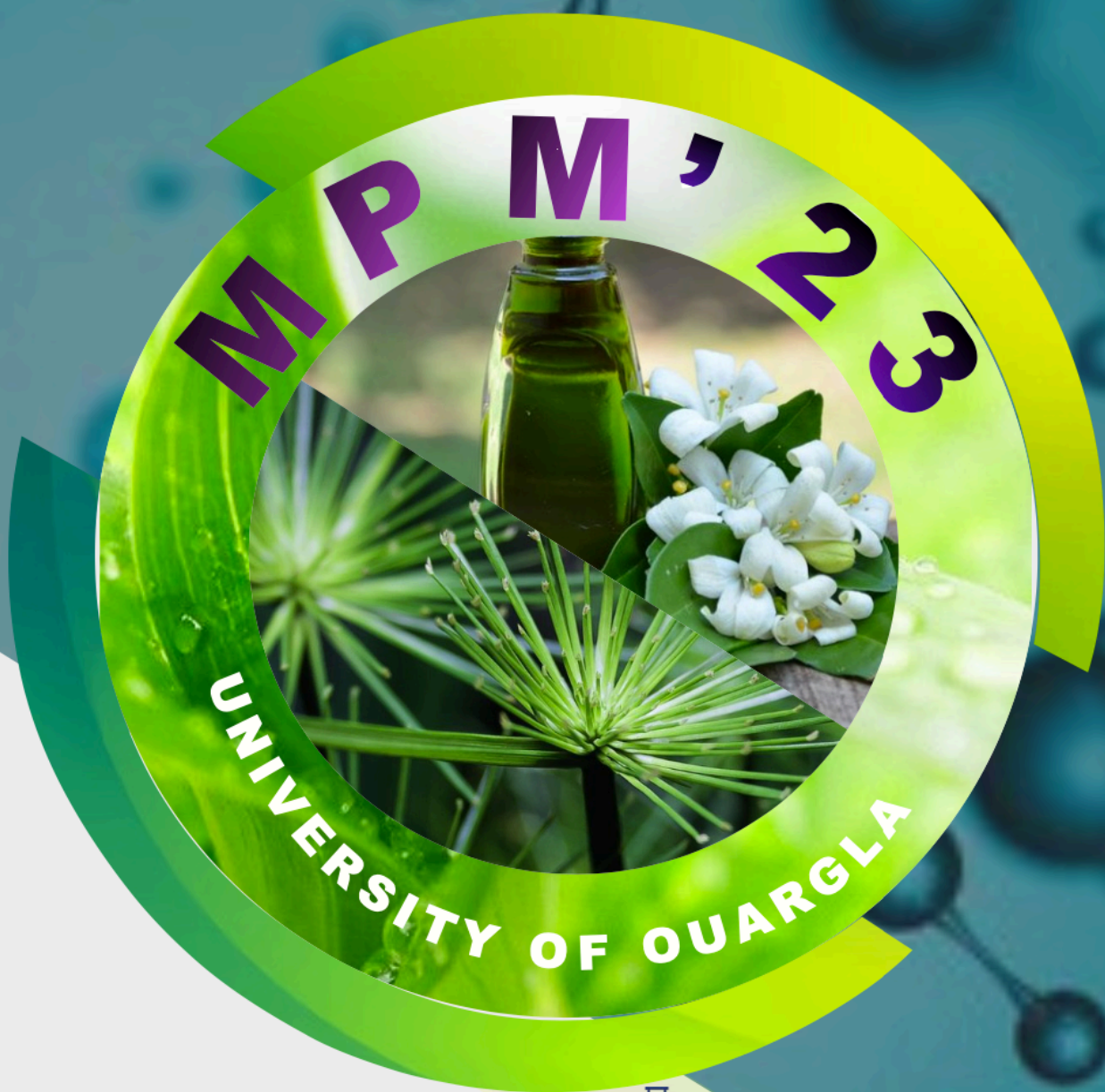




BOOK OF ABSTRACTS

THE FOURTH INTERNATIONAL CONFERENCE ON MEDICINAL
PLANTS AND MATERIALS (MPM'23).

21-23 NOVEMBER 2023



Phytochemistry & Medicinal Plant Laboratory



المعهد الوطني للأرصاد الفلاحية
INVA
National Institute of Agricultural Sciences



<https://mpm2023.sciencesconf.org/>

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DESCRIPTION

This book of abstracts is produced by the university of KASDI-MERBAH OUARGLA. it presents an overview on advancements and interdisciplinary collaboration in the synthesis, characterization, and processing of Medicinal Plants and Materials. It summarizes key discussions, research papers, and case studies, providing readers with insights into advancements in medicinal plant research. Finally, the book includes a large description of various aspects of Medicinal Plants and Materials Synthesis, Characterization, and Processing.

This book of abstracts presents a summary of results concerning technological and scientific advances in the Medicinal Plants sciences and are interested in the development of materials. The huge part of this book was devoted to Medicinal Plants and Materials Synthesis, Characterization, and Processing. It also covers an important topic in Materials Synthesis, and Medicinal Plants. offers as a strong cross-disciplinary collaboration among scientists where they can showcase and engage in discussions about the latest innovations, emerging trends, and relevant issues

KEY FEATURES

- Facilitates exchange of knowledge among academic scientists and researchers.
- Focus on various aspects of Medicinal Plants and Materials, including synthesis, characterization, and processing.
- Provides a platform to showcase the latest innovations in Medicinal Plants and Materials research.
- Emphasizes addressing and presenting practical challenges encountered in Materials Synthesis and Medicinal Plants.

TOPICS

Agricultural Practices; Essential Oils and Secondary Plant Metabolites; Industrial Processing Technologies; Production and Marketing; Natural Cosmetics; Traditional and Modern Herbal Product; Botany & Ethnobotany & Ethnopharmacology; Uses of plants in nanomaterials Production; synthesis et characterization de biomaterial; Synthesis, characterization and applications of new materials; Molecular Modeling and Simulations.

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BOOK OF ABSTRACTS

**OF The Fourth International Conference on Medicinal
Plants and Materials.**

LEVERAGING COMPUTATIONAL CHEMISTRY FOR BIOACTIVE MOLECULES DESIGN



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ABSTRACT: The field of designing bioactive molecules has undergone an immense revolution due to the application of computational chemistry, which has had a profound impact on how bioactive molecules are discovered and developed. In this article, we present the practical use of computational chemistry to the field of designing different bioactive compounds. Modern drug research and discovery rely heavily on computational chemistry because it makes it possible to predict and improve the molecular characteristics that are essential for bioactivity. In this talk, we will emphasize how using computational methods improves the accuracy and effectiveness of designing bioactive molecules, ultimately leading to breakthroughs in pharmaceutical research and therapies.

LE POUVOIR DES PLANTES ADAPTATION ET COMMUNICATION



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RÉSUMÉ: Les plantes ont le pouvoir de communication et d'adaptation pour améliorer leur survie et leur production en réduisant l'impact des herbivores. Elles peuvent recourir à diverses stratégies pour se défendre contre les dommages causés par les herbivores. Ces défenses peuvent être structurales ou mécaniques, basées sur des structures particulières comme les épines ou les trichomes ; soit chimiques par la production de métabolites secondaires. Ces défenses chimiques peuvent agir comme répulsifs ou toxines pour les herbivores ou diminuer la digestibilité des plantes.





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SOME HIGH-VALUE MOLECULES EXTRACTED FROM PLANTS: A RAPID OVERVIEW AND EXTRACTION METHODS

ABSTRACT: Plants have long been a valuable source of diverse compounds with significant economic and medicinal potential. This rapid review provides an overview of the extraction and characterization of high-value molecules derived from plants, highlighting their importance in various industries. These molecules encompass phytochemicals, essential oils, and bioactive compounds that serve as key ingredients in pharmaceuticals, cosmetics, and food products. The extraction methods, purification processes, and analytical techniques employed in isolating these compounds are discussed. Understanding the extraction and utilization of these valuable plant molecules is essential for researchers, industries, and policymakers aiming to harness the potential of nature's biore-sources while promoting sustainability and innovation.



SPEAKER: Pr. Mohamed Yousfi

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HERBAL CHROMATOGRAPHIC FINGERPRINTS IN THE SEARCH FOR NEW DRUGS: CASE STUDY OF PHENOLIC COMPOUNDS FROM PISTACIA ATLANTICA EXTRACT.

ABSTRACT : The vast majority of the pharmacological studies were conducted using uncharacterized crude extracts from various parts of the plant, possessing varying biological activities. Few to no pharmacological evaluations are done to date focusing on the biological effects of the phytochemical compounds isolated from *Pistacia atlantica* leaves. Noteworthy is that the link between activity and particular compounds is not clear, although, phenolic acids and flavonoids seem to play a major role. However, there are still significant gaps in the completeness of our understanding of the bioactivity, therapeutic value, and roles played in our traditional medicines by each of the numerous phytoconstituents of *P. atlantica*. Chromatographic fingerprints integrated with chemometric techniques provide the opportunity to move forward. Fingerprints are regarded to be more accurate representations of the complex chemical profiles of herbal species than focusing only on one or a couple marker molecules. The goal of this study was to provide the reader with an insight on the data analysis of chromatographic fingerprints, and it also demonstrated the potential value of the chemometric treatment of the chromatographic fingerprints as a screening tool for pharmacologically active constituents. When performing multivariate data analysis to chromatographic fingerprint data, pre-treatment techniques, such as column centering (CC), Standard Normal Variate (SNV) and Correlation Optimized Warping (COW) were utilized in order to acquire the appropriate information from the data. Furthermore, fingerprint data will be used to model the biological and antioxidant activities of extracts using a multivariate regression approach. The peaks potentially responsible for the extract's biological and antioxidant activities can be indicated by comparing the regression coefficients of the model with the chromatographic fingerprints.

Keywords: *Pistacia atlantica*, biological activity, chemometrics, chromatographic fingerprints, data analysis, multivariate calibration.

EFFECT OF NATIVE MYCORRHIZATION ON THE BEHAVIOR OF THREE VARIETIES OF ALFALFA (*MEDICAGO SATIVA L.*) UNDER WATER STRESS CONDITIONS



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Abstract: Water deficit and episodes of drought are considered to be the major obstacle to the development of fodder crops in Algeria, particularly in arid and semi-arid zones. However, plants such as alfalfa are characterized by their great capacity to resist major variations in the water content of their tissues. In order to overcome these constraints, symbiotic associations are well known for resisting stress conditions and improving nutrition and productivity in plants that are capable of simultaneously developing highly beneficial associations with both mycorrhizae and Rhizobium. This study focused on the mycorrhization-water deficit interaction in three alfalfa varieties (Siriver, Capitana and Hunter River) in the absence or presence of an native mycorrhizal inoculum, including the morpho-physiological response of *Medicago sativa* (L.) under water deficit conditions (30% of field capacity (F.C.), 50% of F.C., and 80% of F.C.). In the absence of mycorrhizal inoculation, water stress induced a reduction in fresh and dry aerial and root biomass, a decrease in root length and relative water content, and a decrease in chlorophyll a, b, total chlorophyll and xanthophyll carotene levels in all three varieties. The severe water deficit (30% of F.C.) caused a reduction in leaf area, and consequently in stomatal density and stomatal index in the three inoculated varieties. In contrast, it caused an increase in proline content in the Capitana variety. In this study, it is clear that mycorrhization greatly improves the growth of the plants tested. Mineral element concentrations in plant parts were significantly higher in mycorrhized samples, indicating an important role for mycorrhizae in the water nutrition of this plant species. This shows us that colonization of the roots by the spores of endomycorrhizal fungi contributed to improving the plant's water status and, consequently, the productivity of alfalfa. In the absence of mycorrhizal inoculum, the Capitana variety was more tolerant than Siriver and Hunter River

Key Words: Alfalfa, Morpho, physiological response, Native mycorrhization, Water deficit, Productivity.



Enquête ethnobotanique de *Teucrium polium* L. dans la region de Biskra (Nord,Àest algérien).

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Abstract : L'usage des remèdes à base de plantes fait partie intégrante de la culture d'une population. L'Algérie est l'un des pays méditerranéens ayant une remarquable richesse floristique liée à la diversité de ses écosystèmes, la région de Biskra particulièrement connue par l'utilisation des plantes médicinales, plusieurs études antérieures ont fourni d'importantes informations quant à la place de la phytothérapie dans la médecine traditionnelle de la région. En vue d'évaluer l'intérêt et l'usage de *Teucrium polium* L., une enquête ethnobotanique a été réalisée durant la période de mai 2022 suite à la confection d'un questionnaire et qui a permis d'interroger cinquante personnes choisies au hasard, dans la région de Biskra. *Teucrium polium* L. est utilisée selon la grande majorité dans le traitement des plaies. Toutes fois, elle est utilisée dans le traitement des maladies gastriques (Ulcère gastriques et gastritis...). L'enquête ethnobotanique menée dans la région de Biskra a révélé que la totalité des personnes interrogées soit 100%, connaissent la plante et soulignent à l'unanimité l'excellence de l'efficacité thérapeutique du *Teucrium polium* L.

Key Words: *Teucrium polium* L, enquête ethnobotanique, Nord, est algérien, phytothérapie.



ETUDE PHYTOCHIMIQUE D'UNE CISTACEAE

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Abstract: La famille des Cistaceae comprend 200 espèces réparties en huit genres. Le genre *Helianthemum* fait partie des genres les plus importants de cette famille. Les espèces de *Helianthemum* sont fréquemment utilisés en médecine traditionnelle pour leurs diverses propriétés thérapeutiques : cicatrisants, gastro-protecteurs, antihémorroïdaires, antiseptiques, antifongiques, anti-inflammatoires, antidiarrhéiques et anti oxydantes. Cependant, à notre connaissance, très peu d'études consacrées à la composition chimique du genre *Helianthemum* sont rapportées dans la littérature. Les études menées sur quelques espèces de ce genre ont montré que les composés phénoliques sont très abondants. Notre étude phytochimique de l'extrait semi-polaire d'une espèce endémique du genre *Helianthemum* a permis l'isolement d'une série de composés phénoliques dont quatre appartenant à la famille des flavonoïdes. L'identification structurale a été générée par l'analyse des données spectrales obtenues par les méthodes spectroscopiques RMN mono et bidimensionnelles (COSY, HSQC, HMBC et NOESY), par la spectrométrie de masse (ESI-MS et HR-ESI-MS), UV et IR, et par la mesure du pouvoir rotatoire.

Key Words: Cistaceae, *Helianthemum*, RMN, flavonoïdes.



Determination of the antioxidant activity by chemical and electrochemical methods of *Launaea resedifolia*'s Water fraction from the Algeria Sahara.

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Abstract: The aim of this study is evaluating the antioxidant activity of the *Launaea Resedifolia* aerobic parts' extract, which grows in Bashar region (Algeria). the antioxidant properties of Water fraction of *L. resedifolia* has been estimated using the chemical and electrochemical methods. Where the chemical method is the superoxide scavenging assays, while the electrochemical method is the cyclic voltammetry assay. Further, both methods depend on the inhibition of superoxide anion radical. The results indicate that the extract showed a good inhibition of superoxide anion radical with an amount of $I\% = 75,7575 \pm 5,2486 \%$ in chemical method and $IC_{50} = 3.5858 \text{ g/l}$ in electrochemical method.

Key Words: *Launaea resedifolia*, Antioxidant activity, superoxide, cyclic voltammetry.



EVALUATION DE L'ACTIVITE ANTIBACTERIENNE DE QUELQUES EXTRAITS D'HYOSCYAMUS MUTICUS

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Abstract: Les plantes médicinales ont toujours été une source thérapeutique importante tout au long de l'évolution humaine grâce à des molécules actives qu'elles contiennent. *Hyoscyamus muticus* est une plante médicinale appartenant à la famille des solanaceae, elle est utilisée en médecine traditionnelle dans le Sahara Algérien (1). Le but de notre travail est d'étudier la composition biochimique de quelques extraits de feuilles d'*H. muticus* et d'évaluer leurs activité antibactérienne. Deux techniques d'extraction ont été utilisées dans notre étude : l'hydrolyse acide à chaud (2) et l'extraction par reflux. Les différents tests de screening phytochimique utilisés ont montré la présence des composés phénoliques, des tanins, des saponosides et des glycosides cardiaques. L'analyse quantitative a permis de déterminer la teneur en polyphénols dans l'extrait méthanolique ; concernant les aglycones flavoniques une teneur de 2 mg/g MVS a été notée quant aux anthocyanes une teneurs 1,21 mg/g MVS a été déterminée. L'analyse semi-qualitative des extraits obtenus par la technique chromatographie sur couche mince en utilisant trois systèmes d'élution ont permis d'identifier partiellement quelques composés phénoliques et acides gras. L'activité antibactérienne des extraits de notre plante a été évaluée par la méthode de diffusion sur disques en milieu gélosé par rapport à cinq souches pathogènes. Les résultats obtenus montrent que l'extrait d'éther de pétrole possède la meilleure activité antibactérienne vis-à-vis de toutes les souches testées.

