البحوث المنشور في سكوبس والتي تدعم البيئة والتنمية المستدامة

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RESEARCH ARTICLE

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IN VITRO SCREENING OF THREE IRAQI WHEAT (*TRITICUM AESTIVUM* L.) GENOTYPES FOR SALT TOLERANCE

ABSTRACT:

Three wheat genotypes (*Triticum aestivum* L.) namely Hashimia, Latifia and Tamooz were assessed for their salt tolerance *in vitro*. Calli were initiated on Murashige and Skoog (1962) basal medium supplemented with Kinetin 0.1 mg/l and 2,4-Dichlorophenoxyacetic acid (2,4-D) 1.0 mg/l using mature embryos as explants. One month old calli were inoculated onto a solid medium salinized with different concentrations of saline water obtained from drainage canals, Missan district, Iraq to make final concentrations of 0, 5, 7.5, 10, 12.5, 15, 17.5, and 20 $ds.m^{-1}$. Results revealed that the three genotypes of wheat performed very well after subjection to screening and selection for salt tolerance program. The genotype Latifia seems gained more callus fresh weight and responded better than the others. Thus, it is a promising genotype for selection. This study also conducted a molecular marker – based genetic analysis for the three genotypes expressing salt tolerance. The objective was to find molecular markers closely linked to the resistant genes that may be useful for gene cloning and improving salt tolerance in wheat breeding programs. To generate RAPD pattern, 8 primers were used to identify those that would be suitable for this purpose. Four primers showed clear amplification which was completely monomorphic bands. The DNA amplification pattern for Tamooz callus cultured on a medium salinized with 12.5 $ds.m^{-1}$ exhibited genetic changes by using OPB7 primer.

KEY WORDS:

Triticum aestivum L., callus, salt stress, RAPD, PCR

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INTRODUCTION:

Salinity is the primary abiotic stress that adversely affects the overall metabolic activities and causes plant damage and suppression of plant growth and development. Wheat is considered one of the most important cereal crops in many parts of the world. It is salt sensitive crop requires a better understanding of salt stress signaling (Ayolié *et al*., 2011). Over the past few years, much attention has been focused on the identification of genes and proteins induced in response to environmental stress (Rashid *et al*., 2009). Although conventional breeding has made large improvements in different crops, these methods have some limitations such as required long time, limited gene pool available for wheat breeders and presence of genetic barriers among different species. Genetic manipulation and selection of favorable somaclonal variants from calli are supplementary method for breeders in order to produce stress tolerant cultivars (Nasab *et al*., 2012).

Although, salinity resistance is a complex trait resulting from the interaction of several morphological and physiological properties, it should be possible to select salt

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The effect of some secondary metabolites of alcoholic extract for eggplant fruits on liver enzymes in mice.

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Abstract:

The high-fat diet induces liver damage. atorvastatin has been traditionally used as a Lipid-lowering drug. this work studied the effect of *Solanum melongena* ethanolic extract on induced liver damage in mice that were treated with a high-fat diet for 14 days by collecting serum biochemical profiles (including GOT, ALP, and GPT), the treated animals showed a decrease in body fat along with necrotic cells in the liver region. *S. melongena* in high concentrations can lower serum biochemical profiles and hepatic fat formation. Added to this, *solanum melongena* had no acute oral toxicity in mice. These findings point to the potential of this extract as a hepatoprotective agent against liver damage brought on by a high-fat diet without causing any immediate oral toxicity. Its high total phenolic and flavonoid levels may have contributed, or at least in part, to these actions.

Keywords: eggplant, liver enzymes, atorvastatin, *Solanum melongena*.

Introduction:

Due to their rich nutritional content, the Consumption of eggplant fruits (*Solanum melongena* L.) is widespread worldwide. eggplant fruits are widely consumed around the world. The genus Solanum, which includes eggplant, is a member of the Solanaceae family (1). It is also referred to as aubergine (eggplant) and regarded as a basis of minerals (including calcium, iron, magnesium, potassium salt, and zinc), and vitamins C, B6, B12, A, E, D, niacin, thiamin, and K (2,3). In terms of its health benefits and economic value, it has been shown that eggplant has a high nutritional value and low-calorie count. Moreover, it has a very high-water content and is a rich source of fiber and vitamins (3). Also, the effectiveness of eggplant extract in lowering cholesterol levels has been demonstrated. Asthma, bronchitis, diabetes, arthritis, and hypercholesterolemia have all been treated with eggplant due to the presence of phenolic and alkaloid compounds. Eggplant is used in medicine (2). The amazing pharmacological and biological properties of herbal plants were the reason for the disease treatments' advancement and success. On the other hand, it is thought that natural and herbal medicines have a variety of therapeutic effects and fewer side effects (3). Alanine aminotransferase (GPT), alkaline phosphatase (ALP), and aspartate aminotransferase (GOT), among other enzymes, are some of the ones that carry out liver function. Because it can catalyze the hydrolysis of molecules in phosphate esters, ALP is in charge of manufacturing organic radicals and inorganic phosphate, whereas the activity of GPT

