VISION 2030
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المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

كلية العلوم التطبيقية
Faculty of Applied Sciences

UMM AL-QURA UNIVERSITY

مشــــاريـــع التخــــرج

لطلاب وطالبات كلية العلوم التطبيقية

1440-1441هـ

محتــويـات الكتـيب

الحمد للّه والصلاة والسلام على المبعوث رحمة للعالمين سيدنا محمد وعلى آله وصحبه اجمعين

دأبت كلية العلوم التطبيقية كل عام على عمل معرض تحتفي فيه بمشاريع التخرج الطلابية ايماناً بأهمية مقرر مشروع التخرج حيث انه يعطي انطباعاً عن المخرج النهائي للكلية بعد رحلة لسنوات قضاها الطالب او الطالبة في قاعات ومعامل كلية العلوم التطبيقية ينهل من منابع العلم ويعد نفسه لتطبيق النظريات والتجارب العلمية على مشاريع بحثية تعود بالنفع على المجتمع وتكمل لبنات بنائه واعداد الاكاديمي لينخرط في سوق العمل بعد تخرجه وهو قادر على التفكير الابداعي ولديه المهارة اللازمة لوضع الحلول والمقترحات للمشكلات التي يوجهها.

ويقام هذا العام معرض مشاريع التخرج "الثاني" لطلاب وطالبات كلية العلوم التطبيقية في ظروف استثنائية حالت بيننا وبين عمل المعرض بشكله الاعتيادي، ولكن رغم هذه الصعوبات تم عرض مجهود الطلاب والطالبات من خلال الملصقات العملية تقديراً من كلية العلوم التطبيقية لابراز انتاجهم العلمي تحت اشراف أعضاء هيئة التدريس الذي يشكل مصدر فخر لنا.

ختاما نسأل اللّه عز وجل التوفيق والسداد وان يكلل جهود ابنائنا الطلاب وبناتنا الطالبات بالنجاح وان يحفظهم ويحفظ وطننا الغالي من كل مكروه وان يكشف عنا هذا الوباء.

والّه الموفق والمستعان

عميد كلية العلوم التطبيقية
د. حاتم بن محمد الطس

الحمد لله الذي بحمده تتم الصالحات والصلاة والسلام على خير خلق الله محمد عليه أفضل الصلاة وازكى التحيات   وبعد

انطلاقا من أهمية البحث العلمي في عالمنا الحاضر فقد أصبح ولايزال هو السبب الرئيسي بعد الله سبحانه في تقدم الشعوب وتنافسها في تحقيق الانجازات العلمية التي تخدم المجتمعات وتحل الكثير من المشاكل التحديات التي تواجهها.

ونحن اليوم نعيش فترة استثنائية COVID-19 وامام مشكلة أوقفت العالم بأسره وأصبح بانتظار حل من العلماء والباحثين في مختلف التخصصات لا سيما العلوم الأساسية والطبية.

وكلية العلوم التطبيقية تأتي ضمن احدى كليات الجامعة العلمية التي تتميز بمشاركتها الفاعلة في مجال البحث العلمي والتي حرصت في تعليم أبنائها الطلاب والطالبات اساسيات البحث العلمي وادواته الصحيحة من خلال مقرر مشروع التخرج الذي تم ادراجه في كافة برامجها الاكاديمية المعتمدة دوليا من قبل هيئة الاعتماد الألماني ASIIN.

وتحرص الكلية بجميع اقسامها في كل عام ان تولي مقرر مشروع التخرج الأهمية البالغة ايمانا من كافة أعضاء هيئة التدريس ان هذا المقرر يؤسس وينمي لدى الطالب فكرة البحث العلمي والابتكار ويجعله قادرا على التعامل مع مصادر المعلومات بطريقة صحيحة لتساعده في بناء وتطوير الأفكار البحثية مستقبلا وتجعله قادرا على المساهمة في بناء مجتمع العلم والمعرفة من خلال سوق العمل بعد تخرجه خدمة لهذا الوطن الغالي على قلوبنا.

في الختام أتقدم بوافر الشكر والتقدير للزملاء والزميلات المشرفين على مشاريع التخرج لما بذلوه من جهد مضاعف خلال هذا الفصل الدراسي في ظل الظروف الحالية وتذليل الصعوبات والتحديات التي واجهت ابناءنا الطلاب والطالبات واكمال ما تبقى من مهام ومهارات بتفعيل التعلم الالكتروني عن بعد وحرصهم الواضح لتطوير قدراتهم العلمية والبحثية.

اشكر ابناءنا الطلاب والطالبات على هذا الجهد الرائع وعلى هذه الأفكار العلمية المتقنة والتي تم إخراجها من خلال الملصقات العلمية بشكل منظم يليق بطلاب وطالبات كلية العلوم التطبيقية.

الشكر والتقدير لمعالي مدير الجامعة أ.د.عبدالله عمر بافيل لما يقدمه من دعم واهتمام لكلية العلوم التطبيقية وطلابها فجزاه الله خيرا.

الشكر الجزيل لسعادة المشرف على اعمال وكالة الجامعة للشؤون التعليمية د.أحمد عمر با بلغيث على حرصه واهتمامه الدائمين بمتابعة العملية التعليمية وكل ما يختص بدعم مشاريع تخرج طلاب وطالبات البكالوريوس.

شكري وتقديري لعميد كلية العلوم التطبيقية د.حاتم محمد الطس لتوجيهه المثمر ومتابعته المستمرة لكل ما يخص وكالة الكلية للشؤون التعليمية واهتمامه الكبير بطلاب وطالبات كلية العلوم التطبيقية.

والله الموفق...

وكيل كلية العلوم التطبيقية للشؤون التعليمية

د. اسماعيل بن إبراهيم الثقفي

بسـم اللّه والحمد للّه والصلاة والسـلام على نبي الرحمة، ومنار الهـدى محمد بن عبد اللّه وعلى آله وصحبه ومن والاه

ان الحاجة الى الدراسات والبحوث والتعلم لهي اليوم اشد منها في أي وقت مضى. فالعلم والعالم في سباق للوصول الى أكبر قدر ممكن من المعرفة الدقيقة المستمدة من العلوم التي تكفل الرفاهية للإنسان، وتضمن له التفوق على غيره.

واذا كانت الدول المتقدمة تولي اهتماما كبيرا للبحث العلمي فذلك يرجع الى انها ادركت ان عظمة الامم تكمن في قدرات ابنائها العلمية و الفكرية و السلوكية. والبحث العلمي ميدان خصـب ودعامة اساسـية لاقتصاد الدول وتطورهـا وبالتالي تحقيق رفاهية شـعوبها. وقد اصبحت منهجية البحث العلمي واساليب القيام بها من الامور المسلم بها في المؤسسات الاكاديمية و مراكز البحوث، بالإضافة الى انتشـار اسـتخدامها في معالجة المشكلات التي تواجـه المجتمـع بصفة عامة، حيث لـم يعد البحث العلمـي قاصرا علـى ميادين العلوم الطبيعية وحدها.

لذلك فــان الابحاث التـي يعدها الطالـب الغاية منها تعويـده على التنقيب عـن الحقائق واكتشـاف آفاقا جديدة من المعرفـة والتعبير عـن آراءه بحرية وصراحـة. ويمكن تلخيص الاهداف الرئيسية لكتابة الابحاث الى جانب ما ذكر في :

1 - اثراء معلومات الطالب في مواضيع معينة.

2 - الاعتماد على النفس في دراسة المشكلات واصدار احكام بشأنها.

3 - اتباع الاساليب والقواعد العلمية المعتمدة في كتابة البحوث .

4 - التعود على اسـتخدام الوثائق والكتب ومصادر المعلومـات والربط بينهم للوصول الى نتائج جديدة.

5 - التعود على معالجة المواضيع بموضوعية ونزاهة ونظام في العمل .

6 - التعود على القراءة وتحصين النفس ضد الجهل.

وتهدف الجامعـة الى ربط البحـث العلمي بأهـداف الجامعة وخطط التنميـة، والبعد عن الازدواجية والتكرار والإفادة من الدراسـات السـابقة. وتنمية جيل من الباحثين السـعوديين المتميزين وتدريبهم على إجراء البحوث الأصيلة ذات المستوى الرفيع وذلك من خلال اضافة مشاريع التخرج الى خطط الكليات للارتقاء بمستوى التعليم الجامعي.

وكيلة كلية العلوم التطبيقية
د. رجاء بنت طـاهر معتـوق

تأتي مشـاريع التخرج لطلاب وطالبات كلية العلوم التطبيقية كل عـام ضمن أولويات الكلية لابراز الجهد الرائع الذي يقوم به الطلاب والطالبات بإشراف أساتذتهم في مختلف البرامج الأكاديمية

وهذا العام تم وللّه الحمد تقديم 119 ملصق علمي ناتجة عن مشاريع التخرج حيث يعتبر هذا الإنتاج أكبر

دليــل على الجودة التي تطبقها الكليــة من ناحية تعليمية في تقديم هذا المقــرر وتحقيق أهدافه في التأســيس الصحيح والمبني على أسس علمية لتعليم الطلاب أدوات البحث العلمي وكيفية الحصول على المعلومة من مصادرها العلمية وتحليلها وكتابة النتائج ومناقشتها.

وقد كان مجموع عدد الطلاب والطالبات لهذا العام ما يقارب 477 طالب وطالبة وشـارك في الاشراف 68 عضو هيئة تدريس من شطري الطلاب والطالبات

ووكالة الكلية للشــؤون التعليمية تضع بيــن ايديكم هذا الكتيب للملصقات العلمية Posters لأقسـام الكلية الاحيـــاء والكيمياء والفيزياء والعلوم الرياضية ابرازا للجهود المبذولة راجين من اللّه ان ينتج من هذه المشــاريع البحثية ما يتم نشـره في مجـلات علمية عالمية ومحلية للمسـاهمة فــي تقديم الأفضل لجامعتنا ام القرى ولمجتمع مكة المكرمة.

الأقســـام
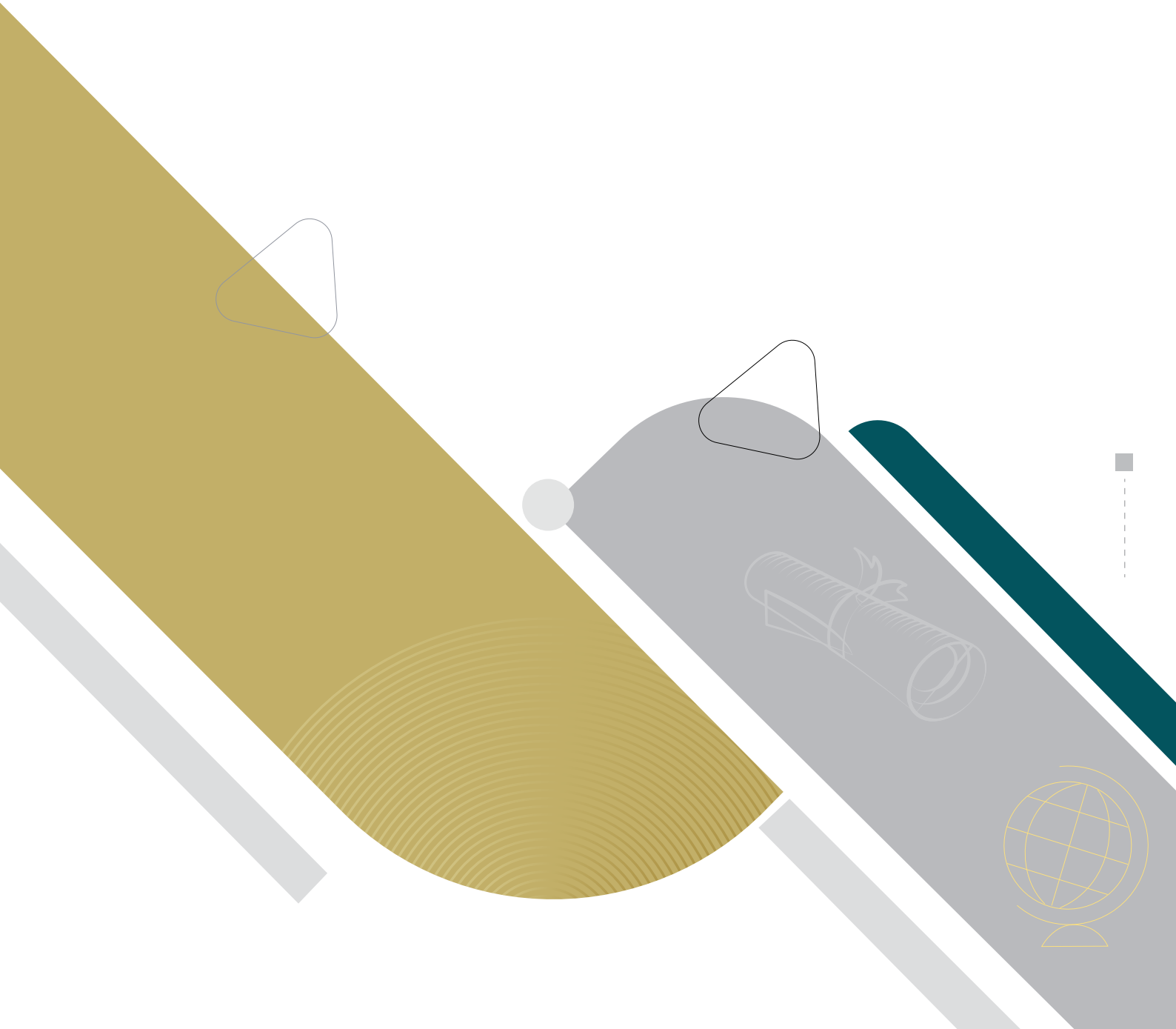
مشـاريـع تخـرج
قسـم الأحيـاء

الحمد لله حمدا كثير تطيب به كل المعطيات مباركة أينما وجدت في قسم الأحياء الذي تميز بمشاريع تخرج ثرية كحصيلة للسنوات الدراسية للطلاب لتكن بإذن الله شاهدا لهم مثرية لسيرتهم الذاتية وحياتهم العملية المستقبلية.

تتميز مشاريع التخرج بأسلوب علمي رصين ومنهجية بحثية مقننة التي تساهم في اكساب الطلاب الخبرات العلمية والمهنية والشخصية المختلفة على الصعيد العملي و المعرفي.

د. ياسر بن عايش المروعي

الحمد لله رب العالمين أن جعلنا من أمة ودين كرم العلم والعلماء، نضع بين يديكم 21 ملصق تمثل مشاريع التخرج لطالبات قسم الاحياء دفعة 1437، وخلاصة عمل دؤوب بذلت فيه المشرفات على المشاريع قصارى جهودهن لغرس روح البحث العلمي في نفوس الطالبات وارشادهن الى طرقه السليمة، وقد شملت هذه المشاريع موضوعات مهمة وحديثة في تخصصات البيولوجيا مثل:الهندسة الوراثية، تطبيقات الجيل الثاني من تسلسل الجينوم، ثورة CRISPR وتطبيقاتها، المناعة، أمراض الدم وطرق مقاومة الخلايا السرطانية.

د. وداد بنت سليم الجهني

قسم الاحياء

الاحياء	القسم
19	عدد الملصقات العلمية (طلاب)
21	عدد الملصقات العلمية (طالبات)
25	عدد الطلاب
104	عدد الطالبات
4	عدد المشرفين
10	عدد المشرفات

(Posters)

الملصقات العلمية

لمشـاريع التخـــرج

قســم الاحيـــاء

(طـــلاب)

Early embryonic development of Oreochromis spilurus (Actinopterygii-Cichlidae). IV- Differentiation of nervous system and formation of eye layers.
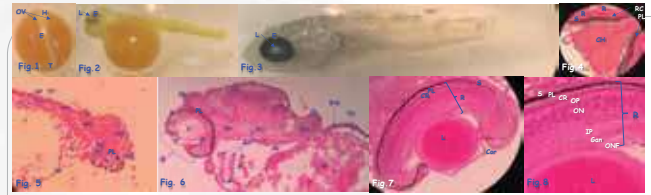
Alzahrani, A.A.[1] and Aldhiyabi, S. B.[1]
Under Supervision: Prof. Osama Mohammed Sarhan[1,2]:
1.Department of Biology, Umm Al-Qura University, KSA, April, 2020
2.Department of zoology, Fayoum University, Egypt.

Abstract

4th part of a graduation project: Development, anatomy and histology of *Oreochromis spilurus,* including cleavage, gastrulation, neurulation and some larval stages were visualized by microscopes using fixed embryos and hematoxylin and eosin stained sections. The brain regions of *O. spilurus* include five main regions with large cerebrum. A Large optic cup was observed. Eye retina showed well developed layers "7 layers" with thin outer plexiform layer and thick inner plexiform layer and outer nuclear layer. The obtained results were discussed and compared with some published data. In prospective studies, We will tracing the regulators that control the formation of lens placode, neuronal layers of retina to detect the diversity and deviation in the detail of microscopic structures in the eye of cichlids specially the five differentiated parts of choroid that were distinguished in many teleost species.

Keywords: Embryogenesis, cleavage, gastrulation, neurulation, retinal layers.

Introduction

Infraclass Teleostei classified belong class Actinopterygii (ray-finned fishes) that contained most fresh water bony fishes. The teleost *O. spilurus* had a large premaxilla with special musculature to protrude and move them outwards from the mouth for grab and draw their preys into mouth[1]. Mostly, females were oviparous, fertilization was external, and has the ability to parental care by fasting for collecting their eggs until they hatching then carried them here and there for protection.[2] Deserted publications related to the neurology of fishes, which represent 1% of all studies.[3] Other publication studied the relation between brain regions and their functions.[4] Fish-brain formed of forebrain "prosencephalon", midbrain "mesencephalon" and hindbrain ""metencephalon". The former consists of telencephalon contains two olfactory lobes, cerebrum and diencephalon that involves epithalamus, thalamus and hypothalamus. Mesencephalon consists of two optic lobes, which are connected internally with torus longitudinalis and medially with the torus semi-circularis, and optic tegmentum. The metencephalon formed of cerebellum and myelencephalon "brain stem". The ventricular system in the fish brain comprise the olfactory and lateral ventricles in the fore-brain; the third ventricle in the mid-brain, while the fourth ventricle in the hind-brain.[4] Postnatal investigations proved that potential neurogenesis was a progressive phenomenon in fish brain, However, the most active regions in fish brain neurogenesis was reported in the olfactory lobes, optic tectum and cerebellum of zebrafish and carp fish.[5-8] Other teleosts showed regressed telencephalon regression, but noticeable developing regions described in optic tectum, corpus cerebellum and mechanoreceptive zone, in addition, duplex cone-rod retinae in their large eyes[9].

This work aimed to investigates early developmental stages of *O. spilurus*, including blastulation, gastrulation, neurulation and differentiation of the anatomical brain regions, in addition to know the histology of eye, especially the inter-neuronal layers of eye retina.

Methods

The Embryos, larvae and juveniles were used in the present investigation. Embryonic samples and histologic paraffin sections (6µ) were prepared, stained with Hematoxyline & Eosine (H&E), then examined with light microscopy.

The present poster "4" concerned with the study of nervous system and eye formation.

Results

The development of teleosts is unique due to their telolecithal eggs, which explain meroblastic cleavage. Cleavage were rapid (15-20 min each). The obtained cells maintain in connection with the underlying yolk cell. These cleavage cells "termed morula stage" continued forming a blastodisc that grow to cover the animal pole with small central subgerminal cavity and the marginal cells attached to the yolk cell called outer "enveloping" and inner syncytial layers. Late cleavage led to formation of blastula stage (2-5 hrs post fertilization "hpf"). After blastulation, trilaminar gastrula formed (5-10 hpf) followed by the formation of the embryo to form a localized thickening, the embryonic shield that extended anteriorly to form a narrowing primitive streak with two lateral folds. Consequently, the mid-dorsal line of epiblast "ectoderm", hypoblasts "mesoderm & endoderm", in addition, the adjacent bilateral undifferentiated mesoderm. In front the primitive streak, the epiblast form a narrow longitudinal neural groove with two bilateral neural folds that fused to form a hollow neural tube. Also, the hypoblast differentiated into the precursors of chordamesoderm, and the paraxial mesoderm cells of the mesodermal somites, while the inner endoderm formed the precursors of gut-wall. Five brain regions were formed anteriorly with the formation of two bilateral stalks having terminal swollen called optic vesicles. Both vesicles invaginated into two optic cups. The outer margins of optic cups attached with head ectoderm who form the lens placode. The later, separated into eye lens, the ectoderm form eye cornea, while the inner lining layer of both optic cups differentiated into retinal layers. Brain regions include olfactory lobe, two cerebral hemispheres, two optic lobes, cerebellum and medulla oblongata. 7 Layers observed in eye retina; pigmented "PL", rod-cone "CR", outer plexiform "OP", outer nuclear "ON", thin inner plexiform "IP", Ganglion cell layer "Gan", and optic nerve fibers "ONF", respectively.

Legends of figures: Figure 1: showed an early embryo with small head and two swollen optic vesicles; 2: newly hatched larva showed eye ball and centrally situated eye lens; 3: lateral view of fully developed eye in a juvenile fish; 4: Horizontal section showed two cerebral hemispheres between left and right eye balls; 5&6: showed two Sagittal sections in both left and right sides to illustrate the anatomical regions of the brain and different layers of right eye; 7: Horizontal section clarified the microscopic structure of right eye; and 8: Magnified micrograph from figure 7 demonstrated the 8 layers of eye retina. Abbreviations: Ce: Cerebellum; Cor: Cornea; CR: Cone-rod layer; E: Eye; EL: Eye lens; G: Gills; GA: Gill arches; Gan: Ganglionic layer of retina; I: Iris; IP: Inner nuclear layer IP: Inner plexiform layer; L: Lens; MO: Medulla oblongata; Nc: Notochord; ON: Outer nuclear layer of retina; ONF: Optic nerve fibers; Op: Optic lobe; Ph: Pharynx; Pi: Pituitary gland; PL: Pigmented layer; R: Eye retina; S: Sclera "skeleton of eye ball"; SCo: Spinal cord; YG: Yolk granules; YS: Yolk sac.

Discussion

Discussion: The 5 brain region was in agreement with that described in other teleosts[11,12&16]. The infoldings of a hollow neural tube relied on interactions between extrinsic signaling factors and intrinsic transcription factors that act permissively to established the fate of neural tissue in the dorsal ectoderm and enables the formation of the neural plate[17]. As regard to retinal sublayers, Kimmel et al (1995) described 4 layers only in zebra fish, which include the inner ganglion cell layer, inter-neuronal layers, and the outer layer of photoreceptor cells just deep to the retinal pigment layer.[12]

Recommendation

In prospective studies, We will tracing the regulators that control formation of lens placode, neuronal layers of retina to detect the diversity and deviation in the detail of microscopic structures in the eye of cichlids specially the five differentiated parts of choroid that were distinguished in many teleost species.

Acknowledgments

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Study the effect of constant and variable temperature and determine the optimum thermal range and water requirement for seed germination of the *Vicia Faba*

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Abstract

1- The Kingdom, despite its lack of abundant water, indicates that it is suitable for growing crops, including Vicia Faba
2- The *Vicia faba* is light-loving
3- The *Vicia faba* loves moisture
4- The Kingdom follows the policy of agricultural sufficiency
5- Reasons for *Vicia faba* growing in Saudi Arabia

Introduction

Benefits of beans:
Helps form red blood cells and maintain bone strength. It strengthens the immune system and protects the body from various diseases. Bean scales help treat constipation. Helps remove excess body pigments, especially melasma and freckles. Bean blossoms are used to increase diuresis.Nutrients in beans It contains high levels of protein and dietary fiber. Beans include growth hormone, which is called human growth hormone, and it helps to revitalize and revitalize muscles after doing exercises or any stress, and the beans do not contain any saturated fat. Reasons for growing beans in the KingdomAmong many environmental factors, temperature is the most important factor regulating the maximum bean germination rate and germination rate (Heydecker, 1977). The prevailing soil temperature determines both the parts of the seeds in the specimen that germinate and the germination rate. To complete a certain stage of development, bean germination requires temperatures that may be different for each development period (Ramen, 1997). The part of the seed that grows and the germination rate usually remains constant over a wide range of temperatures, sometimes 20 ° C or more, and drops sharply on both sides of this range (Thompson, 1970). Germination rate usually increases linearly with temperature, at least within a well-defined range in which the germination rate is higher. Much progress has been made . Roberts (1988) summarized the history of planting and germination, which linked the rate of germination to temperatures. Many researchers have shown that the basic temperatures of germination depend on the species and within the species vary greatly between genotypes. Moderate crops generally germinate between 0 and 35 ° C while tropical crops arebetween 10 and 45 ° C (Mwale et al., 1994). The effect of temperature on seed germination rate and heat time was studied.

Water Resources:
The Kingdom of Saudi Arabia is one of the largest producers of desalinated water from sea water. Seawater desalination, 24 of which are on the West Coast and also known for drawing from surface water and groundwater at 936 percent of total renewable water resources. Groundwater resources in Saudi Arabia are being depleted at a severe rateSpeed Most of the water comes from the deep fossil layers bearing water, and some predictions indicate that these resources may not last for more than 25 years.

Study the effect of constant and variable temperatures on the germination of the seeds of the bean plant and determination of thermal range and optimum germination level .

Methods

1. We put filter papers in petri dishes
2. Divide the dishes into two groups , each group has 20 dishes It is divided into five factors contain 4 dishes for each one first group for constant temperature degrees and the second group for variable temperature degrees
3. Sterilize the *Vicia faba* seeds in sterilization solution for 15 minutes , then wash it with distilled water several times .
4. Put 25 seeds for each dish
5. Put 10 ml from distilled water inside each dish .
6. Set incubators to the temperatures mentioned in point (2) and separate the dishes over the incubators .
7. Every three days we add distilled water to all samples .
8. Record the results of germination obtained daily
9. Calculate the average of each value and the standard deviation of its averages .

Results

At a temperature as low as 5 ° C, there is absolutely no germination of *Vicia faba* seeds.

Seeds at a temperature of 5 ° C

From our experience we found germination at a constant temperature (15 ° C) and at a constant temperature (25 ° C), and there was no germination at all other different temperatures.

Seed at a temperature of 25 ° C.   Seed at a temperature of 15 ° C.

With regard to variable temperatures:We found that germination occurred in the: (8) at a temperature of (8/18C)and at the temperature (10/21˚C).

Seed at a temperature of 8/18 ° C.   Seed at a temperature of 10/21 ° C.

temperatures 14/28 C , 21/36 C and   (26/41C) , we have absolutely no germination of *Vicia faba* seeds

14/28C   21/36C   26/41C

Table (2) Result of germination for variable temperature :

Table (1) Result of germination for constant temperature :

Discussion

At high temperatures: the temperature evaporates the water in a petri dish and thus lacks water in the vicinity of the seed and absorbs very little water. At lower temperatures: the viscosity of the water increases and its kinetic energy decreases, which also reduces the process of absorbing water high. temperatures influence on the seeds:
a - The hydrolysis enzymes inside the seeds that inhibit their action by forming new and strong covalent bonds between the various polypeptide chains which make a change in the shape and structure of the active sites in them .
b- The high temperature increases the permeability of the cell membranes for cells and organelles, so the concentration of toxic substances increases in the cells of the seed embryo .
c - There is an assembly of the protoplasm, where heat has a destructive and negative effect on the cytoplasm .
d - The higher temperature than the optimum for germination and growth increases the liquidity of the lipid that make up the cell membranes

Recomendations

Emphasizing the importance of this kind of experiments that study the effect of different environmental factors and environmental stresses on the germination and growth of crop plants, which are considered a component of food security.
Emphasizing the issue of taking into account the water requirements of agricultural crops, given its great role in reducing waste and excessive depletion of water sources in light of the shortage of water in the Kingdom and the region.
Also, these kinds of experiments are relatively few in the Kingdom of Saudi Arabia, especially field experiments. We recommend making more field experiments of crop plants for self-sufficiency and enhancing national food security , and discussed ways to develop crop cultivation, especially *Vicia faba* in the Kingdom of Saudi Arabia .

Acknowledgments

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Stress and seed germination: an agronomic view.

Tyrosinase inhibitor activity of some medicinal plants extracts (Water extracts)

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Abstract

Skin color is the main contributor to human beauty, melanin is a human pigment responsible for skin color, Skin lightening has become an important stereotype, in both pharmaceuticals and cosmetics. The plants and their extracts are rich and inexpensive resources for the active compounds that can be used to inhibit the activity of the enzyme tyrosine. Six plants were evaluated for their inhibitory effect In the lab and she is (Solanum melongena .. Black and white, Lupinus termis, Trigonella fonieum-graecum, Zizyphus spina-chresti, citrus lemon) Mushroom was used as a source for tyrosinase The enzyme operates on two substances Tyrosine and L-DOPA, Tyrosine was chosen because of its availability We tested these six plants in the laboratory where they showed inhibition concentrations in different proportions, the highest being citrus lemon with 89% and Lupinus termis at 87%, then Zizyphus spina-chresti with 83%, then Solanum melongena black with 82%, followed by Solanum melongena white at 80%, and finally Trigonella fonieum-graecum at 79%. Therefore, we recommend the use of Citrus lemon in cosmetics, and that this research needs a more future study.

Introduction

Skin color is a major contributor to human beauty and attractiveness (Costin and Hearing, 2007), Melanin is a human pigment responsible for the colour of eyes, hair and skin. It is produced and secreted, through a physiological process called melanogenesis, by the melanocytes, which are distributed in the basal layer of the dermis. There are two types of melanin pigments produced by the melanocytes: eumelanin, black or brown, and pheomelanin, red or yellow. The colour of human skin and hair is determined by the type and distribution of melanin pigment. Each individual of the different racial groups have, in general, the same number of melanocytes; thus, the type of melanin produced depends on their functioning, i.e., people with darker skin are genetically programmed to constantly produce higher levels of melanin (Mapunya et al 2012), Skin-whitening products have become increasingly in demand in the past few years. The main purpose for skin-lightening products is to lighten the skin as well as to even out skin tone or to treat pigmentation disordersuch as freckles, melasma, pregnancy marks, and age spot (Zhai and Maibach, 2001), Melanin is the main component responsible for the darkening of the skin and hair, and plays an important role against ultraviolet (UV) ray damage. However, the accumulation of an excessive level of melanin can cause skin damage, such as age spots or malignant melanoma. It has also been associated with Parkinson's disease (Hasegawa, 2010), Therefore, tyrosinase inhibitors are important in cosmetics (hyperpigmentation), medicinal products, and food industries. To date, despite the existence of a large number of tyrosinase inhibitors, only a few are marketed as safe (Chiari et al 2010 , Adhikari et al 2008), Although natural ingredients have been traditionally used for centuries for skin care purposes, they are becoming more prevalent in contemporary formulations (Fowler 2010), Natural plant molecules remain particularly interesting for new research. However, the use of extracts requires paying special attention to the extraction methods, plant-to-solvent ratios and the content of active ingredients (Aburjai and Natsheh, 2003), Numerous approaches have been attempted to find chemicals that inhibit the catalytic activity of tyrosinase, and disrupt the synthesis or release of melanin pigments. Many of these compounds have a tyrosinase inhibiting activity, leading to the decrease of melanin total production. Kojic acid, arbutin and different kinds of vegetal or herb extracts are some of the tyrosinase inhibitors used today (Gillbro and Olsson, 2011) , Tyrosinease also works as hydroxylase and oxidase , it can convert tyrosine to DOPA and can convert DOPA to dopaquinon . (Hearing et al., 1982) .

Thus, those who have preceded us in this field have used many plants .. And based on our questioning of me and my group in the perfume and market stores, we have identified several plants for us, so we decided to choose some of them and experiment with them and see whether the enzyme is discouraged or not and we ask God to help us and these plants are:
Black Solanum melongena.
White Solanum melongena.
Lupinus termis.
Trigonella fonieum-graecum.
Zizyphus spina-chresti.
Citrus lemon.

Objective

Several medicinal plant extracts are used and tested for their efficacy in inhibiting tyrosinase
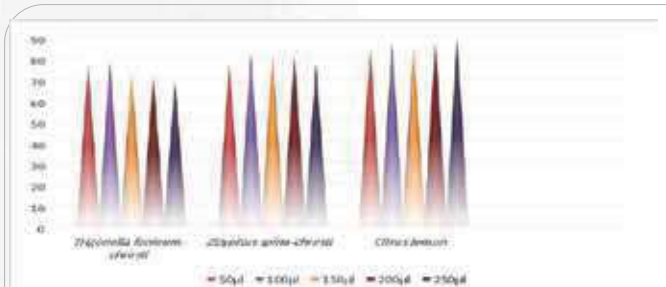
Results

After examining the medicinal plant extracts in the laboratory, the results showed different rates of inhibition , the highest of which was Citrus lemon at a concentration of 250% 89, followed by a Lupinus termis at a concentration of 250% 87, followed by a plant Zizyphus spina-chresti at a concentration of 100% 83, followed by a plant Solanum melongena Black at The concentration of 100% is 82%, followed by the plant Solanum melongena white at a concentration of 250% 80, followed by the lowest plant, the concentration is the plant Trigonella fonieum-graecum at a concentration of 100% 79.

Discussion

By Looking at the results of medicinal plant extracts, it became clear to us that Citrus lemon represented the highest inhibition rate at a concentration of 250µl at 89%, and that the plant Trigonella fonieum-graecum represented the lowest inhibition rate at a concentration of 250µl at 79%And it turns out that the plant, (Solanum melongena ..Black and white , Lupinus termis, Zizyphus spina-chresti,) represent close inhibition ratios.

Conclusion

Six medicinal plants were selected and tested in the laboratory to see their activity and tested in inhibiting the tyrosine enzyme in order to support skin whitening. All plant extracts were evaluated in the possibility of inhibiting the tyrosine enzyme in the laboratory, and among the plants it was found that Citrus lemon was the best in inhibiting the enzyme tyrosine, and it was found that Trigonella fonieum-graecum , plant is the least able to inhibit the tyrosine enzyme, so we recommend using Citrus lemon as a substitute for bleaching preparations, and we do not recommend using Trigonella fonieum-graecum plant.

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STUDIES ON THE ROLES OF SPLICING REGULATORS (SR30, SR33, AND SR45a) IN SALT STRESS RESPONSE IN ARABIDOPSIS THALIANA

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Abstract

RNA splicing is a vital gene expression regulatory mechanism that mediates several biological functions in plant including plant development and stress responses. Serine Arginine rich proteins (SR protein) play a central role in splice site selection and other RNA metabolism. Here, we aimed to study the role of SR30,SR33, and SR45a in plant salt stress responses. Salt stress is worldwide agricultural problem. Therefor, we used genetics analysis in *Arabidopsis thaliana*, as model organism, to assess the loss of function of *sr30*, *sr33* and *sr45a*. We show that sr30, sr33and s45a have different phenotypic response under high salt stress. In addition, we found also those mutants exhibit different senescence phenotypes when growing under long day condition. Our results indicate the importance of SR30, SR33, and SR45a in stress response and plant development.

Introduction

Abiotic Stress in plants

Stress in plants can be defined as any external factor that negatively influences plant growth, productivity, reproductive capacity or survival. This includes a wide range of factors which can be broadly divided into two main categories: abiotic or environmental stress factors, and biotic or biological stress factors. Biotic stress is pathogen like fungi and insect and micro organisms

My project focus on salt stress ,Salt stress is one of the major abiotic stresses limiting crop production especially in arid and semi-arid regions. Salt stress inhibits seed germination and water uptake , inhibits root growth and cell elongation , inhibits leaf growth and new leave production , leaf senescence , oxidative stress , inhibits protein synthesis , inhibits enzyme activity inhibits photosynthesis , yield reduction.

SR proteins

Serine and arginine-rich (SR) proteins are a conserved family of proteins involved in RNA splicing . As splicing is linked to transcriptional and post-transcriptional steps, SR proteins are implicated in the regulation of multiple aspects of the gene expression program.

SR and stress response

SR protein have been shown to involved in different stress pathways. SR proteins play a vital roles in salt stress, though, we aimed here to screen the response of different SR mutants to high salt stress. These mutants include sr30 , sr33, and sr45a which have not been investigated yet in response to salt stress.

Objective

Our objective in this project is to characterize the response of SR30, SR33, SR45a mutants to high salt stress.

Results

Salt stress

Lines of WT, sr30, sr33, and sr45a were sterilized and growing on M.S media and M.S supplemented with 100mM NaCl with concentration 100mM. The response of these lines to salt stress were characterized as below .

Germination Response

Germination rate of all lines were calculated on the second day of planting. All mutants line show early germination compared to WT. This result indicate the negative role of SR30, SR33, and SR45a in salt tolerance at early growth stage in Arabidopsis.
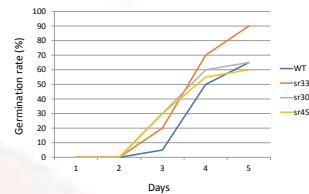
Roots Growth

Root size were measured under salt tress and normal growth condition. Mutant lines displayed different salt stress root growth response . However, the single mutant did not show signficant root growth reduction suggesting there is a redundancy between them. Duoble and triple mutants could resolve this in future .

MS   100mM NaCl
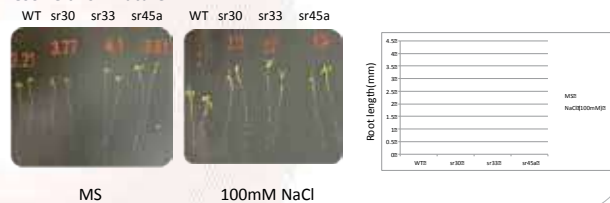
Discussion

Our results clearly show that mutants of sr30, sr33, and sr45a tolerate salt stress than WT at germination and seedling stages. However, this result suggested there may be an interaction between these three splicing factors in response to salt stress, triple mutants in the future will help to address this idea. Our result and   previous reported findings indicate the importance of splicing mechanism in salt stress tolerance mechanism.

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Early embryonic development of Oreochromis spilurus (Actinopterygii–Cichlidae). II- Fertilization, cleavage, gastrulation, formation of primitive streak until hatching.

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Abstract

2nd part of a graduation project. The present part study the anatomy and histology of early developmental stages of Oreochromis spilurus, neurulation and some larval stages were visualized and describes using dissecting and light microscopes using fixed embryos and hematoxylin-eosin stained sections. The obtained results were discussed and compared with other teleosts. We recommend that, it will necessary to make stereotaxic atlas for the embryos of the present species.

Keywords: Embryogenesis, Neurulation, bony fish, developmental histology, teleosts.

Introduction

The tilapia, Oreochromis spilurus, was widely used in fish production in Jeddah coast at western region of Saudi Arabia. This species considered as one of the main fisheries in our country. Commercially, In Arabia, the fluctuation of table size of O. spilurus agreeing to the local consumers and, in general ranges from 150 up to 500 g. In a fish research center at Salman-gulf "Northern coast of Jeddah city", about million fries of the present species was produced in seawater for fish farms in order to satisfy the local market. Studies on the tilapia species interested in mass production, hormonal sexual reversion or nutrition under different experimental conditions.(1-4) However, there is scarce information describing the developmental stages of the present species. Thus, our team try to study the developmental stages after fertilization until fry stage.

The aim of the present work focus on studying the early embryonic development of Oreochromis spilurus. We hoped to help other investigators for manipulate and apply advances embryological experiments. Otherwise, we tried to achieving our team in the present graduation project to complete their objectives according to the project protocol.

Methods

Adult ♂ and ♀ fishes, were used to produce fertilized eggs and embryogenesis under controlled temperature (25-27°C). After fertilization eggs were collected for incubation as described by Abdulkadhim, et.al.(2015). Fertilized eggs were distributed into 4 flasks (1liter size) provided with slow current oxygenated water flow. Samples were immediately fixed for anatomical and histological studies. Group 1 formed of fixed embryos 2-12hrs incubation; Group 2 fixed embryos 12-24hrs incubation; Group 3 involved fixed incubated samples form 24-48hrs; Group 4 involved fixed samples of hatched larvae and small juveniles. Selected samples from each group were sub-grouped for anatomical examination using stereo-microscope and the other processed for histological examination by light microscope using H&E staining technique(6).

The present poster II a part of graduation project to investigate early stages, zygotes, blastulation, gastrulation and formation of primitive streak and the early embryos.

Results

Females of O. spilurus have two separate ovaries, connected with two oviducts that open into swollen genital papilla "GP" of the female (Fig. 1). Fish eggs corresponding that of birds were of telolecithal type. Thus the cleavage was meroblastic "partial cleavage". Zygotes surrounded by chorion as a fertilization membrane (Fig. 2A). Embryonic stages include cleavage, gastrulation, epiboly, primitive streak formation, neurulation followed by the embryonic formation that end with hatching into growing larvae into juveniles "fry stages". Figure 2 and 3 showed different samples of these stages from zygote until fry stage. Zygote undergoes rapid cleavages (cell divisions) to produce a cluster of daughter cells called morula stage that formed of 32-64 blastomeres at the animal pole. Cleavage of morula stage ends by the formation of blastula stage that formed of thin layer of blastomeres that were separated from the yolk mass by a subgerminal cavity "SC". The periphery of this germinal disc was attached to the yolk cells "YC", while the central region showed small subgerminal cavity (Figs. 5&6). Histologically, the germinal disc appeared as a thin layer of blastomeres called epiblast and a subgerminal cavity, which represents a blastocoel (Fig. 7). Blastula grown to form trilaminar structure (ecto, meso and endodermal layers) that begun differentiation to establish cell lineages to set up the basic axes of the fish embryos and internal organo-systems.
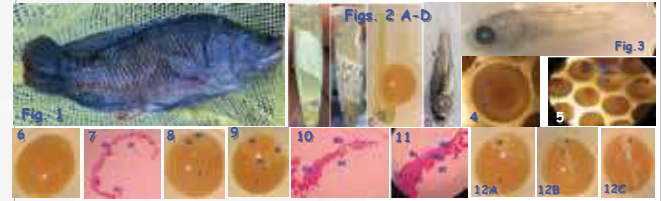
Legends of figures: Fig. 1: female with enlarged genital papilla "GP"; Figs. 2A-D: samples of some embryonic stages, larvae and juvenile; Fig. 3: Juvenile; Fig. 4: zygote; Fig. 5: Morula "M" & blastula "B" stages; Figs. 6-7: Magnified blastula and T. S; Fig. 8: Gastrula, GD: germinal disc, SC: subgerminal cavity; Figs. 9–11: early primitive streak "EP" and Transverse section; Figs. 12A-C: Embryos "E" formations with early head "H" and tail bud "T".

Discussion

Zupanc, (2006), described 5 stages; namely embryonic phase, larval phase, fry phase, rib phase and Senescent phase. The present work deals with the morphogenesis in first three stages with some histological evidence.

Recommendation

Thus, our team try to study the developmental stages after fertilization until fry stage. The authors suggested that the present species need more investigation for staging and designing an standard embryonic atlas for other cichlids.

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Study the effect of constant and variable temperature and determine the optimum thermal range and water requirement for seed germination of the *Vicia faba*

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Abstract

The *Vicia faba* plant is considered one of the most important plants economically and nutritionally and we found that it is affected by the heat and therefore it is not possible to germinate the of *Vicia faba* at temperatures above 25 ° C and less than 8 ° C and the best thermal to germinate the seeds of *Vicia faba* from 10 ° to 25 ° C. Water requirements were important for germination.

Introduction

Water requirements :
Water in its various forms is considered an important factor affecting plant germination, because water plays a sensitive and significant in every stage of plant growth

Benefits *Vicia faba* , Its Nutritional Importance , and Food Security:

Beans help to combat the stress that may afflict a person as a result of hard work, because of his caloric richness, maintains cholesterol levels in the blood, as it is very beneficial for the heart and blood Nutrients in beans. Beans are a source of minerals, especially copper, phosphorus, iron, magnesium, and potassium, in addition to containing folic acid and manganese. Animal products are the most important source

of protein at the level of all countries of the world, but the lack of availability of these products for many reasons has led to dependence on plant protein sources to supplement or compensate for the deficiency in the daily food of protein that has not yet reached the preventive limit of it, which ranges from 28 32 grams per day. Legumes of all kinds are considered one of the sources that can be relied upon in this regard. Of course, the municipal beans, which contain between 28% - 30% protein, and about 50% carbohydrates is considered one of the most important of this group in general El-Tayeb MA (2006).

The effect of temperature on *Vicia faba* germination:

Vicia faba beans are an important leguminous vegetable due to its high nutritional value and its importance in the various fields of manufacturing. It belongs to the Fabaceae family, which contains about 490 genera and about 12,000 species. It is in the form of trees, shrubs, pergolas, or annual or perennial herbs.. Although environmental conditions were not typical, Saudi Arabia was a backbone Agriculture is of great importance and has been given priority in its various development plans. It is expected to achieve the sector has economic development goals that include food security, diversification of the production base and reduction to Minimal dependence on oil as the main source of national income. It Summer field (RJ 1988).

Beans are cold winter vegetable crops. Its seeds grow at a temperature of 3-8 ° C and tolerate frost seedlings to -4 ° C. The ideal temperature for growth is 20-22 ° C. It is noticeable that the flowers, nodes and fruits are falling at a temperature above 25 ° C. The bean plant is light-loving and its flowering time is affected by the length of the light period the plant is exposed to. It is a moisture-loving vegetable, as it requires 75-80% of the soil's moisture field capacity in critical periods (germination, flowering, fruit nodes and growth). Succeeding in heavy, well-yellow areas with a pH of between 5.5-6.5, and in light lands with a high content of organic matter and a low percentage of lime (Meadadi Bouras, 2004).

Study the effect of constant and variable temperatures on the germination of the seeds of the *Vicia faba* plant and determination of thermal range and optimum germination level and Water requirements.

Methods

1. We put filter papers in petri dishes
2. Divide the dishes into two groups , each group has 20 dishes It is divided into five factors contain 4 dishes for each one first group for constant temperature degrees and the second group for variable temperature degrees
3. Sterilize the *Vicia faba* seeds in sterilization solution for 15 minutes , then wash it with distilled water several times .
4. Put 25 seeds for each dish
5. Put 10 ml from distilled water inside each dish .
6. Set incubators to the temperatures mentioned in point (2) and separate the dishes over the incubators .
7. Every three days we add distilled water to all samples .
8. Record the results of germination obtained daily
9. Calculate the average of each value and the standard deviation of its averages .

Results

At a temperature as low as 5 ° C, there is absolutely no germination of *Vicia faba* seeds.

Seeds at a temperature of 5 ° C

From our experience we found germination at a constant temperature (15 ° C) and at a constant temperature (25 ° C), and there was no germination at all other different temperatures.

Seed at a temperature of 25 ° C.

Seed at a temperature of 15 ° C.

With regard to variable temperatures:We found that germination occurred in the: (8) at a temperature of (8/18C)and at the temperature (10/21 C).

Seed at a temperature of 8/18 ° C.

Seed at a temperature of 10/21 ° C.

temperatures 14/28 C , 21/36 C and   (26/41C) , we have absolutely no germination of *Vicia faba* seeds

14/28C

21/36C

26/41C

Table (2) Result of germination for variable temperature :

Table (1) Result of germination for constant temperature :

Discussion

At high temperatures: the temperature evaporates the water in a petri dish and thus lacks water in the vicinity of the seed and absorbs very little water. At lower temperatures: the viscosity of the water increases and its kinetic energy decreases, which also reduces the process of absorbing of the water. high temperatures influence on the seeds:

a - The hydrolysis enzymes inside the seeds that inhibit their action by forming new and strong covalent bonds between the various polypeptide chains which make a change in the shape and structure of the active sites in them .

b- The high temperature increases the permeability of the cell membranes for cells and organelles, so the concentration of toxic substances increases in the cells of the seed embryo .

c - There is an assembly of the protoplasm, where heat has a destructive and negative effect on the cytoplasm .

d - The higher temperature than the optimum for germination and growth increases the liquidity of the lipid that make up the cell membranes

Recomendations

Emphasizing the importance of this kind of experiments that study the effect of different environmental factors and environmental stresses on the germination and growth of crop plants, which are considered a component of food security.

Emphasizing the issue of taking into account the water requirements of agricultural crops, given its great role in reducing waste and excessive depletion of water sources in light of the shortage of water in the Kingdom and the region.

Also, these kinds of experiments are relatively few in the Kingdom of Saudi Arabia, especially field experiments. We recommend making more field experiments of crop plants for self-sufficiency and enhancing national food security , and discussed ways to develop crop cultivation, especially *Vicia faba* in the Kingdom of Saudi Arabia .

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Tyrosinase inhibitor activity of some medicinal plants extracts (Water extracts)

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Abstract

The aim of this study is to search for medicinal plants that have the ability to whiten the skin. Tyrosinase inhibitor activity was evaluated for 6 types of medicinal plants. *Black Solanum melongena, White Solanum melongena, Lupinus termis, Trigonella fonieum-graecum, Zizyphus spina-chresti, Citrus lemon.* These plants were collected from the market in Makkah Al-Mukarramah, Mushroom was used as a source for tyrosinase.The enzyme operates on two substances Tyrosine and L-DOPA, Tyrosine was chosen because of its availability. Inhibition of the plant was used in different proportions, then we found that the *citrus lemon* seeds were the best at 89%, followed by *lupinus termis* at 87%, followed by *zizyphus spina-chresti* at 83%, followed by *Solanum melongena Black* with 82%, followed by *Solanum melongena white* with 80%, followed by *Trigonella fonim-graecum* with 79%. We therefore recommend the use of *Citrus lemon* in cosmetics, and this research needs a deeper future study

Introduction

Researches on natural products, including traditional medicine and herbs, have been increasing recently due to an increase in demand for complementary and alternative medicines with less side effect and increased safety. Finding skin whitening agent from natural sources is one of our research focus. it is advantageous to search for new natural tyrosinase inhibitors from medicinal plants. Recently, the extracts of mulberry have been accepted as popular skin lightening agents. Some extracts and compounds isolated from mulberry were well characterized.(Lee S. H.2002). To decrease hyperpigmentation or melanogenesis on skin, we need to reduce the formation of melanin.(Prota ,Thomson 1976).Tyrosinase is a multicopper monooxygenase enzyme with wide distribution either in plants, mushroom, insects, mammals, including in humans. Tyrosinase is a metalloprotein belonging to type 3 copper enzyme family. It is involved in melanin production in a wide range of organisms.(Ben-Yosef etal,2010) Tyrosinase is a multifunctional enzyme widely distributed in nature (bacteria, fungi, plants and animals). In the human body, it is responsible for the formation of melanin, a biological pigment found in the hair, skin and colored part of the eyes. (Mora, Baraldi, 2000). However, excessive melanin deposition can cause aesthetic skin problems, such as melasma, freckles, and senile lentigines. The cosmetic relevance of melanin in skin has prompted the research and development of cosmeceuticals that inhibit melanin synthesis. Although various melanogenesis inhibitors, such as arbutin, have been incorporated into cosmetics to control unwanted skin pigmentation. (Cabanes J.et al,1994, Maeda K. et al,1996). Tyrosinase is a copper-containing mixed-function oxidase that is ubiquitously expressed in animals, plants, and microorganisms. Furthermore, tyrosinase is a key rate-limiting enzyme that can catalyze enzyme browning and melanin synthesis.Tyrosinase also exhibits monophenolase and diphenolase activities, which catalyze the hydroxylation of L-tyrosine to L-DOPA and the oxidation of L-DOPA to dopaquinone, which can undergo nonenzymatic polymerization to give dark pigments .(Ebanks et al,2009, Ramsden, Riley,2014). Tyrosinase also works as hydroxylase and oxidase, it can convert tyrosine to DOPA and can convert DOPA to dopaquinone. (Korner and Pawelek,1982).
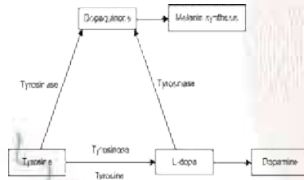

Thus, those who have preceded us in this field have used many plants .. And based on our questioning of me and my group in the perfume and market stores, we have identified several plants for us, so we decided to choose some of them and experiment with them and see whether the enzyme is discouraged or not and we ask God to help us and these plants are:
Black Solanum melongena.
White Solanum melongena.
Lupinus termis.
Trigonella fonieum-graecum.
Zizyphus spina-chresti.
Citrus lemon.

Objective

Screening of several medicinal plant extracts have been examined for efficacy in tyrosinase inhibition.

Results
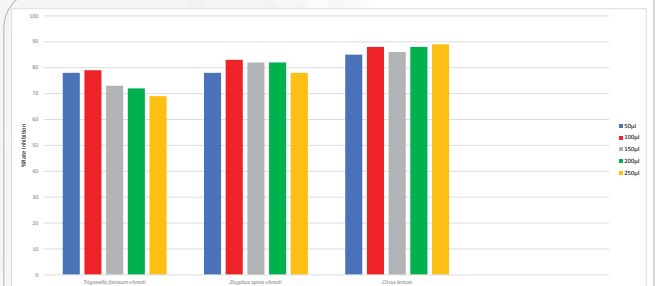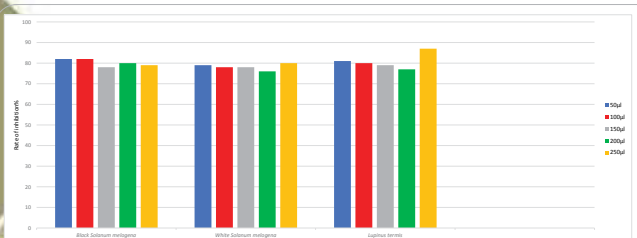
It turns out that the results of medicinal plant extracts have different inhibition rates, the highest of which was *Citrus lemon* at a concentration of 250% 89, followed by a *Lupinus termis* at a concentration of 250% 87, followed by a plant *Zizyphus spina-chresti* at a concentration of 100% 83, followed by a plant (*Solanum melongena Black* at The concentration of 100% is 82%, followed by the plant *Solanum melongena white* at a concentration of 250% 80, followed by the lowest plant, the concentration is the plant Trigonella fonieum-graecum at a concentration of 100% 79.

Discussion

After performing the experiment, the results showed that medicinal plant extracts, it became clear to us that *Citrus lemon* represented the highest inhibition rate at a concentration of 250µl at 89%, and that the plant *Trigonella fonieum-graecum* represented the lowest inhibition rate at a concentration of 250µl at 69%And it turns out that the plant, *Black Solanum melongena* and *White Solanum melongena* , *Lupinus termis, Zizyphus spina-chresti,* represent close inhibition ratios.

Conclusion

After the selection of 6 medicinal plants and their activity was tested in inhibiting tyrosine enzyme,in order to support skin whitening and all plant extracts were evaluated in the possibility of inhibiting the enzyme tyrosine in the laboratory, and among the plants it was found that Citrus lemon was the best in inhibiting the enzyme tyrosine, and it was found that *Trigonella fonieum-graecum* , plant is the least able to inhibit the tyrosine enzyme, so we recommend using Citrus lemon as a substitute for bleaching preparations, and we do not recommend using *Trigonella fonieum-graecum* plant.

Acknowledgments

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Studying the effect of temperature (both constant and variable) on the germination of *Vicia faba* seeds

Prepared By
Fesial khodran AL-shmrany

Abstract

Temperature and water requirements are stipulated to have a significant effect of the germination of plants' seeds. Accordingly, this paper aims at exploring the impact of temperature (both constant and variable temperatures) and water requirements on the germination of *Vicia faba* seeds. To explore this effect, 25 seeds of *Vicia faba* were put in each dish of four dishes used in the experiment. Seeds in the four dishes were exposed to temperature (constant and variable) over 25 days. Germination percentage is identified through the appearance of the roots of seeds. Then, germination percentages are calculated for all seeds in all dishes. Finally, germination average is calculated. Over the experiment, 10 ml of water were added to seeds three times a week to explore the impact of water requirements. Results showed that the ultimate ideal constant temperature is 25 ºC while the ultimate variable range in 10 ºC to 21 ºC. Furthermore, water is proven to increase germination at ideal temperatures in which 10 seeds were germinated at 10 to 21 ºC.

Introduction

Temperature is regarded as the most crucial environmental factor that control the germination of plants' seeds (Heydecker, 1977). However, extreme temperatures (very high and very low temperatures) may result in rapid death of plants (Copeland and McDonald, 1995). Saudi Arabia is an obvious example of extreme temperatures, especially in the central region (Muhammad Sadiq Al-Mat, 1975). Consequently, plants' seeds in Saudi Arabia are more vulnerable to extreme conditions that may inherently damage the germination of these seeds (Dahal and Bradford ،1994). Among various seeds, *Vicia faba* is regarded of substantial importance due to its significant protein content (Croy & Gatehouse, 1985). Accordingly, many studies highlighted the impact of temperature on the germination of *Vicia faba* seeds such as (Muhammad Sadiq Al-Mat, 1975). Regarding Saudi Arabia, extreme temperatures mostly all the year in alignment with water resources scarcity collectively play an essential role against the germination of plants' seeds in Saudi lands, resulting in the emergence of problematic issues regarding Saudi food security (DeNicola et al., 2015). Thus, this paper formulates some recommendations for ensuring food security in KSA.

Aim of work
1. Exploring the impact of temperature (both constant and variable temperatures) on the germination of *Vicia faba* seeds.
2. Exploring the optimal constant temperature for the germination of *Vicia faba* seeds.
3. Exploring the optimal thermally variable range for the germination of *Vicia faba* plants.
4. Exploring the impact of water requirements on the germination of *Vicia faba* at various temperatures.

Methods

1. Putting filter papers in petri dishes and dividing dishes into two groups at constant temperature and variable temperature respectively.
2. Putting 25 seeds in each dish, sterilizing seeds, and putting distilled water every three days.
3. Recording results of germination at both constant and variable temperature.
4. Calculate the average of each value and the standard deviation of its averages.
5. Graphs.
6. Adding 10 ml of water three time a week and recording germination results.

Fig shows petri dishes

Results

At constant temperature:
1. 25 ºC is the optimal constant temperature for the germination of *Vicia faba* seeds, with a germination average of 28%.
2. Germination percentage at 15 ºC is low, with a germination average of 5%.
3. Germination percentage is very low (zero or a bit higher) at 5 ºC (which is extremely low temperature) and 45 ºC (which is extremely high temperature)

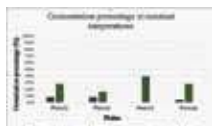Table (1) results at constant temperature

Fig (1) results at constant temperature

At variable temperatures:
1. 10 ºC to 21 ºC is the optimal thermally variable range for the germination of *Vicia faba*, with a germination average of 94%.
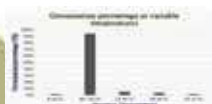
Table (2) results at variable temperature

Fig (2) results at variable temperature

2. Germination ratio at the range 8 ºC to 18 ºC is very low, with a germination ratio of 1%.
3. Germination ratio at the range 21 ºC to 45 ºC is very low (zero or a bit higher)

Regarding water requirements results:
1. No germination at both extreme high and low temperatures.
2. Germination of 10 seeds in the ideal variable range from 10 to 21 ºC
3. Germination of 3 seeds in the ideal constant range @ 25 ºC

Fig (3) water germination at 45ºC   Fig (4) water germination at 10 to 21ºC   Fig (5) water germination at 25ºC

Discussion

- Results came in agreement with previous studies.
- Germination ratio is high at 25 ºC (as constant temperature) and 10 ºC to 21 ºC (as variable temperature range) due to utmost physiological processes at these temperatures. *"optimal temperatures"*
- Germination ratio is very low at 5 ºC (as constant temperature) and 8 ºC to 18 ºC (as variable temperature range) due to low selective permeability and reduction of the function of phospholipids. *"extremely low temperatures"*
- Germination ratio is very low at 45 ºC (as constant temperature) and 21 ºC to 45 ºC (as variable temperature range) due to restriction of hydrolysis enzymes and increasing of toxins. *"extremely high temperatures"*
- Impact of water germination is rare at both extremely high and low temperatures due to evaporation of water at high temperatures and low viscosity of water at low temperatures.

Conclusion & Recommendation

I. Temperature and other environmental factors crucially affect the germination of seeds.
II. There is a few number of Saudi researches regarding the impact of environmental factors on the germination of plants' seeds.
III. Saudi research community may pay intensive attention towards the potential impact of environmental factors (especially temperature) on seeds' germination to ensure self-sufficiency and national food security.
IV. Water requirement for crops must be considered and calculated for preventing wasting of water natural resources.

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Tyrosinase inhibitor activity of some medicinal plants extracts
(Water extracts)

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Abstract

The activity of tyrosinase inhibitor in melanin pigment for skin lightening was evaluated for 6 types of medicinal plants namely *Black Solanum melongena, White Solanum melongena, Lupinus termis, Trigonella fonieum-graecum, Zizyphus spina-chresti, Citrus lemon*. These plants were collected from the Markets in Makkah. Mushroom was used as a source for tyrosinase The enzyme operates on two substances Tyrosine and L-DOPA. We chose tyrosine based on our availability, and tested these six plants in the laboratory where they showed concentrations with different inhibition rates, The highest was *citrus lemon* 89% and *Lupinus termis* at 87%, then *Zizyphus spina-chresti* at 83%, then *Solanum Melongena Black* at 82%, followed by *Solanum melongena white* at 80%, and finally *Trigonella fonieum-graecum* at 79%, Therefore, we recommend the use of *Citrus lemon* in cosmetics, and that this research needs a more future study.

Introduction

Tyrosinase is a multifunctional enzyme widely distributed in nature (bacteria, fungi, plants and animals). In the human body, it is responsible for the formation of melanin, a biological pigment found in the hair, skin and colored part of the eyes(1- Aumeeruddy-Elalfi et al., 2015) Tyrosinase is also a major problem when produced in surplus which can lead to several pathologies. For instance, the excessive formation and accumulation of melanin leads to skin hyperpigmentation disorders such as, seborrheic keratoses, melasma, diabetic dermopathy, tinea versicolor, melasmas and malignant melanomas(2- Chang et al., 2013) Tyrosinase inhibitors therefore can be clinically useful for the treatment of some dermatologic disorders associated with melanin hyperpigmentation and find applications in cosmetic products for whitening and depigmentation after sunburn(3-Khan et al.,2005) Despite the extensive researches on lightening agents and hyperpigmentation, the existing agents present limitations in term of high toxicity, low stability, poor skin-penetration, and insufficient activity(4-Momtaz et al.,2008) Several compounds, such as the well-known tyrosinase inhibitors, hydroquinone, kojic acid, arbutin and corticosteroids, can cause adverse reactions, such as dermatitis and skin irritation, melanocyte destruction, post-inflammatory pigmentation, ochronosis, cytotoxicity and skin cancer(5- Chiari et al.,2011) many tyrosinase inhibitors that suppress melanogenesis have been actively studied with the aim of developing preparations for the treatment of hyperpigmentation(6- Kim and Uyama.,2005) Inhibitors of the tyrosinase enzyme such as hydroquinone, kojic acid and azelaic acid are used against skin disorders. These active substances have also found their place in the cosmetic industry as whitening agents (7-Nakayama et al., 2000) Tyrosinase also plays a role in neurodegenerative diseases like Parkinson's disease. The excessive production of tyrosinase has been purported to lead to an increase in intracellular dopamine, inducing a large amount of melanin and thus causing cell death (8-Hasegawa, 2010)
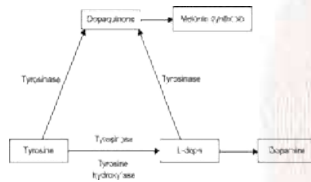

Thus, those who preceded us in this field have used many plants .. Based on our interrogation of me and my group in perfume stores and the market, we have identified many factories for us, so we decided to choose some of them and try them and see if the enzyme is frustrating or not, and we hope We get positive results
Black Solanum melongena.
White Solanum melongena.
Lupinus termis.
Trigonella fonieum-graecum.
Zizyphus spina-chresti.
Citrus lemon.

Objective

Several medicinal plant extracts have been examined to prove its effectiveness in inhibiting tyrosinase.
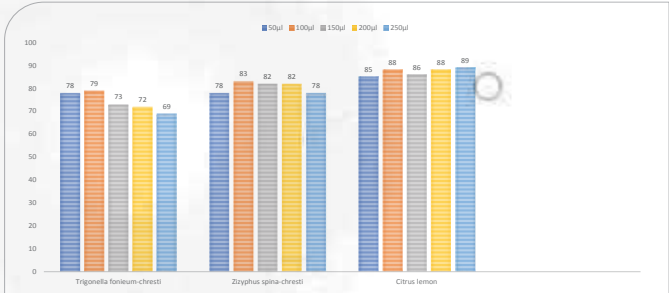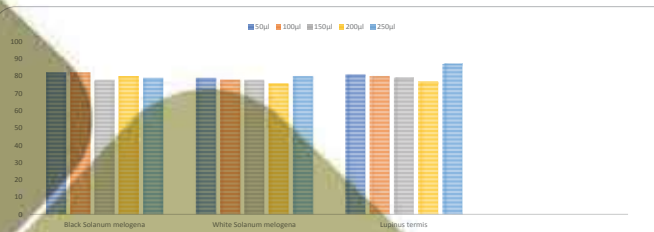
Results

The results of plant extracts showed different inhibition rates, the highest of which was *Citrus lemon* at a concentration of 250% 89, followed by a *Lupinus termis* at a concentration of 250% 87, followed by a plant *Zizyphus spina-chresti* at a concentration of 100% 83, followed by a plant (*Solanum melongena Black* at The concentration of 100% is 82%, followed by the plant *Solanum melongena white* at a concentration of 250% 80, followed by the lowest plant, the concentration is the plant Trigonella fonieum-graecum at a concentration of 100% 79.

Discussion

While experimenting with plant extracts, it became clear to us that *Citrus lemon* represented the highest inhibition rate at a concentration of 250µl at 89%, and that the plant *Trigonella fonieum-graecum* represented the lowest inhibition rate at a concentration of 250µl at 69%And it turns out that the plant, *Black Solanum melongena* and *White Solanum melongena , Lupinus termis, Zizyphus spina-chresti,* represent close inhibition ratios.

Conclusion

Among the six medicinal plants we selected and tested their activity in the inhibition of the enzyme tyrosine in order to support skin whitening and we evaluated all plant extracts in the possibility of inhibiting the enzyme tyrosine in the laboratory, and among the plants it was found that *Citrus lemon* was the best in inhibiting the enzyme tyrosine, and it was found that *Trigonella fonieum-graecum* , plant is the least able to inhibit the tyrosine enzyme, so we recommend using Citrus lemon as a substitute for bleaching preparations, and we do not recommend using *Trigonella fonieum-graecum* plant

Acknowledgments

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Study the effect of constant and variable temperature and determine the optimum thermal range and water requirement for seed germination of the *Vicia faba*

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Abstract

A Study of the effect of temperature on germination of *Vicia faba* seed, the economic and nutritional importance of *Vicia faba* , the benefits of *Vicia faba*, water requirements and food security in the kingdom.

Introduction

Water requirements :
Water in its various forms is considered an important factor affecting plant germination, because water plays a sensitive and significant in every stage of plant growth
Benefits *Vicia faba* , Its Nutritional Importance , and Food Security:
Beans help to combat the stress that may afflict a person as a result of hard work, because of his caloric richness, maintains cholesterol levels in the blood, as it is very beneficial for the heart and blood Nutrients in beans. Beans are a source of minerals, especially copper, phosphorus, iron, magnesium, and potassium, in addition to containing folic acid and manganese. Animal products are the most important source
of protein at the level of all countries of the world, but the lack of availability of these products for many reasons has led to dependence on plant protein sources to supplement or compensate for the deficiency in the daily food of protein that has not yet reached the preventive limit of it, which ranges from 28 32 grams per day. Legumes of all kinds are considered one of the sources that can be relied upon in this regard. Of course, the municipal beans, which contain between 28% - 30% protein, and about 50% carbohydrates is considered one of the most important of this group in general El-Tayeb MA (2006).
The effect of temperature on *Vicia faba* germination:
Vicia faba beans are an important leguminous vegetable due to its high nutritional value and its importance in the various fields of manufacturing. It belongs to the Fabaceae family, which contains about 490 genera and about 12,000 species. It is in the form of trees, shrubs, pergolas, or annual or perennial herbs.. Although environmental conditions were not typical, Saudi Arabia was a backbone Agriculture is of great importance and has been given priority in its various development plans. It is expected to achieve the sector has economic development goals that include food security, diversification of the production base and reduction to Minimal dependence on oil as the main source of national income. It Summer field (RJ 1988).
Beans are cold winter vegetable crops. Its seeds grow at a temperature of 3-8 ° C and tolerate frost seedlings to -4 ° C. The ideal temperature for growth is 20-22 ° C. It is noticeable that the flowers, nodes and fruits are falling at a temperature above 25 ° C. The bean plant is light-loving and its flowering time is affected by the length of the light period the plant is exposed to. It is a moisture-loving vegetable, as it requires 75-80% of the soil's moisture field capacity in critical periods (germination, flowering, fruit nodes and growth). Succeeding in heavy, well-yellow areas with a pH of between 5.5-6.5, and in light lands with a high content of organic matter and a low percentage of lime (Meadadi Bouras, 2004).