Key Words: *Hyoscyamus muticus*, extraits, screening phytochimique, CCM, activité antibactérienne



ÉVALUATION IN VITRO DE L'ACTIVITE ANTI-INFLAMMATOIRE DE L'HUILE ESSENTIELLE DE ROSMARINUS OFFICINALIS DE LA REGION DE TLEMCCEN

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Abstract: Les plantes médicinales aromatiques sont depuis longtemps à la base de la médecine traditionnelle dans le monde à diverses fins, y compris le traitement des maladies inflammatoires et infectieuses, en raison de leur utilisation potentielle pour améliorer la santé. La recherche sur les plantes représente un potentiel inestimable pour la découverte de nouvelles substances aux capacités anti-inflammatoires. Par conséquent, les huiles essentielles en tant que source potentielle de molécules bioactives naturelles ont commencé à attirer une large attention. C'est dans ce contexte que s'inscrit notre travail qui a pour but principal la valorisation de l'huile essentielle de Rosmarinus officinalis de la région de Tlemcen, afin de trouver de nouveaux produits naturels alternatifs aux médicaments synthétiques pour traiter diverses affections telles que les inflammations. L'objectif envisagé dans ce travail repose sur deux volets complémentaires : un premier volet chimique qui vise l'étude de la composition chimique, de l'huile essentielle par chromatographie en phase gazeuse, et un deuxième volet biologique basé sur l'étude des propriétés anti-inflammatoire in vitro de l'huile essentielle de Rosmarinus officinalis par la méthode de l'inhibition de la dénaturation de protéine d'œuf. L'huile essentielle de Rosmarinus officinalis est caractérisée par la présence du 1,8-cinéole (15,4 %), le camphre (15 %), le bornéol (12,7 %), l_ -pinène (11 %) et le verbénone (10,7 %) comme constituants majoritaires. Par ailleurs, nous avons constaté que l'huile essentielle a montré un effet anti-inflammatoir

Key Words: Rosmarinus officinalis, huile essentielle, Activitéanti, inflammatoire, Diclofénac.

Evaluation of analgesic and anti-inflammatory activities of *Warionia saharae* essential oil

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Abstract: *Warionia saharae* Benth & Coss (W.s) (Asteraceae) is a monospecific genus endemic to Algeria and Morocco. Its leaves are used in their traditional medicine, such as gastrointestinal and inflammatory diseases; for instance, rheumatoid arthritis treatment. In this work, our team investigated the antiinflammatory and analgesic effects of essential oil extracted from the dried upper parts of *Warionia saharae* based on different standard experimental test models. The analgesic activity was assessed by central and peripheral models, such as “hot plate” and “writhing” tests on Swiss albino mice. The hot plate test used latency measurements to assess acute cutaneous pain sensitivity, as a result; the latency of the hind-paw pain response was by licking and either shaking or jumping, those occurrences were recorded. Writhing test as a chemical method used to induce pain of peripheral origin in mice by injecting acetic acid intraperitoneally (IP). This results in characteristic stretching behavior of the animals (cramps and contortions). The evaluation of the analgesic activity, shows that the essential oil of this plant induces a decrease in the number of abdominal cramps in the contortion test and a maximum inhibition of pain. As for the anti-inflammatory effect, it was studied by the “paw edema” test, a phlogogenic agent (formaldehyde) was used to stimulate inflammation in the paws of mice. Anti-inflammatory properties can be observed by inhibiting this edema compared to the standard drug Diclofenac. In conclusion, *Warionia Saharae* essential oil (75 mg/kg) showed a strong antiinflammatory and analgesic activities which supports the conventional use of this plant in traditional medicine.

Key Words: analgesic effects, anti, inflammatory effects, essential oils, medicinal plants, Swiss Albinos mice, *Warionia saharae*



Evaluation of chemical compounds of Heart of Phoenix dactylifera L. extracts in southeast Algeria

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Abstract: The inner core of the date palm (*Phoenix dactylifera* L.), known as the Heart of Phoenix dactylifera L. (HPd), is a valuable source of dietary components such as fibers, proteins, sugars, healthy fats, and essential minerals. Additionally, it contains phenolic compounds that are responsible for a range of nutritional and health benefits. This research aims to investigate the chemical composition of HPd, also referred to as "Al-Jammar," from the southeastern region of Algeria. The study focuses on two date palm cultivars, namely "Deglet Nour" and "Talaa Al-Dakar," utilizing analytical methods like Atomic Absorption Spectrophotometry (AAS) and Scanning Electron Microscopy (SEM). Results from the AAS analysis demonstrate the presence of various minerals in both cultivars, including Magnesium (Mg), Silicon (Si), Potassium (K), Iron (Fe), Boron (B), Calcium (Ca), Zinc (Zn), and Cadmium (Cd). Notably, the concentrations of these minerals vary between the "Deglet Nour" and "Talaa AlDakar" cultivars. Furthermore, the study involves the extraction and quantification of phenolic compounds from HPd. This is complemented by estimating the content of sugars and proteins using the UV-Vis spectroscopic method (UV-Vis). To assess the biological activity of these compounds, techniques such as Gas ChromatographyMass Spectrometry (GC/MS) will be employed. This comprehensive approach aims to evaluate and characterize the antioxidant and anticancer potential of the extracted compounds.

Key Words: the date palm, the Heart of Phoenix dactylifera, phenolic compounds, the biological activity.



Evaluation of the phytochemical and antioxidant activity of the methanolic extract of *Fagonia glutinosa* Del. from Ghardaia (Algeria)

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Abstract: *Fagonia glutinosa* Del. known by its vernacular name "Cherrik" is a medicinal plant in the Zygophyllaceae family, widespread in Saharan regions and widely used in traditional Algerian medicine. The present study aims to investigate the phytochemical and antioxidant activity of the methanolic extract of this plant. The results of the phytochemical analysis showed the plant is rich in total polyphenols ($131.64 \pm 3.50 \mu\text{g}/\text{mg}$ EAG/mg Ex) and total flavonoids ($16.86 \pm 0.23 \mu\text{g}/\text{mg}$ EQ/mg Ex). Antioxidant capacity was assessed using the DPPH, ABTS free radical scavenging and FRAP iron reduction methods. The obtained results revealed higher anti-free radical capacities towards DPPH and ABTS radicals, respectively ($144.48 \pm 2.48 \mu\text{g}/\text{mL}$ and $20.67 \pm 0.94 \mu\text{g}/\text{mL}$). On the other hand, the FRAP test revealed that the methanolic extract had a higher reducing power ($A_{0.5} = 88.06 \pm 0.36 \mu\text{g}/\text{mL}$). In conclusion, the methanolic extract of *Fagonia glutinosa* Del. has powerful antioxidant activities, which support its use in traditional medicine.

Key Words: *Fagonia glutinosa* Del., Methanolic extract, Polyphenols, Flavonoids, Antioxidant activity.



Identification structurale d'un composé flavonique de la plante *Cynodon Dactylon* (L) Pers de la région d'Ouargla

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Abstract : La Phytochimie est devenu l'objectif d'un grand nombre des recherches chimique, Afin de contribuer au développement des ressources naturelles, en particulier plantes médicinales utilisés depuis l'Antiquité jusqu'à nos jours dans le traitement de plusieurs maladies. De ce point de vue, nous avons traité dans cette étude une des plantes vivaces existante dans la plupart des régions, nommé Chiendent « *Cynodon dactylon* (L) Pers ». Nous nous sommes concentrés dans ce travail sur l'étude d'une classe particulière qui sont les « Hétérosides Flavoniques » Où on a déterminé le taux de ces dernier et définir la structure de quelque composés flavoniques séparé à partir des extraits de la plante *Cynodon dactylon* « L » Pers, récolté a une des exploitations de la région de Ouargla. L'analyse a été effectuée par différentes techniques telle que la chromatographie sur couche mince (CCM), la chromatographie d'adsorption sur la colonne (CC), la spectrophotomètre UV-visible et la chromatographie en phase liquide couplé avec la spectroscopie de masse (LC MS/MS).

Key Words: BENZAHI Khedidja, DELLALI Rchid, ZORAI Ameer, BENZAHI Rabia, LABED Brahim

Phytoconstituant identification and biological activities of the aerial part of *Genista saharae* (Coss & Durr).

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Abstract: *Genista saharae* is an endemic plant belonging to the Algerian Sahara and widely used in traditional medicine for the treatment of various diseases. This work was established in order to valorize this plant by studying her phytochemical profile and evaluating the antioxidant potential in-vitro of the chloroformic extract obtained from the hydromethanolic infusion crude extract. The total polyphenols, flavonoids and tannins were analyzed by methods of Folin-Ciocalteu [1], aluminum trichloride [2] and vaniline. The chemical compositions of aerial part of *G. saharae* extract was analyzed by the high performance liquid chromatography and characterized with ¹H and ¹³C NMR. The antioxidant activities were evaluated using hydrogen atoms and single electron transfer. The phenolic content assays demonstrate that the chloroformic extract contain the highest amount of polyphenols, flavonoids and tannins. The chemical analysis revealed the presence of phenolic acids, hydroxycinnamic acid and flavonoids illustrated by the presence of flavonol, isoflavane and flavanones. However, the NMR spectroscopy allowed the characterization of genistein structure. The antioxidant assays revealed that chloroformic extract exhibited a potent antioxidant activity with a IC₅₀DPPH = 122 ± 1.51 µg/mL ; IC₅₀ABTS = 4.31 ± 0.01 µg/mL ; EC₅₀FRAP = 86.22 ± 1.35 µg/mL. The obtained results suggest the possibility that *G. saharae* plant can be further developed as a potential disease-curing remedy.

Key Words: *Genista saharae* (Cos & Durr), HPLC, NMR ¹H ¹³C, antioxidant activities, DPPH, ABTS.



The phytochemical composition of the plant *Periploca laevigata* and a study of its effectiveness on oxalocalcic stone crystallization

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Abstract: This study focuses on the evaluation of the medicinal properties of locally used plants in Metlili area for the treatment of kidney stones, a condition affecting many individuals due to factors such as poor dietary habits, genetics, and the quality of drinking water [1]. In this research, we analyzed the chemical composition of the *Periploca laevigata* [2] plant and identified the presence of tannins, saponins, sterol recovery compounds, triterpenes, as well as a substantial amount of flavonoids 29.17 ± 0.64 mg EAG/g MS and polyphenols 14.02 ± 0.17 mg EAG/g MS. Following this analysis, we investigated the efficacy of *Periploca laevigata* plant extracts in inhibiting the formation of calcium oxalate crystals through various methods, Turbidimetric method, gravimetric method, and microscopic observation. Our findings were particularly noteworthy when compared to a standard drug, with inhibition rates of 10.5%, 25.73%, and 65.1% for concentrations of 0.5 mg/ml, 1 mg/ml, and 1.5mg/ml, respectively 69% with the drug, using the turbidity method. In terms of mass loss, we observed 5.73% and 10.15% for calcium oxalate stones and uric acid stones, as opposed to 6.88% and 11.3% with the drug. Furthermore, microscopic observation revealed a significant reduction in the formation of calcium oxalate crystals. These results are highly promising and suggest the potential of using this plant in the treatment of kidney stones, warranting further research in this area.

Key Words: medicinal plants, Metlili, *Periploca laevigata*, kidney stones.



COMPUTATIONAL DETAILS OF MOLECULAR STRUCTURE, SPECTROSCOPIC PROPERTIES, TOPOLOGICAL STUDIES AND ANTIBACTERIAL ACTIVITY AGAINST ESCHERICHIA COLI MOLECULAR DOCKING SIMULATION OF 2-4- NAPHTHOQUINONE DERIVATIVES

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Abstract: Computational tools in investigating of spectral heterocyclic compounds ranges based on aryloxy-1,4-naphthoquinone, take some importance in identifying their molecular and electronic behavior. Molecular structure of three heterocyclic aryloxy-1,4- naphthoquinone derivatives was studied at DFT/B3LYP/6- 31G (d,p) level in ethanol solvent[1]. Spectroscopic properties such Infrared (IR, ¹H NMR and ¹³C NMR) and ultraviolet–visible (UV–VIS) analyses were computed. Some quantum and reactivity parameters (HOMO energy, LUMO energy, energy gap, ionization potential, electron affinity, chemical potential, global softness, lipophilicity) were studied, also molecular electrostatic potential (MEP) was performed to indicate the reactive nucleophilic and electrophilic sites. Topological analysis using reduced density gradient (RDG) was discussed. To predict the relevant antibacterial activity of the reported heterocyclic compounds, molecular docking simulation An Autodock vina was applied to explore the interaction of the designed molecules with the protein (PDB code: 4WUB). We used Discovery Studio 2021 software to visualize the types of interactions that were created. The hydrogen bonding interactions were evaluated from molecular docking with different strength for each ligand compound to discuss the efficiency of heterocyclic ligands toward antibacterial inhibition.

Key Words: Molecular Simulation, Molecular Docking, Aryloxy, 1, 4, naphthoquinone, Antibacterial Activity



MYCORRHIZATION EFFECT ON THE BEHAVIOR OF THREE ALFALFA VARIETIES (*Medicago sativa* L.) SUBJECT TO PHOSPHORUS DEFICIENCY CONDITIONS

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Abstract: The aim of the study is to evaluate the effect of mycorrhization with arbuscular mycorrhizal fungi (AMF), on the response of three varieties of *Medicago sativa* L. to phosphorus deficiency. For this purpose, plants were used in two regimens: with or without mycorrhizal inoculum, and with or without phosphorus amendments. The effects of mycorrhizae on the mineral nutrition, growth parameters of plants and the rhizospheric soils chemical properties were evaluated. The obtained results showed that the phosphorus deficiency affected negatively growth parameters. For all varieties, the lowest values were recorded in mycorrhized-free plants regardless of phosphorus supply, while the mycorrhized plants that got phosphorus intakes recorded the greatest values of the nutritional metrics and the growth parameters except for root length where the highest values were recorded in uninoculated control plants that did not receive phosphoric amendment and the shortest roots were recorded in mycorrhized plants growing on P-efficient soil. Phosphorus supplementation with mycorrhizal fungi inoculation also contributed to improving soil fertility, with increases of the amount of available phosphorus and reducing the pH values. The results may be a useful extension of our knowledge on the interaction between plants and AMF in view of their possible applications as biofertilizer to improve plant growth and enhance P uptake in poor soils that affects yields.

Key Words: Arbuscular mycorrhizal fungi (AMF), Growth, Mineral nutrition, *Medicago sativa*, Phosphorus, Inoculation



Physicochemical and microbiological characterization of the by-products of ethanol extraction process from dates not fit for human consumption.

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Abstract: With appropriate techniques, agricultural wastes can be recycled to produce an important source of energy and natural fertilizer for crops.. Our research aims to study some characteristics of some samples of the by- products of the ethanol extraction process from palm residues (dates not fit for human consumption) which produced in AMETNA factory in Biskra. The physico-chemical and microbiological analyzes of samples were done during the period of two months (from 07/03/2023 to 15/05/2023). The results revealed that the by-products can used as a good fertilizer. Also, the EC, the pH and the OM values were within the permitted range of the United Arab Emirates and free from pathogens. Moreover, applying these samples in the agriculture by adding them to soil showed good results.