EFFECT OF CuO NANOPARTICLES ON SEED GERMINATION AND SEEDLING GROWTH IN *ECHINACEA PURPUREA IN VITRO.*

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ABSTRACT

This study was aimed to examin the effect of CuONPs on both seeds germination, seedling growth and comparing the method of soaking and adding to the culture medium, The research was implemented at PTC. Lab. College of Biotechnology - Al Nahrain University, during 2022 and 2023. The experimental design was factorial within CRD. It was included five experments and ten replicates (4X3). first experment was by using Sodium Hypochlorite (0.0, 1, 2 and 3%) with (5, 10, 15min) duartion time. The second experment was CuONPs (0, 25, 50, 75mg,L^{-1}) combined with (3,6,9 and 12 day) Time duration, same factors wre examined after soaking seeds with CuONPs which represented the third experment, fourth and fifth experments soaked before culture seeds were cultured respictively with CuONPs (0.0, 25, 50, 75mg,L^{-1}) for 1hour then culturing them on MS media. Results showed full reduction in the contamination rate of the selected *E. purpurea* explant recorded in 3% sodium hypochlorite at 10 and 15min. the highest rate of seeds germination were a chieved with CuONPs of 50 mg, L^{-1} for 9 days rated 7.80 germinated seeds in MS media culture method, at the soaking method the results clarify the highest CuONPs 75 mg, L^{-1} combined with 6,9 and 12 days of soaking a chieved the highest germination rate 10.0 seeds (100% germination).The results also showed that 50% of CuONPs increases shoot numbers 8.6 explant and dry weight 198 mg. 25% of CuONPs achieve the best shoot length 14.5 cm. in seeds soaking results showed the best shoot Nu. 8.7, shoot length 9.7 cm. and dry weight 204 mg. when seeds was soaked in 75 mg. L^{-1} of CuONPs.

Key words: tissue culture; agricultural applications of nanoparticles, medicinal plants.

تأثير جزيئات أوكسيد النحاس النانوية في إنبات البذور ونمو البادرات في نبات القنفذية خارج الجسم الحي

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المستخلص

هدف البحث الى تأثير أوكسيد النحاس النانوي على انبات البذور ونمو البادرات ومقارنة طريقة النقع بطريقة الاضافة الى الوسط الزرعي، نفذ البحث في مختبر زراعة الانسجة النباتية – كلية التقنيات الاحيائية– جامعة النهرين للفترة 2022 – 2023. كانت التجارب عاملية ضمن تصميم تام التعشية CRD باستعمال خمسة تجارب وبعشرة مكررات. التجربة الأولى هو تركيز هيبوكلورات الصوديوم (0.0، 1، 2 و 3٪) بالتداخل مع المدة الزمنية (5، 10، 15 دقيقة) ، التجربة الثانية هي تراكيز مختلفة من اوكسيد النحاس النانوي CuONPs (0.0، 25، 50، 75 ملجم، لتر$^{-1}$) بالتداخل مع (3،6، 9 و 12 يوم) وزراعتها في وسط MS ، تم فحص العوامل نفسها بعد نقع البذور بـ CuONPs والذي يمثل التجربة الثالثة، وتمت الزراعة بعد نقع البذور بـ CuONPs (0.0، 25، 50، 75 ملجم.لتر$^{-1}$) لمدة ساعة واحدة ثم زراعتها على وسائط MS. أظهرت النتائج انخفاض معدل التلوث لنبات القنفذية *E.purpurea* الى 0% عند تركيز 3% من هيبوكلورات الصوديوم بالتداخل مع المدد 10 و 15 دقيقة، واظهر أعلى معدل للبذور النابتة بلغ 7.80 بذرة باستعمال CuONPs بمقدار 50 ملغم، لتر$^{-1}$ لمدة 9 أيام بطريقة اضافة النانو الى الوسط ، وفي طريقة النقع أوضحت النتائج بان تركيز75 ملغم. لتر$^{-1}$ من CuONPs ولمدة 6 يوم اعطت أعلى معدل للانبات بلغ 10.0 بذرة (100% إنبات). كما أظهرت النتائج أن 50 ملغم. لتر$^{-1}$ من CuONPs زاد عدد الأفرع الى 8.6 فرع كذلك الوزن الجاف بلغ 198 ملغم، اما 25% من CuONPs حقق أفضل معدل لطول الفرع بلغ 14.5 سم. مقارنة بتجربة نقع البذور كان افضل عدد للافرع بلغ 8.7 فرع وطول9.7 سم. بوزن جاف بلغ 204 ملغم تحقق عند نقع البذور في 75 ملغم. لتر$^{-1}$ CuONPs.