Methods

1. We put filter papers in petri dishes
2. Divide the dishes into two groups , each group has 20 dishes It is divided into five factors contain 4 dishes for each one first group for constant temperature degrees and the second group for variable temperature degrees
3. Sterilize the *Vicia faba* seeds in sterilization solution for 15 minutes , then wash it with distilled water several times .
4. Put 25 seeds for each dish
5. Put 10 ml from distilled water inside each dish .
6. Set incubators to the temperatures mentioned in point (2) and separate the dishes over the incubators .
7. Every three days we add distilled water to all samples .
8. Record the results of germination obtained daily
9. Calculate the average of each value and the standard deviation of its averages .

Results

At a temperature as low as 5 ° C, there is absolutely no germination of *Vicia faba* seeds.

Seeds at a temperature of 5 ° C

From our experience we found germination at a constant temperature (15 ° C) and at a constant temperature (25 ° C), and there was no germination at all other different temperatures.

Seed at a temperature of 25 ° C.

Seed at a temperature of 15 ° C.

With regard to variable temperatures:We found that germination occurred in the: (8) at a temperature of (8/18C)and at the temperature (10/21C).

Seed at a temperature of 8/18 ° C.

Seed at a temperature of 10/21 ° C.

temperatures 14/28 C , 21/36 C and (26/41C) , we have absolutely no germination of *Vicia faba* seeds

14/28 C

21/36C

26/41C

Table (2) Result of germination for variable temperature :

Table (1) Result of germination for constant temperature :

Discussion

We found that the germination rate at variable temperatures was better than at constant temperatures. According to the results, we can decide that temperatures between (10-25 ° C) are the optimum thermal range for *Vicia faba* germination.
-Faba bean, plant growth and physiology
-The Quantitative Effects of Temperature and Light on Growth, Development and Yield of Faba Bean (*Vicia faba* L.)
-Influence of Early Water Deficit on Seed Yield and Quality of Faba Bean under Arid Environment of Saudi Arabia
- Peter Matthews, District Agronomist, Temora Harry Marcellos, Research Agronomist, Tamworth .2003 . Faba bean .

Recomendations

Emphasizing the importance of this kind of experiments that study the effect of different environmental factors and environmental stresses on the germination and growth of crop plants, which are considered a component of food security.
Emphasizing the issue of taking into account the water requirements of agricultural crops, given its great role in reducing waste and excessive depletion of water sources in light of the shortage of water in the Kingdom and the region.
Also, these kinds of experiments are relatively few in the Kingdom of Saudi Arabia, especially field experiments. We recommend making more field experiments of crop plants for self-sufficiency and enhancing national food security , and discussed ways to develop crop cultivation, especially *Vicia faba* in the Kingdom of Saudi Arabia .

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Early embryonic development of *Oreochromis spilirus* (Actinopterygii-Cichlidae). III- Fate of neural crest in lineage progenitors of pigmented cells of eye, skin chromatophore and adrenal medulla.

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Abstract

3rd part of a graduation project; This part investigated the fate of neural crest of Oreochromis spilurus. The neural crest NC cells appeared at late neural tube stage. They were differentiated into numerous lineages "progenitors" according to the different embryonic regions including head, trunk and tail. in addition, they migrated into the medullary portion of bilateral adrenal buds. The obtained results were discussed and compared with some published data. The authors suggested that the fate of neural crest depend on tracing their proliferation, migration and investigation of specific regulators which control their migration pathway and their activities of cell lineages derived from them.

Keywords; Neural keel, lineages, progenitors, regulators, differentiation.

Introduction

Genus *Oreochromis spilurus* as a teleost fish (Actinopterygii "ray-finned fishes") was dominate in all freshwater but *Oreochromis spilurus* was acclimatized in marine environments. They have large premaxilla with special musculature to protrude and move them outwards from the mouth for grab and draw their preys into mouth. In addition, females were characterized by their ability to fasting for a few days in order to collect their fertilized eggs in their mouths, so that they were compassionate for their young after hatching and free them for grazing then transfer them to other safer areas for feeding. Zygotes started the cleavage, blastulation, gastrulation and formation of primitive streak. Then, the formation of neurula stage that end with the formation of neural tube. The neural crest cell progenitors arise from the dorsal edge of the neural folds at the time of neural tube closure[1]. They may undergo a morphological transition from neuroepithelial to mesenchymal cells; and begin migration with contributions from ectoderm, endoderm and paraxial mesoderm were involved in head skeleton[2-3] craniofacial cartilage, retinal pigmented layer, skin chromatophores, cranial sensory neurons and glial cell lineages, enteric neurons, pigment cells and other cell types such as progenitors of adrenal medulla.[1] In fishes, the neural crest cells are specified from ectoderm at dorsal and dorsolateral aspects of the neural keel.[4-6]

Methods

Fish were raised and kept under standard laboratory conditions at 28.5°C.[6] Embryos were staged and fixed at specific hours or days post fertilization as described by Kimmel et al (1995).[2] Embryos, larvae and juveniles are examined to tracing neural crest progenitor cells.

Results

In late neural tube stage, a neuro-epithelial keel formed in the mid-dorsal line between embryonic epidermis and neural tube called neural crest. They may transformed into mesenchymal lineages that migrate into many regions. Some of these lineage progenitor cells move under epidermis of head, trunk and tail regions. Figures 1–3 explain two early phases that showing the migratory pathway of chromatophore progenitors into iris and eye retina or under the growing epidermis of all embryonic regions. In Juvenile stages, clusters of chromatophore progenitor cells distributed under the epidermis. The cells of these masses started to be specialized as adult chromatophores.

Moreover, the medial mesodermal region "nephrotomes" showed that special lineage derived from neural crest cells were migrated deeply towards the cortical bud of the embryonic adrenal gland then penetrate it to form the adrenal medulla. Figure 5 a sagittal section that clarified a nephrotome of the left side, where a special lineage of neural crest cells will be move into the cortical bud of adrenal medulla. These migratory cells will be differentiated into progenitors of adrenal medulla.
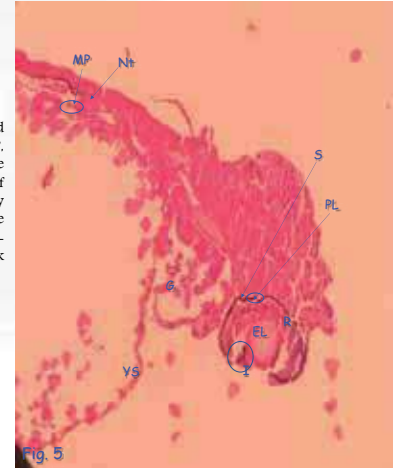
Fig. 5; Sagittal section showed pigmented cells of iris "I", pigmented layer "PL" of eye Medullary progenitors of adrenal "MP" in the vicinity of a nephrotome "Nt". EL; eye lens; G; Gills; R; Retina (8-layers); S; Sclera and YS; yolk sac.

Discussion

Discussion; Many investigators study the fate of neural crest cells proved that some derived lineages could be transformed from neuro-epithelial cells to mesenchymal cells that begin to give numerous progenitors that will be migrate to be involved in the formation of different structures including chromatophores of the skin, fins and fin-rays, eye color, pigmented layer of eye and medullary progenitor cells of adrenal bud (Barrallo-Gimeno et al, 2004; Schilling and Kimmel, 1994; Mitchell et al., 1991 and Le Dauarin, 1982).

Recommendation

The authors recommend the importance of tracing fate of neural crest "NC" by tracing their proliferation, migration and related regulators of survival cell lineages derived from NC cells.

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INVESTIGATING THE ROLES OF ARABIDOPSIS SPLICING FACTOR SR45 IN STOMATAL DEVELOPMENT

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Abstract

Stomata are microscopic pores on the plant epidermis that act as a major passage for the gas and water vapor exchange between a plant and the atmosphere. A pair of specialized guard cells works in concert to adjust pore size to maintain gas exchange while minimizing the water loss. The formation of stomata requires a series of cell-fate transitions from an initial meristemoid mother cell (MMC), to meristemoid, to a guard mother cell (GMC). Three closely related Arabidopsis basic helixloop-helix (bHLH) genes SPEECHLESS (SPCH), MUTE, and FAMA act sequentially at each key step to direct cell-fate transitions during stomatal development. In this study, we aimed to investigate the role of Arabidopsis SR45 in stomatal development. SR45 is a splicing factor that itself is spliced to generate two different isoforms, SR45.1 (long isoform) and SR45.2 (short isoform). To achieve our goal, we used sr45 mutant and mutant complemented with both isoforms of SR45 to study stomata density and distribution. As most of the stomata in the Arabidopsis plant are located on the lower surface of the leaves, we applied nail polish imprint protocol to the abaxial side of Arabidopsis leaves. The number of stomata was calculated using a microscope slide on a 40 X lens. Our results show that the SR45 mutant has the highest stomata density and SR45.2 overexpression line has the lowest number. These findings indicate obvious affect of SR45 in stomatal development.

Introduction

Arabidopsis Thaliana is a small flowering plant that is widely used as a model organism in plant biology. Arabidopsis is a member of the mustard (Brassicaceae) family. A mature Arabidopsis thaliana plant consists of a rosette of small leaves, with a main stem topped by an inflorescence. At its tallest, the plant may reach 30 or 40 m, although size depends on nutrition and other factors. In depleted soil a plant may mature and produce seed when only a few centimeters in height. Arabidopsis has no agricultural significance, and Arabidopsis has important advantages that have made it a model organism for basic research in the field of genetics and molecular biology It is characterized by a rapid life cycle, as it takes about 5-6 weeks, from germination of seeds to give a new crop of mature seeds. Its size is small, and it can be easily grown in the laboratory and in a relatively small space.

 A stomata can define as a tiny aperture generally found in the epidermis layer of the leaves. The number of stomata varies with the plants of different species. Stomata play an important role in photosynthesis by maintaining a balance of gas exchange between the atmosphere and the plant's air parts. The stomata can form either on leaf surfaces or on a single surface.
 Stomata perform two significant roles in a plant like: An influx of carbon dioxide for the photosynthesis in plants. To maintain the water balance in a plant cell. The opening and closing activity of stomata are mediated by the two guard cells, to maintain the plant's water balance and to access CO2. A Stoma is opened It occurs when the stomata have a high water potential. A stoma is closed It occurs when the stomata have low water potential.

Stomatal development in Arabidopsis invariably requires three different precursor cells , the meristemoid mother cell (MMC), the meristemoid, and the guard mother cell (GMC). The first precursor cell is the first cell in the stomatal pathway to divide asymmetrically. All Arabidopsis stomata are produced by at least one asymmetric division, that of the MMC. MMCs typically originate from relatively small epidermal cells that do not have very sinuous cell walls.   (Meristemoid) : Some newly formed meristemoids convert directly into guard mother cells. Other meristemoids divide one to three times asymmetrically before conversion. As in the asymmetric divisions of MMCs, meristemoids that are about to divide can be recognized by their polarized cytoplasm. (GMC) : Guard mother cells divide symmetrically to produce two guard cells. In Arabidopsis GMCs, the division site is marked by wall thickenings at opposite ends of the cell. The transition to GMC is a cellular differentiation step which involves the growth and rounding of the cell. The GMC has only two options with regard to differentiation, to divide symmetrically and form a stoma or to arrest development. This complex series of fate changes are guided by master transcription factors essential for the formation of stomata

The first transition into the stomatal lineage is controlled by SPCH, which promotes differentiation of protodermal cells into MMCs and their subsequent asymmetric division. Mutants that do not have a functional SPCH protein are unable to enter the stomatal lineage and instead form an epidermis consisting entirely of pavement cells. SPCH levels and activity are highly regulated through a peptide signalling pathway, which acts through a mitogen-activated kinase (MPK) cascade. SPCH is regulated by many factors including plant hormones Brassinosteroid (BR),abscisic acid and mechanical signals. bHLH transcription factors, SPCH, MUTE and FAMA are able to heterodimerize with other transcription factors through the helix-loopfeloix domains. Overexpression of SPCH does not lead to all epidermal cells developing into stomata, but results in an epidermis full of ectopic cell divisions further indicating its role in promoting asymmetric divisions and amplifying cell divisions. The transition from meristemoid to GMC is regulated by MUTE, which when mutated, results in stomatal lineage cells arresting at the meristemoid cell type. When MUTE is overexpressed in wild-type Arabidopsis, it creates an epidermis that is almost solely composed of stomata. Overall, this suggests that while SPCH primes the epidermis with the correct spacing and patterning of meristemoids, it is MUTE which ultimately drives cells through the lineage to become stomata. The final step of the stomata lineage is the symmetric division into the two cells that ultimately form the guard cells. Leaves lacking FAMA are unable to produce stomata, but instead produce fama tumours, through a series of uncontrolled symmetrical divisions of GMCs. Loss of correct FAMA expression results in the development of the unusual phenotype known as stoma-in-stoma, where guard cells have SPCH switched on after differentiation allowing for cell division and reentry into the stomatal lineage. FAMA also directly activates genes needed for guard cell function.

SR45 IS A Splicing Factor: Although SR45 has been investigated intensively in different aspect of plants life, its role in stomatal development not known. Therefor, we here aimed to study the function of its both spliced isoforms in stomatal development.
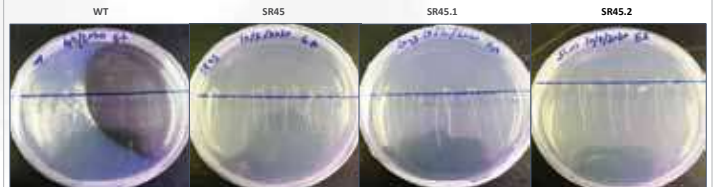
Objective

In this study, we aimed to study the roles of Arabidopsis splicing factor SR45 and its spliced forms (SR45.1 and SR45.2) in stomatal development.

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Results

Growing different genotypes on MS media. Seed of all lines have been sterilized and then grown on MS media for 6 days under long day conditions


WT   SR45   SR45.1   SR45.2

Then seedlings have been transferred to soil. The plants were grown for two weeks under short day conditions

WT   SR45   SR45.1   SR45.2

Stomata density screening Number of stomata in different genotypes was analyzed as described in the methods

	WT	sr45	SR45.1	SR45.2
Leaf#1	208	274	166	114
Leaf#2	134	210	226	92
Leaf#3	152	248	216	118
Leaf#4	158	194	156	100
Leaf#5	146	126	190	100
Leaf#6	156	170	112	106
Average	159	204	178	105
St-DE	25.5	53.3	42.1	9.7
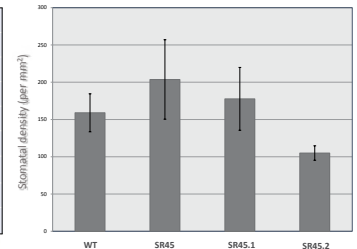
Discussion

The SR45 mutant shows the highest stomata density compare to WT. However, short overexpression line exhibits the lowest stomata density. These findings indicate the possible role of SR45 in stomatal development. Given the function of SR45, it seems that SR45 plays role in regulating the splicing and isoforms selection of transcripts that essential for stomatal development in Arabidopsis. Both isoforms of SR45 have different phenotypes in stomatal development. Long overexpression line has high stomata density compare to short overexpression line. The low stomata density of short isoform may be due to the negative role of short isoform in stomatal development that could because of differentially producing transcripts that negatively affect stomatal development. Our results clear shows that pre-mRNA splicing play vital role in stomatal development in plants. The number of stomata per unit area varies in sr45 mutant and mutant complemented with two spiced isoforms of SR45 (long and short). Here, we have shown clear evidence that pre-mRNA splicing involved in stomatal development. Stomatal density can vary within leaves, plants, and individuals of a single species. Our findings may indicate that pre-mRNA splicing regulating stomatal density is conserved among different plant species and cross plant kingdom. The function of stomata is associated with various physiological processes. The rate of transpiration is regulated mainly by stomatal movement but is also affected by stomatal size and density. This may explain the link between SR45 role in stress response and stomata phenotype. Stomatal movement is regulated by changes in light conditions, CO2 level, temperature, humidity, water availability, and ABA. SR45 has shown to play role in ABA response. It would be of interest to investigate the stomata movement in SR45 mutant and its overexpression lines.

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Early embryonic development of *Oreochromis spilurus* (Actinopterygii-Cichlidae): I- Fish care and breeding and egg incubation

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Faculty of Applied Sciences

Abstract

The anatomy and histology of Oreochromis spilurus neurulation and some larval stages were visualized and describes using dissecting and light microscopes using fixed embryos and hematoxylin-eosin stained sections. The obtained results were discussed and compared with other teleosts. We recommend that, it will necessary to make stereotaxic atlas for the embryos of the present species.

Keywords: Fish care, breeding, Embryogenesis, teleosts

Introduction

The tilapia, *Oreochromis spilurus*, was widely used in fish production in Jeddah coast at western region of Saudi Arabia. This species considered as one of the main fisheries in our country. Commercially, In Arabia, the fluctuation of table size of *O. spilurus* agreeing to the local consumers and, in general ranges from 150 up to 500 g. In a fish research center at Salman-gulf "Northern coast of Jeddah city", about million fries of the present species was produced in seawater tanks to be used by fish farms in order to supply the local fish market. Studies on the tilapia species interested in mass production, hormonal sexual reversion or nutrition under different experimental conditions.(1-4) However, there is scarce information describing the developmental stages of the present species. Thus, our team try to study the developmental stages after fertilization until fry stage.

The aim of the present work concerned with lab fish care and breeding in order to studying the early embryonic development of the present species. We hoped to shed light about fish cultivation for different experimental applications, declaring standard embryonic stages in family Cichlidae. Otherwise, We try to prolonging our team work by different stages to complete their objectives according to the protocol of this graduation project.

Methods

Adult ♂ and ♀ fishes, were used to produce fertilized eggs and embryogenesis under controlled temperature (25-27°C). After fertilization eggs were collected for incubation as described by Abdulkadhim, et.al.,(2015). Fertilized eggs were distributed into 4 groups in 4 flasks (1liter size) provided with slow current oxygenated water flow. Samples were fixed immediately for anatomical and histological studies. Group 1 involved fixed incubated samples form 2-12hrs; Group 2 involved fixed samples incubated form 12-24hrs; Group 3 involved fixed incubated samples form 24-48hrs; Group 4 involved fixed samples represent different phases of hatched larva and small fries. Selected samples from each group were divided into two subgroups, one for anatomical examination using stereo-microscope and the other were processed for histological examination by light microscope using H and E staining technique The present poster 1 concerned with fish care and breeding.

Results

Adult male and fishes left together until the time of egg laying. When the abdomen and genital papillae of females became larger, which meaning that the time of ovulation was ready. Hence, females ongoing to swim actively side by side with males, and started to hits bottom gravel by their caudal fins for making a small nest that accommodates the eggs and fertilization process. After fertilization, we transferred adults gently for saving newly fertilized eggs and collecting zygotes into four incubation flasks (each of which 1liter in size). These flasks supplied with slow flow of highly oxygenated water. Some samples from zygotes were separated for fixation in 10% neutral formalin and Bouin's fixative. Other samples were collected during development. These samples were collected randomly from each flask every two hours until 24hrs. Then after 48hrs, additional samples were collected from newly hatched larvae and fry stages.

All samples were immediately fixed for 48hrs in neutral 10% formalin, Bouin's fixative or 5% potassium dichromate in 10% neutral formalin. After fixation, samples were sorting into successive stages and processed for anatomical and histological studies. The sorting samples include the following stages zygotes, early cleavage, morula, blastula, gastrula, formation of primitive streak, neurulation, formation of embryos, hatching larvae and fries, respectively.

Figs. 5A-D   Fig. 6A   Fig. 6B
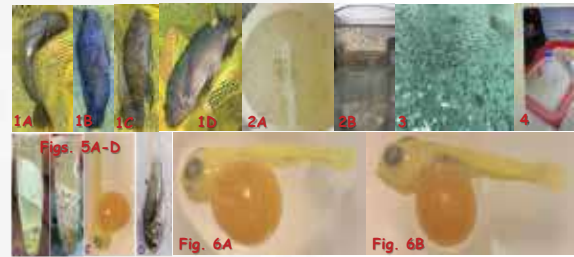
Legends of figures: Figures 1A-D presented adult fishes removed after fertilization; figures 2A and 2B showed newly hatched larvae; figure 3 displayed small fry stages; figure 4 indicated preparation of solutions. Figures 5-6 revealed early, late stages and newly hatched larvae. Fujimura and Okada (2007) defined 18 pre-hatched stages, including zygote, cleavage, blastula, gastrula, segmentation, pharyngula and hatching periods, in addition, 7 early and late larval stages and 7 juvenile periods. Also, Schmidt et al. (2013) described the main stages only which include cleavage, gastrulation, organogenesis, formation of embryos, hatched larvae and fry stages.

Discussion

Staging the fish embryos in scientific publications differs according to the objectives of their work. Zupanc, (2006), described 5 stages; namely embryonic phase, larval phase, fry phase, rib phase and Senescent phase. The present work deals with the morphogenesis in first three stages with some histological evidence.

Recommendation

The authors suggested that the present species need more studies for staging and designing a standard neuroanatomical atlas signify family Cichlidae to assist investigators.

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Tyrosinase inhibitor activity of some medicinal plants extracts (Water extracts)

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Abstract

Plants were collected in the Makkah region from popular drug stores (perfumes) and the use of these plants to dampen the activity of tyrosine and to lighten the skin. These plants are 1- *Black Solanum melongena* 2- *White Solanum melongena* 3- *Lupinus termis* 4- *Trigonella foenum* 5- *Zizyphus Spina-Christie* 6- *Citrus lemon* . Mushroom was used as a source for tyrosinase.The enzyme operates on two substances Tyrosine and L-DOPA , Tyrosine was chosen because of its availability , and prepared 5 different concentrations for each plant and Through our studies and measurements, we obtained the following: We obtained the highest and best inhibition rate in *Citrus* plants at a concentration at 89%, followed by *Lupinus* at 87%. Followed by *Zizyphus spina-chresti* at 83%. Followed by *Melongena Black Solanum* at 82%. Followed by *White Solanum melongena* at 80% followed by *Trigonella foenum* at a concentration of 79%. I recommend adding an extract (*Citrus lemon*) in cosmetics, and the topic needs deep studies in the future.

Introduction

Tyrosinase (EC 1.14.18.1; PPO) is known to be a key enzyme in melanin biosynthesis and is widely distributed in plants and mammalian cells. (Sánchez-Ferrer et al., 1995) Melanin is a human pigment responsible for the colour of eyes, hair and skin. It is produced and secreted, through a physiological process called melanogenesis, by the melanocytes, which are distributed inthe basal layer of the dermis. There are two types of melanin pigmentsproduced by the melanocytes: eumelanin, black or brown, and pheomelanin,red or yellow. The colour of human skin and hair is determined by the typeand distribution of melanin pigment. Each individual of the different racialgroups have, in general, the same number of melanocytes(Mapunya et al 2012), Pharmacologically, melanogenesis can be controlled by inhibiting the activity of tyrosinase or other related melanogenic enzymes. Among melanogenic enzymes, tyrosinase is the rate-limiting enzyme for controlling the production of melanin . (Lin et al 2017) .The use of tyrosinase inhibitors is the most promising method for melanogenesis inhibition. Tyrosinase inhibitors specifically interact with melanogenic cells and do not lead to side effects compared with other melanogenesis inhibitors . (Wang et al 2017) it is very encouraging to explore the potential of Sudanese plants for cosmaceutical purposes. Despite few of these medicinal plants used for skin decoration and softening the authors decided to investigate the ability of some Sudanese medicinal plants as skin whitening which it could be useful for cosmaceutical industry. The ability of different extracts of Sudanese medicinal plants to act as a skin-lightening agents was tested as their ability to inhibit tyrosinase, the rate limiting enzyme in melanogenesis, initially using a cell-free mushroom tyrosinase system. (Song et al., 2009) Enzyme inhibitors are mostly bioactive secondary metabolites binding with an enzyme to reduce its bioactivity. Subsequently, blocking enzyme activity can kill a pathogen or correct a metabolic imbalance. Many natural products are enzyme inhibitors characterized by their specificity. (Rauf and Jehan 2017) . the search for new tyrosinase inhibitors is important for the treatment of hyperpigmentation, development of skin-whitening agents, and use as preservatives in the food industry. Peru is a developing country characterized by a rich biodiversity, where medicinal plants still represent the main therapeutic tool in traditional medicine (Brack 1999 , Carraz et al 2015) Plants and their extracts are inexpensive and rich resources of active compounds that can be utilized to inhibit tyrosinase activity as well as melanin production (Momtaz et al 2008) .tyrosinease also works as hydroxylase and oxidase , it can convert tyrosine to DOPA and can convert DOPA to doaquinon (Hearing et al.,1982).

Thus, those who have preceded us in this field have used many plants .. And based on our questioning of me and my group in the perfume and market stores, we have identified several plants for us, so we decided to choose some of them and experiment with them and see whether the enzyme is discouraged or not and we ask God to help us and these plants are: *Black Solanum melongena, White Solanum melongena, Lupinus termis, Trigonella fonieum-graecum, Zizyphus spina-chresti, Citrus lemon.*

Objective

Study and examination of several medicinal plant extracts to see their efficacy in inhibiting tyrosinase.

Results

[Results chart]
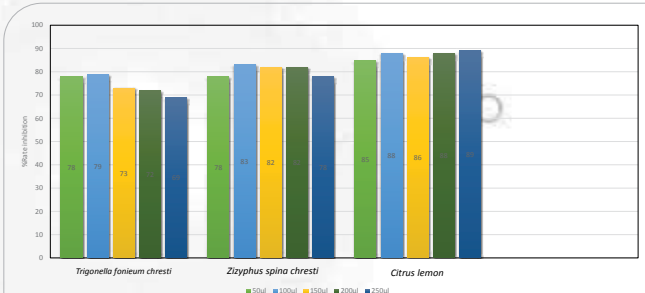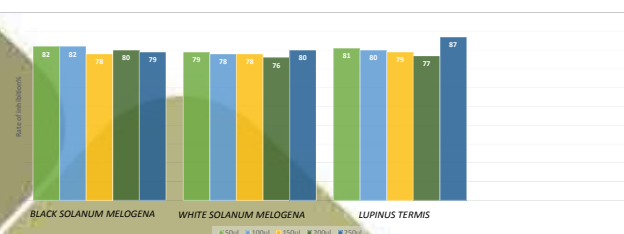
These plant extracts, after testing them, showed different results in the inhibition process.The highest of which was *Citrus lemon* at a concentration of 250% 89, followed by a *Lupinus termis* at a concentration of 250% 87, followed by a plant *Zizyphus spina-chresti* at a concentration of 100% 83, followed by a plant (*Solanum melongena Black* at The concentration of 100% is 82%, followed by the plant *Solanum melongena white* at a concentration of 250% 80, followed by the lowest plant, the concentration is the plant *Trigonella fonieum-graecum* at a concentration of 100% 79.

Discussion

In this experiment, lemon showed the best 250µl concentration at 89%. and that the plant *Trigonella fonieum-graecum* represented the lowest inhibition rate at a concentration of 250µl at 79% And it turns out that the plant, *Black Solanum melongena* and *White Solanum melongena* , *Lupinus termis, Zizyphus spina-chresti,* represent close inhibition ratios.

Conclusion

Some medicinal plants were taken and mentioned by their names, as they were prepared as aqueous extracts, and the enzyme inhibition test was carried out, and among the plants it was found that Citrus lemon was the best in inhibiting the enzyme tyrosine, and it was found that *Trigonella fonieum-graecum* , plant is the least able to inhibit the tyrosine enzyme, so we recommend using Citrus lemon as a substitute for bleaching preparations, and we do not recommend using *Trigonella fonieum-graecum* plant.

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Study the effect of constant and variable temperature and determine the optimum thermal range and water requirement for seed germination of the *Vicia faba*

Student name: Faisal Sobhan Alwadani
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Abstract

Vicia faba are cold winter vegetable crops. Its seeds grow at a temperature of 3-8 ° C and tolerate frost seedlings to -4 ° C. The ideal temperature for growth is 20-22 ° C. The *Vicia faba* plant is light-loving and its flowering time is affected by the length of the light period the plant is exposed to.

Introduction

Vicia faba are cold winter vegetable crops. Its seeds grow at a temperature of 3-8 ° C and tolerate frost seedlings to -4 ° C. The ideal temperature for growth is 20-22 ° C. The *Vicia faba* plant is light-loving and its flowering time is affected by the length of the light period the plant is exposed to. It is a moisture-loving vegetable, (MeadadiBouras, 2004.(

Influence of temperature on germination
The temperature is the climatic element that most influence the beans crop; it can delay / re-duce seed germination and seedling emergence.

Water resources and use
It was estimated that the total water withdrawal in 2006 was 7.23 km % of what was the case in 1992, and this total is distributed among different sectors as follows: Next: agriculture 88 percent, household purposes 9 percent, industry 3 percent.

Aim of work

Study the effect of constant and variable temperatures on the germination of the seeds of the *Vicia faba* plant and determination of thermal range and optimum germination level and Water requirements.

Methods

1- We put filter papers in petri dishes .
2- Divide the dishes into two groups , each group has 20 dishes It is divided into five factors contain 4 dishes for each one .
first group for constant temperature degrees : 5 - 15 - 25 - 35 -45 0 C , and the second group for variable temperature degrees : 8/18 - 10 /21 - 14/28 - 21/36 - 26/41 0 C with all data written on the dishes custom for each group.
3- Sterilize the bean seeds in sterilization solution for 15 minutes , then wash it with distilled water several times .
4- Put 25 seeds for each dish .
5- Put 10 ml from distilled water inside each dish .
6- Set incubators to the temperatures mentioned in point (2) and separate the dishes over the incubators .
7- Every three days we add distilled water to all samples .
8- Record the results of germination obtained daily in the tables (1 – 2) by recording the number of germinated seeds .
9- Calculate the average of each value and the standard deviation of its averages . Graph the averages of the factors and discussed the differences resulting from the factors and their causes, along with an explanation of the effect of the constant and variable temperature, the optimum temperature and the thermal range of bean seed germination.

Results

We observed that the result of the effect of temperature on the *Vicia faba* plant is as follows: at a low temperature of 5 ° C, and temperatures such as (14/28), (21/36) and (26/41) ° C, there is no germination . At a temperature of (8/18) degrees Celsius and (10/21) degrees Celsius, germination is required.
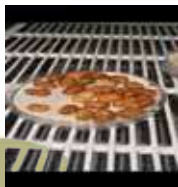
Vicia faba germination at 10/21 °C

Vicia faba germination at 21/36 °C

Vicia faba germination at 26/41 °C

Table (1) Result of germination for constant temperature :

Table (2) Result of germination for Variable temperature

The water requirements have a role in germination as follows: At high temperatures the water evaporates, and at medium temperatures the water does not evaporate and has a kinetic energy and a suitable viscosity, while at lower temperatures the viscosity of the water increases and the kinetic energy of it decreases.

Discussion

At a temperature of 15 ° C and 25 ° C, we have germination because biological processes were at their highest level because the water does not evaporate and has a kinetic energy and a suitable viscosity. At temperatures 14/28 ° C, 21/36 ° C and 26/41 ° C, we have absolutely no water evaporation. As for the lower temperatures, there is no coil because the viscosity of the water increases and the kinetic energy decreases. .

Recomendations

Emphasizing the importance of this kind of experiments that study the effect of different environmental factors and environmental stresses on the germination and growth of crop plants, which are considered a component of food security.
Also, these kinds of experiments are relatively few in the Kingdom of Saudi Arabia, especially field experiments.

Acknowledgments

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Tyrosinase inhibitors activity of some medicinal plant extracts
Water extract

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Abstract

a Plants and in melanin was tested to lighten the skin from six t extracts are rich and inexpensive resources for active compounds. The activity of tyrosinase inhibitor ypes of plants found in folk medicine: *Solanum melongena black, Solanum melongena white, lupinus termis, trigonella fonim-graecum, zizyphus spina-chresti* and *citrus iemon*). The fungus has been used as source of tyrosinase, and the enzyme operates on two substances tyrosinase and L-DOPA. Tyrosinase was chosen due to its availability and we got different inhibition rates. We have tested plant extracts in the laboratory from five different groups for each plant. Snippets displayed. Plant inhibition was used in various proportions ranging from 89% to 69%, then we found that seeds were the best with *Citrus lemon* 89%, followed by *Iupinus termis* with 87%, followed by *zizyphus spina-chresti* with 83%, followed by *Solanum Melongena Black* with 82%, Followed by *Solanum melongena white* with 80%, followed by *tronella fonim-graecum* with 79%. Therefore, we recommend the use of *Citrus lemon* in cosmetics, and this research needs a deeper future study
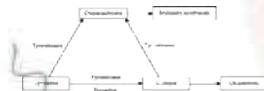
Introduction

Skin-whitening products have become increasingly in demand in the past few years. The main purpose for skin-lightening products is to lighten the skin as well as to even out skin tone or to treat pigmentation disorder such as freckles, melasma, pregnancy marks, and age spots (H. Zhai et al 2001).

Considering that current therapies have shown less than satisfactory results in the treatment of various dermatological disorders such as melasma, post-inflammatory or senile lentigo and ephelides, and that the side effects of the therapy include high cytotoxicity and mutagenicity, poor skin penetration and low stability of formulations (Grimes 1999.Nerva et al., 2003)

Melanin is the main component responsible for the darkening of the skin and hair, and plays an important role against ultraviolet (UV) ray damage. However, the accumulation of an excessive level of melanin can cause skin damage, such as age spots or malignant melanoma. It has also been associated with Parkinson's disease (Hasegawa, T 2010)

Finding skin whitening agent from natural sources is one of our research focus. To decrease hyperpigmentation or melanogenesis on skin, we need to reduce the formation of melanin. The formation of melanin in the human body is influenced or reduced by several mechanisms, including antioxidant, direct tyrosinase inhibition, melanin inhibition of migration from cell to cell and hormonal activities (Pawelek and Kormer, 1982)

In mammals including in humans, tyrosinase is responsible for melanogenesis or hyperpigmentation (Chang, 2009))

However, there is still a need to search for other potential compounds such as tyrosinase inhibitors from natural sources like plants. Many plant extracts have a good inhibitory effect on melanin formation and may be a good choice for cosmetic purposes of whitening facial skin and defense against skin darkening. In addition, they have comparatively less side effects. (Kim Jand Lee KT.1998)

In cosmetic preparations, many plant extracts such as Morus alba, Acacia bark, Glycyrrhiza glabra and Green tea have been used as whitening agents (Ali A, Akhtar N, et al 2012)

With the availability of natural resources for skin-lightening applications

Plants and their extracts are inexpensive and rich resources of active compounds that can be utilized to inhibit tyrosinase activity as well as melanin production (Mumtaz et al 2008). Tyrosinase also works as hydroxylase and oxidase.it can convert tyrosine to DOPA and can convert DOPA to dopaquinon (korner and pawelek.1982).

Thus, those who have preceded us in this field have used many plants .And based on our questioning of me and my group in the perfume and market stores, we have identified several plants for us, so we decided to choose some of them and experiment with them and see whether the enzyme is discouraged or not and we ask God to help us and these plants are
1-Solanum melongena (Black)
2-Solanum melongena (White)
3- Lupinus termis
4-Trigonella fonieum-graecum
5- Zizyphus spina-chresti
6- Citrus lemon

Objective

Several medicinal plant extracts have been tested for their ability to inhibit tyrosinase.

Results
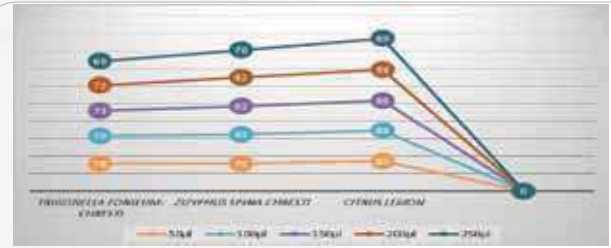
. The results of plant extracts revealed various inhibition ratios, the highest of which was citrus at a concentration of 250% 89, followed
a *Lupinus termis* at a concentration of 250% 87, followed by *Zizyphus spina-chresti* at a concentration of 100% 83, followed by a plant
(*Solanum melongena Black* with a concentration of 100% is 82%, followed by *Solanum melongena white* with a concentration of 250% 80, followed by the lowest plant, the concentration is *Trigonella fonieum-graecum* with a concentration of 100% 79

Discussion

After many experiments with plant extracts, it became clear to us that *Citrus lemon* represented the highest inhibition rate at a concentration of 250 *Citrus lemon* 89%, and that the *Trigonella fonieum-graecumm* represented the lowest inhibition rate with a concentration of 250 plant. at 79% and it was found that the
, *Solanum melongena Black* and *white*, *Lupinus termis*, *Zizyphus spina-Christi*) represent close proportions of the inhibition of tyrosinase.

Conclusion

It was found that the six medicinal plants were chosen in their ability to inhibit the enzyme tyrosine in order to support skin whitening and all plant extracts were tested in the possibility of inhibiting the enzyme tyrosine in the laboratory, and among the plants it was found that *Citrus lemon* was the best in inhibiting the enzyme tyrosinase, and found that the plant *Zizyphus spina- chresti* is the least able to inhibit tyrosinase, so we recommend using *Citrus lemon* as an alternative to chemical bleaching preparations, and we do not recommend using *Zizyphus spina-chresti.*

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Study the Effect of Constant and Variable Temperature and Determine the Optimum Thermal Range and Water Requirement for Seed Germination of the *Vicia faba* .

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Abstract

In this experiment we studied the effect of constant and variable temperatures on *Vicia faba* germination and studied the effect of temperature during 25 days with results recorded daily. We aim to determine the Optimum thermal range for *Vicia faba* germination . We have applied in this experiment all the criteria used in scientific research supported by advanced modern technologies and we found the Optimum thermal range between 15 °C and 25 °C and compared these results with other similar experiments in this field .

Introduction

A) The Effect of , Constant and Variable Temperature :

The temperature is the climatic element that most influence the *Vicia faba* crop; it can delay / re-duce seed germination and seedling emergence. High temperature stress is particularly damaging to *Vicia faba* during the germination period, when the viability of pollen is critical for successful reproduction. (Dhruv Lavania , 2014)

B) Germination of Crop Plants :

Germination is the first essential stage in crop and food production, as well as for the establishment of trees and regeneration of wild species. Temperature and water potential are the primary environmental factors that control germination in all species and affect both the rate and final percentage germination. (C. Dürra , 2015)

C) *Vicia faba* in Saudi Arabia , Its Nutritional Importance , and Food Security :

Vicia faba is considered one of the most important crops that contain protein and one of the most important elements in food security. The leader producing countries are China, Italy, Spain, the UK, Egypt Ethiopia, Moroco, USSR Mexico and Brazil. Under Saudi Arabia condition, until recently, there is very little cultivation area in Medial and West Region . (AL-Suhibani , 2009).

Food Security :

According to FAO, food security can be defined as "a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life". (FAO, 2002).

D) Water Requirement for Seed Germination of the *Vicia faba* and Water Scarcity in Saudi Arabia :

Soil water shortage has been identified as a major constraint in increasing *Vicia faba* production. However, high water availability could cause excessive vegetative growth in indeterminate *Vicia faba* . (De Costa 1997)

The Middle East is now in a water crisis, with Saudi Arabia and the other countries of the Gulf Cooperation Council (GCC) already classified by the United Nations as water-scarce nations , because water resources are already so scarce . Saudi Arabia is one of the poorest nations in terms of natural renewable water resources . (Erica DeNicola , 2015)

Objective

Study the Effect of Constant and Variable Temperature and Determine the Optimum Thermal Range and Water Requirement for Seed Germination of the *Vicia faba* .

Methods

1. We put filter papers in petri dishes .
2. Divide the dishes into two groups , each group has 20 dishes .
3. Sterilize the *Vicia faba* seeds in sterilization solution for 15 minutes ,
4. Put 25 seeds for each dish .
5. Put 10 ml from distilled water inside each dish .
6. Set incubators to the temperatures and separate the dishes.
7. Every three days we add distilled water to all samples
8. Record the results of seed germination obtained daily .
9- Calculate the average of each value .

Results

For constant Temperature : we found that germination occurred in the following days : (6th , 7th , 8th) temperature (15 º C) and in (5th , 7th , 8th) at temperature (25 º) with germination rate less than 50 % , and there was absolutely no germination in other days for all other different temperatures .

Fig.1. Germination at 15 ºC   Fig.2. Germination at 25 ºC   Fig.4   No germination at 45 C

For Variable Temperature : we found that germination occurred in the following days : (8th) at temperature (8/18 º C), and (5th , 6th , 7th ,8th , 9th , 10th , 15th , 16th) at temperature (10/21 º C) with germination rate more than 50 % , and there was absolutely no germination in other days for all other different temperatures .

Fig.6. Bean germination at 10 / 21 ºC

So, according to the results we can decide that temperatures between (10 – 25 C) is the optimum thermal range for germination of *Vicia faba* seeds .

Discussion

Most seeds germinate at temperatures ranging between 20 and 30 degrees Celsius, which represent the ideal temperatures for their growth because the physiological processes are at their maximum efficacy . And when germination of seeds at extreme temperatures, whether high or low this leads to a defect in these processes even if some seeds show a kind of , resistance in general high or low temperatures have a damaging effect on germination processes . (Mohamed Al-whaibi , 2014

As for the water requirements, it became clear to us that the quantity and quality of water is very important for the growth of the bean plant, but it is affected by low and high temperatures as it impedes the work of water in germination . (Peter Matthews, 2003)

Recomendations

Emphasizing the importance of this kind of experiments that study the effect of different environmental factors and environmental stresses on the germination and growth of crop plants, which are considered a component of food security . Our data can also be useful as germination parameters in crop models to simulate the emergence of cover crops under different pedoclimatic conditions.

Also, these kinds of experiments are relatively few in the Kingdom of Saudi Arabia, especially field experiments. We recommend making more field experiments of crop plants for self-sufficiency and enhancing national food security , and discussed ways to develop crop cultivation, especially *Vicia faba* in the Kingdom of Saudi Arabia . We also emphasize the issue of considering the water needs of agricultural crops, given its significant role in reducing waste and excessive depletion of water sources considering the shortage of water in the Kingdom and the region.

Acknowledgments

We would like to thanks our supervisor of graduation project Dr. Alae Ahmad Chakib Jabbour whose valuable guidance has been the one that helped us patch this project and make it full proof success his suggestions and his instructions has serves as the major contributor towards the completion of the project .

Then we would like to thank the head of the biology department Dr . Yasser al-Marwei and laboratory technicians Mr. Mohammad al-Nahas and Mr. Abid al-Luhaibi who have helped us with their valuable suggestions and guidance has been helpful in various phases of the completion of the project .

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Tyrosinase inhibitor activity of some medicinal plants extracts (Water extracts)

Bayounes M, Alghmidy A, Althebyani T, Agily M, Alatify T,and Alzahrani A

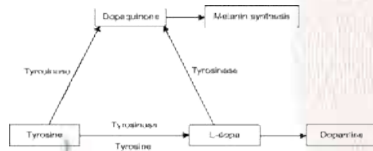Current address: Biology Department, Faculty of Applied Science, Umm Al Qura University, Makkah 21955, Saudi Arabia.

Abstract

The current study was designed to evaluate six medicinal plants and their ability to inhibit tyrosine activity. We searched for plants that have the ability to whiten skin, and through our research we found many plants related to skin whitening, and we took these plants from the markets of Mecca, which are Solanum melongena (black), Solanum melongena (white), Lopinus termis, Trigonella fonieum-graecum, Zizyphus spina-chresti and Citrus lemon , Mushroom was used as a source for tyrosinase. The enzyme operates on two substances Tyrosine and L-DOPA, Tyrosine was chosen because of its availability, We did laboratory tests on these plants and found that Citrus lemon was 89% better. Then Lupinus termis increased by 87%, followed by Zizyphus spina-chresti with 83%, then Solanum melongena Black with 82%, followed by Solanum melongena white with 80%, and finally Trigonella fonieum-graecum with 79%. Therefore, we recommend the use of Citrus lemon in cosmetics, and that this research needs a more future study.

Introduction

Finding skin whitening agent from natural sources is one of our research focus. To decrease hyperpigmentation or melanogenesis on skin, we need to reduce the formation of melanin.

The formation of melanin in the human body is influenced or reduced by several mechanisms, including anti-oxidant, direct tyrosinase inhibition, melanin inhibition of migration from cell to cell and hormonal activities, etc (Prota et al 1976).Melanin is the black pigment in hair and skin and is essential for protecting human skin against radiation. Accumulation in the epidermal layer leads to melanogenesis or skin pigmentation, and this can be undesirable(Villareal, et al 2017).In humans and other mammals, the biosynthesis of melanin takes place in a lineage of cells known as melanocytes, which contain the enzyme tyrosinase (Robb, 1984)..Plants and their extracts are inexpensive and rich resources of active compounds that can be utilized to inhibit tyrosinase activity as well as melanin production (Momtaz et al., 2008). Tyrosinase inhibitor have been used frequently in cosmetics and depigmenting agents for hyperpigmentation (Sanchez-Ferrer et al., 1995).Many tyrosinase inhibitors and antioxidant agents have been tested as a way of preventing overproduction of melanin in epidermal layers either from synthetic or natural resources. However, there is still a need to search for other potential compounds such as tyrosinase inhibitors from natural sources like plants. (Cabanes et al.1994).

Therefore the inhibitors of this enzyme may lead to novel skin whitening agents, anti-browning substances or compounds for insect control. Recently applications of tyrosinase-inhibiting agents are increasingly used in cosmetic products for maintaining skin whiteness (Kadekaro et al., 2003). Tyrosinase (EC 1.14.18.1; PPO) is known to be a key enzyme in melanin biosynthesis and is widely distributed in plants and mammalian cells. (Sánchez-Ferrer et al., 1995)

Tyrosinease also works as hydroxylase and oxidase , it can convert tyrosine to DOPA and can convert DOPA to dopaquinon . (korner and pawelek , 1982)


Thus, those who have preceded us in this field have used many plants .. And based on our questioning of me and my group in the perfume and market stores, we have identified several plants for us, so we decided to choose some of them and experiment with them and see whether the enzyme is discouraged or not and we ask God to help us and these plants are:
1-Solanum melongena (Black).
2-Solanum melongena (White).
3-Lupinus termis.
4-Trigonella fonieum-graecum.
5-Zizyphus spina-chresti.
6-Citrus lemon.

Objective

The aim of the experiment is to uncover plant extracts and the effect of their efficacy in inhibiting tyrosinase.
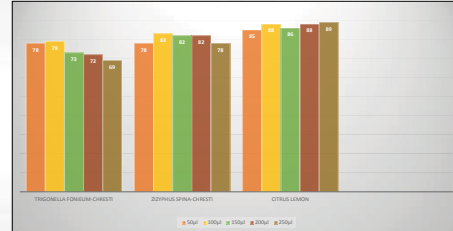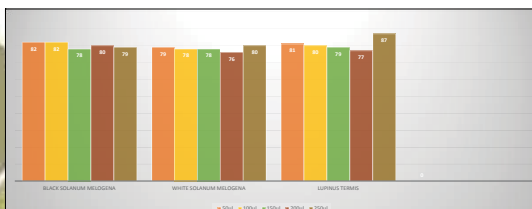
Results

It was found through the results of our research on plant extracts that Citrus lemon was the best among them, at 89%, at a concentration of 250 , followed by a Lupinus termis at a concentration of 250 %87, followed by a plant Zizyphus spina-chresti at a concentration of 100% 83 , followed by a plant (Solanum melongena Black at The concentration of 100% is 82%, followed by the plant Solanum melongena white at a concentration of 250% 80, followed by the lowest plant, the concentration is the plant Trigonella fonieum-graecum at a concentration of 100% 79.

Discussion

Through our research and laboratory tests on plant extracts, we found that citrus lemon was the highest 89% inhibition rate at a concentration of 250μl. and that the plant Trigonella fonieum-graecum represented the lowest inhibition rate at a concentration of 250μl at 79%And it turns out that the plant, (Solanum melongena .Black and white, Lupinus termis, Zizyphus spina-chresti,) represent close inhibition ratios.

Conclusion

Through our study of six medicinal plants and the effect of their ability to inhibit tyrosine in the laboratory, citrus lemon was one of the six best plants in inhibiting tyrosine. Trigonella fonieum-graecum was found to be the least able to inhibit the tyrosine enzyme, so we recommend using citrus lemon as an alternative to bleaching preparations, and we do not recommend Trigonella fonieum-graecum.

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Study the effect of constant and variable temperature and determine the optimum thermal range and water requirement for seed germination of the *Vicia faba*

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Under the supervision of Dr. Alaa jabbour

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Abstract

Vicia faba) is the most important pulse crop in the term of popularity, seed protein content (seeds provide substantial part of the protein in human diet) and world's cultivated area. FAO statistics show the total cultivated area occupied with faba bean was approximately 4-7 M/ha. The leader producing countries are China, Italy, Spain, the UK, Egypt (the area was decreasing due to many factors), Ethiopia, Moroco, USSR Mexico and Brazil.

Introduction

Vicia faba L. (faba bean) is an important legume and is cultivated essentially as a cool-season crop. Changes in sowing dates and lack of precipitation expose faba bean crop to drought and heat stresses. The gradual rise in global temperatures owing to climate change is likely to exacerbate the detrimental effects of hot and dry climatic conditions on faba bean cultivation. High temperature stress is particularly damaging to faba bean during the flowering period, when the viability of pollen is critical for successful reproduction. Recent studies have shown that maintenance of protein homeostasis through synthesis of heat shock proteins plays a key role in the heat response of plants. To date, there has been no significant work linking the heat response of faba bean to the repertoire of its heat shock proteins. While quantitative trait loci have been identified for resistance against biotic stresses in faba bean, there is no parallel success with abiotic stresses in this species. Programs aiming at genetic improvement of the heat/drought resistance of this crop by both conventional breeding and molecular breeding methods are hampered because of the large and majorly ill-analyzed genome of faba bean plants. Likewise, molecular and biotechnology-related tools are poorly developed for faba bean; as a result, the fruits of transgenic research developed with model plant species are not reaching this crop. While specifically discussing the prospects for the genetic improvement of faba bean(C. Durra - J.B. Dickieb - X Y. Yangc - H.W. Pritchardb 2015)

Germination is the first essential stage in crop and food production, as well as for the establishment of trees and regeneration of wild species. Temperature and water potential are the primary environmental factors that control germination in all species and affect both the rate and final percentage germination. A comprehensive description of intra- and inter-variations between groups of species (perennials and annuals, trees, grasses, crops and wild species) helps understand where these species are currently able to grow on earth and will be in the future. By collecting germination trait data on 243 species from the literature and unpublished data, we provide a wide spectrum of species' seed germination traits, in the form of a set of parameter values describing germination responses to variations in temperature and water potential.

d. (- W.A.J.M. De Costa - M.D.Dennett - U.Ratnaweera - K.Nyalemegbe – 1997)

Methods

1-We put filter papers in petri dishes .

2-Divide the dishes into two groups , each group has 20 dishes It is divided into five factors contain 4 dishes for each one . first group for constant temperature degrees : 5 - 15 – 25 – 35 -45 ^{0} C , and the second group for variable temperature degrees : 8/18 – 10 /21 – 14/28 – 21/36 – 26/41 ^{0}C with all data written on the dishes custom for each group , and Noting that the first temperatures represent night temperatures and first

temperatures represent morning temperatures , with lighting period adjustment (12 hours morning) and (12 hours night) .

3-Sterilize the bean seeds in sterilization solution for 15 minutes , then wash it with distilled water several times .

4-Put 25 seeds for each dish .

5-Put 10 ml from distilled water inside each dish .

6-Set incubators to the temperatures mentioned in point (2) and separate the dishes over the incubators .

7-Every three days we add distilled water to all samples .

8-Record the results of germination obtained daily in the tables (1 – 2) by recording the number of germinated seeds , Noting that the germination of seeds is determined by the appearance of the root of the seed and remove the germinated seeds so that they are not counted again and stop recording when the seed germination process is stable for several days or after 4 weeks have passed since the start of the experiment .

9-Calculate the average of each value and the standard deviation of its averages . Graph the averages of the factors and discussed the differences resulting from the factors and their causes, along with an explanation of the effect of the constant and variable temperature, the optimum temperature and the thermal range of bean seed germination.

Results

At a low temperature of 5 ° C, we have absolutely no germination of *Vicia faba* seeds this is because low temperatures influence on the seed embryo tissues :

a - Seed drying .

b - The movement of Cytoplasm stops .

At temperatures 10 / 21 ^{0}C, we have perfect germination of seeds in the following days : (5th , 6th , 7th ,8th , 9th , 10th , 15th , 16th) because the biological processes were at their highest levels, so germination of seeds occurred and with rate up more than 50 % .

water does not evaporate and has a kinetic energy and a suitable viscosity, so it is absorbed by the shell of the seed and absorbed within it.

Discussion

At high temperatures: the temperature evaporates the water in a petri dish and thus lacks water in the vicinity of the seed and absorbs very little water. At lower temperatures: the viscosity of the water increases and its kinetic energy decreases, *Vicia faba* .high temperatures influence on the seeds:

a - The hydrolysis enzymes inside the seeds that inhibit their action by forming new and strong covalent bonds between the various polypeptide chains which make a change in the shape and structure of the active sites in them .

b- The high temperature increases the permeability of the cell membranes for cells and organelles, so the concentration of toxic substances increases in the cells of the seed embryo .

c - There is an assembly of the protoplasm, where heat has a destructive and negative effect on the cytoplasm .

d - The higher temperature than the optimum for germination and growth increases the liquidity of the lipid that make up the cell membranes

Recomendations

Emphasizing the importance of this kind of experiments that study the effect of different environmental factors and environmental stresses on the germination and growth of crop plants, which are considered a component of food security. Emphasizing the issue of taking into account the water requirements of agricultural crops, given its great role in reducing waste and excessive depletion of water sources in light of the shortage of water in the Kingdom and the region.

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teacher. Muhammad Nahas

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(Posters)

الملصقات العلمية

لمشـــاريع التخـــرج

قســـم الاحيـــاء

(طالبات)

Metabolic Activities of Medicinal Plant (*Moringa oleifera* L.) Traditionally by Saudi People to Treat Common Diseases

Rawan A. I. Alhazmi
Under the supervision of Prof. Dr. Hameda El Sayed Ahmed El Sayed
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Abstract

Moringa oleifera, native to India, grows in the tropical and subtropical regions of the world, it is commonly known as 'drumstick tree' or 'horseradish tree Moringa can withstand both severe drought and mild frost, The leaves are rich in minerals, vitamins and other essential phytochemicals. Extracts from the leaves are used to treat malnutrition; It is used as potential antioxidant, anticancer, anti-inflammatory, antidiabetic and antimicrobial.

Introduction

Moringa oleifera belonging to the family of Moringaceae is an effective remedy for malnutrition. Moringa isrich in nutrition owing to the presence of a variety of essential phytochemicals present in its leaves, pods and seeds. In fact, Moringa is said to provide 7 times more vitamin C than oranges, 10 times more vitamin A than carrots, 17 times more calcium than milk, times more protein than yoghurt, 15 times more potassium than bananas and 25 times more iron than spinach.

Objective

The active substances have the ability to eliminate pathogenic bacteria from natural plants
Instead of using chemical antibiotics that affect different body systems.

Nutritive properties

Moringa has lot of minerals that are essential for growth and development among which, calcium is considered as one of the important minerals for human growth, Moringa powder can be used as a substitute for iron tablets, hence as a treatment for anemia
Every part of *M. oleifera* is a storehouse of important nutrients and antinutrients. The leaves of *M. oleifera* are rich in minerals like calcium, potassium, zinc, magnesium, and Vitamins like beta-carotene of vitamin A, vitamin B such as folic acid, Phytochemicals such as, sterols,flavonoids

Folic acid   Flavonoids

Beta-carotene   Sterols
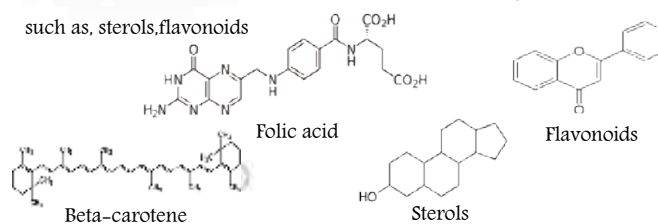
Conclusion

Moringa oleifera it is proven in numerous cases that the Moringa oleifera tree possesses a wide range of medicinal and therapeutic properties. it views the general nutrition contents of the Moring it several specific remedial properties including its anti-inflammatory, anti-microbial, anti- hyperglycemic, antioxidant, anti-tumour and anti-cancer properties.

Acknowledgments

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Metabolic Activities of Medicinal Plant (Allium sativum L.) Used Traditionally by Saudi People to Treat Common Diseases

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Abstract

It is estimated that there are 250,000 to 500,000 species of plants on Earth. A relatively small percentage (1 to 10%) of these is used as foods by both humans and other animal species. It is possible that even more are used for medicinal purposes. . They have tried to extract different parts of plants are used to prevent and treat a wide range of conditions and diseases. In this research, we will speak about a plant which is used in the medical treatment. This plant is garlic.

Introduction

Garlic: Latin name, *Allium sativum L.* common name: Garlic is common name of this plant. Garlic produces a chemical called allicin. This is what seems to make garlic work for certain conditions. Allicin also makes garlic smell. Some products are made "odorless" by aging the garlic, but this process can also make the garlic less effective. It's a good idea to look for supplements that are coated (enteric coating) so they will dissolve in the intestine and not in the stomach. Garlic belongs to the genus Allium. So it is closely related to the onion, rakkyo (an onion found in Asia), scallion, chive, leek, and shallot. It has been used by humans for thousands of years and was used in Ancient Egypt for both culinary purposes and its health and therapeutic benefits

Objective

Garlic produces a chemical called allicin. This is what seems to make garlic work for certain conditions. Allicin also makes garlic smell. Some products are made "odorless" by aging the garlic

Chemical composition

Garlic contains 0.1-0.36% of a volatile oil these volatile compounds are generally considered to be responsible for most of the pharmacological properties of garlic. Garlic contains diverse bioactive compounds, at least 33 sulfur compounds, minerals, 17 amino acid and their glycosides, arginine and others.
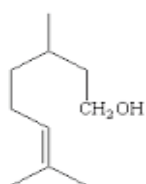
Citronellol
(3,7-dimethyl-6-octen-1-ol)
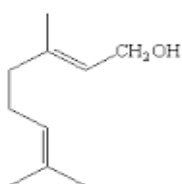
Geraniol
(E-3,7-dimethyl-2,6-octadien-1-ol)
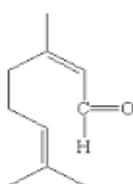
Neral
(Z-3,7-dimethyl-2,6-octadienal)

Discussion

Studies have found that garlic has strong antioxidant properties. Garlic and its active ingredients (such as phenols and saponins) have certain antioxidant effects.

Garlic also plays role in treatment of swelling, inflammation and sores inside the mouth (oral mucositis). It is thought that garlic improves redness in people with mouth sores. People seem to be more satisfied with garlic than the drug nystatin,

Garlic can give us oil. This oil is an essential oil which contains variety of sulfide such as dially disulfide and dilly trisulfide. It can be extracted by process of steam distillation of the garlic cloves using n-hexane as solvent. Allicine is not found in this oil.

Conclusion

Garlic is a widely consumed spice with a characteristic odor. It contains many bioactive. Garlic and its bioactive compounds are promising as functional foods or nutraceuticals for the prevention and treatment of different diseases Ancient civilizations used garlic to treat asthma, digestive disorders, heart disease, infections, respiratory disorders, tumors, and even intestinal worms. Today, claims for the health benefits of garlic include lower blood pressure and cholesterol, an anti-inflammatory effect, a reduced risk of cancer, and a stronger immune system

Acknowledgments

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Metabolic Activities of Medicinal Plants (*Avicennia marina*) Used Traditionally by Saudi People to Treat Common Diseases

Lamees Hosain Almarghalani
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Abstract

Avicennia marina (White mangrove) is one of the mangrove species that have wide use in traditional medicine because it is rich in active compound (secondary metabolites). Researchers make different experiments with mangrove extractions to treat different diseases. As in food industry *Avicennia marina* leaves extraction determined by "screening antimicrobial activity" and "disk agar diffusion test" had inhibitory effect on *Penicillium digitatum* at different concantrations (Behbahania *et al*, 2012). Seeds and leaves extraction hava anticancer activity was determined in mouse liver and results show the cells treated with *A. marina* extraction inhibited cell growth in cancer cell lines more than in normal cells (Huang *et al.,* 2016). Study on the affect of alcoholic extract of *A. marina* leaves on swiss webester showed that supplementation with the reduced oxidative stress and blood sugar levels, protected the liver, and improved the neurobehavioral changes associated with diabetes in mice *(Okla et al, 2019)*. *Avicennia marina* also have anti-inflammatory activity were the results of treated mice with *A. marina* extraction and vitamin C show that treated with high dose of vitamin C and high dose of extract have greatest impact on reducing inflammatory markers and improving joint lesions (Shafie *et al*, 2013).

As a result of all these experiments we find that *Avicennia marina* is a valuable source of medical compounds and more safely than chemical medicines.

Introduction

Avicennia marina (White mangrove) is one of the mangrove species from family Acanthaceae that have wide use in traditional medicine because it is rich in active compound (secondary metabolites). The content of bioactive compounds in *A. marina* has been reported the class of compounds tannins, saponins, terpenoids, alkaloids and steroids which have bioactivity as antimicrobial, antifungal, antiviral, antitumor, insecticides and antileukemia (Shadariah *et al,* 2012). *A. marina is a plant that grow on* the inland side of tropical and subtropical coastal due to their abilty to salt tolerance; as in KSA they widespread in Jizan, Rabigh, Jeddah and on the Farasan Island.

Researchers make different experiments with mangrove extractions to treat different diseases. Extracts of the leaves have anticancer and antiviral activity. Seeds have antimalarial activity. Stems and fruit used as a cure rheumatism, skin diseases and inflammatory.

In this project we mentioned some of the benefit affects of *Avicennia marina leaves extract In vitro* antimicrobial, anticancer, anti-diabetes, and anti-inflammatory acticity.

Objective

Show the benefits activities of *Avicennia marina leaves extracts* to treat common diseases and decrease the use of chemical medicines.

Chemical composition

There are ten compounds were isolated and identified from the aerial parts of A. *marina,* including,-(1) Acteoside, (2) isoacteoside, (3) syringaresinol, (4) 5, 7-dihydroxy-3′, 4′, 5′-trimethoxyflavone, (5) indolyl-3-carboxylic acid, (6) betulinic acid, (7) betullin, (8) lupeol, (9) avicequinone C, (10) kaempferol.
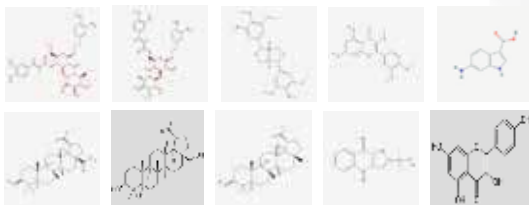
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Medical significance

a) Antimicrobial activity.

A. *marina* alcohol leaves extraction with ethanol 96 degree, methanol 96 degree and 20% glycerin antimicrobial effect of extract were determined by "screening antimicrobial activity" and "disk agar diffusion test" in 20, 40, 60 and 80 Percent concentration of the extract against *Penicillium digitatum (Behbahania et al, 2012).* Results showed *Avicennia marina* leaves extract can be used as natural antimicrobial in food products.

A: Control B: concentration of 2000 μg/ml Glycerin C:concentration of 2000 μg/ml Methanol D: concentration of 2000 μg/ml Ethanol

b) Anticancer activities.

Avicennia marina leaves soxhlet extraction in water, ethanol, methanol, and ethyl acetate (EtOAc). The chemotherapeutic potential of *A. marina* extracts was evaluated in a mouse model with tow cancer cells line and one normal cells line. Results show *A. marina* leaves extracts inhibited cell growth in cancer cell lines more than in normal cells line (Huang *et al.,* 2016).

Antioxidant, Hypoglycemic on Autoimmune Diabetic Mice.

Alcoholic extract (80% ethanol) of *A. marina* leaves was giving to four groups of webster mice . The DM group which is diabetic receiving the alcoholic extract of *A. marina* leaves shows positive affect include in reduced oxidative stress and blood sugar levels, protected the liver, and improved the neurobehavioral changes associated with diabetes in mice (Okla *et al.,* 2019).

d)Anti-inflammatory activity.

Hydroalcoholic[ethanol: water (7:3)] leaves extract of *A. marina* (HEA) was giving to six groups for 30 days. These groups consisted of healthy, arthritic, arthritic treated with 200mg/kg of the extracts, arthritic with 400 mg/kg, arthritic treated with Vitamin C+400mg / kg extracts and arthritis were treated only with vitamin C. Healthy and arthritic control groups. Arthritic treated with Vitamin C+400mg / kg extracts group reduced inflammatory markers and improving joint lesions.

Conclusion

Avicennia marina is a valuable source of medical compounds. These compounds have Toxicological characteristics, such as, anti-tumor, anti-inflammatory and different anti-microbial can be used in the treatment of disease instead of chemical medicines that had harmful side effects.

Avicennia marina can be use in food industry also, as anti-fungul compound. *Avicennia marina* rich in active compounds includes: alkaloids, flavonoids, phenolic acids, gallic acid, cryptomeridiol, and cedrondiol

Acknowledgments

Metabolic Activities of Medicinal Plant (*Matricaria chamomilla*) Used Traditionally by Saudi People to Treat Common Diseases

Kholod Talal Malawi

Under the supervision of Prof. Dr. Hameda El Sayed Ahmed El Sayed

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Abstract

Chamomile (*Matricaria chamomilla*). "Nowadays it is a very preferred and more widely used medicinal plant in folk and traditional medicine, 1)the above essential oil obtained above anhydrous is found. It shows moderate antimicrobial activity mainly associated with Gram-positive and Gram-negative bacteria, 2)use of Chamomile General Anxiety Disorder (GAD) To prevent relapse and symptoms of GAD, use the pharmaceutical chamomile extract 1500 mg (500 mg 3 capsules 3 times daily). Chamomile was long-term safe and significantly decreased from moderate to severe symptoms3)chamomile flower oil was composed of alpha-bisabolol oxides (12.2–30.9%) known as anti-inflammatory drugs

Introduction

Chamomile (*Matricaria chamomilla*) is a herbal chamomile plant, a member of the Asteraceae family. Spread in the Levant, Morocco and Turkey and almost every part of Europe (Ivens *et al.*, 1979) is an annual plant that grows after the rains in the eastern and northern regions of the Kingdom of Saudi Arabia, flowers open early in the middle of summer, and it should be noted that the plant blooms 6-8 weeks after germination, it has a strong and aromatic scent. (Franz *et al.*, 2005) It has several common types such as:

1) *Cladanthus mixtus* (Moroccan chamomile)

2) *Matricaria discoidea* (wild chamomile or pineapple weeds)

Objective

Chamomilla (*Matricaria chamomilla*) is extracted from flowers and volatile oil as natural antibiotics instead of chemical drugs that have side effects

Chemical composition

Chamomile flowers contain volatile oil of up to 1.5% dry flowers and extract the oil using the steam distillation method

The volatile oil contains compounds 1) alpha-bisabolo 2) bisabolol oxide 3) flavonols(Gupta *et al.*,2010)

Discussion

The Chamomile tea can lower blood pressure as it has a "direct relaxant effect" on your blood vessels, bringing down your BP

chamomile oil can be used to treat a wide variety of skin problems: acne, sunburn, boils, dry skin, eczema and other forms of dermatitis

German chamomile is used for stomach cramps, gastritis, indigestion and menstrual cramps.