Key Words: liquid fertilizer. Bioethanol. Anaerobic fermentation. Palm tree. Date waste



Study of the agricultural production system in semi-arid regions, Yabous case study (Khenchela)

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Abstract: This research was conducted with the primary aim of identifying the prevailing production systems in the semi-arid Yabous region. This area is seen as having significant potential for agricultural production within the Khenchela province. The research methodology entailed the formal surveying of agricultural farms, with a total of 42 farms included in the study. The results obtained highlight substantial agricultural development in the region, making a noteworthy contribution to both the local and national economies. The descriptive assessment of these farms revealed their small scale, typically not exceeding 7 hectares, primarily due to the challenging terrain. These farms heavily rely on family and seasonal labor and possess limited equipment. Additionally, it was observed that the majority of farm owners are young but have a lower level of education, suggesting prospects for the region's ongoing development. Statistical analysis (PCA and CAH) of the data underscored the dominance of three production systems in the region: System I, an older mixed system with average-sized plots known for their high diversity, but featuring limited equipment and a reliance on family labor. System II, a more recent apple orchard system characterized by small plots located in the northern and central areas of the region. System III, an established apple orchard system with medium to large plots, well-equipped, and utilizing a mix of family, seasonal, and permanent labor. However, despite this reasonably positive situation, agricultural production in the region remains underdeveloped, primarily due to various constraints, especially of a technical and economic nature. Consequently, it is imperative to address the challenges encountered and counteract factors that may impede the sustainability of these production systems through the integration of new technologies for managing natural and agricultural resources.

Key Words: Production system, Yabous, Typology, Exploitation, Semi, arid.



TRACE CONTAMINATION OF ALGERIAN VIRGIN OLIVE OIL PRODUCED USING GOOD AGRICULTURAL PRACTICES

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Abstract: Owing to its important nutritional features, virgin olive oil became one of the highest-value products, mostly manufactured in Algeria as in other Mediterranean countries. Virgin Olive Oil can be extracted from the olive paste using different extraction systems, including pressure, centrifugation, and percolation, therefore, their composition strictly depends on the extraction technologies, usually employed. However, in spite of the application of good harvesting practices, from extraction of the juice to bottling for eventual storage its production exerts several negative environmental effects were identified. The packaging material for virgin olive oil was chosen using its resistance to breaking as well as the clarity in order to show the color which considered as critical parameters of good quality. Admittedly, food contact materials are covered by the European regulation N°10/2011, which established the list of authorized compounds for use in their formulation, but the raw material is imported in the form a mixture whose exact composition is unknown, however, it has been demonstrated that packaging contains various substances such as additives and monomers but also non-intentionally added substances coming mainly from three sources: interaction between constituents of the packaging material, degradation processes and impurities of the raw materials. Thus, our finding focused on evaluating the contamination levels of olive oil during storage. We have used a high chemical quality of extra virgin olive oil with the respecting good agricultural practices from the tree to bottling step and stored them at room temperature during one year. The material tested can absorb water at $0.51 \pm 0.11\%$ to $0.65 \pm 0.09\%$, and can lose at 105°C after evaporation 0.33 to 0.53%.The rate of ash is established and analyzed, and some metals are identified in oil by the comparison between the results obtained by the spectroscopy of atomic absorption and the microanalysis. The global migration was calculated by determination the weight of specimens before and after 10 days of contact with the oil at 40°C and the amount of absorbed oil. The absorbed oil was determined by gas chromatographic analysis. The results of these determinations guided us to follow the migration from containers to oil during storage. The lowest migration is recorded in oil while no significant difference ($p \leq 0.05$) was found, and the amounts of specific migration conform to European Union legislation that identifies specific migration limits, whereas the rate of the total migration is relatively high. Further investigation will be needed to better explain this contamination and these results of interaction. Therefore, due to olive oil's nutritional and economic values, it might be useful to investigate their feasibility in order to apply the good practices agricultural and its environmental impacts, mainly related to the agricultural phase as the use of fertilizers, pesticides.

Key Words: Extra Virgin olive oil, Good Agricultural Practice, Packaging, Contamination, Safety and Quality.



Use of desert local plant (Tamarix) filter to purify wastewater

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Abstract: The objective of this study is to demonstrate work to purify civilized wastewater by a filter For: Tamarix Party Plant for Sex Physical and electrical media, in relative capacity for wastewater purification in two long tubes 50 cm and 30 cm. For water treated with tartar plants and was better than purification yields in Tubin Where the highest ratios achieved purification returns in physical media in the treated tubes of the elements next (electric conveyor 81.88%, Dissolved Oxygen 84.64%). While the other physical media were in convergent proportions, it was not greater than it was in purification revenues with Witnesses in all cases. Finally, the plant has proven its efficiency and ability to achieve the desired specifications of wastewater purification for the way to reduce the proportion of our bacteria, contaminants and pathogens. Here, it can be used in watering Trees such as ornamental trees (and within permissible limits that have the capacity to withstand salinity and technical support) From the processing of its affirmative cost lower compared with other processing techniques.

Key Words: Purify, Wastewater, Treated, Tamarix.



INTERETS DE L'EMPLOI D'UN BIOCOAGULANT NATUREL DANS LA CLARIFICATION D'UNE EAU RESIDUAIRE DE LAITERIE

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Abstract: L'objectif de cette étude, est de clarifier par coagulation/floculation une eau résiduaire d'une laiterie industrielle locale à moindre coût en testant seuls et en mélange : un biocoagulant (cactus en poudre) et un coagulant chimique couramment employé en traitement des eaux à savoir le sulfate d'aluminium. L'étude de l'influence de paramètres opératoires comme la concentration de coagulant chimique ou biocoagulant, la turbidité initiale etc., a été réalisée. Les résultats ont montré, qu'en absence de sulfate d'aluminium et en présence de 0,05g/L de cactus en poudre, le taux de clarification des eaux résiduaires de laiterie est de 35%. L'ajout de sulfate d'aluminium dans l'eau à traiter à 0,2g/L augmente indéniablement le taux de clarification à son haut niveau soit à 91%. Il est noté que sans l'emploi de biocoagulant la concentration en sulfate d'aluminium aurait été de 0,3 g/L. Ces résultats montrent l'intérêt de mélanger un biocoagulant naturel comme la poudre de cactus afin de réduire le coût opérationnel du traitement de clarification d'une part et de réduire le l'inconvénient sanitaire de l'emploi du sulfate d'aluminium seul et à forte concentration d'autre part. Mots clés : Cactus, Sulfate d'aluminium, Clarification, Coagulation, Eaux, laiterie.

Key Words:



Chemical Characterization of Essential Oils from Algerian *Juglans regia*.L Leaves Obtained Using Different Extraction Methods in Different Months

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Abstract: *Juglans regia* L. is widely studied for its traditional therapeutic applications as anticancer, diuretic, anti-inflammatory and laxative agent. It is a rich source of antioxidants as phenolics and flavonoids. [1]. The aim of this study is to investigate widely the phytochemical volatile profile of *J. regia* leaves cultivated in Algeria, many extraction methods were used in different months of their presence in the tree. An advanced hydrodistillation; microwave-assisted hydrodistillation (MAHD) and conventional hydrodistillation (HD) were conducted to extract the essential oil from the leaves of *J. regia* harvested during four different months. All samples were analyzed using GC–FID and GC/MS. Large quantitative variation in the composition of the different oils was showed. The monthly change in the content of the main constituents of the essential oil was irregular. Sesquiterpene hydrocarbons constitute the major portion for almost all oils, with a maximum of 77.23% in the oil extracted using MAHD in May and the minimum of 37.64% in the oil extracted using SDPS in May too, except for oil extracted with HD in May, June and July, where the monoterpene hydrocarbons were the dominant class with 43.45%, 60.03% and 55.85% respectively.

Key Words: *Juglans regia* L, month, essential oil, GC/MS, sesquiterpene and monoterpene



IN VITRO SUN PROTECTION FACTOR OF TWO ECOTYPES OF LAWSONIA INERMIS LINN EXTRACTS AND ESSENTIAL OILS.

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Abstract: The rapid growth of commercially available products containing sunscreens indicates that even though a suntan is still desired, people are conscious of the possible dangers of photoaging and skin cancer, occurring because of sun overexposure. This study focused on the evaluation of in vitro Sun Protection Factor (SPF) of aerial part's extracts and leaves essential oils of two ecotypes of *Lawsonia inermis* Linn (Lythraceae) from Biskra and Adrar. To prepare the extracts collected vegetable material was air-dried, powdered and macerated in different solvents. The filtrate was evaporated to dryness and subjected to preliminary phytochemical analysis. In the other hand these essential oils were prepared by hydro-distillation method. The concentration aerial part and the essential oils were compared with a solution of a sun protection cream vichy with a concentration of 2.0 mg/mL that prepared in methanol. The absorbance of each sample was determined in triplicate by spectrophotometry in the range of 290–320 nm, at 5 nm intervals, using methanol as the blank. The SPF values were calculated using the Mansur-equation. Total polyphenols Alkaloids, flavonoids, tannins, saponins, terpenoids, were qualitatively observed. The highest SPF of the extracts were 43, 05±0, 37 with methanolic extract. Since the presence of profound sun screening activity, this would offer an exciting avenue for further research towards the development of herbal sunscreens of high importance especially for the people living in tropical countries.

Key Words: *Lawsonia inermis*, Photoprotective, Sun Protection Factor, UVB Radiation.



PHENOLIC COMPOUNDS OF BEE POLLEN RECOLTED BY APIS MELLIFERA FROM SOME SAHARAN MEDICINAL PLANTS AND THEIR ANTIOXIDANT ACTIVITIES

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Abstract: The goal of this study was to describe pollen gathered by bees from Saharan medicinal plants. Bee pollen is widely used as a dietary supplement depends to a large extent on its chemical composition, which varies according to the botanical and geographical origin of the pollen grains. Using colorimetric techniques, the concentration of phenolic and flavonoidic substances was quantitatively determined. Utilizing LC-MS/MS, the phenolic component profile was also assessed. The biological processes, including the assays for antioxidant activity (DPPH test (1), FRAP assay (2), and b-carotene bleaching procedure (3)), were then carried out. The ethanolic extract obtained contains high levels of phenolics and flavonoids (95.23 ± 0.054 mg EAG/100 g ; 52.08 ± 0.6 mg EQ/100g) . Furthermore, LC-MS-MS phenolic profile analysis identified the presence of 10 chemicals composition and the major compounds are phenolic acids. Antioxidant levels in the pollen extract tested equal $IC_{50} = 0.9 \pm 0.08$ mg/ for the DPPH test, 2.252 ± 0.04 mg/mL for FRAP and 0.737 ± 0.062 and 7.428 ± 0.09 mg/mL for the β -Carotene. These results should help establish better quality control criteria for saharan honeybee pollen and its potential use as a functional ingredient.

Key Words: Pollen extract, Phenolic compounds, DPPH test, FRAP test, β -Carotene activity



PHYTOCHEMICAL SCREENING, ANTIOXYDANT ACTIVITY AND ACUTE TOXICITY OF LEAVES EXTRACT OF *Pergularia tomentosa* L., Asclepiadaceae

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Abstract: *Pergularia tomentosa* L. is a very common Asclepiadaceae in the Algerian Sahara. This study aims to extract and quantify phenolic compounds from the leaves of *Pergularia tomentosa* L as well as to assess their antioxidant activity and acute toxicity. Phytochemical screening has been occurred by standard reactions. The antioxidant activity of the extract was determined by the DPPH method. An acute oral toxicity study was conducted on Balb/c mice. The Phytochemical screening revealed the presence of carbohydrates, lipids, proteins, cardiotoxic heterosides, polyphenols, flavonoids, tannins, and alkaloids in the leaves of *Pergularia tomentosa* L. The content of condensed tannins was 81,100 µg ECT/g MS while the content of flavonoids was 27,150 µg ER/g MS. The extract showed a high scavenger power (IC₅₀=0.006mgEAA/ml) compared to vitamin C used as standard (IC₅₀=0.081 mgEAA/ml). The acute toxicity study conducted on BALB/c mice showed no mortality at an extract dose of 5000mg/kg. However, it was associated with some toxicity signs (reduced movements, lying posture, complete eye closure) and a significant decrease in water consumption (p =0.045) and in organ weight (liver, p = 0.048). The leaves of *Pergularia tomentosa* L. could be used as a source of antioxidant substances that might be exploited in cosmetic and dietary industries.

Key Words: phenolic compounds, *Pergularia tomentosa* L., acute oral toxicity in vivo, antioxidant activity



Phytochemical study and evaluation of the antibacterial activity of the endemic medicinal plant *Bunium incrassatum*

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Abstract: Among the medicinal plants recorded with the local populations is *Bunium incrassatum* locally known as Talgouda, an endemic plant from the Apiaceae family of the North of Algeria. In order to provide evidence of the extent of its use by the local population of Ghardaïa and some of its biological activities, a study of some phytochemical characteristics and anti-bacterial activities were carried out. An ethnobotanical survey reached a sample of over 292 people of the two sexes, ages and regions. The survey showed that almost the entire local population uses medicinal plants to treat of at least two diseases. And about 70.55% of people generally use Talghouda to treat angina. Phytochemical screening revealed the presence of various secondary metabolites such as tannins, terpenoids, coumarins, steroids and reducing compounds. This richness in phytochemicals is confirmed by the yields of aqueous, methanolic, ethanolic extracts and essential oils which gave yields of 22.25%, 20.93%, 8.18% and 0.66% respectively. Antibacterial activity was demonstrated by the agar diffusion method. Five referenced bacterial strains were tested: *Micrococcus luteus*, *Staphylococcus aureus*, *E. coli*, *Pseudomonas aeruginosa* and *Streptococcus* sp. The results showed that all tested bacteria were sensitive to the different extracts with maximum inhibition zone was observed on *Pseudomonas aeruginosa* (30.33mm) by the methanolic extract. The obtained results help to prove Talgouda's efficacy in inhibiting the growth of certain pathogenic bacteria. This explains the extensive use of Talgouda by the local population treating angina.

Key Words: *Bunium incrassatum*, Talghouda, ethnobotanical survey, phytochemical analysis, antimicrobial activity, secondary metabolites.



METHOD DEVELOPMENT FOR THE DETERMINATION OF METRONIDAZOLE DRUG USING RP-HPLC.

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Abstract: The aim of this study is to develop a simple, selective and accurate reversed phase high performance liquid chromatographic method for the analysis of Metronidazole (MTZ) in both pure form and pharmaceutical dosage form. Metronidazole (MTZ) is used in the treatment of susceptible protozoal infections, treatment and prophylaxis of anaerobic bacterial infections, and specific bacterial infections. Chromatographic separation is achieved isocratically on a C 18 column [Zorbax C 18, 5 μ m (particle size), 150 _ 4.6 mm] utilizing a mobile phase of Methanol / Water (80 : 20 v/v) at a flow rate of 0.8 mL/min with a photo diode array detector (DAD), at a wavelength of 260 nm. The retention time of Metronidazole was 3.6 min with a total run time of less than 5 minutes. The method was found to be precise, accurate, and suitable for the analysis of metronidazole in both both pure form and pharmaceutical dosage form.

Key Words: Metronidazole, RP, HPLC? Validation, Pharmaceutical dosage form.



Mise au point d'une lotion anti-poux à base d'huiles essentielles de *Melaleuca alternifolia*, *Cymbopogon citratus* et *Eucalyptus radiata*

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Abstract: Introduction : La pédiculose est un problème de santé publique et le besoin de la population est en perpétuelle croissance en matière de traitement contre les poux de la tête, en particulier chez les enfants, qui sont les plus touchés par cette affection. Bien qu'il existe des traitements conventionnels efficaces mais sont potentiellement toxiques d'où l'intérêt des alternatives naturelles sûres pour éliminer les poux. Matériel et méthodes : Les huiles essentielles de tea tree, eucalyptus et citron ont de nombreuses propriétés thérapeutiques, elles sont pédiculicide et insecticide, elles agissent en perturbant le cycle de vie des poux, en repoussant les parasites et en les étouffant [1] , [2], [3], [4], [5], [6]. Notre travail vise la mise au point d'une lotion anti-poux à base des huiles essentielles sus- cités (ingrédients naturels), qui doit être efficace, sûr, inoffensif et facile à utiliser, notamment pour la population pédiatrique. Ce produit permet d'offrir une alternative aux traitements classiques. Afin de cibler le besoin et d'orienter le processus de formulation, une analyse des différents produits anti-poux disponibles sur le marché algérien a été effectuée, en mettant l'accent sur la composition et le prix. Aussi un questionnaire visant à connaître les attitudes et pratiques du consommateur algérien a été établi. Des essais d'optimisation ont été nécessaires pour établir la formule de référence en faisant varier la proportion de certains constituants de la lotion, qui se présente sous forme d'émulsion . Le balayage de formulation a été réalisé selon trois variables : la proportion d'émulsifiant, la proportion de l'agent gélifiant (gomme xanthane) et la quantité d'huile de ricin. Résultats : La formule retenue pour constituer la base de la lotion contenant les huiles essentielles présentant une taille moyenne des globules de 0,6 μ m, un indice de crémage de 4,8 %, une conductivité de 228 μ S/Cm et un p de 7,02 à 25°C. Conclusion : La formulation d'une lotion anti-poux à base d'huiles essentielles représente une solution prometteuse pour lutter contre les infestations de poux de manière naturelle et efficace. Elle nécessite une méthodologie rigoureuse pour garantir l'efficacité et la sécurité du produit. Des tests de compatibilité cutanée et de toxicité doivent être effectués pour s'assurer de l'innocuité de la lotion sur les utilisateurs. De plus, il est important de respecter les concentrations recommandées d'huiles essentielles pour éviter tout risque de toxicité.