الكلمات المفتاحية: زراعة الأنسجة، التطبيقات الزراعية للجسيمات النانوية، النباتات الطبية.

INCREASING SOME FLAVONOIDS COMPOUNDS FOR *ECHINACEA PURPUREA* L. USING COPPER OXIDE NANOPARTICLES *IN VITRO*.

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ABSTRACT

This study was aimed to increase some flavonoids active compounds production in *Echinacea purpurea* seedlings through plant seeds treatment with different concentrations of copper oxide nanoparticles that daignosed and characterized using AFM technique. This research was implemented at plant tissue culture labrotary of College of biotechnology - Al Nahrain University, during the period of 2021 and 2023. The experiment designed factorial within CRD using three factors and ten replicates (3X3). Sodium hypochlorite concentration (S1, S2, S3, S4) (0.0, 1, 2, 3%) represented the first factor, treatment duartion time (T1, T2, T3) (5, 10, 15min) represented the second factor and copper oxide nanoparticles concentrations (C1, C2, C3, C4) (0.0, 25, 50, 75mg/ml) represented the third factor. Results showed that the full reduction in the contamination rate of the selected *E. purpurea* explant recorded in 3% sodium hypochlorite at 10 and 15min. The results also showed that there were a significant increase in the shoots numbers in 50mg/ml CuNPs that recording the highest shoots numbers, the shoot length increased significantly within the 25mg/ml recording 13.5cm then decreased in 50 and 75 mg/ml and the seedlings dry weight increased significantly up to 50mg/ml CuNPs that recording the highest seddlings dry weight, then the seedlings dry weight also decreased significantly in 75mg/ml CuNPs. Also, all the analyzed flavonoids compounds using HPLC device as Echinolone, Humulene, Coumarin, Myricetin, Heperidin and Naringin concentrations were significantly increased in 50 and 75 mg/L^{-1} Cu ONPs, except the Humulene and Coumarin compound that significantly decreased in 75 mg/L^{-1} Cu ONPs in comparsion to the control.

Key words: Tissue culture; Plant medicinal compounds; Active flavoniods, Agricultural applications of nanoparticles.

زيادة بعض المركبات الفلافينويدية لنبات الاكنيسيا باستخدام جسيمات اوكسيد النحاس النانوية CuONPs خارج الجسم الحي

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المستخلص

تم تنفيذ هذا البحث في مختبر زراعة الأنسجة النباتية بكلية التقنيات الاحيائية – جامعة النهرين اثناء المدة من 2021 إلى 2023. كانت التجربة باستخدام تصميم عاملي كامل العشوائية مع ثلاثة عوامل وعشرة مكررات (3X3). يمثل تركيز هيبوكلوريت الصوديوم (S1، S2، S3، S4) (0.0، 1، 2، 3٪) العامل الأول، ويمثل المدة الزمنية بالمعاملة (T1، T2، T3) (5، 10، 15 دقيقة) العامل الثاني ويمثل تراكيز جسيمات أكسيد النحاس النانوية (C1، C2، C3، C4) (0.0، 25، 50، 75 ملغ / مل) العامل الثالث. هدفت هذه الدراسة إلى زيادة إنتاج بعض مركبات الفلافونويد النشطة في شتلات نبات الاكنيسيا من خلال معالجة البذور النباتية بتراكيز مختلفة من جزيئات أكسيد النحاس النانوية التي تم تمييزها وتشخيصها باستخدام تقنية مجهر القوة الذرية AFM. أوضحت النتائج أن الانخفاض الكامل في معدل التلوث أثناء النبات بذور نبات الاكنيسيا سجل في 3٪ هيبوكلوريت الصوديوم في 10 و 15 دقيقة، كما أظهرت النتائج أن هناك زيادة معنوية في أعداد البراعم بتركيز 50 مجم / مل من جسيمات اوكسيد النحاس النانوية، زاد طول النبيتات بشكل ملحوظ في 25 مجم / مل مسجلاً 13.5 سم ثم انخفض في 50 و 75 مجم / مل وزاد الوزن الجاف للشتلات بشكل ملحوظ حتى 50 مجم / مل من جسيمات اوكسيد النحاس النانوية التي سجلت أعلى وزن جاف للشتلات ، ثم الشتلات انخفض الوزن الجاف أيضًا بشكل ملحوظ في 75 ملجم / مل من جسيمات اوكسيد النحاس النانوية. أيضًا، حصلت زيادة بتراكيز جميع مركبات الفلافونويد التي تم تحليلها باستخدام جهاز HPLC مثل Echinolone و Humulene و Coumarin و Myricetin و Heperidin و Naringin بشكل ملحوظ في 50 و 75 مجم/لتر من جسيمات اوكسيد النحاس النانوية، باستثناء مركب Humulene و Coumarin الذي انخفض بشكل ملحوظ في 75 مجم. / L^{-1} Cu ONPs مقارنة بعنصر التحكم.