Conclusion

Matricaria chamomile is a valuable source of natural medical compounds 1) for treating diseases caused by microbes like bacteria 2) useful in cases of diarrhea, stomach and intestinal colic 3) improves the immune system and increases white blood cells instead of chemical drugs that have had harmful side effects

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Metabolic Activities of Medicinal Plant (*Commiphora gileadensis*) Used Traditionally by Saudi People to Treat Common Diseases.

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Faculty of Applied Sciences

Abstract

Commiphora gileadensis is one of the burseraceae families, known locally as "Besham" or Balsam. As this study aims to find the medical benefits and therapeutic uses that are traditionally used for many diseases. Bark extract contains antibacterial and antimicrobial.

Plant bark is used to treat burns and skin infections. Ad the fruit as a medicine to dissipate gases and relieve stomach pain as a stimulant. As defined in the Arabian Peninsula, the tree resin is used to treat poisoning and stings and to treat wounds. Chemical compounds were reported in C. gileadensis, where flavonoids, sterols, tryptrin, saponins, volatile bases, and oils were shown. The plant aqueous extract was shown to have antihypertensive effects (Abdul-Ghani AS and Amin R, 1997). Anti-bacterial, microbial and inflammatory activities have been reported.

Objective

Commiphora gileadensis has proven the effectiveness of bark extracts in treating many diseases, making it a better alternative to chemical drugs.

Chemical Compounds

Phytochemical examination showed the presence of thirteen compounds in addition to volatile bases and oils (Al-Yahya *et al.*, 1990) including: flavonoids, sterols, triterpenes, saponins, terpenoids, furanosesquiterpenoid, simple phenols, phenolic acids, quinone, flavone, flavonols, coumarin and tannins
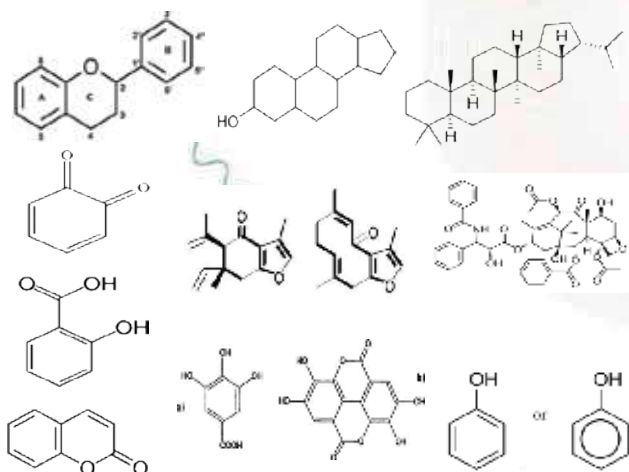
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Discussion

Commiphora gileadensis belongs to the Burseraceae and has many therapeutic benefits, as the extract from this plant has antimicrobial, antiviral, anti-tumor , and anti-bacterial activity.

The antibacterial activity:
Methanol extract 1423 mm and aqueous extract 14-20 mm have inhibitory activity of metastatic streptococcus and salivary streptococcus, which makes them effective in solving some dental problems.

The antimicrobial activity:
Effective antimicrobial compounds that include enzyme inhibition have been discovered by oxidizing compounds that act as sources of unstable root, which sometimes leads to protein identification and job loss and also contains efficacy in inhibiting the virus. (Aly and Bafeel, 2010; Aly and Gumgumgi, 2011).
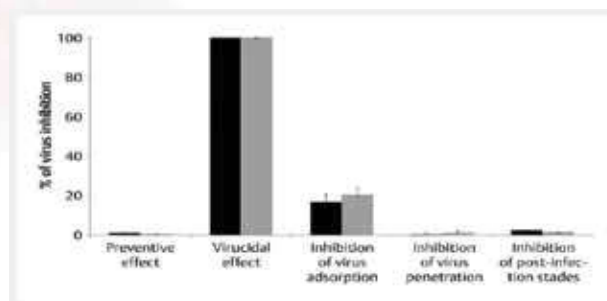
The antitumor activity :
Stem extract contains a Apocatalyst that works selectively against cancer cells. In addition, methanol extract has proven excellent against tumors with 100 g / ml L (Aly and Gumgumgi, 2011).

Conclusion

Since there are many active compounds in C. gileadensis, they contain antimicrobials and infections. C. gileadensis can be used in conventional treatment. The bioactive compounds of this plant can be used to treat bacterial and fungal infections and infections as well as to treat other diseases.

Acknowledgments

Application Of Genetic Modification And Genetic Engineering Technology For Some Plants Used And Their Impact On Public Health
Genetic Modification Of The Plant Colour And Size

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Abstract

The potential of genetically modification plant to meet requirements of growing population has not recognized today these include impact on human health and environment.

Introduction

Modification in plant include inserting gene into plant cell to produce the GM Plant Resistance environment condition, increased nutrition value, produce plant with new sequence DNA Gm in reducing the of waste and agriculture chemical in Agriculture ,and potential of technology to further improve crops in the future and use of antibiotic resistance brands and preventing the interdiction of new allergens into food.

Objective

1-produce anew trait to the plant not occur naturally
2-produce plant resistance diseases environment condition
3-increase Nutrition value in plant

Results

Genetic modification plant have the ability to transfer to other plant even bacteria we note that the transfer gene has a role in identifying of forming risk that occur to the environment by changing the composition a local ecosystem as result .
In most countries use of genetically modification plant for commercial purpose.

Discussion

Public opinion regarding the application and development of genetic engineering is likely to be an important factor affecting the future development of technology and its subsequent application in the commercial sector

Conclusion

Genetic modification plant attracted a large amount of media attention in recent years and counite to do Despite this, the general public remains largely unaware of what a GM plant actually is or what advantage and disadvantages the technology.

Acknowledgments

First and foremost our thanks go to Almighty Allah we would like to be able to express our deepest gratitude to all those who supported us to complete this work.

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A GM plant requires transfer of DNA into a plant cell
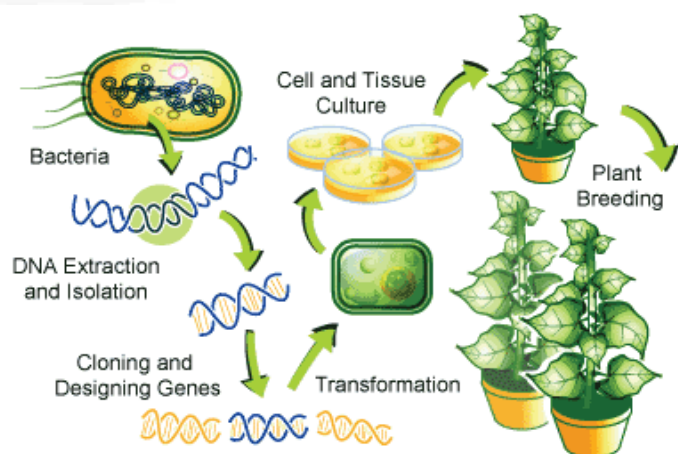
The process of genetic modification through isolation of a gene and insertion into the genetic sequence of a host organism

Applications of Genetic Modification and Genetic Engineering Technology for Some Plants Used and Their Impact on Public Health
Genetic engineering to enhance shelf life

Afrah hassan ghazi
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Abstract

Plant ripening and softening are key traits that have an effect on food supply, fruit nutritional value and consequently, human health. Since ethylene induces ripening of climacteric fruit, it is one of the main targets to control fruit over ripening that leads to fruit softening and deterioration. The characterization of the ethylene pathway in Arabidopsis and tomato identified key genes that control fruit ripening.

Introduction

Plant products are significant supporters of human eating regimens and wellbeing, giving basic supplements, cancer prevention agents, sugars, and fiber. The aging procedure has advanced to make natural product tasteful to living beings that expend them and scatter their seeds. In doing as such, aging actuates pathways that for the most part impact the degrees of pigments(typically arytenoids and flavonoids), sugars, acids, and smell volatiles, to make the organ all the more engaging, while at the same time advancing tissue mellowing and debasement to allow simpler seed discharge (Giovannoni JJ,2004.)(Giovannoni JJ,2007) In reality the volatiles created by aging natural product are additionally determined from, and speak to signals for, the nearness of basic supplements for creatures which may expend them (Goff SA, 2006). Expanded weakness to postharvest microbial disease protects that the seed are discharged through natural product spoil, if not utilization.

Objective

- Ethylene reaction qualities: potential targets for ethylene reaction and aging control .
- Transcriptional control of organic product maturing and rationed aging controllers

Chemical composition
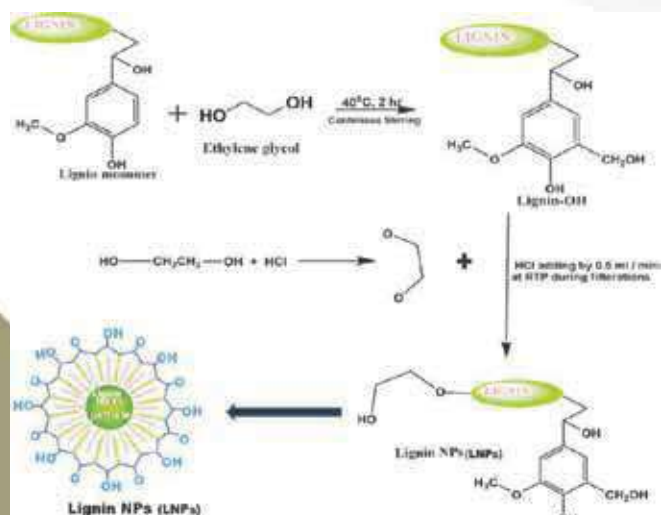
Discussion

To investigate fruit maturation and fruit softening we should a list of candidate genes and isolated key mutants that enhanced melon fruit quality Hence, by opening the TILLING platform to the scientific community, we hope to fulfill the expectations of both crop breeders and scientists who are using melon as their model of study.

Increase in shelf-life of ySpdSyn-transgenic fruits was not facilitated by changes in the rate of water loss or ethylene evolution. Additionally, expression of several cell wall and membrane degradation-related genes in ySpdSyn-transgenic fruits was not correlated with extension of shelf-life indicating that Spd-mediated increase in fruit shelf- life is independent of the above factors. Crop maturity, indicated by percent ripening fruits on the vine, was delayed in a CaMV35S-ySpdSyn genotype with fruits accumulating higher levels of the antioxidant, lycopene. Notably, whole plant senescence in the transgenic plants was also should delayed compared to WT plants. Together,

Accumulation of Anthocyanins in Tomato Fruit Delays Late Ripening and Decreases Pathogen Susceptibility (Zhang *et al.,* 2013).

Delayed Ripening and Reduced Pathogen Susceptibility Are Associated with the Accumulation of Anthocyanins, and Expression of Ripening-Related Genes Is Suppressed in Purple Tomatoes (Zhang *et al.,* 2013).

Accumulation of Anthocyanins in Tomato Fruit Delays Late Ripening and Decreases Pathogen Susceptibility (Zhang *et al.,* 2013)

Conclusion

In conclusion, the present study in genetic engineering showed to enhance plant life span using the ethylene reaction for aging control

Acknowledgments

First and foremost our thanks go to Almighty Allah. We would like to be able to express our deepest gratitude to all those who supported us to complete this work Our deepest gratitude and indebted to our supervisor Prof. Dr. Hameda El Sayed Ahmed El Sayed, Prof. of Plant Physiology, Faculty of Applied Science, Umm Al Qura University, for her supervision, continuous encouragement and also for sincere help to our in all occasions during the progress of the study and through the preparation of the manuscript. In the fact without this helps, this project would not have been possible.

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Evolution in DNA Barcode Methods for Authentication the Herbal Medicinal Products

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Abstract

In recent years, there has been worldwide interest in using medicinal plants as a safe alternative to chemical medicines. Accurate and fast species identification is an important and fundamental issue to herbal market safety. Even taxonomists and experts spend a long time confirming the identity of herbs, among which a large degree of morphological similarity exists between some species. Many herbs lose their distinctive morphological properties when they are prepared for sale as medicinal herbs. Both difficulties in accurate identification and unethical practices in the use of these medicinal herbs pose a real threat, and reliable tools are required to confirm the identity of these herbs. In the last five years, there have been recommendations to use the DNA barcoding method as a reliable approach for validating medicinal herbs and detecting fraud. There has been a significant increase in the application of this method for the verification of medicinal herbs. In addition, efforts have been made by researchers to develop this method, improve its performance, and increase its efficiency.

Introduction

Fraud in medicinal herbs is a global issue ?!

The percentage of adulterated herbal products, using DNA tests in 37 countries. The highest percentage of adulterated herbal products was in Australia (79%) (Brown), while the lowest proportion (Green) was in Asia (23%).

(Ichim, 2019)
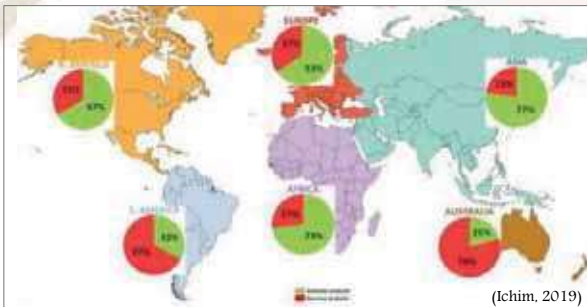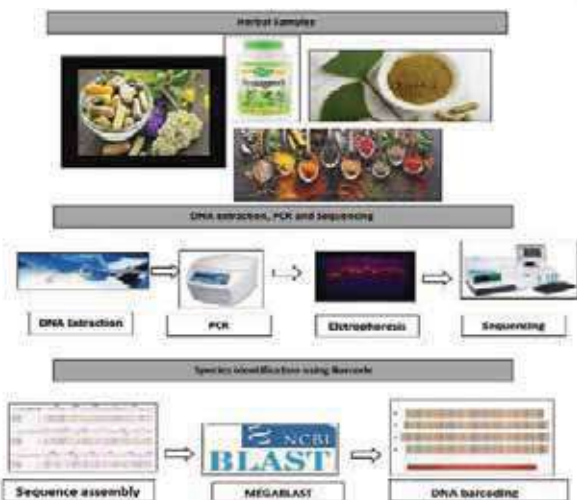
Methods

Development of DNA Barcoding Methods

Meta-barcoding and Mini-barcoding method!!

Features	DNA meta-barcoding method	DNA mini-barcoding method
Used to	To identify a product of many species(bulk)	To identify specific-species (one or few very related species)
Primers	Universal PCR primers applicable to amplify multiple species	Species-specific primers
Requires	–Large quantity of sequence. –Using next-generation illumina sequencing (NGS)	–Highly specific conserved fragments of sequences –Length of sequence (100–300 bp)

What is advantages of DNA-Gold Nanoparticles ?!

*It can resolve many issues such as
*Degradation in herbal products
*Low concentrations of extracted DNA
*Low PCR amplification efficiency
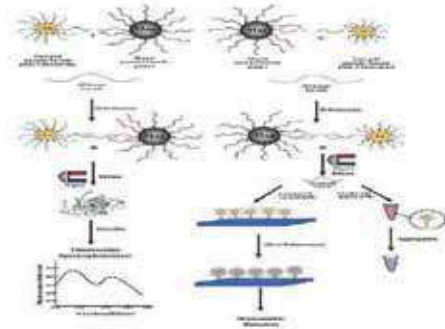
(Gao *et al*, 2019)

Recommendation

1. The importance of approval a unified global approach to validate the identity of medicinal herbs.
2. The importance of using DNA barcode as a standard to detecting fraud in medicinal herbs.
3. Possibility of use alternative of advanced DNA barcode insisted of regular barcode.
4. The barcode method should be used along with the chromatography fingerprint method or NMR spectroscopy.
5. We recommend Spread the culture of wild plant cultivation in its natural environment.

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Assess the effects of beetroot juice in blood component, blood pressure and iron-deficiency anemia on biology department female students

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Abstract

Several studies have investigated the effect of beetroot in body health. The present study aimed to investigate the effect of beetroot juice in blood component and blood pressure in adult female volunteer's in biology department. The experiment divided in to two steps: First step: Blood samples were collected from all the volunteers (7n) for hemoglobin, red and white blood counts using CBC device and used as control. The blood pressure was measured in all volunteers before the experiment start and used as control. Second step: six volunteers were drink beetroot juice (100g with 150 ml water) daily for 7 and 14 days. Aftar 7 and 14 days blood pressure, measured. The blood samples collected from venous blood for hematological investigation, and histological examination. Histological results showed normal structure of blood cells (erythrocytes and leucocytes). Significant decreased in blood pressure measured after 7 and 14 days, little increased in WBCs after 7 and 14 days of drinks beetroot juice. Non- non-significant difference in red blood cells (RBCs) count, hemoglobin content (HGB) showed little increased after 14 days. comparing to control. **In conclusion** the beetroot may have component which decreased blood pressures and increased hemoglobin and improve the blood iron-deficiency anemia. Also, beetroot increased WBCs which raise the immunity of the body against the pathogenesis. All these properties of beetroot may due to its component which rich in vitamins, minerals, and dietary fiber, petaline tincture, nitrate and many very powerful antioxidants.

Introduction

Anemia is a common health problem among women throughout the world, The World Health Organization (WHO) estimates that anemia affects over 2 billion people worldwide. Anemia is a general term referring to the condition characterized by abnormally low levels of healthy red blood cells or hemoglobin. There are multiple causes of anemia including genetic and dietary factors.

Many studies showed the Anemia is defined as a decline in one or more of the major RBC (Red Blood Cell) measurements: hemoglobin concentration, hematocrit, or red blood cell count. It is a disorder caused by nutritional deficiency involving iron, minerals, folic acid and vitamins (lotfi et al., 2019). The highest prevalence of anemia exists in the developing world where its causes are multi-factorial defects in human.

Beetroot juice is particularly beneficial as an anemia remedy for children and teenagers, according to H. K. Bakhruauthor of "food that heal". Easton Patrick (2011) says that consuming beet root juice or beet as cooked vegetable in salad is highly beneficial in treating anemia. Nirman Walker, D.Sc (2010) , in fresh vegetables and fruit juices, claims that beets build red corpuscles and add tones to blood so that it increases hemoglobin level in blood. Many studies proved that beet root contribute to improve the hemoglobin level in the blood. The cost is low when compared with other iron rich vegetables and it can be stored easily" (Jayaraman.2015).

Objective

The aim of the present study to assess the effects of beetroot juice in blood component and blood pressure in biology department female students

Materials and Methods

The study sample : Nine volunteers' adults' female from biology department in umm Al-Qura university, Makkah city, Saudi Arabia are participated in present study. The volunteers age was about 20-35 years old and their weight about 36-80 kg.

First step
Blood samples were collected from all the volunteers by using assaying a venous blood sample, red and white blood counts using CBC device and used as a control. The blood pressure was measured in all the volunteers before the experiment start and used as a control.

Experiment design

Second step
The volunteers were given beetroot juice (100g) orally daily for 14 days. After 7 and 14 days the blood samples were collected from venous blood. The blood pressure measured for day7 and 14 days.

Results

1- The histological results

Fig.1. Light micrograph showing normal structure of blood cells of volunteers' adults' female in control group.

Fig. 2. Light micrograph showing normal structure of blood cells in volunteers' adults' female given 100 mg beetroot juice for 14 days.

2- Haematology results

Fig. 3. Effect of beetroot juice on haematological parameters in adults' female showed increased in hemoglobin content (HGB) and there was a non-significant difference in red blood cells (RBCs). The white blood cells (WBCs) count showed miled increased after 7 days comparing to red blood cells count and hemoglobin content before they drink beetroot juice (control).

Fig. 4. Effect of beetroot juice on white blood cells in adults' female showed increase in the count of all different types of white blood cells after 7- 14 days comparing to all different types of white blood cells count before they drink beetroot juice.

3- Blood pressure results
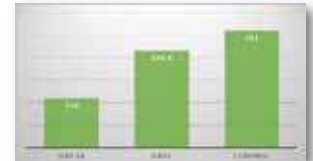
Fig. 5. Effect of beetroot juice on blood pressure in adults' female showed significant decreased in blood pressure measured after 7 and 14 days in volunteers' adults' female given beetroot juice for 7- 14 days comparing to blood pressure measured before they given beetroot juice.

Discussion

The results obtained in present study indicated that beetroot did not affect the blood cell structure and function. Also the results showed significant decreased in blood pressure after 7 and 14 days. Similar study showed that beetroot juice will lower blood pressure in men when consumed as part of a normal diet in free-living healthy adults. (Coles and Clifton, 2012). The present results showed little increased in blood hemoglobin after 7 and 14 days of drinks beetroot juice in female volunteers. Current results agreement with results obtained by Al-aboud,. (2018) which showed increase in serum iron level and mild increase in hemoglobin readings after 20 days on the blood samples of female volunteers. The results of the current study showed increase in the count of all different types of white blood cells. Neutrophil, monocytes, lymphocytes, basophil and eosinophil in volunteers' adults' female given beetroot juice for 7- 14 days comparing to all different types of white blood cells count before they drink beetroot juice. Which indicated beetroot may improvement the body defence against pathogenesis and my have anti- inflammatory effect. The study by Rauha et al. (2005) showed beetroot as one of the sources rich in vitamins, minerals, and dietary fiber, in addition to that it contains a high percentage of water, and it is distinguished by the presence of petaline tincture, which is distinguished by its anti-inflammatory and nitrate benefits.

Conclusion

The present study, showed, mild increase in hemoglobin and WBCs but there was a decreased in blood pressures after drinking 100 g of beetroot for 14 days. So, the beetroot may have component which decreased blood pressures and increased hemoglobin with improve the blood iron deficiency anemia

Acknowledgments

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Effect of Green Coffee on blood component, body weight losing and blood sugar levels on female volunteers' students in biology department

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Abstract

Many studies have investigated the relationship between green coffee body weight loss. The present study aimed to investigate the effect of green coffee in body weight loss, fat amusement, blood sugar levels and blood component in adult female volunteer's in biology department. The experiment divided in to two steps: First step: Blood samples were collected from all the volunteers (7n) for hemoglobin, red and white blood counts using CBC device and used as control. The blood sugar was measured in all volunteers before the experiment start using (Accu-CHEK instant) and used as control. The body mass index was measured in all volunteers before the experiment start using body mass index equation (BMI = kg/m^2) and used as control. Second step: Four volunteers were given orally green coffee (12g with 150 ml water) daily for 10 and 20 days. Aftar 10 and 20 days blood sugar, body mass, fat mass, body weight were measured. The blood samples collected from venous blood for hematological investigation, and histological examination. Histological results showed normal structure of blood cells (erythrocytes and leucocytes). Little decreased in blood sugar measured after 10 and 20 days, little increased in different types of WBCs after 20 days of drinks green coffee. The red blood cells (RBCs) count and hemoglobin content (HGB) showed little increased after 20 days, little decreased in body weight index and fat parameters in volunteers' adults' female drinks green coffee for 20 days comparing to control. **In conclusion** these alterations may due to green coffee beans contain which have specific substance Chlorogenic acid, and it has antioxidant properties, which makes it have a role in aiding in weight loss, increased insulin, decreased blood sugar and may increase body immunity.

Introduction

Green Coffee :

The coffee flower is tubular. It contains five crowns and twigs. The duration of the flowers is very short and does not exceed one or two days only. The fruit matures within 6-7 months, is green in color, then yellow and crimson red. The fruit of coffee is similar to cherry in size, shape and color.
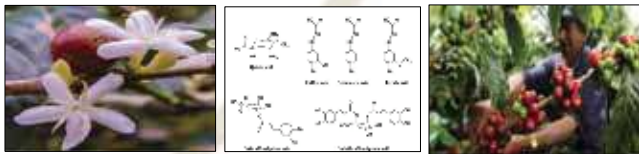
Green coffee is composed primarily of water, carbohydrates, fiber, proteins, free amino acids, lipids, minerals, organic acids, CGA, trigonelline, caffeine (Bagchi, et al., 2017)

Chlorogenic acids (CQAs):

are naturally occurring phenolic compounds originate in all higher plants.Because their various biological characteristics, such as antispasmodic, antioxidant, inhibition of the HIV-1 integrase and inhibition of the mutagenicity of carcinogenic compounds (Gil and Wianowska, 2017).

Coffee bean was recently used in a mental health and prevention of mental disorder study and may serve as an optional treatment for neurodegenerative disease (Bagchiet al.,2017). It also has a protective effect on liver function (Hosseini et al., 2017).

Obesity :

The worldwide development of an obesity epidemic with associated diabetes and cardiovascular disease represents one of the major challenges of the 21st century. (Despres and marzo, 2008)

Objective

The aim of present study to investigate the effect of green coffee in body weight loss, blood sugar levels and blood component in adult female volunteer's in biology department.

Material and methods

The study sample:

Seven volunteers' adults' female .age was about 20-23 years old and their weight about 48-81 Kg were used in the study.

Experiment design

First step
Blood samples were collected from all the volunteers by using assaying a venous blood sample.The blood sugar, fat mass, body weight and blood component were measured in all volunteers before the experiment start

Second step
Four volunteers were given orally green coffee (12g with 150 ml water) daily for 10 and 20 days. After 10 and 20 days blood sugar, fat mass, body weight and blood component were measured

Statistical analysis
The data obtained were analyzed using statistical analysis (SPSS).

Results

1-Histological results

**Fig. 1,** Light micrograph showing normal structure of blood cells of volunteers' adults' female in control group. (Giemsa X400) .Examination by light microscopic showed normal structure of blood cells in control group. The erythrocytes (RBCs) appeared with round shape, non-nucleated. The leucocytes (WBCs) also appeared with normal nucleus and shape.

Fig. 2, Light micrograph of blood cells from volunteers' adults' female given green coffee orally for 20 days . (Giemsa X400). Examination of Blood cells of volunteers' adults' female given green coffee (12 g) for 20 days showing erythrocytes in normal shape and the leucocytes (WBCs) appeared with normal shape with and little increased in number of neutrophil cells comparing to control.

2-Blood sugar results:
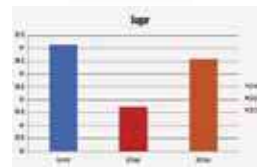
Fig. 3 , showed little decreased in blood sugar measured after 10 and 20 days in volunteers' adults' female were drink green coffee (12g daily) for 10- 20 days comparing to blood sugar measured before they drink green coffee.

3-Hematological results:
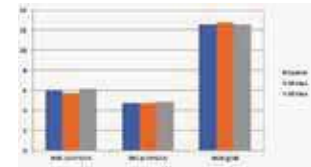
Fig. 4, showed little decreased in WBCs after 10 days of drinks green coffee and no change after 20 days comparing to WBCs count before they drinks green coffee (control). The red blood cells (RBCs) count and hemoglobin content (HGB) showed little increased in red blood cells count and hemoglobin after drinks green coffee for 10 and 20 days comparing to red blood cells count and hemoglobin content before they drink green coffee (control).

4-Weight and fat
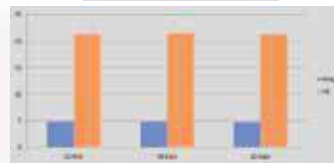
Fig. 5, showed little decreased effect on weight and fat parameters in volunteers' adults' female drinks green coffee for 10 and 20 days comparing to weight and fat parameters before they drink green coffee (control).

Discussion

Examination by light microscopic showed normal structure of blood cells in control group. Red blood cells appeared in their natural form for volunteer females. As for white cells, they also appeared naturally, but with an increased number of neutrophil cells compared to control. As for analyzing the results of blood sugar, results have shown little decreased in blood sugar measured after 10 and 20 days in volunteers' adults' female were drink green coffee for 10-20 days comparing to blood sugar measured before they drink green coffee. In the results of blood diseases, white blood cells decreased slightly after 10 days of drinking, and there was no change after 20 days compared to the number of white blood cells before drinking green coffee. The number of red blood cells (RBCs) and hemoglobin (HGB) showed a slight increase in the number of red blood cells and hemoglobin after drinking green coffee for 10 and 20 days compared to the number of red blood cells and hemoglobin content before they drank green coffee. As for weight, it decreased slightly after 20 days.

Conclusion

The results indicated that green coffee did not affect the structure and function of blood cells, as well as it showed a slight decrease in weight and blood sugar. these slight changes are due to a substance known as Chlorogenic acid with an anti-oxidant properties, which makes it have a role in decreasing blood pressure and helping to lose weight and increase insulin and hypoglycemia.

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The Queen of Spices: *Elettaria Cardamomum* Chemical Composition and Antibacterial Activity

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Abstract

Spices are widely used in our lives as a major ingredient in kitchens. Each type of spice has distinctive personalities that can be recognized by its taste and flavor. Small and cardamom monocot belongs to the Zingiberaceae family. Cardamom has been applied in many areas such as: anti-inflammatory, anti-oxidant, anti-bacterial, etc. Various herbal extracts are known to provide therapeutic benefits in the oral cavity when used topically. the aim for this study, to detecting the different functional groups in the seed and pods of the *Elettaria cardamom* powder from different regions and determining the antibacterial compounds. Based on the analysis results of fourier transform infrared spectroscopy (FTIR) and gas chromatography mass spectrometry (GC-MS) are determined some of the anti-bacterial compounds in the seed and pods of Elettaria cardamom powder from different regions (India and Guatemala).

Introduction

Cardamom belongs to the monocot family Zingiberaceae (ginger family). The genus consists of six species. *Elettaria cardamomum* (small cardamom) is grown in India, Guatemala, Sri Lanka, Nepal, Indonesia, Saudi Arabia. The basic composition of cardamom consists of many monoterpenes. Monoterpenoids are a type of volatile oil. The chemical composition of cardamom varies considerably with variety, several factors such as the origin of harvest, part of the plant used, environmental factors, soil characteristics, harvest time and storage conditions. The main factor that determines the quality of cardamom is the content and composition of volatile oil. The Cardamom possesses the following medicinal properties : anti-inflammatory, antioxidant activity, blood pressure lowering activity, antimicrobial and anti-bacterial activity.

Objective

- Detecting the different functional groups of seeds and pods powder in Indian and Guatemalan (Mexican) *Elettaria cardamom*.
- Identify the active chemicals in the cardamom that influence bacterial growth.

Results

1. Detecting the different functional groups in the seeds & pods of *Elettaria cardamom* powder from different regions

Table.1: FTIR peak values of *Elettaria cardamomum* powder (India and Guatemala).

Type /Origin	Absorption (Cm⁻¹)	Bond	Functional group
Pods / India	1620.62	C=C stretching	► α,β-unsaturated ketone
	1098.94	C-O stretching	► Secondary alcohol
Seeds / Guatemala	1077.56	C-O stretching	► Primary Alcohol
	989.19	C=C bending	► Alkene
Pods / Guatemala	1617.77	C=C stretching	► α,β unsaturated ketone
	1604.94	C=C stretching	► conjugated alkene
	1097.52	C-O stretching	► Secondary Alcohol

► Functional groups that indicate to presence of antibacterial chemicals.

The 2- methoxy-4 Vinyl phenol compound contains conjugated alkene and secondary alcohol functionals groups, while the compound phytol contains primary alcohol and alkene, in addition, 4H-1-Benjopyran-4-one , 2,3- dihydro-5,7-dihydroxy-2-phenyl compounds contain α,β-unsaturated ketone and alcohol.

2. Determination the antibacterial compounds:

Table.2: Activity of Phyto-components identified in *Elettaria cardamom* by GC-MS (Khatri *et al.,* 2017).

Name of the compound	Structure	Nature	Activity
2-methoxy-4 Vinyl phenol		Phenolic compound	Antibacterial, Antioxidant, Antiseptic, Antiviral, Fungicide
Phytol		Diterpene	Antimicrobial, Anticancer, Anti-inflammatory, Diuretic
Octadecanoic acid		Fatty Acids	Anti-inflammatory, Hepatoprotective, Nematicide, Antimicrobial
4H-1- Benjopyran-4- one, 2,3- dihydro-5, 7- dihydroxy-2- phenyl		Flavonoid fraction	Antimicrobial, Anti-inflammatory

Discussion

Indian cardamom and Guatemalan (Mexican) are involved in some functional groups and some active substances against bacterial growth, and they differ in other functional groups. This difference in functional groups is due to the region, age of the plant, genetic make-up of the variety, environmental factors, soil characteristics, harvest time as well as the isolation method used (Tambe and Gotmare, 2019). The effective chemical compounds against bacterial growth in *E. cardamom* are 2-methoxy-4 Vinyl phenol, Phytol, Octadecanoic acid and 4H-1-Benjopyran-4- one, 2,3- dihydro-5, 7- dihydroxy-2- phenyl (Khatri *et al.,* 2017).

Conclusion

The results obtained for three type of cardamom powders (seeds, pods, and capsules) from different regions (India and Guatemala), reveal that there is considerable difference in the chemical profile by FTIR analysis. And there are anti-bacterial compounds detected by a GC-MS device.

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Applications on the immune checkpoints as cancer therapy

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Abstract

Cancer is defined by uncontrolled cell growth and metastatic properties. In most cancer cases, uncontrolled cell growth takes place when oncogenes are activated and/or tumor suppressor genes and apoptotic mechanisms are deactivated. Typically, the mammalian immune system recognizes and responds to cancer if sufficiently activated; however, immune responses are not enough for curing cancer if there is no therapeutic intervention. Fortunately, scientists have discovered immunotherapeutic approaches that supplement antitumor responses. The most commonly-used class of immunotherapeutic drugs are made of antibodies that block immune checkpoint inhibitory receptors, thereby producing effective antitumor responses in a subset of cancer patients. Drugs target inhibitory molecules programmed death (PD1), PD ligand (PDL1), and cytotoxic T lymphocyte-associated antigen (CTLA-4), and some of them have already been approved by the Food and Drug Administration for use, particularly, PDI and CTLA-4. Clinical trials show that cancer immunotherapy is effective for melanoma, non-small cell lung cancer, Hodgkins Lymphoma, and colorectal cancer, among others.

Introduction

Cancer is defined by the accumulation of genetic mutations. Specifically, cancer is characterized by "uncontrolled cell growth, "as well as, metastatic properties. (FIG.1)
Conventional therapy for treatment can be: chemotherapy, radiation therapy, and surgery.
Immunotherapy is one of those that shows promise as means of killing cancer cells without destroying healthy ones. Drugs used for this kind of treatment enhance the ability of the immune system to find cancer cells and destroy them. Notably, the human immune system usually responds to cancer by blocking pathways through antibodies ca

CANCER CELL
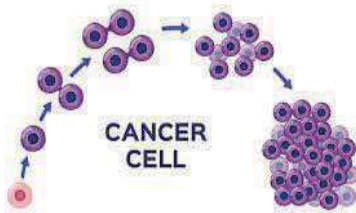
Immune Checkpoints:

The term **"immune checkpoints"** refers to the immune switches regulating stimulatory or inhibitory state of immune cells primarily T cells. Escape Mechanisms in the tumor microenvironment prevent the immune system from effectively suppressing tumor growth so that the tumor can ultimately lead to cancer progression. Escape Mechanisms start when the **PD-1/PDL1** pathway is activated in the tumor microenvironment.
Among the different immune checkpoints, blockade of CTLA-4, PD-1 and PD-L1 have been the most effective in terms of therapeutic effect. Immunotherapy use blocking mechanism for these immune checkpoints to reduce metastatic after tumor resection.
The FDA approved over 15 anti-PD-1/PD-L1 medicines which considered the first-line treatment for certain cancers.

How Does Immunotherapy Work?
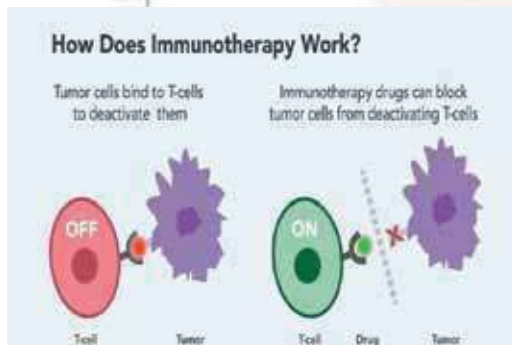
Clinical trails

- Ipilimumab, is an anti-CTLA-4 antibody, was the firsts studied for melanoma.
- Nivolumab, is a blockade of PD-1 signaling shows increased median survivability, decreased hazard ratio, and increased objective response rate.
- Durvalumab, Avelumab and Atezolizumab, are antibodies against PD-L1 ligand they have recently been studied and is in late-phase clinical development.
- Cancer immunotherapy has also been successfully studied for Hodgkin's Lymphoma.

Treatment mechanisms

Human immune system has its own mechanisms in order to discern between normal and foreign cells including cancer cells. This ability to discern signals to the immune system to release substances that attack the cancer cells while leaving the normal cells alone. This is achieved using checkpoints. Cancer cells may elude these checkpoints to avoid attacks from the immune system. However, checkpoint inhibitors drugs remove the brakes of immune responses that are yet to begin and thus, do not function fully. In other words, checkpoint inhibitors are used today as cancer immunotherapy. This is the mechanism of checkpoint in inhibitors.

Conclusion

Cancer cells can multiply and eventually invade different organs of the body, hence, the importance of stopping cell division in order to prevent spreading the disease, as well as kill cancer cells in the process. This process though is not as straightforward as finding the diseased cells and destroying them.
Immunotherapy using monoclonal antibodies against checkpoint molecules, including PD 1, PD L1, and CTLA 4, have been found effective for a significant subset of patients. They are targets for immunotherapy based on extensive basic research showing that these molecules are physiological inhibitory regulators of T cell responses. Cancers that have been effectively been treated using immunotherapy are colorectal cancer, melanoma, non-small cell lung cancer, and, Hodgkin's Lymphoma.

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Acknowledgements

Biological Control of Pathogenic Fungus Causing Root Rots and Damping off Seedling in Agricultural Crops

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Abstract

In this study, the pathogenic fungi of the cucumber plant, namely, *Rhizoctonia, Pythium, and Fusarium*, were isolated and identified through microscopy. Also, pathogenic antifungal bacteria were isolated from the cucumber root zone. The study demonstrated the ability of bacteria isolated from the area of cucumber plant roots and *B subtilis* to inhibit the growth of pathogenic fungi. Experimental results show the ability of bacteria 1 to inhibit the growth of Fusarium 81%, bacteria 2 to inhibit the Pythium 72.2%. Bacillus also showed a high ability to inhibit Rhizoctonia inhibit 61.1%.

Introduction

The crops can be infected with many agricultural pests in general and plant pathogens in particular, including fungi R. solani, P. aphanidermatum and Fusarium solani (Bilgrami and Verma, 1981). Plant diseases are responsible for the loss of at least 10% of global food production, representing a threat to food security (Strange & Scott, 2005). Agrios (2004).
Worldwide, plant diseases were responsible for severe famines in the past (Agrios, 2004). For example, potato blight caused by the plant pathogenic oomycete Phytophthora infestans on potato cultures caused more than one million deaths in Ireland during the "the great famine" between 1845 and 1849 (O'Neill, 2009).
To prevent or control these diseases, producers have become increasingly dependent on agrochemicals, especially over the past few decades, as agricultural production has intensified. Despite the great effectiveness and ease of utilization of these products, their use or misuse has caused many problems including significant pollution of soils and ground water reservoirs, accumulation of undesirable chemical residues in the food chain, emergence of fungicide-resistant strains of pathogens, not to mention health concerns for growers. According to the Stockholm convention on persistent organic pollutants, 10 of the 12 most dangerous and persistent organic chemicals are pesticides (Gilden et al., 2010). An example is the synthetic pesticide dichlorodiphenyltrichloroethane, well known as DDT, which was extensively used in agriculture between 1950 and 1980 and was found genotoxic in human and responsible for endocrine disorders (Cohn et al., 2007).
Consequently, there is an increasing demand from consumers and officials to reduce the use of chemical pesticides. In this context, biological control through the use of natural antagonistic microorganisms has emerged as a promising alternative. Indeed, these biopesticides present many advantages in terms of sustainability, mode of action and toxicity compared to chemical pesticides. Here, we focus on the versatile utilization of Bacillus based products as biopesticides. More precisely, a special emphasis is given to the three main specific mechanisms involved in biocontrol of plant diseases by this bacterial genus: competition for ecological niche/substrate in the rhizosphere, production of inhibitory chemicals and induction of so-called systemic resistance in host plants.

Aim of work
This research aims to is to study the resistance of pathogenic fungi to pathogenic crops of economic value through biological resistance. The objectives can be summarized as follows:
1. Isolation of pathogenic fungi and antibacterial bacteria in the rhizosphere.
2. Identification of the pathogen.
3. Study the ability of these isolated microbes to inhibit the growth of pathogenic fungi.
4. Reducing environmental pollution as a result of the use of chemical pesticides and their damage from the environment and the consumer.
5. Contributing to reducing the costs of chemical pesticides and replacing them with safe and cheaper alternatives.

Methods

1. Survey and isolation of the cucumber root-rot pathogens
2. Isolation of antimicrobials from the root zone (rhizosphere) in cucumber plant
3. Test the antibacterial ability of Pathogenic fungi:
4. The effect of antibacterial on the longitudinal growth of pathogenic fungi
5. Effect of bacteria on the wet weight of pathogenic fungi
6. Soil infestation

Results

1. Survey and isolation of the cucumber root-rot pathogens
Fungi have been isolated from the root zone of the cucumber plant, and they are defined as: *Fusarium* sp, *Rhizoctonia* s, *Pythium* sp and *Aspergillus niger*

Fusarium sp   *Pythium* sp   *Rhizoctonia* sp

2. Isolation of root zone microbes from cucumber plant
Pathogenic antimicrobial microbes from the rhizosphere of the cucumber plant were identified as follows: B1 – B2 – B3 – B4 – B5 - Bacillus sp

Table (1) Table (1) Estimating the ability of isolated bacteria to inhibit the longitudinal growth of pathogenic fungi.

Fungi	Fusarium sp		Pythium sp.		Rhizoctonia sp.	
Microbes	Rate of inhibition	Diameter of fungi	Rate of inhibition	Diameter of fungi	Rate of inhibition	Diameter of fungi
Bacteria (1)	22.2	7	25	6.75	19.4	7.25
Bacteria (2)	25	6.75	27.8	6.5	22.2	7
Bacteria (3)	11	8	16.7	7.5	11	8
Bacillus	17.8	7.4	42.2	5.2	33.3	6
Control	0	9	0	9	0	9

Table (2) Percentage % of antimicrobial effect on linear growth of pathogenic fungi.

Fungi	Fusarium sp		Pythium sp.		Rhizoctonia sp.	
Microbes	Rate of inhibition	Diameter of fungi	Rate of inhibition	Diameter of fungi	Rate of inhibition	Diameter of fungi
Bacteria (1)	81.1	1.7	70	2.7	22.2	7
Bacteria (2)	72.2	2.5	72.2	2.5	47.7	4.7
Bacillus	50	4.5	50	4.5	61.1	3.5
Control	0	9	0	9	0	9

Pythium &B subtilis   *Pythium and Bacillus*   *Fusarium and bacteria2*   *Fusarium and Bacillus*

Table (3) Evaluating the weight for the diseased fungi's of the cucumber plant

Bacillus+Pythium sp.	2.4g
Bacteria 2+Pythium sp.	4. g
Bacteria 1+Pythium sp.	4.2 g
Control	6 g

Discussion

The results showed that the bacterial growth of B subtilis had the greatest inhibitory effect on the growth of the Pythium, as the rate of inhibition reached 42.2%, and it gave the highest rate of inhibition of the Rhizoctonia 33.3%. While bacteria number three showed less ability to inhibit the growth of fungi, it reached 11% for both Fusarium and Rhizoctonia, while it reached 17% for Pythium. These results are consistent with previous studies that confirmed the role of biological resistance in controlling pathogenic fungi. The ability of bacteria to parasitize and degrade spores or hyphae of pathogens through the production of various cell-wall degrading enzymes has also been suggested (Whipps, 2001). As examples, isolates related to Bacillus ehimensis (Hoster et al., 2005) produce chitin-degrading enzymes while Bacillus subtilis displays some fungitoxicity through the secretion of N-acetyl glucosaminidase and glucanase (Manjula and Podile, 2005). Some more specific pathogen–biocontrol strain interactions leading to pathogen restriction were reported such as interference with biofilm formation, inactivation of pathogen germination factors and degradation of pathogenicity factors such as toxins.

Recomendations

1- Reducing the use of chemicals and pesticides because of their damages and replacing them with a safe method.

2- The use of biological resistance to combat pathogenic fungi being less expensive and safer.

Acknowledgments

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Effects of Plant Extract on Pathogenic Fungi Causing Root Rots and Death of Seedlings in Agricultural Crops

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Abstract

Fungi have been isolated from the root zone of the cucumber plant, and they are defined as: *Fusarium* sp, *Rhizoctonia* sp, *Pythium* sp, *Aspergillus niger* and *Alternaria alternate*. The disease of seedlings and root rot in cucumbers causes a serious problem for cucumber crops under the conditions of protected cultivation, and causes great losses in plants, especially in repeated plantations in the same soil. Through the previous study, it is clear the effective role of plant extracts to combat plant pathogenic fungi instead of using chemical pesticides because of their harmful effect on the environment and humans. Based on results the high ability of filtrate extract of Ziziphus spina-christi extract was observed with a concentration of 5% on the inhibition of the longitudinal growth of the *Pythium* sp, where the rate of inhibition was 61.11% in water compared to the rest of the treatments. It was also observed that the concentration of 5% in the filtrate of the Lawsonia inermis extract was more effective in inhibiting the longitudinal growth of the *Rhizoctonia* sp compared to the Ziziphus spina-christi extract in the concentration of 5% in the inhibition amounting to 53.33%. The results were compared to the control experiment, where the inhibiting rate for pathogenic fungi was 0%.

Introduction

Plant diseases need to be controlled to maintain the quality and abundance of food, feed, and fiber produced by growers around the world. Different approaches may be used to prevent, mitigate or control plant diseases. growers often rely heavily on chemical fertilizers and pesticides. the environmental pollution caused by excessive use and misuse of agrochemicals Pathogenic fungi are among the most dangerous and most harmful fungi. Their pathological symptoms usually appear on the vegetative system after they have completely managed to eliminate   the root system(Garrett, 1970). Fungi cause seedlings death and root rot in cucumbers, large losses for plants, especially under the conditions of protected agriculture, where the fungus Rizoctonia solani causes large losses to plants because it is in the fungi that reside in the soil and are widespread. Nahed (2007) and Inbar et al. (1994)

(Hadizadeh et al.,2009) Research results showed that the plant extracts of Zizphus spina-christi leaves had achieved a significant decrease in the growth rate and inhibition rate of the pathogenic fungus *F.oxysporim*, which causes root rot disease of cucumber plants.

Aim of Work

This research aims to study the effect of plant extracts on the growth of some pathogenic fungi that infect agricultural crop plants. The objectives of this research can be summarized as follows:
1- Extracting chemical compounds from the leaves of plants under study.
2- Study the vital activity of plant extracts and their ability to inhibit the growth of pathogenic microorganisms and fungi.
3- Test the effectiveness of plant extracts in fighting plant diseases instead of chemical pesticides.
4- Reduce environmental pollution by using natural plant extracts instead of chemical pesticides.
5- Test different concentrations of plant extracts, up to the effective concentration affecting pathogenic fungi.

Methods

1- Survey and isolation of the cucumber root-rot pathogens.
2- Selection of plant samples : Two plants were selected which are Lawsonia inermis and Ziziphus spina.
3- Methods of preparing the plant extracts.
4- Purification of pathogenic fungi on the environment of PDA (Potato Dextrose Agar).
5- Determine the effective concentration of   aqueous extracts of the plant under study on the vitality of pathogenic fungus in vitro: Prepare the   nutritional medium (PDA) and before the solidification stage, the plant extract was added at   two concentrations per plant species (2.5 – 5 %) .
6- Study the effect of plant extracts on the wet weight of pathogenic fungi: The broth was prepared and distributed in 50 ml flashes and sterilized with an autoclave device, then the plant extracts for Lawsonia inermis & Ziziphus spina were added at a concentration of 5% .

Results

1- Survey and Isolation of the Cucumber Root-rot Pathogens Fungi have been isolated from the root zone of the cucumber plant, and they are defined as:
1- Fusarium solany.
2- Rhizoctonia sp.
3- Pythium sp.
4- Aspergillus niger.
5- Alternaria alternata

a) Fusarium solani
b) Pythium sp
c)Rhizoctonia
d) Aspergillus
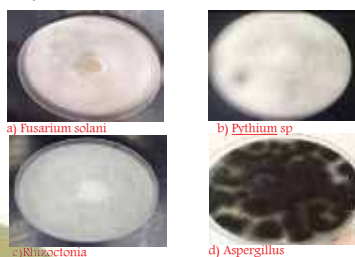
2- Determination of active substances of plants under study : Lawson contains of (2- Hydroxyl - 1.4 Naphthalene), tannic acid, chrysophanic acid, anthraquinone, mucilage, gallic acid, mannite cyan glycosides , sterols , triterpenes (Saadabi, 2007). Ziziphus spina contains of flavonoids, sterols, peptids alkaloids, glycosides and polyphenols (Gupta and Bansal, 2003).

Table (1) The effect of overlapping concentrations of plant extracts of Ziziphus spina-christi and Lawsonia inermis plants on inhibiting the fungal growth of some pathogenic fungi.

Fungi / Plant extract		Fusarium solani		Rhizoctonia sp		Pythium sp	
	The concentration	Inhibition By(cm) P	The percentage (%)	Inhibition By(cm) P	The percentage (%)	Inhibition By(cm) P	The percentage (%)
Lawsonia inermis	2.5%	9.5cm	55.6%	7.2cm	20%	4.2cm	53.33%
Lawsonia inermis	5%	6cm	33.3%	4.2cm	53.33%	3.7cm	58.9%
Ziziphus spina	2.5%	5.7cm	36.7%	6.7cm	25.6%	4cm	55.6%
Ziziphus spina	5%	5cm	44.44%	6cm	33.3%	3.5cm	61.11%
control	Fusarium Pythium Rhizoctoina	9cm	0%	9cm	0%	9cm	0%

Table (2) the effect of plant extracts with a concentration of (5%) on the wet weight of pathogenic fungi (in grams).

Fungi / Plant extracts	Wet weight of fungi		
	Pythium	Rhizoctonia	Fusarium
Ziziphus spina 5%	1.5g	1g	1.7g
Lawsonia inermis 5%	1.4g	1.6g	1g
Control	3g	4.4g	4g

Lawsonia inermis 5% & Pythium

Ziziphus spina 2.5%& Pythium

Lawsonia inermis 2.5%& Fusarium

Filtration of pathogenic fungi treated with plant extracts
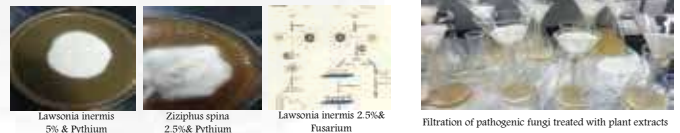
Discussion

The disease of seedlings and root rot in cucumbers causes a serious problem for cucumber crops under the conditions of protected cultivation, and causes great losses in plants, especially in repeated plantations in the same soil. The results of isolation in the roots of cucumber plants affected by the disease showed that the fungi (*Fusarium, Pythium and Rhizoctonia*) are fungi that Prevail among the isolated pigs. *Pythium* was the most dominant, followed by the Fusarium; Rhizoctonia. Inbar et al. (1994) and Al-Tuwaijri (2008) confirmed that these pathogenic fungi with the collected cucumber samples are endemic in the soil and that the reproduction of the host's culture in the same soil leads to increased.

Based on the results , the results confirmed the ability of the extract of Ziziphus spina-christi and Lawsonia inermis plant, with its different concentrations, to inhibit the growth of pathogenic fungi. The greater the concentration, the greater the effect is given to controlling the pathogens. Plant extracts have been used in many studies for the flowers, roots and leaves of plants that contain toxic substances against many agricultural pests (insecticidal, bacterial, fungal), including *Alternaria alternata, Rhizoctonia solani, Fusarium solani* and Fusarium oxysporum where the inhibitory activity against the tested fungi is demonstrated (Hadizadeh et al., 2009).

Recommendations

1- Avoid using different chemical pesticides and educate people about their risks and damages to human health and the environment.
2- Using natural materials from the environment that are less harmful to human health and the environment, such as plant extracts.
3- Conducting more studies on plant extracts.

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Applications on targeting the tumor suppressor p53 as anticancer therapy

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Abstract

TP53, encoding p53, is one of the most famous tumor suppressor genes. The majority of human cancers demonstrate the inactivation of the p53 pathway, functions as a tumor suppressor but can also exert tumor-promoting effects. The basic function of p53 is to respond to cellular stress. We herein review the recent advances in p53 research and focus on apoptosis, cell cycle arrest, and senescence in response to stress. We also review the clinical applications of p53-based therapy for human cancer. The majority of human cancers acquire mutations that abrogate the p53 tumor suppressor network and, as a consequence, p53 is one of the most extensively studied proteins in cancer research. Because of its potent tumor suppressive activity, it is widely assumed that a molecular understanding of p53 action will produce fundamental insights into natural processes that limit tumorigenesis and may identify key molecular targets for therapeutic

Introduction

The P53 gene, which encodes p53, is one of the most frequently mutated genes in human cancers. P53 has been known as a tumor suppressor gene. Tumor suppressors genes act to maintain tissue homeostasis, that is, to control the cell cycle division and apoptosis. The loss or mutation of P53 leads to most of human cancer. Because of that p53 becomes a good candidate in cancer therapy research.

p53 Functions

In normal cells, the p53 protein is low. DNA damage and other stress signals may trigger the increase of p53 proteins.
p53 Proteins have three major functions:
- Cell cycle arrest
- DNA repair
- Apoptosis
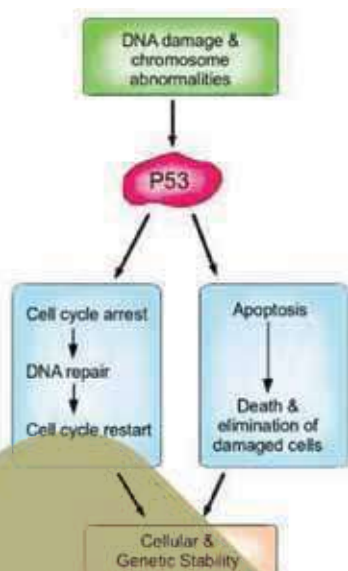
Applications of p53-Based Cancer Therapy

Because most, if not all, human cancers harbor mutated p53, the concept of recovering the p53 for cancer therapy is very attractive.

Some of the applications in targeting the P53 as cancer therapy:

p53 mediated Therapy

Alternatively, the re-activation of mutant p53 contributes to much more efficient treatment of cancers bearing mutant p53. After screening of a library of low-molecular-weight compounds, Bykov et al. found that one compound termed PRIMA-1 has an ability to restore wild-type function to mutant p53 such as R248Q and R175H. Further studies demonstrated that PRIMA-1 binds to the DNA-binding domain of mutant p53 and covalently modifies the thiol groups in the central core DNA-binding domain, and thereby reactivates mutant p53 .

p53 stabilization

MDM2 controls p53 degradation. Many tumors overexpress MDM2 , even tumors without p53 mutation.
MI-219 is a small molecule that inhibits the MDM2-p53 interaction. MI-219 also activates the p53 pathway in cells with wild-type p53.

Gene therapy

The first p53-based gene therapy was reported in 1996 . A retroviral vector containing the wild type p53 gene under the control of an actin promoter. After development of a replication-defective recombinant p53 virus (Ad5CMV-p53).

Reactivating mutant p53

There is class of small molecules that reactivate the wild-type functions of mutant p53:
PRIMA-1 is small molecule identified by cell-based screening which restored sequence-specific DNA binding and the active conformation of p53.
CP-31398 is also a small molecule that can restore the protein folding of mutated p53 to a more natural conformation that permits a wild-type function.

Conclusion

p53 was originally viewed as tumor suppressor gene. Many p53 family transcriptional targets have been identified as having the capacity to modulate various cellular processes including growth arrest, apoptosis and DNA repair. In fact, it has become evident that this tumor suppressor is a molecular that is involved in an extensive and complex network of stress response pathways. Mutations in p53 has been found in many cancer tumors. Understanding the mechanisms of p53's function is currently a major challenge in p53 research, and such knowledge may provide novel targets and approaches to therapeutic manipulation of the p53 pathway in the treatment of cancer. Here we discussed some of the applications that have been reported in targeting the tumor suppressor gene p53 as anti cancer therapy. The challenge in the future will be to use our knowledge of p53 to develop more highly effective strategies and novel drugs for cancer prevention and treatment with fewer side effects.

Acknowledgment

Eating Disorders for University Students

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Abstract

Background. Eating disorders (ED) are complex mental health disorders that arise from a combination of biological, psychological, interpersonal, and social factors. The three most known types of eating disorders are bulimia nervosa, anorexia nervosa and binge eating disorder. The high rates of eating disorder behavior observed in college students' women, may be because women attend college at the peak age of onset for bulimia nervosa.

Conclusion. Information collected in this review suggests that the management of the early stages of the disorder's development seems crucial in order to prevent the most negative outcomes after to know the different types of eating disorder.

Key words. Eating disorders, Bulimia nervosa (BN), bulimia, Anorexia nervosa (AN), Binge eating disorder (BED)

Introduction

Eating disorders are a group of conditions characterised by specific difficulties with body shape, weight, eating and exercise. The potential to develop and maintain an eating disorder appears to be influenced by a range of factors. Eating disorders often occur in adolescents and young adults, although they may develop at other ages. Women are more prone to eating disorders than men.
types of eating disorders **(i)Bulimia nervosa (BN)**, also called bulimia, is a psychological eating disorder that is characterized by episodes of binge eating (consuming a large quantity of food in one sitting). That's accompanied by no sense of control overeating behavior and followed by inappropriate methods for trying to lose weight, such as vomiting, fasting, enemas, excessive use of laxatives and diuretics, or compulsive exercising. Bulimia usually starts when the person is a young adults.
(ii) Anorexia nervosa (AN) a disease which is the result of extreme fear of gaining weight or becoming obese. Anorexia usually begins at a younger age i.e. during or after puberty.
(iii) Binge eating disorder (BED) occurs when you eat too much on a regular basis. You may also feel guilty about bingeing or feel like your bingeing is out of control. With BED, you may continue eating long after you feel full, sometimes to the point of discomfort or nausea. BED can happen to people of all sizes and weights.
Eating disorder behavior is prevalent on college campuses, especially among women. Bulimia nervosa and anorexia nervosa are often more alike than different. Some people with anorexia will also have bulimic symptoms eg. purging (self-induced vomiting). College is a particularly risky environment, studies have examined whether eating disorder attitudes and behaviors actually increase during college, and, if they do, what factors increase the risk. Given the high rates of disordered eating on colleges, this information could be beneficial in developing treatment and prevention programs tailored to college students.

Figure 1– signs and symptoms of **anorexia nervosa**

Figure 2. Signs and symptoms of **Bulimia nervosa**

Figure 3. Signs and symptoms of **binge eating disorder.**

Objective

This research aims to summarize the meaning of eating disorders including the the most known types if it which they are anorexia nervosa, Bulimia nervosa and binge eating disorder. Our research also summarize how these three types effects university students.

literature review

A study (Gilbert & Meyer, 2005) examined change in mean scores on measures of eating disorder attitudes and behaviors in freshmen women during the first 34 weeks of school as well as risk factors for these behaviors. There were no significant changes in body dissatisfaction or drive for thinness over time although bulimic attitudes decreased significantly from Time 1 to Time 2. Three of the four potential risk factors also decreased over time (depression, anxiety, and negative evaluation fears).

Abdul-Majeed (2001) conducted a study on a sample consisting of (690) students studying in high schools and universities in Cairo, whose ages ranged between (25, 15) years, and the results showed that body image, anxiety, self-esteem and depression were related to their school life.

In a survey conducted by the National Eating Disorders Association involving 1,002 students on private and public college campuses across America, 20% of the students polled responded that they, at some point in their lives, have had an eating disorder. 55% of students polled claimed to know at least one individual who struggled with an eating disorder and 75% admitted to skipping or avoiding meals while dieting (National Eating Disorders Association, 2006).

Researchers have suggested that the unique social and academic stressors associated with the college environment may put students at increased risk for disordered eating (Compas, Wagner, Slavin, & Vannatta, 1986).

To analyze change in eating disorder symptoms during college (Striegel-Moore, Silberstein, Frensch, & Rodin, 1989), 962 men and women reported the frequency of dieting, binge eating, and purging behaviors during the first week and the last month of their freshman year. The majority of women reported no change in dieting, binge eating, or purging from Time 1 to Time 2. Among women who did report changes, it was more common to develop eating disorder behavior than to discontinue such behavior.

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The royal disease (Hemophilia)

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Abstract

The main current problem in hemophilia is the onset of alloantibodies inactivating the infused coagulation factor. In addition, availability of products that bypass the intrinsic coagulation defects have dramatically improved the management of this complication. Acquired hemophilia is a serious coagulopathy usually affecting the elderly, persons with autoimmune disorders and, infrequently, women in the immediate postpartum period. Mixing patient plasma with normal plasma prolongs the activated partial thromboplastin time of the normal plasma and the Bethesda assay provides a quantitative estimate of the strength of the inhibitor. Acquired inhibitors of coagulation are a group of rare but potentially life-threatening blood disorders characterized by the presence of autoantibodies directed against clotting factor. Autoantibody against factor VIII is the most common form of clotting factor inhibitor, a condition also known as acquired hemophilia A. The success story of hemophilia care first materialized in the 1970s, when the availability of plasma derived concentrates of coagulation factor VIII (FVIII) and factor IX (FIX) made possible the effective treatment of bleeding in patients with hemophilia A and B. Thirty Hemophilia A children (≤ 12 y) with factor VIII were given prophylaxis , the result with low dose secondary/tertiary prophylaxis, there is significant reduction in the annual joint bleed rate with improvement in joint health and child activity. As factor consumption is reduced, this has a positive effect on cost benefit; and is a very feasible option in developing countries. Antithrombin reduction has been shown to improve thrombin generation in hemophilia with or without inhibitors. Pregnancy related acquired hemophilia are features that appear to be different from other patients.

Introduction

People with hemophilia lack a protein that is necessary for normal blood clotting. As many as one third of people with hemophilia develop an antibody—called an inhibitor—to the blood products that they use to stop or prevent a bleeding episode. Treatment of bleeding becomes extremely difficult, and the cost of care can skyrocket. In addition, people with inhibitors are at increased risk for joint disease and other complications from bleeding resulting in a reduced quality of life. In the Inhibitor Study, researchers are looking at why some people develop inhibitors. Centers for Disease Control and Prevention (CDC) hopes that better understanding the causes of inhibitors will help us learn how to prevent them. Proteins called clotting factors work with platelets to stop bleeding at the site of an injury. People with hemophilia produce lower amounts of either Factor VIII (factor VIII is an essential blood-clotting protein) or Factor IX (Factor IX (FIX) is one of the serine proteases of the coagulation system) than those without the condition. This means the person tends to bleed for a longer time after an injury, and they are more susceptible to internal bleeding. This bleeding can be fatal if it occurs within a vital organ such as the brain. When blood doesn't clot properly, it can lead to bleeding inside the body too – for instance, following a fall or a crush injury. Sometimes there's no clear cause, though. Internal bleeding may damage organs, muscle tissue or joints. Hemophilia is an inherited bleeding disorder that mostly affects males. "Inherited" means that the disease is passed down through a family, and "bleeding disorder" means that hemophilia affects a person's blood. Specifically, the blood is missing important proteins that are necessary for the blood to clot. When a person's body is unable to clot blood correctly, the body has trouble stopping itself from bleeding. Hemophilia is an umbrella term for several different diseases. The most well-known are hemophilia A and hemophilia B. Each form is caused by the lack of a particular protein in the blood that helps it to clot. People with hemophilia don't have clotting factor VIII (eight), while people who have hemophilia B lack clotting factor IX (nine). Hemophilia A is more common. Hemophilia A and B are X chromosome-linked bleeding disorders included among the rare diseases and caused by mutations in the factor VIII (FVIII) and factor IX (FIX) genes.

Our Recomendation

- Research should be conducted to show more accurate results about hemophilia.

- More research should be conducted in order to show the possibility of treating this disorder and exploring the use of gene therapy.

- Centers concerned only with hemophilia treatment should be increased.

- Raising awareness among people who suffer from hemophilia is a must such as encouraging safe activities and having first aid kits.

- Factor replacements should be done such as going to the hospital or to a treatment center, at home by a nurse or at home by the person with hemophilia or someone else, after being trained.

- Emphasizing the importance of the premarital blood test to ensure having children in good health.

Conclusion

When blood doesn't clot properly, it can lead to bleeding inside the body too – for instance, following a fall or a crush injury. Sometimes there's no clear cause, though. Internal bleeding may damage organs, muscle tissue or joints.

Hemophilia is an umbrella term for several different diseases. The most well-known are hemophilia A and hemophilia B. Each form is caused by the lack of a particular protein in the blood that helps it to clot. People with hemophilia A don't have clotting factor VIII (eight), while people who have hemophilia B lack clotting factor IX (nine ,(The severity of hemophilia that a person has is determined by the amount of factor in the blood. The lower the amount of the factor, the more likely it is that bleeding will occur which can lead to serious health problems, Hemophilia A is more common.

Hemophilia is usually an inherited bleeding disorder in which the blood does not clot properly, and also in rare cases, a person can develop hemophilia later in life. The majority of cases involve middle-aged or elderly people, or young women who have recently given birth or are in the later stages of pregnancy.

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CRISPR/Cas9 : The Genome Editing Revolution

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Abstract

CRISPR/Cas (clustered regularly interspaced short palindromic repeats/CRISPR-associated) adaptive immune systems constitute a bacterial defence against invading nucleic acids derived from bacteriophages or plasmids. This prokaryotic system was adapted in molecular biology and became one of the most powerful and versatile platforms for genome engineering. CRISPR/Cas9 is a simple and rapid tool which enables the efficient modification of endogenous genes in various species and cell types. CRISPR-Cas9 technology can be used to remove and correct genes or mutations, and to introduce site-specific therapeutic genes in human cells. In this review we describe the CRISPR- Cas9 Structures, mechanisms and show their application in gene targeting as a powerful tool in biological research, ranging from the modification of plants, protect or repair the environment from human harm and the improvement of human diseases including Cancer, Haematological, AIDS, Muscle atrophy and Malaria diseases, Introduction of the revolutionary CRISPR genome editing tool, ushered in new hope with its promising potential in new gene and cell-based therapies.

Conclusion

The CRISPR technique has revolutionized the genetic engineering world because it relies on an enzyme called Cas9, which uses a guiding molecule of RNA, to target the desired portion of the DNA, then modifies the DNA, in order to break down the genes, or create the required sequences. CRISPR-Cas9 has become popular in recent years. sciences note that the technology is easy to use and is about four times more efficient than the previous best genome-editing. CRISPR has already changed the way scientists search. But what everyone expects, whether with enthusiasm or fear, is using it in humans. In theory, the CRISPR technique can allow us to free any genetic mutation as desired, and treat the disease it causes. In practice, it is just beginning to develop CRISPR as a treatment and there are still many unknowns. CRISPR has been applied to key bacteria that naturally contain part of the pathways necessary for producing biofuels. Getting these organisms to grow happily while churning out fuel precursors is not trivial. The precision and efficiency of CRISPR allows for the type of complex genetic engineering that could help make biofuels a viable alternative. (Fernández, C. R., & Crispr. 2020).