Key Words: Anti, poux, Lotion, HE tea tree, HE Eucalyptus, HE Citron.



Basicity and Nucleophilicity Effect in Charge Transfer of ALH3-Base Adducts: Theoretical Approach

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Abstract: This study permits to explore the interactions involved in Lewis acid (AlH₃) and Lewis bases: CO; H₂O; NH₃; PH₃; PCl₃; H₂S; CN⁻; OH⁻; O²⁻; F⁻; N(CH₃)₃; N₂; N₂H₄; N₂H₂; C₅H₅N; C₆H₅-NH₂. By means of DFT theory calculations with B3LYP functional using 6-31G(d,p) basis set and in order to check the effects of both the do-nor and the acceptor in the establishment of the different adducts we focused mainly on the calculation of the energetic gap $\epsilon_{\text{HOMO-LUMO}}$, Gibbs energies ΔG , the angle (θ) in AlH₃-base and the interaction energy values E_{inter} . The several parameters of the reactivity (electrophilicity index (χ), nucleophilicity (N), chemical potential (μ), hardness (η), and polarizability (α)) are also calculated to define the weak interaction as well as to distinguish between the nucleophilicity and basicity of different Lewis bases. The results showed that the electronic charge transfer is estimated to be important in the systems where the interaction is established between Al and anionic bases, and the electron donor power is predictable for O²⁻, F⁻, OH⁻, and CN⁻. The pseudo-tetrahedral adduct arrangements depend on the parameter geometries (bond length interaction and θ angle) and Gibbs energies ΔG characterizing the main stability.

Key Words: Lewis acid, base interaction, stability, DFT, NBO analysis.



Molecular modeling of glass transition temperature, elastic properties and refractive index of Polycarbonate (BPA-PC)

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Abstract: The polymer material investigated in this work is bisphenol A polycarbonate (BPA-PC) due to its commercial relevance (Fig. 1). It belongs to the family of amorphous thermoplastics because its high viscosity prevents it from crystallizing. It is therefore a non-crosslinked polymer obtained by phosphogenation of bisphenol A. Transparency and high rigidity are great assets that make polycarbonate one of the most widely used technical polymers [1]. It finds its application mainly in construction or industry. The aim of our study is to predict the glass transition temperature of a chain of bisphenol A polycarbonate (BPA-PC) Homopolymer consisting of 30 repeating units (UR: monomers) by the molecular dynamics (MD) method using the PCFF force field (Polymer Condensed Force Field) [2,3]. On the other hand, a static approach method was applied to estimate the elastic properties of (BPA-PC) homopolymer. The optical properties took part of our study, the extraction of the optical indices such as the refractive index n and the extinction coefficient k was carried out by the combination of molecular mechanics (MM) method and Kramer-Kronig relations [4]. Reasonable results were obtained and showed good agreement with available experimental results.

Key Words: Polycarbonate, Molecular dynamic, Force Field, Glass transition, Refractive index.



QUANTUM COMPUTATIONAL, ADMET, MOLECULAR DOCKING AND DYNAMICS SIMULATION OF VARIOUS QUINAZOLINES AND PYRIDOPYRIMIDINES AS INHIBITORS OF THE EPIDERMAL GROWTH FACTOR RECEPTOR

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Abstract: The epidermal growth factor receptor (EGFR) sensitivity to tyrosine kinase inhibitors gefitinib and erlotinib-activated mutants is common in non-small cell lung cancer. An in-silico screening study of quinazolines and pyridopyrimidines against the wild-type (WT) and mutation of EGFR tyrosine kinase inhibitors was conducted, employing several computational approaches such as covalent docking and molecular dynamics simulation followed by reactivity and the absorption, distribution, metabolism, excretion, and toxicity (ADMET). Twenty-two heterocyclic compounds were screened by covalent docking against WT protein and mutated protein (L858R and T790M). Compounds 4 and 19, which contain quinazoline[3,4-d]pyrimidine and pyrido[3,4-d]pyrimidine, respectively, were found to have an affinity towards the wild-type and the mutant protein. In addition, they had good chemical reactivity and kinetic stability toward the WT and mutations and desirable ADMET properties. These findings reveal new, robust, and irreversible tyrosine kinase inhibitors for the WT and its mutant proteins.

Key Words: ADMET, EGFR, tyrosine kinase family, covalent docking, molecular dynamic simulation and reactivity.

STRUCTURAL PROPERTIES AND REACTIVITY OF URIC ACID: DFT CALCULATIONS

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Abstract: Uric acid is a heterocyclic molecule resulting from the degradation of purines. A theoretical study is carried out in the gas phase and by the effect of the solvent, via the density functional theory (DFT) at the level B3lyp/6-311G++ (d, p) and M06-2x/6-311G++ (d), on the structure of different chemical forms that are neutral (ketonic, enolic, dimeric, monohydrate) and anionic or urate (mono and di-anion). The results obtained indicate that the ketone form is more stable than the enol form. On the other hand, dimerization, mono-hydration and solvent effect lead to additional stability estimated by the energy gap $\Delta E_{\text{HOMO-LUMO}}$. The overall uric acid reactivity is calculated based on the DFT-conceptual. The calculation of the theoretical pKa, the chemical shift δ (ppm) of the NMR ^1H and the charge carried by each proton made it possible to evaluate the Brønsted acidity of the four protons, the charge transfer was also calculated by the NBO analysis.

Key Words: Uric acid, chemical forms, solvent, acidity, DFT, conceptual.



CONVERGENT AND FACILE SYNTHESIS OF HYBRID SULFONOPEPTIDES

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Abstract: Peptides are important biological substances and have been widely used as drugs and prodrugs. However, Sulfonopeptides are more stable analogs of naturally occurring or synthetic peptides than phosphonopeptides and have been used as enzyme inhibitors as well [1]. An efficient and convenient method was developed for the synthesis of sulfonopeptides via radical addition of different xanthates to benzyl N-allylcarbamate and subsequent oxidative chlorination with N-chlorosuccinimide (NCS)/HCl of N-Benzyloxycarbonyl (Cbz)- protected 2-aminoalkyl xanthates to the corresponding sulfonyl chlorides followed by aminolysis with amino esters [2]. The current method is an efficient and convenient method for preparation of protected sulfonopeptides with functionalized side-chains in satisfactory to good yields (see "fig.1").

Key Words: oxidative chlorination, radical reaction, Sulfonopeptide, xanthate, aminoalkanesulfonyl chloride.

Conception et optimisation d'un nouveau matériau composite

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Abstract: Les matériaux composites qui font l'objet de ce travail sont synthétisés à partir de l'intercalation des précurseurs organiques d'origine naturelle dans la bentonite sodique industrielle, dans le but d'améliorer les propriétés physico-chimiques. La caractérisation de ces biocomposites a été effectuée par la spectroscopie IR , diffraction des rayons X , ainsi par une étude d'indice de gonflement et de potentiel zêta. Ces composites possèdent une structure poreuse et sont appliqués pour l'étude de phénomène d'adsorption de colorant anionique sur la surface du support solide (rouge bemacide). L'étude d'adsorption du colorants bemacide sur les composites a montré que le colorant est favorablement adsorbé, ceci dépend fortement de pH et de la structure poreuse des matériaux, à pH acide la surface de biosorbant porte la charge positive. Ainsi, il existe une attraction électrostatique élevée entre les charges positive de surface de ces matériaux et les charges négatives du colorant.

Key Words: précurseurs, biocomposite, adsorption.

EFFECTS OF d ORBITAL OCCUPANCY AND THE NATURE OF THE LIGAND ON THE GEOMETRY OF OCTAHEDRAL COMPLEXES : SYNTHESIS, IDENTIFICATION AND MODELING.

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Abstract: In this study, we prepared samples (hybrid materials) from reactions of organic and inorganic precursors, based on acids (gallic acid, oxalic acid, malic acid and squaric acid) and transition element cations (nickel) in the presence of amines (4,4-bipyridine, acetanilide) The aim of this research is to design different phases and to obtain hybrid systems by the technique of soft chemistry, in order to characterize the hybrid compounds prepared. This study was supposed to be based on the characterization of hybrid chemical samples synthesized by X-ray analysis and infrared spectrum theory, in order to reveal their quantitative and qualitative structures and therefore their crystalline structures, then to study them at the same time. using modern chemical programs. A group of compounds were studied in order to determine the effect of the filling of d orbitals and correlated nature on the octahedral geometry of the complexes and to compare these results with similar scientific papers of the same work.

Key Words: Soft chemistry, Hybrid materials, Transition metals, X, ray, Crystalline structure.

EXPLORING THE ANTIBACTERIAL ACTIVITY OF CITRUS AURANTIFOLIA PEELS EXTRACTS AGAINST MULTI-DRUG RESISTANT BACTERIA

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Abstract: Citrus peels are rich in phytochemicals and bioactive constituents. In this study, the antibacterial activity of methanol and ethanol extracts obtained from Citrus aurantifolia peels has been evaluated using well diffusion and minimum inhibitory concentration methods [1,2]. Total phenolics and flavonoids contents have been determined for the different extracts by the Folin-ciocalteu method [3] and aluminum chloride (AlCl₃) colorimetric assay [4], respectively. Multidrug-resistant strains of Staphylococcus aureus isolated from raw milk and references strains including Escherichia coli ATCC 25922, Pseudomonas aeruginosa ATCC 27853, Staphylococcus aureus ATCC 25923, and Bacillus cereus ATCC 11778 have been used. The results demonstrated significant antibacterial activities against the tested bacteria with inhibition zone diameters varying from 16.08 mm to 21.08 mm. The highest antimicrobial effect was observed with the ethanol extract against the multidrug-resistant S. aureus strains, with a minimum inhibitory concentration of 1.56 mg/ml. Total phenolics and flavonoids contents were found to be 96 mg gallic acid equivalents /g and 54 mg Quercetin /g. Thus, Citrus aurantifolia peels represent a valuable source for the development of antimicrobial drugs.

Key Words: Citrus aurantifolia, peels extracts, antibacterial activity, multi, drug resistance, polyphenols, flavonoids

Faujasite-cellulose composite membranes for heavy metals and bacteria removal

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Abstract: New composite membranes zeolite- cellulose were synthesized and investigated in heavy metals removal, using ion exchange and filtration processes. Two types of composites were prepared via different routes and characterized by Scanning electron microscopy, X-ray powder diffraction and N₂ sorption. The elimination rates of divalent cations Cu²⁺ and pb²⁺ are high for different concentrations studied (1000, 3000, 5000ppm). Regarding lead results, the composite 2 reached up to 100% retention, while C1 registered slightly low values for 3000 and 5000 ppm concentrations. The same findings are noted for the copper. The lead is well retained compared to copper. Their effectiveness in bacteria removal has been approved for total coliforms, Escherichia Coli, Enterococcus and Clostridium. It is important to note that the composite C2 has purified water from bacteria with removal rate up to 80%, compared to the composite C1. These composites can be investigated in the industry as filters for water purification.

Key Words: Faujasite, Membrane, Water treatment, heavy metals, Bacteria.

Fe(OH)₂ IN SITU GROWN ON DIATOMITE: HIGHLY EFFICIENT PHOTOCATALYST FOR THE REMOVAL OF INDUSTRIAL TEXTILE

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Abstract: Mineral material as titanium prepared ferric modified diatomite composite “ TDF ” composite as catalyst and characterized in this study. TDF was made a surface modification treatments including iron (III) nitrate nanohydrate Fe(NO₃)₃.9H₂O deposition on raw diatomite .In the Fe(NO₃)₃.9H₂O treatment, surface silica of diatomite and TiO₂ degussa P25 were partially dissolved in The iron (III) nitrate nanohydrate Fe(NO₃)₃.9H₂O by means of x-ray fluorescence (XRF), scanning electron microscopy (SEM), thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), and UV-visible diffuse reflectance spectroscopy (DRS). TDF with gap band was $E_g = 1.1$ eV by UVvisible DRS technique. Photocatalytic activity of Diatomite biosilica – Fe₂O₃ /TiO₂ hybrid film was studied towards Olive Green B under UV irradiation. The mixture Diatomite biosilica- Fe₂O₃ / Fe(OH)₂ / TiO₂ gave a better colour remove rate about 97 % at pH=4. The Objective of this work is the industrial textile dye in wastewater.

Key Words: Diatomite, silica, hematite, gap band, wastewater

INFLUENCE DU GREFFAGE DE GROUPEMENTS FONCTIONNELS SUR LA SURFACE DE BIOPOLYMERE LORS DE LA RETENTION D'UN COLORANT INDUSTRIEL

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Abstract: La demande sans cesse croissante en eau et la contamination fréquente de l'eau potable par des rejets d'origine industrielle ou agricole nécessitent impérativement le développement de techniques de purification nettement efficaces. Le choix de matériaux adéquats lors du traitement des eaux est d'une importance capitale pour l'accomplissement de taux d'élimination optimum de ces polluants. Bien que l'utilisation du charbon actif dans l'adsorption de polluants des eaux contaminées soit révélée l'une des méthodes la plus largement utilisée elle est cependant coûteuse. Cette étude a été consacrée à la valorisation d'un déchet lignocellulosique (sciure de bois) en vue de l'élimination d'un colorant industriel fourni par l'industrie textile SOITEX de Tlemcen, Algérie connu sous leur nom commercial le Noir. ETL. Le matériau adsorbant est élaboré par un prétraitement du déchet avec de la soude suivi d'une modification chimique par le biais de greffage de motifs carboxylate sur la matrice lignocellulosique (1). L'étude de l'adsorption de colorant N.ETL par SB à l'interface solide-liquide a été étudiée par la cinétique, les isothermes d'adsorption, l'effet de température, l'effet de pH, l'effet de sel et la détermination des paramètres thermodynamiques. Enfin un dernier volet de notre étude consisté à vérifier la régénéralité du matériau en le soumettant à trois cycles de réutilisation. Les résultats obtenus montrent que le support adsorbant SB possède une bonne efficacité dans l'élimination de colorant N.ETL avec une capacité d'adsorption maximale de l'ordre de 125 mg/g.

Key Words: déchet lignocellulosique, Noir ETL, greffage, isotherme, régénéralité.

Investigating a New Solar Dryer Design with Forced Airflow in the Climate of El Oued, Algeria: An Experimental Study

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Abstract: In this paper, experimental work has been presented to study the novel design of a solar crop dryer includes inverted absorber perforate type collector with forced airflow. A novel design configuration was constructed and tested in Sahara Algeria climate (ElOued city) for drying of potatoes. Aim to present a test of the thermal performance of the novel dryer and use only clean energy sources for evaluated of the drying efficiency. Under real Sahara climatic condition, the experimental test indicates that the average air temperature of the drying chamber of 50 °C, and the time required for drying potato starting at the initial moisture contents (MC) of 84.17% until final MC of 12.5% were 6h. Highest specific moisture extraction rate value was obtained as 1.074 g Water/Kwh. The Drying efficiencies ranged from 20.37 to 34.01%, whereas the exergy efficiency ranged from 58.48 to 93.22%. Payback period was estimated as 0.66 years. The proposed novel dryer will dry potato free of cost for almost its entire life period (20 years) and about 555.62 DAZ/day can be saved. Compared with electric oven drying, the advantage of the novel one, the cost of electricity saving and avoiding penalty tax for CO₂ emission, were 68.49 kWh and 487.13 DZD, respectively.