الكلمات المفتاحية: زراعة الأنسجة، مركبات نباتية طبية، الفلافونيدات النشطة، التطبيقات الزراعية للجسيمات النانوية.

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RESEARCH ARTICLE

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Cytotoxic Activity of *Hypericum triquetrifolium* Turra Methanolic Extract Against Cancer Cell Lines

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Abstract

Background: Since ancient times, several people in the Mediterranean region have employed *Hypericum triquetrifolium* Turra in traditional medicine. However, only the composition of its essential oils has received extensive research. **Objective:** This study investigated the cytogenetic and cytotoxic effects of *H. triquetrifolium* methanolic leaf extract on four different cancer cell lines. **Methods:** Methanolic extract of *H. triquetrifolium* leaves was prepared. Albino male mice were grouped into five: group 1 (blank control) received water;group II (CYP) received cyclophosphoamide; groups III, IV, and V were administered 50, 100, and 200 mg/kg of *H. triquetrifolium* extracts. On the 11* day, the animals were sacrificed and bone marrowwascollected. The metaphase index (MI) of the bone marrow cells was determined to evaluate the cytogenetic effect of the extract. The cytotoxic activity of the extract was tested on four cancer cell lines (HepG2, PC3, MDA, and A594), while WRL-68 normal cells were employed as control. **Results:** The index of bone marrow cells in cyclophosphamide (CYP)-treated albino male mice shows a significant difference ($P \leq 0.05$) between concentration inhibition 50 % IC_{50} of cancer cell line compered to WRL-68 normal cells, on MDA and WRL-68 cells (IC_{50} =185.7, 200.7), HepG2 and WRL-68 (IC_{50} 104.9, 564.6), A549 and WRL-68 (IC_{50} 115, 192), PC3 and WRL-68 (IC_{50} 160.7, 298.7). The results showed that the extracts was able to increase metaphase index compared to cyclophasoamide-treated mice, which caused a drop in the percentage of metaphase index. **Conclusions:** The current study was showed that significant anti – proliferation activity of Hypericum triquetrifolium methanolic extract against MDA-MB-231 cell line is an epithelial, human breast cancer cell line,WRL-68, HepG2 and lung cancer cell lines (A594).

Keywords: Hypericum triquetrifolium- cytogenetic- cytotoxicity- inhibitory concentration

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Introduction

Hypericum triquetrifolium Turra is native to Eastern Europe and the Mediterranean area (Couladiset al., 2002). Several studies have reported the potential use of its essential oil and crude extracts as therapeutic substances, mainly in the treatment of burns, and gastroenteritis. It is also used as an antinociceptive and antioxidant agent (Alzoubi et al., 2020). Numerous studies have shown that the constituents of herbal derivatives are important in the conventional treatment of many diseases and have cytotoxic effects, which inhibit the growth of cancer cells (Ad'hiahet al., 2018). According to some studies, *H. triquetrifolium* has antinociceptive (Çiraket al., 2011), anti-inflammatory, antioxidant (Conforti et al., 2002), antibacterial, antifungal, and cytotoxic (Fraternaleet al., 2006) activities.