Introduction

CRISPR technology

What Is CRISPR Technology?

CRISPR technology is a revolution that received the attention of the entire scientific community during the past few years, it is a powerful tool for editing genomes. It allows researchers to easily alter DNA sequences and modify gene function. It include correcting genetic defects, treating and preventing the spread of diseases and improving crops.
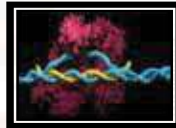
The Difference Between CRISPR And Other Genome Editing Methods

○ CRISPR technique is faster, cheaper, more accurate, and more efficient than other existing genome editing methods.
○ CRISPR genome editing allows scientists to quickly create cell and animal models, which researchers can use to accelerate research into diseases such as cancer and mental illness.
○ The other types of Gene therapy are an insertion of functional gene in the location of dysfunctional gene or neighbouring to it, but CRISPR is simple, it's a way of finding a specific bit of DNA inside a cell. After that, the next step in CRISPR gene editing is usually to alter that piece of DNA.

Where Do CRISPRS Come From?

○ CRISPR (clustered regularly interspaced short palindromic repeats) is a family of DNA sequences found in the genomes of prokaryotic organisms such as bacteria and archaea.

○ These sequences are derived from DNA fragments of bacteriophages that had previously infected the prokaryote.

○ They are used to detect and destroy DNA from similar bacteriophages during subsequent infections.

Crop Resistance:

Researchers are looking into how CRISPR can edit plant genes so that they can stand up against these bacterial strains, which could potentially result in less worldwide hunger. CRISPR technology differs from the process of genetically modifying a fruit. GMOs are created as a result of making gene edits that wouldn't occur in nature. On the other hand, CRISPR uses evolutionary genetic editing to rewrite a plant's DNA (Koutroumpa, F. A. et al, 2016).

BIOFUELS

Plants, algae and cyanobacteria naturally turn carbon dioxide and sunlight into byproducts. The sugars, fats or alcohols produced are all potential alternative fuel sources. Scientists have shown that CRISPR works in certain species of cyanobacteria, algae and several key biofuel crops. Bacteria can also break down plant cell walls into biofuels, and certain species can generate fuel precursors from waste products, such as methane from landfills (Shuba ES, 2018).

CRISPR applications

Identification of Novel Cancer Drug Targets Using CRISPR Screens
Cancer is a disease in which abnormal cells divide uncontrollably Cancer affects millions of people worldwide, New drugs, chemotherapy, and radiation techniques have been used over the years to treat patients, but none of these are devoid of side effects. Introduction of the revolutionary CRISPR genome editing tool, ushered in new hope with its promising potential in new gene and cell-based therapies, such as Chimeric antigen receptor CAR-T therapy, scientists can engineer the patient's own T-cell receptors to express CAR antigen that recognizes cancer cells in the patient, Once engineered in the lab, doctors can transplant the modified CAR T-cells back into the patient, whereby they can attack the cancer cells. As CRISPR is known for its precision in genomic editing, researchers have been testing its application in editing T cells. One study found that CRISPR engineered CAR T-cells are more potent against tumors (Eyquem, 2017). Thus CRISPR precision editing is a promising tool for future cancer cell therapies.

CRISPR-Cas9 technology in Sickle cell anemia:
Sickle cell anemia (SCA) is an inherited hemoglobinopathy resulting in sickling of erythrocytes that cause micro-vascular obstruction leading to acute complications and chronic organ damage. research groups have successively applied CRISPR-Cas9 technology to correct β-thalassemia mutations in patient-derived induced pluripotent stem cells (iPSCs)resulting in higher efficiencies compared with other nucleases (Huang et al, 2015).

CRISPR Use Creates Malaria-Resistant Mosquitoes
Malaria remains a human scourge, resulting in hundreds of thousands of deaths every year. While the complex life cycle of the parasite that causes malaria can help in its stability and genetic diversity, it also provides multiple therapeutic target areas. Deleting a single gene from mosquitoes by CRISPR can make them highly resistant to the malaria parasite and thus much less likely to transmit the parasite to humans(K. V., & Weinberg, M. S. 2015).

Discussion

CRISPR-Cas9 was first used as a gene editing tool in 2012. In just a few years, this technology exploded in popularity thanks to its promise to make gene editing much faster, cheaper and easier than ever. the first reports of using CRISPR-Cas9 to edit human cells in an experimental setting were published by researchers have demonstrated that the technology can be effective in correcting genetic defects. Examples of such diseases include Cancer, One study found that CRISPR engineered CAR T-cells are more potent against tumors (Eyquem, 2017). Thus CRISPR precision editing is a promising tool for future cancer cell therapies. Hematological diseases. CRISPR/Cas enhanced Picture1.jpg correction of the sickle cell disease (SCD) genetic defect in patient-specific induced Pluripotent Stem Cells (iPSCs) provides a potential gene therapy for this debilitating disease(Huang et al, 2015). Also, diseases such as malaria, the research team used the CRISPR / Cas9 system, allows precise DNA editing, to remove a gene called FREP1 from the genome of Anopheles Gambia, the most important transmitter of most strains of malaria (Plasmodium falciparum) for humans. Within modified mosquitoes, malaria parasites were less likely to survive and reproduce. (K. V., & Weinberg, M. S. 2015). CRISPR technology has also been applied in the food and agricultural industries to engineer probiotic cultures and to vaccinate industrial cultures (for yogurt, for example) against viruses. It is also being used in crops to improve yield, drought tolerance and nutritional properties. In addition, gene drives could also be used to eradicate invasive species and reverse pesticide and herbicide resistance, (Koutroumpa, F. A. et al, 2016).

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The Role of Genetic Engineering in Agriculture and in Plant Resistance Under Biotic and Abiotic Stress

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Abstract

Genetic engineering (GE) of crop provides important potential for seed, agrichemical and food processing, to create new technologies, and to change and improve crops. Here, in this review we explain the DNA structure, process of replication and gene expression in eukaryotes .Recombinant DNA techniques are importantly used in GE research. Also, plant tissue cultivation and its development are significant in these studies. We strongly focus on Genetic modified plants under stress. Biotic stress which called decadence by infectious disease that developed in fruits caused by fungi, bacteria, virus and insect. In addition, abiotic stress which means how plant be more resistant under abiotic stress such as drought, heat, and salt by plyaing with genes and how they do it. Thus, we shed light on modern techniques and resources which are very useful of this field to extract genetic information and used for the directed manipulation of genes, of which molecular based methods such as cloning by restriction enzymes, gene delivery and genome editing methods were used.

Introduction

People started domesticating the plant from10,000 years ago which is the process of genetically modifying the plant . Starting around 6,000–10,000 years ago, ancient Mesoamerican farmers changed the Teosinte Zea mays dramatically. Chemical techniques or ionizing radiation have been used since the 1930s to change or mutate genomes, and to add new traits .The advent of genetic engineering in the 1970s and 1980s allowed researchers to push beyond the traditional sources. In the last 10 years, researchers have developed tools to allow genome manipulation.

Objective

The purpose here is to review the studies of genetic engineering (GE) in plants. To give an idea about the basic technologies and the modern technologies of GE and to collect the answers of how GE is useful to make plants resistance to biotic and abiotic stress.

DNA structure
DNA has three types of chemical component
Phosphate, sugar (deoxyribose) and four
nitrogenous bases.
Adenine pairs with thymine with 2 hydrogen bonds.
Guanine pairs with cytosine with 3 hydrogen bonds

Basic technologies of GE of plants
Recombinant DNA:
Recombinant DNA technology is a set of procedures used to connect (recombine) fragments of DNA together. rDNA molecule is formed from parts consisting of two or more separate DNA molecules.
#### Plant tissue culture:
1-pick a suitable explant from a healthy and vigorous plant.
2-Eliminate microbial contamination from the explant surface.
3-Inoculate the explant in an adequate culture medium.
4-Include the properly regulated environmental conditions for an explant in a community.

Genetic modified plants under biotic stress
– Biotic stress which called decadence by infectious disease that developed in fruits caused by fungi or bacteria, these plants react to biotic stress by defense system to be resistance from fungal, bacterial, viral and insect disease.
–Transgenic plants that developed with genes involved in specialized pathways to enhance disease resistance to fungal pathogens. E.g, Tobacco *bean Chitinase* and *Brassica napus* were expressed in the first studies. Also, transgenic technology is also an excellent option for shielding seed plants from damaging viral pathogens. In addition, one of the most harmful cotton pests is the cotton *boll weevil* larvae.

Genetic modified under abiotic stress
It has been played with genes to make the plants more resistant for abiotic changes. Such as WXP1 under guidance of the promoter CaMV335 witch result to increase in cuticular wax on transgenic alfalfa leaves. Also, Hsp70 in *arabidopsis thaliana* witch help to increased thermotolerance in transgenic plants. DREP called transcription factor in arabidopsis witch help to increased tolerance to salinity.
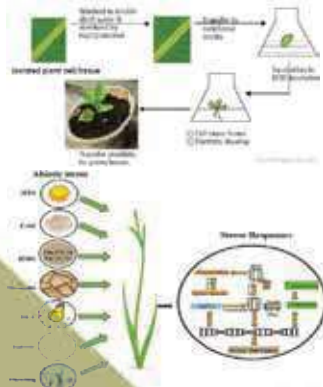
Modern plants breeding methods
1. Molecular based method:
Polymerase chain reaction
Cloning
Gel electrophoresis
DNA sequencing
2. Gene delivery:
1-Marker Assisted Selection **MAS**
2-Nanoparticle
3-Single Nucleotide Polymorphisms **SNPs**
4-RNA sequencing **RNA-seq**
3. Genome editing:
The mechanism of techniques are:
1- Zinc finger nucleases (ZFNs)
2- Transcription Activator-Like Effector Nucleases (TALENs)
3- Clustered Regularly Interspaced Short Palindromic Repeat (CRISPR)-Cas9
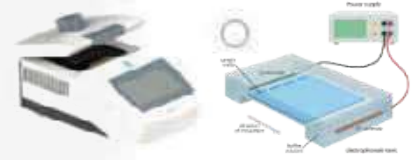
The nanoparticles new methods for the delivery of plant genes by encapsulating, delivering DNA to target cells, and trapping and releasing DNA to cells from nanostructured surfaces. Nano pore systems are based on sequencing detection of electronic DNA and possess the capacity for low sample preparation, fast speed, and lower cost.
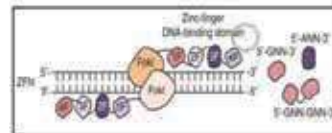
Zinc-Finger Nucleases(ZFNs), mechanism adapted from
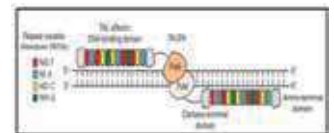
Transcription Activator-Like Effector Nucleases (TALENs) mechanism adapted from.
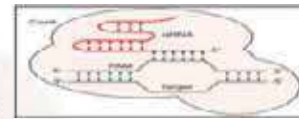
Type II Clustered Regularly Interspaced Short Palindromic Repeat (CRISPR)-Cas9 mechanism adapted from

Conclusion

People staof genetically modifying the plant for traits that are more advantageous or desirable rted domesticating the plant from10,000 years ago which is the process for human. Recombinant DNA technology is very important in many current researches and studies. Also, Biotic stress caused by living organisms such as, fungi, viruses, bacteria and insects, this biotic stress which called decadence by infectious disease that developed in fruits caused by bacteria or fungi, these plants react to biotic stress by defense system. Abiotic stress involves cold, heat, drought, and soils with high concentrations of salts or different synthetic concoctions that repress plant production. To make the plant be more resistance, many genes were modified to improve it. One of the main methods used in GE is cloning, it involves clone small DNA fragments with bacteria, the desired DNA fragment is inserted into a bacterial plasmid using restriction enzymes. Short stretches of DNA can be amplified by PCR. Fragmented or whole chromosomes can be separated based on size by gel electrophoresis. Also, Next-generation sequencing techniques are increasing the speed and reduce the cost of DNA sequencing. Modern breeding methods are large-ranging applications which are designed to help enhancing the breeding efficiency and productivity, By nanotechnology. The next generation of genetic markers is based on SNPs. In addition, Three main genome editing mechanisms have been discussed in this review. ZNFs nucleases, TALENs and CRISPR Cas9 which are playing a significant role in several fields such as agricultural science, gene therapy and disease modelling.

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The Effect of Phytohormones in Plant Growth and Their Crosstalk

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Abstract

Phytohormones are plant hormones that control and regulate germination, growth, metabolism by manipulation of one hormone activity resulting change for another hormone. Here, in this review we will discuss the essential types of phytohormone the relationship of the hormones to vital stress. There are many functions of each phytohormone such as cytokinin's (CKs) that promote cell division in plant roots and shoots and the growth of buds, gibberellic acid (GA) and it's role in plant development, abscisic acid (ABA) which play a major role in seed maturation and germination and in adapting to abiotic environmental stress. Also, Strigolactones (SLs) which are components of root exudates that promote symbiotic interactions between plants and soil microbes. Gasmonic acid (JA) is important in many physiological processes including plant growth, development, and plant response to biotic and abiotic pressures. In addition, Phytohormones are playing an important role under abiotic stress such as, drought, salt and heat. Here, we focus on how these phytohormones are able to make the plant resistance under these abiotic stress. Moreover, we shed light on the crosstalk of hormones which is the key for many biological processes of plant.

Introduction

Plant hormones are a group of naturally occurring, organic substances which influence physiological processes at low concentrations may also be affected. Plant hormones have also been referred to as 'phytohormones' though this term is infrequently used. The term 'hormone' was first used in medicine about 100 years ago for a stimulatory factor, though it has come to mean a transported chemical message. The word in fact comes from the Greek, where its meaning is 'to stimulate' or 'to set in motion'.

Objective

The purpose is to review the studies of phytohormones. To give an idea about the functions, structures, biosynthesis and the role of phytohormones under abiotic stress. Also, to study the crosstalk of many phytohormones.

Auxin
• Homeostasis of auxin has a major impact on root architecture.
• Give the Strength of the roots.
• Auxin is important for developmental processes in organs embryogenesis and leaf flower vascular and fruit development.
• Auxin affects the photosynthesis function.
• Plants produce IAA in the stem and buds, and send the hormone to other plant cells, causing it to grow the whole plant.

Cytokinin's (CKs)
• CK stimulates cell division.
• CK stimulates morphogenesis (shoot initiation/bud formation) in tissue culture.
• CK stimulates the growth of lateral buds-release of apical dominance.

Gibberellic acid (GA)

Chemical structure
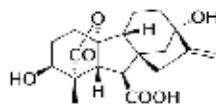
• GA increases the internode extension.
• GA increases leaf-growth and enhanced apical dominance.
• High concentrations of GA results in increasing dry weight of plant.
The most important differences it results effects on vegetative cell extension for GA.
• Auxins greatly increase cell-extension in excised tissue sections, whereas GA has little effect.
• Auxins inhibit root growth strongly, but GA does not.

Abscisic acid (ABA)
• Flowering: It is useful in introducing flowering in some short day plants kept under un-favorable Photoperiod.
• Rooting.
• Seed Dormancy and Germination.
ABA and abiotic stress:
Plant makes use of ABA to imitate the impact of a stress situation and might modify ABA stages continuously based on altering physiological and environmental conditions corresponding to seed in germination.

Strigolactones (SLs)

Chemical structure
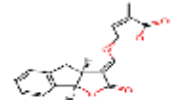
Strigolactones—Biosynthesis and Importance:
The first natural SL, strigol was discovered as a germination stimulant of Striga lutea, since then these compounds were collectively called as strigolactones. As root parasitic plants depend entirely on a host plant for water, assimilates, and nutrients so these plants not only devastate natural vegetation, but also are a major threat to commercial crops including maize, legumes and tomato. In symbiosis between plant and AM fungi, SLs stimulates branching of fungal hyphae and help plant in obtaining available mineral nutrients.

Jasmine acid (JA)
JA is important in many physiological processes including plant growth, development, and plant response to biotic and abiotic pressures.

Ethylene
Ethylene Is influences diverse processes in plant growth, development and stress responses throughout the plant life cycle.

Phytohormones and Abiotic stress:
Abiotic stress such as salinity, drought, and heat has effect on agricultural crops. Therefore, Plants adapt many strategies in response to abiotic stresses by the activity of several phytohormones such as abscisic acid , gibberellins , ethylene, auxin , Salicylic acid , which ultimately help in plant growth and productivity.

Phytohormones crosstalk:
For example, crosstalk between NO and CKs in hypocotyl elongation and root development. CKs hormones control the root development, CK is reduce the root growth and the length of meristem, and by applying NO on a plant reduce the CK activity, and the exogenous CK inhibition the root growth.

Conclusion

Phytohormones are important in plant growth and organization of plants with the most important natural hormones. We focused on many types of these phytohormone such as, auxin, CKs, ABA, GA, SLs, JA and ethylene in details. These phytohormones can work together or independently. We clarified the functions of each hormone and how it affects the abiotic stress. Plants are exposed to abiotic stresses such as drought, extreme temperature, salinity and heavy metals. Abiotic stress has a negative effect on physiology and growth regulators that make up plant hormones and their role in stimulating the response to plant defenses against stress. The crosstalk of many phytohormomes was clarified and it is still under study.

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Antiviral activity for bee´s venom and new suggested modalities of treatment

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Abstract

Background. Holy Quran has paid our attention to the importance of bees in life more than 1400 years ago by including a separate complete chapter 16, Surat An-Nahl, entitled by the name of bees where you find two verses; 68 and 69 talking about the life of bees and healing properties of its secretions. Bee venom contains several active molecules such as peptides and enzymes that have advantageous potential in treating viral disease even against the challenging human immunodeficiency virus (HIV). **Aim.** In this review, we summarize the biological properties of Bee Venom (BV) and its bioactive molecules that may be have anti-viral actevity. **Methodology.** We suggests a preventive strategy in which nanoparticles are used to inhibits the spread of pulmonary viruses such as COVID-19. Its theoretical principle is based on use of the two active compounds in bee venom Melittin and Phospholipase A2 (PLA2) molecules present on nanoparticles which combine with the viral envelope forming pore-like attack complexes, and consequently breaking the viral envelope and suppress the viral replication in the host cell. These nanoparticles can be utilized as a spray to the affected lung cells. **Conclusions.** Information collected in this review suggests that bee´s venom contains an arsenal of biologically active molecules. Bee venom stimulates natural immunity through activation of the pituitary and adrenal glands and to stimulate the body to produce natural cortisone. Bee venom has the potential to become prophylactic or therapeutic agent for infectious viral diseases and it needs more research and study.

Key words. Bee Venom (BV), Toxin mellittin, Phospholipases A2, Apitherapy.

Introduction

Massive growth in human population, immense rise in urbanization, drastic changes in global environment, and improved connectivity worldwide in terms of better transportation facilities have led to the emergence and re-emergence of viral diseases in human population (Li *et al.*, 2011). Outbreaks of many RNA viruses are still the leading cause of morbidity and mortality in worldwide population.

Many antiviral agents against diverse viruses have been reported. However, effective antiviral agents which specifically target to some RNA viruses such as SARS-CoV, influenza A (H5N1, H1N1) and measles are in shortage due to genetic variations of the virus and the lack of approved or universally recommended therapies (Wen *et al.*, 2003; Lorin *et al.*, 2005 and Triggiani *et al.*, 2006). Hence, there is a global requirement for continued development of new antiviral agents, especially from natural sources to provide several alternatives for the control, prevention, and management of the spread of diseases caused by RNA and DNA viruses

Bee venom (BV) of the honey bee Apis mellifera is a secretion produced by the sting apparatus of bees. Its biological purpose is to protect the bees from their enemies. BV is a complex mixture containing pharmacologically active proteins, peptides and enzymes, but its composition varies among different types of bees. Because of its anti-inflammatory, anti-bacterial, anti-viral, antimutagenic, radioprotective, anti-nociceptive immunity-promoting, hepatocyte-protective and anti-cancer characteristics (Lee *et al.*, 2005; Gajski and Garaj-Vrhovac, 2009; Ramadan *et al.*, 2009; Park *et al.*, 2014; Choi *et al.*, 2013; Lee *et al.*, 2009 and Lim *et al.*, 2013), it has a long history of use in folk medicine to treat various diseases.

Objective

This research aims to summarize the evidence to date elucidating the most salient biological properties of Bee venom. It also revealed prominent knowledge on the responsible underlying action mechanism of bee venom constituents and how BV and/or its components support its potential use as an alternative therapy against virals.

Our suggested plan of treatment

We suggests a preventive strategy in which nanoparticles are used to inhibits the spread of pulmonary viruses such as COVID-19. Its theoretical principle is based on use of the two active compounds in bee venom Melittin and PLA₂ molecules present on nanoparticles which combine with the viral envelope forming pore-like attack complexes, and consequently breaking the viral envelope and suppress the viral replication in the host cell. These nanoparticles can be utilized as a spray to the affected lung cells (Figure 1).

Melittin and PLA2 molecules can be delivered via inhalation of nebulised liposomes mixed with Melittin and PLA2. The liposomes enhance transport of the Melittin and PLA2 into host airway cells via endocytosis or direct fusion with the cell membrane (Figure 2).
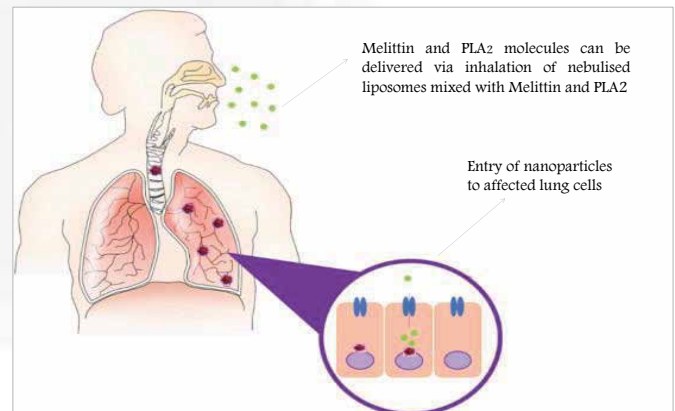
Figure 1. The liposomes enhance transport of the Melittin (MLT) and Phospholipase A₂ (PLA2) into host airway cells via endocytosis or direct fusion with the cell membrane.
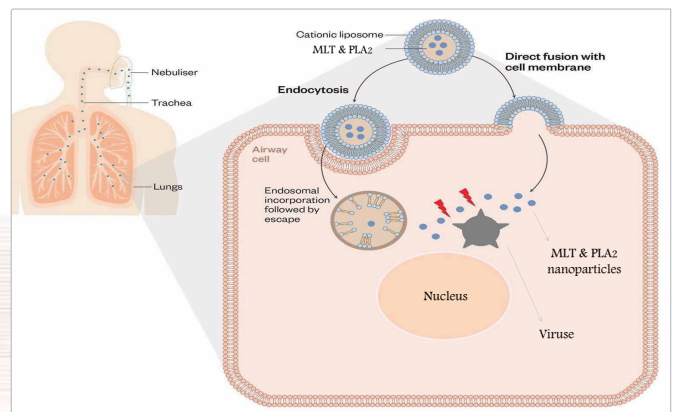
Figure 2. The proposed preventive strategy in which nanoparticles are used to inhibits the spread of pulmonary viruses such as COVID-19.

Conclusion

Information collected in this review suggests that bee´s venom contains an arsenal of biologically active molecules, Melittin is the main and most toxic compound in bee venom, constituting 50–60% of the whole venom. Melittin is classified as a lytic peptide that is able to destroy membrane phospholipids. Phospholipase A₂ is the second most abundant compound (10–12%) . PLA2 forms a complex with melittin, called bee hemolytic factor, it cleaves cellular membrane phospholipids. Bee venom stimulates natural immunity through activation of the pituitary and adrenal glands and to stimulate the body to produce natural cortisone. Bee venom has the potential to become prophylactic or therapeutic agent for infectious viral diseases and it needs more research and study.

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مشـاريــع تخــرج
قســـم الكيمياء

بسم الله و الحمد لله والصلاة والسلام على سيدنا رسول الله، وعلى آله وصحبه وسلم، أما بعد..

ايماناً من قسم الكيمياء وتماشياً مع أتجاه الجامعات إلى تنمية الممارسات البحثية ودعم هذه الجهود في ظل تزايد المطالب في الإنتاج البحثي التطبيقي الذي يعتبر محركاً رئيساً لتنمية المجتمع. لذلك يسرنا أن نضع بين أيديكم مشاريع التخرج التي هي ثمرة الجهد والعمل لأبنائنا الطلاب بقسم الكيمياء، ولتشجيعهم في بناء مجتمع المعرفة ودعم اقتصاد الوطن مستقبلاً بأذن الله.

د. معتز بن هاشم مراد

بسم الله و الحمد لله والصلاة والسلام على سيدنا رسول الله، وعلى آله وصحبه وسلم، أما بعد..

الحمد لله الذي علم بالقلم، علم الإنسان مالم يعلم، ونصلي ونسلم على نبينا محمد وعلى آلة وصحبه أجمعين. حرصا من قسم الكيمياء على إعطاء طلابه وطالباته القدر الكافي من الخبرة التطبيقية التي تساهم في رفع مستوى تأهيلهم العملي وربطهم ببيئة العمل والمجالات البحثية، فقد أولى اهتماما بمشاريع التخرج والتي تعتبر أحد متطلبات برنامج الكيمياء والذي يُمكن الطلاب من تطبيق المعارف والمهارات العلمية التي تعلمها وذلك تحت إشراف نخبة من أعضاء هيئة التدريس من ذوي الكفاءة العالية والإنجازات العلمية.

د. تهاني بنت محمد باوزير

قسم الكيمياء

القسم	الكيمياء
عدد الملصقات العلمية (طلاب)	13
عدد الملصقات العلمية (طالبات)	33
عدد الطلاب	54
عدد الطالبات	163
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عدد المشرفات	26

(Posters)

الملصقات العلمية

لمشـاريع التخــرج

قسـم الكيميـاء

(طــلاب)

Photochromic Materials: Molecules and systems

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Abstract

For the first time, this research project planned to synthesize some thermally revisable photochromic bases dihydroindolizines based on 2,7-di-tert-butyl-9H-fluoren-9-one with hydrazine with substituted the fluorene region (part A) with electron donor tert-butyl group. The synthetic pathways were done using both chemical and photochemical strategies. Some techniques during the research work in lab have been learned which will help us to work independently and to think how to get over the research problems

Introduction

Photochromic materials have been studied worldwide by Markwald. Hirschberg discovered for the first time the photochromism in solid state and known as photochromic organic materials. They find applications in for data storage and molecular switches emerged, solar cell, umbilical links, lenses, and many research worldwide to find many applications in such phenomena. This motivated us to synthesize some more photochromic materials based on Dihydroindolizines system (DHIs) based on 2,7-di-tert-butyl-9H-fluoren-9-one. The synthesis approach based on both chemical and photochemical pathways. The photochromic material (DHI) will switched to colored (betaine) upon UV irradiation

Objectives

1-Preparing photochromic material that have applications in solar cells, umbilical inks, dental fillings, and cosmetic tools.
 2- Learning of different techniques in the laboratory and safety regulations to work safe.
3- Characterizations of the synthesis DHI using different spectroscopic tools .

Results

1-Litreature survey on photochromic materials .
2- Synthesis photochromic material based o DHI system as presented in the following experimental images and scheme .
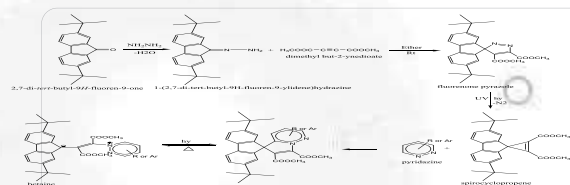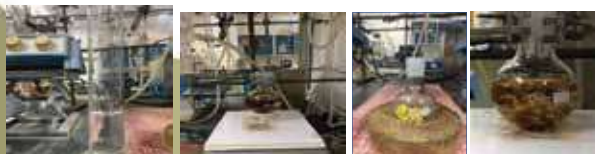
Discussion

In the synthetic strategy,   2,7-di-tert-butyl-9H-fluoren-9-one react with hydrazine in ethanol as a solvent under refulz condition for 5 h. to produce 1-(2,7-di-tert-butyl-9H-fluoren-9-ylidene)hydrazone in 70% yield. Oxidation of hydrazone derivative with MnO_2 in ether let to formation of the diazo derivative in last yield (35%). Cycloaddition of diazo derivatives with methyl acetylene dicarboxylate in ether at rt for 24 h. let to the formation of pyrazole derivative in moderate yield (55 then This product convert to spirocyclopropene by photolysis process, with remove the nitrogen molecule in 64% yield. This product allowed to react with pyridazine to product the photochromic DHI which upon irradiation with UV light afforded the thermally revisable betaine colored form.

Conclusion

In this work, some photochromic compounds related to thermally reversible dihydroindolizines (DHIS) have been synthesized. Interesting photochromic behavior in solution and in thin film was recorded. The most pronouncing properties is the structure-photochromic propertie relationship which will led to tune the chemical structure of the DHI skeleton towards many applications.

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PHOTOCHROMISM: Current and Future phenomena

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Abstract

Organic photochromic molecules are well established as colorants in the manufacture of niche products, providing striking color change effects when irradiated with light. This paper describes the industrially important classes of photochromic dye in terms of their development and chemistries, the applications in which their photochromism is employed commercially, and the technical features behind their success. Photochromic systems form the subject of much industrially funded research into nascent high-tech applications that have the potential to become the most commercially significant outlets for photochromic dyes. Those types being scrutinized are therefore also discussed along with the directions in which the industrial use of photochromic colorants may take.

Key word : Photochromism, betaine, Photolysis, DSSC .

Introduction

Photochromic molecules became an important filed of research in organic chemistry due to the large number of their practical and potential applications [1-3]. In the field of these variable-transmission optical materials, the main characteristics strived for, are[4,5] :

I.   The ability to be activated by sunlight (heliochromism) and bleached through a thermal process.
II.   Extended absorption in the visible region to provide a neutral color upon irradiation,
III.   A suitable fading rate (is related to the stability of the colored state),
IV.   High efficiency of coloration upon irradiation (colorabilit and v) a high resistance to photodegradation (fatigue resistance) .
V.   In this work, we wish to report the synthesis and photochromism of dihydroindolizines bearing pyridazine moiety in the region C and study their photochromic behavior in both solution.

Photochromic dihydroindolizes which discovered by Prof. H. Duerr in Germany find many application in many life era such as dental filling materials, cosmetic, solar cells, memories and switches and data storage. To follow these sounding application, in this research project we aimed to synthesis photochromic materials based DHI with electron donner substituents in the fluorene region which maybe will make a drastic change in the photochromic DHI and its betaine.

Objective

In this work, we wish to report the synthesis and study the photochromism of dihydroindolizines bearing pyridazine moiety in the region C and study their photochromic behavior in both solution and solid state.

Results

A live experimental synthetic approach of the photochromic DHI are repected in the following scheme and images. Details of the synthetic procedure will is given in the full project report.
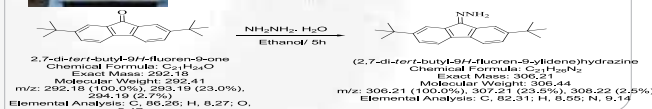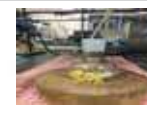
Discussion

The synthesis of photochromic DHI mentioned above we carried our in five steps chemically and photochromically pathways. Reaction of 2,7-di-tert-butyl 9-fluoreneone with hydrazine hydrate in methanol for 8 h. let to the formation of the hydrazone derivatives in high yield (89%). Oxidation of the hydrazone with HgO in ether for 12 h. at rt let to the formation of the diazo derivatives in good yield (75). The pyrazole derivatives is obtained via cyclization of nucleophilic addition of the of the diethyl acetylene dicarboxylate to the diazo compound in ether and in absence of light. Photolysis of the pyrazole let to the formation of spirocyclopropene in 54 %. Formation of the photochromic materials will be done in the near future.

Conclusion

In this work, we planed to synthesis new electron donor substituted DHI synthesis and study the photochromic behavior in both solution and solid state. Many laboratory techniques and safety rules have been learned. A lot of synthetic difficulties and purification of the synthesized compound have been solved. Training on the spectroscopic tools such as IR, UV and recently NMR has been successfully done. This reach project helped us to work as a team and to think how to get over the scientific problems. Further investigations will be done in the near future

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Kinetics and Mechanisms of Oxidation of Polysaccharides

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Abstract

Kinetics is a part of science of motion. The subject of chemical kinetics is concerned with quantitative study of the rate of chemical reactions and explanation of the rate in terms of reaction mechanisms as well as the factors affected a such reaction rate. It is well known that kinetics of reactions in solutions can not be interpreted in terms of the kinetic theory and statistical mechanics. The interpretation of rates in the liquid phase is necessarily more complicated from a molecular point of view because of much greater interaction between molecules.

Polysaccharides are organic compounds made of repetitive units called monomers. They often have a well-defined structure, though this is not a defining characteristic. The exact chemical composition and the sequence in which these units are arranged is called the primary structure, in the case of proteins. Many polysaccharides spontaneously fold into characteristic compact shapes, which determine their biological functions and depend in a complicated way on their primary structures. Cellulose is the most common organic compound and polysaccharides on Earth. About 33 percent of all plant matter is cellulose.

Literature Review

The acid-catalyzed oxidation of kappa-carrageenan polysaccharide as a natural polymer by chromic acid in aqueous perchloric acid at a constant ionic strength of 4.0 mol dm^{-3} have been investigated spectrophotometrically [1]. Spectrophotometric evidence for the formation of hypomanganate(V) and manganate(VI) intermediate complexes has been confirmed during the oxidation of iota- and lambda-carrageenan sulfated polysaccharides (CAR) by alkaline permanganate at pH's 12 using a conventional spectrophotometer [2].

The kinetics of formation of the green manganate(VI) intermediate complex formed during the oxidation of pectin polysaccharide (poly galacturonate methyl ester) (PGME) by in alkaline solution at pH 12 have been studied [3]. The kinetics of oxidation of pectin polysaccharide as a natural polymer by permanganate ion in aqueous perchloric acid at a constant ionic strength of 2.0 mol dm^{-3} has been investigated spectrophotometrically. The reaction time curves showed two distinct stages, the initial stage was relatively slow, followed by an increase in the rate of oxidation at longer times. Kinetic evidence for the formation of an intermediate complex between the polysaccharide and the oxidant is presented. The results obtained at various hydrogen ion concentrations showed that the reaction is acid catalyzed. The added salts lead to the prediction that Mn^{4+} and/or Mn^{3+} play an important role in the autoacceleration period kinetics. A tentative reaction mechanism consistent with the kinetic results is discussed [4]. The kinetics of formation of the intermediate complex formed during the oxidation of pectate polysaccharide by permanganate ions in alkaline solutions at pH 12 have been measured by a conventional spectrophotometric technique. The results obtained indicated that the rate of formation is base catalyzed. Thermodynamic parameters were evaluated and a suitable mechanism consistent with the results was suggested [5].

The acid-catalysis of chromic acid oxidation of carboxymethyl cellulose (CMC) as a polysaccharide in aqueous perchlorate solutions at a constant ionic strength of 2.0 mol dm^{-3} have been investigated spectrophotometrically. A kinetic evidence for the formation of 1:1 complex between chromic acid and CMC was revealed. The kinetic parameters have been evaluated and a tentative reaction mechanism consistent with the kinetic results is suggested [6]. The kinetics and mechanism of the disproportionation of MnO$_4^-$ via intermediate complex formation during the oxidation of carboxymethyl-cellulose (CMC) polysaccharide have been investigated spectrophoto-metrically at pH $\geq$ 12 and various temperatures (15–35°C). Kinetic and spectrophotometric measurements revealed the base-catalyzed formation of manganate(VI) transient species. A mechanism was postulated consistent with the experimental data [7].

Objective

Polysaccharides have a large list of industrial applications in *food*, *medical and pharmaceutical uses*, and have *other applications* in industry. Despite the potential applications of different types of biopolymers in various fields, these compounds are frequently subjected to the action of oxidizing agents and their activities depend largely in their redox behaviour. The information regarding the oxidation kinetics of these important macromolecules by any oxidant is scarce in the literature. This fact may be attributed to the complexity of the oxidation kinetics for these compounds since they contain various groups in their macromolecular chains.

In view of these facts, the present work is to search on the kinetics and mechanisms of oxidation of polysaccharides by the widely used oxidizing agents in both alkaline and acidic aqueous media.

Conclusion

Although the kinetics are considered as experimental facts, the mechanism is a mental or imiganatic model which support the experimental chemical kinetics. Therefore, to elucidate a reaction mechanism, the information about the elementary steps, molecularity stoichiometry and order of reaction are of great significant Furthermore, the factors which affect the reaction rate such concentration of reactants, ionic strength, added salts, "catalysts and solvent effects will help in elucidation a correct reaction mechanism consists with the experimental kinetic results.

Acknowledgments

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CORROSION AND CORROSION CONTROL OF COPPER

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Abstract

Corrosion phenomenon of metals and alloys and its serious effects are considered as large global problems facing all countries in the world for last centuries, which caused heavy financial losses for the global economy. Copper is an essential redox active transition metal which used as a conductor of heat and electricity, as a building material, and as a constituent of various metal alloys, such as sterling silver used in jewelry, cupronickel used to make marine hardware and coins, and constantan used in strain gauges and thermocouples for temperature measurement. Copper is generally subjected to corrosion phenomenon in a number of environments especially in acid media. A considerable effort was devoted to develop more efficient, economically viable and environmentally compliant methods to prevent copper corrosion. However, using corrosion inhibitors is considered as one of the most effective, practical and economic methods to protect metallic surfaces against corrosion in aggressive media.

Objective

The objective of the present research project was searching on the following significant items:

1. An introduction to corrosion of metals and alloys and its prevention or control.

2. Electrochemical and corrosion behavior of copper and copper alloys as well as how to overcome such dangerous problem in different corrosive media particularly in acidic, alkaline and neutral media at various conditions.

3. Several groups of inhibitors were employed for the reduction of corrosion of copper and copper alloys.

4. Different chemical and electrochemical techniques used for such investigations.

Introduction

Corrosion is a naturally occurring electrochemical process, which results in deterioration of useful properties in a material due to reactions with its environment. This type of damage usually affects metallic materials, and typically produces oxide(s) and/or salt(s) of the original metal. Electrochemical corrosion causes between \$8 billion and \$128 billion in economic damage per year in the United States alone, degrading structures, machines, and containers. Most structural alloys corrode merely from exposure to moisture in the air, but the process can be strongly affected by exposure to acids, bases, salts and organic chemicals. It can be concentrated locally to form a pit or crack, or it can extend across a wide area to produce general deterioration [1-5].

Copper is one of the few metals that can occur in nature in a directly usable metallic form (native metals). Copper used in buildings, usually for roofing, oxidizes to form a green verdigris (or patina). Copper is sometimes used in decorative art, both in its elemental metal form and in compounds as pigments. Copper compounds are used as bacteriostatic agents, fungicides, and wood preservatives. Therefore, the study of copper corrosion phenomena and its control has become very important in different media.

Corrosion inhibitors are compounds used to control corrosion of the metal surface. Most of the inhibitors are organic compounds containing heteroatoms, such as nitrogen, oxygen, sulfur, unsaturated bonds such as double and/or triple bonds and plane conjugated systems including all kinds of aromatic cycles [1-6]. Relying on the actions of these heteroatoms, inhibitors are adsorbed onto the metal surface and block the metal surface, and thus do not permit the corrosion process to take place. The influence of the inhibitor upon metal corrosion is often associated with physical or chemical adsorption [7-10]. The long-chain carbon linkage and multiple adsorption sites of the inhibitor can block large area of the corroding metal. The adsorbed film on the metal surface acts as a barrier isolating the metal from the aggressive anions present in solution. Cost, health issues, and environmental regulation restrictions have made researchers focus on the development of non-toxic organic compounds used as corrosion inhibitors.

Conclusion

This review is a result of the literature survey concerning the corrosion phenomenon and its serious impacts as well as copper corrosion and the possibility to inhibit that process. This subject have been topics of interest of wide scientific society for quite some time now. This is obvious from the great number of studies conducted and published so far. Focus is on the efficiency obtained using various organic and inorganic compounds as corrosion inhibitors in numerous conditions. There are some new methods of inhibitor application and new investigating techniques as well as the novel research approaches developed recently.

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Spectrophotometric Estimation of Flutamide in Pure and in Pharmaceutical Preparations

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Abstract

Three simple, rapid, precise, sensitive, and accurate visible spectrophotometric methods (A, B, and C) are described for the estimation of flutamide in both pure and pharmaceutical preparations. They are based on the diazotization of reduced flutamide (FA) with nitrous acid followed by coupling with acetyl acetone (method A), citrazinic acid (method B), and 8-hydroxyquinoline (method C) to form colored azo dyes, exhibiting absorption maxima (λ_{max}) at 410, 440 and 500 nm, for methods A, B, and C, respectively.

Introduction

Flutamide (FA), chemically known as 2-methyl-N-[4-nitro-3-(trifluoromethyl)phenyl]-propanamide, is a potent nonsteroidal antiandrogen drug primarily used to treat prostatic cancer [1–3]. Flutamide belongs to a class of drugs known as anti-androgens (anti-testosterone). Testosterone is a natural hormone that is responsible for the growth and spread of prostate cancer cells in humans. Flutamide works by blocking the effects of testosterone, thereby slowing down (decrease) the growth and spread of prostate cancer cells. Different analytical methods for the quantitative determination of FA in pure form, in pharmaceutical preparations and in biological fluids, including HPLC [4], electrochemical reduction [5] and spectrofluorometry [6] have been reported.

The present work proposes three simple, sensitive, and inexpensive methods which allow a quick determination of FA in pure form and in dosage forms. The developed three visible spectrophotometric methods are based on diazocoupling reactions using acetyl acetone (AA), citrazinic acid (CZA), and 8-hydroxyquinoline (HQ) as the coupling agents.

Methods

The methods that involve the aromatic amino group in reduced flutamide undergo diazotization with nitrous acid, and resulting diazonium ion was coupled with acetyl acetone (Method A), citrazinic acid (Method B), and 8-hydroxyquinoline (Method C) to formcolored azo-dyes and exhibiting absorption maxima (λ_{max}) at 410, 440 and 500 nm, respectively for methods A, B, and C (Figure 1). The formed colored azo dyes are stable for a period of 2 h in eachmethod.
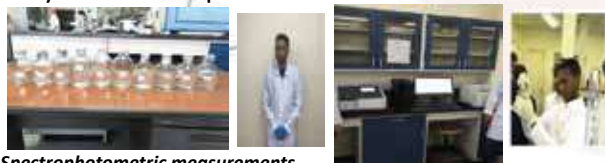
Spectrophotometric measurements

All the absorption spectral measurements are made using Shimadzu UV-1800 (UV-Vis.) spectrophotometer (Japan) with scanning speed 400 nm/min, bandwidth 1.0 nm and equipped with 10.0 mm matched quartz cells.

Results

Figure 1: Absorption spectra for 5 $\mu g/mL$ FA (methods A–C).
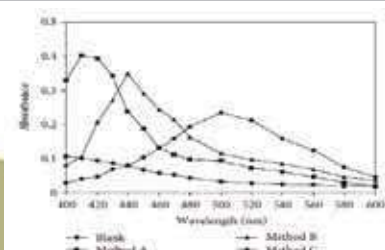
Table 1. Optical characteristics and precision.

Parameter	Method A	Method B	Method C
λ_{max} (nm)	410	440	500
Linear range ($\mu g/mL$)	0.5–12	0.5–10	0.3–10
Molar absorptivity (ε), (L/mol/cm)	2.23×10^4	2.04×10^4	1.35×10^4
Sandell sensitivity ($\mu g\ cm^{-2}$)	0.0281	0.0136	0.0205
Intercept (a)	0.0124	0.0179	0.0116
Slope (b)	0.0734	0.0669	0.0439
LOQ ($\mu g/mL$)	0.1197	0.1047	0.2587
LOD ($\mu g/mL$)	0.0395	0.0345	0.0854

Discussion

Two steps are involved in the reaction that produces the colored azo dyes. In the first step, reduced FA is treated with nitrite solution in hydrochloric acid medium and undergoes diazotization to give diazonium ion. In the second step, the diazonium ion is coupled with the coupling agent's acetyl acetone (Method A), citrazinic acid (Method B), and 8- hydroxyquinoline (Method C) to formcolored azo dyes in an alkaline medium. The reaction pathways of all the methods are shown in Scheme 1.
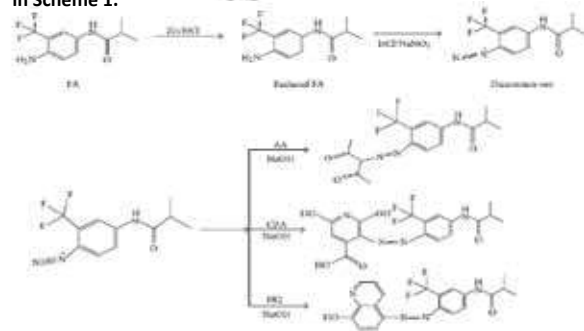
Conclusion

The developed visible spectrophotometric methods are sensitive, accurate, precise, reproducible, and economical and can be successfully applied for the determination of flutamide in bulk and in pharmaceutical dosage forms. The most striking advantage of the spectrophotometric methods developed is that diazotization was carried out at room temperature, and cooling to 0– 5°C was not necessary. The methods are unaffected by slight variations in the experimental conditions such as basicity, reagent concentrations, and temperature.

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Spectrophotometric determination of pKa value of nonsteroidal antiinflammatory celecoxib drug

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Abstract

Celecoxib (CLX) is a selective cyclooxygenase-2 (COX-2) inhibitor; however, the application of CLX is compromised due to its poor aqueous solubility and low oral bioavailability. In this study, pKa value were determined by using the dependence of the capacity factor on the pH of the mobile phase. The method developed was successfully applied to determination of this drug compound in laboratory-prepared mixtures and their commercial pharmaceutical dosage forms.

Introduction

Visualization of molecules can help to understand the interactions and molecular pathways of pharmacologically active substances. Labeled substances are tools to identify unknown binding partners and to clarify the details of the mechanism of action. Celecoxib (1) (Celebrex™) is a non steroidal anti-inflammatory drug used for the treatment of numerous diseases and medical conditions including osteoarthritis, rheumatoid arthritis, acute pain, painful menstruation, and menstrual symptoms. [1,2] This pharmaceutical agent exerts its pharmacological effect as a highly selective cyclooxygenase (COX-2) inhibitor. Celecoxib was used as a lead compound, the structures of six-membered rings, five-membered heterocycles, and substituents on five-membered heterocycles were transformed by using the principle of bioisosterism .

Methods

A series of universal buffer solutions of pH range 2.54-13.50 were prepared as recommended by Britton [3]. The pH of all solutions was adjusted to the required value using pH-meter type HI 8014 HANA instruments.

The effect of different pH values on the formation of Drugs with metal ions under investigation was studied in suitable buffer media (universal, borate, phosphate, ammonia, citrate, acetate, pure HCl or pure NaOH) as optimum buffer for investigating the complexes. A series of solutions was prepared in which 1.0 mL of 1 x 10-3 M solution of drug and 9.0 mL of buffer of different pH values in 10.0 mL measuring flask and completed with distilled water. The absorption spectra were recorded in the UV and visible regions against a blank of the pure buffer solution of the same pH value.

Spectrophotometric measurements

All the absorption spectral measurements are made using Shimadzu UV-1800 (UV-Vis.) spectrophotometer (Japan) with scanning speed 400 nm/min, bandwidth 1.0 nm and equipped with 10.0 mm matched quartz cells.

Results

To estimate the ionization constant of the studied drugs using spectrophotometric method, The half-height method [4] was used:
This method is based on the fact that at the half-height of the pH-absorbance curve, the dissociated and undissociated species exist in equivalent quantities, this: pK = pH at A ½ (where: A1/2 = [(Amax-Amin)/2] + Amin)

Table 1. pH values and the corresponding absorbance at λ_{max} = 250 nm

pH	2.54	3.24	4.37	5.95	6.47	7.11
Abs	0.965	0.971	0.969	0.968	0.961	0.970
pH	8.53	9.75	10.34	12.00	12.70	13.50
Abs	0.993	1.010	1.088	1.248	1.265	1.271
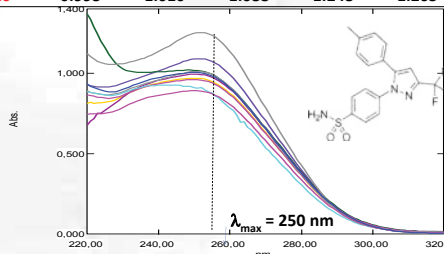
Figure 1. The relation between pH values and the corresponding absorbance for celecoxib (The half-height method).

Discussion
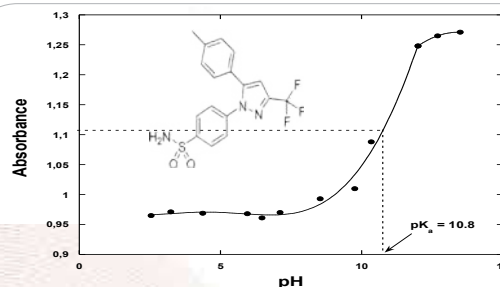
Figure 2. Absorption at 250 nm of a water solution of celecoxib as a function of pH. The point of inflection gave a pKa value of 10.80.

Table 2. pK$_a$ values of some Drugs

Name of Drugs	pKa	Name of Drugs	pKa
Theophyline	0.7	Sulphadimidine	7.4
Ampicilin	2.5	Theophylline	8.8
Aspirin	3.5	Atropine	9.7
Phenylbutazone	4.5	Adrenaline	10.2
Sulfacetamide	5.4	Celecoxib	10.8
Trimethoprim	6.4	Ascorbic acid	11.5

Conclusion

Celecoxib is a relatively persistent drug in river water underenvironmental conditions. The photochemical reactions are moreimportant than the chemical reactions in aqueous solution, at apH value of 7.8, to foresee its degradation in surface water. Thebiological degradation is negligible.

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Nano-synthesis and structural characterization of some metal complexes based on sulfa thiazole Schiff base ligand

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Abstract

We reported here, the synthesis, structural characterization of a new series of nanosized homo bi-nuclear metal complexes with sulfathiazole Schiff base for prospective chemotherapeutic uses. The operative and active coordination sites in the Schiff base ligand and the geometrical configurations of the complexes have been inspected applying elemental and thermal (TG) analyses, FT-IR, ESR, UV-Vis spectra, x-ray diffraction (XRD), and transmittance electron microscopy (TEM).

Introduction

Recently, a great number of novel interesting compounds and nanomaterials were synthesized applying the green solid state techniques [1]. The room temperature solid state method is a simple, effective and appropriate for the preparation of different transition metal complexes [2]. Depending on the vigorous tendency of sulfonamide derivatives in coordination with transition metals by different ways, a wide range of publications has been interested in the synthesis and structural features of sulfonamide complexes [3]. Inclusive research work of Schiff bases has been achieved as a result of their important and interesting properties, such as their ability in forming metal chelates with a great number of metals and for their excellent activities such as antitumour, bactericides and fungicides [4]. The Schiff base complexes of sulfonamides have gained considerable importance due to their broad medicinal applications such as antitumour, anti-inflammatory, anti-microbial, anti-tubercular and anti-malarial substances [5]. Additionally, bi and poly-nuclear metal complexes were received growing interest attributable to their immense applications in material sciences and biological systems, as well as their unique spectroscopic and magnetic properties [6]. This work is a continuation of research work, nearby this very interesting point.

Research project plan

No	Subjects	Weeks													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Introduction to the lab. safety														
2	Identify the research project plan.														
3	Comprehensive inventory of the latest studies and research conducted in the research subject.														
4	Providing the necessary chemicals and equipments.														
5	Preparation of the ligand and complexes.														
6	Characterization of the prepared compounds.														
7	Presentation.														

Plan of the research project

Experimental

1. Preparation of the thiazole Schiff base ligand (H₃L)

4-amino-N-(1,3-thiazol-2-yl)benzenesulfonamide + 2,4-dihydroxybenzaldehyde → (Condensation, -H₂O)

2. Synthesis of nano-sized metal complexes

H_3L + Metal salt → Grinding for 6 hrs. → Nano-sized metal complexes
(1 mmol) + (2 mmol) → Washing and drying

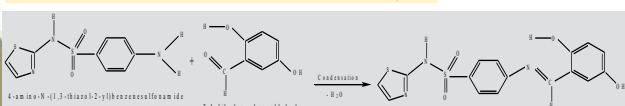## Results and discussion

1. Elemental, thermal analysis and physical measurements

Table 1 shows the molecular formulae, empirical formulae, analytical data, colors, molecular weights, molar conductance values of H_3L and complexes 1-5 based on elemental and thermal analysis as well as physical measurements.

Table 1:

Comp No	Molecular formula (Empirical formulae)	Microanalysis: Found (Cal.)				M. Wt. Found (Calc.)	Colour (Am)
		C%	H%	N%	M%		
Lig.	H_3L ($C_{16}H_{13}N_3O_4S_2$)	51.62 (51.47)	3.42 (3.49)	11.12 (11.19)	— (---)	375.08 (375.42)	Yellow (---)
1	$[Sn_2HLCl_2(H_2O)_2]\cdot H_2O$ ($C_{16}H_{17}Cl_2N_3O_7S_2Sn_2$)	26.42 (26.12)	2.66 (2.33)	5.24 (5.71)	32.66 (32.27)	735.00 (735.78)	Yellow (10.02)
2	$[Pb_2HLCl_2(H_2O)_2]$ ($C_{16}H_{15}Cl_2N_3O_6Pb_2S_2$)	21.55 (21.48)	2.04 (1.69)	5.02 (4.70)	46.08 (46.32)	894.00 (894.74)	Yellow (9.22)
3	$[Cu_2HL(AcO)_2(H_2O)_2]\cdot H_2O$ ($C_{20}H_{23}Cu_2N_3O_{11}S_2$)	36.01 (35.71)	3.65 (3.45)	6.45 (6.25)	18.42 (18.89)	672.00 (672.63)	Green (10.65)
4	$[Fe_2HL(NO_3)_4(H_2O)_4]\cdot 2H_2O$ ($C_{16}H_{23}Fe_2N_7O_{22}S_2$)	22.42 (22.84)	2.91 (2.76)	11.42 (11.66)	13.62 (13.28)	841.00 (841.21)	Brown (11.33)
5	$[Cr_2HL(NO_3)_4(H_2O)_4]\cdot 3H_2O$	22.25 (22.57)	2.58 (2.96)	11.74 (11.51)	12.67 (12.21)	851.00 (851.62)	F. green (10.64)

2. FT-IR spectra

The active chelation centers in the inspected ligand and the mode of bonding in the formed complexes were investigated based on a comparative studies between the IR spectra of both the free ligand and the synthesized complexes (Table 2).

Table 2:

Compound	ν(OH)	ν(C=N) thiazole	ν(C=N) azomethine	N(M-O)	ν(M-N)
H_2L	3442	1673	1617	—	—
Complex 1	3385	1617	1576	624	572
Complex 2	3444	1616	1574	627	579
Complex 3	3446	1656	1615	659	565
Complex 4	3420	1653	1616	656	568
Complex 5	3381	1644	1624	633	564

3. XRD and TEM studies

The x-ray diffraction patterns of H_3L and complexes **1-5** were performed in 0° < 2θ < 90° range of scattering angle. The diffraction patterns of free ligand are perfectly different with that of corresponding metal complexes (Fig. 1), which shored complex formation. The XRD patterns denote that H_3L and its Sn(II) and Pb(II) complexes attain crystalline nature whereas Cu(II), Fe(III), and Cr(III) complexes displayed amorphous nature

Fig. 1:
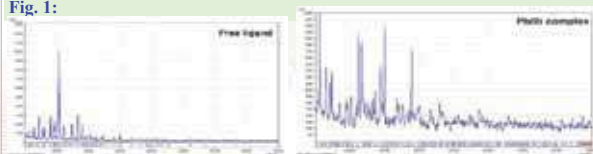
High-resolution TEM images were obtained for H_3L and complexes **1-5** (Fig. 2). The observed particle diameters for all metal complexes were found to be in nano-range.

Fig. 2: Transmission electron micrographs of complexes **3 (A)**, and **4 (B)**.
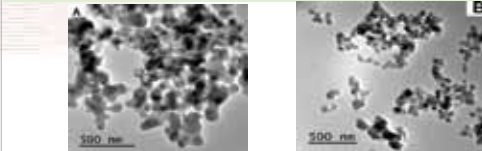
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Synthesis of Quinoxaline Derivatives under Green Conditions

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Department of Chemistry

Abstract

Simple and efficient synthetic procedures for the preparation of quinoxaline, pyrazine, pyridopyrazine, and benzoxazin-2-onc derivatives were developed. The one- pot cascade process involves the acidic elimination of a-aminoxylated dicarbonyl compounds to generate 1,2,3- Lricarbonyl compounds and subscquent condensation with 1,4-N,N or -N,0 dinucleophiles to afford quinoxaline, pyrazine, pyridopyrazine, and benzoxazin-2-one scaffolds. All the proposed processes do not need extra catalysts, dry solvents, or harsh reaction conditions.

Introduction

Quinoxaline is an important class of benzoheterocycles found in naturally occurring and synthetic small molecules displaying diverse biological activities, such as anticancer, anti-inflammatory and DNA-cleaving agents. Therefore, the synthesis of quinoxaline and its derivatives has been and continues to be attracting the attention of synthetic organic chemists and medicinal chemists. To date, reported methods for the synthesis of quinox- aline and its derivatives mainly include (a) condensa- tion of o-phenylenediamines with a-diketone, (b) tandem reaction of o-phenylenediamines with a-halo-B- ketocaters or a-halo-ketones, (c) oxidation and condensation-cyclization of a-hydroxy ketones or vicinal-diols with aromatic 1,2-diamines, (d) cyclization and oxidation of 1,2-diaza-1,3-butadienes with 1,2-diamines, and (e) other annulating conditions. Although there are many reports on the synthesis of quinoxaline derivatives, most of them suffer from narrow scope of substrates, harsh recaction conditions, and tedious work-up procedures. Therefore, the development of simple, rapid, and efficient procedures for the synthesis of quinoxa- line derivatives is still needed. [1–5]

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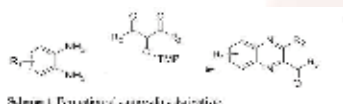
Objective

The aim of the project is the preparation of quinoxaline, pyrazine, pyridopyrazine, and benzoxazin-2-one derivatives were developed. The one- pot cascade process involves the acidic elimination of a-aminoxylated dicarbonyl compounds to generate 1,2,3- tricarbonyl compounds and subsequent condensation with 1,4-N,N or -N,O dinucleophiles to afford quinoxaline, pyrazine, pyridopyrazine, and benzoxazin-2-one scaffolds And also improving graduation projects in the college to highlight our skills that are required by the labor market and activating the capabilities available in the college for research and development and the transition from academic thinking to the applied system and increasing our capabilities for creativity and innovation and creating an applied scientific environment

Results

Initially, a series of a-aminoxylated 1,3-dicarbonyl com- pounds were synthesized according to the literature [23]. a-Aminoxylated ethyl acctoacetate and o-phenylenediamine were selected as model substrates to investigate this tan- dem reaction. As shown in Table 1, the choice of solvent influenced the reaction outcome significantly: organic acids such as formic acid, acetic acid, propionic acid, and butyric acid all could promote the reaction to afford ethyl 3- methylquinoxaline-2-carboxylate 3aa in high yields (Table 1, entries 1-4). Non-acidic organic solvents, such as acetoni- trile, toluene, and THF were not favorable solvents for the domino reaction, all of which needed longer reaction times and higher temperatures which ultimately did not improve the reaction results (Table 1, entries 5-7).

The results demonstrated that the domino process is

Different diamine compounds reactecd with a-aminoxylated cthyl acctoacetate

Optimization of the quinoxaline-forming reaction
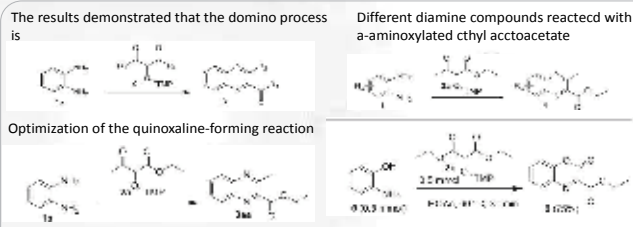
Discussion

applicable to a wide range of a-position TEMPO-substituted 1,3-dicarbonyl compounds providing access to diverse 2- carbonyl quinoxaline derivatives. Specifically, B-keto esters, containing sterically different substituents, afford desired products in good-to-cxcellent results (Table 2, entries 1-7). B-Diketone substrates, such as acetyl acctone and diben-zoylmethane derivatives, also react with 1,2-benzenediamine to generate the corresponding quinoxaline products in high yields (Table 2, entries 8-9). Morcover, 6-diesters 2j and 2k subjected to the domino reaction produced the desired

Conclusion

In Conclusion we have developed a mild and efficient one-pot reaction that produces quinoxaline, pyrazine, pyridopyrazine, and benzoxazin-2-one derivatives. The process involves the acidic climination of a-aminoxylated dicar- bonyl compounds to generate 1,2,3-tricarbonyl compounds and following condensation with 1,4-N.N or -N.O dinucle- ophiles to afford quinoxaline, pyrazine, pyridopyrazine, and henzoxazin-2-one scaffolds.

Acknowledgments

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Metal-Organic Framework, Structure, Properties and applications

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كلية العلوم التطبيقية
Faculty of Applied Sciences

Abstract

This thesis project has focused specially on a class of substances generally identified as metal organic frameworks (MOFs). We studied the preparation and properties of MOFs. We also studied their porosity, shape and size of pores, and also their applications

Introduction

Over the past 50 decades, porous materials, from Zeolites, coordination polymers to metal organic Frameworks (MOFs), have gained considerable Attention. The interesting feature is their porosity that Allows the diffusion of guest molecules into the bulk Structure. The shape and size of pores govern the shape and size selectivity of the guests to be incorporated.
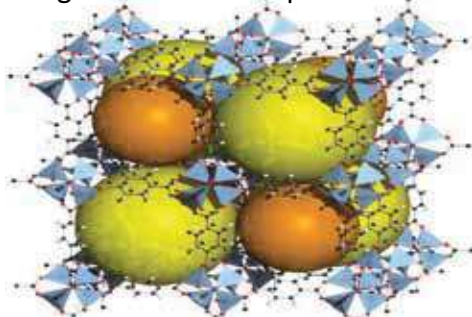
What are the MOFs?

metal organic frameworks (MOFs) represent a class of porous material which is formed by strong bonds between metal ions and organic linkers. By careful selection of constituents, MOFs can exhibit very high surface area. Metal organic frameworks (MOFs) are distinct from other traditional porous materials because of their high porosity and thermal stability.

Metal-Organic Framework (MOF)
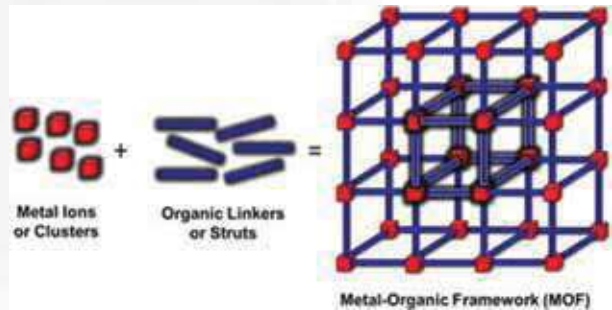
Examples of (MOFs)
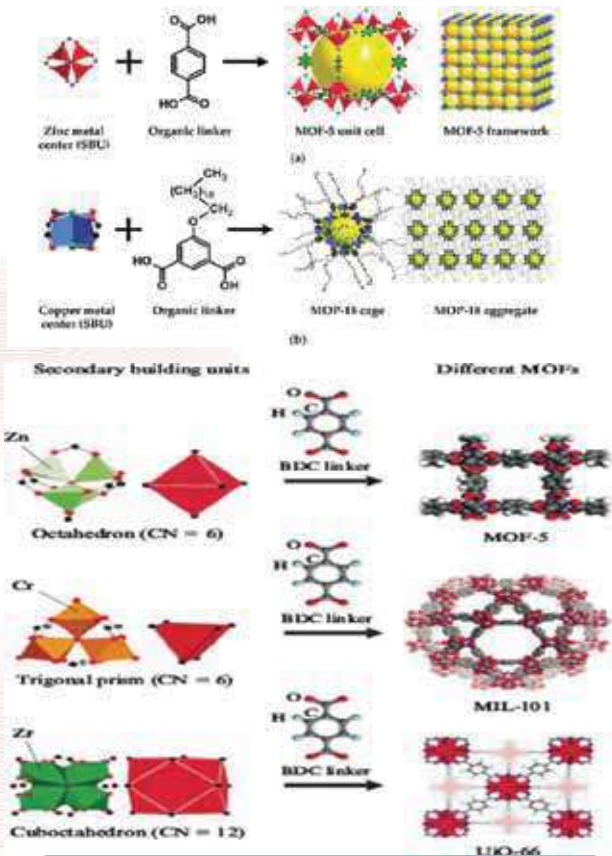
Applications of MOFs

Electrochemicl sensing of Dopamine

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Chem. Department, Faculty of Applied Sciences,
Umm Al-Qura University

Abstract

Dopamine as a catecholamine neurotransmission is one of focal point of neuroscience research. Dopamine metabolism plays a key role in many neuropsychiatric diseases. This poster outlined recent electrochemical techniques used for the analysis of dopamine. The main attention will be paid to the spectrum of detection methods used for determination of dopamine in neurosciences.

Introduction

DA is oxidized according to the following. Because of its reducing properties it has been analysed using electrochemical methods

Dopamine (DA) ⇌ Dopaquinone (DQ) $+ 2H^+ + 2e^-$

Carbon Nanohorn-Modified Carbon Fiber Microelectrodes for Dopamine Detection
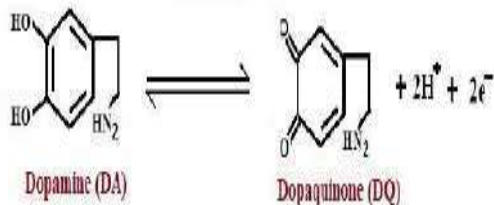
Results
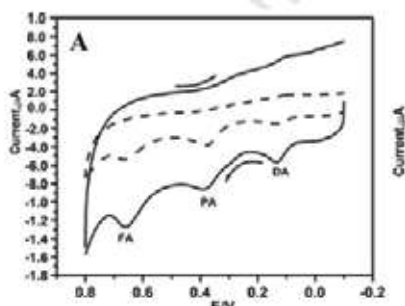
Simultaneous determination of Dopamina, folic acid and paracetamol at TiO2-WO3 nanoparticles1

Acknowledgments

Students appreciate the support of the Chemistry department, Faculty of Applied Science

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Electrochemicl Analysis of Vitamin B6

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Abstract

Pyridoxine, known as water soluble vitamin B6 (VB6), is essential for metabolism of amino acids, helps in the formation of antibodies, mediates a signal transmission in the brain, maintains healthy nerve function, is necessary for hemoglobin synthesis, and keeps blood sugar level at normal range. Few recent reports on analysis of Vitamin B6 will be presented

Introduction

Vitamin B6 is electrochemically oxidized according to the following equation

Results

Simultaneous Determination of Caffeine and Pyridoxine in Energy Drinks using Differential Pulse Voltammetry at Glassy Carbon Electrode Modified with Nafion
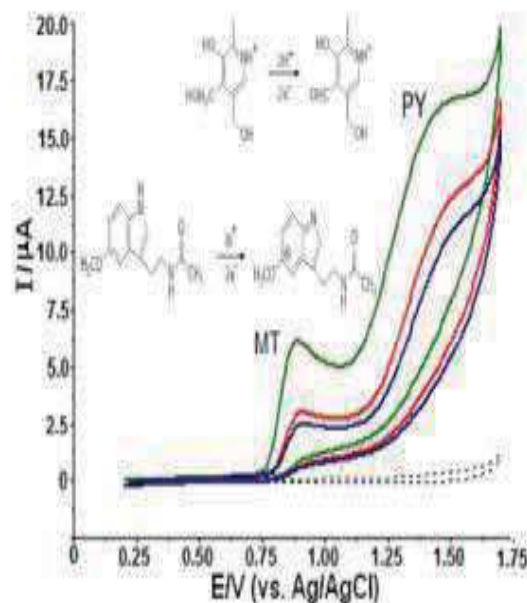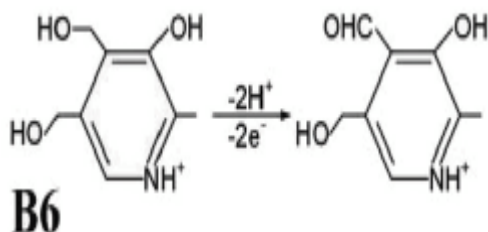
Voltammetric Method for the Simultaneous Determination of Melatonin and Pyridoxine in Dietary Supplements Using a Cathodically Pretreated Boron-doped Diamond Electrode

Acknowledgments

Students appreciate the support of the Chemistry department, Faculty of Applied Science

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1,3-Dipolar cycloaddition reactions:
A convenient tool approach to synthesis of fused dispiro-2-oxindoles

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Abstract

A 1,3-dipolar cycloaddition of 4-arylidene-1-phenyl-pyrazolidine-3,5-diones to azomethine ylide, generated in situ via decarboxylative condensation of isatin and sarcosine or L-proline has been reported to form the dispiro[pyrazolidine-4,3'-pyrrolidine-2',3''-indoline]-2'',3,5-triones or dispiro[pyrazolidine-4,3'-pyrrolizidine-2',3''-indoline]-2'',3,5-triones, respectively, regio- and stereoselectively and in good yields.