Key Words: Solar dryer, Moisture contents, Experimental, Dryer Efficiency, Sahara Climate

METAL ORGANIQUE FRAMEWORK'S (MOF'S) AS ANTIBACTERIAL AGENT FOR BIOLOGICAL REMEDIATION : SYNTHESIS AND CHARACTERIZATION

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Abstract: Since the introduction of the first antibiotic (1911), several new drugs have been discovered, giving physicians more treatment options for previously life-threatening diseases. However, the widespread use of antibiotics ushers in a new era in which physicians face the emergence of drug-resistant pathogens. Among alternative antibiotic candidates, organometallic compounds composed of periodic networks of inorganic metal ions and organic ligands have attracted increasing attention in recent years due to their high biological potency. Moreover, the literature has shown that many ligands have stronger bacteriostatic effects when complexed than unchelated ligands/drugs. This allowed us to create a complex of copper ion with high biological properties. It has been synthesized by coordinating different ligands to the center ion based on co-precipitation process. The complex was identified by IR and MEB/EDS. The morphology of the complex was revealed to be a plate-like structure, and compositional analysis indicated the presence of the expected elements. Furthermore, the IR spectra showed that the coordination of the acidic ligand to the metal atom occurred via two oxygen atoms belonging to the groups (C=O) and (CO), respectively, while the amine coordination has yet to be identified. The structure of the complex should be confirmed by X-ray diffraction. This complex was tested for antibacterial activity against E. coli and showed potent activity.

Key Words: Synthesis, Co, precipitaion, Coordination Chemistry, Hybrid Materials, Antibacterial Activity.

Neodymium doping and photopolymerization monomer nature effect on structural properties of Bi-2212 superconducting ceramics.

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Abstract: Two series of Neodymium doped Bi-2212 superconducting phase ($Bi_2Sr_{2-x}Nd_xCaCu_2O_8$) s samples with $x= 0, 0.05, 0.1$ and 0.15 were prepared using a photopolymerization based method and with two nature of monomer (E,T). The samples were analyzed by X-ray diffraction (XRD) and scanning electron microscopy (SEM) coupled with energy dispersive X-rays technique (EDX). The XRD results showed that the Bi-2212 was the predominant phase in all samples especially in the T monomer case with a minor presence of the phase Bi-2201 phase, with a time preparation gain of 120 hours. Furthermore, XRD results revealed a change in the crystal system from pseudo-tetragonal to orthorhombic when $x = 0.05 - 0.1$ in the case of the E monomer and from orthorhombic to monoclinic starting from $x=0.05$ in the case of the T monomer with a decrease of the c parameter and stability of the volume cell V with increasing the Nd concentration in the T case. The SEM photography revealed a high density of the samples which may increase the current density and the critical temperature TC. The grain size was appreciated in the range from 1 to 5.

Key Words: Bi, 2212 superconductors, photopolymerization, X, ray diffraction, Nd dopping.

SILVER NANOPARTICLE TREATMENT AS APPROACHES TO INCREASING THE SALT TOLERANCE OF WHEAT

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Abstract: This study focuses on the application of silver nanoparticle on seed priming's effect on germination and the plant's early growth on tow varices (Boussalm and Mgress) of durum wheat. Germination and seedling experiments were performed after seeds of tow species of wheat were exposed to 0, 20, 40, 80 mgL⁻¹ AgNPs. then was treated by tow salinity levels and distilled water (DW) was used as a control. after 14 day of experiment Mgress variety appeared stamped resistance to salinity at both germination and seedling growth (germination speed near to 90% at 150 mM for 20 Mg silver nanoparticle treatment whereas it come to 75% Within the same treatment at the control (DW). This finding is consistent with our finding that 20Mg silver nanoparticles have improved germination speed, plant height, and stem length compared to control treatment. In general, it can be admitted that the application of silver nanoparticles in wheat increases the seed germination and growth of this plant in greenhouse conditions, which makes it possible to easily establish the conditions for survival. This approach licenses assurance for appealing characteristics, engaging more successful applications in breeding methodologies

Key Words: silver nanoparticle, salinity, Wheat, germination, growth.

Sm-doped CdS thin films prepared by chemical bath deposition: a structural, and optical examination

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Abstract: Pure CdS and Sm-doped CdS thin films were deposited on ordinary glass slides using the chemical bath deposition (CBD) technique at 60°C, CBD which is a more promising method than the others owing to its high-quality films and low cost. The prepared thin films were characterized using XRD and UV-VIS spectroscopy. 1%, 2%, 3%, 4% and 5% Sm-content was used for doping, the obtained films grow preferentially along (111) or (200) directions of the CdS face centered cubic structure depending on the doping level. The particle size was found to decrease from 21.83 nm to 11.5 nm upon Sm-doping. The influence of Sm-doping on the dislocation per unit volume has been estimated from the XRD data. Transmission measurements were studied in the spectral range of (300– 900) nm to extract the optical properties variation upon Samarium doping. Also, the band gap was found to increase from 2.39 to 2.51 eV with increase in Samarium content, while the value of Urbach energy increases from 0.46 eV to 0.93 eV upon Sm-doping.

Key Words: Cadmium Sulfide, Thin Films, Chemical Bath Deposition, Optical and Structural Properties

Synthesis and Characterization of new Sulphur-Containing Heterocyclic Compounds

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Abstract: The emergence of new diseases associated with the resistance phenomena developed by certain pathogens to current drugs, has become a major and permanent concern, thus induced the development of new synthesis methods and the search for new bioactive molecules. Among a versatile class of Sulfur-containing heterocyclic compounds, The 2-thiolene nucleus, is widely found in many natural products, bioactive scaffolds possessing significant medicinal and biological activities. [1-3] In this current study, we have disclosed a method for the synthesis of novel substituted 2- thiolene via new domino reaction, for the first time. This reaction demonstrates broad functional group tolerance, which makes these five-membered sulfur heterocycles valuable synthetic intermediates in organic and medicinal chemistry. Furthermore, we established the scope and limitation of this reaction, which enabled further modification that led to molecular diversity.

Key Words: multicomponent reaction, 2, thiolene, sulfur heterocycles, bioactive molecules.

SYNTHESIS AND USE OF MFIMICROPOROUS MATERIALS FOR CAPTURE OF MICROORGANISMS

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Abstract: Microporous zeolites are aluminosilicates composed of silicon, aluminum, and oxygen in a framework with cations. The cation contents can be exchanged with metal ions in order to add antimicrobial (antibacterial, anticandidal, and antifungal) properties. [1]. Here, application of ion exchanged zeolite ZSM-5 combined with adsorption properties is presented. Zn^{2+} and Cu^{2+} ions confer antibacterial properties to the zeolite ZSM-5 surface. The functionalized zeolite inhibits the growth of the bacteria . This was demonstrated with the study in which the functionalized zeolite was placed in contact with highly infectious pathogens microorganisms that represent a problem of great clinical and epidemiological importance, such as *Escherichia coli*, *Staphylococcus aureus* , bacteria. In all cases the presence of a halo of inhibition of microorganism growth and kinetic studies confirmed that the ZSM-5 zeolite functionalized with Zn^{2+} , Cu^{2+} inhibits the growth of microorganisms Zn^{2+} , Cu^{2+} ions impart antibacterial attributes to the surface of ZSM-5 zeolite. The modified zeolite effectively hinders the proliferation of both bacteria *Escherichia coli*, *Staphylococcus aureus* Ion-exchanged zeolite ZSM-5 samples containing sustained antimicrobial activities

Key Words: Porous materials, ions, ZSM, 5 zeolite, Microorganisms

Synthesis of new nanohybrid using yellow Arabic gum

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Abstract: Arabic yellow gum extract, a natural resin obtained from the Acacia senegal tree. This gum is extracted from the sap of Acacia senegal tree and is known for its various applications in food, medicine, cosmetics, and other industries. In this study, we explore a different application of Arabic gum by focusing on the synthesis of a novel nanohybrid material. This nanohybrid is created by combining two composites: one based on reduced graphene oxide (rGO) and the other based on carbon nanotubes and CuNi-LDH. The catalytic reaction is facilitated by an organosilicone polymer, resulting in a high-quality nanomaterial with unique properties, including potential applications in electrochemical sensing, antibacterial activity, and excellent photocatalytic performance. The green synthesis approach presented in this study underscores the potential of eco-friendly methods for producing high-performance nanomaterials. This approach promotes sustainability and environmentally friendly practices in material synthesis.

Key Words: Polymethylhydrosiloxane, yellow Arabic gum, environmentally, nanohybrid.

synthesis, characterisation and evaluation of porous hybrid materials for the removal of pollutants from the aquatic environment.

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Abstract: In this research, porous hybrid materials were synthesized, characterized and evaluated for the removal of pollutants from the aquatic environment. co-precipitation process was used to combine two solutions of ammonium oxalate and cadmium at room temperature, and the outcome was a white powder. XRD, FTIR, MEB/EDX, High Score Plus analyzers were utilized to confirm new product characterisation. while Mercury software was used to visualize the finished product structure and determine its kind, When it was tried to remove nitrates from a prepared aqueous medium in order to assess its efficacy in eliminating contaminants, it produced unfavorable results.

Key Words: synthesized, characterization, co, precipitation, pollutants

welding of dissimilar materials

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Abstract: The welding of dissimilar materials is of great interest since it allows to innovate in the world of multi-materials by proposing new technological solutions in systems where strongly different properties may be required (weight gain and mechanical strength for example). Heterogeneous welding is applied in several industrial fields and in particular transport fields such as aeronautics, naval or automotive and also the petroleum industry. However, the feasibility of such combinations is often limited by the large difference in the thermo-physical properties of materials and their chemical nature (solubility, formation of fragile phases, oxidation etc.) [1]. For this reason, several dissimilar metal welding processes have been innovated and are divided into two main categories. The first is based on melting at the contact joint like laser welding; and the second category is based on solid state welding like friction welding. On the other hand, the number of dissimilar metals welded in the petroleum industry until today remains very limited [2], hence the interest to contribute in this research axis. Therefore, the purpose of this research is to focus on welding dissimilar materials used in the petroleum industry.

Key Words: dissimilar welding, mechanical properties, solubility, friction welding.

IN VITRO EVALUATION OF PHOTOPROTECTIVE, ANTI-HEMOLYTIC, ANTI-INFLAMMATORY, AND ANTIOXIDANT EFFECTS OF METHANOLIC EXTRACT FROM *Bassia muricata* (L.) Asch.

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Abstract: Recently, plant-derived extracts gained considerable attention as skincare agents, because of their capacity to exert a broad spectrum of biological activities, including their power to absorb ultraviolet radiation, their antioxidant, anti-inflammatory and hemostatic properties. In this context, the study focused on the evaluation of in vitro pharmacological activities of the methanolic extract obtained from the *Bassia muricata* (L.) Asch. The plant is used by the local populations of Algeria for diarrhea and skin diseases, specifically to treat dermatosis, pustules, boils, and infected wounds. The quantification of the total phenolic and flavonoid content was performed spectrophotometrically. The antioxidant activity was determined by two assays including ferric reducing antioxidant power, and DPPH method. The in vitro anti-inflammatory activity was assessed by albumin denaturation method, the photoprotective effect was evaluated by the measurement of sun protection factor (SPF) and the anti-hemolysis activity was performed by determining the percentage of hemolysis by free radicals. Moderate contents of polyphenols and flavonoids were estimated. The MeOH extract possessed good antioxidant activity for various tested assays and had the ability to inhibit thermally-induced protein denaturation in a dose-dependent manner with a percentage of 62.88% at 500 µg/ml. Moreover, this plant extract led to a lower hemolysis and had an effective sun protection factor (SPF) of 18.89 ± 0.005 . The methanolic extract from *B. muricata* could be used in cosmetic formulations and as a skincare agent.

Key Words: *Bassia muricata* (L.) Asch, Photoprotective, Anti, hemolysis, Antioxidant, Anti, inflammatory

Study of the antimicrobial activity of traditional herbal's extracts: *Salvadora persica* and *Juglans regia* against microbial strains from oral cavity

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Abstract: Several plants were used in traditional medicine; *Juglans regia* (Souak) and *Salvadora persica* (Miswak) are largely used for the oral hygiene in Arabic countries. Forty bacterial isolates were identified from the oral cavity of healthy individuals of different age categories (from 10 to 44 years) and only seven isolates were selected and characterized as *Staphylococcus saprophyticus*, *Proteus vulgaris*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Serratia marcescens*, *Streptococcus salivarius*, *Streptococcus mutans* and a yeast species identified as *Candida albicans*. On the other hand, Four extracts prepared with organic solvents of increasing polarity; petroleum ether, chloroform, ethyl acetate, and methanol were used to test the antibacterial and antifungal activities of these plants with three different concentrations of each extract; 5, 10 and 15mg/ml. The results showed that *Juglans regia* seems to be more efficient against the isolated strains than *Salvadora persica*. Moreover the ethyl acetate extract of *J. regia* showed a high degree of antimicrobial activity.. The highest efficiency of all extracts of the two plants achieved with *Streptococcus mutans* (mean of diameters of inhibition zones MDIZs = 10.29mm) followed by *Streptococcus salivarius* (MDIZs = 9.75mm), *Candida albicans* (MDIZs = 6.45mm), *Proteus vulgaris* (MDIZs = 5.75mm), *Staphylococcus aureus* (MDIZs = 5.62mm), *Serratia marcescens* (MDIZs = 5.58mm), *Pseudomonas aeruginosa* (MDIZs = 4.87mm) and *Staphylococcus saprophyticus* (MDIZs = 3.08mm).

Key Words: *Salvadora persica*, *Juglans regia*, Antimicrobial activity, Oral cavity .

EFFECT OF SILVER NANOPARTICLES ON SALT TOLERANCE OF SOME ALGERIAN VARIETIES OF DURUM WHEAT (*Triticum durum* desf). THROUGH GERMINATION STAGE

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Abstract: This study to evaluate the effects of silver nanoparticles of *Artemisia herba alba* on the salinity tolerance of fourth varieties of durum wheat (*Triticum durum* desf.). The study done based on factorial experiment using a completely randomized design with three replicate, in a laboratory, Three different treatment was used the first one is the NaCl only , the second treatment is the NaCl with Silver nanoparticles of *A. herba alba* and the control was used the distillate water . Germination seeds of durum wheat were counted for 07 days at laboratory. Traits measured were, percentages of germination, germination rates, , and radicle and coleoptile lengths . Results showed that the silver nanoparticles improved significantly germination average; plants shoot length and increased plants resistance to salinity. Results showed that a significant reduction in germination percent and seedling growth due to the salinity stress while significantly increased with nanoparticles application. In control treatment increased seed germination percentage, while the high levels of salinity inhibited the seed germination significantly. The results showed that the effect of silver nanoparticles was significant on germination percentage in $P \leq 0.05$. finally, application of silver nanoparticles was beneficial in improving salinity tolerance in the durum wheat seedling and its application may stimulate the differences defines mechanisms of plants against salt toxicity.

Key Words: Grmination, Salt stress, Nanoparticles, *Triticum durum*, Algeria

Green synthesis of silver nanoparticles using *Helianthemum lippii* extracts (Hl-nps): Characterization and study of interaction with DNA

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Abstract: This study's objective was to formulate silver nanoparticles by reducing a *Helianthemum lippii* extract. We looked into how AgNPs attach to deoxyribonucleic acid using cyclic voltammetry and spectroscopy (UV-Vis) techniques. Biosynthesized AgNPs were characterized using UV-Visible and FTIR Spectroscopy, XRD, and EDX technics. The UV-vis spectra at 428 nm validated the outcomes of the synthesized AgNPs. The results of SEM, EDX and XRD examination showed that AgNPs were the crystallite cubic, high purity with size ranged from 4.810 to 12.844 nm. Additionally, the produced AgNPs' FT-IR spectra revealed the presence of phytoconstituents that served as capping agents. Furthermore, the experimental findings showed that AgNPs had a strong propensity for binding to DNA through electrostatic interactions, which is supported by binding energy values. In conclusion, the current study opens up avenues that make them candidates for therapy against many cancer disorders.

Key Words: *Helianthemum lippii* L, Silver nanoparticles, free binding energy, binding free constant

PHYSICOCHEMICAL CHARACTERIZATION OF NATURAL PLANT EXTRACT THYMOPHIONE MICROPARTICLES, AND ITS EVALUATION IN VARIOUS BIOLOGICAL ACTIVITIES

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Abstract: Controlled drug release has been used to improve the bioavailability properties of various drugs. These systems enable better regulation of drugs administered for treatments and reduce their side effects in therapeutic levels with minimum concentrations. Thymoquinone (TQ), dithymoquinone, thymol, and thymohydroquinone are among the bioactive chemicals found in *N. sativa* L. Researchers have focused their attention on thymoquinone (TQ), the most significant component of black cumin. TQ was the most abundant of the identified chemicals with a concentration ranged from 20.1 to 52.6 mg /100 g. Thus, the various therapeutic benefits exerted by *N. sativa* L. may be linked to TQ. In this study, gum arabic (GA) microparticles were used as a carriers to encapsulate Thymoquinone (TQ) due to their attractive physicochemical properties which can improve targeted drug delivery. Therefore, the main objectives of the current study were to develop a micromaterial-based carrier as a novel drug delivery system of TQ by using gum arabic microparticles for enhanced delivery efficiency. Then, the antioxidant and in vitro antihypertensive properties of the microoparticles (MPs) were assessed. Comparisons were made between active compounds, respective polymers and synthesised microopartilces (MPs) in terms of their antioxidant, antihypertensive and antidiabetic properties.