Numerous bioactive substances, including the naphthodianthrones hypericin and pseudohypericin, have been shown to be present in the methanolic extract of the various parts of Hypericum species. Phenolic compounds have potent antioxidant agents (Çiraket al., 2011). Clinical research has shown that flavonoids, which are considered dietary components, can help prevent cancer and a variety of cardiovascular problems. Hypericum triquetrifolium was reported previously to contain chlorogenic acid, rutin, hyperoside, quercitrin, quercetin, kaempferol, phenolic, and flavonoid compounds (Rafieian-Kopaie, 2012; Brankiewiczet al., 2023). It has been used for centuries for its anti-inflammatory, anti-septic, and worm-killing properties (Rouiset al., 2013; Ozkan and Mat, 2013). The presence of phenolic compounds such as phenylpropane derivative, chlorogenic acid, and flavonoids like rutin, hyperoside, apigenin-7-O-glucoside, kaempferol, quercitrin, quercetin, and amentoflavone has been demonstrated in *H. triquetrifolium* (Cirak et al., 2011; Ayan and Cirak, 2008). Tumor necrosis factor-α (TNF-α) and interleukine-6 (IL-6) production and release, as well as inducible nitric oxide synthase, were assessed using THP-1 human monocytic cells (iNOS). Nitric oxide (NO) release, iNOS expression, and the levels of soluble proteins and mRNA for TNF-α and IL-6 were all evaluated in THP-1 cells by Saad et al., (2011) and Ahmadet al., (2021).

The present study wasconducted to investigate the cytogenetic and cytotoxic effects of Hypericum

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A new drug formula for pneumonia and severe seasonal flu; a promising drug for eradicate COVID19

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ABSTRACT

World Health Organization (WHO) well-known pleiotropic antiviral compounds.This study was designed to evaluate the effects of herbal drug combination in treatment of pneumonia, severe respiratory distress, and severe flu and recently for COVID19.The treatment phase includes 12 days period of herbal drug mixture (X) . Results showed the activity of herbal drug in eradication of COVID19, pneumonia and severe seasonalful.

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1. Introduction

The Dietary Supplement Health and Education Act (DSHEA) of 1994 classifies herbs as dietary supplements (Dietary [4,11–15]. Dietary supplements can be produced, sold, and marketed without first demonstrating safety and efficacy, as is required for pharmaceutical drugs (Dietary [4]. Because herbs are plants, they are often perceived as "natural" and therefore safe ([5,9,10]. Table 1.Table 2. Table 3.Table 4.Fig. 1.

2. The herbal formula

The novel formula was created by combining 7 herbs (*Tetraclinis articulate, eucalyptus, thymus vulgaris, syzygium aromaticum, illicium verum, boswellia carterii, mentha*) that have commonly been used in the prevention and treatment of different diseases. >14 ingredients noted in the modern herbal pharmacopoeia to have strong antiviral properties were in the components of drug. The entire drug formula therefore consisted of 7 herbs. (Alhayani, B. 2017)

3. Subjects and data collection methods

Volunteer's patients who were diagnosed by respiratory disease specialist were recruited for the study. the study patients received 2 bottles of the herbal preparation free of charge for each one and were learn the methods of administration, the herbal drug mixture every day for 12 days.

4. Exclusion criteria included

Note: previously we used this drug formula in the treatment of pneumonia, severe respiratory distress, severe seasonal flu, and after the occurrence of COVID19 pandemic, we developed the formula to treat the COVID19. (Alhayani, B. 2014)

4.1. Detection of the drug components

Drug materials were obtained from traditional medicine suppliers in Iraq.

4.2. Pre-clinical experiment: Safety of drug preparation

4.2.1. Median lethal dose (LD50)

Thirty adult female albino BALB/C mice (6–8 weeks, range of body weight = 20–25 g, 4 mice in each group) were used to determine the S/C median lethal dose (LD_{50}) of drug (aqueous extracts). The animals were kept in well air-condition rooms at the private animal house, given pellets of balanced specially prepared animal feed and water.Graded doses of drug extracts in 0.1 ml PBS were administered orally to each one animal daily, a series of concentrations of local herb extract employed by ([32].).(Alhayani, B.2020)

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Nickel oxide nanoparticles with ginger extract: An environmentally sustainable method for antibacterial applications

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ABSTRACT

Attention on phyto-synthesized nanoparticles (NPs) has recently increased due to their low chemical toxicity, which gaining significance in nanotechnology. Our research synergizes ginger extract and nickel oxide NPs to make a new composite of antibacterial potential against bacterial strains, namely: *P. aeruginosa, S. aureus, E. coli, and K. pneumonia*. The prepared NPs were filled into Polymethacrylic acid (PMMA) films, where they displayed notable bactericidal effects, particularly against *S. aureus and E. coli*. Three examination techniques were applied to characterize the produced sheets, namely: scanning electron microscopy, atomic force microscopy, and X-ray diffraction. Simultaneously, NiO nanoparticles induced the generation of reactive oxygen species, disrupting bacterial functions, and altering cellular morphology. This study highlights the need for continuous research into effective and ecologically friendly antimicrobial treatments.