Introduction

1,3-Dipolar cycloadditions are an important group of reactions in organic synthesis for building of five membered heterocycles especially substituted pyrrolidine, pyrrolizine, and pyrrolothiazole derivatives [1-5]. The cycloaddition of azomethine ylides to exocyclic olefins represent one of the most reactive and versatile classes of 1,3-dipoles and is trapped readily by a range of dipolarophiles, either intra or intermolecularly, construction of functionalized five-membered spiro-heterocycles [5-11]. N-arylpyrazoles are very exciting class of heterocyclic compounds

Objective

- synthesized a series of novel dispiro[pyrazolidine-4,3'-pyrrolidine2',3''-indoline]-2'',3,5-triones and dispiro-[pyrazolidine-4,3`-pyrrolizidine-2`,3``-indoline]-2``,3,5-triones through 1,3-dipolar cycloaddition of azomethine ylides
- Simplicity, easy workup, mild reaction
- High atom economy, and good to excellent yields.
- The reactions proceed with regio and stereo-selective
.

Results

Reaction of (Z)-4-arylidene-1-phenylpyrazolidine-3,5-diones 2a-e with non-stabilized azomethine ylides, generated in situ via decarboxylative condensation of sarcosine (4) or Lproline (7) and isatins 3a,b (Scheme 2) in refluxing methanol afforded only one product in each reaction as indicated by TLC in a highly regio- and stereo-selective manner.
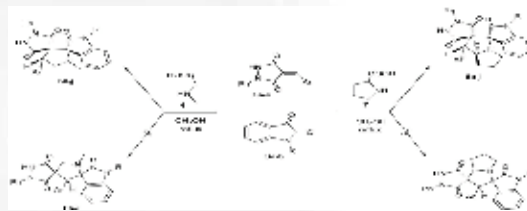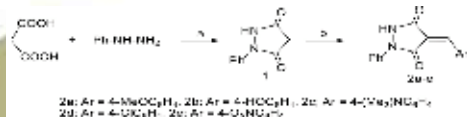
Discussion

Accordingly, the formation of the observed regioisomers 5a-j via path A is more favourable than 6a-j due to the secondary orbital interaction (SOI) which is not possible in path B. Hence, only one set of regio-isomers 5a-j was formed.

Conclusion

In conclusion, we have synthesized a series of novel dispiro[pyrazolidine-4,3'-pyrrolidine2',3''-indoline]-2'',3,5-triones and dispiro[pyrazolidine-4,3`-pyrrolizidine-2`,3``-indoline]-2``,3,5-triones through 1,3-dipolar cycloaddition of azomethine ylides generated in situ via decarboxylative condensation of isatin derivatives and sarcosine or L-proline with various (Z)-4-arylidene-1-phenylpyrazolidine-3,5-dione derivatives dipolarophiles in methanol as suitable reaction medium. This method has the advantages of operation simplicity, easy workup, mild reaction conditions, high atom economy, and good to excellent yields. The reactions proceed with regio and stereo-selective manner.

Acknowledgments

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Green synthesis of spirothiazolidinone derivatives

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Abstract

A simple and highly efficient protocol was developed for one-pot synthesis of polyfunctionalized spirothiazolidin-4-ones using sulfonated mesoporous silica (MCM-SO$_3$H) as a heterogenous and reusable acidic catalyst. In comparison to the reported synthetic methods for the synthesis of thiazolidin-4-one and spirothiazolidin-4-one derivatives, this strategy provides superior yields under mild conditions, while avoiding hazardous solvents.

Introduction

The thiazolidinone derivative have a biological activities, such as, antimicrobial, bacteriostatic, anticonvulsant, antifungal, anti-inflammatory and anticancer activities.

Organic synthesis is considered one of the most important types of synthesis in chemistry and is used in the pharmaceutical industry. But sometimes the synthesis is not environmentally friendly and in terms of the use of toxic or explosive catalysts or difficult reaction conditions we have prepared spirothiazolidinone derivatives in the conditions of green chemistry and is used in the production of drugs significantly. In comparison to the reported synthetic methods for the synthesis of 4-thiazolidineone and spirothiazolidine-4-one derivatives, this strategy benefits in improving yields, and using non-toxic or non-explosive solvents. Using MCM-SO$_3$H as an efficient solid acid catalyst for the synthesis of spirothiazolidin-4-one derivatives under mild and environmentally friendly conditions is the most important aspect of this study. The interesting features of this protocol are the environmentally benign conditions, simplicity of reaction, short reaction times, excellent yields, easily work-up and catalyst reusability.

Objective

- Synthesis of spirothiazolidin-4-one derivatives under mild and environmentally friendly conditions.
- Using simplicity of reaction.
- Shortening reaction times.
- Producing excellent yields.
- easily work-up and catalyst reusability.

Results

The Scheme represented the synthesis of 4-(4-(Piperidin-1-ylsulfonyl)phenyl)-1-thia-4-azaspiro[4.5]decan-3-one under the optimized conditions *via* the reaction of cyclohexanone 1 and 4-(piperidin-1-ylsulfonyl)aniline to afford the corresponding imine. derivative which is isolated in 90% yield, and then is allowed to react with thioglycolic acid o afford the corresponding product.
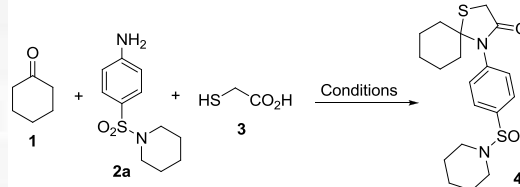
Discussion

The reaction mechanism

MCM-SO$_3$H as a Brønsted acid catalyst, activates the carbonyl group of the cyclic ketone, then, react with NH$_2$ group to product aromatic amine. Subsequently, the thiol group of thioglycolic acid react with the amino group (activated by MCM-SO$_3$H). The NH group react with carboxylic group, by cyclization give a final product is formed by elimination of H$_2$O molecule. The proposed mechanistic pathway shown in Scheme 5 was experimentally supported by stepwise synthesis of 4-[4-(piperidin-1-ylsulfonyl)phenyl]-1-thia-4-azaspiro[4.5]decan-3-one (**4a**) under the optimized conditions via the reaction of cyclohexanone (**1**) and 4-(piperidin-1-ylsulfonyl)aniline (**2a**) to afford the corresponding imine derivative, which was isolated in 90% yield, and then was allowed to react with thioglycolic acid (**3**) to afford the respective product **4a**.

Conclusion

Synthesis of spirothiazolidin-4-one derivatives under mild and environmentally friendly conditions The interesting features of this protocol are the environmentally benign conditions, simplicity of reaction, short reaction times, excellent yields, easily work-up and catalyst reusability.

Acknowledgments

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Spectrophotometric Determination of Famotidine Using Methyl orange, Methyl blue, Phenol red, Congo red,bromophenol red, methyl green

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Abstract

The present article reports six simple, sensitive, and accurate spectrophotometric methods have been developed for the determination of famotidine in bulk and in pharmaceutical formulations which based on the formation of ion-pair complexes between the examined drug and dyes in universal buffer of different pH values. The formed complexes are extracted with chloroform and should be measured at different wavelength for the six systems. The best conditions of the reactions should be studied and optimized. Beer,s law should be obeyed in the concentration ranges $2.0 - 20.0$ µg mL^{-1} and molar absorptivity, Sandell,s sensitivity, correlation coefficient, detection and quantification limits of all methods should be calculated.

Introduction

Famotidine is an 1,3-[amino(diaminomethylidene)]-2})]-3 N′-[Sulfanyl(methyl{thiazol-4-y-l sulfamoylpropanimidamide
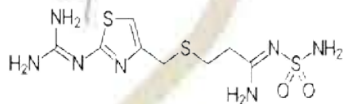
Famotidine (FT), sold under the trade name Pepcid among others, is a medication that decreases stomach acid production. It is used to treat peptic ulcer disease, gastroesophageal reflux disease, and Zollinger-Ellison syndrome. It is taken by mouth or by injection into a vein. It begins working within an hour [1]. Several methods have been published for estimation of famotidine, which include spectrophotometric methods [2-4], spectrophotometric and spectrofluorimetric method [5] and flow-injection analysis [6]. The aim of the present work is to develop simple, rapid, accurate, and sensitive spectrophotometric methods for determination of famotidine in its pure, dosage forms using methyl orange **(MO) ,** methyl blue **(MB) ,** phenol red **(PhR) ,** methyl green **(MG)** congo red **(CR)** bromophenol red**(BR) .**

Materials and Methods

Materials and Reagents
All materials and reagents used were of analytical reagent grade. A series of Britton-Robinson (B-R) universal buffer solutions were prepared. A stock solution of famotidine FT (1.0×10^{-3} M) was prepared by dissolving accurate weight of pure drug in least amount of ethanol, then diluted with water up 50 ml mark with dist. water. Standard Solutions of the (10×10^{-3} M) reagents were prepared by dissolving accurately weighted acid dyes in a few drops of ethanol and then diluted, separately to the mark With water in 50 ml measuring flasks
Apparatus
A UV-Visible spectrophotometer model Shimadzu UV- Vis with 10 mm quartz cells was used for spectrophotometric determination. The pH measurements were performed by using a pH meter model 3510 Jenway Instruments.
Procedure for calibration curve
Aliquots of GL in the concentration range , were transferred into a series of 50 ml separating funnels. A 1.0 ml of 1×10^{-3}M dye solution and 5.0 ml of buffer solutions of (pH 2-10) were placed. The volume of the aqueous phase was adjusted to 10 ml with distilled water and mixed well. The funnels were shaken vigorously with 5 ml of chloroform for 2 min. The two phases were allowed to stand for clear separation and the chloroform layer was dried by running through anhydrous sodium sulfate. The absorbance of the organic phase was measured at 410, and 421 nm for BPB and MO, respectively, against chloroform.

Results and Discussion

Famotidine forms ion-pair complexes in acidic medium with different dyes such as MO, MB, PhR , MG, BR, CR and these complexes are quantitatively extracted into chloroform. The absorption spectra of the ion-pair complexes were measured in the Specific wavelength against the blank solution (Figure 1.). The ion-pair complexes show maximum absorbance at Specific wavelength for MO, MB, PhR , MG, CR, BR respectively, against chloroform
Optimization of the reaction conditions
Effect of pH , choice of organic solvent and effect of shaking time should be studied.
For Example:
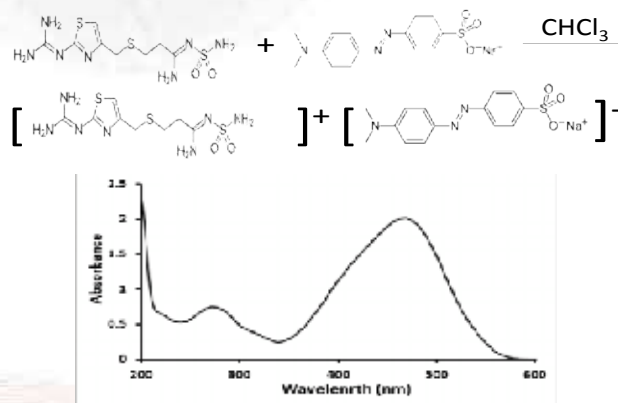
Figure 1: Absorption spectra of MO

Conclusion

In the present study, FT was determined successfully in bulk drug and its pharmaceutical preparations. The maximum color development of ion-pair complex formations, are completed immediately after all reagents were added and thus, all the measurements were made in 5.0 min after standing the extracted solutions in all the experiments. The commonly used additives and excipients in pharmaceutical dosage forms of FT should be not interfere in the analysis. The proposed methods are simple, sensitive, and reproducible and can be used for routine analysis of FT in pure form and in formulations.

Acknowledgments

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(Posters)

الملصقات العلمية

لمشـاريع التخــرج

قسـم الكيميـاء

(طالبات)

Study the effect of 'Zamzam water on plants

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Faculty of Applied Sciences

Abstract

Magnetic water fields are known to induce biochemical changes and could be used as a stimulator for growth related reactions.

The study discusses a new scientific topic, which is the study of the effect of Zamzam water that have unique properties on plants. The results of the current study showed the positive effects of Zamzam water on all parameters studied.

Introduction

Plants are among the most important groups of living organisms contain amount of nutrients important for their healthy and growth. The lack of these elements of the plant causes a group of problems. plants cannot obtain these nutrients without water. Magnetic water is considered one of several physical factors affects plant growth and development. Magnetic water fields are known to induce biochemical changes and could be used as a stimulator for growth related reactions. However, the available studies and application of this technology in is very limited. Therefore, the aim of the present work for evaluate study the effect of irrigation by Zamzam water on the speed of plant growth, yield, yield components, organic and inorganic (uptake of mineral elements) components of broad bean

Objective

1-Cognitive curiosity.
2-Solve problems resulting from soil salinity and plant quality.
3-Study the effect of Zamzam water on the speed of plant growth.

Methodology

Before planting
1- PH measurement of Zamzam water
2- Measuring the amount of minerals and salts available in Zamzam water

During planting

3- Cultivation of the fenugreek seeds with the addition of Zamzam water to it
4-Fenugreek plant growth

After planting

5-Chlorophyll, Organic, inorganic materials analysis:
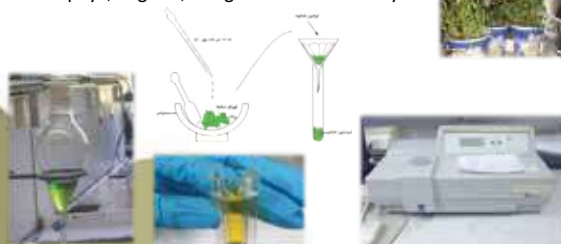
Result and Discussion

The results were positive because of the features of Zamzam water, which include (magnetization), which helped to break down the salts to facilitate their entry into the plant and increase its growth rate.

Through this picture, it is clear to us the effect of the water of Zemzah on the plant and its growth through the magnetic property, which had a great impact in facilitating the entry of minerals to the plant, as was observed on the fenugreek seeds that were used in this research. Among the results of other research is that Zamzam water was added in different concentrations to infer any concentration of salts that are suitable for plant growth and the result of a concentration of 25% of the best and fastest results.

Conclusion

The results of the current study showed the positive effects of Zamzam water on all parameters studied. Therefore, Magnetic that in zamzam water is known to provoke biochemical changes, and can be used as a catalyst for growth-related reactions, which increases nutrient absorption. Possesses the property of magnetization helps to wash the soil, so the plant can absorb water and minerals easily from the soil, then the ability of the plant to resist diseases, and reduces the use of chemical fertilizers, which reflects positively on human health and the environment

Acknowledgement

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Preparation of Na-p zeolite from Saudi Arabia kaolin

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Supervisor :Dr.Hanan Alzahrani

Umm Al Qura University

Figure 2: SEM of calcined kaolin
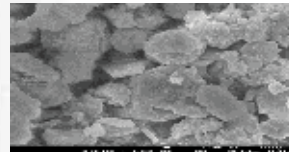
Figure 3: SEM of Na-p zeolite

Na-p zeolite was successfully prepared using Saudi kaolin by the thermal transformation . The sample is characterized using XRD and SEM.

Introduction

Zeolite is a mineral with a structure that enables liquid absorption and loss easily[1]. zeolite contains a wide range of natural and synthetic aluminum silicate[2].
The properties of zeolite are adsorption and catalyzing reactions , as well as ionexchang, which helps remove many organic and inorganic pollutants[3].

Objective

Preparation of zeolite from Saudi Arabia kaolin and use it to remove organic and inorganic pollutants .

Results

Samples were analyzed by two devices.

Figure1: XRD patterns of Calcined kaolin and Na-P zeolite

Discussion

The phase analysis of XRD in figure 1 showed that the calcined kaolin is observed with a pure phase. After hydrothermal treatment Na-P zeolite is observed with a pure phase. clear tetragonal crystals of Na-P zeolite are appeared in SEM in figure 3.

Conclusion

We succeeded in preparing zeolite from Saudi kaolin and using this type of low-cost clay doubles its economic use. Finally, the shape of zeolite crystals was determined using two devices.

Acknowledgments

First, we want to thank our supervisor Dr. Hanan for helping us and responding to us and to stand with us and the way she speaks with us with all kindness and affection. Second, All authors were collaborators to complete all works .

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Novel Antibiotics Derived from 2-Aminothiazole

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Introduction

Infectious diseases are one of the top 10 causes of death worldwide[1]. 3.8 millions cases have been recorded in 2018 due to 4 different infectious diseases **(Fig1)**.
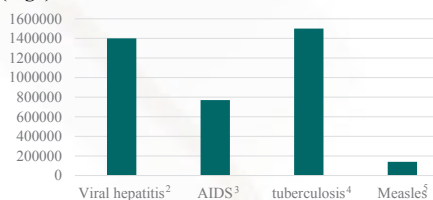
Figure 1: Some approved infectious diseases' cases in 2018.

Aminothiazole and its derivatives

Substituted 2-aminothiazole compounds have a wide range of uses especially in biological activity. It is an important aid to synthesise Schiff base when reacting with aldehydes. Many researches approved its biological activity and efficacy as a therapeutic agent for different diseases.

(Antifungal)[6]   **(Antibiotic)[7]**   **(Anticancer)[8]**
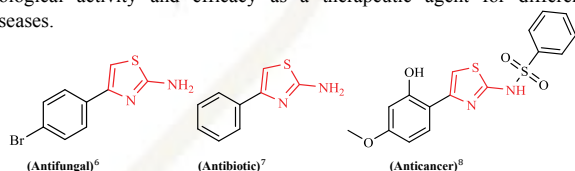
2-amino-4-phenylthiazole synthesis
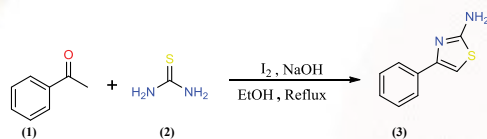
Scheme 1: Synthesis of 2-amino-4-phenylthiazole (3).

We examined the preparation of 2-amino-4-phenylthiazole **(3)** through Hanzch reaction **(Scheme 1)**.[9] The most significant advantage of this method is the ease of performance under mild conditions with perfect yield.

A suggested mechanism **(Scheme 2)**[7] for 2-amino-4-phenylthiazole **(3)** starts by enolate **(4)** formation in basic medium. Then, initiating it by iodine to form a reactive ketoiodite **(5)**. The lone pair of nitrogen in thiourea **(2)** will attack the ketoiodite **(5)** to form an intermediate which goes under cyclization then dehydration in two steps to give 2-amino-4-phenylthiazole **(3)**.
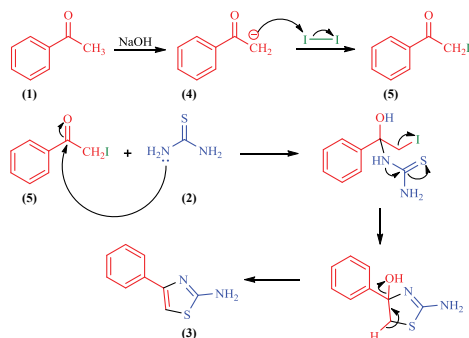
Scheme 2: Mechanism of 2-amino-4-phenylthiazole (3) synthesis.

Results

Synthesis of 2-amino-4-phenylthiazole **(3)** has been examined three times in different conditions. The best yield was obtained by using the minimum amount of iodine and refluxing the mixture for 15 hours **(table 1)**.

Sample	NO. of equivalents (thiourea:acetophenone:iodine)	Reflux Time]hours[	Yield]%[	Antibacterial Data in MIC against E. coli]gram -ve [ ]µg/ml[[7]
A	1.5:1:1	11	32	5
B	1.5:1:1	18	37	
C	2:1:0.5	15	60	

Table 1: Three attempts were performed for synthesising 2-amino-4-phenylthiazole (3).

Conclusion

2-amino-4-phenylthiazole **(3)** was successfully synthesized in several reaction conditions. The last attempt C gave the best yield up to 60%. UV analysis and physical properties conformed the formation of the target compound. Its biological activity has been proven depending on A.S. Tekale, B.N Muthal, S.A Shaikh and V.K Jadhav results.

Future work

The biological activity of 2-amino-4-phenylthiazole **(3)** will be developed by nucleophilic addition reaction with several compounds such as furfural **(6)**, sebacoyl chloride **(7)**, anisaldehyde **(8)**, and benzoyl chloride **(9)** **(Scheme 3)**.
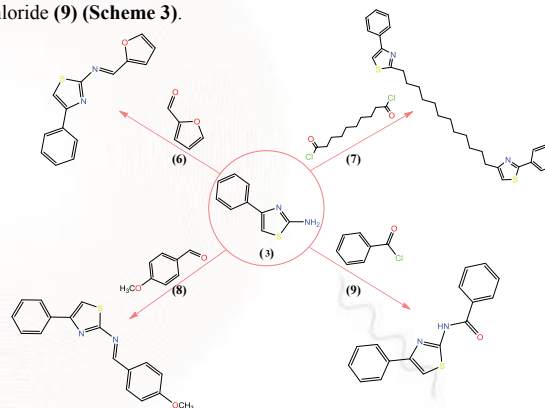
Scheme 3: Several nucleophilic reagents reacted with 2-amino-4-phenylthiazole (3).

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Photochromic properties of Fulgimides doped in PMMA polymer film

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Abstract

A thin film of Fulgimides 1-E doped in a PMMA was prepared on a quartz plate. The film was irradiated with ultraviolet light (366 nm), a Pink colour was developed. The later color was switched back to the original color when the film was irradiated with a white light. The photocoloration and photobleaching reactions obeyed first order rate equation with rate constants equal 5.93×10^{-4} s^{-1} and 0.0147 s^{-1} , respectively. Another three films prepared and were annealed for four hours, at (40 C° , 80 C° , 100C°) . The photocoloration and photobleaching reactions of the annealed films obeys first order rate equations. Interestingly, the rate of the photocoloration reaction increases with increasing the annealing temperature. On the other hand, the rate of the photobleaching reaction is almost similar for the three films. In conclusion, the Photochromic properties of Fulgimides   1-E doped in PMMA polymer film was improved significantly upon annealing the film at various temperature, compared with other polymers films we studied previously. Both, the coloration and bleaching reactions proceeded faster for the annealed film than the non-annealed film and with better fatigue resistant .

Open forms   Closed form

E   Z   C

Fulgimides   X =N-R

Introduction

Photochromism is the ability of photochromic compounds to change their absorption spectra with exposure to UV-vis light in a reversible manner . Fulgides and fulgimides belong to one of the most important families of compounds which show excellent photochromic properties .Their known for their thermally stable isomers and high resistance to photochemical fatigue [1,2] . Furthermore, fulgimides have a higher hydrolytic stability compared to fulgides because of the imide group. Hydrolytic stability of fulgimides is an important property for applications in optical memory devices ,materials are required to maintain stability and function in humid environments specialty inks and dyes. fulgimide was also used as an "on-off" fluorescence switch in live cells. All these applications depend on the binary nature of photochromic compound [3,5] .
In a previous paper, we reported the photochromic properties of vacuum-deposited films [6] and PMMA of fulgide 1-E. Now, we reported the photochromic properties of the fulgimides doped in PMMA polymer

Objective

In this work, photochromic properties of fulgimides were studied by preparing thin polymeric films with using PMMA

Results and Discussion

Photocoloration
Fulgimides was obtained as a greenish solid mixture of two geometrical isomers, the cis and trans isomers (Z, E). Fulgimides E undergoes a conrotatory photocyclization upon irradiation with UV light (366 nm) to give product C as a pinkish color with absorption maximum at λ max 560 nm . Figure shows the spectrum of Fulgimides in PMMA polymer films before and after irradiation of the film without heating at intervals of time. The photocyclization process was found to obey a first order rate equation .

$$ln \frac{A_o}{A_t} = kf$$

where k is the rate constant , A_o the absorbance at *zero* time , A_t is its absorbance at time t

The rate constant for the process was found to be 5.92742×10^{-4} s^{-1}. Similarly, the annealed films were irradiated with UV light at (40 °C , 80 °C, 100 °C) .
 It was found that the rate constants are slightly increased with increasing annealing temperature.

Photocoloration
The photocyclized products were then photobleached using a white light lamp. The pink color is gradually disappeared with time and fulgimides in PMMA polymer films is regenerated . This process was also found to obey a first order rate equation . As it is clear, the rates of photobleaching reactions are almost similar for the three films at (20 °C , 40 °C , 80 °C) and slightly decreased at 100 °C
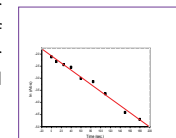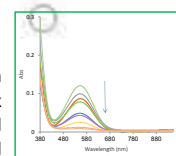
Fatigue resistant
One of the important characteristics should be fulfilled by a compound to have a potential use as a data-storage medium is its good fatigue resistant, which allows for repetitive cycles without the loss of optical properties. Thus, Fulgimides in PMMA polymer films was   photocyclized and photobleached consecutively for 8 cycles.

Conclusion

The photocoloration and photobleaching reactions of the annealed films show first order rate equations. Interestingly, the rate of the photocoloration reaction increases with increasing the annealing temperature. On the other hand, the rate of the photobleaching reaction is almost similar for the three films.

Acknowledgments

Many thanks   to my supervisor Dr.Amerah for her support and advice throughout the duration of the study . We also want to thanks Umm Al-Qura university and chemistry depertment for all the support

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Theoretical and Computational Study of Carbon Dioxide Solubility in primary amines, secondary amines, tertiary amines and amides Solvents

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Abstract

The density functional theory method (DFT) and B3LYP functional with *cc*-pvqz basis set were used to study the carbon dioxide solubility in sixteen solvents under standard conditions. The calculations were carried out in solvent using the polarizable continuum model (PCM). Solvation free energies give the free energy change associated with the transfer of a molecule between ideal gas and solvent. The results show that NMF-Mixture, Formamide, and Water have similar solvation free energies, with the lowest for NMF-Mixture. The NMF-Mixture is the most thermodynamically favored solvent for capturing CO_2 gas among all the studied solvents.

Introduction

Global warming, climate change, and ocean acidification are the most important environmental issues which recently have taken the scientists' interest. [1,2]

Carbon dioxide concentration is continuously increased in the atmosphere due to the emissions. [1] These emissions come from different human activities such as burning fossil fuel [1], cement [1,3], oil refining, steel and iron manufacturing [3]. The industrial emissions contribute to 25% of the global carbon dioxide emissions. The CO_2 concentration has been increased since the industries started from 270 ppm[3] in 1750 to 413 ppm in March 2020.[4] Therefore, limiting those emissions have attracted scientists for decades.

A proposed technique which has shown promising results to reduce these harmful emissions, is the Carbon Capture and Storage (CCS) technology. [1] Its principle goal is to capture 90% of the CO2 emissions through the use of a chemical solvent.[5] Moreover, the theoretical calculations can be used to study and fully understand the CO_2 capture phenomenon.

Table 1 and figure1. the calculated solvation energy of CO_2

Calculation method

The density functional theory method (DFT)[6] and B3LYP[7] functional with the 'correlation-consistent polarized' basis set *cc*-pvqz[8] that recently have become widely used and are the current state of the art for correlated or post-Hartree-Fock calculations have been used to carry out all the calculations.

The reactants and products were optimized to their lowest ground states, which have the lowest energy (Gibbs free energy), and fully converged using Gaussian 09[9]. The calculations were carried out in the gas phase and in the solvent using the polarizable continuum model PCM[10] solvation model, which is a useful form to describe nonspecific solute-solvent interaction. The frequency calculations were done and no negative frequency obtained. The thermodynamic parameters obtained from the frequency calculations at 298K

Results and Dissociation

The solubility of CO_2 in water, primary amines, secondary amines, tertiary amines and amides has been studied under standard conditions. Table 1 and Figure 1 shows the solvation energy of CO_2 calculated using equation 1 in different solvents.

$$\Delta G_{solvation} = G_{solvent} - G_{gas} \qquad (1)$$

The data of solvation energy shows that the solubility of CO_2 in dipropyl amine is the lowest among all the studied solvents predicted by the highest solvation energy (-0.89 kcal/mol) obtained from the calculations. On the other hand, the solvation of CO_2 in n-methyl formamide-mixture, formamide, and water is similar (-1.64 kcal/mol, -1.63 kcal/mol, and -1.62 kcal/mol respectively).

The solubility of CO_2 in primary, secondary and tertiary amines is lower than that in water and in n-methyl formamide-mixture by 0.75 ~ 0.18 kcal/mol with the higher solubility in pyridine and lower solubility in dipropyl Amine.
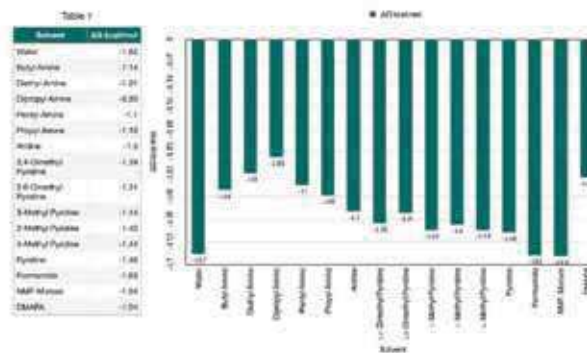
Conclusion

The solvation of CO_2 in different solvents was studied under the standard conditions to find the most suitable solvent that can be used to reduce the CO_2 emissions. All the sixteen solvents are suitable and have exothermic solvation processes. The order of decreasing solubility is NMF-Mixture > Formamide > Water > Pyridine > 3-Methyl Pyridine = 4-Methyl Pyridine > 2-Methyl Pyridine > 2,4-Dimethyl Pyridine > 2,6-Dimethyl Pyridine > Aniline > Propyl Amine > Butyl Amine > Pentyl Amine > DMAPA > Diethyl Amine > Dipropyl Amine.

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Oxidation Reactions of Carvacrol, A Natural Antioxidant Extracted from Negilla Sativa Plant

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Abstract

The density functional theory method (DFT)[1] and B3LYP[2] functional with the *d*-polarized split-valence basis set (6-31G*)[3] basis set were used to investigate the antioxidant activity of carvacrol and determine its probable free radical scavenging mechanisms. The study shows that the ipso attack is more thermodynamically favored when the OH radical attacks the carvacrol.

Introduction

Carvacrol is a predominant monoterpene phenol presents in many essential oils of the medicinal plants e.g. N. sativa. Studies of carvacrol have shown that it has different properties as anti-inflammatory, antifungal, antigenotoxic, antihepatotoxic, hepatoprotective, antitumor, antimicrobial, antibacterial and strong antioxidant activities due to the scavenging activity against several reactive oxygen species (ROS) including hydroxyl radicals.

It is widely known that OH radicals react with benzene ring systems by the addition reaction to form cyclohexadienyl type radicals, and there are different possibilities of the addition reactions of carvacrol:
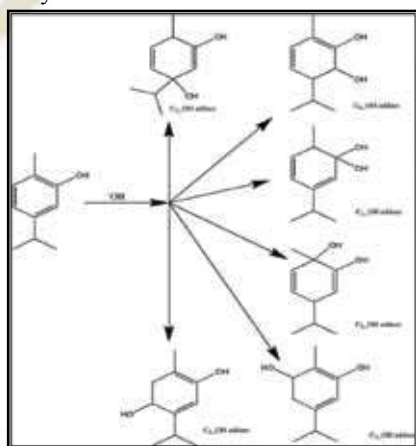
Results

The geometry structures for the six OH-adducts of carvacrol with free radical, Gaussian[4] output
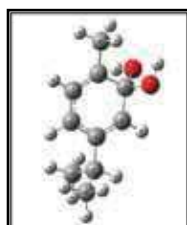
C1_OH adduct C2_OH adduct C3_OH adduct
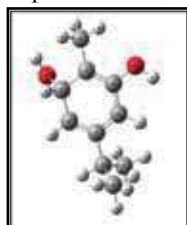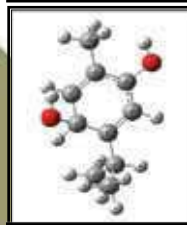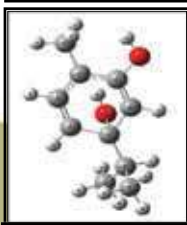
C4_OH adduct C5_OH adduct C6_OH adduct
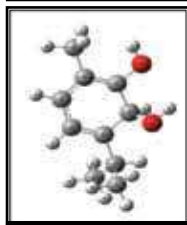
The relative energy (ΔE), the relative enthalpies change (ΔH), and the relative free energy change (ΔG) of the six possible OH-adducts:

Compounds	ΔE kcal/mol	ΔG kcal/mol	ΔH kcal/mol
Carvacrol	0	0	0
C_1-OH adduct	-29.16	-19.06	-29.03
C_2-OH adduct	-28.66	-18.03	-28.53
C_3-OH adduct	-23.74	-14.22	-23.62
C_4-OH adduct	-24.69	-14.59	-22.65
C_5-OH adduct	-25.46	-15.14	-25.33
C_6-OH adduct	-24.47	-14.53	-24.34

Table(1):The relative energies (ΔH), the relative enthalpies change (ΔH), and the relative free energy change values (ΔG) of the OH-adducts.

Discussion and Conclusion

The relative energy values of the six possible OH-adducts were compared to find the most stable OH-adduct that have the lowest energy. The relative energies (ΔE), the relative enthalpies change (ΔH), and the relative free energy change values (ΔG) of the OH-adducts were compared to determine the most stable geometry of OH-adduct (Equation 1 and 2) (Table 1).

$$\Delta H = H_{OH\text{-}adduct} - (H_{carvacrol} + H_{OH\,radical}) \qquad (1)$$
$$\Delta G = G_{OH\text{-}adduct} - (G_{carvacrol} + G_{OH\,radical}) \qquad (2)$$

From Table(1), the product C_1-OH adduct is the most stable geometry that has a lowest relative energy (-29.2 kcal/mol) and a lowest heat of formation (-29.03 kcal/mol) compared to other OH-adducts. The free energy (-29.06) indicates that the C_1-OH adduct is the most thermodynamically stable OH-adduct. These data shows that the ipso attack is more favored when the OH radical attacks the carvacrol molecule.

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Measuring the effectiveness of DNA as corrosion inhibitor

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Abstract

The current analysis to reduce metal corrosion is the using of DNA. Excellent inhibition properties were investigated by using DNA ranging from 20-80 bases. This study was applied on steel. The results showed that the DNA inhibitor increased the corrosion resistance of the steel significantly, by forming a film on the steel via physisorption of DNA on the steel. Other studies used DNA as green corrosion inhibitor to protect carbon steel against 1 M of HCl solution, and the corrosion behavior was systematically investigated by weight loss and quantum chemistry calculation et al.
The results showed that the maximum inhibition efficiency of compound DNA reached 74.2% to 91.9%.

Introduction

Corrosion is a common physical chemical reaction between the metal and the surrounding (air, water, and soil), which leads to changes and damage to the metal.
Corrosion is a natural phenomenon, not entirely controllable, but we can work to limit its spread. The phenomenon of erosion is difficult to predict, but the factors leading to it are very clear and their effects are large and costly.
Inhibitors were used
DNA is one example which used previously as a green inhibitor to protect carbon steel. Corrosion behavior was verified and results showed that the DNA is a promising inhibitor and environment friendly with effective efficacy.

Aim of the study

Studying the effect of DNA on metal corrosion in different media using different metals.

Methodology

In the absence of DNA
Immersion + Wt. loss

inhibition efficiency
74.2% to 91.9%.

In the presence of DNA
Immersion + Wt. loss
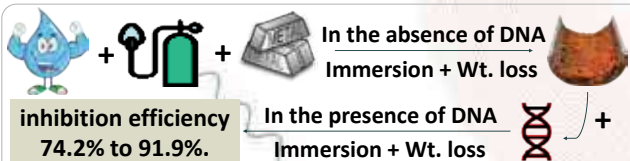
Expected Results
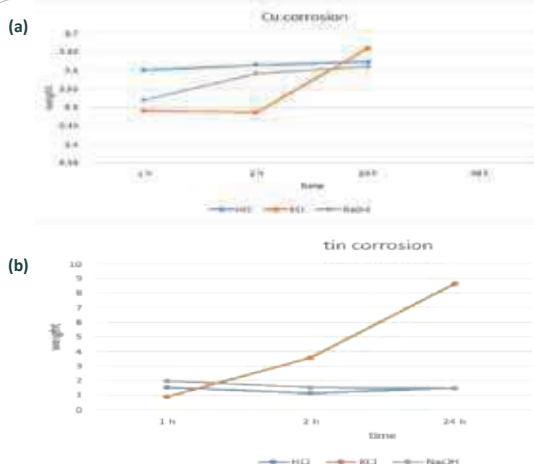
Figure 1. Weight-loss method. (a): for Cu and (b): for Sn. Both experiments were done at different times and media.
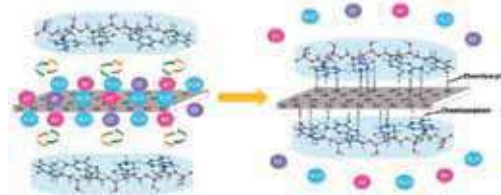
Figure 2. The adsorption model demonstrates the mechanism of interaction of a DNA inhibitor with steel

Discussion

Through the estimated results: expression and the graph of the Sn and Cu rate are that there is an increase in the depth of corrosion. Results were identified by using the weight-loss method. Different conditions such as: different media, concentrations and time were studied, see figure 1.
On the other hand, recent results showed that the carbon steel surface is covered by H_2O molecules, H ions, and Cl ions, (HCl media of corrosion) without adding DNA inhibitor in the corrosive medium. While in the presence of DNA, the DNA molecules adsorb on the metal surface and dispel H_2O molecules, H ions and Cl ions on the surface forming a film. The inhibitor film derives from the donor-acceptor interaction by the ion pair of heteroatoms (N, O) and the d-orbitals of the surface iron atoms (donation). Because of the particular advantages of DNA, such as large molecular weight, large number of polar groups, effectively isolates the steel from the corrosive medium, see figure 2.
Additionally, DNA was applied at different temperatures. Significant results were demonstrated.
Those results identified that the DNA is a promising inhibitor.

Conclusion

COVID-19 was a primary limitation affected the completion of our experiments. Such that, our project is fully depend on previous studies.
Based on previous results:
the bio-macromolecule DNA worked as a novel environment-friend and effective corrosion inhibitor on different metals who have been studied by immersion in 1-2N-HCl at different conditions.
The maximum inhibition efficiency of DNA reached 74.2% to 91.9%.

Acknowledgments

Our heartiest thanks with a deep sense gratitude and respect to all those who provides us help and guidance. Sincere gratitude to our supervisor Dr. Alia A. Alfi for this opportunity to undertake such a great challenging and innovative work, guidance, encouragement, understanding and insightful support in our graduation project. Our thanks to the head of department Dr. Tahani Bawazeer and Raja Noqali for their advices.

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Detection of Sugars with Benedict Detector

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Abstract

Sugars or carbohydrates are one of the main types of nutrients, and they create an important source of energy in the body, as the digestive system converts them into blood sugar or glucose, which is used to obtain cells, tissues and organs, and stores any additional sugar in the liver and muscles until Need it, Carbohydrates play important roles in living organisms, the most important of which are :It is an energy source during its combustion .It is a carbon source in the process of forming other cellular components .It is considered a large store of chemical energy .They are considered as structural elements of cells and tissues .Cellulose prevents constipation

Introduction

Sugars are made up of organic compounds classified within the family of hydrogen Fuchs (carbohydrates) characterized by a sweet taste so they are used in foods and beverages for dessert Sucrose is a type of sugar with extreme sweetness, also called food sugar Sucrose is formed by the first two sugar sucins, glucose and fructose, so it is a binary sugar, and is in the form of a solid crystal extracted from sugar cane or sugar beet Sugars are classified into three types: 1-Monochromatic sugars , 2 – low-polymorphic sugars, 3 – multiple sugars Monochromatic sugars Mono sugars are the simplest carbohydrates, physically colorless and water-dissolved and have a crystalline form, chemically polyhydroxy aldehyde or ketone, i.e. molecules containing more than the hydroxyl group (-OH) and the Carbonyl Group (C=O) Multiple sugars It consists of long chains of single sugar linked to each other, the most important of which are starch, glycogen and cellulose

Objective

Detection of reducing sugars using the Benedict reagent. Know the colors of each of the different reducing sugars when interacting with the Benedict reagent measure the wavelength for (glucose, galactose, fructose, sucrose, maltose and lactose) using a device called (spectrophotometer).

Results

Benedict's quantitative reagent contains potassium thiocyanate and is used to quantify the quantity of sugar diluted. This solution forms a copper thiocyanate precipitate which is white and can be used for titration. Titration should be repeated with 1% glucose solution in place of the sample for titration . And in this experiment, sugar is recognized by its color, because each sugar has a certain color that appears after heating. Second step we prepared the samples and measured them with a spectrophotometer device and each type of them had its own λ max that is able to detect the type of each sugar if it is unknown. The device was installed at 366nm for all sample .

Name of sugar	Color
Maltose	Reddish yellow
Glucose	Brown
Lactose	Green
Fructose	Orange
Sucrose	Blue

Name of sugar	Absorbance
lactose sugar	0.162A
glucose sugar	0.190A
fructose sugar	0.194A
Sucrose sugar	0.198A
Galactose sugar	0.204A
maltose sugar	0.206A

Discussion

We have detected sugars in two different ways, but with one reagent in order to check the sugar . This is the common and traditional method for detecting sugars with the Benedict reagent . Benedict's quantitative reagent contains potassium thiocyanate and is used to quantify the quantity of sugar diluted. This solution forms a copper thiocyanate precipitate which is white and can be used for titration. Titration should be repeated with 1% glucose solution in place of the sample for titration

Conclusion

Sugars or carbohydrates are one of the main types of nutrients, and they create an important source of energy in the body, as the digestive system converts them into blood sugar or glucose, which is used to obtain cells, tissues and organs, and stores any additional sugar in the liver and muscles until Need it. Carbohydrates play important roles in living organisms, the most important of which are It is an energy source during its combustion. It is a carbon source in the process of forming other cellular components. It is considered a large store of chemical energy. They are considered as structural elements of cells and tissues. Cellulose prevents constipation.

Acknowledgments

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Process development for removal of hazardous dye Methylene Blue from wastewater by waste materials-Banana peels as adsorbents .

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Abstract

Banana peels was used to remove Methylene blue dye Successfully, This study was carried out in two step, the adsorbent preparation step and the removal Methylene blue step, different effects were used for the removal process PH, contact time and amount of adsorbent . In addition use a magnetic stirrer to agitate substances and also used uv-vis spectrophotometer to measure absorbance , Based on the results of this study, the adsorbent substance (banana peels) managed to adsorb the ratio 84.37% during 15min .

Introduction

Water is a substance that has no taste, no color, no smell. It constitutes 71% of the earth's surface it has many sources: seawater, wells, and sewage, etc. Water is very important to living organisms on earth it`s quality has become a more important issue than ever, because low quality water causes many important problems [1]. Water pollution has a high impact on all living systems including plants, wild and atmospheric animals. In addition to pollutants such as as the presence of dyes, the increase in global warming and the consequent climate changes pose a great danger to clean water [2]. With the increasing use of a variety of dyes, pollution from dyeing water has become a serious problem. There are nearly 3000 dyes on the global market, and more than 6000 dyes are released into the water every year worlds [3] At first sight of anything the color is what gives a good impression Whether it's tasting food or touching something It affects a large proportion on consumer choices, so it is the main reason for food coloring and visual attractions, especially colorless foods and beverages, They are colored with either natural or synthetic colorants [4] The methylene blue is a known synthetic colorant-Azo dye- 3,7-bis(dimethylamino)phenothiazin-5-ium its molecular formula ($C16H18ClN3S$) , A commonly used dye that also exhibits antioxidant, antimalarial, antidepressant and cardioprotective properties., methylene Blue powder Soluble in water solution And insoluble in other organic solvents . [5]

Objective

Remove Methylene Blue from aqueous solution by banana peels the Advantage of this method low cost and help preserve the environment .

Material and method

Material
Banana peels – Methylene blue -Distilled water-Sodium Hydroxide-Hydrochloric Acid.
method
1-Preparation of adsorbent
Banana peel obtained and almost cut (<5mm) , then wash it with tap water two to three times, then rinse it with distilled water to remove the external dirt, it was put in the air to remove the water and then it was put to dried in an oven at 105˚C for 24 hours. then grind it and sieved with a sieve and kept in glass bottle .
2- Removal Procedure using uv-vis spectrophotometer
Add Methylene blue of 2.7X10^-5 M which prepared in different PH, and banana peels powder it has particles 200 µm in conical ,then it was placed in a hot plate and add magnetic stirrer in conical , at fixed temperature 50 ˚C, after that the solution was filtered and placed in a device uv-vis spectrophotometer to measure absorbance .

Result and Discussion

The study was conducted under different pH conditions (acidic-neutral-basic) , also different amount of adsorbent (0.1g-0.2g0.3g-0.4g-0.5g) and different times (5min-10min-15min-20min-) the present removal of Methylene blue by the adsorbent was calculated according to the Eq1

$$R(\%) = \frac{(C_0 - C_f)}{C_0} \times 100$$
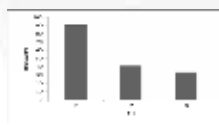
Fig.1 :Effect of pH on $2.7x10^{-5}$ M of Methylene blue solution by banana peels , amount of adsorbent 0.1 g , temperature 50°C, contact time 15 min and particles of size 200 µm).

The highest removal rate was in the acidic medium PH=3 90.69% .
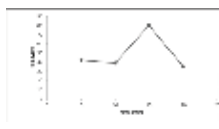
Fig .2:Effect of contact time on removal of $2.7x10^{-5}$ M of Methylene blue, amount of adsorbent 0.1g ,pH =3, temperature 50°C and particles of size 200 µm).

The highest removal rate was 15 min (80.10%)
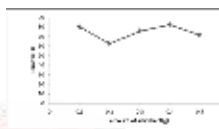
Fig .3:Effect of amount of adsorbent on removal of $2.7x10^{-5}$ M of Methylene blue,pH =3, and particles of size 200 µm). at temperature 50°C contact time 15 min.

The highest removal rate 0.4g (82.32%)

Conclusion

banana peels has showed a good result to removing Methylene blue dye from aqueous solution . the results showed that optimum conditions for highest removing of Methylene blue (84.37%) were at pH =3, contact time at 15 min and by using 0.4g of the adsorbent . This study revealed that the banana peels can be used as an economical natural based bio adsorbent to remove Methylene blue dye from an aqueous solution Advice for the next research, Study of absorbance under the effect of different temperatures and also under the effect of different sizes of particles and use flam photometer to determine some metal .

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Sporopollenin interact with inorganic metals

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Abstract

Sporopollenin interact with inorganic metals and the compound investigate by some spectroscopy techniques such as, IR and UV-vis spectroscopy to examine the functional groups and absorbance.

Introduction

The sporopollenin is the outermost layer of pollen and acts as a protective wall for it, and is used in many fields such as pharmacy, cosmetic. The aim of this research project is to interact of metal salts such as copper and nickel with the sporpollenin. Then it is analyzed by ultraviolet spectroscopy (UV-Vis) and infrared spectroscopy (IR) to know the functional groups resulting from the reaction. And their use in a variety of applications [1].

Experimental

Sporopollenin, nickel and copper acetate in powder

There are many steps that have been taken to interact sporopollenin with inorganic metals and in this research provides a preparation methods used to investigate sporopollenin and their interactions with inorganic which are nickel acetate (Ni(OAc)$_2$)and cupper acetate (Cu(OAc)$_2$).

Results and discussion

Based on the current health conditions and the spread of the epidemic, it could not complete the experiments, so it was searched for the previous results and founded some Analysis.
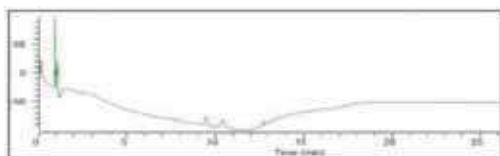
Ultraviolet-visible (UV– visible) spectroscopy

Electronic absorption spectroscopy in the UV-visible (UV-vis) region was used to obtain information about the color of the sporopollenin, and those reacted with metals (copper and nickel salt), as well as important insight into the electronic structure of the metal.

The intensity of the color produced by the complex ion can be used to identify the concentration of metal within a sample [2].
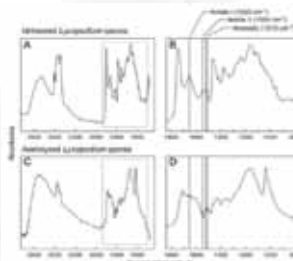
Infrared (IR) spectroscopy

All the atoms within a molecule are vibrating continuously with respect to each other, When the frequency of a specific vibration is equal to that of the incident IR, the radiation is absorbed. Building on the work of Kawase performed infrared spectroscopy of Sporopollenin. These IR studies showed that Sporopollenin contained hydroxyl groups, eithers and C = 0 groups, The C = 0 groups were possibly of the structure R - CO, where R = aromatic, aliphatic or conjugated group. KaWase et al, also suggested that the main structure of Sporopollenin was a simple aliphatic polymer with aromatic and conjugated side groups. These studies suggest that Sporopollenin consists of a main structure, with side chains that vary between species [3].

Conclusion

The summary of this research is based on uncovering the association of sporopollenin with metals to know the composition and functional group by analyzing it in the Uv –vis and IR depending on that the form of sporopollenin is not fully known yet. We hope that the research will be completed in the future.

Acknowledgments

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Green synthesis of Pyrazole and its derivatives

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Abstract

Green chemistry provide alternative synthetic pathway for prevention of pollution in the utilization of set of principal that reduces or eliminates the use or generation of hazardous substances in the design, manufacture, and application of chemical products or processes. Pyrazoles are a class of heterocyclic compounds that have a wide range of applications in the pharmaceutical industry. Pyrazoles derivatives have been found to show anti-bacterial, anti-inflammatory, anti-tumor, anti-viral, hepatitis, anti-cancer, anti-radiation, and antispasmodic properties. We interested in this review to shed some light on the green methods for synthesis of pyrazoles and their derivatives.

Introduction

We, as chemists, try to reduce environmental risks while doing chemical experiments so that we can work and conclude when we finish what is useful or new that we discovered. At the same time we preserve the environment and for this we included in our research that the relationship between green chemistry and pyrazole or pyrazoles derivatives .In this research we talk about importance of pyrazole and pyrazole derivatives, and importance of synthesis by green methods. Also we talk about synthesis methods and pyrazole uses.
First: the importance of pyrazole and pyrazole derivatives it has very important in biological, organic and pharmaceutical . Because it has high biology activity[1]. it use as anti-fungal[2], insecticide[3], anti-malarial[4], anti-bacterial[5], anti-cancer[5] , anti-depressant[6] and anti-inflammatory[7]
Second: the importance of green Synthesis lies eco-friendly this is highly required and It does not produce waste that harms the environment. It includes used; green solvent, green catalyst, Ultrasound, microwave, one-pot and water medium.

Discussion

Scheme 1. Synthesis of 4-alkyl-5-methyl-1H-pyrazol-3-ols.

General reaction for the synthesis of benzoyl-1H-pyrazole derivatives in lemon juice.

Ag/TiO₂ catalyzed one-pot synthesis of 4,4-(arylmethylene)bis(1H-pyrazol-5-ol) and dihydropyrano[2,3-c]pyrazoles.

NiO(OH) mediated electrosynthesis of azopyrazoles (general scheme).

Chemoselective synthesis of pyranodipyrazolones.

Conclusion

pyrazole and its derivatives were synthesized by several green catalytic methods. The reaction in these methods was achieved by electrical power, ultrasound, or microwave radiation. The media was changed depending on the kind of the method. So, the starting materials were allowed to react as an aqueous solutions, in lemon juice, or without any reagent just by changing the conditions of the reaction . All these methods are ecofriendly, rapid, simple, free-solvent, clean, which means free-toxic residues, and with high efficiency. Moreover, most of the used catalysts were reusable several times

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Eco-Friendly Synthesis of Iron Nanoparticles:
Development of Sensors for Hydrogen Peroxide detection

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Abstract

In this research, Synthesis of iron nanoparticles by using green tea leaves extract and characterization of these particles using IR spectroscopy, UV spectroscopy and scanning electron microscopy SEM are discussed. Also, using them for hydrogen peroxide sensing.

Introduction

Nanotechnology is the study of very small things on an atomic level between 1_100 nm [1]. Nanomaterial 's are using in many applications such as sensing , catalysis and electronics due to they show unique properties [2] .Recently, scientists try to discover a green and eco friendly methods for synthesis nanoparticles instead of the limitations conventionally method [3] . The eco friendly synthesis of iron nanoparticles worked by using plant extracts [4].

Methodology

1 **Materials and Preparation**

2.5 g of green tea — 50 ml distilled water — filtering — 0.03 g of ferric chloride — 40 ml distilled water — 2.1 ml green tea soln — 40 ml of ferric chloride

2 **Characterization**
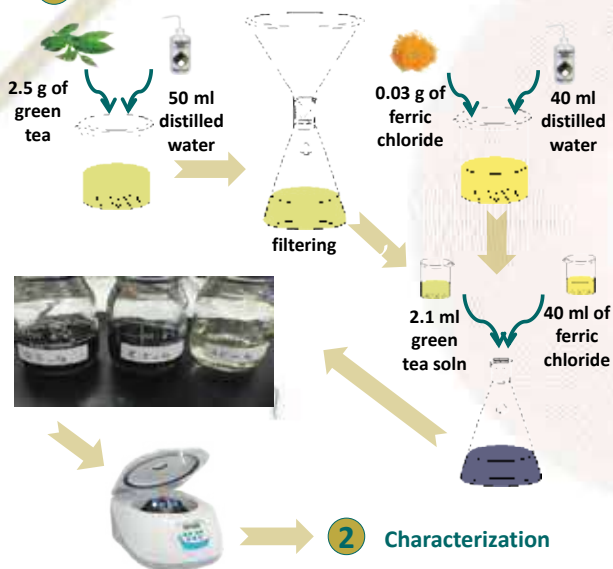
Mechanism

The **FT-IR** study the functional groups of both extracted tea soln. and synthesis FeNPs. The results suggest that the polyphenol is working as reducing and capping agent [7].

EGCg, R=OH
ECG, R=H
$2Fe^{3+}$ Complex formation
Semiquinone $+2Fe^{2+}$
$2Fe^{3+}$
Benzoquinone product $+4Fe^{2+}$
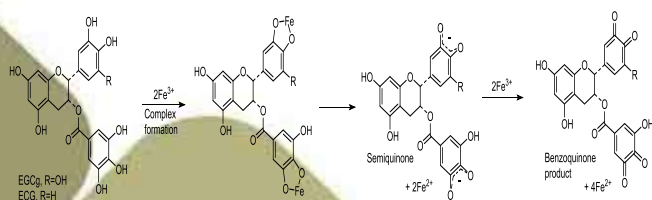
Results and Discussion
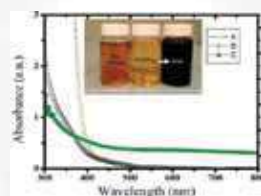
(*figure1: UV-Vis spectrum, A=metal solution, B=green tea extract and C= the synthesis of FeNPs*)

UV-vis spectrum displays that the extract solution has an absorption band at 500 nm which is similar to the iron solution. The color changed from yellow to black when adding Fe soln. to extract soln. UV-Vis spectroscopy used for determination the reduction of Fe^{+3} to Fe^0 [5].
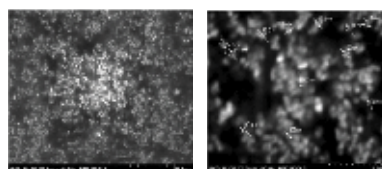
(*Figure2: SEM image of synthesized iron nanoparticles*)

SEM confirmed the diameter of iron nanoparticles. It was approximately around 116 nm [6].

Application

(*Figure3: Set-up for Electrochemical sensor*)

There are variety of methods to detect and quantify H_2O_2 and the most powerful method is the electrochemical sensors. It works through reacting with the chemical solutions and producing an electrical signal that is related to the analyte concentration

Conclusion

We succeeded in synthesis of FeNPs by from green tea leaves extract. The properties of these particles were detect using 3 devices. UV-Vis spectroscopy used for determination the reduction of Fe^{+3} to Fe^0. FT-IR confirmed that polyphenol in green tea is working as reducing and capping agent. SEM confirmed the diameter of iron nanoparticles which it was approximately around 116 nm. The synthesis FeNPs used for H_2O_2 sensing.

Acknowledgments

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Synthesis and characterization for new Cr(III)- azaindazole complexes to be used as bandages for bacterial wounds
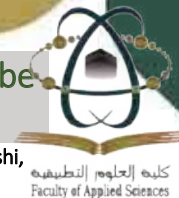
Fayrooz Yar, Munirah Almusakkiti, Sarah Al-hazazzi , Maryam Alammar, Afnan Alharbi , Nada Alloqmani, Asail Alqurashi, Asma Albedi , Alhanouf alsulami , Afrah Alsharif, Njuood Alassmare, Shatha Almhmadi

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Abstract

New Cr(III) complexes were prepared from four azaindazole derivatives. The used ligands were fully characterized by all possible analytical and spectral tools to elucidate their structural and molecular formulae. While, the isolated solid complexes are still under investigation for characterization. Each complex was used to dye cotton fiber (1g) to be ready for culturing bacteria on pigmented fabric, to evaluate the efficiency of dye (complex) on inhibiting bacteria growth. After such stage, we can recognize the extent of successes our aim to made bandage for bacterial wounds.

Introduction

For many years, the heterocyclic compounds containing O, N, and S, displayed magnificent importance in medicinal and chemical applications[1,2]. They are widely applied as cosmetics, perfumes, food additives, pharmaceuticals, optical brighteners, laser and fluorescent and dyes[3]. Azaindazole derivatives have enhanced antimicrobial activities towards various pathogens including *Helicobacter pylori* and *Mycobacterium tuberculosis*[4]. These azaindazole compounds, have also good anti-cholinesterase, anti-cancer, anti-analgesic, anti-inflammatory activities[5]. Transition metals have incorporated with numerous biological processes that are animated to life processes[6]. Hence, they can coordinate with N- or O-terminals from proteins in a assortment of models, and so, play a peppy role biological system such as the utility and conformation of living macromolecules [7].

Objective

- Synthesis and elucidation for new azaindazole derivatives to be used for coordination
- After full characterization, the organic derivatives were used as ligands to coordinate with Cr(III) ion
- The isolated complexes need spectral and analytical characterization (still un-achieved)
- The complexes were used for dyeing cotton fabrics to be used for bacterial bandage
- The expectation for such bandage to play a dual nature as the bandage and treatment for bacteria in the wounds

Results

1- Characterization for azaindazole derivatives

IR spectra displayed new band at, 1428–1441 cm^{-1} range, which attributes to υ(N=N) vibrations, that normally yielded from diazo-coupling(Table 2). ^{1}H &^{13}C NMR (DMSO-d$_6$) spectra (Fig. 1S) were executed for three derivatives to assert on chemical formulae suggested (Table 3). For example, ^{1}HNMR spectrum of DPTT, 4b, exhibited the following signals; δ = 2.21 (s, 3H, CH$_3$), 2.46, 2.44(s, 6H, 2CH$_3$), 4.15 (s, H, NH, triazene), 6.86(s, 2H-benzene), 7.14(s, 2H-benzene), 7.21 (s, H-pyridine), 13.14 (s, 1H, NH, pyrazole), which confirm suggested structural form. Moreover, its ^{13}C NMR spectrum exhibited the following signals; δ; 18.57(CH$_3$); 19.88(CH$_3$); 24.21(CH$_3$); 107.19, 115.14, 116.71, 119.27, 124.21, 125.74(Ar-6C); 129.34, 130.88, 148.57, 152.71, 159.01, 159.43 (pyrazolo-pyridine -6C),

2- Characterization for Cr(III) complexes is still in concern

Some experimental pictures

Discussion
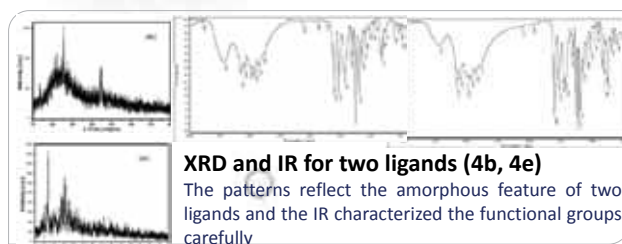
XRD and IR for two ligands (4b, 4e)
The patterns reflect the amorphous feature of two ligands and the IR characterized the functional groups carefully

Conclusion

The azaindazole derivatives were characterized carefully and their chemical formulae were built. The synthesized Cr(III) complexes were prepared and still in analytical labs, for investigation. The bandages were already dyed, and their use for bacterial wounds treatment is still uncompleted.

Acknowledgments

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Synthesis of some novel dimethine, bis-dimethine cyanine dyes and octacosa methine cyanine dyes endowed with promising biological potency against (HepG2), (Hela), (MCF-7), (MIA), (SN12C) and (H358) cell lines

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Abstract

The synthesis of some cyanine dyes by pyridinum salt with some different aldehydes for producing compounds with improved biological efficacy for various tumor treatments . Herein we report the synthesis different type of cyanine dyes and these dye showed great efficacy to detect tumor cells. Studies suggest the better cyanine dye is basis on presence of a functional group or chain length (conjugated system) functioning to improve efficacy and expand the field of organic dyes that improve optical properties and absorb various radiation with different wavelengths.

Introduction

The term "cyanine" was originally applied to one compound but subsequently extended to a group of dyes. The general structure of cyanine dyes is shown in **Fig (1)**. Cyanine dyes differ from other dyes , It is formed by two hetero cyclic ring contain two nitrogen atoms are joined by a chain of several conjugated carbon atoms.When increases length of the chain this leads to an increase conjugated system and therefore increase effectiveness, also the substitution group on the chain has an important influence on applications, especially in medical, bioanalytical and solar cells.It has been used in several ways due to its physical and chemical properties the presence of photosensitizing properties in some cyanine dyes gives it advantageous properties for application in photodynamic therapy (PDT). Those dyes have many advantages when used as fluorophore the absorption and have relatively good stability to preparation of novel cyanine dyes the heterocycles can be altered which allows chemists to create dyes that possess ideal photophysical properties .1,5
Cyanine dyes are recently being used in many applications such as nonlinear optics, optical data storage ,biomolecular labeling, laser materials ,photodynamic therapy and solar cells. In this research will be highlighting to synthesis of new dyes and applications in medical sciences as antitumor drugs.4
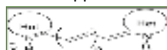
Fig (1). general structure of cyanine dyes

Objective

Preparation of some different types of methane cyanine dyes and screen their application as antitumor agents cancer cells, spontaneous liver (HepG2), cervical (Hela), breast (MCF-7), pancreas (MIA), kidney (SN12C) and lung (H358). Tested the activity toward all the cell lines. And know the compound that shows a good activity

Results

Polymethane cyanine dyes **1, 2, 3, 4, 5, 6, 7** tested as antitumor for cyanine dyes And compound 8,9 give high potent activities due to the long conjugate system associated with the two pyridine loops, the longer the conjugate system became the greater The activity of dyes is stronger, so the activity was in order **9> 8> 7> 6> 3> 2> 5> 4 (Fig. 2)**
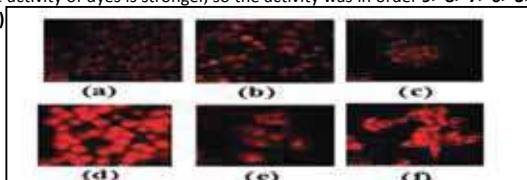
Fig. 2: Antitumor of six cell lines: (a) represent SN12C, (b) represent MIApaCa-2, (c) represent HepG2, (d) represent H358, (e) represent Hela and (f) represent MCF-7.)

Compound No.	Absorption bands λ_{max} (nm)	Emission bands λ_{max} (nm)	Molar absorptivity log- λ_{max} (Lmol⁻¹cm⁻¹)	Stoke shift $\lambda_{max} - \lambda_{max}$	(Quantum yield) Q
2	468	490	4.49	22	1.05
3	502	522	4.46	20	1.04
4	447	462	4.51	15	1.03
5	478	508	4.48	30	1.06
6	558, 430	583, 439	4.42, 4.53	25, 9	1.14, 1.12
7	562, 433	580, 448	4.41, 4.53	19, 8	1.03, 1.04
8	596, 428	605, 438	4.39, 4.53	9, 10	1.01, 1.02
9	622, 425	642, 436	4.37, 4.55	20, 11	1.03, 1.02

(Table 1: Electronic spectra of the newly prepared styreyl and bis-styrylcyanine dyes 2, 3, 4, 5, 6, 7, 8, 9 and 10)

(Table 2.*In vitro* antitumor activity of the screened methine cyanine dyes on various tumor cells.)

Discussion

bis-pyridinium salt reacted with different type of aromatic aldehydes to afford different series of methine cyanine dyes 1,2,3,4,5,6,7,8 and 9 as showing in the following schemes:
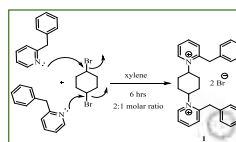
(Scheme 1: New features of bis-pyridinium salt 1) .
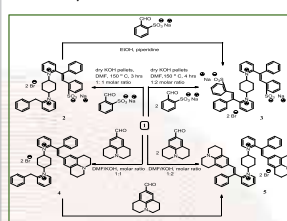
(Scheme 2.: Synthesis of interested dimethine and bis-dimethine cyanine dyes 2–5)
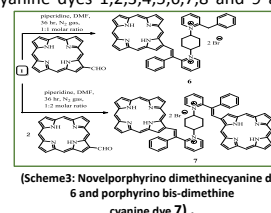
(Scheme3: Novelporphyrino dimethinecyanine dye 6 and porphyrino bis-dimethine cyanine dye 7) .
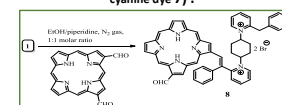
(Scheme 4: Synthesis of first report of dimethinecyanine dye 8) .
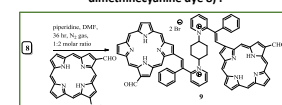
(Scheme 5: Compound 8 act as an intermediate in synthesizing a new class of bis- dimethine of cyanine dye 9) .