Key Words: Thymoquinone, Gum Arabic, Controlled release, Antihypertensive, Antidiabetic

Using the aqueous extract of red radish leaves(*Raphanus sativus.L*) as a mediated for the biosynthesis of zinc oxide (ZnO) nanoparticles

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Abstract: Zinc oxide nanoparticles (ZnONPs) are one of the most popular metal oxide nanoparticles currently receiving scientific interest due to their potential use in various applications, especially in specialties such as anti-cancer and anti-bacterial fields. The photochemical ability, medicinal, fungicidal, antibacterial, and UV filtering effects have made ZnO NPs a multifunctional and most important agent in wastewater treatment. Because of this unique set of ZnO NPs distinct properties, There have been several researches to synthesis it by different methods such as hydrothermal synthesis [1], vapor phase deposition [2], chemical vapor deposition [3], sol-gel method [4], and microwave-assisted pyrolysis [5]. Green synthesis[6]. and other methods, the green synthesis of metal nanoparticles using different plant extracts is a good and preferred option compared to other methods. Our research is based on the synthesis of zinc oxide nanoparticles (ZnONPs) using leaf extract of the red radish plant that grows in southern Algeria. (*Raphanus sativusL*). Analytical methods were used to characterize the produced ZnONPs. Using ultraviolet (UV) "fig1.a", X-ray (XRD)fig2, infrared (FTIR) "fig1.b", analysis, the XRD graphs indicate"fig1.c" the presence of planes (100), (002), (101), (102), (110), (103), (112), (201) and (202) strongly suggest the production of wurtzite ZnO and energy dispersive X-ray (EDX) "fig1.d"and the morphological study of ZnO nanoparticles using scanning electron microscopy (SEM) "fig1.e", showed the formation of crystals of irregularly scattered ZnO nanoparticles. With these results, we have contributed to the realization of the green synthesis of zinc nanoparticles

Key Words: Nanoparticles . *Raphanus sativus.L*. biosynthesis. zinc oxide

DETERMINATION OF HEAVY METAL LEVELS IN WASTEWATER TREATMENT PLANT: THE CASE OF AERATION LAGOON IN OUARGLA

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Abstract: Pollution associated with sewage treatment plants is a major and frequently encountered problem. Human activities and industrialization have mostly resulted in the discharge pollutants, including heavy metals into water resources, affecting and posing a serious health risk to human life and environment. Previous remediation methods have several limitations such as high cost and producing large quantities of hazardous wastes that cause secondary sources of pollution. The aim of this study is to determine heavy metal levels in aerated lagoons wastewater treatment plant (WWTP) located in Ouargla, southeast Algeria, the study was conducted between March and May 2023. All metals in the wastewater (zinc, cadmium and mercury) were measured by using atomic absorption spectrometric (AAS) method and X-ray fluorescence spectrometry (XRF). Physical-chemical parameters were also measured to determine the effectiveness of the aeration lagoon treatment plant. The results showed that the removal rates of BOD, COD, and TSS ranged from (21.58-82.5%), (51.1-77.2%), and (13.36-37.93%), respectively. Heavy metal concentration in the wastewater samples were low and within World Health Organization (WHO) standards.

Key Words: WWTPs, aeration lagoon, heavy metal, physical, chemical parameter

Techniques to improve biomethane yields

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Abstract: Organic wastes come from many sources , and the fate of these wastes is usually neglect or incineration , resulting in environmental and health problems. In addition, Anaerobic digestion of different organic wastes is a promising technique to enhance clean energy (bioenergy) and manure (slurry) production ,reducing stresses on the environment .Anaerobic digestion has attracted the scientific community due to its simplicity and easiness to handle , and has the potential to utilize any kind of organic waste to produce a mixture of combustible gases ,biogas and digested slurry , which has further application in agriculture , solid biofuels , and purification . However , the conventional processes encounter with the low biogas yield and long retention time , which discourage the developers . To enhance biogas yield and quality , the momentum of research has increased towards implementation of advanced techniques for development of efficient processes. This work aims to provide an analysis of the different optimization strategies towards resources recoveries such as pretreatment , co digestion , trace elements supplementation. It has been shown by analytical studies that the application of better equipment and the modification of operating conditions and parameters to improve the process is necessary to obtain the best results.

Key Words:

Heavy metals monitoring variation in drainage's water of Ouargla's oases.

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Abstract: Due to its size and specificity, Ouargla is one of the most important cities in the region of Oued Ri'gh in the southern –east of Algeria that is specified by the hyperarid climate. Micropollutants analysis results obtained through physicochemical methods of the two campaigns indicate that ouargla's water drainage is considered contaminated, as confirmed by the Chemical Oxygen Demand (COD) results averaging 150 mg/l, whereby heavy metals were detected chromium, mercury, and nickel. So the present study aims at: comparing and monitoring the variation of heavy metals of some heavy metals such as chromium, nickel and mercury in drainage's water of Ouargla

Key Words:

Diagnostic sur l'utilisation du sable de dune pour l'amendement des sols hydro-halomorphes dans les oasis du sud de l'Algérie (cas de la région de Ouargla et de Oued Righ)

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Abstract: Dans la région de Ouargla et de Oued Righ, l'amendement sableux est de plus en plus utilisé au niveau des oasis. L'objectif de notre étude est un diagnostic sur l'utilisation du sable de dune pour connaître et vérifier l'efficacité du sable de dune. Les enquêtes sont faites dans 20 exploitations, réparties dans les deux régions. Les critères de choix des sites sont basés sur l'utilisation du sable de dune pour l'amendement et la présence de la salinité et de la remonté de la nappe. La plupart des exploitants enquêtés sont de la tranche d'âge de 45-65ans. Ils présentent des petites surfaces agricoles allant de 1 à 2 ha. D'après ces agriculteurs, l'amendement sableux est utilisé principalement pour résoudre le problème de la remonté de la nappe et la salinité du sol. Les agriculteurs ont parlé de l'importance et de l'efficacité de l'utilisation du sable, pour réduire ces problèmes (hydro-halomorphes).

Key Words: Diagnostic, sable de dune, hydro, halomorphes, Ouargla, Oued Righ

Chemical composition, antibacterial and anti-biofilm activities of selected essential oils produced by medicinal plants in Algeria.

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Abstract: The resistance of bacterial biofilms to antibiotics has led to the search for alternative approaches for bioactive molecules of plant origin capable of destroying the biofilm. Essential oils are natural compounds with important biological activities. This work aims to study the chemical composition, and to evaluate the antibacterial and antibiofilm activities of 3 Essential oils extracted from plants from Souk Al-Ahras. The antibacterial activities were assessed against 5 isolated clinical pathogens. The essential oils were extracted by hydrodistillation Rosmarinus officinalis, Aloysia citrodora and Artemisia herba alba oils provided a yield of (0.93%), (0.24%) and (0.87%), respectively. The study of the antibacterial activities by the method of micro-dilution showed MICs values from 5 to 20 μ l/ml. The antibiofilm activity showed that essential oils exhibited antibiofilm activities even at sub-MIC concentrations. This study illustrates the great potential for natural compounds from plants to be used in the development of future phytotherapeutic antibiofilm agents.

Key Words: Keywords: Rosmarinus officinalis, Aloysia citrodora, Artemisia herba alba, bioactive molecule, essential oil, antibiofilm

Chemical Composition, Antioxidant, and Antimicrobial Potential of Basil Essential Oil (*Ocimum basilicum* L.) from Algeria's Oued Souf Region

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Abstract: Essential oils are intricate blends of diverse chemical constituents, often volatile in nature, which collaboratively yield a wide spectrum of biological activities. This harmonious interplay of compounds offers an extended range of synergistic effects, enabling essential oils to effectively replace conventional antibiotics in various applications. The rising interest in essential oils as antibiotic alternatives stems from their inherent antimicrobial properties, pivotal in the face of escalating concerns regarding antibiotic resistance. This study endeavors to meticulously scrutinize the chemical composition of essential oil extracted from basil plants thriving in Algeria's Oued Souf region. Beyond chemical analysis, the study seeks to shed light on the essential oil's intricate makeup, spotlighting its potent antioxidant and antimicrobial attributes. The extraction of the essential oil hinged upon the precise technique of water distillation. The resultant essential oil underwent thorough examination via gas chromatography and mass spectrometry (GC/MS). Prominent constituents, particularly alfa.-Copaene (15.16%), Estragole (20.65%), and Linalool (30.17%), emerged from the analysis. Subsequent evaluation involved unveiling the antioxidant potential through DPPH assays was according to literature [1]. Parallely, the essential oil's antimicrobial efficacy against a diverse array of five bacterial strains was assessed, employing both growth inhibition area quantification and the precise determination of Minimum Inhibitory Concentration (MIC) values according to [2], employing the disc diffusion method. The outcomes underscore the essential oil's remarkable potential as an alternative to conventional antibiotics, corroborated by its robust antioxidant capabilities and potent inhibition of bacterial growth. This research not only contributes to the understanding of essential oils' role as intricate botanical resources but also holds implications for their utilization across diverse sectors.

Key Words: Antioxidant activities, Antibacterial activity, DPPH assays, Chemical composition, Essential oil .

Chemical constituents in pollen grains of *Pistacia Atlantica* and their antioxidant activity

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Abstract: *Pistacia Atlantica* is one of the most popular trees all over the world belongs to the Anacardiaceae family. Almost all parts of the PA tree, including the fruits, galls, and leaves are commonly used in traditional medicine for treating diabetes, cancer, digestive problems, inflammatory diseases because of its medical potential. Previous studies demonstrated that pollen in different plants exhibit antioxidant, antibacterial, anti-inflammatory, anticarcinogenic, and antiallergic properties. In this new study we worked on pollen grains of PA that located in Algeria, the extraction of the phenolic compounds was carried out with a maceration in mixture of methanol/water before a liquid-liquid extraction with three different solvents. The results showed that pollen grains of PA are rich in phenolic compounds that ranged between 0.125 and 32.13 mg GAE /g DM and between 0.045 and 3.37 QE mg/g DM for flavonoids. The extracts of pollen grains containing bioactive compounds have potential to provide protection against oxidative stress with an % inhibition around 74%, 26% and 20% determined based on the DPPH radical scavenging activity, FRAP and ABTS respectively

Key Words: *Pistacia atlantica*, Pollen, polyphenols, Antioxidant activity

Chromatographical Analysis and In vitro Hypoglycemic Activity of Leaves Sonchus maritimus Aqueous Extract

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Abstract: *Sonchus maritimus* belongs to the Asteraceae family, which is one of the largest plant families in the world [1]. The *Sonchus* genus is distinguished its pharmacological activity against various diseases [2]. This study aimed to characterize leaves *Sonchus maritimus* aqueous extract and to evaluate the in vitro hypoglycemic proprieties including anti- α -amylase enzyme, inhibition of glucose uptake by yeast and glucose adsorption activities. Moreover, the phytochemical HPLC analysis of *S. maritimus* aqueous extract were performed in standard conditions. Hypoglycemic activities of *S. maritimus* aqueous extract using referenced protocols. The results of phytochemical analysis showed richness of *S. maritimus* in different phenol acids and flavonoids. The results showed that *S. maritimus* extract had an important activity against α -amylase action and showed a significant glucose adsorption and inhibit the uptake of glucose by yeast. As conclusion, potential properties of the hydro-soluble compounds that have been revealed in *Sonchus maritimus* through the hypoglycemic efficiency, which might be used in several biological applications.

Key Words: *Sonchus maritimus*, hypoglycemic activity, anti α -amylase, glucose uptake, adsorption

Etude et valorisation de la composition chimique de l'huile essentielle d'une plante médicinale dans la wilaya d'Annaba.

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Abstract: Les Plantes aromatiques et médicinales représentent une source inépuisable de remèdes traditionnels et efficaces grâce à leurs différents principes actifs notamment les huiles essentielles. dans le but de valoriser les plantes aromatiques algériennes, nous nous sommes intéressés à la caractérisation chimique de l'huile essentielle de *Teucrium polium* L de la région d'Annaba (Nord-est algérien). L'extraction de l'huile a été effectuée par hydrodistillation et le rendement a été calculé par le rapport entre la masse la masse d'huile essentielle et la masse végétale à traiter. L'analyse de l'huile par GC-MS a permis l'identification de 77 constituants, Les principaux constituants sont : Germacrene D (27,2%), delta-Cadinene (8,36%), α -pinène (4,27%), D-Limonene (4,50%).

Key Words: *Teucrium polium* L, GC, MS, Hydrodistillation, Huile essentielle.

Exploiting essential oils' bioactive characteristics and their potential applications in the food sector

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Abstract: Food additives are chemical compounds that have negative effects on human health. Indeed, the problems of food deterioration linked to microbial contamination remain a global interest. This issue has encouraged scientists to investigate natural alternatives to chemical or synthetic food preservatives.[1] Due to its antibacterial and antioxidant qualities, the use of essential oils is becoming increasingly common in a variety of industries [2]In this work, we are interested in evaluating the antimicrobial activity of the Artemisia herba alba essential oil. Steam distillation was used to extract essential oil (EO) from aerial parts of A. herba alba. The chemical composition was determined by Gas chromatography (GC). In vitro testing was performed on four standard strains: Escherichia.Coli, Staphylococcus aureus, Pseudomonas aeruginosa and Baccillus subtilis. The antimicrobial activity of essential oil was evaluated by disc diffusion method Analysis of the chemical composition of A. herba-alba essential oil revealed the presence of nineteen compounds representing 84 % of the total composition. The most abundant component was α -thujone. The antibacterial potential of extracted essential oils was generally active against the majority of bacterial strains and the diameters of growth inhibition ranged from 7 mm to 25 mm. The results of this study reveal that the essential oil studied in vitro has significant activity against the majority of microorganisms tested and it could be an interesting bio-preservative in the food industry. Many studies have found that essential oils can effectively sanitize and preserve food.

Key Words: Essential oils, Artemisia herba alba, Antibacterial activity, Food Preservatives.

The investigation of biological activities of arabinoxylan oligosaccharides derived from *Plantago ciliata* Desf

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Abstract: For centuries, *Plantago* have been used in traditional medicine due to their various properties as healing, anti-inflammatory, antibacterial, antihyperglycemic and anti-asthmatic agents. These multiple pharmacological effects have been attributed mainly to their polysaccharides which are often described as heteroxylans. This study focuses on assessing how partial hydrolysis of arabinoxylan from *Plantago ciliata* seeds influences its biological potential, specifically examining its anti-hyperglycemic and anti-complement activities, as well as its resistance to digestive processes. The results revealed that these arabinoxylan oligosaccharides of *Plantago ciliata* seeds (AXOPCs) have demonstrated significant inhibitory effects on α -amylase and α -D-glucosidase enzymes, with IC₅₀ values of 2.36±0.38 and 1.19±0.16 mg/mL, respectively. Where they act as effective uncompetitive inhibitors of α -amylase and exhibit noncompetitive inhibition towards α -D-glucosidase, with inhibition constant values of 5.47 and 2.49 mM, respectively. The AXOPCs show a dose-dependent inhibition of the alternative pathway of 50.76% at 1 mg/ml. The AXOPCs have been successfully tested as non-digestible oligosaccharides with maximum percentages of digestibility of 22.8% compared to 51.3% for fructooligosaccharides used as a reference. These results are consistent with traditional uses of *P. ciliata* seeds in medicine for reducing blood sugar levels. In vivo experiments should complete these results to assess their uses as new naturel healthy drugs.

Key Words: arabinoxylan oligosaccharides, *Plantago ciliata* Desf., antihyperglycemic activity, anticomplement, nondigestible.