Introduction

"Nanomaterials" is a term called on materials that size between 1 and 100 nm, which was noted for their remarkable properties and significant impact in diverse applications [1]. These materials showed high potential to be engineered by manipulating their size, shape, and properties. These properties, including chemical, physical, and biological characteristics, attracted interest due to their uniqueness, particularly in medicine [2]. The magnetic, catalytic, and electrical properties of nickel (Ni) and nickel oxide (NiO) NPs make them highly valuable in various disciplines, such as energy technology, magnetism, and electronics [3]. For medical purposes, these nanoparticles are used in biomedicine, photocatalysis, anti-inflammatory therapy, and antibacterial therapies due to their remarkable chemical stability, supercapacitive characteristics, electron transfer capabilities, and electrocatalytic activity [4].

The chemical procedures used to synthesize nanoparticles pose significant risks and generate environmentally harmful consequences. Hence, a growing interest in using biological approaches to produce nanoparticles is identified to avoid the generation of harmful byproducts and ensure ecologically safe synthesis procedures [5]. Green nanotechnology is being used to develop metal oxide NPs in aquatic environments, to create natural, safe, and practical products [6,7]. The current advancement in green nanotechnology involves the creation of effective, secure, and environmentally friendly methods. During the process of manufacturing nanomaterials, the bioactive components, particularly in ginger, extract can serve as stabilizing and reducing agents [4,8].

Zingiber officinale, known as ginger, has several active metabolites, such as volatile and nonvolatile chemicals. Examples of metabolites include gingerol, paradols, shogaol, alkaloids, flavonoids, and zingerone; these compounds are believed to possess distinct pharmacological and biological effects [9]. Using ginger extract is considered a green synthesis strategy, which promotes environmentally responsible and sustainable approaches [3,10]. This method reduces the need for strong chemicals and the negative effects on the environment that are usually linked to traditional synthesis [11]. Moreover, the bioactive substances found in ginger demonstrate compatibility with living organisms and have few harmful effects, making ginger extract a desirable material for medical uses [10,12].

In this research, four types of bacteria, *Staphlococcus aureus (S.*

STUDY ANTIBACTERIAL ACTIVITY OF *LAURUS NOBILIS* LEAVES WATER EXTRACT ON SOME ISOLATES OF PATHOGENIC BACTERIA

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ABSTRACT:
This study was aimed to isolation of pathogenic bacteria from different clinical cases like burns, wounds &UTI infections, then study the antimicrobial activity of *Laurus nobilis* leaves water extract on it. From a total of (80) samples were taken from these cases, the most isolated bacteria were related to *Pseudomonas aeruginosa*, *Klebsiella pneumoniae, Staph aureus & Escherichia coli*. Antibiotic sensitivity test was done for isolated bacteria against (9) antibiotic and most of them revealed sensitivity to gentamycin, ciprofloxacin& trimethoprim/ sulphamethoxazole. Different concentration of *Laurus nobilis* leaves water extract (25, 50, 100, 200) mg/ml were tested for detection its antibacterial activity against isolated bacteria .Results revealed that concentration (50, 100, 200) mg/ml revealed high antibacterial activity against *Staph aureus* & *Klebsiella pneumoniae*, also showed intermediate level against *Escherichia coli*, while higher concentration only (100, 200) mg/ml of extract revealed antibacterial activity against *Pseudomonas aeruginosa*

Keywords: *Laurus nobilis*, antmicrobial activity, pathogenic bacteria, burns, wounds, UTI

دراسةُ التأثير البكتيري المضاد للمستخلص المائي لأوراق الغار *Laurus nobilis* على بعض العزلات البكتريه المرضيةً

بشرى هندي صالح حيدر ناطق يحيى ريم نعيم ابراهيم
استاذ مساعد مدرس مساعد مدرس
كليةُ التقنيات الاحيائيةً- جامعةُ النهرين-بغداد