Conclusion

A convenient and simple protocol for the synthesis and reactivity of a series of some novel dimethine cyanine dyes, bisdimethine cyanine dyes and icosamethine cyanine dyes 2–9 was built on the basis of the above strategy. The newly synthesized compounds were screened for against varied tumor cells as antitumor agents. Among all the tested compounds, Finally, many experiments and analyzes were performed on the pigments that were found to be anti-tumor, and among all the compounds tested, it was found the structure 9 is the most active and has the ability to reverse whole cell lines.

Acknowledgments

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Synthesis of thiazoles under green methodologies

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Abstract

Most of chemical processes have a negative impact on the human health and environment. The green chemistry prevent waste, minimize energy use, use renewable raw materials, design biodegradable products, and choose chemicals to minimize potential accident. Thiazoles are important class of heterocyclic compounds with wide range of biological activities as antitumor, antimicrobial and anti-inflammatory. Synthesis of thiazole containing compounds under green conditions, such as reactions in the water, the use of natural catalysts, and heating using the microwave and ultrasound, which have several benefits, including preserving the environment from harmful solvents, and it is possible to obtain a high yield percentage in a short reaction time. This review contains valuable data about the synthesis of thiazoles under green conditions.

Introduction

Thiazoles are an important class of heterocyclic compounds having nitrogen and sulfur elements. They are present in a wide variety of biologically active compounds, including anti-inflammatory [1], antitumor [2], anti-HIV [3], antibiotic [4], antidepressant, antimalarial [5], antibacterial [6], antiviral, antifungal [7], antidiabetic [7] and insecticidal agents [8]. Also, heterocyclic compounds congaing thiazole moiety possess important applications in materials science such as fluorescent sensor [9], acceptor for fullerene-free organic solar cells, dyestuff, catalytic activity and dental resin. Nowadays, as a result of the increase of environmental pollution from the residues of chemical reactions in factories and research centers, extensive efforts have been directed to develop new, green and efficient synthetic strategies to produce chemical compounds, which used in different fields. Among a variety of synthetic protocols, a) heating techniques such as microwave and ultrasound irradiations; b) the green solvent such as water or the reaction carried out without solvents; c) the type of catalysts such as efficient nanosized catalysts. Such synthetic protocols were proved efficiency in synthesis of different heterocyclic compounds with high percent yield and short reaction time [18,19]. In this review, we focused on the collection of all green methodology utilized in the synthesis of thiazole derivatives.

Effect of organic solvents on

1- Environment
1- Raises the temperature of the earth and lead to environmental pollution
2- Cause acid rain that leads to corrosion

2- Human health
1- cause many types of cancer such as leukemia and liver cancer -
2- affect the nervous system (delayed access of nerve messages leads to the complete death of part of the nervous system)
3- affect digestive devices-
4- affect the heart and muscles
5-irritation of the skin
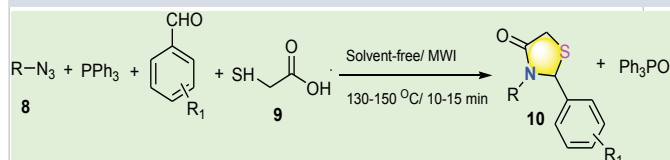
Solvent-free thiazolidin-4-ones **10** synthesis by one-pot under microwave-acceleration.
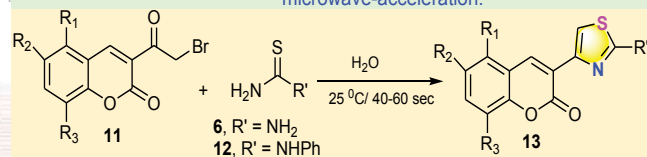
Synthesis of 3-(2-substitutedthiazol-4-yl)-2*H*-chromen-2-one derivatives **13**
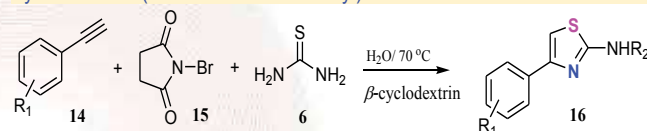
Synthesis of thiazoles **16** catalyzed by β-cyclodextrin in aqueous medium at 70 °C.

Discussion

Synthesis of a series of hydrazinylthiazoles **4** using substituted acetophenones /benzophenones under MW irradiation.

Synthesis of a 2-amino-4-arylthiazoles **7**

Acknowledgments

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Green synthesis of nanoparticles and their catalytic activity for the A³-coupling reaction.

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Supervisor: Dr.Alaa M. Munshi

Abstract

Silver nanoparticles were successfully synthesized from $AgNO_3$, through a simple green route using the green tea as reducing as well as capping agent. Nanoparticles were characterized with the help of TEM, UV-Vis spectroscopy. FTIR spectroscopy. The new prepared nanocatalyst was applied effectively as a heterogeneous catalyst for the synthesis of propargylamines through A³-coupling reaction.

Introduction

In current years, nanomaterials have attracted growing lookup interest because, addition to their large surface area, they have special optical, physical, chemical and electrical properties that make them attainable candidates for use in catalysis. In catalytic applications, nanomaterials have been demonstrated to show high activity, selectivity, easy recovery from the reaction mixture and reusability, which can be candidates to their ability to mimic heterogeneous and homogeneous catalysts. In this project we synthesized nanoparticles using plant extracts and use them in the A³-coupling reaction.
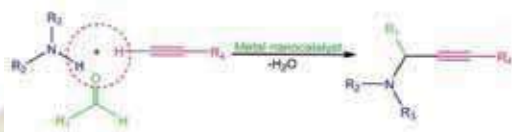
Scheme 1. Gernal reaction for A3-coupling reaction[1].

Objective

- Green synthesis of Ag NPs.
- Study the catalytic activity of Ag NPs for the A³-coupling reaction to produce propargylamines.

Results and Disussion

After the addition of AgNO3 to the tea extract. The color changed from yellow to light brown and after 5 min to dark brown. This confirms the formation of silver nanoparticles in the solution. The formation of Ag NPs then confirmed using UV-Vis which recorded the reduction process of silver ions to silver nanoparticles and it is done before and after the synthesis reaction . The FTIR measurement was made to find out and identify the molecules that works as a capping agent and stabilizing agent for the silver nanoparticles. There are three infrared bands. The intense broad band at 3271 cm-1 is because of N-H and O-H stretching in the linkage of proteins. The medium intense band at 1637 cm-1 is due to C=O stretching which is found in protein. which confirms that the protein works as a capping agent for silver nanoparticles and enhance the stability of silver nanoparticles, also prevent their aggregation. The intense broad peak at 386 cm-1 is due to silver metal . TEM was used in the determination of shape and morphology of silver NPs which appears nearly spherical. The XRD patterns for Ag nanoparticles Five main characteristic diffraction peaks for Ag were observed at 2θ = 38.4, 44.5, 64.8, 77.7 and 81.7, which correspond to the (111), (200), (220), (311), and (222) crystallographic planes of face-centered cubic (fcc) Ag crystals

Figure 1- change in color from dark yellow to brown
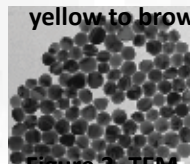
Figure 3- TEM micrograph of AgNPs
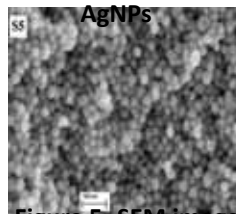
Figure 5- SEM image of AgNPs
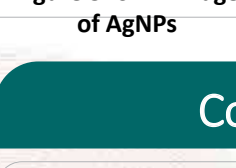
Figure2- uv-vis spectra for AgNP
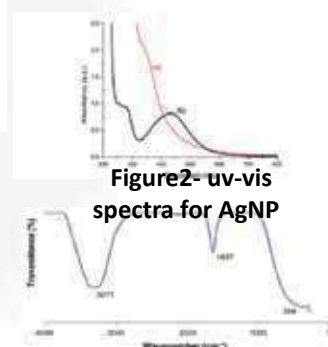
Figure 4- FT-IR spectroscopy for AgNPs

Figure 6- XRD patterns for AgNPs
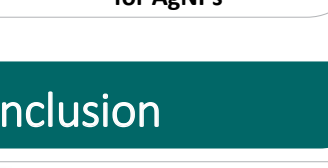
Conclusion

Silver nano-particles synthesized by using a green tea as a reducing agent. the green tea showed its effectiveness in reducing AgNPs and as a good stabilizing and capping agent . The use of plant extracts in the preparation of nanoparticles is considered an economical and effective a safer method for the environment, and helps in preserving human health and the environment, which leads to reducing waste and environmental pollution. Also we have demonstrated that AgNPs can serve as an efficient and environmentally friendly catalyst for the propargylamines through A³-coupling reaction. The recovery and recycling of the AgNPs as a catalyst will be addressed in future study.

Acknowledgments

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Study the ideal time to collect blood samples for analysis using lactic acid as parameter

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University of Umm Al-Qura

Abstract

Collecting blood samples is a frequently used method to diagnosis and monitor diseases. Lactic acid test helps to find out if enough oxygen is reaching the body tissues. One of the ways to investigate the effort of the person is the analysis of lactic acid.
This study examined whether there is some divergence in the blood lactic acid results, if the person sample collected at rest or after physical activities and demonstrated the suitable time for collecting blood.

Introduction

Lactic acid plays a role in various biochemical processes, which is synthesized from the pyruvic acid derived from glycolysis, whereas it can be utilized to form glucose, or it can be oxidized through pyruvate and the tricarboxylic acid cycle.

Pyruvate ⇌ Lactate
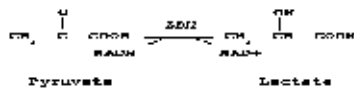
The concentration of blood lactate is usually 1−2 mmol/L at rest but can rise to over 20 mmol/L during intense exertion. Lactic acid is used as marker of many diseases such as lactic acidosis, obesity, hypertension, diabetes, injury, infection, inflammation or ischemia and tumors.

In animals, the enzyme lactate dehydrogenase (LDH) constantly produces L-lactate from pyruvate during a fermentation process during normal metabolism and during physical activity. The concentration only increases when the lactate production rate exceeds the lactate elimination rate.

Lactic acid is economically effective for important applications. Its formation can be obtained either by fermentative microorganisms or chemical synthesis. Among these, lactic acid is widely used in food, dairy product, pharmaceutical, cosmetics industries, inks, fibers and films.

Objective

Obtainment of samples
Blood samples were obtained from seven female student volunteers aged 22 years old, at rest, after thirty minutes of physical activities, followed by thirty minutes after rest from physical activities, finally after sixty minutes from rest after physical activities.

Formation of plasma
Blood samples were collected in the green cap test tubes with sodium lithium heparin for measuring lactic acid levels and in the grey cap test tubes with NaF 3.0 mg Na_2EDTA 6.0 mg for measuring lactate dehydrogenase enzyme activity, which placed on ice before analysis. Plasma formed by centrifuged blood samples at 3500 rpm for 4 min at 24°C.

Measurement of lactic acid levels
Lactic acid levels were measured in plasma. The analysis was carried out using the kit's reagents in a semi-micro cuvette which containing 500 µl glycylglycine buffer, 100 µl NAD^+, 10 µl glutamate-pyruvate transaminase suspension, 50 µl plasma and 450 µl water (H_2O), for blank 500 µl H_2O, in this order, followed by mixing. The absorbance was recorded after 5 minutes at 548 nm. The absorbance was then recorded at 548 nm, 30 minutes after the reaction was started by adding 10 µl lactate dehydrogenase solution. The lactic acid concentration was calculated from the difference between the absorbance using as the molar extinction coefficient of NADH (6220 $M^{-1}cm^{-1}$) and the lactic acid molecular weight (90.1 g/mol) *(Fig 1)*.

Measurement of LDH activity
LDH activity measured in plasma. The LDH assay was carried out in a semi-micro cuvette which contained 870 µl of PBS, 90 µl plasma, 60 µl of 3 mg/ml NADH (made up fresh, wrapped with foil and kept on ice during use) and 30 µl of 0.8 mg/ml pyruvate, added in this order and followed by mixing. The absorbance at 340 nm was recorded at 0.1 minute intervals over 5 minutes at 340 nm. The molar extinction coefficient of NADH (6220 $M^{-1}cm^{-1}$) was used to calculate the rate of NADH release in µmol per minute *(Fig 2)*.

Results

	Rest (control)	30 min of physical activities	30 min of rest after physical activities	60 min of rest after physical activities
Lactic acid levels mmol/L	0.85	1.96	1.4	1.2
Percentage %	0	57	39	29
SE	0.1	1.09	0.4	0.32
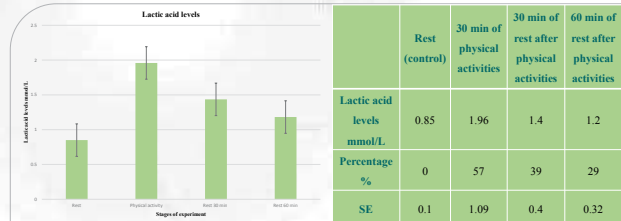
Fig 1: Lactic acid levels and percentages at rest (control), 30 min of physical activities, 30 min of rest after physical activities and 60 min of rest after physical activities.

	Rest (control)	30 min of physical activities	30 min of rest after physical activities	60 min of rest after physical activities
LDH enzyme activity µmol/min	432	257	498	690
Percentage %	0	-68	13	37
SE	302	37	239	176
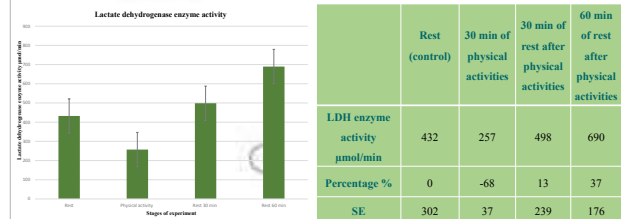
Fig 2: Lactate dehydrogenase enzyme activity (LDH) and percentages at rest (control), 30 min of physical activities, 30 min of rest after physical activities and 60 min of rest after physical activities.

Discussion

In this study, there is obviously opposite proportion between lactic acid levels and lactate dehydrogenase enzyme activity (LDH) after thirty minutes of physical activities. Under normal condition, in healthy humans during exercise, lactate is produced in the muscle faster than the tissues can remove it. For this reason, lactic acid concentration in the blood stream begins to rise. The purpose of this process is to regenerate nicotinamide adenine dinucleotide (NAD^+) to ensure that energy production is maintained in many cells by anaerobic conditions when pyruvate is reduced to lactate by the lactate dehydrogenase enzyme (LDH).

Conclusion

This research showed that, dramatic relationship between lactic acid synthesis and the activity of the lactate dehydrogenase enzyme (LDH). Therefore, the suitable time for collecting blood samples for analysis should be when the body at rest, or not less than sixty minutes of rest after physical activities. Also, it is recommended that to measure the body mass index (BMI) of the body must be in rest.

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Some applications of waste chicken eggshell as Eco-friendly material

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Abstract

Worldwide consumption of eggs results in availability of large amount of discarded egg waste particularly eggshells, and it is economical to transform the eggshell waste to create new values from these waste materials. The purpose of this research is to summarize the applications of eggshell as:

1- Adsorbent for heavy metals from wastewater as serious environmental problem in the ecosystem.

2- Environmental friendly corrosion inhibitor.

The results of the study suggest that eggshells can be used beneficially as low-cost biosorbent for Lead(II) ions adsorption from aqueous solution by 99% actual removal and also it reduce corrosion rate of stainless steel by 83.33% efficiency

Introduction

Heavy metals are often found in industrial wastewater, and their disposal into the environment poses a serious threat due to their acute toxicity to aquatic life and terrestrial animals that include humans. This has prompted environmental engineers and scientists to research ways to efficiently and economically treat wastewater carrying heavy metals. Heavy metals can be removed using chemical, physical and biological methods, and there are traditional treatment methods for removing heavy metals: chemical precipitation and solvent extraction also adsorption is an excellent traditional method with lower and more efficient costs that is characterized by eggshell that contains a high percentage of calcium carbonate as an absorbent material to freeze heavy metals in wastewater and soil, and can be used for soil treatment and wastewater treatment [1].

One of the most reliable and cost proven way of preventing/minimizing corrosion is through the application of corrosion inhibitors. Eggshell corresponds to 11% of the total weight of an egg and it is mainly made up of 95% calcium carbonate, 1% calcium phosphate and other organic matters [2]. Egg shell is regarded as a non edible product with very limited use, mostly disposed as a waste.

Objective

1- To evaluate the feasibility of using eggshells (ES) as low-cost biosorbent for Lead(II) ions adsorption from aqueous solutions.

2- study the inhibitive tendency of ES on stainless steel in 1N HCl environment through weight loss method.

Results and Discussion
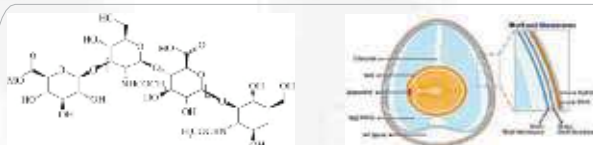
Fig.(1): the chemical structure of egg shell.

Table(1): Adsorption experimental results.

run	Initial pb concentration	Adsorbent dose (g)	Contact time (min)	Pb residual	Actual removal (%)
1	116	0.58	58	1×10^{-3}	99.9
2	200	1.00	100	1.5×10^{-3}	99.9
3	300	1.50	150	2×10^{-3}	99.9
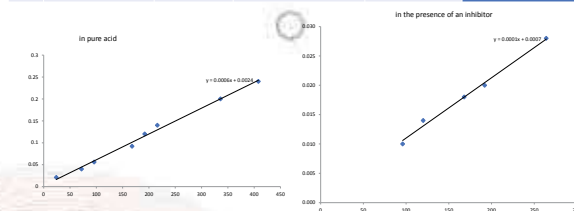
Fig. (2): Weight loss versus time of exposure for stainless steel sample dipped in 1N HCl solution in the presence and absence of ES.

Conclusion

The result presented in this study supports the possibilities of using eco-friendly waste products as follow:

1-Eggshell is an efficient and excellent inhibitor for stainless steel in 1N Hydrochloric acid solution with inhibition efficiency of 83.33% at 2 g egg shell concentration.

2-Eggshell is an easily, locally available and low-cost biosorbent; it may be a cost effective biosorbent for the removal of Ni(II) ions from aqueous solutions by 99.9% efficiency and treatment of wastewater.

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Determination of Iron , Zinc and Copper in Grains using Flame Atomic Absorption Spectrometry (FA-AAS)

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Abstract

Micronutrient elements such as iron , zinc and copper are essential for many biological functions. Deficiencies of such elements contribute significantly to the global burden of disease; however, if present at higher levels, they can have a negative effect on human health. Both toxicity and necessity vary from element to element. This study was conducted to quantify the concentrations of Fe , Zn and Cu in Barly , Wheat and Buckwheat and to estimate the daily intake and health risk index of metals through consumption of grains. The quantitative analysis of the metals were performed using flame atomic absorption spectrometry (FA-AAS).
Keywords: quantitative analysis , mineral Analysis, FA-AAS.

Introduction

Iron , zinc and Cu are essential elements because of their biological function in the human body. Recommended daily intakes for these essential trace elements are 18 mg for Fe , 15 mg for Zn and 1.5mg Cu per day . The biological role of iron is to transport oxygen and electrons to prevent deficiency syndromes such as anemia and hemochromatosis. Zinc is necessary, to prevent disturbances of growth.[1]. Copper is an essential trace mineral necessary for survival. It is found in all body tissues and plays a role in making red blood cells and maintaining nerve cells and the immune system. Wheat is the staple food for 35% of people around the globe . In developing countries, wheat is the main source of minerals, proteins and provides almost 50% of the daily caloric requirements. In wheat, zinc and iron are among the most significant micronutrients from a health point of view. [2] .Barley is one of the oldest cultivated crop plants and the fourth most important cereal crop in the world . The crop has been part of a sustainable food source for humans since pre-historic time. Today, less than 2% of the barley grain produced is used directly for food it is a major part of a staple diet more than 60% of the barley produced is used directly for human consumption[3]. Buckwheat contains several compounds that may have potential in reducing risk of certain diseases [4].Because of the above-mentioned reasons, it has become necessary to evaluate the suitability of procedures for the determination of essential elements (Fe and Zn) in Wheat ,Barly ,BuckWheat. The aim of this study was the development of a simple and fast , the determination of iron and zinc by using flame atomic absorption spectrometry (FAAS).

Methods

Wheat   Barley   Buckwheat

Flame Atomic Absorption Spectroscopy

Material and Method

Peroxide + Nitric acid

Heater

Barley Sample   Wheat Sample   Buckwheat Sample

Results and Discussion
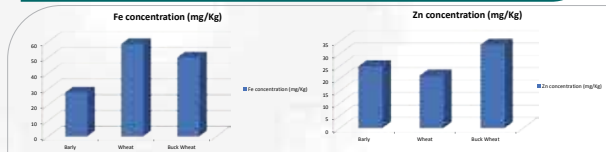
Fig1.Show concentration of Fe in Barley , Wheat and Buckwheat.

Fig 2. Show concentration of Zn in Barley , Wheat and Buckwheat.
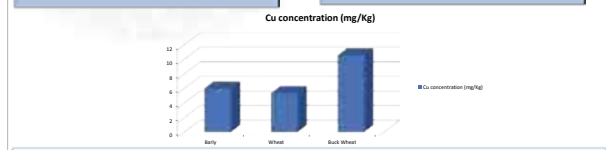
Fig3. Show concentration of Cu in Barley , Wheat and Buckwheat.
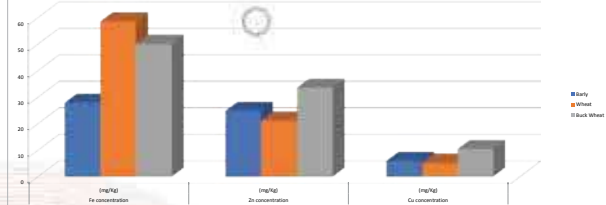
Fig4. Show concentration of Zn ,Fe and Cu in Barley, Wheat and Buckwheat

Table: concentration of iron,zinc and copper in Barley , Wheat and Buckwheat

Grains	Fe concentration mg/Kg	Zn concentration mg/Kg	Cu concentration mg/Kg
Barley	27.992	24.971	6.038
Wheat	58.682	21.231	5.384
Buck wheat	50.131	33.698	10.568

Conclusion

This study was conducted to determine the concentration of zinc and iron in the wheat, barley and buckwheat samples. The results showed that the highest concentration of zinc is in the sample of buckwheat and less in wheat, barley is relatively moderate with daily recommended dose. The iron is higher in wheat and is relatively lower in buckwheat and barley . Concentration of Cu is lower than iron and zinc in all grains. From the results obtained, it is recommended to add wheat and buckwheat to our daily meals.

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Synthesis and characterization of unsaturated polyester resin and its uses as anti chemical varnish coatings

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Abstract

Unsaturated polyester resins (UPR_c) have attracted a significant attention due to the ease of their synthesis and the wide range of their applications. In the present study, unsaturated polyester resin is prepared by curing unsaturated polyester with styrene. The structure of the prepared resin is investigated by fourier-transform infrared spectroscopy (FT-IR) and proton nuclear magnetic resonance ^{1}HNMR. The prepared polyester resin shows good resistance to almost chemical environments.

Introduction

Synthesis of unsaturated polyester resin:

The first step:

The unsaturated polyester (UP) is synthesized by the reaction of 1,3bis(carboxymethoxy)benzene, 2-[3-carboxypropenoylamino)]benzoic acid and maleic anhydride with ethylene glycol.

The second step:

The unsaturated polyester is cured with styrene to give the resin.
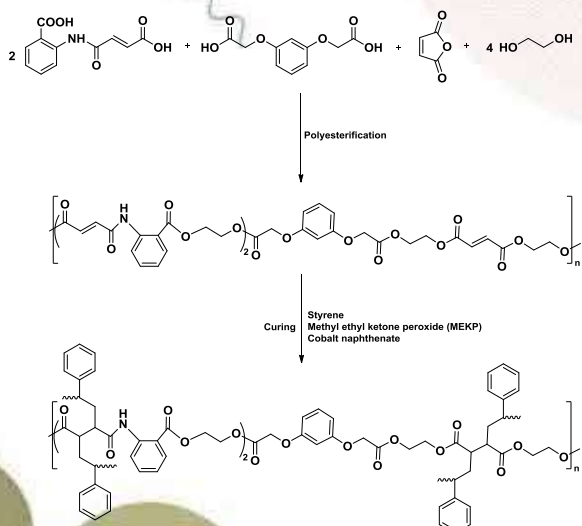
Objective

The aim of this project is to cure the unsaturated polyesters with styrene to improve its chemical resistance to different chemical environments. As a result, the prepared unsaturated polyester resin will use as anti chemical varnish coatings.

Results and discussion

- Unsaturated polyester resin is successfully prepared.

- Chemical structure of prepared unsaturated polyester is characterized and confirmed by FT-IR and ^{1}HNMR.

- The physical properties of prepared unsaturated polyester such as acid value, molecular weight, number of repeating units and viscosity measurements are studied.

- Moreover, cured polyesters is casted to form a film. The chemical resistance of the cured polyester film is determined in different chemical environments.

- As a result, cured unsaturated polyester resin shows a good chemical resistance to different chemical environments.

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The Synthesis Of Pyridine Derivatives, 1H-Pyrazolo [3,4-b]pyridine And Their Biological Applications

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Malak Alharthi, Reem Sultan Alotibi
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Faculty of Applied Sciences

Abstract

pyridine derivatives and pyrazolo[3,4-b]pyridine have an important role in medicinal application due to its biological activities. by nucleophilic aromatic substitution reaction of amino alkylphosphoramidates over 4-Cl substituted pyrazolo[3,4-b]pyridine in good yields, many compound 1H-pyrazolo[3,4-b]pyridine phosphoramidate derivatives were synthesized under mild conditions The new compounds were characterized by IR, 1H NMR, 13C NMR spectroscopy. The crystal structure of one compound was solved by X-ray diffraction and showed a network of intermolecular interactions involving phosphoramidate groups. also in this report we have summarized medical and non-medical of pyridine derivatives.

Introduction

Heterocyclic compounds are organic compounds that have one carbon atom bound to a different atom, and one of the elements that has a great ability to form heterocyclic compounds is nitrogen, sulfur, or oxygen, which distinguish cyclic compounds heterogeneous in their pharmacological efficacy and biological examples such as pyridine, indole, pyrazolopyridine and Benzofuranoyl-Pyrazole derivatives [1.]

Firstly: Pyridine structure used in many medical applications. The compounds share the same biological and medicinal properties Such as antioxidants, anti-inflammatory, anti-bacterial, anti-cancer and gonorrhea disease. pyridine and its derivatives are very important compound in heterocyclic family, and they are widely used in many applications [2]

Secondly: preparing pyrazole-pyridine derivatives to obtain new anti-tumor agents with higher activity and fewer side effects.[3.]

pyrazolopyridine is a heterocyclic system that includes many biological and medical activities. Substituted pyrazolo[3,4-b]pyridines represent a very important building block in organic synthesis and numerous studies have been reported due to their well-documented biological activity.[4]

Biological Application of pyridine

1- Anti-viral :The Oxime derivatives of thiazolo[5,4-b]pyridine exhibit activity against influenza BMass virus. The oxime derivatives of pyridine and naphthiridine have high activity against HIV. Recently it has been reported that oximes of naphthiridine also show antibacterial activity. Oximes-Pyridine derivatives are used as antidotes against poisoning by organophosphorus compounds.[5]

2- Antioxidant : Some thiopyridine derivatives are antioxidant (SOD) in addition to their cytotoxic (DPPH) activities. [6]

3- Anti-Diabetic : The pyridine derivatives containing thiazolidinones exhibit antidiabetic activities.[7]

4- Anti-Cancer Activities : Metal complexes of Cu(II) with Schiff base 2-[N-(apicolyl)-amino]-benzophenone have highest cytotoxity and show very good antitumor activity [7].

Objective

- 1- Synthesis and characterization of pyridine derivatives,
- 2- summarized medical and non-medical of pyridine derivatives

Results

1 Synthesis of Different Derivatives of Pyridine
(1) On-pot Synthesis of Pyridines Catalyzed by the nanomagnesium oxide (NAP-MgO^{19})

(2) **Synthesis of DMAP [4-(N,N-dimethylamino) Pyridine] Derivative**

Scheme 2. Synthesis of DMAP [4-(N,N-dimethylamino) pyridine] derivatives

(3) Synthesis of a novel Series of Imidazo Pyridine derivatives.[21]
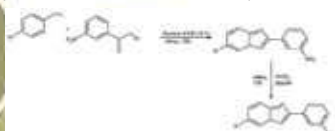
Scheme4: Reagents and conditions: (i) β-aminocrotononitrile or benzoylacetonitrile (ii) diethyl ethoxymethylenemalonate, ethanol, reflux, 2 h (iii) POCl3, 110 ºC, 5 h, (iv) CCl4, ethanol, T < 55 ºC, 10 min; (v) 7a-d, THF, reflux, 9-12 h

Discussion

FT-IR Spectroscopy:This technique provides useful information regarding geometry and other aspects of chemical compounds. , its IR spectrum gives characteristic peaks corresponding to groups present there in i.e., vC=N 1570-1654 cm-1, vC=C 1593-1597 cm-1, vC=O 16811700 cm-1 [4]
The 1H NMR spectra of compounds 8a-l showed a singlet in the range of 8.85-9.00 ppm attributable to the pyridine ring proton.
Substitution of certain group on six member heterocyclic aromatic ring of pyridine cause changes in chemical schift value of all proton and carbon atoms of ring.
Signals corresponding to a particular 1H present in pyridine molecule appear in the range of 6.5-9.2 ppm [10, 12-16] the electron donating group like aromatic group at position 3 at pyridine ring the 1HNMR appears in range of (8.05-9.00) when there is carbonyl group is present between pyridine and other aromatic group at position 3 the proton of pyridine appear at (7.56-9.00) the proton at position 2 is most deshielded among the other proton of pyridine ring [4]. The presences of amide functionality at position 2 so the hydrogen will appear at (8.29-8.37)[4].
 all The products were fully characterized by infrared, 1H, 13C NMR spectroscopies and by high resolution mass spectrometry (HRMS).

Conclusion

Pyridine derivatives very important in biological application especially in medicinal applications. the biological targets vary from microbial diseased to viruses and to types of cancer cells according to changing substituents of pyridine nucleus. Pyridine derivatives closely related to biological problems due to its interaction with enzymes, proteins and DNA. Also the 4-substituted Pyrazolo [3,4-b] pyridine has been successfully applied to aminoalkylphosphoramides such as the nucleophile. By the aromatic substitution of the nucleus in the chlorine atom in 4-substituted , Thus, many compound pyrazolo 1H-pyrazolo [3,4-b] phosphoramide pyridine were synthesized and distinguished

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Removal of Rhodamine b dye from an aqueous solution by a lower cost adsorbent

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Chemistry Department

Abstract

Among the pollutants that cause environmental damage to industrial, there are the dyes, textile dye results in wastes which are discharged into the wastewater. This study used hibiscus sabdariffa as a powder to remove rhodamine-b dye from wastewater. It is an organic dye dissolved in water, which causes colour to appear in water and diseases such as cancer. Adsorption and parameterization experiments have been experiments that determine the adsorbent properties: pH, concentration, contact time, adsorbent dose. All samples were characterized and analyzes by a UV spectrophotometer. Also, the best conditions of removal was (0.2-1.6 g/l) ,40 minutes and 10ml of rhodamine-b dye solution, the percentage of dye removal on the absorbent surface was 95.01%.

Introduction

Dyes are very important in our life, they enter in several industries. Dyes are classified according to the charge they carry:
(a) Cationic: they are basic dyes
(b)Anionic: they are acidic or reactive dyes
(c) Non-ionic: they are disperse-dyes1
Each one has its own removal method.
Dyes are chemical compounds having the ability to attach themselves to surfaces or fabrics in order to give it color.

Objective

Studying the adsorbent properties of Hibiscus sabdariffa for the removal of harmful Rhodamine B dye from several wastewater.

Experiment

Hibiscus sabdariffa

Drying paper hibiscuc sabdariffa → grinding → sieving → Powder of Hibiscuc sabdariffa

Results and discussion
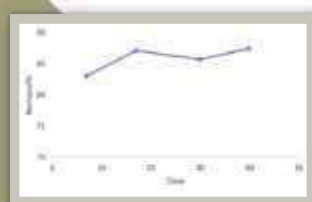
Fig(1) Effect of contact time on Removal of Rhodamine-B By Hibiscus Sabdariffa
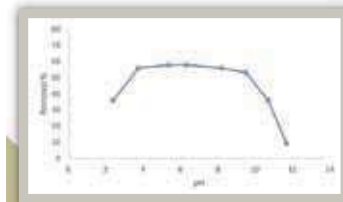
Fig(2) Effect of pH on Rhodamine-B Removal By Hibiscus Sabdariffa

Results and discussion
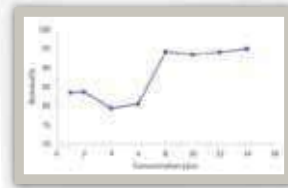
Fig (3) Effect of dye concentration on Removal of rhodamine-B By Hibiscus Sabdariffa
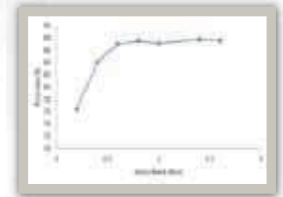
Fig. (4). Effect of adsorbent dose on the removal of Rhodamine-B By Hibiscus Sabdariffa

Conclusion

Research reveals several methods that were used as adsorbents, including active carbon and photosynthetic catalysts, most of these methods use materials that are harmful to the environment and constitute a risk because they contain chemicals. The powder of hibiscus sabdariffa used in this study is possible to remove the rhodamine-b dye at pH (2.4), at time of 40 minutes and at a concentration of 14mg / L The data and result have been obtained found to be appropriate to adsorption process according to the Langmuir form. Whereby each rhodamine-b dye increased the adsorbent concentration to remove the dye. Through the results, the hibiscus sabdariffa powder can be used because of its low cost to remove the dye from the wastewater.

Acknowledgment

I would like to thank my supervisor, Dr. Gharam Ibrahim Mohammed, for her assistance and her patience with us t,o complete the search to the fulles.

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Spectral and analytical studies on some novel ion complexes synthesized from Sodium Oxalate

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Abstract

In this study, novel Chromium coordinated with sodium oxalate to produce the corresponding complex. These synthesized complex was characterized using different techniques; including UV-vis, FTIR spectra. The specrtral data suggested the octahedral geometry for Cr(III) complex. Also infrared spectral Cr(III) its and ligandfor studiedwascomparative-analysis complex, to propose the mode of bonding.

Introduction

Oxalate have and importantveryarecomplexes several researchers have shown significant interest in the design and synthesis of novel metal coordinated oxalato (C_2O_4) complexes because it is found to be very flexible in the bis-chelating coordination mode for connecting different metal ions, acting as monodentate, bidentate, tridentate potentialhave ion Oxalatotetradentate.or applications in the field of catalysis, luminescence, conductivity, antibacterial activity, and a vital role in metalIn properties.magneticintegrating coordination complexes, the oxalato plays a key role in biological inorganic chemistry and the transition metal complexes provide immense opportunities to design and develop new drug compounds.

Objective

Oxalate complexes are very important metal ions, acting as monodentate, bidentate, tridentate or tetradentate. -Oxalato ion also plays an important role in the material sciences as an organic ligand for the synthesis of metal-organic framework materials. -In metal coordination complexes, the oxalato plays a key role in the construction of coordination polymers, and because of the flexible nature of oxalate, the oxalate complexes of transition metals assume -considerable importance. These compounds play a key role in biological inorganic chemistry and the transition metal complexes provide immense opportunities to design and develop new drug compounds, which possess excellent biological activities with the available metals.

Results

The infrared spectra of the ligand and its complex with Cr(III) are shown in figures (1.2).The Uv-vis Spectra of the complexe of Cr(III) are shown in figs.(3,5).
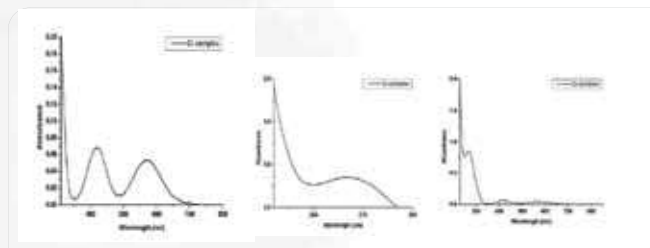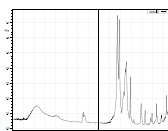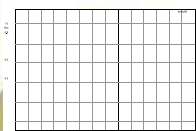
Discussion

FT-IR. The peaks observed at 462 and 510cm−1 Infrared Spectra & discussion: correspond to stretching vibration of Cr-O bond. The δ(OCO) bending modes of C2O42− ion are observed at 782 and 836 cm−1 respectively. The peaks at 632 and 735cm−1 are attributed to bending modes of COO−. The stretching modes of C2O42− ion were exhibited at 1312, 1366 and 1442 cm−1 respectively. Ultraviolet-visible Spectra & discussion. UV–visible The ligand field spectra of low spin Octahedral Cr(III) ion complex gives three absorption bands. These bands are assigned to the: $4A_{2g}$ (F)→ $4T_{2g}$ (F)
$4A_{2g}$ (F)→ $4T_{1g}$ (F)
$4A_{2g}$ (F)→ $4T_{1g}$ (P)

Conclusion

The Oxalate derivatives were characterized carefully and their chemical formulae were built . The synthesized Cr (III) complexes were prepared and still in analytical labs , for investigation .

Acknowledgments

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Spectrophotometric Determination of Curcumin and its Application

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Abstract

A specific spectrophotometric method for the determination of (0.01-15) ppm of curcumin in spices using acetone-bicarbonate buffer (pH 11) is described. The effects of various experimental conditions such as pH of solutions, volume ratio of acetone-buffer solution, and interferences have been discussed. The detection limit and molar absorptivity have been found to be 1 ng ml-' and 46,000 liters mol-' cm-', respectively. RSD and relative accuracy percentages have been determined to be 2.67-2.0 and 2.76250% for 1 and 15 ppm curcumin, respectively.

The importance of Curcumin

Curcuma longa belongs to the Zingiberaceae (ginger) family. Curcumin is the major component of three curcuminoids that give turmeric its charac-teristic yellow color and is used as a food colorant, flavoring and additive (1). Over the past few decades, numerous studies have explored the medicinal properties of turmeric and curcumin, including antitumoral, antimicrobial, anti-inflammatory, antioxidant, antihepatotoxic, antihyperlipidemic, antiviral ,and anti-Alzheimer's disease effects. In fact, turmeric has even been termed the ''multi-anti spice'' in herbal medicine, and curcumin has been referred to as ''curecumin''(2,3).

In more detail, the following diseases and disorders may be treated successfully with curcumin: liver and biliary diseases, wounds and ulcers caused byinjuries and diabetes, psoriasis, arthritis and rheumatism, sinusitis, heart diseases and high blood cholesterol, diabetes, amyloidosis as well as cervical, colon and pancreatic cancer. The anticancer properties include suppression of cellular transformation, prevention of cancer cell proliferation, and suppression of carcinogenic effects (4).

Curcumin compounds alone or in combination with other anticancer drugs have been reported to inhibit the clonogenicity of cancer cells and induce anti-proliferative and apoptotic effects on drugresistant and sphere-forming cancer cells expressing stem cell-like markers as well as reverse the chemoresistance. Thereby they improve the cytotoxic effects induced by diverse chemotherapeutic drugs on these immature cancer cells. These beneficial health effects of curcumin are all well documented in the current literature (3).

Clinical studies in humans showed that curcumin is generally safe even at high daily doses of up to 12 grams with only few side-effects. A severe problem encountered in clinical trials involving curcumin is its poor bioavailability, leading to low levels in plasma and tissues. The bioavailability of curcumin in the form of food colorants or additives (spices) may be higher due to the cooking process or the dissolution in oils. The insolubility of curcumin in water, poor absorption, rapid metabolism and systemic elimination have been shown to be the main factors limiting its bioavailability. As a result, numerous studies have been directed to increasing curcumin bioavailability, including the use of absorption factors (e.g. piperidine/piperine), the encapsulation of curcumin in the cavities of cyclodextrins, or the use of nanoparticles6 and ceramic particles (5).
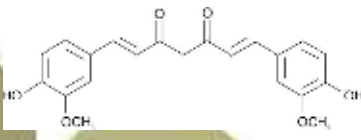
Curcumin analysis methods

The past 10 years have witnessed a dramatic increase in studies directed to the synthesis, characterization and biological investigation of metal curcumin complexes. Already it has become clear that the potential medicinal applications are as diverse as those of curcumin itself.

The phenolic –OH groups are additional centers of potential reactivity which could lead to complications in metal complex preparation (i.e. formation of insoluble polymers) (6).

The X-ray study clearly showed that the curcumin acts as a chelating ligand to the tetrahedrally coordinated boron to produce a tetrahedral boronate to which one methanol molecule is added, consistent with the coordination geometry observed in rosocyanine (7)

Iron is one of the ions studied with the Curcumin which has gained quite a relevant position, given its great importance in biological processes such as in oxygen transfer and the DNA synthesis, to mention but a couple of the most important ones. The aforementioned underlines the fact that iron plays an important role in human consumption, such that the deferoxiamine turns out to be the only chelating agent used for clinical purposes, mainly because of its low gastrointestinal absorption. Thus, it is important to seek for other alternative chelating agents that can be used for the purpose (8,9)

Several studies have been carried out with the Curcumin– Fe(III) in non-aqueous media that refer to the formation of complexes (8,9,10)

A novel, simple and economic vortex-assisted alcohol-based deep eutectic solvent microextraction (VA-DES-ME) procedure has been developed for the preconcentration of curcumin in food samples prior to its spectrophotometric determination (11)

A simple and rapid method for monitoring curcumin in food samples using a magnetic molecular imprinted technique combined with UV-visible spectrophotometry was investigated (12

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Synthesis and characterization of Schiff base Co(II) and Ni(II) complex

Students

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Super Visor
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Abstract

Condensation of Schiff base compounds [2-((E)-4-((Z)-2-hydroxy1,2-diphenylethylideneamino)-1,5-dimethyl-2phenyl-1H-pyrazol-3(2H)-ylideneamino) propanoic acid] [H_2L] with Co(II) and Ni(II) salts to get Schiff base complexes. In this work we study the spectral and analytical data UV and IR spectra, The result showed that the ligand behaves as bidentate on complexation with Co(II) and Ni(II) via two N atoms of iminic group forming octahedral geometry around metal central ion.

Introduction

Schiff base

Schiff bases are aldehyde- or ketone-like compounds in which the carbonyl group is replaced by an imine or azomethine group. They are widely used with transition metals to get complexes by coordinate metals through imine nitrogen and another group, they have been wide applications in various fields such as dyes and pigments, catalysts and in biological field exhibit activities including anti-fungal, anti-bacterial, anti-malarial, anti-proliferative, anti-inflammatory, anti-viral, and anti-pyretic properties [1-4]

Objective

Study the Schiff base complex with metal of Co(II) , Ni(II) from the paper Sajid and co work [17]. And we are synthises one Schiff base complex by condensation in the lab.

Results

The ultraviolet and infrared analysis was studied on the two Complex

Discussion

1. FT-IR spectral data :

I.R. spectral data for the ligand [H_2L] and prepared complexes, (1) (2) were listed in table (2.2.1.1). The I.R. spectrum (fig.1 and 2) for [H_2L] and complexe displayed two bands at (1635 and 1560) cm^{-1} whose referred to $v(C=N)$ of imine groups in the free ligand were shifted to lower frequency and appeared at (1579 and 1535) cm^{-1} for complex (1), and at (1622 and 1558) cm^{-1} for complex (2), the shift in $v(C=N)$ confirming the coordination of the ligand through nitrogen's atom to the metal ion [18-20]. On the other hand, the bands related to the carboxylato moiety at 1456 and 1375 cm^{-1}, whose are assigned to v_{asy} (COO-) and v_{sy}(COO-) modes, respectively [21] in the free ligand. The shift of these bands to lower or higher frequencies in the (1) and (2) complexes may be attributed to Hydrogen-bonding [22,23] , the spectra showed bands at (570 and 578)cm^{-1} can be refer to $v(M-N)$ for complexes (1) and (2) respectively. The new bands supported the coordination of the ligand to the central metal ion through two nitrogen atoms of iminic group [24]. The characteristic bands are summarised in Table (2.2.1.1)

Discussion

2 (U.V.-Vis) spectral data

(U.V.-Vis.) spectral data for ligand [H2L] and (1) and (2) complexes are shown in Table (2.2.2.1). The (U.V.-Vis) spectrum for [H2L] (fig.3) exhibits two intense absorption peaks, the first peak at (244) nm (40983)cm^{-1} assigned to ($\pi \to \pi*$) electronic transition and the second peak at (350) nm (28571)cm^{-1} assigned to (n$\to\pi*$) electronic transition [25]. The spectrum showed intense peak in the (U.V.) region at (243)nm (41152)cm^{-1} and (243) nm(41152) cm^{-1} for complexes (1) and (2) respectively assigned to intra ligand ($\pi \to \pi*$) electronic transition [26]. Also the peak at (350)nm (28571) cm^{-1} for complex (1) can be assigned to intra-ligand. All intense absorption peaks of each complexes (1) and (2) were shifted to higher or lower frequency in comparison with that of free ligand [H2L], that confirming the coordination of the ligand to the central metal ion. The spectra showed peaks at The spectrum of complex (1) showed peaks at (400) nm (25000) cm^{-1} which can be assigned to (d-d) electronic transition type ($^4T_{1g} \to {}^4T_{1g}(P)$) and ($^4T_{1g} \to {}^4A_{2g}$) respectively [26]. the spectrum of complex (2) fig.(3) showed peaks at (350) nm (28169) cm^{-1}, (475) nm (21052) cm^{-1} and (821) nm (12180) cm^{-1} which may be assigned to (d-d) electronic transition type (3A$_{2g} \to$3T$_{1g}$(P)), (3A$_{2g} \to$3T$_{1g}$) and (3A$_{2g} \to$3T$_{2g}$) respectively [27]. The (d-d) electronic transition for all prepared complexes (1) and (2) were a good agreement for octahedral geometry around Co(II) and Ni(II)

Conclusion

We study the spectroscopic measurements [IR, UV-Vis] of the ligand [H2L] compering with tow complex with Co(II) and Ni(II), they suggest that the ligand behaves as bidentate on complexation via two N atoms of imin group forming octahedral geometry around metal central ion.

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Secondary interaction in hypervalent iodine chemistry

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Abstract

"Two novel hypervalent iodine reagents containing a carbonyl group and a heterocycle close to the iodine atom were prepared. The crystal structure of the reagent containing furan moiety showed that the carbonyl oxygen, not the furan oxygen is coordinating to the electrophilic iodine. We can select the reactivity of newly prepared reagents, and Finally Found Good Yield.

Introduction

Hypervalent Iodine Chemistry [1]
The chemistry of organic hypervalent iodine compounds has experienced an unprecedented, explosive development during the last two decades. Hypervalent iodine reagents are now commonly used in organic synthesis as efficient multipurpose reagents. Their chemistry is similar to that of mercury, thallium, lead and other metal derivatives. They are widely used as less toxic and environmental benign replacements of heavy metal oxidants. They have diverse synthetic applications, including, but not limited to, oxidative couplings, phenol dearomatization.

Secondary interactions in hypervalent iodine chemistry:[2]
The reactivity and selectivity of hypervalent iodine reagent is strongly affected by the interaction between the electrophilic iodine centre and the nearby heteroatom's.
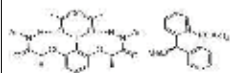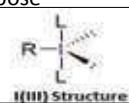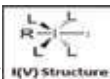
Objective

- Synthesis of different iodoarenes containing different heteroatoms in the vicinity of the iodine atom.
- Oxidation of the synthesized iodoarenes into the corresponding hypervalent iodine reagents.
- Study the effect of the interaction between the nearby heteroatoms and the electrophilic iodine centre on the bonding, structure, and reactivity of the synthesized hypervalent iodine reagents.

Results

Synthesis of iodoketones containing furan and thiophene moieties
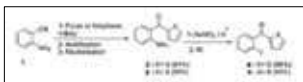
Oxidation of iodoketones
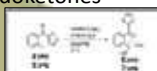
Analysis of 6 and 7 demonstrated the presence of a strong intramolecular interaction between the carbonyl oxygen and the central iodine atom.
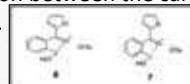
Synthetic applications:

Discussion

lithiated heterocycles, generated in situ via deprotonation of furan and thiophene using n-buLi, to 1 leads to formation of the aminoketones 2 and 3 in 64% and 80% yield sequentially, after acidification and neutralization. The aminoketones formed were then converted into the respective iodoketones 4 and 5 in 66% and 95% yield sequentially. the oxidation of furan and thiophene derivatives 4 and 5 using m-CPBA and p-TsOH, monohydrate was produced and separated in pure form.

Conclusion

In conclusion, the synthesis and structural elucidation of new hypervalent iodine reagent 7 is reported. The X-ray analysis of showed the presence of strong intramolecular interaction between the carbonyl oxygen and the hypervalent iodine atom of compounds respectively Reagents 7 is versatile reagent for a wide range of oxidative transformations oxidative rearrangements and heterocyclisations.
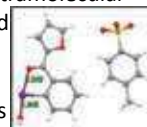
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Inhibition of aluminum corrosion using eco-friendly corrosion Inhibition (cinnamon oil)

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Abstract

The use of inhibitors for the control of corrosion of metals and alloys which are in contact with aggressive environment is an accepted practice. Large numbers of chemical compounds were studied and are being studied to investigate their corrosion inhibition potential. Essential oils such as those found of natural ،for example cinnamon oil, their use is limited due to lack of knowledge of their importance. Cinnamon oil is environment friendly, inexpensive and abundant. The environment may help in solving the problem of corrosion of aluminum in a way that is not dangerous.

Introduction

Corrosion is the deterioration of a metal as a result of chemical reactions with the surrounding environment condition. Both the type of metal and the environmental conditions, particularly gasses that are in contact with the metall, determine the form and rate of deterioration.

Corrosion is a dangerous and extremely costly problem. Such as, buildings and bridges collapse, oil pipelines break, chemical plants leak, and bathrooms flood. Corroded electrical contacts can cause fires and other sever accident. To stop or reduce corrosion, chemicals are used such as zinc and steel, but one of the disadvantages of these materials is that they are expensive, and thus they will be replaced by environmentally friendly materials problems. The purpose of this project was to test the efficacy of The corrosion inhibition efficiency of cinnamon oil for Aluminum.

Methodology

Extract cinnamon oil was done by putting about 25g of crushed cinnamon sticks together with 200ml of water into a boiling flask and connecting that to a condenser,. this will extract 100ml of oil. Separating the oil from the water was done by adding 120 ml of ether on cinnamon oil in separated funnel in 2 steps. First, by adding 60ml of ether and shake it for 30 min. Then, by adding 60ml and shake it again until oil separated from water. Then oil was left in a beaker for 2 days and after that was heat it to evaporate the ether.
Aluminum preparation was done by using 3 panels of frosted aluminum, washed by distilled water then washed by Acetone. Weight of aluminum panels before immersion was left for different periods and was measured after each period.

Extract cinnamon oil | separate the oil from the water | Preparing different concentrations of cinnamon oil

Results and Discussion

Through looking at the table 1 and after fixing the temperature to 25 ° C and after preparing three samples with different ratios and concentrations, the following results were reached. The weight loss was calculated through the duration of immersion and the efficiency of fluid inhibition was calculated to reach possible results to know the effectiveness of cinnamon oil inhibition. Through the results of the experiment, we showed the effect of the acid medium HCL (0.1%) on the corrosion of aluminum, where the weight loss showed a significant decrease in the weight of the aluminum before immersion. The results of the experiment showed us the effect of the acid medium HCL with the presence of cinnamon oil in the first sample, and the amount of oil was 10%, as it showed a significant effect on the non-corrosion of aluminum by calculating the weight loss before and after the immersion process, where after calculations were reached that the effect of cinnamon oil With a concentration rate of 10% in both of the following times (6, 18, 24, 30)

The results of the second sample (cinnamon oil 20%) also showed us a lower impact than the first sample, bringing the damping efficiency range to 60%, and this decrease may be due, after reading several researches, that this behavior can be attributed to not increasing the surface coverage by adsorption on The aluminum surface, or the effect of the sample at temperatures during immersion and the possibility of impurities in the aluminum surface and with the lack of other Possibilities such as measuring the development of hydrogen and the microscope examining the aluminum surface, But after reviewing and with these results are not judged by comparison, we can say that cinnamon oil is a natural inhibitor of aluminum corrosion

Table 1: Calculation schedule for aluminum immersion in HCL 0.1% acid with cinnamon oil inhibitor

UV-Visible Spectrometry: Cinnamon oil was placed in a UV device to find out wavelength , In order to ensure the purity of the oil

Conclusion

The results showed that this compound effectively inhibits the Aluminum corrosion , 270 ml in 0.1%M HCl Using the immersion method. Three different concentrations were prepared at different times of immersion , The time of immersion in 0.1% HCl a reaction to the anode occurred, which was explained by the dissolution of the metal Strongly ; the addition of 10% cinnamon oil led to a corrosion It reaches efficiency 85.71% to 97%. ,While cinnamon oil was not effective enough at a concentration of 20%. Our findings indicate that cinnamon oil can be proposed as an efficient eco-friendly corrosion inhibitor for Aluminum In an acidic medium and should be tested at large scale.

Acknowledgments

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Improving the Properties of Textile Fibers by Using Metal Nanoparticles

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Abstract

Some types of fabrics made of silk, wool and cotton have very weak bacterial and UV protection properties and are highly flammable, and some nanomaterials like SiO_2, TiO_2, ZnO and Ag, have been used to improve their properties. Each of them has different setting, applications and results. Some of them are against microbes, others have self-cleaning, fireproof properties such as firefighters' clothing and others. In this project, we provide a brief overview of research conducted in this field

Introduction

Throughout history, humans have always been searching for new applications of available materials. The world faced a population explosion, prompting scientists to find new solutions to everyday issues, in an effort to improve lifestyle. Lifestyle has improved compared to previous decades, using new inventions and discoveries.

Nanotechnologies and nanomaterials have been developed: they are particles 1 to 100 nanometers in diameter and are human-safe materials and have been applied in textiles, nanomaterials play an important role in the birth of products with good properties and have found their applications in the textile field. It is one of the most important areas in which it has sought unprecedented growth in recent years. Cotton fabrics require more than 72% of the artificial energy to be cleaned, dried, and ironed, and with the recent increasing trend towards better health and hygiene around the world, great research attention has been focused on developing textile materials.
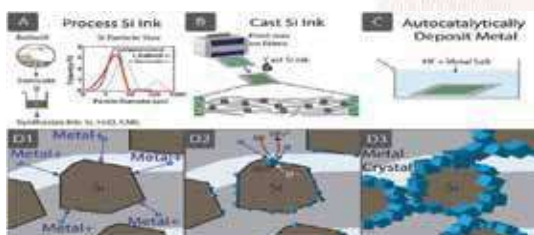
Nanomaterials have been used to successfully modify cotton surfaces using new methods to improve their properties, and a wide range of textures have been studied in textiles to improve antibacterial, UV protection, flame retardant, water repellent, and self-cleaning properties. The surface of self-cleaning is receiving great attention worldwide, and in this project we have summarized some outstanding research studies on the application of metal oxide nanoparticles to textiles. The study of methods, properties and applications of nanoparticles has gained a lot of attention in the past several years

Objective

- Learning about properties of metals nanoparticles
- Identifying the best method for preparing metals nanoparticles
- Applying nanoparticles to fabrics to improve their properties
- Detecting the effect of metal nanoparticles on fabrics

Metal oxide nanoparticles

The engineered metal oxides nanoparticles (MONPs) are among the widest used manufactured nanomaterials because of their unique properties. The properties that make the nanophase structures indispensable tools in modern nanotechnology are their various nonlinear optical properties, higher ductility at elevated temperatures than the coarse-grained ceramics, cold welding properties, superparamagnetic behavior, unique catalytic, sensitivity, and selective activity. For example, the melting point of the nanosized material is lower than that of a bulk material with the same composition.
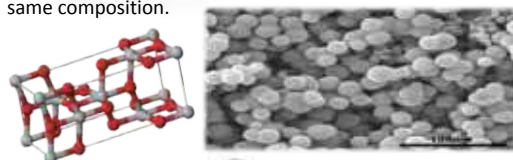
Properties of Metal oxide Nanoparticle on cotton fabric

The application of silver nanoparticles to cotton fabrics received a great deal of attention due to its high resistance to microbes the demand for cotton fabrics made of metallic particles (AgNPs), especially cotton fabrics, has increased due to its proven long–term effectiveness, anti–microbial and UV protection. The coating of Ag NPs on the cotton fabric showed excellent antibacterial prop– retires and laundering durability

Conclusion

A new era of scientific research was introduced to the world through the advent of nanotechnology. Nanotechnology has solved many of the problems that humans face through nanomaterials. Nanoparticles have been added to the surfaces of cotton and silk fabrics, so new textiles properties such as self-cleaning, UV protection and anti-bacterial properties have been transferred.

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Review of nitroimidazole derevatives

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Abstract

A series of compounds in which a 2-nitroimidazole is linked to a DNA intercalating phenanthridine moiety has been synthesised. Previously, three such compounds, termed nitroimidazole-linked phenanthridines or NLPs, were tested in vitro and showed a greatly enhanced molar efficiency as hypoxic cell radiosensitisers and cytotoxins compared with the untargeted 2-nitroimidazole, misonidazole. Since the cytoxicity of these compounds was shown to be inversely proportional to linker chain length while radiosensitising ability was dependent of it, compounds with five and six carbons in the chain were synthesised in an attempt to lower the toxicity of the drugs while increasing their ability to 'scan' DNA for target radicals.

Introduction

Nitroimidazole drugs have been in use for over many years and their use is increasing not only as major antimicrobial drugs but also as sensitizers of hypoxic tumors in conjunction with radiotherapy. Such drugs have a wider spectrum of useful clinical activity than that of any antibiotic. This chapter discusses the action of these drugs and attempts to explain the basis of their selective toxicity and their unique contribution to microbial and tumour chemotherapy. The major clinical uses of nitroimidazole drugs are for diseases caused by bacteria and protozoa. Metronidazole (2) is the present drug of choice for the treatment of several protozoal diseases including trichomoniasis and intestinal infections caused by Giardia lamblia, all forms of Entamoeba histolytica and Balantidium.
Selective toxicity is an important concept in chemotherapy and the basis for the selective activity of many antimicrobial drugs is the interference of molecular mechanisms that are specific to certain taxonomic groups. The chapter discusses the effects of nitroimidazole on photosynthesis, morphology, and DNA.

Objective

We aim to write a brief literature review of the importance of nitroimidazole compound and its derivatives

---

Physicochemical properties Absorption spectra, used to determine the stability and concentration of the compounds, were determined on a Perkin Elmer model L3B recording spectrophotometer coupled to a personal computer. Partition coefficients were determined using equal volumes of drug dissolved in phosphate-buffered saline (PBS) and PBS-saturated 1-octanol at 24°C. Highperformance liquid chromatography (HPLC) was used to confirm the stability of the compounds in growth medium at 37°C. A radial-Pak CN cartridge in a radial compression cartridge holder (Millipore, Mississauga, Ontario, Canada) was employed with a mobile phase of 99% methanol plus 1% 40 mmol dm-3 potassium bromide to provide an ion pairing environment with a flow rate of 2 ml per min. Single symmetrical pea. Chronic cytotoxicity The cytotoxicity of the NLP and P series of compounds was determined following 8 days of continuous exposure to different concentrations of the drugs. Five hundred cells were plated in each well of 24-well tissue culture dishes in 1 ml of a- MEM plus 10% FCS. Cell numbers were determined using an electronic particle counter. Volumes of 0.1 ml of different drug concentrations were added to each well of the dishes and the plates were incubated for 8 days in a humidified atmosphere of 95% air plus 5% carbon dioxide at 37C. The plates were then stained with 1% methylene blue in a 1:1 solution of 95% ethanol and water. The highest drug concentration which did not give cytotoxicity was determined by visual inspection of the monolayers.

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Review of Nitroimidazole derivatives

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Abstract

Nitroimidazole is a wide family of antibiotics, which have been used for hundreds of years and showed great efficacy. And it has been divided into several types of drugs.

Introduction

Nitroimidazole in nature is a prodrug which needs activation to show its antibacterial and antiprotozoal activities Not only that but it also shows a high bioavailability character .Nitroimidazole family has several drugs each has its own properties, physical properties and occurrences. in addition to its own synthesis methods . All nitroimidazoles are capable of being photodegraded and should be protected from light The nitroimidazoles belong to the group of nitro heterocyclic compounds which play an important role as drugs in chemotherapy. The first heterocyclic compound to be used in human medicine was nitrofurazone

Objective

The object of this project it to write a short literature review of the importance of nitroimidazole in medicines .

conclusion

Nitroimidazole and its derivatives are used in medicines and antagonists and are noticeable in two ways. First, they are active against Gram-positive and negative bacteria, protozoa, episodic helminths, and even hypoxic tumours. Second, the rate of resistance in anaerobes is still very low , The compounds with nitro group at position 4 are usually less active than the corresponding 5-nitro derivative , the modification of the 5-nitroimidazole at the 2 position increases not only its antitrichomonal activity but also its antibacterial activity , . The main structural characteristics for the biological activity of these molecules appear to involve the presence of one or more nitro-groups giving the molecules a high (less negative) one electron reduction potential. In some systems the steric protection of the N02 group by a side chain is necessary in order to reduce the rate of some metabolic processes and to influence acid/base properties.

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Review of Nitroimidazole derivates
Umm Al-Qura University

Prepared by
Samar saleh kheder mohammed
Presented to Dr: Matokah abulnaja

Abstract

In this project, we aim to write a literature review of the importance of nitroimidazole derivates

Introduction

The nitroimidazoles belong to the group of nitroheterocyclic compounds which play an important role as drugs in chemotherapy, Nitroimidazoles gained importance because of their antiprotozoal activity Nitroimidazoles are an extremely abundant subclass of such materials and current estimates are that between 25 and 100 kilograms of nitroimidazole per 100 000 global inhabitants are used for both human and veterinary medical purposes,

Objective

Clarify the importance of nitroimidazole and their derivates compounds in drugs as anti-agents

Conclusion

In the end of this research , Nitroimidazole are categorized mainly as bioredcutive prodrugs characterized by both radiosensitizing and cytotoxic activities

Acknowledgments

First of all, I'd like to express my gratitude to almighty Allah to enable me to complete this project I convey my sincere gratitude to
Dr Matokah her supervision this job to be completed perfectly .

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Review of nitroimidazole derevative

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Abstract

Heterogeneous compounds are among the most important chemical compounds that have a special place in preparing treatments and medications. Among the most important of these compounds is nitroimidazole, which is characterized by its biological activities and has been used in the treatment of many diverse diseases for many years. Here we will talk about this compound in how it is prepared, its properties, derivatives and applications.

Introductin

Since the beginning of the year 1964, a nitroimimidazole compound has appeared. Many of its applications have been found as therapeutic agents, as some of these compounds are characterized by radioactive sensitization activities of hypoxia tumor cells, and it is now the preferred treatment for many diseases. It is prepared by the reaction of nitrate with nitric acid in the following equation: C3H3N2H HNO3+ H2SO4 → O2NC3H2N2H + H2O. Among its most important applications first: imaging tissues that have hypoxia in the body. Second: the measurement of hypoxia, where the binding of nitroimidazole depends on the oxygen concentration in addition to the levels of nitrodectase in tumor cells. Among its derivatives are 2-nitroimidazole and include medications such as (benzinidazole), and th 5-nitroimidazole include medications such as (tinidazole, megazole). These compounds with a nitro group at position 5 are usually more active than the corresponding 4-nitro-derivatives. However, 4-nitroimidazoles exhibit lesser toxicity than 5-nitroanalogues. And the Bis nitroimidazol means the insertion of two rings of nitroimidazole to improve its pharmacological effect. The 4-nitro- and 5-nitroimidazole output was obtained by the action of concentrated nitric acid on 1 methyl imidazole in trifluoroacetic anhydride at 0-5 ° C for 12.0 hours, as these products have chemical and physical properties such as: 1-Methyl-4-nitro-1H-imidazole. White prisms (39 %), mp 133.0–134.0 ºC. And 1-Methyl-5-nitro-1H-imidazole. Orange prisms (22 %), mp 59.0-60.0 ºC. The previous two compounds have the same molecular formula and molecular weight (molecular formula is ($C_4H_5N_3O_2$) and (molecular weight is 127.11 g/mol).

Objective

Study nitroimidazole compounds, their properties and method of preparation to know how to derive compounds from them that meet our medical needs and have a high biological activity that can be used as medicines, treatments and antibiotics.

Conclusion

The nitro group is the active part of the compound that plays an important role in treatments and medications. When changing the position of this group on the imidazole ring leads to the formation of new derivatives that expand the range of treatments with precise specifications with high capabilities as it is used as radioactivity activities for hypoxia tumor cells, and as drugs against a series of microorganisms such as fungal bacteria and anaerobic bacteria, and also as a treatment for some infectious diseases.

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review of Nitroimidazole derevatives

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Abstract

Nitroimidazole, a class of drugs showing antimycobacterial activity that are found
either naturally or can be synthetically prepared, they have broad spectrum against different mycobacterium thus used in the treatment of various diseases

Introduction

Nitroimidazole is a class of drugs showing an antimycobacterial activity nitroimidazoles were discovered in the 1950 , it is considered one of the high active compounds for treating and prophylaxis of anaerobic bacterium. Nitroimidazoles are prodrugs that require bioreduction of the nitro group to show
antimycobacterial activity

Objective

Explain the importance of the effectiveness of nitro imidazole in medicines

conclusion

At the end of scientific research we mention the most important conclusions The most used class is metronidazole it is found in market under the name of Flagyl Tinidazole is another example of nitroimidazole family Upon researches tinidazole was found to be more effective and better tolerated than metronidazole

Acknowledgments

At the end of my graduated research, I would like to take this opportunity to thank my family for their constant support.
to my supervisor.   And great thankful She is always gives benefit information and clear instructions . And finally , I will not forget to thank my university. I here four years. it provides   have spent me and many students knowledge and I will miss every thing here   .sciences and I hope be professional girl in chemical field

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DNA binding ability of Schiff base ligands derived from benzimidazole derivatives and their metal complexes

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Abstract

DNA is believed to be the primary target for many metal-based drugs. To evaluate the anticancer tendency of the newly obtained compounds, DNA binding ability is the dominant attitude that examined in pharmacology. Consequently, the interaction between DNA and metal chelates is of significantly essential to understand the mechanism of such interaction. The current review presents the structures of alternative Schiff base metal complexes based on benzoimidazol moiety with insight into their binding ability and binding modes with various types of DNA. Their biological activities have been also focused on

Introduction

Nucleic acids are molecules that store information for cellular growth and reproduction , there are two types of nucleic acids deoxyribonucleic acid (DNA) and ribonucleic acid (RNA) , these are polymers consisting of long chains of monomers called nucleotides , a nucleotide consists of a nitrogenous base, a pentose sugar and a phosphate group . This makes it a molecule of great biological importance and hence many researchers direct their work on the interactions exhibited by their compounds with these DNA molecules in order to improve their ability into applications such as biosensors. The availability of varied sites and modes of binding in DNA which allow both covalent and non-covalent interactions, inclusive groove binding, electrostatic forces in addition to intercalation and hydrogen bonding with metal chelates is another reason for the interest in these studies

Discussion

DNA binding modes
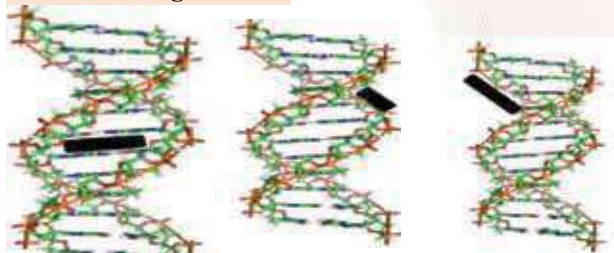
Intercalation bonding

Minor Groove binding

Major Groove binding

Literature review about Schiff base complexes and their DNA binding modes
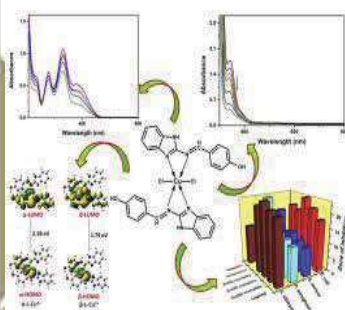
- Synthesis and characterization of Schiff base with benzimidazole moiety and its metal complexes.
- Investigation of antimicrobial activity of Schiff base metal complexes.
- Theoretical studies using DFT calculations.
- Studies of absorbance sensor activity of the Schiff base for Ca^{2+} and Mg^{2+} ions.
- CT-DNA binding studies with metal(II) complexes
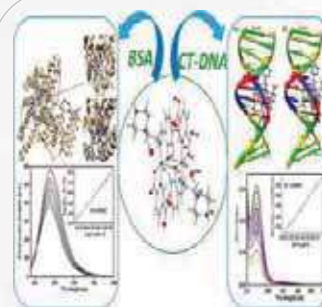
Binding interaction of two copper complexes with DNA and bovine serum albumin has been investigated and supported by using molecular docking tool. One complex shows a higher binding affinity exhibiting in vitro moderate growth suppression activity against human breast (MCF7) cancer cell line ($= 24 \pm 6.24$ μM).