Excess thermodynamic studies of mixture containing an associative compound at 298.15 K

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Abstract: Investigation of binary polar liquid mixtures that contain associative liquid provides valuable information regarding molecular complex formation in solution. In recent years, measures of the thermodynamic and transport properties have been used adequately to understand the nature and strength of molecular interactions and physicochemical behavior in liquid mixtures. The used two compounds were selected because of their importance in the engineering process. Densities, ρ , viscosities, η , and refractive indices, n_D , of the binary mixture, including those of pure liquids were measured over the entire composition range at $T = 298.15$ K and under atmospheric pressure. From the experimental data, the excess molar volumes, V_E and the other excess thermodynamic properties such as deviations in viscosity, $\Delta\eta$, refractive index, Δn_D , and excess free energy of activation, ΔG^*E , have been evaluated. The computed data V_E , $\Delta\eta$, ΔG^*E , and Δn_D have been correlated with Redlich-Kister polynomial equation to ascertain the fitting parameters and standard deviations. The V_E and Δn_D values are positive. The $\Delta\eta$, and ΔG^*E are found to be negative over the entire range of mole fraction. The changes in positive and negative values of excess properties could explain the different kinds of interactions between the component molecules. These results can be used to develop comprehensive theoretical models for designing various technological processes in the chemical and biochemical industries. A good agreement between experimental data and the values estimated by theoretical procedure was obtained. The deviations for excess properties have been explained based on the intermolecular interactions.

Key Words: Refractive index, density, viscosity, excess properties, Redlich, Kister equation.

First-Principles Investigation into the Structural, Electronic, and Magnetic Properties of FeNi Alloys.

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Abstract: Electric power generators, motors, and transformers are just a few examples where magnetic materials find an application in modern technology. The ordered FeNi phase (tetrataenite) is recently considered a promising candidate for the rare-earth free permanent magnets applications, To investigate the electronic and magnetic properties of FeNi structures, a computational approach based on the full potential linearized augmented plane wave (FPLAPW) method was employed which is based on density functional theory (DFT) These calculations were performed using the WIEN2k software package . Structural properties obtained as the lattice parameter are in good agreement with the experimental results available and Other theoretical studies. From the electronic band structure along with total and projected DOS, we conclude that FeNi shows metallic nature with a significant contribution of 3d-Fe and 3d-Ni states to the total electronic density of states. Magnetic materials play a pivotal role across various modern technologies, such as electric power generators, motors, and transformers. Lately, there has been a surging interest in leveraging the capabilities of the ordered FeNi phase, referred to as tetrataenite, as a promising avenue for applications involving rare-earth free permanent magnets. To delve deeper into the intricacies of FeNi structures' electronic and magnetic traits, an advanced computational methodology was employed. This methodology, rooted in the full potential linearized augmented plane wave (FPLAPW) approach, stands firmly on the foundation of density functional theory (DFT). These complex calculations were facilitated by the utilization of the WIEN2k software suite. Notably, the structural attributes obtained from these computations, particularly the lattice parameter, demonstrate an impressive.

Key Words: Generalized gradient approximation (GGA), FP, LAPW, WIEN2K, density functional theory (DFT)

In silico Investigation of Withangulatin A Derivatives as Potential Allosteric Glutaminase C Inhibitors for Breast Cancer Treatment

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Abstract: The current study aims to understand the binding mechanism and intermolecular interactions of the novel Withangulatin A derivatives [1] towards the allosteric site of Glutaminase C (GAC) using in silico analysis. The molecular docking and dynamics simulation results revealed that compounds L5, L8, L13, and L18 show high affinity toward the allosteric pocket of the GAC (PDB:3UO9) [2], as confirmed by the high negative score values and hydrogen bonds. It was found that these compounds interact with the most important residues and suggest a similar binding mechanism to the native compound (BPTES) and the clinical trial drug (CB-839). The combination of molecular electrostatic potential (MEP) analysis and molecular docking/dynamics studies confirms that the favorable reactive sites of these compounds establish many hydrogen bonds with active site residues of the target. Finally, pharmacokinetics prediction showed that L8 and L13 present the best ADMET profile among the selected compounds, and they share similar properties with the clinical compound CB-839. The obtained results in this investigation demonstrate that these two Withangulatin A derivatives might be used for further development as new allosteric GAC inhibitors for treating TNBC.

Key Words: Withangulatin, Molecular, Docking/Dynamic simulations, MEP analysis

IN SILICO MOLECULAR DOCKING STUDY OF WARFARIN BY USING MOLEGRO VIRTUAL DOCKER

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Abstract: Warfarin is one of the crucial vitamin K antagonists. It is clinically administrated as racemate of both enantiomers R and S. It has been the most prescribed anticoagulant over 60 years owing to its high efficiency in the prevention of strokes and recurrent Deep Vein Thrombosis and Pulmonary Embolism. It has a significant anticoagulant activity. It decreases blood clotting by blocking vitamin K epoxide reductase (VKOR) that activates vitamin K[1]. Its anticoagulant activity has been studied in silico using numerous molecular modeling techniques; since computer-aided drug design approaches are currently very useful in several stages of drug discovery keeping in view that they are time and cost effective[2,3]. In our case we have used Molegro Virtual Docker which is a powerful tool which its process is the search for the most energetically favourable pose of the ligand in the enzyme binding site in order to predict the structure of the stable complex (ligand-protein) with good accuracy[4,5]. Molecular docking study was carried out using Molegro Virtual Docker with VKOR with PDB ID : 3kp9. First, we perform a re-docking of the active ligand of VKOR in order to validate the molecular docking protocol and also to get insight into the reference active amino acid residues involved in interactions. Energy of warfarin was optimised using MM2 after being drawn in ChemDraw Professional 16.0, Chem3D 16. Two types of interactions are shown in fig1 : both H bond and steric interaction with Thr34, steric interactions with Thr72, Leu37, Val75, Glu115, Met111. Key Words : Molecular docking, Warfarin, VKOR, Anticoagulant activity.

Key Words: Molecular docking, Warfarin, VKOR, Anticoagulant activity.

In Silico Study of N-ferrocenyl methyl aniline as Inhibitors of IL-6 in Immune-Mediated Inflammatory Disease Rheumatoid Arthritis

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Abstract: Pro-inflammatory cytokines play a key pathogenic role in the processes of inflammation, synovial proliferation, and cartilage destruction because there is an imbalance between pro-inflammatory cytokines, such as Interleukin -6 (IL-6), present in excess, and cytokines with anti-inflammatory action as Interleukin-10, which are present in insufficient quantity and cannot block the action of the former. Thanks to a better understanding of the mechanisms controlling immunity and inflammation, these cytokines and their receptors are becoming particularly important therapeutic targets. To support this study, The focus of the current research is to examine the molecular identification and diverse interactions of Pro-inflammatory cytokine IL-6 with the ferrocene derivative N-ferrocenylmethyl aniline(FcMA). Ligand chemical structure was optimized by Gaussian 09 program package, using (DFT), B3LYP, 6-311++G(d,p) basis set. Prediction of ADMET (Prediction of Swiss Absorption, Distribution, Metabolism, Excretion and Toxicity) properties was carried out using Swiss ADME software from the Swiss Institute of Bioinformatics and Pro-Tox II. The computational molecular docking technique was used for the in-silico evaluation using AutoDock 4.2 docking software. The crystal structure of human IL-6 (PDB ID: 1ALU) was imported to the AutoDock molecular docking software, and the visualization of the interaction was generated with the Discovery Studio Client 2021 program service. The bond's length(2.013 Å) and energy(-22.07 kJ/mol) values and binding constant ($7.34 \times 10^3 \text{ M}^{-1}$)of the hydrogen bond indicated the existence of strong interactions between FcMA and the IL -6 via both H-bonds and hydrophobic Alkyl and Pi-Alkyl where the electrostatic mode was the dominant mode. and The results of ADMET analysis showed that FcMA does not possess any functional group responsible for major toxicity. So, it can be assumed that the FcMA is qualified as a candidate anti-arthritic potential drug.

Key Words: N, ferrocenylmethyl aniline, anti, arthritic potential, interleukin, 6, molecular docking, rheumatoid polyarthritis.

Theoretical investigation on the biological activities of 2,4-dimethoxy-6-(pyrimidin-2-yl-hydrazonomethyl)-phenol- Transition metal complexes $[M(HL)_2]_x$ (M = Mn, Fe, Co, Ni and x = +1, 0)

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Abstract: This theoretical investigation using DFT/B3LYP calculations is dealing with the molecular structures and biological activities of complexes $[M(HL)_2]_x$ (M = Mn, Fe, Co and Ni ; x = +1 and 0 ; HL = 2-methoxy-6-(pyrimidin-2-yl-hydrazonomethyl)-phenol). The complex of Fe as described experimentally [1]. The HOMO-LUMO gaps explain that the possible charge transfer interactions that take place within the molecules are responsible for the molecular reactivity of the studied molecules. The chemical hardness, the chemical potential, and the electrophilicity indexes show clearly the improvement of the biological activities of $[M(HL)_2]_x$. The TD-DFT theoretical study performed on the optimized geometry $[Co(HL)_2]_x$ allowed us to predict the UV-Vis spectra and to identify quite clearly the spectral position and the nature of the different electronic transitions according to their molecular orbital localization.

Key Words: DFT calculations, Metal, ligand coordination, Biological activities, Electronic transitions.

Medicinal forest plants and Arthropods in the Djurdjura National Park (Algeria)

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Abstract: The study took place at two sites in the Tigounatine black pine reserve (Djurdjura, Algeria). The first one consists of old-growth Atlas cedar « *Cedrus atlantica* », Aleppo pine « *Pinus halepensis* » and holm oak « *Quercus ilex* » in the upper stratum and common juniper « *Juniperus communis* ssp. *hemisphaerica* » as the lower woody stratum. The second site mainly hosts Atlas cedar, black pine « *Pinus nigra* ssp. *mauretunica* » and holm oak in the upper stratum and oxycedar juniper « *Juniperus oxycedrus* ssp. *rufescens* » in the lower stratum. The aim of the study was to obtain informations on the health status of the forest medicinal studied plants through the biological diversity and activities of the sampled Arthropods. The experimentation was conducted during 2018. 20 field trips were carried out periodically every 15 days. Five sampling methods have been applied (Pitfall traps, sweeping, beating, colored traps and the aerial attractive traps). 12772 individuals belonging to 228 Arthropods species diversified over 140 genera and 103 families were sampled. The Coleoptera order is the most diverse with more than 45% of insects richness, followed by the Heteroptera, Hymenoptera and Diptera with 25 species per taxonomic order. Among the diversity of Hymenoptera, the Torymidae family is present with the *Megastigmus* genus, whose larvae and adults were observed inside the seeds of the plants studied that have negative effect on the natural regeneration of forest plants. Four bioindicator species of environmental quality have been identified as *Notiophilus biguttatus*. Data collected on the biological activities, the roles and the various interactions between plants and Arthropods will be

Key Words: Medicinal, Plants, Arthropods, Activities, Reserve.

Study of extraction and separation techniques from a plants of the Brassicaceae family

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Abstract: The medication is on old destitution, which was exercised by the people before the invention of drugs. Humans are used to treat diseases and they are activated by their medical effectiveness or experiment.[1] Then depends as a medicine and it has another effectiveness. These plants include the Brassicaceae family, and the study chose Al-Hara . Brassicaceae, a mustard family includes about 338 genera and more than 3,700 species that are most commonly consumed a group of plants all over the world.[2,3] *Eremobium aegyptiacum* (*Malcolmia aegyptiace* Spr) could be considered as pro-drug candidates in the future clinical research as dietary intervention in the management and improvement of the progression of Alzheimer's disease. The study, in its entirety, was based on a plant of the Brassicaceae family, which grows in the desert region of the Algerian state of Wadi Souf, where the extraction process was carried out using two different techniques, the classical soaking technique, as well as the microwave extraction method, and then the comparison was made in the yield of each process from the process, and then the extraction by phases Membership for each experiment on its own, and compare the results. The study found that the yield of the acetate phase in the extraction by means of the microwave is up to twice as high as that in the extraction experiment (soaking), and in the a_butanol phase it reaches 5 times in comparison. HPLC analysis was conducted on the samples, to study differences in the extraction method, as well as LC-MS. And study the biological and antioxidant activity of DPPH, as well as ABTS.

Key Words:

Evaluation de la capacité antioxydante des extraits phénoliques de plante locale *Plantagociliata* (Desf)

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Abstract: **REFERENCES** Introduction : *Plantagociliata* (P) est une espèce endémique à l'Afrique du Nord, elle est connue localement sous le nom "Lelma". C'est une plante herbacée annuelle, de petite taille ne dépassant guère les 15 cm, de hauteur et de couleur grisâtre. Feuilles lancéolées, très allongées, très velues et nombreuses, poussant en rosette à la base de la plante. Les fleurs naissant de cette rosette, sont petites et verdâtres. Les épis sont cylindriques et très laineux. Ce travail sera focalisé sur l'examen de la capacité antioxydante des extraits de plante par la mesure in vitro de leur capacité, en évaluant leur pouvoir de piégeage du radical libre (test de DPPH) et la réduction du molybdène (test de PPM). Matériels et méthodes : Pour extraire les composés phénoliques de la partie aérienne de cette plante (P), nous avons utilisé deux systèmes de solvants : (PM)(Méthanol/Eau) et (PA)(Acétone/Eau) avec plusieurs rapports (v/v) (1, 2, 3, 4, 5 : les rapports de solvants (60/40), (70/30), (80/20), (90/10) et (100/0) respectivement). Nous avons utilisé la méthodologie d'extraction et de purification des composés phénoliques décrite par. Une quantité de 3g de poudre fine de plante est macérée dans 100ml d'un mélange hydro-alcoolique pendant 48 heures à température ambiante. La même opération est faite avec le mélange hydro-acétonique. Après filtration et évaporation du méthanol et l'acétone, la phase aqueuse obtenue est lavée par l'hexane pour l'élimination des produits apolaires. L'extraction des polyphénols est réalisée par l'acétate d'éthyle. Après évaporation, le résidu est repris dans 10 ml de méthanol pur, et les extraits ainsi obtenus sont conservés à 4°C. Résultats et discussions : La teneur des phénols totaux, est variable entre les différents extraits et qu'il n'existe aucun sens de variation en fonction de la proportion du solvant. Les teneurs de ces composés varient entre 1,66±0,06 et 2,32±0,03 mg GAE/g de la matière sèche pour les extraits méthanoliques et entre 1,30±0,01 et 1,97±0,04 mg GAE / g de la matière sèche pour les extraits acétoniques. Ainsi, la teneur la plus élevée est constatée dans l'extrait PM3 (2.32±0.03 mg EAG / g MS), tandis que, la teneur la plus faible a été enregistrée pour l'extrait PA5. D'autre part, les résultats obtenus montrent que la quantité des phénols totaux dans les extraits méthanoliques est supérieure à celle dans les extraits acétoniques. Les valeurs des quantités de flavonoïdes obtenues sont comprises entre 1.41±0.09 et 2.19±0.06 mg CaE/g de la matière sèche pour les extraits méthanoliques et varie entre 0.91±0.05 et 1.43±0.09 mg CaE/g de la matière sèche pour les extraits acétoniques. La capacité antioxydante in vitro des extraits de plante évaluée par le test de DPPH a montré une activité antiradicalaire très importante de la fraction PM3 (EC50 = 3.5±0,05 mg/l) par rapport à tous les autres extraits et les antioxydants de références (BHA, Vit C et vit E). Cependant, dans la méthode de PPM, tous les extraits ont présenté des capacités très intéressantes (EC50 < 32 mg/l) par rapport aux antioxydants standards. Autant, les extraits hydrométhanoliques de *Plantagociliata* ont une bonne capacité antioxydante en particulier l'extrait PM1 qui s'est avéré le plus actif. Son effet antioxydant semble être lié à sa richesse en flavonoïdes. Ce résultat suggère que les extraits qui ont fourni un pouvoir antiradicalaire important sont aussi de bons agents réducteurs. Et on remarque aussi les rapports (80/20 MeoH/H2O) et (70/30 Acé/H2O) ont enregistré les meilleurs rendements en extraits bruts, les quantités en phénols totaux et flavonoïdes et l'activité antioxydante pour les deux tests. Conclusion et perspective : Ce travail s'articule autour de la valorisation phytochimique de *Plantagociliata* plante médicinale de la région de Laghouat. L'estimation quantitative des polyphénols totaux et des flavonoïdes a révélé que la plante présente des teneurs élevées en flavonoïdes (66.48%-94.39%). Cependant, les bonnes teneurs en phénols totaux et en flavonoïdes ont été obtenues par le système méthanol /eau (80/20). Le pouvoir antiradicalaire a montré que l'extrait PM3 a exposé un effet antioxydant très important. Par contre, tous les extraits testés ont dévoilé des pouvoirs réducteurs supérieurs aux antioxydants de références.