المستخلص:
هدفت هذه الدراسةُ الى عزل البكتريا المرضيةً من حالات سريريةً مختلفةً مثل التهابات الحروق والجروح والتهابات المجاري البوليةً ومن ثم دراسةُ التأثير البكتيري للمستخلص المائي لأوراق نبات الغار عليها حيثُ من مجموع 80 عينةً سريريةً , كانت معظم البكتريا المرضيةً المعزولةً تعود لبكتريا الزوائف الزنجاريةً,الكبسيلةً الرئويةً ,المكورات العنقوديةً الذهبيةً والاشرشيا القولونيةً. تم اجراء اختبار الحساسيةً للبكتريا المعزولةً ضد (9) انواع من المضادات الحيويةً وقد اظهرت اغلب العزلات حساسيتها تجاهَ الجنتاميسين، السيروفلوكساسين والترايميثوبريم/سلفاميثاكازول. تم تحديد الفعاليةً الضد بكتيريةً للمستخلص المائي لأوراق الغار بتراكيز مختلفةً (200,100,50,25) ملغم /مل ضد البكتريا المعزولةً حيثُ اظهرت التراكيز (200,100,50) ملغم / مل تأثير عالي ضد بكتريا المكورات العنقوديةً الذهبيةً والكبسيلةً الرئويةً كما اظهرت تأثير متوسط ضد بكتريا الاشرشيا القولونيةً, في حين اظهرت التراكيز العاليةً للمستخلص (200, 100) ملغم /مل تأثير ضد بكتريا الزوائف الزنجاريةً.

الكلمات المفتاحيةً: اوراق الغار, الفعاليةً الضد ميكروبيةً, البكتريا المرضيةً, حروق, جروح, التهاب المجاري البوليةً

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Protective activity of Ruta chalepensis methanolic extract against nephrotoxicity and testicular damage induced by Carbon tetrachloride on albino male mice

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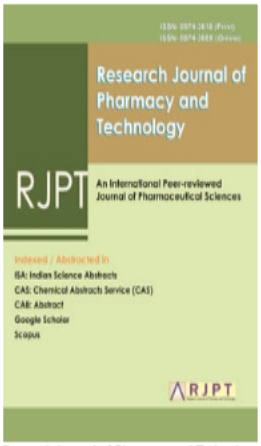
ABSTRACT:

Herbal medicinal products can contain whole or partially prepared plant components from plant leaves, bark, stems, flowers and seeds.They are administered orally, inhaled or directly applied in the skin. Ruta chalepensis is a wild herb of the Mediterranean region used by many countries in herbal medicine. The existence of bioactive molecules responsible for their pharmacological properties has been shown by phytochemical screening. Results of kidney protective activity of plant. Showed that: for total cholesterol, the effect was dose dependant (50 and 100 mg\kg) in which the plant decreased it in compared to positive and negative groups (162.1±1.83 and 154.6±1.11 mg\dl) compared to (202.1±1.13 and 167.5±2.96 mg\dl) respectively. For total protein, creatinin and albumin the plant also had the ability to keep it near control groups compared to CCL4group.While the results of interaction groups indicated the ability of plant to provide protection against CCL4 damage. the plant possessed the ability to keep testosterone, progesterone and estrogen hormones level near normal in compared to CCL4 treated group (2.96±0.03, 1.93±0.01 and 3.63±0.04 ng\dl); (11.51±4.12, 9.85±2.18 and 11.78±3.42 ng\ml); (29.07±7.21, 30.11±9.11 and 30.67±8.98 ng\ml) for 50,100 mg\kg and negative control respectively. While for interaction group the results showed the ability of plant to counteract the damaged caused by CCL4 (1.67±0.01, 2.54±0.02); (10.42±2.21, 13.65±4.37); (39.74±10.13, 35.45±9.91) for testosterone, progesterone and estrogen hormones in Ruta chalepensis +CCL4 at dose (50 +0.02%) and



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ABSTRACT

Plants used in traditional medicine contain a vast array of substances that can be used to treat chronic and infectious diseases. It was estimated that about 25% of all modern medicines are directly or indirectly derived from higher plants. Indeed, well into the twentieth century, much of the pharmacopeia of scientific medicine was derived from the herbal lore of native people. *Ruta chalepensis* are plants used in folkloric medicine as antispasmodics, digestive, and for intestinal gases. *R. chalepensis*, is a species of the family Rutaceae. The species is hairless, not glandular at the top, 30 to 80 cm with broad leaves. This study aimed to investigate the *in-vitro* (antimicrobial) and *in-vivo* (immunoprotective activity) of *R. chalepensis* methanolic extract. The Results indicated the plant's capacity to inhibit microbial growth against *Eschereshia coli, Staphyloccocus aureus*, and *Candida albicans* and stimulate immunoglobulin titer in mice damaged with CCL_4 in comparison with positive and negative controls.

Keywords: *Candida albicans*, *Eschereshia coli*, Immunoglobulin, *Ruta chalepensis, Staphyloccocus aureus*.