Several metal complexes of a benzimidazole Schiff base were prepared and characterized showing moderate DNA binding as intercalators and interesting activity against Gram positive and negative bacteria.
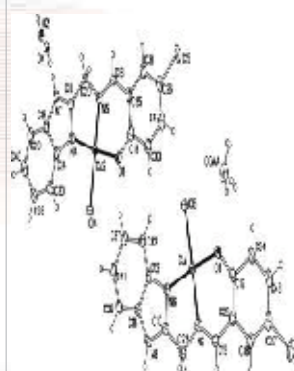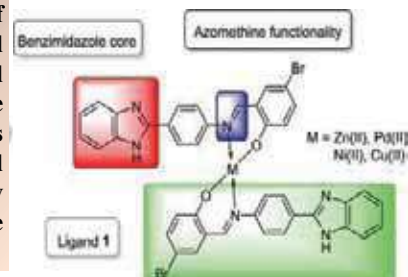
Two novel copper(II) complexes [Cu(L)Cl]2·CH3OH (HL1 = N-(benzimidazol-2-ymethyl)-5-chlorosalicylideneimine, C15H11ClN3O; HL2 = N-(benzimidazol-2-ymethyl)-salicylideneimine, C15H12N3O) have been synthesized and characterized. The interactions between the complexes and DNA have been investigates by means of fluorescence spectra, viscosity and agarose gel electrophoresis. The inhibition ratios of complex (1) and HL against human breast cancer cells (MCF-7) and human colorectal cancer cells (COLO205) were tested in vitro.

Conclusion

Hence DNA is believed to be the primary target for many metal-based drugs and in order to evaluate the anticancer tendency of the newly obtained compounds in a trial to obtain more potent and effective drug, the Current review introduces the DNA binding modes with organic and inorganic compounds with a focus on the Schiff base ligands derived from benzimidazole derivatives and their metal complexes.

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Analysis of soil in forensic science with using physical and chemical techniques

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Abstract

Soil analysis plays an important role in solving criminal cases by comparing samples from the crime scene with the samples taken from the suspects. The aim of this study was to examine the usefulness of physical and chemical analysis in quantifying: bulk density, pH mater also color test in different types in soil collected from different suspects, as attention to these samples helps the forensic analyst to reach what he is looking for by confining the analyzes and then reaching the standard sample. The four soil samples collected from suspects based on the previous test the samples will be recognized in-terms of properties, acidity, and alkalinity. In the end, The soil is an important piece of evidence, so it is necessary to take into account the rest of the evidence gathered from the crime scene, as forensic evidence is considered complementary to each other.

Introduction

1.1 Soil composition:
 The soil is considered physical evidence at the crime scene of great importance, by comparing the suspended soil with the soil sample at the crime scene, this leads to the
 expectation of a relationship between the suspect and the crime scene.
Soil: is a complex mixture of organic and inorganic materials.
- about 2000 types of minerals present on the ground Only 50 of them are widespread, while the rest are rare minerals.

1.2 Nature of soil:
The source of this soil depends on its nature.

1.3 The importance of soil in criminal cases:
The soil has different colors, more than **1000** colors, and therefore material evidence is useful at the crime scene Attention to these effects (the soil) helps the forensic researcher to reveal what he is looking for.

Objective

To resolve a criminal issue using soil analysis

Experiments

Four soil samples were collected from different locations (sandy, Loam, normal and clay)

Color test:
A color test was done by taking a simple amount of soil and comparing it to the unknown sample using the Munsell soil color chart.

PH test:
PH was measured for all samples, by adding 10 ml of distilled water to 10 g of soil sample, stirring, filtering the solution and taking a leachate, and then calculating the PH for it, the process was repeated 3 times and the mean was calculated.

Bulk density:
Using the bulk density method, the density was calculated for each sample by calculating the weight of the soil that fills Burke with known volume and using the density law to find it.

Results

In a color experiment, the colors of the samples were variable in brown shades.

Table.1   Results for pH test and Bulk density for all the samples

Sample type	Results of pH test	Results of Bulk density
Unknown	6.51	2.1182g/ml
Sandy	9.90	2.5112g/ml
Normal	6.73	2.122g/ml
Clay	10.20	1.4844g/ml
Loam	8.27	2.3964g/ml

Discussion

The results of the samples were compared with the unknown sample and we found the following:
The colors of the sandy and normal samples were close to the unknown sample.
In Table.1: the PH results Indicate that the closest value to the unknown samples is normal samples, and the bulk density results also indicate the same result. The unknown sample is the normal sample .
Finally, it was concluded, based on all the experiments ,that the unknown sample is the normal sample.

Conclusion

The analysis of the four samples that, were collected from different places to be tested for forensic science in the crime scene to define the suspect. we have compared the soils to eliminate the suspects and obtain one suspect. By compared each sample with respect to physical and chemical analysis in quantifying: bulk density, pH mater also color test .using these methods help the researchers to define the suspect in the crime scene.

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March 23, 2020.

مشــاريــع تخــرج
قســـم الفيزياء

في ظل الظروف الراهنة من تعليق الدراسـة للوقاية من فيروس كورونا المستجد واستمرار العملية التعليمية للطلاب والطالبات عن طريق التعلم عن بُعد، ما زال قسم الفيزياء حريص على مساعدة أبنائه وبناته الطلبة في إخراج أفضل ما لديهم من إمكانيات لتجعلهم باحثين ومفكرين فـي مجالات الفيزياء المتعددة. وكانت إمكانيات بعض الطلبة أعلى من المتوقع، وهذه مجرد البداية. وبهذا يتمنى قسـم الفيزياء لجميع الطلبة الخريجين دوام التوفيق في حياتهم العلمية والعملية والمواصلة في البحث.

د.تركي بن عثمان المعطاني

كلمة وكيلة رئيس قسم الفيزياء

هو يوم يضاهي بجماله يوم التخرج

يوم يولـد فيه باحث صغيـــــــر

يوم تحصد فيه معرفة أربع سنيــن

يوم تتباهى بــه الخريجـــــــــات

هـو يـــوم مشـــاريع التــــــخرج

د. نهى عبدالحليم فلمبان

قسم الفيزياء

الفيزياء	القسم
2	عدد الملصقات العلمية (طلاب)
11	عدد الملصقات العلمية (طالبات)
9	عدد الطلاب
45	عدد الطالبات
1	عدد المشرفين
4	عدد المشرفات

(Posters)

الملصقات العلمية

لمشـــاريع التخـــرج

قسـم الفيـزيـاء

(طـلاب)

Synthesis of Antimony oxide thin films
Structural ,optical and electrical study

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Abstract

Antimony oxide thin films were obtained by thermal evaporation technique followed by thermal treatment under air. XRD revealed a formation of Sb_2O_3 phase , UV-VIS Spectroscopy revealed that the transmission increases with temperature and band gap values increases, the electrical study shows that the semiconductor is N type.

Introduction

Antimony oxide have attracted increasing attention as semiconducting metal oxides thin films due to their optoelectronics properties and applications in semiconducting fields, similar to zinc oxide and indium oxide [3-1].

Although much work has already been reported, there is little work on the preparation films cupper oxide, obtained by thermal evaporation. this work aims to prepare Sb_2O_3 thin film with suitable method.

Objective

synthesis of Antimony oxide thin film deposited on glass substrate with thermal evaporation technique.

Results

The XRD pattern of optimized sample shows a phase of Sb_2O_3 of oxide. The optical band gap (E_g) can be determined by the absorption coefficient (α) and photon energy ($h\nu$) as follows : $\alpha(h\nu)=A(h\nu -E_g)^{2/1}$, where A is a dimensional constant, E_g the optical band gap. $\alpha(\nu)$ is the absorption coefficient defined by the Beer-Lambert's law : $\alpha=(1/d) Ln (1/T)$

Figure 5c shows different value of direct band gap for samples. The Eg value increases if Temperature increases with values 3.55 eV to 3.95 eV

Electrical study was carried out on our samples, using the hot point method ,which is a method commonly used to determine the type of majority carriers of thin semiconductor layers. The result reviled that the antimony oxide is a N type semiconductor .

Hot tip principle

Discussion

the transmittance increases with temperature as shown the color of different prepared samples. the oxide obtained at 400 degrees is transparent with high transmittance %70 .

The band gap of optimized phase has a band gap value around 3.95 eV.

Conclusion

In this work we show that thin films of Antimony oxide can be obtained by thermal treatment under air , this technics allowed us to obtain a thin layer of Antimony oxide. The optimized temperature made it possible to obtain thin layers of Sb_2O_3 of good crystalline and morphological quality.

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Synthesis of Cupper sulfide thin films
optical and electrical study

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Abstract

Cupper sulfide thin films were obtained by thermal evaporation technique followed by thermal treatment under sulfur atmosphere. UV-VIS Spectroscopy revealed that the transmission increases with temperature and band gap values decreases, the electrical study shows that the material is P type.

Introduction

Copper sulfide have attracted increasing attention from biomedical researchers across the globe, because of their intriguing properties which have been mainly explored for energy and catalysis related applications to eliminate any pollutants from air and wastewater [1-3]. Although much work has already been reported, there is little work on the preparation films Cu2S, obtained by thermal evaporation.

this work aims to prepare cu2s thin film with suitable method.

Objective

synthesis of cupper sulfide thin film deposited on glass substrate with thermal evaporation technique.

Results

The optical band gap (E_g) can be determined by the absorption coefficient (α) and photon energy ($h\nu$) as follows : $\alpha(h\nu)=A(h\nu - E_g)^{1/2}$ where A is a dimensional constant, E_g the optical band gap. $\alpha(\nu)$ is the absorption coefficient defined by the Beer-Lambert's law : $\alpha=(1/d)\ Ln\ (1/T)$.

Figure 5c shows different value of direct band gap for samples. The Eg value increases if Temperature increases with values 3.68 eV to 4.04 eV
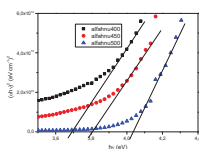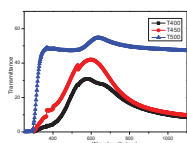
A first test was carried out on our layers, using the hot point method ,which is a method commonly used to determine the type of majority carriers of thin semiconductor layers. . The result reviled that the antimony oxide is a P type semiconductor .

Hot tip principle

Discussion

the transmittance increases with temperature as shown the color of different prepared samples. the sulfide obtained at 500 degrees is transparent with high transmittance 70% .
The band gap of optimized phase has a band gap value around 4.04 eV.

Conclusion

In this work we show that thin films of copper sulfide can be obtained by thermal evaporation, the cupper films thermally treated under sulfur atmosphere at different temperatures.
The optimized temperature made it possible to obtain the phase Cu$_2$S with good crystalline and morphological quality.

Acknowledgments

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(Posters)

الملصقات العلمية
لمشــاريع التخـــرج
قسـم الفيـزياء
(طالبــات)

Comparison in different radiation dosimetry

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Abstract

This study aims to standardize the review of glossy thermometry dosimeter (TLDs) and the diversity of materials allows their various physical forms to define radioactivity on a large scale and this makes TL dose measuring devices useful in radiation protection (TLD) is a good method for point dose measurements in measuring doses in the body Living for illness during radiation therapy as an integrated dosimetry technique that can be applied to personal dosimetry and subject itself to determining dose distribution due to multiple radiation sources This article aims to describe the various applications that TLD has found in medicine by observing and practicing TLD measurements

Introduction

Glossary Thermal Dosimetry (TLD) calibration systems are a system used in determining absorbed dose and consist of dosimeters and measuring tools. Dosage devices are useful in protecting against ionizing radiation as dose levels are monitored in radiotherapy, radiation dosimetry is a measurement according to the radiation dose that Materials and tissues receive from direct or indirect exposure to ionizing radiation, and the diversity of different materials varies greatly in the suitability of the technique, the main advantages of TL detectors are their small size and the lack of cables or auxiliary equipment during the dose assessment. Doses due to radiation sources, such as multiple or animated corresponding radiation therapy and dynamic, CT), this project aims at measurements of TLD in medicine through different applications.

Objective

- This study aimed at calibrating to review the thermoluminescent dosimeters (TLDs)
- Study of TL dosimeters
- The main advantages of TL detectors
- This article aims to describe the various applications that TLD has found in medicine by taking into account the physics and practices of TLD measurements.

Results

This study aimed at calibrating to review the thermoluminescent dosimeters (TLDs) Study of TL dosimeters The main advantages of TL detectors This article aims to describe the various applications that TLD has found in medicine by taking into account the physics and practices of TLD measurements

Discussion

1. Study of very small particles and their effect under radiation
2. Comparin the advantages and disadvantages Of pocket ionization dosimeters, and film Badges dosimeter, thermoluminescence dosimeter
3. Study the effect of polymer gel

Conclusion

The study of radiation dosimeters provides different types of protection for the human body from radiation and overcoming problems in the use of radioactive materials, and finding the best and methods of methods for measuring radiation such as a thermometer because it is able to take larger measurements of doses on readings easily, using TLDs easily

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6 Author: Hamed Imani Shirvanedeh,Hamid Shafa eDouk ,Baghe Farhood
7 Physica Medica Volume 65, September 2019, Pages 106-113). Author: P. Pellicioli,S. Bartzsch,M. Donzelli,M. Krisch,E. Bräuer- Krisch
8 Radiation Physics and Chemistry Volume 156, March 2019, Pages 169-173) Author: Julia Torres del Río,Cristina Forastero,Miguel Moreno-Torres,María Molina-Matas,Ana M. Martínez-Felipe,Álvaro Moreno,Jesús J. LópezPeñalver,Damián Guirado
9 Construction and Building Materials Volume 176, 10 July 2018, Pages 156164(Author: Bin Ye,Zirui Cheng,Xueqian Ni
10 Radiation Measurements Volume 125, June 2019, Pages 89-95. Author: Leila Sadri,Kheirollah Mohammadi,Saeed Setayeshi, Mohammad Hasan Khorasani

Investigations of the gamma-rays shielding features of B2O3 – Bi2O3 – ZnO – CaO glasses

Done by:
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Hind Abdullah Al-Raqeeb

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Abstract

The aim of this study is to Investigations of gamma-rays shielding features of B2O3 – Bi2O3 – ZnO – CaO glasses through measurements of linear and mass attenuation coefficients using NaI (Tl) detector and WinXCOM programme. The shielding features for the proposed glasses were examined by evaluating the leanier and mass attenuation coefficients of the samples . The efficacy of photon protection for the BBZCa0.0 glass sample was found to be superior compared to other glasses.

Introduction

Exposure to ionizing radiation, for longer times, is hazardous to human beings such as gamma-ray photons . Therefore, there is a need to develop new class of shielding materials, time to time, to protect them from direct exposure to the harmful radiation. One such requirement is to develop building materials with high radiation shielding efficiency for residential buildings. At the same time, the use of gamma-ray photons has been increasing drastically, in the fields of medicine, industry, defence and in other applications. The effect of the radiation could be minimized by three common methods, namely (i) time, (ii) distance, and (iii) shielding. The most effective method among these for attenuation of radiation is shielding and measurement of these attenuation coefficients of materials was published by Hubbel [1]. It is important to report the interactions between gamma-ray photons and the materials they go through to evaluate their penetrability and to determine the kind of shielding required for gamma-ray photons protection. Gamma radiation consists of uncharged photons; therefore, their interaction with any absorbing material is a statistical mechanism that depends upon the γ-photon energy, the density, and the thickness of the material. Examining the shielding factors of gamma-ray photons interacting with novel absorbing mediums has become very important to choose a suitable material to reduce the effects of gamma-rays. This provides the necessary protection for humans and workers who deal directly with ionizing radiation [2] .

Materials and methods

In this study we have five samples of bismuth borate glass, with composition $(40B2O3–20Bi2O3 – (40-x) ZnO) – xCaO$, and different concentration were coded BBZCa0.0 (x=0.0), BBZCa5.0 (x=5.0), BBZCa10.0 (x=10.0), BBZCa15.0 (x=15.0), and BBZCa20.0 (x=20.0). Gamma source is cesium-137 with a half-life of 30.17 yr. We put the source over the sample in NaI (TI) detector and the distance between them was 6.5cm . the aim of experiment is calculation is the linear attenuation coefficient of the sample from eq $I = I_0^{-\mu x}$ where I_0 and I are the incident and attenuated photon , x (cm) is the thickness of the samples, and μ (cm−1) is the linear attenuation coefficient of the sample. The measurement are first carried out without the glass sample placed between the source and the detector to determine the value of I_0 . After that, the measurments are repeated with the glass sample placed between the source and the detector with the concentration from 0.0 to20.0 . The thickness of our sample is 4.47 mm.

Glass samples:

These samples of glass were used during the experiment,

sample of glass with x=20.0

sample of glass with x= 15.0

sample of glass with x=0.0

sample of glass with x = 5.0

sample of glass with x=0.0

· **Experimental arrangement and apparatus:**
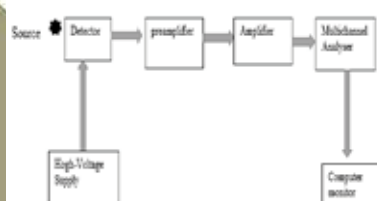
· **NaI (TI) detector:**

A schematic electronic system for gamma spectrometry.
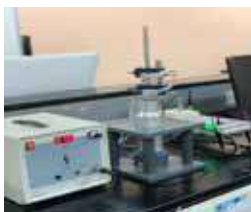
NaI (TI) detector in the lab.

Results and Discussion

· **Cassy lab 2:**

The Cs 137 spectrum from cassy lab without the glass sample placed between the source and the detector to determine the value of I_0 .

· **Results from WinXCom :**
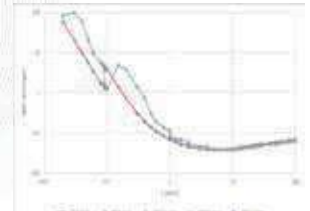
The results from winxcom with all glass sample placed between the source and the detector to determine the value of I .

· **Linear attenuation coefficient of glass BBZCa samples.**

samples	Glass thickness(mm)	Concentration of a samples	Intensity transmitted $I(Mev)$	$\mu_1(cm)$
		0.70 keV	$I_0 = 11970 MeV$	
A	4.47	BBZCa20.0 (x=20.0)	1210	$0.5037 x 10^{-2}$
B	4.47	BBZCa15.0 (x=15.0)	1350	$0.4803 x 10^{-2}$
C	4.47	BBZCa10.0 (x=10.0)	1211	$0.5036 x 10^{-2}$
D	4.47	BBZCa5.0 (x=5.0)	1231	$0.5001 x 10^{-2}$
E	4,47	BBZCa0.0 (x=0.0)	1275	$0.4925 x 10^{-2}$
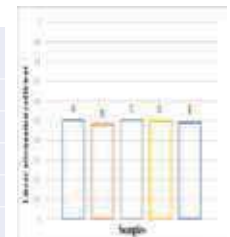
Table 1. Linear attenuation coefficient of glass BBZCa samples

Linear attenuation coefficient of glass BBZCa samples.

Gamma ray shielding properties:

If a bundle of photons moves through specific glasses, the energy of the photons is reduced by the interactions between the photons and the sample atoms. The degree of attenuation that can be described by Lambert-Beer (I) I0 exp - μx) . I0 is the number of photons before the attenuation of the glass sample, indicating the remaining photons that penetrate the sample, is called the Ient coefficient Linear attenuation (LAC) which gives an indication of the sample's ability to block or stop photons from penetrating the sample. The high values of some substances indicate that they have excellent attenuation properties, and therefore, these substances have superior radiological protection features.

To assess the ability of the vitreous system B2O3 - Bi2O3 - ZnO-CaO that has been examined by accident gamma attenuation, we use a comprehensive attenuation factor (MAC), which can be easily expressed by the base of the mixture. Attenuation coefficient of the glass system B2O3 - Bi2O3-ZnO-CaO.

0.015-15 MeV photon energies as obtained from WinXCOM. All MAC values related to the BBZCa0.0, BBZCa5.0, BBZCa10.0, BBZCa15.0 and BBZCa20.0 samples were identified. At attenuation, there is a difference in chemical compositions.

Moreover, μ (or LAC) was calculated for the studied samples

This parameter will be used to estimate the half-value layer. It is clear that the addition of CaO reduces the values of LAC and BBZCa0.0 which have the highest values for this parameter due to the high amount of ZnO. The atomic number of zinc (Z) is 30, which is greater than calcium, (Z) = 20. Increasing the amount of ZnO in the BBZCa0 sample increases the interaction between photons and the Zn atom, which reduces the transition

MAC = ∑wi (μ / ρ) wi is the fractional weight of the elements (in our samples, Zn, O, B, Ca, and Bi).

Conclusion

The shielding features for the proposed glasses were examined by evaluating the MAC of the samples using WinXCOM. The efficacy of photon protection for the BBZCa0.0 glass sample was found to be superior compared to other glasses.

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Mobile Radiation And Its impact On Human Pressure And The Performance Of His Tasks

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Abstract

Radiation of mobile phones and their impact on health is one of the most important aspects of recent studies, as a result of the tremendous increase in the use of mobile phones, there were more than 5 billion subscriptions worldwide . Cell phones use electromagnetic radiation in the microwave or microwave range, and other digital wireless systems, such as data and communication networks, produce similar radiation . Accordingly, additional research and studies were required to discover the harmful effects of radiation on human pressure and the performance of its daily tasks. We are in this research we have studied on some people who use the phone at least two hours a day

Introduction

There is no doubt that phones and tablets have become an essential part of our daily life, in that it appeals to people of all ages, so a person cannot dispense with them even for a moment, because they have simply become the most used method of communicating with the world, so The purpose of this thesis is to study the effect of microwave frequency on human.

Objective

With the growing communication technologies and increasing use of the mobile phone and other applications of microwave energy in daily life, many concerns have been raised about the possibility of adverse effects on human health as a result of the emission of electromagnetic radiation from these technologies.
For this reason, the current study was designed to research the effects of biogeography in the light of the following:
- Knowing the extent of the influence of the mobile phone on a person from social and psychological standpoint
- The extent of the impact of mobile phones on human
- The relationship between the use of mobile time and its harm

Results

- (1): Do you feel anxious and upset when you forget your phone or have to turn it off !
- (2):Are you separated from your family and friends when using your Smartphone !
- (3): Do you use your smartphone while driving a car !
- (4): Does the continued use of smartphones affect the academic level of teenagers !
- (5):):Do you think that smartphones make use of the laptop better !

Discussion

Q(1):We have found that 74.3% of teenagers feel anxious and weary when they forget the phone They also feel happy when using it. 73.5% of people in question
(2):are isolated from their family and friends Because using the mobile, and on question
(3): 89.7% they use more than it until the time of food ,so that the time of their use of the mobile exceeds five hours a day!!
On question
(4): 87% of people are agree with this affects their academic achievement, especially for teenagers, question
(5):Also, 91% think smart phones have become indispensable for the laptop.

Conclusion

There is no one single opinion if cell phones bring harm to human's health. However, addiction and huge reliance on cell phones carry some risks on human development and health. The risks are emotional, physical, social and psychological.
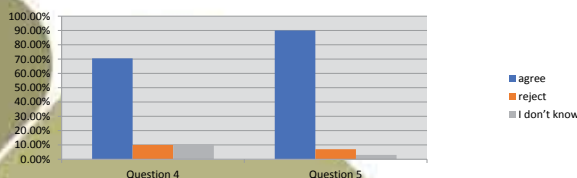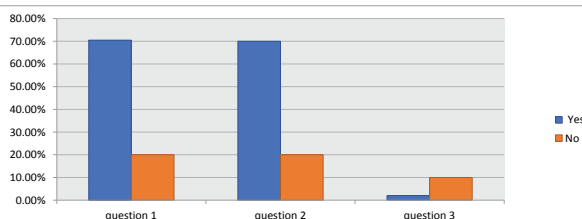
Acknowledgments

Thanks to God for giving me this special opportunity and helping me towards achieving my goal. Getting knowledge and high education has always been my dream. I am highly indebted to my family for their encouragement and support which helped me a lot through this period. I will not forget my friends who were always with me; thank you for everything

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Title: Structural properties of melt-spun polyamide fibers

Names
1-Einas Ali Alharbi
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Abstract

The development of crystallinity during the melt spinning of polyamides was investigated. This study reports the question of the crystallinity determination of nylon 66 by means of DSC, and XRD techniques during the cold drawing process. From the obtained XRD ,The different structural properties such as crystallinity, crystal size, were calculated as a function of the draw ratio .. The drawing process improves the chain orientations along the fiber axis of nylon 66 fibers..

Introduction

The crystallinity is depending on texturing effects. Nylon 66 fibers are classified as a semicrystalline polymer. The structure of semicrystalline polymers is strongly sensitive to the processing conditions. Nylon 66 fibers are common used in plastic engineering and fibers due to its high strength and toughness. To reach a comprehensive result about the different physical properties of semicrystalline fiber, the crystallinity of the fiber after thermomechanical treatment must be measured. Different techniques were used to measure the degree of crystallinity such as differential scanning calorimetry (DSC), X-ray diffraction(Afaf M. Ali & El-Dessouky, 2019).

DSC (Differential scanning calorimetry) is the easiest and widely used technique for the determination of degree of crystallinity in fibers. This method depends on measuring the amount of heat should be provided to the fibers. That heat used to melt its crystalline phase during the thermal treatment at constant rate of heating.

(XRD) X-ray diffraction technique has been used to assign the different polymeric materials Since earlier times . XRD technique is Are classified the most prominent method used to determine the different materials crystallinity due to its professed strength, nondestructive technique, and availability(Ali et al., 2019) .

Objective

The aim of the present work is to investigating the dependence of the different structural properties on the drawing process and produce as-spun polyamides (nylon 66) fibers. Two important techniques were used DSC, XRD, were characterize the different structural and orientational properties of fibers during the cold drawing process.

Results
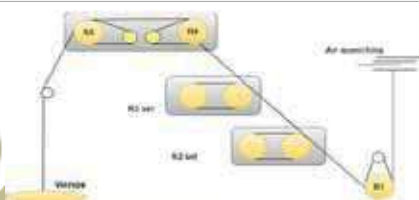
Figure 1 displays Schematic Diagram of the Fiber Spinning System
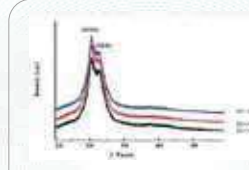
The X-ray diffraction patterns for nylon 66 fibers at different draw ratio

Dr	Linear density (dtex)	Tm	X*100 (DSC)	X*100 (XRD)	D (nm)
4	125.36	253.26	58.78	60.34	3.94
4.25	120.54	253.65	60.56	63.21	3.98
4.5	114.34	235.78	62.78	65.32	4.02

Discussion

The measured crystallinity is given in Table 1 using XRD and DSC techniques. It is clear that as the draw ratio increase, the crystallinity value increase. So the Drawing process has played an important role in enhancing the structural properties of 66 nylon fibers . The measured linear density continuously decreased with the drawing ratio as shown in Table 1. This findings suggest that during the cold drawing process the fiber became more finer .The obtained results clarify that there is developing further ordered crystalline structure and an increase in crystallinity .

Conclusion

The tests obtained by DSC technique showed that there is no major difference in temperature melting of nylon 66. The fusion heat increased by increasing the draw ratio. This may be considered as a result of the existence of crystals with lower perfection and sizes.

The results of the degree crystallinity and crystal size of nylon 66 fibers calculated using XRD technique showed that it relates directly to the draw ratio.This can be considered due to the transformation in the amorphous region to become densely packed..

Acknowledgments

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The impact of processing conditions on the structural properties of PLA fibers

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Abstract

Polylactic acid (PLA) fibers are receiving growing interest as one of the recent innovative materials being developed for various applications .To improvement The structure and properties of PLA fibers, we adjusted the take-up speeds of melt-spinning and then studied their properties by using laser diffractometry, differential scanning calorimetry (DSC) and X-ray diffraction (XRD) The results showed that the degree of crystallinity of drawn process of PLA fibers are improved significantly.

Introduction

Biodegradable materials have been given increasing attention in the last few decades ,and the obtained products from biodegradable polymers fit in the natural recycling processes [1,2]. Polylactic acid (PLA) is the first feasible thermoplastic fiber that can be produced from plant-based renewable resources, such as corn and sugar cane, and extruded by conventional melt-spinning processing technologies. PLA successfully bridges the gap between synthetic and natural fibers, thereby expanding its application range.[3,4] The decomposition of PLA occurs by hydrolysis, followed by biodegradation via bacteria;[5] therefore, PLA as nontoxic material can be absorbed by the human body PLA has been intensively studied due to its biocompatibility, sustainability and environmentally friendly characteristics, as well as its desirable physical and mechanical properties.[6] The mechanical and thermal properties of such fibers are strongly dependent on the drawing speed and drawing temperature. The degree of crystallinity of polymer is a temperature-dependent physical property. Various analytical techniques can be used to measure the crystallinity, such as X-ray diffraction (XRD), differential scanning calorimetry (DSC), Fourier transform infrared spectroscopy (FTIR) and nuclear magnetic resonance (NMR) measurement.

Objective

In this study, the structure and properties of PLA fibers, manufactured at different spinning speeds, were studied.

Results
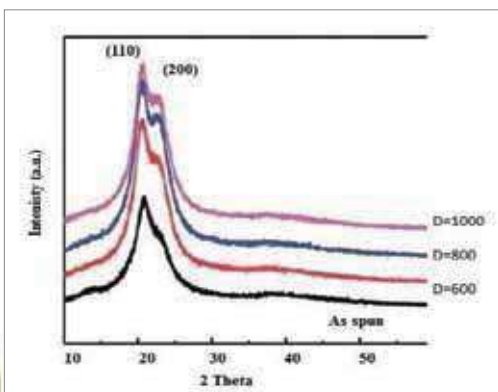
Figure 1. XRD diffraction patterns of obtained for as-spun and drawn PLA fibers.
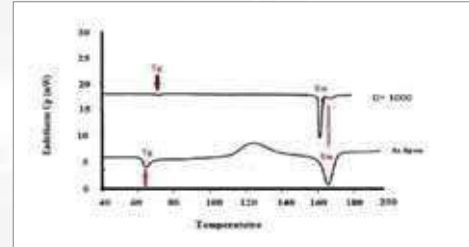
Figure 2. Differential scanning calorimetry thermograms of as-spun polylactic acid (PLA) fibers and an example of drawn PLA fibers: D1000 sample.

Discussion

In this paper we studied and compared as-spun fiber with 3 samples drawn with different take-up speeds.
XRD diffractogram
It was observed from the XRD curve that all samples still have the same diffraction patterns, i.e. they still have the crystal structure. As for the calculated values of the degree of crystallization, it was observed that when the take-up speed increase , the crystallinity degree increased i.e. the chains not-crystallite become oriented and after that occurred the crystallization.
DSC thermogram
From thermogram of DSC for as-spun and D1000 fibers we can see after drawing process at take-up speed 1000m/min, the glass transition Tg increased slightly and there no endotherm chain relaxation or crystallization peak i.e. there were no more free amorphous chains to be crystallized. The melting crystallization temperature Tm during melt drawing was decreased insignificantly. The heat of fusion increased significantly compared to the as-spun sample, i.e. the crystallinity degree has increase significant compare to the as-spun PLA fiber. While the changes of the values crystallinity of drawn PLA fibers was insignificant. From both techniques , we can see there are improve of the structural properties.

Conclusion

- The drawing effect was significantly of PLA fiber characteristics.
- There was significant decreasing of drawn PLA fiber diameter by ~93% in the D1000 sample compared to the as-spun sample.
- The shrinkage ratio of PLA fibers increased with increase the take-up speed.
- The crystallinity degree of PLA fibers are enhanced by cold drawing.
- The take-up speed has low impact on the properties of PLA fibers (D600 ,D800 and D1000) during the cold drawing.

Acknowledgments

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COMPARISON BETTEWEN THE AMOUNT OF RADIATION EMITTED FROM THE DIFFERENT TYPES OF BATTERIES.

Umm Al-Qura University

Students By
Wejdan Almoulad-Hayam Alharbi-Sahar Almuteani-Samar Almuteani
Supervised By
Dr.Zainb Matar

Abstract

Electronic batteries are widespread in the world so it is important to know the kind and effect of radioactive materials found in these substances on human health. The amount of radiation emitted from the different types of batteries was measured, using a Geiger-Muller (G-M) counter model (ST-360 Radiation Counter). For batteries old types, the amount of radiation emitted from Phone (NOKIA)-1200mAh, Panasonic-AA, Novabox-AAA, Ayverstar-AG13, and Gassner-AG3 ranged from 18 to 29. For batteries new types, the amount of radiation emitted from Phone (SAMSUNG)-1356mAh, Panasonic-C, Panasonic- AA, Tianqiu-AG3 and Tianqiu-AG4 ranged from 18 to 26. Are also compared old batteries with new batteries for the same size. We also took different samples of batteries and put them under different temperatures, where we put these samples Novabox-AAA, Gassner-AG3, under a low temperature of 6C and these samples Panasonic-AA, Ayverstar-AG13, under high temperature (sunlight).

Introduction

Electronic waste refers to all items of electrical and electronic equipment and its parts that have been discarded by its owner as waste without the intent of re-use, each product of the six e-waste categories has a different lifetime profile, which means that each category has different waste, economic values, as well as potential environmental and health impacts if recycled inappropriately. Consequently, the collection and logistical processes and recycling technology differ for each category, in the same way as the consumers' attitudes when disposing of the electrical and electronic equipment also vary, was used a Geiger Muller to measurement the radiation from different types of batteries, so that set the counting interval at 20 seconds and the high voltage at 840 volts.

Objective

❖ The measurement by Geiger-Muller and compare the amount of radiation emitted different types of batteries of selected samples of old and new to ensure the safety of human health.

❖ Consumer's user knowledge of the relationship between the effect of the radioactivity and different temperature on batteries.

❖ Reducing the potential damage caused by leaking.

❖ Reducing using inferior batteries consumption.

Results

We can notice that figure and table the values of count close together for all radioactive old and new batteries for different sizes.

The amount of radiation emitted from the New and Old batteries.

New batteries			Old batteries		
TYPE	SIZE	Activity (count/min)	TYPE	SIZE	Activity (count/min)
Phone(SAMSUNG)	1356 mAh	26	Phone(NOKIA)	1200 mAh	29
Panasonic	C	18	Panasonic	AA	18
Panasonic	AA	24	Novabox	AAA	22
Tianqiu	AG3	21	Ayverstar	AG13	18
Tianqiu	AG4	19	Gassner	AG3	26

Batteries Old and New
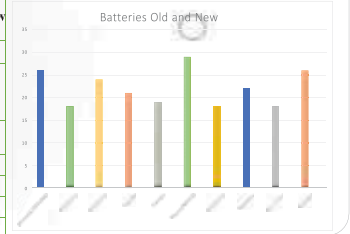
Discussion

The amount of radiation emitted from the different types of batteries was measured using a Geiger-Muller (G-M) counter model (ST-360 Radiation Counter) the amount of radiation emitted batteries old ranged from 18 to 29 and the amount of radiation emitted batteries new ranged from 18 to 26.

Conclusion

We studied the type and effect of radioactive materials in electronic batteries that affect human health. The radiation ratio from the phone (NOKIA) 1200mAh, Panasonic-AA, Novabox-AAA, Ayverstar-AG13, Gassner AG3, phone (SAMSUNG)-1365mAh, Panasonic-C, Panasonic-AA, Tianqiu-AG3and Tianqiu -AG4 were of Various of samples used and unused for electronic batteries were then measured using the Geiger-Muller (GM) counter model (ST-360Radiation Counter). The amount of radiation emitted from new batteries has been compared to old batteries, as the amount of radiation emitted from old batteries is greater than the amount of radiation emitted from new batteries. Also, the amount of radiation emitted from the old battery as compared to the new battery of the same type and size, as the amount of radiation emitted from the new battery -AA, is the largest amount of radiation emitted from the old battery-AA. We also studied the amount of radiation emitted from different types of batteries and at different temperatures where some different samples were placed under a low temperature (freezer coolness), and other samples were placed under high temperature (the degree of sunlight) and concluded from this experiment that samples placed under sunlight have been recycled again due to sun exposure.

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Qualitative Assessment of Selected Water Samples Treated by Magnetic Field

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Abstract

. The present study aims to make a qualitative assessment of selected water samples (tap, zamzam, bottled, and distilled water), widely consumed in Makkah, treated by magnetic field. Tap, bottled (safa, Aquafina), and distilled water samples were treated with magnetic field of 0.5 T strength and compared with the properties of zamzam water. The results revealed that the pH, boiling point, viscosity, electrical conductivity and surface tension values increased after the treatment by the magnetic field in all water samples, since the stabilization of hydrogen bonds increased the bulk Helmholtz free energy. In conclusion, the results are of great importance, in a way they help in applying magnetic treatment devices technology in various fields such as industry, medicine and agriculture to improve water properties.
Keywords: magnetic field, surface tension, pH, electrical conductivity,

Introduction

Water is a polar molecule in a V-shaped order of dipoles. Magnetic field, when applied to normal water, restructures the water molecules into very small water molecule clusters, each made up of six symmetrically organized molecules. This miniscule cluster is recognized by the cell as "bio-friendly" due to its hexagonal structure and because the toxins cannot travel within the cluster, and easily enters the passageways in plant and animal cell membranes. The result provides maximum, healthy hydration with less water.[1] Nowadays, the use of magnets to improve water quality is of significant interest due to low cost compared to chemical and physical treatments. The circulation of water in magnetic field can change some of its properties. These changes may be useful in industries associated with water properties like pH, surface tension, electrical resistivity, viscosity, and calcite formation inhibition. The magnetized water has many applications in different science fields and in industry, especially in green technology.[2]

Value to the Kingdom

citizens have a good health free of serious health diseases and flourishing economy are the central axes related to the 2030 vision of Saudi Arabia. This project aims to perform qualitative assessment of the physical properties of different water samples (tap, bottled and distilled) under the effect of magnetic field and compared their properties with that of zamzam. These are very important in various applications in industrial, medical, and engineering fields

Results
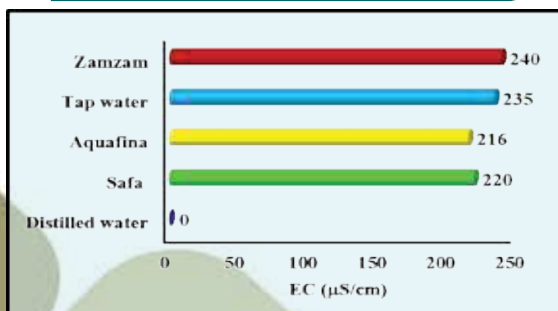
Fig. 1: Electrical conductivity (EC) of different water samples under the effect of magnetic field strength 0.5 T compared to that of zamzam water
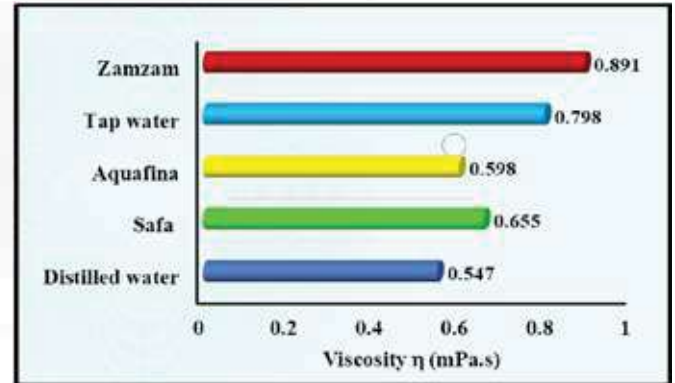
Fig. 2: Viscosity (η) of different water samples under the effect of magnetic field strength 0.5 T compared to that of zamzam water
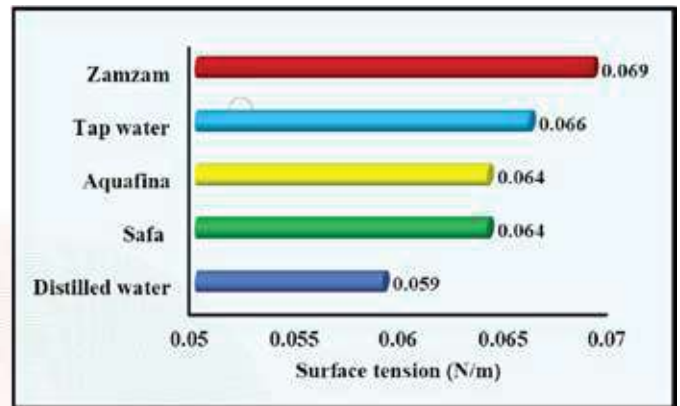
Fig. 3: Surface tension (γ) of different water samples under the effect of magnetic field strength 0.5 T compared to that of zamzam water

Conclusion

Results of this study revealed a change in the physicochemical properties of magnetic water of all selected water samples rather than the original. The application of magnetic field enhanced the stabilization of hydrogen bonds and increases the bulk Helmholtz free energy, which thereby increases the surface tension., as they pass perpendicular to the direction of the applied magnetic field and may decrease the intermolecular distances between water molecules. This may be the explanation of the increase of electrical conductivity, viscosity, pH and surface tension. . These changes in turn may cause bioeffects, which will be our goal in future studies.

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Investigations of gamma-rays shielding features of Cement and Granite

Thesis
by
Afnan almalki
Amjad althaqafi
Jumanah jeelani

Abstract

Nuclear reactors are one of the main sources of radiation risk generated during the operation of nuclear reactors such as X-rays and other radiation that threatens human health and safety. Cement is an ideal material for building radiation shields. Although there are other substances that can be used for radiation protection purposes. Cement is now commonly used to protect atomic research facilities, nuclear power plants and medical and radiological research units or equipment, and there are other protective materials and alternative protective materials used in radiation protection. In NaI (Tl) detector we can know the ability of cement to protect against radiation and other materials.

Introduction

The use of radiation in industry, medical applications, and nuclear installations has reached broad proportions. Radiation technology has brought about many health problems related to radiation exposure Protection precautions must be taken to reduce the risk of radiation Sometimes, shielding materials are important to protect from the damaging effects of ionizing radiation. Cement, the most important concrete element, is preferred due to its high bonding properties, easy accessibility and durability. With heavy additions to the cement content, it increases the radiation protection ability.

Material and methods

In the scientific experiment, we need samples of cement and granite, and we manufacture in the figure 1 (a) form a 100% cement sample, and in the (b) form we make a sample consisting of 75% cement and 25% granite, and in the (c) form we make a sample consisting of 50% cement and 50% granite, and in(d) form We make a sample consisting of 25% cement and 75% granite. In a NaI Ti Detector in the figure 2, it shows us the size of the samples and helps us know the results.
Cement samples :

Fig. 1 : (a) (b) (c) (d)
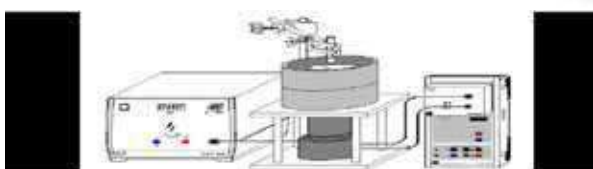
Fig.2 Detection Efficiency of a NaI Ti Detector experiment

Fig.3. a schematic electronic system for gamma spectrometry.

Result and Discussion
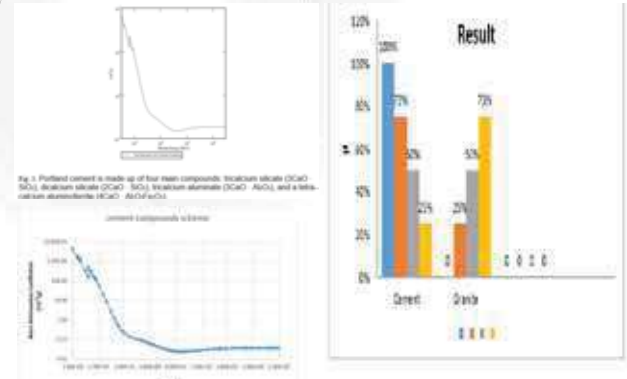
Fig 4. according to the result table, we compare to our result in this diagram.

The volume and Thickness of the cement pastes were visualized in Fig. 2. The Thickness of the samples were varied depending on the proportion of additives. The Thickness volume of cement pastes are increased with increment in Granite percentage. The Thickness of the cement samples varies between 9.41 mm and 7.13mm and 9.14mm and 8.4mm . The high density of a material is important not only for the attenuation of photon radiation, but also for reducing the thickness of the shielding material. The attenuation coefficient of the cement samples were and calculated by using WinXCOM program theoretically.

Conclusion

The total attenuation coefficient was calculated in a NaI(Tl) detector of Portland cement samples and three other samples mixed with granite in three different ratios. There were slight differences in the thickness of those attenuation factors. The boxes differed according to the chemical composition and density of the substance.

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Meaurement Of The Radiation Rate Of The Soil Of Different Region in Saudi Arabia

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Supervised By:Dr.Zainb Matar
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Samples From	Activity for 3g (count/1min)	Activity for 3g (count/5min)	Activity for 3g (count/10min)	Activity for 1g (count/1min)	Activity for 1g (count/5min)	Activity for 1g (count/10min)
Makkah	26	133	236	22	122	218
Asfan	29	910	1802	153	888	1872
Taif	29	110	487	52	92	216
Dhalm	21	99	193	23	161	600
Al-Jumum	34					
Bahrah	24					
Almahameed	28					
Al Quwaiiyah	20					

Abstract

At our study Soil samples have been collected from some cities of both Eastern and western regions like Makkah, Al-Jumum, Bahra, Almahameed, Asfan and Taif in western of The King Dome of Saudi Arabia, and Eastern region Al-Quwaiiyah and Dhalm, the main goal of our research using Geiger counter device to measurement the radiation in the soil of different samples. In this research, the activity of the different soil samples were measured by using Geiger countor . the values of the activity ramyed from 21-34 count 1min . the radioactivity of the samples is directly proportional to the increase in the measurement time and the increase in sample weight.

Introduction

With the development of nuclear physics, the fields of applied uses of radiation and isotopes ,Radiation is found in everything in our life. It may happen naturally on Earth, or it can reach us by radiation from space.sources of radiation
1The natural sources It is divided into two types: The first is from outside the Earth, such as the sun, where ultraviolet rays are emitted and can cause skin burns. And the second originates from the Earth's crust-like granite,
 a rock commonly used in kitchens.
2 Industrial sources: Such as an X-ray or an MRI

Objective

After placing the sample in the third level, first we take 3gram and but it at Geiger counter device and display select high voltage (840 volt) and the time have been selected at(1minute), in the second we take 3gram and 1gram at different time (1, 5 and10 minute) also display select high voltage (840 volt), In the third we take 3 and 1 gram at 5 minute We have taken the first , 2ed and 3ed readings of all cities And comparisons were made in the ration of radioactivity between cities in the eastern and western regions

Results

The activities for different soil samples at different time

Discussion

An illustrative graph has been developed showing the difference in the soil radiation level for the selected areas as shown in the figure above:
In the first reading, we find that radioactivity 1g for all regions at 1 minute ranged from 20 to 100, at minute 5 it ranged from 90 to 900, at minute 10 it ranged from 200 to 2000, and in the second reading at 3g for all regions in 1 minute it ranged from 20 To 30 and at the 5th minute it ranged from 90 to 1000 and at the 10th minute it ranged from 100 to 2000 and when fixing time at 5 minutes to (1g-3g) we find that the radiation ratio increases with increasing volume and time, and the reasons for the high radiation ratio may be due to Soil to some areas due to the presence of arable soil for exposure to sunlight or industrial soil due to the presence of compost in it or the soil exposed to pollution Aia to its proximity to the sea

Conclusion

We studied the activities for different soil samples at different cities from Eastern and western regions like Makkah , Aljumum , Bahrah, Almahameed , Asfan ,Taif, The radioactivity of the samples is directly proportional to the increase in the measurement time and the increase in sample weight

Acknowledgments

We thank God for his kindness because he showed us the right path and for helping us complete our graduation project. Many thanks to Dr. Zainb Matar project supervisor for the efforts she has made with us throughout the work, we owe her the trust and guidance she has given us that helped us to strengthen our understanding and guidance during this work and thank the teaching lab to supervise the equipment used in the lab, and we are grateful to friends for bringing the samples. Finally, we would like to thank our family for their support and for all the good and bad times we have experienced.

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Investigation of tailor-made glassees for TL dosimetry

Raheeq Noorwali ,Shahad Alkhattabi ,Dania Brnawi ,Nouf Al-Masoud

This research study is lovingly dedicated to our family, friends and Dr. Amani Alalawi who gave us heartfelt supports, believed and guided us in order to finish this study.

Aim

The purpose of our study is to investigate the dosimetric characteristic of tailor-made glasses with different concentration of dopant material.

Introduction

current studies concern the thermoluminescence signal stored in irradiated tailor-made glasses with different concentration of dopant material. Dosimetric characterisations, including linearity and glow curve have been investigated.

Thermoluminescence Dosimeter
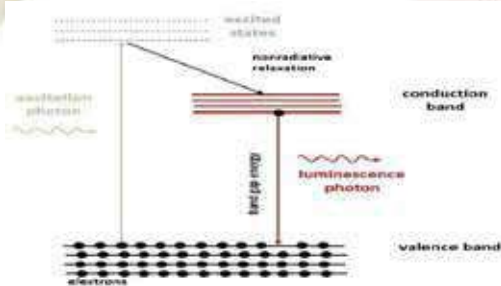
Materials

Tailor-made glasses

Sample Preparation

Cleaned with alcohol

Methods

Obtain mass of fibres

Linear accelerator

Read Out

Glow Curve
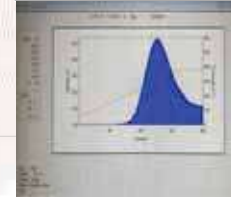
The Results
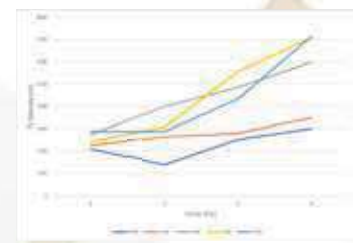
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Title: The effect of drawing conditions on the different optical and structural properties of fibers
Names: Abrar Alhashmi,Ashwaq Alssahdi, alqurashi Noura AL masoudi, Rawan
University: Umm AL-Qura

Changes in the different structural parameters of iPP fibers during the dynamically cold drawing process were characterized. Using the dynamic mechanical cold drawing device attached to Fizeau interference system all the optical and structural properties can be measured. With the aid of this device the effect of the strain rate on the different structure properties was measured
. Reorientation of the molecules led to a significant variations in the measured structure properties of the drawn iPP fibers.
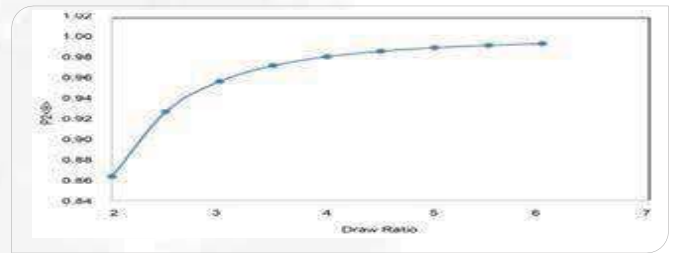
Introduction

Isotactic polypropylene (iPP) can be used in different applications. Isotactic polypropylene polymer is a semi crystalline polymer. The textile characteristics can be improved by drawing process. During the drawing. The orientations formed during the cold drawing process depend on the strain rate and drawing conditions. Refractive index can be used as an indicator for the optical, structural and electrical properties of fibers. The birefringence is another key from the optical parameter of fiber. Interferometric techniques: are highly accurate techniques for measuring the optical properties of fibers .Online Video OptoMechanical device (VOM) was designed to determine the mechanical, optical and structural properties of fibers at different strain rate.

Objective

The major objective of this work is to throw light on the effect of mechanical cold drawing and strain rate on different structural parameters of isotactic poly- propylene fibers. The structural properties of iPP fiber were described by mea- suring the number of chains per unit volume, molecular polarizability, dielectric constant, dielectric susceptibility, molar reflectivity and Mechanical orientations.

Results

Discussion

Isotactic polypropylene iPP fiber is of the common semi-crystalline polymer. The results of this study prove that dynamic cold drawing process has a signifi- cant effect on the optical and structural properties of iPP fibers. The draw ratio effect on the structural properties of iPP fibers is greater than the effect of strain rate on that physical properties. From the calculated data the following conclu- sions may be drawn: The number of chains per unit volume decrease by increasing the draw ra- tio but increase with increasing the strain rate.The molecular polarizability decrease by increasing the draw ratio and strain rate.Both of the dielectric constants and dielectric susceptibility have the same behaviors.Increasing the molar reflectivity by increasing the draw ratio and the strain

Conclusion

Isotactic polypropylene iPP fiber is of the common semi-crystalline polymer. The results of this study prove that dynamic cold drawing process has a significant effect on the optical and structural properties of iPP fibers. The draw ratio.
effect on the structural properties of iPP fibers is greater than the effect of strain rate on that physical properties. From the calculated data the following conclu-sions may be drawn:
1The number of chains per unit volume decrease by increasing the draw ra-tio but increase with increasing the strain rate.
2 The molecular polarizability decrease by increasing the draw ratio and strain rate.
3Both of the dielectric constants and dielectric susceptibility have the same behaviors.
4- Increasing the molar reflectivity by increasing the draw ratio and the strain rate.

Acknowledgments

Researches desire to thank the physics department and our apparition to doctor Afaf for her efforts with us
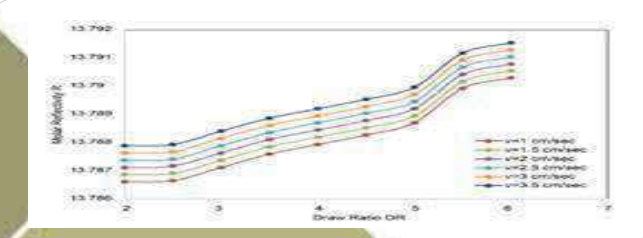
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مشـاريــع تخــرج
قسم العلوم الرياضية

يولي قسم العلوم الرياضية اولوية لتزويد الطلاب بأساسيات مهارات البحث العلمي بما يتناسب مع مستواهم العلمي وبما تحصلوا عليه من معارف خلال دراستهم لمقررات الخطة الدراسية ويتم ذلك من خلال مقرر المشروع البحثي حيث يتعلم ويتدرب عمليا على القراءة من المراجع العلمية واعداد وكتابة التقارير القصيرة ومناقشة الافكار مع المشرف والعمل ضمن فريق من الطلاب وقد تناولت المشاريع البحثية للطلاب في الفصل الدراسي الحالي موضوعات في مجالات التوبلوجي والحلول العددية للمعادلات التفاضلية والرياضيات التطبيقية والاحصاء الرياضي.

د. عبدالله عوض الاحمري

انتم الشباب الطاقة التي تتجدد وتدفع عجلة التنمية، انتم اللذين تسلكون طريق المستقبل الذي لانهاية له لكن بداية مع كل نجاح، استطعتم تخطي الصعاب حتى كانت محطة النجاح وثمرة الجهد، مسيرتكم شارفت على بدايتها تسلحوا بما جمعتم من علم وقيم ومبادئ لتحققوا رؤية وطن وشعب وقائد.

أ.د. حنان سعد الصاعدي

قسم العلوم الرياضية

العلوم الرياضية	القسم
4	عدد الملصقات العلمية (طلاب)
16	عدد الملصقات العلمية (طالبات)
15	عدد الطلاب
62	عدد الطالبات
4	عدد المشرفين
10	عدد المشرفات

(Posters)

الملصقات العلمية

لمشــاريع التخـــرج

قسم العلوم الرياضية

(طـــلاب)

The First fundamental form of a surfaces and its applications
Um Al-Qura University

VISION 2030
المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

كلية العلوم التطبيقية
Faculty of Applied Sciences

Abstra

In this research, the open subset are defined in space R, as well as what is called the differential coordinate patch in the R^3 and the study of its various engineering properties, with many examples of the coordinate patch Then we moved to define the tangent plane of the coordinate patch at a point located on it, finding an equation for this tangent plane and providing some examples to obtain this equation for some coordinate patches.

Introduction

Differential Geometry IS Mathematical Disciplin That uses The Technial Caluls, Intergral Calculus Liner Algebra and Multinear Algebra to Study Problems in Geometry. The theory of Plan and Space Formed the Basis for Development of Differential Geometry During The 18 Century and The 19th Century. Since The Late 19th Century, Differential Geometry During The 18th Century and The 19th Century. Since The Late 19 Century, Differential Geometry Has Grown into A Feld Concerned More Generally with the Geometric Aspects Of The Theory Differential Equation. The Differential Geometry of Surfaces Captures Many of The Key Idea And Techniques Endmic to this field Most Of The Results In The Considered Work Can be Found in [1] and [2]

Objective

Calculation of the first fundamental form of some surfaces and their use in calculating the lengths of curves, as well as the area of some surfaces as a type of applications Finding the formula for the tangent plane of the coordinate patch. Learn the coordinate patch and provide examples of it.

Results

Finding the formula for the tangent plane of the coordinate patch.
Calculation of the first fundamental form of some surfaces and their use in calculating the lengths of curves, as well as the area of some surfaces as a type of applications
Learn the coordinate patch and provide examples of it.

Also, the concept of the first fundamental form of a coordinate patch was obtained, and its corresponding matrix was presented, and its most important properties are limited to the fact that it is a 2×2 matrix, positive definite and non-singular. After that we provided some examples to obtain the first fundamental form of some of the coordinate patches. Finally, we got some applications to use the first fundamental form to find the length of curves on a surface and find the surface area of this surface.

Discussion

In this research, the open subset are defined in space R, as well as what is called the differential coordinate patch in the R^3 and the study of its various engineering properties, with many examples of the coordinate patch Then we moved to define the tangent plane of the coordinate patch at a point located on it, finding an equation for this tangent plane and providing some examples to obtain this equation for some coordinate patches.

Conclusion

Learn the coordinate patch and provide examples of it. Finding the formula for the tangent plane of the coordinate patch. Calculation of the first fundamental form of some surfaces and their use in calculating the lengths of curves, as well as the area of some surfaces as a type of applications

Acknowledgment

Differential Geometry IS Mathematical Disciplin That uses The Technial Caluls, Intergral Calculus Liner Algebra and Multinear Algebra to Study Problems in Geometry. The theory of Plan and Space Formed the Basis for Development of Differential Geometry During The 18 Century and The 19th Century. Since The Late 19th Century, Differential Geometry During The 18th Century and The 19th Century.

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POPULATION DYNAMICS OF INTERACTING SPECIES

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Abstract

This work aims to study the qualitative behavior of dynamical equation(s) describing the behavior of a single population as well as of two interacting populations. The systems have been formulated. Their equilibrium and stability analyses have been studied.

Introduction

Definition: (Equilibria)

Consider the dynamical equation $\frac{dx}{dt} = f(x);$ $x \in \mathbb{R}^n$ $\longrightarrow (1)$
Then the equilibria of (1) are given by the solution of the algebraic equation

Definition: "stability of equilibria"

An equilibrium point is said to be stable if all the eigenvalues of its corresponding Jacobian matrix have negative real part. If at least one eigenvalue has a positive real part, then it is unstable.

Definition: "The jacobian matrix"

In one-dimension, the Jacobian matrix of $f(x)$ is given by $J = \frac{df}{dx}$.

However, in two dimensions, say $\frac{dx}{dt} = f(x, y), \quad \frac{dy}{dt} = g(x, y)$

then the jacobian matrix is given by

$$J = \begin{pmatrix} \frac{\partial f}{\partial x} & \frac{\partial f}{\partial y} \\ \frac{\partial g}{\partial x} & \frac{\partial g}{\partial y} \end{pmatrix}.$$

Results

Malthus equation $\frac{dN}{dt} = bN - dN = (b - d)N$ $\qquad N(t) = N_0 e^{rt}$

Logistic equation $\frac{dN}{dt} = rN\left(1 - \frac{N}{K}\right)$ $\qquad N(t) = \frac{KN_0}{N_0 + (K - N_0)e^{-rt}}$

$$\lim_{t \to \infty} N(t) = \frac{KN_0}{N_0} = K \qquad \text{there are two equilibria}$$

$$\overline{N_1} = 0 \quad and \quad \overline{N_2} = K.$$

the equilibrium $\overline{N_1} = 0$ is unstable. $\qquad$ Thus $\overline{N_2} = K$ is stable.

Application # 1 $\qquad \frac{dN}{dt} = rN\left(\frac{N}{U} - 1\right)\left(1 - \frac{N}{K}\right)$

There are three equilibria

$$\overline{N_1} = 0, \quad \overline{N_2} = U, \quad \overline{N_3} = K$$

$\overline{N_1} = 0$ is a stable equilibriun $\qquad \overline{N_2} = U$ is unstable

$\overline{N_3} = K$ is locally asymptotically stable

Application # 2 $\qquad \frac{dN}{dt} = rN^2\left(1 - \frac{N}{k}\right)$

There are two equilibria: $\quad \overline{N_1} = 0 \quad, \quad \overline{N_2} = k$

$\overline{N_1} = 0$ (center) $\qquad \overline{N_2} = k$ is locally asymptotically stable.

Predation

$$\frac{dU}{dt} = \alpha U - \gamma U V, \qquad \frac{dV}{dt} = e \gamma U V - \beta V$$

There are two equilibria

- $E_0 = (U_0, V_0) = (0, 0), \quad E_1 = (U_1, V_1) = \left(\frac{\beta}{e\gamma}, \frac{\alpha}{\gamma}\right)$

Competition

$$\frac{dU_1}{dt} = r_1 U_1\left(1 - \frac{U_1 + \alpha U_2}{K_1}\right),$$

$$\frac{dU_2}{dt} = r_2 U_2\left(1 - \frac{U_2 + \beta U_1}{K_2}\right).$$

- At the point E_0, we have $J_0 = \begin{pmatrix} r_1 & 0 \\ 0 & r_2 \end{pmatrix}$ which has the eigenvalues $r_1 > 0$ and $r_2 > 0$. Thus, E_0 is unstable

- At the point E_1, we have $J_1 = \begin{pmatrix} r_1 & 0 \\ -r_2 \beta & -r_2 \end{pmatrix}$ which has the eigenvalues
$$(r_1 - r_2) \mp \sqrt{(r_1 - r_2)^2 + 4 r_2(r_1 + \beta)}$$
One of them is positive. Therefore, this equilibrium is unstable

- At the point E_2, we have $J_2 = \begin{pmatrix} -r_1 & -r_1 \alpha \\ 0 & r_2 \end{pmatrix}$ which has the eigenvalues
$$(r_2 - r_1) \mp \sqrt{(r_1 - r_2)^2 + 4 r_1(r_2 + \alpha)}$$
One of them is positive. Therefore, this equilibrium is unstable

- At the point E_0, we have $J_0 = \begin{pmatrix} \alpha & 0 \\ 0 & \beta \end{pmatrix}$ which has the eigenvalues $\alpha > 0$ and $\beta > 0$. Thus, E_0 is unstable

- At the point E_1, we have $J_1 = \begin{pmatrix} 0 & -\frac{\beta}{e} \\ e\alpha & 0 \end{pmatrix}$ which has the eigenvalues $\mp i \sqrt{\alpha \beta}$. Thus, E_1 is center. I.e., the model has periodic solutions.

There are four equilibria

- $E_0 = (0, 0)$,
- $E_1 = (0, K_2)$,
- $E_2 = (K_1, 0)$
- $E_3 = \left(\frac{K_1}{1-\alpha\beta}\left(1 - \alpha\frac{K_2}{K_1}\right), \frac{K_2}{1-\alpha\beta}\left(1 - \beta\frac{K_1}{K_2}\right)\right)$

- At the point E_3, we have
$$J_3 = \begin{pmatrix} \frac{r_1(\alpha\overline{U}_2 - \overline{U}_1)}{K_1} & -\frac{r_1\alpha\overline{U}_1}{K_1} \\ -\frac{r_2\beta\overline{U}_2}{K_2} & \frac{r_2(\beta\overline{U}_1 - \overline{U}_2)}{K_2} \end{pmatrix}$$
which is the most complicated case. If we substitute the values of
$$\overline{U}_1 = \frac{K_1}{1 - \alpha\beta}\left(1 - \alpha\frac{K_2}{K_1}\right) \text{ and } \overline{U}_2 = \frac{K_2}{1 - \alpha\beta}\left(1 - \beta\frac{K_1}{K_2}\right)$$
in J_3 and consider the resulting matrix. The conditions assuring local stability of this equilibrium could be discussed based on the conditions $\det(J_3) > 0$ and $\text{trace}(J_3) < 0$.

Conclusion

In this work, we introduced some basic concepts which are used in the analysis of the rest of the report. In chapter one, we considered the dynamics of a single population, where the population is subject to four processes, namely, birth, death, immigration and emigration. We analyzed the Malthus equation as well as the logistic equation. Extension to the logistic equation with applications has been considered.

In chapter two, we considered the case where two populations are interacting. We defined the various possible cases and focused only on predation and competition. Dynamical models for both cases have been considered and the equilibrium analysis has been performed. Moreover, stability analysis of the equilibrium is considered.

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Numerical Solution of Partial Differential Equations

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Abstract

In This Project, we present the concept of discretization for Parabolic, Elliptic and Hyperbolic equations.

Introduction

Partial differential equations (PDEs) form the basis of very many mathematical models of physical, chemical and biological phenomena, and more recently their use has spread into economics, financial forecasting, image processing and other fields. To investigate the predictions of PDE models of such phenomena .

Objective

In this project, we shall concentrate on model problems of three types: Parabolic, Elliptic and Hyperbolic

Results

1) Forward and Backward finite Difference Approximation for first Derivative

2) Numerical solution of Parabolic partial differential equation
3) Numerical solution of Elliptic and Hyperbolic equations

Discussion

The adomian decomposition method and the efficiency of this method.

Conclusion

Many numerical illustrations of the methods are given in this project to prove the efficiency of the numerical methods.

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Statistics and probability issues with a real satatistical study for mathematics department students in Umm al qura university

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Abstract

In the name of Allah the most gracious the most Merciful. Praise be to God, Lord of the Worlds, peace and prays be to our prophet Muhammad. And after:
We have prepared this research, which includes knowledge of statistics, probabilities, its divisions and uses. Its relationship to various sciences

Introduction

IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL. PRAISE BE TO ALLAH, THANKS TO WHOM HE HAS ENDOWED US WITH KNOWLEDGE AND MADE IT A LIGHT AND A GUIDING US LIGHT FOR, YET WE PRESENT THIS RESEARCH TO ALL WHO ARE INTERESTED IN SCIENCE AND TO OUR FELLOW STUDENTS AND TO ALL OF US WHO BRING THEM TOGETHER THE BOND OF SCIENCE AND TO ALL TEACHERS, SCHOLARS AND READERS, AND THIS RESEARCH IS ENTITLED (STATISTICS AND PROBABILITY). WE HOPE THAT WILL ACHIEVE YOUR APPROVAL

Objective

1- To study the science of statistics.
2- To study of probability.
3- To study the number of students enrolled in the department of mathematical sciences since 2014 to 2016.
4- To study the number of students graduating from the mathematical sciences department since 2014 to 2016.
5- To study students' rates.

Results

1-WE MADE A STUDY ABOUT NUMBER OF STUDENT WHO JOINED AND GRADUATE FROM MATHEMATICAL DEPARTMENT
2-WE MAKE A RESEARCH ABOUT STATISTICS AND PROBABILITY

3-TWO STUDENTS OF US TOKE STATISTICS AND TWO TOKE PROBABILITY PART
4-FINALLY WE FINISHED THIS RESEARCH IN ABOUT TWO MONTHS

Discussion

WE TALK ABOUT STATISTICS AND WHAT DOES IT MEAN , ALSO WE TALK ABOUT PROBABILITY AND IT'S SECTIONS AND WHAT DOES IT MEAN . AND FINALLY WE MAKE A STUDY ABOUT NUMBER OF STUDINTS WHO JOIND MATHEMATICAL DEPARTMENT AND WHO GRADUATE FROM IT.

Conclusion

After what was studied in the number of students enrolled and graduated in the Department of Mathematical Sciences, statistics and probability science were applied after we were provided with real numbers from the Department of Mathematical Sciences and the study was clarified in the research

Acknowledgments

On conclusion of this research, we present the presentations of our research with sincere thanks and appreciation to all of supervised and helped us, who directed us to overcome difficulties, we appreciate Dr. NAIF MUSSA ALZAHRANI, as well as the Department of Mathematical Sciences, that enabled us to access information and statistics, and do not forget the distinguished doctors who have the discussion.

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(Posters)

الملصقات العلمية

لمشـــاريع التخـــرج

قسم العلوم الرياضية

(طالبــات)

Using chi-square test to analysis the graduation student numbers from 2013-2017 in Saudi Arabia

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Abstract

Using chi-square test to analysis the graduation student numbers from 2013-2017 in Saudi Arabia in this research for questions and objective of research is Distribution of graduating students in Makkah, The relative distribution of students by administrative region ,Distribution of graduating students by sex during the past years.The relative distribution of students according to doctoral and master's levels in the regions of the Kingdomby . using ,Descriptive statistics and Inferential statistics (Chi-Square test)and we got in Makkah exist various and various specialties but most holders of masters and PhDs in the capital Riyadh and the specialties of female graduates are different and not limited to one specialty .

Introduction

Research is an organized process to arrive at a solution for activities, or answers to questions, Choose the right analytical method Increases the researcher's ability to interpret variables that affect a particular phenomenon Allows to see how variables affect t On a particular phenomenon, Data analysis can be defined as the process of bringing order, structure and meaning to the mass of collected data The chi-square test of independence is a nonparametric statistical analysis method often used in experimental work where the data consist in frequencies or 'counts'. The most common use of the test is to asses the probability of association or independence of facts and test to determine if two or more classifications of the samples are independent or not.
We talk about the studies that used the chi- square
This study aimed to investigate differential functioning items and distractors of a criterion referenced science test for sixth grade. The test is constructed according to item response theory (IRT). To achieve this goal, the researcher designed a test constitutes of (75) multiple-choice items. The test was applied at the end of the school year (2015-2016), on a sample of (520) 6th grade students, in Jeddah, Saudi Arabia, (418) of which are from public schools, and (102) of which are from private schools. The results of the statistical program (BILOG-MG3) verified that 61 test items fit the three parameters model, 16 of which presented item differential functioning (IDF). In addition, chi square test ($\chi 2$) presented distractors differential functioning (DDF) in (6) of these items, and (75%) of the arbitrators agree on this matter. The study recommendation indicates to the importance of checking items distractors differential functioning, to check if it was the reason of item differential functioning. I think
(Mahmoud, 2018)

Objective

1-Distribution of graduating students in Makkah.
2-The relative distribution of students by administrative region.
3-Distribution of graduating students by sex during the past years.
4-The relative distribution of students according to doctoral and master's levels in the regions of the Kingdom

Results

Specializations of Makkah graduates from 2013-2017 .
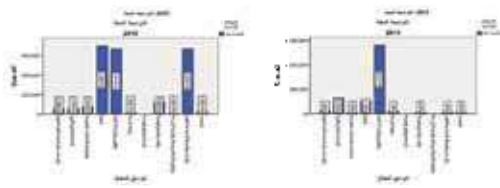
(Figure1)   (Figuer2)
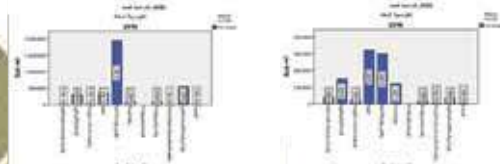
(Figuer3)   (Figuer4)

Results
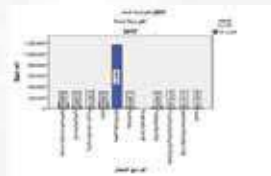
(Figure5)

Using Chi-square test for independence between educational level and gender .

H_0: gender and Educational level two separate variables

H_1: gender and Educational level are dependent

(Tabel1)   (Table2)

Conclusion

In this article , we analyzed data from university graduates in Saudi Arabia from 2013 to 2017 , and It became clear to us that there are a variety of specialties in the Makkah area due to developments in the labor market , Because of this , the disciplines from which students graduate each year vary (look at from figure 1 to figure 5) . and For the two variables the level of study and gender are also considered to be independent variables . And that's because the percentage of those with doctorates degree is male , While the percentage of those with a bachelor's degree is female , This is because of the inability of females to complete their studies (look at the table 1 and 2) . Statistical methods are safe methods to reach the desired goals of carrying out any study The statistical method can be relied upon as an efficient method of solving a study or problem when statistical data , information and indicators are available , That's why it was easy for us to collect , analyze and interpret the data in order to get the results that answered the questions about university graduates in Saudi Arabia from 2013 to 2017 .

Acknowledgments

First , my thanks to Allah , and we will thank our university Umm al-Qura for giving us an opportunity to work on a research project , and we thank the open data platform and the Ministry of Education for the availability and easy access ibility of the data .

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The Skew Normal Distribution and Its Related Properties

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Abstract

In this Project, We studied a new class of normal distribution with one extra skewness parameter, λ, than the normal distribution. This distribution is introduced by (Azzalini 1985) which is called the skew normal distribution, denoted by SN (μ, σ^2, λ). It is more flexible than the normal distribution as it contain the normal distribution as a special case. Related properties of this distribution family such as mathematical properties, moments, moment generating function are discussed. The proposed distribution is applied to a real dataset using the MLE method to illustrate the estimation procedure.

Introduction

The normal distribution is a common continuous probability model which is used widely to analyze data in many applications. It has many useful applications due to the central limit theorem. The normal distribution is symmetric about its mean, and it ranges over the entire real line. Therefore, it may not be the best option for data that is inherently positive or skewed.

Objective

The skew normal distribution (SN) is an extension of the normal distribution allowing the presence of skewness. It introduced the shape parameter λ to model skewness.

Discussion

(Azzalini 1985) studied the univariate skew normal distribution as an extension of the normal distribution to accommodate asymmetry. This new class of distribution shared similar properties with the normal distribution.

Definition: A random variable X is said to have the standard skew normal distribution with shape parameter $\lambda \in \mathbb{R}$ if it has the pdf given by:
$$f(x) = 2 \phi(x)\Phi(\lambda x), -\infty < x < \infty, \quad (1)$$
where $\phi(x)$ and $\Phi(x)$ are the probability density function and the distribution function of the stander normal distribution, respectively, and we say $X \sim SN(\lambda)$.

If $X \sim SN(\lambda)$ then the following properties apply:
a) $SN(\lambda = 0) = N(\mu = 0, \sigma^2 = 1)$.
b) If $X \sim SN(\lambda)$ then, $(-X) \sim SN(-\lambda)$.
c) The density function (1) is skewed to the right if $\lambda > 0$ and skewed to the left if $\lambda < 0$.
d) If $X \sim SN(\lambda)$ then, $X^2 \sim \chi_1^2$.
e) $E(X) = \sqrt{2/\pi}\lambda \Big/ \sqrt{(1+\lambda^2)}$.
f) $Var(X) = 1 - \frac{2\lambda^2}{\pi(1+\lambda)}$.
g) The skewness coefficient $\beta_1 = \frac{1}{4}(4 - \pi)(\frac{E^2(x)}{Var(x)})^{3/2}$.
h) The kurtosis coefficient $\beta_2 = 2(\pi - 3)(\frac{E^2(x)}{Var(x)})^2$.
i) $\beta_1 \in [-0.995, 0.995]$ and $\beta_2 \in [0, 3.86]$.
j) $M_x(t) = 2\exp\{(t^2/2)\Phi(\lambda t/\sqrt{(1 + \lambda^2)})\}$

Illustrative Example

We illustrate the superiority of the SN distributions proposed here by comparing with its sub-model which is the normal distribution using the Akaike information criterion (AIC) and Schwarz information criterion (SIC). We give an application using well-known data set to demonstrate the applicability of the proposed model. The data "Australian Institute of Sport" is taken from the "sn" package in "R". The data includes 100 females and 102 males with 13 variables. We choose the BMI values for the second 50 females to apply the proposed method. we estimated the parameters for each model using the MLE method then we compared the AIC and SIC for each model.

	μ	σ	λ	$-log\theta$	AIC	SIC
SN	19.968	4.133	2.313	490.099	986.198	996.123
N	22.955	2.856		498.667	1001.336	1007.952

Fitted SN and N Densities to AIS (BMI) Data
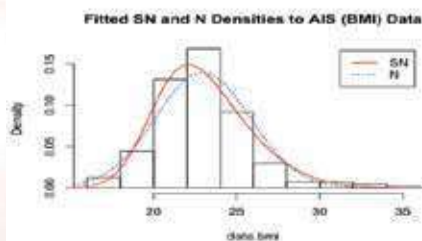
Conclusion

From the above table, we note that the SN model has a smaller SIC value than the normal model. Hence, the SN model a better fit to the dataset. We conclude that the skew normal distribution includes the normal distribution and covers its faults, and therefore it is more general and broader than the customary distribution.

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Ordinal Topological Space

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Abstract

Let Γ be ordinal number , ω_1 is the first limit , uncountable ordinal number. We study the ordinal topological space Γ such that $\Gamma < \omega_1$. we prove some topological properties of the ordinal topological space Γ such that $\Gamma < \omega_1$.

Introduction

The topological spaces extends back to the age of Greek civilization, where the Greeks studied the concept of Continuous, but the topological spaces did not appear in its current state until the beginning this century when (Ferchet) published in 1906 his thesis that dealt with the function of distance and relationship between it and the concept of continuity, but later (Riesz and Hausdorff) are explain there is no necessity for this conjugation, and continuity can be studied without referring to the conjugation of distance, and then the topological spaces appeared. In this project, we study one of the topological spaces which is ordinal topological space and their various topological property such as first countable, second countable property, separable property, T_i (i=0,1,2,3,$3\frac{1}{2}$) property, regular and completely regular property.

Objective

Studying one of the topological spaces which is The ordinal topological space and their various topological property.

Definitions

An ordinal number is a set α with the following properties :
1. If $x, y \in \alpha$, then either $x \in y$, $y \in x$ or $x = y$.
2. If $y \in \alpha$ and $x \in y$, then $x \in \alpha$.
- since an ordinal number is a set , we can define a relation on each ordinal number (Let α be an ordinal number for any two members x and y of α, define $\leq$ on α by $x \leq y$ if and only if $x = y$ or $x \in y$)
- $(\alpha, \leq)$ is a well-ordered set.
- Any ordinal number β is either **a successor ordinal or a limit ordinal**.
- The building of the ordinals can be described like this :
The first ordinal number is ϕ we will denote by 0 .
The second ordinal number is $\{\phi\}$ we will denote by 1.
The third ordinal number is $\{\phi, \{\phi\}\}$ we will denote by 2.
we will continue on the same way. 0, 1, 2, 3, ... each time we just add 1, continuing with this, each time we will get a finite ordinal. so we have to jump to get the first infinite ordinal and we will denote by ω_0 , ω_0 is the first limit ordinal and countably infinite. countinuing like this and doing the same, $\omega_0 + 1$, $\omega_0 + 2$,.... we will get $\omega_0 + \omega_0$ and we will denote by $2\omega_0$ ond continuing until we get $n\omega_0$. continuing on the same way we get $\omega_0 \omega_0$ and we will denote by $\omega_0{}^2$. Doing the same, we get ... , $\omega_0{}^3$, $\omega_0{}^3 + 1$, ... , $\omega_0{}^4$, $\omega_0{}^4 + 1$, ... , $\omega_0{}^n$, $\omega_0{}^n + 1$, ... , $\omega_0{}^{\omega_0}$, $\omega_0{}^{\omega_0} + 1$, ... All these will be countable. So we have to do a higher jump to get the first uncountable ordinal and we will denote it by ω_1, By adding 1 we get $\omega_1 + 1$, ...

Ordinal Space:

consider the ordinal number Γ such that $\Gamma < \omega_1$, $\alpha \in \Gamma$
Define the local base $B(\alpha)$ by,
$B(\alpha) = \{\{\alpha\}\}$ if α is a successor ordinal.
$B(\alpha) = \{(\beta, \alpha)\} : \beta < \alpha\}$ if α is a limit ordinal.
The unique topology on Γ generated by the collection $\{B(\alpha)\}_{\alpha \in \Gamma}$ is called **The Ordinal topology**.

Results

In this research, we study the ordinal topological space Γ such that $\Gamma < \omega_1$ and we get the following results:
1. Γ is first countable.
2. Γ is second countable.
3. Γ is separable.
4. Γ is T_0-Space.
5. Γ is T_1-Space.
6. Γ is T_2-Space.
7. Γ is Regular Space.
8. Γ is T_3-Space.
9. Γ is Completely Regular Space.
10. Γ is $T_{3\frac{1}{2}}$-Space (Tychonof).

Conclusion

Through our study of ordinal topological space, we can verify that this space will achieve all separation axioms because its LOTS means linearly order topological space (A topological space whose topology is the order topology for some linear order on the underlying set) and every LOTS achieve all separation axioms.

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Continuous function on topological space

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Abstract

In these papers , we will address in our study of the subject of Continuous functions in topological space , and show the meaning of the open functions, also we show that closed functions. Finally we study about topological equivalent and provide some property of it .

Introduction

The branch of mathematics now called Topology begins with the study of some questions in mathematical engineering . Leonhard Euler wrote a paper in 1736 AD on the Seven Bridges of Königsberg), where his research is one of the first topological results . In 1847 AD, Johan Benedict defined and presented the term topology. As for the modern topologist, his ideas depend strongly on the theory of groups developed by George Cantor in the last part of the nineteenth century in addition to his elaboration of the main ideas of group theory. He also studied a set of points in a Euclidean space as part From his study of Fourier series, published by Jules Henri Poincaré) . And in 1914 the scientist Felix Housedorff presented the definition of topological space through the neighborhood system, and in 1716 the scientist Gottfried Leibniz introduced the term of functions and In 1817, the scientist Bernhard Bolzano introduced the term connected functions and defined the most famous mathematical symbols such as Delta and Epsilon € and in 1854 AD the scientist Peter Gustavo Dercelet introduced another term related functions and also in 1859 both the scientist Augustin Cauchy and the scientist George Rayman Goats are important in the world of functions.

Objectives

1- This research contributes to expanding the reader's horizons and removing the similarity between the vocabulary of the topological space and defining the basic concepts of it .
2- Give definitions, characteristics, theories, and results related to the basic concepts mentioned above in topological space
3 -Study definitions, properties, and theories related to the basic concepts of continuous functions in topological space and draw conclusions.

Results

1- Expanding the topic of continuous functions by providing some definitions, examples, theories and proofs.
2- We provided contact at some point and some definitions, examples, and theories that pertain to it.

3- We studied the topic of closed and open functions and presented them with some important theories and concepts
4- We presented topological equivalence and explained the relationship of the concepts of this research to other topological concepts.

Discussion

1- A number of topics were discussed, such as the connection of functions at a point in the topological space and closed and open functions, and we presented these concepts clearly.
2- We also discussed topological equivalence and studied theories and examples that link these concepts to each other.

Conclusion

1- Continuous function on topological space is one of the most important concepts in mathematics .
2- The continuous function on topological space and other concepts presented in this search is very significant tool to studying mathematics and is very important reference about future investigation .

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Poisson Distribution

Some Discrete Probability Distribution with its Applications

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Abstract

A Poisson distribution is a tool that helps to predict the probability of certain events from happening when you know how often the event has occurred, It gives us the probability of a given number of events happening in a fixed interval of time.in this figure the horizontal axis is the index k, which is the number of occurrences. As we can see the function is only defined at integer values of k.
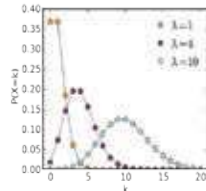
Introduction

The probability discrete distribution is a matter of fact in our live to describe many random phenomena, the Poisson distribution provides a realistic model for many random phenomena for example the huge number of people infected with coronaviruses in Saudi Arabia.The distribution was first introduced by Siméon Denis Poisson (1781–1840) and published in (1837), The work focused on certain random variables N that count among other things, the number of discrete occurrences that take place during a time-interval of given length, He approached that the distribution by considering the limit of a sequence of binomial distribution if the number of successes occurring is approximately a Poisson random variable with parameter $\lambda=Np$. Also the Poisson distribution it can be applied with law of small number, The Law of Small Numbers is a book by Ladislaus Bortkiewicz about the Poisson distribution, published in (1898).

Objective

The purpose of this research is to applied Poisson distribution in aspects of working life like R software and also applied in biostatistics to discuss Injury cases and recovery in Saudi Arabia.

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Results

recovery cases   Infect cases
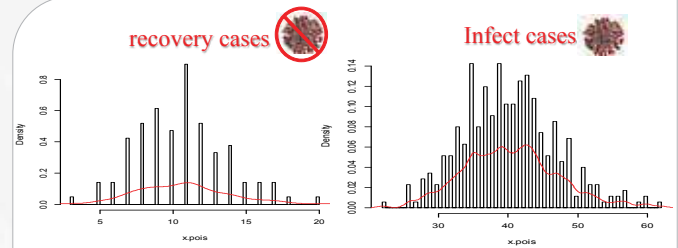
To showing the main characteristics of Poisson distribution we using R software and applying the Poisson distribution, the curves of two different cases such as the patients and recovery people of Covid-19 are illustrated in above Figures respectively, we obtain a graph whose horizontal axis represents the product of the probability and its vertical axis represents the number of occurrences ,According to the Saudi Ministry of Health We searched the number of different situations of illnesses and recovery cases under Covid-19 for the first month since such viruses spread in the hall world, and we found that the number of infected people was 351 at a rate of 40 while the recovery people was found to be 165 cases at a rate of 10.3.

Discussion

when we applied Poisson distribution for recovery and infect covid-19 cases in R software we have two histogram, The curves illustrated that the increasing in the number of cases of recovery, however, by comparing cases recovery with the cases of infection it is clear that the infect cases is greater than the cases of recovery. We need to be more careful these days and take all precautions to avoid an infection with this virus.

Conclusion

Finally, The Poisson distribution is type of probability distribution distinct random variable are we observing the occurrence of certain happening in time, space, region or length, The Poisson distribution provides a realistic model for many random phenomena such as applied in biostatistics to discuss Injury cases and recovery covid-19 in Saudi Arabia ,and have some properties have been taken under consideration, such as the expectation, the variance, The characteristics of distribution has a single parameter and that the variance is equal to the average.

Acknowledgments

Some Discrete Probability Distribution with its Applications

By Roaa alsubhi.

Mathematical Sciences

Supervisor: Rana khashab

Abstract

The Bernoulli distribution is the discrete probability distribution of a random variable two outcomes .The probability function $f(x) = \{p^x(1-p)^{1-x}$
If the random variable x the number of times the success in n of Bernoulli's independent attempts, we say that the random variable follows a binomial distribution.

Introduction

there is a discrete probability distribution that associated to such variables Such probability distribution is known in the literature as probability mass function .The Bernoulli distribution is the discrete probability distribution of a random variable two outcomes in your success which takes 1 with probability p, and in your failure takes 0 with probability $(1-p)$.

Objective

1-The Main Concepts and Features for Bernoulli Distribution
2-Some Applications of Bernoulli Distributions no obvious data can we apply the Bernoulli distribution to it we try as much as we can do this using R software by generating randomly

Results
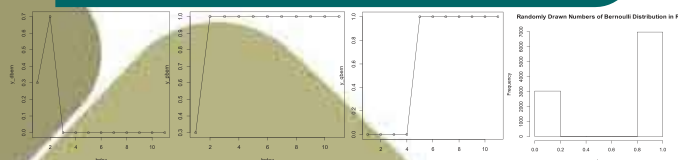
Discussion

the general form of density and cumulative functions taking under consideration the range of the variable x ranges between 0 and 1, and the probability is 0.7.Regarding of showing the main characteristics of Bernoulli distribution, random sample also can be generating using R-software. If we consider the sample size is n = 1000 and by plot of randomly drawn density

Conclusio

Probabilities defined in this way accord with the intuitive notion that the probability of an event as the proportion of times that A might be expected to occur in repeated independent observations under specified conditions and that the probability of A therefore takes some value in the closed interval [0, 1] We well obtained probability random discrete and continuous distribution

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Wavelets in Numerical Analysis

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Dr. Khulud Ziadi

Abstract

Wavelet analysis has become a significant computational tool in signal processing and image processing applications, numerical analysis, and physics. In wavelet case, we use one scaling and one wavelet function. Wavelet analysis is a successful approach to the problem of analyzing a signal in both time domain and frequency domain. In addition, it is capable to analyze one dimensional signal like audio signals and two-dimensional signals like images. In this research, wavelet analysis techniques and its applications are discussed in detail and the experimental results are shown using MATLAB Wavelet Toolbox software.

Introduction

- Wavelets have been around since the late 1980s, and have found many applications in signal processing, numerical analysis, operator theory, and other fields.
- In 1982, the French geophysicist Jean Morlet introduced the concept of a "wavelet", which means a small wave and studied wavelet transform or analysis.
- The wavelet analysis is a tool that divided data or functions into different frequency components, and then studies each component with a resolution matched to its scale.
- We have introduced some properties and applications, refinable functions, orthogonal and biorthogonal wavelets, vanishing moments, and approximation order.

Objective

- Introducing wavelets theory.
- Understanding wavelet analysis's applications s.t. signal analysis, audio compression, and image and video compression.
- Discuss the methodology of image compression.
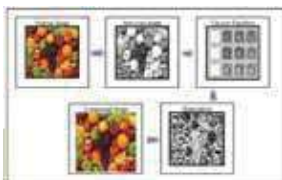
Applications

MATLAB program is a powerful mathematical software for use in wavelets applications. In this research, we have used MATLAB programming to plot both the scaling and wavelet functions for the Daubechies db4.
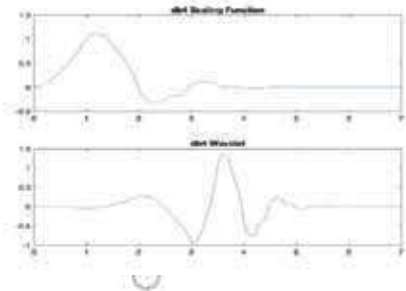
Conclusion

We have discussed the main issues regarding to the wavelet analysis and provides a general introduction of the wavelet theory. In short, wavelets are a powerful tool for the analysis and adjustment of signals and images. Wavelet analysis can be applied for numerical analysis. It has been used for compression, denoising and feature extraction.

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Rayleigh-Taylor instability in Cartesian Geometry

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Abstract

We Consider two superposed fluids with different densities, where one is accelerated towards each other. This describes Rayleigh-Taylor instability. A stability condition has been investigated and clarified. the Rayleigh-Taylor instability of accelerated two superposed fluids is systematically developed from basic fluid equations, we perform linear stability analyses via simulations in the Cartesian geometry.

Introduction

Rayleigh-Taylor instability occurs when two fluids with different densities immerge into each another. This type of instability arise in many applications and recently it is involved in electrically conducting fluids. In our research, we consider flow of two different fluids between two parallel horizontal plates. We will investigate this instability for inviscid incompressible fluids. The governing equations are linearized and solved analytically.

Objective

Determine the ability of these fluids to sustain themselves against small perturbations. Under what conditions this flow can be considered as stable?

Governing Equations

The general equations are

$$\frac{\partial \rho}{\partial t} + \frac{\partial}{\partial x}(\rho U) + \frac{\partial}{\partial z}(\rho W) = 0. \qquad (1)$$

$$\rho \frac{DV}{Dt} = \rho g - \underline{\nabla} p. \qquad (2)$$

where ρ is density, t is time, $\underline{\nabla}$ is the vector differential operator, and $\underline{V} = (U, W)$ is the velocity vector.

linearized around the stationary state for 2-D system we get:

$$\frac{\partial u}{\partial x} + \frac{\partial w}{\partial z} = 0, \qquad (3)$$

$$\rho \frac{\partial u}{\partial t} = -\frac{\partial \delta p}{\partial x}, \qquad (4)$$

$$\rho \frac{\partial w}{\partial t} = -\delta \rho g - \frac{\partial \delta p}{\partial z}, \qquad (5)$$

$$\frac{\partial \delta \rho}{\partial t} = -w \frac{\partial \rho}{\partial z}. \qquad (6)$$

We have four equations and four unknowns: $u, w, \delta p, and\ \delta \rho$.

Apply normal mode analysis and combining the system

$$\frac{d}{dz}\left(\rho \frac{dw}{dz}\right) - \rho k^2 w = -wg \frac{k^2 d\rho}{n^2 dz}.$$

Where n eigenvalue, and k is the wave number.

Discussion

The solution of flow in each fluid has the form:

$$w_2 = w_0 e^{-kz}, \qquad (z > 0) \qquad (7)$$

$$w_1 = w_0 e^{kz}, \qquad (z < 0) \qquad (8)$$

The eigenvalue that controls the stability has the following main cases

$$n = \sqrt{gk \frac{\rho_2 - \rho_1}{\rho_2 - \rho_1}}.$$

Thus, as our intuition initially told us, the system is unstable if the heavy fluid is above the lighter fluid ($\rho_2 > \rho_1$) because the eigenvalue is real, and stable if the light fluid is above the heavy fluid ($\rho_2 < \rho_1$) because the eigenvalue is imaginary.

Conclusion

This research explains the RTI when the heaviest dense fluid is on top and the less dense fluid is at the bottom and both are affected by the earth gravity and we realize that this situation is as accelerating the fluids when the fluid with lighter density accelerates to the heavier one. The eigenvalue problem is explained as an exponential function in time. The stability has been investigated and we found that for negative Atwood number the interface is stable. This work can be expanded to include the case of compressible, nonuniform density and/or for magnetohydrodynamics.

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Rayleigh-Taylor instability in Cylindrical Geometry

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Abstract

We Consider Rayleigh Taylor instability for two superposed fluids with different densities, where one is accelerated towards each other in cylindrical geometry. The initial value problem is described by linearized governing equations. The flow is considered for uniform density incompressible limit and fully compressible. The discussions include the results of compressibility effects.

Introduction

Rayleigh Taylor instability (RTI) arise in many applications and recently it is involved in electrically conducting fluids and flow in cylinders. In our research, the RTI occurs at an interface between two fluids having different densities when the fluids are subjected to accelerations. If the acceleration points from the heavy to the light fluid the interface between the two fluids is unstable. In this case any perturbation with a wavelength larger then the cutoff due to surface tension (for the immiscible case) or mass diffusion (for the miscible case) will grow.

Objectives

- Study the growth rate of the interface between the two fluids under the linear stability of pressurized and incompressible fluids in cylindrical coordinates

Governing Equations

The general equations in cylindrical geometry are

$$\rho_{,t} + (r\rho u_r)_r \, r + (\rho u_\theta)_{,\theta} + r(\rho u_z)_{,z} = 0,$$

$$r\,(\rho u_{r)t} + (r\rho u_r^2)_{,r} + (\rho u_r u_\theta)_{,\theta} + r(\rho u_r u_z)_{,z} - \rho u_\theta^2 = -rp_{,r} + \rho,$$

$$r(\rho u_\theta)_{,t} + (r\rho u_r u_\theta)_{,r} + (\rho u_\theta^2)_{,\theta} + r(\rho u_z u_\theta)_{,z} + \rho u_\theta u_r = -rp_{,\theta},$$

$$r(\rho u_{z),t} + (r\rho u_r u_z)_{,r} + (\rho u_z u_\theta)_{,\theta} + r(\rho u_{z)_{,z}}^2 = -rp_{,z},$$

$$rp_{,t} + (rpu_r)_{,r} + (pu_\theta)_{,r} + r(pu_z)_{,z}$$
$$= -(\gamma - 1)\{(rq_r)_{,r} + q_{\theta,\theta} + rq_{z,r} + p_j[(ru_r)_{,r} + u_{\theta,\theta} + ru_{z,z}]\},$$

where (u_r, u_θ, u_z) velocity , p is pressure, ρ is density, γ is specific heats, $j = l, h$ *refer to* the light and heavy fluids, (q_r, q_θ, q_z) is the heat fluxes and r is radial position.

Linear Stability Analysis:

$$\rho'_{,t} + \rho^{(0)}(\nabla.u') + u_r\rho_r^{(0)} = 0,$$
$$\rho^{(0)}u_{r,t} = -p'_{,r} + g\rho',$$
$$r\rho^{(0)}u_{r,\theta} = -p'_{,r},$$
$$\rho^{(0)}u_{z,t} = -p'_{,z},$$
$$p'_{,t} + u_r p_r^{(0)} = -\gamma p^{(0)}(\nabla.u'),$$

where $(...)^{(0)}$ denotes the equilibrium state and $(..)'$ refers to the perturbed variables

---

Apply normal mode analysis and combining the system we get the differential equation in u_r:

$$\rho^{(0)}u_r - \frac{g\rho^{(0)}[(m^2 + r^2 k_z^2)\left(\frac{g}{c_s^2}\right) - \frac{rn^2}{c_s^2}]}{n^2\left[r^2\left(\frac{n^2}{c_s^2} + k_z^2\right) + m^2\right]}u_r - D\left(\frac{\rho^{(0)}r^2 D u_r}{r^2\left(\frac{n^2}{c_s^2} + k_z^2\right) + m^2}\right) - u_r D\left(\frac{g\rho^{(0)}\left(\frac{r^2}{c_s^2}\right)}{r^2\left(\frac{n^2}{c_s^2} + k_z^2\right) + m^2}\right) + \frac{g}{n^2}u_r D\rho^{(0)} = 0$$
$$+ \frac{g}{n^2}u_r D\rho^{(0)} = 0$$

where n is the growth rate of the perturbations, m, k_z *are* wavenumbers, g gravity, c_s sound speed.

Discussions

Compressibility Effects
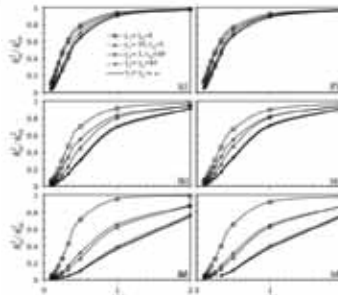
FIG.1. compressible to UDIL growth rate as a function of $1/M$ for the convergent (left column) and divergent (right column) configurations for different γ_l and γ_h combinations at G=0.5, $\tilde{r}_0 = 2.0$. The pure solid line corresponds to $\tilde{n}^2_{cv}/\tilde{n}^2_{cu}$. [(a) and (d)] A=0.2, [(b) and (e)] A=0.5, and [(c) and (f)] A=0.8.
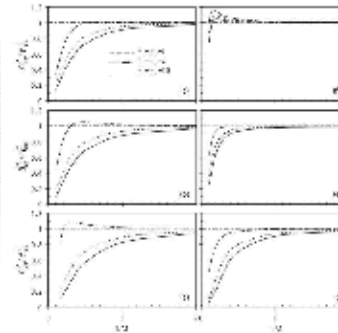
FIG.2. Compressible to UDIL growth rate ratio for the convergent (left column) and divergent (right column) cases as a function of $1/M$ for different γ values at G=0, $\tilde{r}_0 = 0.1$. [(a) and (d)] A=0.2, [(b) and (e)] A=0.5, and [(c) and (f)] A=0.8.

Conclusion

Linear stability analysis of the RTI in cylindrical geometry with circular interface is performed to study compressibility effects. For equilibrium initial conditions (both hydrodynamic and thermal) the compressible growth rate was found to be bounded

Acknowledgments

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Mixture Experiment with its properties

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Abstract

The experiments is the most accurate search methods that can be considered as an organized work or a systematic way of exploring the facts related to a specific case There are a variety types of experiments that can be conducted and taking under consideration, such as mixture experiments The discussion and the statistical properties of such experiments were introduced in the mid fifties in this present work is concerned with the modeling and designing of such experiments when there are maximum and minimum values on the mixture components. the comparisons between the obtained models in terms of their sufficiencies and goodness ale also evaluated and demonstrated with different examples.

Introduction

The design of an experiment is an essential part of the statistical methodology to improve the scientific experimentation Such experiments needs to be planned and analyze to decide what conditions (inputs) are to be varied (treresponses)are to be measured to manage the factor inputs in order to optimize the output Once the experimenter decides the treatments that are to be varied and the response that is to be observed and measured,Such relationships can be represented analytically as:

Responses = f(the levels of factors) the main concern or properties of interest is to and the optimum proportions of the ingredients in order to maximize the product performance and is to explore the relationship between the measured property and the components'values to express the expected response as a function of the proportions of the mixture component In addition,Scheffé's polynomials are by for the most commonly encountered mixture model.Once a decision has been made about the model, the next step is to develop suitable designs to support such models the experimental region for such experiments is constrained,These constraints are known as natural constraints, there are standard mixture designs for fitting standard canonical polynomial models proposed by Scheffé (1958, 1963), which are known as Simplex-Lattice atment factors) and what outputs (designs and Simplex-Centroid designs

Objective

1- Provide different and general information regarding to experiments with mixture setting and their main properties.
2- Demonstrate the class of linear of models to fit data from mixture experiments with restricted design regions.
3- Showing how such models are more applicable and flexible to apply in practice to some different data

Results

1- We note that the mixture experments are easy and flexible and we can influence all different data
2- We show the new modelling approach through an example from an animal husbandry experiment. The experimental data are provided in Cornell (1990) and involve three mixture components with proportions bounded above and below. We will fit the linear models of first and second and third degrees ,the data from this experiments can be represented as

The Models	MSR	R^2
First degree polynomial model	135	0.9909
second degree polynomial model	51	0.9969
Cubic degree polynomial model	44	0.9975
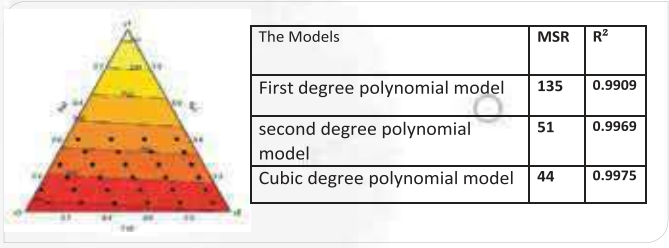
Discussion

1- the The mixture experiments and their conditions were discussed and compared to some other experiments to see what were better and easier than others such as factorial experiments
2- the resulting the second degree model it is much better to fit the data then first degree model and cubic degree models provide better fit to the data collected than other statistical models

Conclusion

In experiments with mixtures, the response depends on the proportions of the components and not on the total amount of the mixture. Thus, the proportions of the components making up any mixture must add to unity. we using linear models, such as Scheffé polynomial models. Such models are consider much easier to apply to most data set and flexible enough in all situations.Once a decision has been made about the model,a choice of suitable designs for the region of interest is needed so that the collection of the observations may possible.There are different types of mixture designs according to the shape of the region under consideration,constraints can be divided into two categories, simplex shape when the design region results from natural constraints, and non-simplex shaped region, on the other hand, when the component proportions are subject to further constraints

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Series B (Methodological), 20:344–360

Analysis of Breast Cancer Patients Data Using SPSS

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العام الدراسي 1440–1441هـ

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Abstract

This study aimed to employ the two branches of statistics in analyzing the study data using the SPSS statistical package program in order to determine the effect of black seed and honey on improving the condition of women with breast cancer. The questionnaire was used to collect data with laboratory analysis. The study population was divided into (54) patients into 4 groups. All groups continued to be chemotherapy. The first group was cons-idered control (11 patients) and the experimental groups: the honey group (14 patients) and the black seed group (11 patients) and the honey and black seed group (15 patients). The questionnaire contained several axes on personal data and health information, while the laboratory evaluation included biochemical analy-zes. The data was organized into tables of frequency distributions appro-priate to the type of variables (quantity and quality) and the work of grap-hs of averages of the study variables. Calculation of correlations was perf-ormed using the Pearson correlation coefficient, statistical inference by estimating confidence intervals for the study community averages for all quantitative variables, with a significance level (0.05) and (0.01). Correlations were calculated using the Pearson correlation coefficient for some variables. The research concluded with the the hypotheses testing (Kruska-Wallis)).

Introduction

One of the most dangerous types of cancer in women in Saudi Arabia is br-east cancer. This study aimed to identify the effect of black bean and honey on improving the condition of women with breast cancer, which was condu-cted in the oncology department of Al-Noor Specialized Hospital and King Abdullah Medical City in Makkah. The data of the study axes were analyzed and they are:

By organizing the data into iterative tables suitable for the type of variable, the averages of the variables for the four groups are calculated for comparison in addition to the confidence intervals for the averages. Correlation and hypothesis tests showed statistically significant differences between the averages of the control group and the experimental groups at the level of significance (0.05) and (0.01).

Objective

Using statistical methods in analyzing the data of breast cancer patients to know the effect of honey and black seed consumption on their health condition.

Results

1-The results of the study indicated that the age group of 41-60 years represents the highest percentage of the study sample at 72.22%. 36% of the study population indicated that a family member has breast tumors. The number of red blood cells for the control group decreased, while the level of red blood cells for the three experimental groups improved.

2. The results indicated that no significant changes occurred in both the average size of red blood cells and the average hemoglobin red blood cells in both the control group on the one hand and the experimental groups on the other hand. While there was an increase in the mean values of hemoglobin concentration in the three experimental groups, compared to the control group.

3. The number of white blood cells in the control group decreased significantly compared to the three experimental groups.

4- It was clear from a study of correlation between the variables that both hemoglobin Hb and mean RBC count are statistically significant at the level of significance (0.01) and (0.05) and the mean correlation coefficient value is (0.698).

Discussion

The figures above shows a low hemoglobin level before treatment compared to the normal level for all members of the sample. The hemoglobin level increased during treatment and was within the limits of the normal level and the hemoglobin level continued naturally even after the treatment ended two weeks ago.
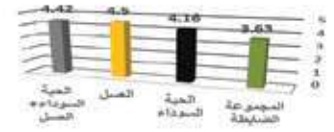
The above figure shows a decrease in the number of red blood cells for the control group, while the level of red blood cells for the three experimental groups that dealt with black seed, bee honey, black seed, and bee honey together improved and approached the normal level, as noted in the table.

Thus, the previous figure represented the average calcim in the analysis of salts and minerals in the blood of the control group and the three experimental group. We note that the mean increased in the honey group compared to other groups. Calcim confidence intervals are shown in the table.
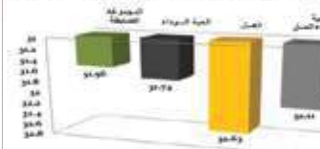
The figure above shows the mean MCHC concentration of the control group and the other three experimental group, whereby the mean hemoglobin concentration of red blood cells in the control group decreased, while the mean hemoglobin concentration of erythrocytes in the three experimental group improved, as seen in the figure.

Conclusion

This study concluded the importance of the use of complementary and alternative treatment by using natural foods, especially black bean and honey, for the prevention and protection from cancer or an alleviation of symptoms associated with various cancer treatments.

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Compactness in topological space

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Supervisor : Dr. Najah Ahmed Alsaeidi.

Abstract

In these papers, we will address in our studay of the subject of
Compact in topoiogical space and explain Heine-Borel theorem, and we clarify the relationship between compact space andSeparatio Axiom and countinous.finally,we will introduce the characteristics
and dvantages.

Introduction

The Heine–Borel theorem, as the result is now known, is another special property possessed by closed and bounded sets of real numbers.
This property was significant because it allowed for the passage from local information about a set (such as the continuity of a function) to global information about the set (such as the uniform continuity of a function). This sentiment was expressed by Lebesgue (1904), who also exploited it in the development of the integral now bearing his name. Ultimately, the Russian school of point-set topology, under the direction of Pavel Alexandrov and Pavel Urysohn, formulated Heine–Borel compactness in a way that could be applied to the modern notion of a

Objective

A study a theory of the compact space (Heine-Borel).
A study of The relationship between (compactness and separation axiom).
A study of The relationship between (compactness and continuous).

Results

Expansion of (compact spaces) that provide some definitions, examples, theories and their proofs).
We presented a theory of the compact space ((Heine-Borel) by clarifying and proving it.
The relationship between (compactness and separation axiom) we have presented some definitions, examples and theories.
The relationship between (compactness and continuous)) between some examples, definitions and theories.

Discussion

1- Every compact Hausdorff space is T3 space.
 2- Every locally compact Hausdorff space is a Tychonoffspace .
3- Every compact hausdorff space is normal.
 4- continuous the compact space is compact.

Conclusion

After we knew the relationship between the compact and separation axiom, we conclude Every compact hausdorff space is normal.

Acknowledgments

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Mathematics and Crowds in Makkah

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Abstract

The causes of crowding may vary, But they may be similar in outcomes. So this is a problem that surrounds us and we strive to solve of it before evolves to more difficult problems that are impossible to control. This research will discuss this phenomenon and its problems, as well as some solutions. One example of the solution to be detailed is the simulation model of the Jamarat bridge.

Discussion

Among the most important points discussed in the research:
1) What are the crowds?
2) The crowd's impact on people, health and the economy.
3) Jamart accidents that occurred due to the crowds.
4) Some of the solutions used to solve the crowd problem at Jamarat.
5) Crowds and simulations.

Introduction

Jamarat Bridge is one of the areas where crowds gather. These human gatherings may lead to death due to stampede. So, some scientists are working to find mechanisms to prevent stampede accidents. There is a need to build a model that explains how and why people can die in a crowd. The mathematical model of crowd dynamics was one way to study this phenomenon.

Conclusion

Mathematics had a great role in solving the problem of crowds at the Jamarat by changing the shape of the Jamarat from the circular shape to the shape of the ellipse. Also, the changes that occurred in the Jamarat Bridge had the great effect in solving the crowd problem.

Objective

Knowing the crowd dynamics is very important in keeping crowd safe. Where studying problems and understanding the solutions previously presented are useful in creating effective treatment techniques.
 It may provide an opportunity to change negative impacts and avoid future accidents.

Acknowledgments

We thank God, then we thank the university and specifically the Department of Mathematics for giving us the opportunity to learn. We thank Dr. Ibtesam Abu-Sulyman for help us and guidance, we thank our parents and friends.

Results

Among the most prominent solutions that contributed to solving the problem of crowds at the Jamarat is the evolution of the Jamarat Bridge by increasing the number of entrances and exits and changing the shape of the Jamarat from circular to the ellipse, and also solutions to build a model for the movement of pilgrims and organize them according to human nature in addition to solving the simulation.

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JAMARAT BRIDGE LAYOUT

5 floors   950 m

80 m
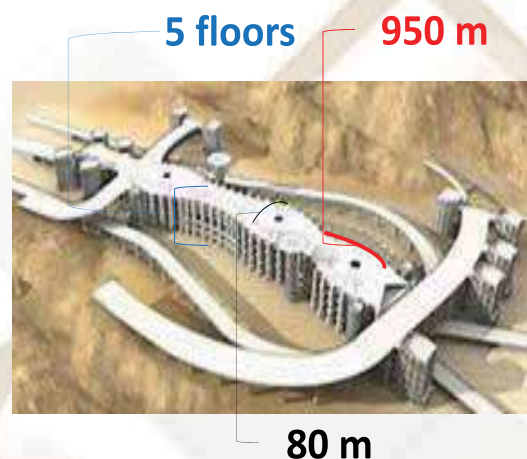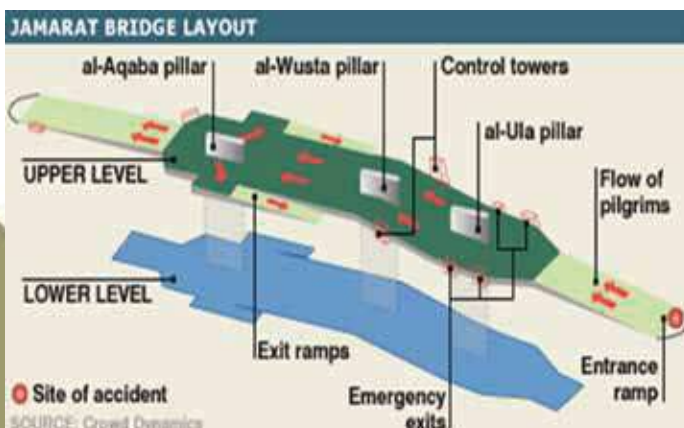
Corona and Mathematics

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Abstract

In this research, we will discuss three main models: SI, SIS, and SIR, which are used to understand how infectious diseases spread among living people and to use mathematical equations that help us understand the ways in which we can reduce the spread of these diseases .

Introduction

Despite scientific advances in the field of medicine , however , epidemics constitute a major challenge for scientific research in the face of its rapid and dangerous outbreak .There are many infectious diseases that affect the respiratory system such as bird flu, swine flu and the currently spreading Corona virus .
In December 2019, pneumonia was reported in Wuhan, China. In December 2019, pneumonia was reported in Wuhan, China. SARS-CoV-2(Severe acute respiratory syndrome coronavirus 2) (is the strain of the virus that causes coronavirus 2019 (COVID-19), which is a respiratory disease.

Conclusion

The spread of diseases and epidemics can lead to economic risk Throughout the world, through their impact on the areas of spread, as well as on the main engines of economic growth in the world, such as trade, tourism and oil.
The spread of infectious diseases is caused by viruses, bacteria, fungi or parasites and can spread between individuals directly or indirectly through contact with body fluids, by aerosols, or by carriers.

Objective

1- Learn about mathematical models of infectious diseases .
2- Applying mathematical equations for infectious diseases spread around us .

Results

Learn the mathematical models of infections diseases and how to apply them to corona virus

Discussion

Explain the mathematical models of infections diseases and their equation and applied to the corona virus.
The SIR model .
SIR model is the most popular mathematical infectious disease model.
Susceptible(S) Infectious(I) Recovered (R)

The SIR model can be represented by the following system of ODEs:
$$\frac{dR}{dt} = \gamma \times I$$

$\frac{dR}{dt}$	$=$	γ	$\times$	I
Rate of change of the number of recovered people	$=$	Recovery rate Rate at which infectious people recover	$\times$	Number of infectious people

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Acknowledgments

Artinian Rings

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Introduction

An important role in the theory of rings is played by various finiteness conditions, in particular, **chain conditions on ideals**. We say that a ring satisfies the descending chain condition on ideals, if there is no infinite descending sequence of ideals. Such rings are called **Artinian Rings** after Emmy Emil Artin, who first discovered that the descending chain condition for ideals simultaneously generalizes finite rings and rings that are finite-dimensional vector space over fields.

In this work we will introduce this special classes of rings. In addition, we study the basic properties of such classes. We, also, discuss the nilpotency of ideals in Artinian Rings.

1.The Artinian Condition

Definition 1.1. [3] A ring R is said to satisfy the descending chain condition (DCC) for left (right) ideals if for each sequence of left (right) ideals $A_1, A_2, ...$ of R

with $A_1 \supseteq A_2 \supseteq ...$ there exists a positive integer n (depending on the sequence) such that $A_n = A_{n+1} = ...$

Definition 1.2. [3] A ring R is said to satisfy the **minimal condition (mC)** for left   (right) ideals if in any non-empty set of left (right) ideals of R (partially ordered by inclusion) there exist some left(right) ideals which is minimal in the set.

Theorem 1.3. [3] In any ring R ,the following conditions are equivalent.
   i.R satisfies the DCC for left (right) ideals.
   ii.R satisfies the mC for left (right) ideals.

Definition 1.4. [3] A ring which satisfies either of the conditions of Theorem 1.3 is called a left (right) Artinian ring.
A ring which is both left Artinian and right Artinian is called an **Artinian**

Example 1.5.

[1] Every field is an Artinian ring.

[2] Every finite ring is an Artinian ring, accordingly $(\mathbb{Z}_n, \oplus, \odot)$ is an Artinian ring   for every $n \geq 2$.

[3] If $R = \left(\begin{bmatrix} a & 0 \\ 0 & c \end{bmatrix} : a, b, c \in \mathbb{Z}_2 \right, +, .)$ then R is an Artinian ring.

[4] If $R = (\mathbb{Z}, +,)$ the ring of integers, then R is **not** Artinian ring, since

$$(2) \supset (4) \supset .... \supset (2^n) ...$$

is an infinite descending chain of ideal in R. For each $n \in \mathbb{Z}^+$.

[5] Consider a polynomial ring $F[x]$ over a field F. This ring is **not** Artinian ring, because

$$(x) \supset (x^2) \supset (x^3) ...$$

is an infinite descending chain of ideas of $F[x]$, with $(x^n) \supset (x^{n+1})$, $n = 1, 2, ...$

[6] Let $R = (\mathbb{R}^\mathbb{R}, +, \cdot)$ the set of real valued functions on R.

For an arbitrary real number $r > 0$, we define

$$A_r = \{f \in R : f(x) = 0 \text{ for all } x \in [-r, r]\}.$$

Then A_r is an ideal of R and $A_t \supset A_r$ if $r > t$. Therefore, $A_1 \supset A_2 \supset A_3 \supset ....$
is an infinite descending chain of ideals of R. Hence R is **not** Artinian ring.

2.Basic Properties of Artinian rings

Theorem 2.1. [1] If R is a left Artinian ring, then any homomorphic image of R is also left Artinian.

Corollary 2.2. If I is an ideal of the Artinian ring R, then the quotient ring R/I is Artinian.

Remark 2.3. The converse of the above corollary may not be true, as the following example showes: let $R = (\mathbb{Z}, +, \cdot)$ the set of integers, $I = (2)$ then $I \triangleleft R$ and $R/(2) = \{a + (2) : a \in \mathbb{Z}\} = \{(2), 1 + (2)\} \subset \mathbb{Z}_2$. Since Z_2 is a field it is Artinian but $R = \mathbb{Z}$
is not Artinian.

Theorem 2.4. Let I be an ideal of a ring R. If I contains no infinite, strictly descending chain of left ideals of R and R/I is left Artinian ring then R is left Artinian.

Corollary 2.5. Let I be an ideal of a ring R. If I and R/I are both left(right)Artinian   ring, then R is a left (right) Artinian.

Theorem 2.6. A finite direct sum of left(right) Artinian rings is a left (right) Artinian.

Remark 2.7. A right Artinian ring need not be left Artinian and vice versa.
For example:

Let $R = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix} = \left\{ \begin{bmatrix} 0 & x \\ 0 & y \end{bmatrix} : x, y \in \mathbb{Q} \right\}$. Then R is right but not left.

Remark 2.8. An ideal of left (right) Artinian need not be left (right) Artinian.
For example,

Let $R = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix} = \left\{ \begin{bmatrix} a & b \\ 0 & b \end{bmatrix} : a, b \in \mathbb{Q} \right\}$ then R is right Artinian .

Let $I = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix} = \left\{ \begin{bmatrix} 0 & x \\ 0 & 0 \end{bmatrix} : x \in \mathbb{Q} \right\}$, so I is an ideal in R and I is not right Artinian. To show that,

For any positive integer n, Let $J_n = \begin{bmatrix} 0 & 2^n\mathbb{Z} \\ 0 & 0 \end{bmatrix} : k \in \mathbb{Z}$, so $J_n \triangleleft I$ for all n and

$J_n \supset J_{n+1}$. Then we have $J_1 \supset J_2 \supset J_3 \supset \cdots$ which is an infinite descending chain of right ideals of I . Then I is not Artinian.

Remark 2.9. A subring of Artinian need **not** be Artinian.

For example, the field $\mathbb{Q}$ of rational numbers, has only two ideals $\{0\}$ and $\mathbb{Q}$, so it
is Artinian. The ring $\mathbb{Z}$ of integers is a subring of $\mathbb{Q}$ but $\mathbb{Z}$ is not Artinian.

Results

Theorem 2.10. [1] Any Artinian domain R (integral domain and Artinian ring) is a field.

Corollary 2.11. An integral domain with only a finite number of ideals is a field.

Theorem 2.12. [1] If R an Artinian ring, then every proper prime ideal of R is a maximal ideal.

Theorem 2.13. [1] If R an Artinian ring, then every proper prime ideal of R is a maximal ideal.

3. Nilpotence and the Jacobson radical

Definition 3.1. [3]
■ The **Jacobson radical** of a ring R, denoted by rad R, is the set

$$\text{rad } R = \cap\{M : M \text{ is a maximal ideal of } R\}.$$

■ A ring R is called a **Jacobson semisimple ring (J-semisimple ring)** if rad $R = \{0\}$.

Example 3.2.

[1] Let $R = (\mathbb{Z}, +, .)$ be the ring of integers. The maximal ideals of $\mathbb{Z}$ are precisely the principle ideals generated by the prime numbers; thus

$$\text{rad} R = \cap\{< p >: p \text{ is a prime number}\} = \{0\}$$

Hence $R = (\mathbb{Z}, +, .)$ is semisimple ring.

[2] Let $R = (\mathbb{Z}_{12}, \oplus, \odot)$, then Rad $R = (2) \cap (3) = (6)$. Note that $\mathbb{Z}_{12}$ is not semisimple ring.

[3] Let $R = (Z[x], +, \cdot)$, The maximal ideals in R are (x, p), where p is a prime number,
   thus rad $R = \cap(x, p) = (x)$. Hence R is not J-semisimple ring.

Definition 3.3. [2] , [3] An element of a ring R is said to be nilpotent if $a^n = 0$ for some positive integer n. An ideal I of a ring R is called a **nil ideal** if each element of I is nilpotent   element, and it is called a **nilpotent ideal** if $I^n = 0$ for some positive integer n.

Example 3.4.

[2] Let $R = (\mathbb{Z}_{20}, \oplus, \odot)$ then $I = ((6), \oplus, \odot)$ is a nil ideal since each element of I is nilpotent , where $\overline{6}^2 = 0$, $\overline{12}^2 = 0$, $\overline{18}^3 = 0$, Also, I is nilpotent ideal because $I^3 = (0)$.

Results

Theorem 3.5. [3] Let $y \in R$. Then $y \in$ rad R if and only if $1 - xy$ is a unit in R for all $x \in R$.

Theorem 3.7. [3] For any ring R, the quotient ring $R/radR$ is semisimple; that is , rad $(R/radR) = \{0\}$.

Main Result
Theorem 3.8. [3] Let R be a commutative ring with 1 , If R is an Artinian ring then radR is a nilpotent ideal.

Corollary 3.9. Let R be a commutative ring with 1. If R is an Artinian ring , then every nil ideal of R is nilpotent.

Acknowledgment

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Noetherian Rings

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Introduction

One of the important problems of Rings theory is the determination of the structure of Rings satisfy the ascending chain condition on ideals. Such rings are called Noetherian Rings , in honor of Emmy Noether, who first demonstrated the importance and usefulness of this condition. The notion of a Noetherian ring is of fundamental importance in both commutative and non-commutative ring theory. For instance, the ring of integers and the polynomial ring over a field are both Noetherian rings, and consequently, such theorems as the Lasker-Noether theorem and Hilbert's basis theorem hold for them.

Our prenciple aim in this project is to introducing such interesting class of rings. We study the basic properties of this classes. In addition, we discuss the ideal structures of Noethrian rings. In particular, we study the nilpotency of ideals in Noetherian rings. We, also, describe the primary decomposition of ideals in Noetherian rings.

1. The Noetherian Condition

Definition 1.1. [1] A ring R satisfies the *ascending chain condition* (ACC) for left (right) ideals if, given any sequence of left (right) ideals $I_1, I_2, \cdots$ of R with $I_1 \subseteq I_2 \subseteq \cdots \subseteq I_n \subseteq \cdots$, there exists an integer n (depending on the sequence) such that $I_m = I_n$ for all $m \geq n$.

Definition 1.2. The *maximum condition* (MC) for left (right) ideals is said to hold in a ring R if every nonempty set of ideals of R, partially ordered by inclusion, has at least one maximal element.

Definition 1.3. An ideal A is said to be *finitely generated* if there exists an n such that $A = (a_1, a_2, \cdots a_n)$.

Theorem 1.4. [4] In any ring R, the following conditions are equivalent:
(i) R satisfies the ascending chain condition (ACC) for left (right) ideals.
(ii) The maximum condition (MC) holds in R.
(iii) Every left (right) ideal of R is finitely generated.

Definition 1.5. A ring R is called a left (right) Noetherian if and only if R satisfies any one of the
three equivalent conditions of Theorem 1.4.
A ring which is both left and right Noetherian is called
A **Noetherian ring**.

Some examples:

1- Any field and any finite ring is a Noetherian ring.
2- Any principal ideal ring is a Noetherian ring. For instance, $\mathbb{Z}$ and the polynomial ring $F[x]$, where F is a field are Noetherian rings.
3- Let D be a division ring, then D has no left (right) ideals other than $\{0\}$ and D, so D is both left and right Noetherian ring.
4- Consider the ring $R = (\mathbb{R}^{\mathbb{R}}, +, .)$ of real valued function on $\mathbb{R}$. Given an arbitrary real number $r > 0$, we define
$$I_r = \{f \in R : f(x) = 0 \ for \ -r \leq x \leq r\}$$
Then $I_r \lhd R$. It is not difficult to see that:
$$I_1 \subset I_{1/2} \subset I_{1/3} \subset \cdots$$
Therefore, R contains an infinite (strictly) ascending chain of ideals. Hence R is not Noetherian ring.

5- Let R be the set of all finite subsets of $\mathbb{Z}^+$. The symmetric difference of two subsets $A, B \subseteq R$ is the set $A \Delta B$, where $A \Delta B = (A \cup B) - (A \cap B)$.
Then $(R, \Delta, \cap)$ is a commutative ring without identity.
Now consider the set $P(I_n) \in R$, where
$I_n = \{1, 2, ..., n\}$, then $P(I_n) \lhd R$. Note that $P(I_n) \subset P(I_{n+1})$. Therefore
$P(I_1) \subset P(I_2) \subset P(I_3) \subset \cdots$ forms an increasing chain of ideals of R which terminates at no point. Hence, R is not Noetherian.

2. Basic Properties of Noetherian rings

Theorem 2.1 [4]. If R is a left Noetherian ring, then any homomorphic image of R is a left Noetherian ring.

Corporally 2.2. [1] If I is an ideal of the Noetherian ring R, then the quotient ring R/I is Noetherian ring.

Remark 2.3. The converse of the above corollary may not be true (i.e. If $I \lhd R$, R/I is Noetherian, then R may not be Noetherian), as the following example shows:
Example 2.4.

Let $R = \begin{bmatrix} 0 & \mathbb{Q} \\ 0 & \mathbb{Z} \end{bmatrix} = \left\{ \begin{bmatrix} 0 & a \\ 0 & b \end{bmatrix} : a \in \mathbb{Q}, b \in \mathbb{Z} \right\}$ and let

$I = \begin{bmatrix} 0 & \mathbb{Q} \\ 0 & 0 \end{bmatrix} = \left\{ \begin{bmatrix} 0 & x \\ 0 & 0 \end{bmatrix} : x \in \mathbb{Q} \right\}$ then $I \lhd R$, and
$R/I \cong \mathbb{Z}$. Hence R/I is Noetherian ring but R is not Noetherian ring. To show that :

Let $I_n = \left\{ \begin{bmatrix} 0 & \frac{m}{2^n} \\ 0 & 0 \end{bmatrix} : m \in \mathbb{Z} \right\}$. Then $I_n \lhd R$ for
all n. Since $\frac{m}{2^n} = \frac{2m}{2^{n+1}}$, $I_n \subseteq I_{n+1}$, but $\begin{bmatrix} 0 & \frac{m}{2^{n+1}} \\ 0 & 0 \end{bmatrix}$
is not in I_n. Therefore $I_n \subset I_{n+1}$. Thus

$$I_1 \subset I_2 \subset I_3 \subset \cdots$$
is an infinite ascending chain of ideal of R. Then R is not Noetherian ring.

Theorem 2.5. [3] Let I be an ideal of a ring R. If I contains no infinite, strictly ascending chain of left ideals of R and R/I is left Noetherian ring then R is left Noetherian.

Remark 2.6. Note that: If $I \lhd R$, and I is Noetherian then I contain no infinite ascending chain of ideals of R.

Corollary 2.7. [4] let I be an ideal of the ring R. If I and R/I are both left Noetherian rings, then R is also left Noetherian.

Theorem 2.8. [4] A finite direct sum of left Noetherian rings is a left

Remark 2.9. A subring of a Noetherian ring may not be Noetherian. As the following example shows:
Let $S = F[x_1, x_2, ...]$ be the infinite polynomial ring over a field F, then S is an integral domain, and S can be embedded in a field $(k, +, .)$ and $(k, +, .)$ is Noetherian, but $S \cong T \leq k$ is not since
$$\langle x_1 \rangle \subset \langle x_1, x_2 \rangle \subset \langle x_1, x_2, x_3 \rangle \subset \cdots$$
is an infinite ascending chain of ideals of S.

Remark 2.10. A right Noetherian ring need not be left Noetherian and vice versa.

For example:

Let $R = \begin{bmatrix} \mathbb{Z} & \mathbb{Q} \\ 0 & \mathbb{Q} \end{bmatrix} = \left\{ \begin{bmatrix} a & b \\ 0 & c \end{bmatrix} : a \in \mathbb{Z}, b, c \in \mathbb{Q} \right\}$. Then R is right but not left Noetherian ring.

Remark 2.11. ideal of Noetherian ring may not be Noetherian. As the following example shows:
Example 2.12.

Let $R = \begin{bmatrix} \mathbb{Z} & \mathbb{Q} \\ 0 & 0 \end{bmatrix} = \left\{ \begin{bmatrix} a & b \\ 0 & 0 \end{bmatrix} : a \in \mathbb{Z}, b \in \mathbb{Q} \right\}$. Then R is a right Noetherian ring.

Let $I = \begin{bmatrix} \mathbb{Z} & \mathbb{Q} \\ 0 & 0 \end{bmatrix} = \left\{ \begin{bmatrix} x & y \\ 0 & 0 \end{bmatrix} : x \in \mathbb{Z}, y \in \mathbb{Q} \right\}$. Then
$I \lhd R$ and I is not right Noetherian. Since, for

any positive integer n, let $J_n = \left\{ \begin{bmatrix} 0 & \frac{m}{2^n} \\ 0 & 0 \end{bmatrix} : m \in \mathbb{Z} \right\}$,
then J_n is a right ideal of I for all n. Furthermore
$J_1 \subset J_2 \subset \cdots$ is an infinite ascending chain of right ideals of I. Hence, I is not right Noetherian.

3. The ideal Structures

3.1. Nilpotence and Prime Radical

Definition 3.1. [2]
1- Let I be an ideal in a ring R. The prime radical of I, denoted Rad I, is the set
$Rad\, I = \cap \{P : P \supseteq I ; P \text{ is prime ideal}\}$ the intersection of all prime ideals which contain I.

2- The *prime radical of a ring R*, denoted by Rad R is the set $Rad\, R = \cap \{P : P \text{ is a prime ideal of } R\}$ the intersection of all prime ideals of R .

Example 3.2.
1- Let $R = (\mathbb{Z}, +, .)$, then
Rad$R = (0)$, also, Rad $(2) = (2)$,
Rad $(12) = (6)$.
2- Let $R = (\mathbb{Z}[x], +, \cdot)$ then
Rad $R = (0)$, also
Rad $(x) = (x)$, Rad $(x, 8) = (x, 2)$.

Definition 3.3. [2],[4] Let R be a ring. An element a of a ring R is said to be *nilpotent* if there exists a positive integer $n \in \mathbb{Z}^+$ such that $a^n = 0$. An ideal I of R is called a *nilpotent ideals* if $I^n = \{0\}$ for some positive integer n. An ideal I of R is called a *nil ideal* if each element of I is a nilpotent element.

Results

Theorem 3.4. [4] Every ideal in a Noetherian ring R contains a product of prime ideals.

Theorem 3.5. [1] If I is an ideal of the Noetherian ring R , then I contains some power of its prime radical ;that is, $(Rad\, I)^n \subseteq I$ for some $n \in \mathbb{Z}^+$.

Theorem 3.6. [1] Let R be a Northerian ring. Then the prime radical of R , Rad R , is a nil ideal; that is, Rad R is simply the ideal of all nilpotent elements of R.

Theorem 3.7. [1] For a Noetherian ring R , the quotient ring R/Rad R without prime radical , that is , $Rad\,(R/Rad\, R) = \{0\}$

Main Result:

Our main result of this section brought out as a corollary of the following theorem
Theorem 3.8. (Levitsky)[1]
In a Noetherian ring R , the prime radical Rad$R$ is the largest nilpotent ideal of R.
Corollary 3.9. [1] In a Noetherian ring , any nil ideal is nilpotent.

3.2. Primary Decomposition

Definition 3.10. [4] Let R be a commutative ring and Q be an ideal of R. Then Q is called a *Primary ideal* if for all $a, b \in R$, $ab \in Q$ and $a \notin Q$ implies that there exists a positive integer n such that $b^n \in Q$.

Example 3.11.
1- Every prime ideal is primary
2- In the ring of integers $\mathbb{Z}$, for any prime integer p, the ideal $\langle p^n \rangle$ is a primary ideal. On the other hand, $\langle 6 \rangle$ is not primary ideal in $\mathbb{Z}$,because $2.3 \in \langle 6 \rangle$ but $2^n \notin \langle 6 \rangle$ nor $3^n \notin \langle 6 \rangle$.
3- Let $R = (\mathbb{Z}[x], +, .)$ then, the ideal $\langle x \rangle$ is primary in R because it is prime. Also $\langle x^2 \rangle$ is a primary ideal in R.

Definition 3.12. [1] Let I be an ideal of the ring R Then I is said to be irreducible if it is not a finite intersection of ideals of R properly containing I, that is, if $I = J \cap K$ implies that $I = J$ or $I = K$.
Example 3.13.
1-Any prime ideal is irreducible.
2- If $R = (2\mathbb{Z}, +, .)$, $I = \langle 4 \rangle$, then I is irreducible.

Results

Lemma 3.14. [1] Every ideal in a Noetherian ring R is a finite intersection of irreducible ideals.

Lemma 3.15. [1] In a commutative Noetherian ring R , every irreducible ideal is primary.

Main Result:

The above results may now be put into the form of a decomposition theorem, the so-called
Primary Decomposition Theorem of Noether

Theorem 3.16. [1] Every ideal of a Noetherian ring can be represented as a finite intersection of primary ideals.

Acknowledgement

References

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