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INTRODUCTION

In the latest years an excessive scientific improvement concerns pharmacological and chemical studies of medicinal plants finding new compounds with biological properties.[1] Indeed, the presence of secondary metabolites that support health and decrease infection has been very interesting in all worlds. The importance of herbs used in the original system of medicines to control the body's immune system.[2] Plants produce a wide diversity of secondary metabolites (SM), which serve as defense compounds against herbivores, other plants, and microbes, and signal compounds. Because of this, some plants or products isolated from them have been and are still used to treat infections, health disorders, or diseases. Phytochemicals compound such as polysaccharides, flavonoids, peptides, natural sulfur compounds, and tannins are "known to moderate the immune system *in-vivo*". Rutaceae, generally identified as citrus family, is part of flowering plants with approximately 160 genera.[3] Among the innumerable species of therapeutic attention, plants are going to the Rutaceae family, «which has species of financial, biological and therapeutic significance which is *R. chalpensis*.[4] The phytochemicals of *R. chalpensis* characterized the presence of volatile oil, "flavonoids, alkaloids, coumarins, "flavonoids, "glycosides and tannins are reflected the potential inhibitors of pro-inflammatory molecules.[5] *R. chalpensis* widely used in the Mediterranean area to treat pain, dermatitis, rheumatism, and other inflammatory diseases.[6] *R. chalpensis* possessed antibacterial properties in methanol extract of different plant parts (leaves, flower, and stem) against highly pathogenic bacteria such as *S. aureus, E. coli* in addition to inhibiting the *in-vitro* growth of *C. albicans*.[7,8]

METHODS

Plant Sample Collection and Identification

An amount of 250 g of *R. chalepensis* plant greeneries was collected from the local markets of Baghdad, Iraq. The leaves, previously identified by National Herbarium of Iraq, were ready, dried, and set in the shadow at room temperature, then grounded and prepared for extraction.

Methanolic Abstraction

Some 30 g of punished plant leaves were balanced and allocate "thumble tube in soxhlet device. Aliquots " of 200 mL from methanol alcohol were used for extraction at 45°C for 7 hours; after that, the solvent was evaporated by rotary evaporator. The residue was put in an incubator at 37°C until the solvent fully disappeared. After that, the extraction was calm and weighed formerly diluted with distilled water to make the required concentrations, and then the extract was sterilized with "Millipore filter paper (0.22 mm).[9]

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DISEASES OF PINEAPPLE (*Ananas comosus*)

Pathogen, symptoms, infection, spread & management

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Pineapple is one of the most important fruit crops of Kerala. The pineapple originated in South America, where native people selected a seedless mutation from a wild species. It belongs to the family Bromeliaceae, many members of which are epiphytes living on trees and rocks. Pineapples grow in the soil and resemble epiphytes in that their roots are intolerant of poor soil aeration. 'Kew' of the smooth-leaf 'Smooth Cayenne' group and 'Mauritius' of the rough leaf 'Queen' group are the two varieties of pineapple grown in India. Diseases of pineapple are associated with fungi, bacteria, nematodes and viruses. Pineapple roots are adventitious and will not regenerate if damaged. Mealy bug wilt also affects the root system. Base rot and water blister are economically significant. Diseases such as Phytophthora fruit rot, pink disease, yeasty rot and marbling at times become significant warranting control measures though they occur infrequently and have only a minor effect on yield or fruit quality in general.

■ FUNGI ASSOCIATED DISEASES

■ PHYTOPHTHORA HEART (TOP) ROT

Pathogen

The oomycetes *Phytophthora cinnamomi* and *Phytophthora nicotianae*

Symptoms

- Plants of all ages are attacked, but three to four month old crown plantings are most susceptible.
- Fruiting plants or suckers on ratoon plants may be affected.
- The colour of the heart leaves changes to yellow or light coppery brown. Later, the heart leaves wilt (causing the leaf edges to roll under), turn brown and eventually die.

Plant collapse caused by Phytophthora heart rot

- Once symptoms become visible, young leaves are easily pulled from the plant, and the basal white leaf tissue at the base of the leaves becomes water-soaked and rotten with a foul smell due to the invasion of secondary organisms. The growing point of the stem becomes yellowish-brown with a dark line between healthy and diseased areas.

Infection and spread

Chlamydospores of the two species are the primary inoculum and they can survive in the soil or in infected plant debris for several years. They germinate directly to produce hyphae that are able to infect roots and young leaf and stem tissue, or indirectly to produce sporangia.

Phytophthora pathogens are soil inhabitants and require water for spore production and infection. As free water is required for producing sporangia and releasing motile zoospores, infection and disease development is exacerbated in soils with restricted drainage.