Key Words:

Biological activities of foliar extracts of two Saharan plants *Euphorbia guyoniana* (Boiss. et Reut.) and *Calotropis procera*

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Abstract: This work is compunction to the valorization of medicinal plants, used in traditional medicine. Its objectives are the study of new biologically active agents, derived from a medicinal plant widely used by the Algerian population which is *Euphorbia guyoniana* (Boiss and Reut) of the Euphorbiaceae family which is harvested from the region of Ghardaia, and *Calotropis procera* Aiton of the Asclepiadaceae family, Cultivated in the Adrar region. It is considered a plant with important therapeutic purposes in the synthesis of the drugs used. The first part of this study concerns the study of the antimicrobial power of hydromethanolic extracts (2/3 Methanol + 1/3 Distilled water) obtained by reflux and by maceration of the leaf powder of two Saharan plants including *Euphorbia guyoniana* B & R (Euphorbiaceae) and *Calotropis procera* Ait. (Asclepiadaceae). The extraction yields for the hydromethanolic extracts obtained by reflux of two plants are estimated to be 7.8 ± 0.85 for *Euphorbia guyoniana* and 6.46 ± 0.34 for *Calotropis procera* and 4.0 ± 0.05 and 1.35 ± 0.02 for the extracts of two plants obtained by maceration respectively. The results obtained show that they are rich in alkaloids, flavonoids, phenolic compounds, and other secondary metabolites including terpenes and sterols. The second part makes the objective of the study of the biological activity of hydromethanolic extracts prepared in two plants on 12 bacterial and fungal strains reveals their strong antimicrobial power, shown that the two extracts of two plants studies presents satisfactory results. The diameters of the inhibition zone observed for the batches treated with the extracts obtained by reflux oscillate between 0mm to 24mm for the batches treated with the *Euphorbia guyoniana* extract and between 0mm to 20mm for *Calotropis procera*. While they are of the order of 0mm to 32mm and 0mm to 37mm for the batches treated with extracts obtained by maceration of leaf powders of *E. guyoniana* and *C. procera* respectively. The extract is considered bactericidal and fungicidal if no colonies are observed in the zone of inhibition. On the other hand, it is said to be bacteriostatic when a few colonies are present, even in low density, and even for fungi.

Key Words:

Biological activity and phytochemical study of bulbous plant from Asparagaceae family

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Abstract: The thermoelectric (TE) materials are one of the promising candidates for environmental friendly technologies. Thermoelectric materials can directly convert waste heat into electric energy. New mixed oxides of $\text{Na}_{0.74-x}\text{Nd}_x\text{CoO}_2$ ($x = 0, 0.1$) materials were successfully synthesized using a sol-gel method and characterized by several techniques such as: X-Ray Diffraction (XRD), Scanning Electron Microscopy and various thermoelectrical properties (Resistivity, Seebeck coefficient and Power factor). The results showed that the undoped $\text{Na}_{0.74}\text{CoO}_2$ pellet sintered at 1123K for 12h crystallized with hexagonal symmetry, while the doped samples shows the formation a second phase (NdCoO_3). SEM analysis showed that the porosity of the samples decreases with increasing Nd content. The resistivity of the undoped sample and doped sample with $x=0.1$ increases with increasing temperature range while the resistivity of the sample with $x=0.1$ increases in the temperature range $307\text{K} \leq T \leq 419.5\text{K}$ and then decreases with rest of temperature range. The Seebeck values of the samples are between 61.6-137.5 $\mu\text{V/K}$ and positive at all temperature range. The highest power factor value of 0.4425 mW/mK^2 at 1070.5K is obtained for $x=0.1$ sample. Key Words :sol-gel, thermoelectric materials, X-ray diffraction, oxides mixes, Scanning Electron Microscopy. REFERENCES [1]EmineAltin., Erdinc Oz., SerkanDemirel., Ali Bayri., Magnetic and thermoelectric properties of B-substituted NaCoO_2 , Applied Physics A: Materials Science and Processing 119 (2015) 1187.[2]Lei Wang., Ming Wang., Dongliang Zhao., Thermoelectric properties of c-axis oriented Ni-substituted NaCoO_2 thermoelectric oxide by the citric acid complex method, Alloys and compounds 471(2009) 519.[3]RizwanAkram., Jansher Khan., SaimaRafique., MozaffarHussain., Asghari., Maqsood., Akhtar Ali Naz., Enhanced thermoelectric properties of single phase Na doped Na_xCoO_2 thermoelectric material, Materials Letters 300 (2021) 130180.

Key Words:

Traditional diabetes treatment in north-eastern Algeria

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Abstract: Diabetes mellitus is a major public health problem. In Algeria, phytotherapy has always occupied an important place in the medication of various diseases. This work was undertaken for the identification of medicinal plants used for the diabetes treatment by the local population of Batna province. To conduct this study, an ethnobotanical survey was carried out by distributing questionnaires to 100 diabetic patients and 31 herbalists, who have traditional knowledge of medicinal plants, in different areas of the Batna region over a period ranging from February 20th to April 17th, 2023. Among the diabetes interviewees, only 33.44% used medicinal plants. Ninety-four percent of plant users were satisfied with herbal medicine. By faithful reproduction of the collected data, 27 species of plants belonging to 18 botanical families have been identified. The most represented are the Lamiaceae (22.22%), the Fabaceae (11.11%), the Asteraceae and the Lauraceae (7.40%). The most used plant species are *Artemisia herba alba*, *Olea europaea*, *Boswellia sacra flueck* and *Cinnamomum verum*. The most used preparation form of antidiabetic remedies are decoction (48.48%), and maceration (18.18%) from particularly the leaves and the seeds (29.66%). The results of this study could constitute a valuable source of information for the studied area, and serve as a basis for future researches in phytochemistry to identify new natural active compounds that can be used in pharmacology, especially for the treatment of diabetes.

Key Words: Diabetes, ethnobotanical survey, medicinal plants, phytotherapy

ANTI-DIABETIC AND ANTI-INFLAMMATORY PROPERTIES OF PARONYCHIA ARABICA AND ITS PHENOLIC CONTENTS

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Abstract: The aim of this study was to evaluate the biological effects of an aqueous extract of *Paronychia arabica* leaves, which is used in traditional medicine to treat stomach ulcers and other gastrointestinal conditions. Colorimetric techniques were used to quantify the quantity of phenolic [1] and flavonoid [2] substances. Two biological activities were then carried out, namely the in vitro antiinflammatory activity [3] of *Paronychia arabica* extract, which was studied using the albumin denaturation inhibition technique, and the in vitro anti-diabetic activity of this extract, which was evaluated by studying the inhibitory effect of α -amylase [4]. The data obtained show that the aqueous extract obtained by decoction of *P. arabica* leaves contains high levels of phenolic compounds and flavonoids (149.14 μg GAE/mg extract and 64.08 μg QE/ mg extract). The results of anti-inflammatory ratios for *P. arabica* aqueous extract and Acid Acetilsalicilic at concentrations of 125, 250, and 500 g/mL show that the anti-inflammatory activity increases with increasing concentrations, with ratios of 52.47%, 62.19%, and 71.69% for the extract and acid acetilsalicilic has a ratio of 53.01%, 58.53%, and 64.81%. Antihyperglycemic activity marked by a significant inhibitory effect on α -amylase in vitro with an IC₅₀ equal 78.82 ± 3.4 $\mu\text{g}/\text{mL}$. The results of this study justified that *Paronychia arabica* extract revealed strong biological activities ; this could be due to the high levels of polyphenols and flavonoids. Consequently, we suggest that the plant be kept and safeguarded, primarily because it benefits human health and the ecology.

Key Words: *Paronychia arabica*, Phenolic and flavonoids contents, Anti, inflammotry activity, Alpha amylase enzyme activity

Antioxidant Activity, Phenolic and Flavonoid Contents Of plan Extract.

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Abstract: The study of plant chemistry is still of great importance because the plant kingdom represents a source of bioactive molecules. Plants have many active compounds, they are the richest bio-resource of drugs of traditional and modern medicine (Hammar et al., 1999), this medicinal value is based on some chemical substances that produce a definite physiological action on the human body. the most important activity of these compounds is antioxidant activity. The work aimed to quantify the total phenolic and flavonoid contents (TPC and TFC) and determine the antioxidant activity of ethyl acetate extract and butanol extract . TPC was determined by Folin–Ciocalteu colorimetric method using gallic acid as standard, and various concentrations of the extract solutions were measured at 760 nm. TFC was calculated by aluminum chloride colorimetric assay. Quercetin was used as standard, and the absorbance was measured at 510 nm. antioxidant potential of the extracts was estimated by DPPH free radical scavenging assay, and the absorbance was measured at 517 nm. From the results of the quantitative analysis of compounds, we found the greatest amount of flavonoids in butanol extract and phenols in ethyl acetate extract. We also studied the antioxidant activity of ethyl acetate and butanol extracts with the DPPH test method; the efficiency of the ethyl acetate extract was greater than the efficiency of the butanol extract. In comparison, the antioxidant activity of the reference ascorbic acid was greater than that of the two extracts. the result of the present study showed that the extract of acetate ethyl, which contains the highest amount of flavonoid compounds, exhibited the greatest antioxidant activity. Considering that antioxidants prevent lipid peroxidation in foods and help in the treatment and prevention of degenerative illness, these two species are good candidates to be considered and further evaluated as natural additives in foods to protect against oxidative degradation.

Key Words: total phenolic, flavonoid contents, antioxidant activity, the DPPH

Biological activity of *Deverra scoparia* Coss & Dur (Apiaceae) and *Commiphora myrrha* Nees. (Burseraceae) extracts.

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Abstract: *Deverra scoparia* Coss& Dur (Apiaceae) and *Commiphora myrrha* Nees. (Burseraceae) are two plants that are widely used in Algerian pharmacopoeia for the treatment of inflammatory diseases. Since the main component of immunosurveillance tumoral is the alternative complement pathway (ACV), in this context we were interested in studying the effects of total alkaloid extract of *D. scoparia* and the crude extract of *C. myrrha* resin on the activation of VAC. A functional test (AP100) was used to evaluate their effect on VAC in vitro on normal human plasma (NHP). The evaluation of AP100 shows that the extract of the total alkaloids of *D. scoparia* has a significant inhibitory potency and in a dose-dependent manner ($94.51 \pm 6.82\%$ at 1 mg/ml), whereas the crude extract of the resin *C. myrrha* is showing an inhibitory effect at a single concentration ($86.73 \pm 8.54\%$ at 0.25 mg / ml) and their increased toxicity that is dominant. The results of the bioactivity-guided fractionation of the alkaloid extract of *D. scoparia* show that fraction C has the highest inhibitory effect ($50.93 \pm 9.73\%$) relative to the other fractions.

Key Words: *Deverra scoparia* Coss& Dur, *Commiphora myrrha* Nees, Alternative pathway of complement, AP100.

Separation of Essential Oil from Psidium Guajava L Leaves and Study of its Antioxidant Activity

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Abstract: Free radicals are reactive and play an essential role in the occurrence of various diseases, because free radicals can bind to carbohydrates, proteins, fats, and even DNA, so the body needs antioxidants to counteract the presence of free radicals. Essential oils have aroused interest as sources of natural products due to their antibacterial, antifungal, antioxidant, etc. properties[1][2]. In this study, the essential oil was extracted from psidium guajava leaves by hydro-distillation technique, then the antioxidant activity of the oil was studied by the DPPH test. The essential oil showed strong antioxidant activity. This study proved that the essential oil of psidium guajava leaves could be a potential effective source of natural antioxidants.

Key Words: Free radicals, The essential oil, Antioxidant activity, Psidium guajava leaves.

الخواص الفيزيائية والكيميائية وتحليل الأحماض الدهنية للزيوت الثابتة

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Abstract: تعتبر البذور الزيتية عاملاً اقتصادياً مهماً. في ألونة ا في التجارة العالمية للمنتجات الزراعية الأخيرة، تم التركيز بشكل أكبر على الاستفادة من الزيوت النباتية الغذائية. زيت البذور الذي يحتوي على مستويات عالية من الأحماض الدهنية غير المشبعة وحتى كمية صغيرة من الأحماض الدهنية الحرة المستخرجة من المحاصيل الزيتية والتي تستخدم في غذاء الإنسان ذات القيمة الغذائية العالية، حيث تحتوى هذه البذور على مواد غذائية دهنية وبروتينية وكربوهيدراتية وفيتامينات ونسبة مرتفعة من الزيت تتراوح ما بين 21-03% ونظراً لأهمية هذه الزيوت وفوائدها العديدة في عدة مجالات، كان ال بد من الاستفادة من هذه المعطيات، وقد اخترنا مجموعة من هذه البذور لدراسة خصائصها الفيزيوكيميائية، قرينة النكسار و لزوجة وكذا رقم اليود و رقم الحامض و تحليل الأحماض الدهنية بالإضافة إلى محتواها الزيتي بشكل رئيسي.

Key Words: الكلمات المفتاحية: البذور الزيتية ، الزيوت ، الأحماض الدهنية، قرينة النكسار، رقم اليود

Identification of heavy metals in the drainage of Ouargla's oases.

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Abstract: The water rise is a specific phenomenon to the region of Oued Righ , Ouargla's city is one of the important cities of this region so in ordre to counter the water rise problem, different approaches have been developed, including the establishment of drains which could be reused for irrigation after having been cleaned out of impurities such as pollutants and miropollutants which are known for their toxicity even in low concentrations. So the present study aims at : identifying some heavy metals such as chromium, nickel and mercury in drainage's water of Ouargla.

Key Words:

Contribution to the theoretical phytochemistry study and biological evaluation of some plants from Rhanterium genus

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Abstract: This research focuses on advancing the theoretical analysis of phytochemicals and assessing the medicinal potential of select plants from the Rhanterium genus within the vast Asteraceae plant family. The Asteraceae family is of significant medical and pharmaceutical interest owing to its rich repository of secondary metabolites. This study emphasizes Gas Chromatography-Mass Spectrometry (GC/MS) for its analytical techniques to quantitatively and qualitatively analyze essential oil compounds. The primary components identified in these oils were predominantly monoterpenes and sesquiterpenes. It's noteworthy that the composition and abundance of these compounds varied among Rhanterium plants, but it was universally recognized that they contained bioactive compounds, This investigation places significant importance on Gas Chromatography-Mass Spectrometry (GC/MS) for its analytical techniques. Additionally, the organic extracts of these plants exhibited significant biological activity, which can be attributed to their phenolic and flavonoid content.

Key Words:

Contribution to the comparison of the chemical composition of flowers and (leaves and branches) extracted from *Rhantherium Adpressum* grown in Algeria

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Abstract: The present study focuses on the analysis of chemical constituents of the *Rhantherium adpressum* (locally known as “Arfaj”; Family: Asteraceae) which is available in the Sahara of Algeria. The essential oil of Arfaj (flowers) and (leaves and branches) was extracted separately by the Clevenger apparatus under the same experimental condition. The phytochemical constituents were analyzed by gas chromatography-mass spectrometry. The mass spectra were compared with the standard spectra available in National Institute Standard and Wiley library. The results indicated that the Essential oil of the Leaves and branches showed an interesting percentage of chemical compounds including Camphene (17.66 %), Beta-Myrcene (18.56 %), and 2-pinene (10.09 %) as major components of essential oil. These substances are present in (leaves and branches) with an average of 30% more than in the flowers. It can be concluded that the *Rhantherium adpressum* due to the presence of a high quantity of many volatile bioactive compounds in (leaves and Branches) can be used as a target of a new potential source of medicine for the treatment of various types of illness.

Key Words:

Absorption system operating with a lithium bromide working pair

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Abstract: Absorption is the process by which something that has been moved from one phase to another, such as a liquid, penetrates the second phase and creates a solution [1] At a big scale, the absorption system is more cost-effective [2]. This paper presents a simulation of an absorption system operating with a lithium bromide working pair using the Aspen Plus program. This study was carried out using operating temperatures variable. The obtained results showed that the performance of the proposed system improves by increasing the operating temperatures of the generator, and the results also showed that the best coefficient is achieved by decreasing the absorption and condensation temperatures.

Keywords : absorption; lithium bromide.

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Sizing of a photovoltaic system coupled to the electrical distribution network, application to the ouargla region

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Abstract: The development of solar electric energy production systems has effectively contributed to the development of the electrical distribution network performance by reducing energy losses, improving, and strengthening the tension scheme. The accurate sizing of the photovoltaic station is an important factor from the technical and economic point of view, as well as for analyzing the performance of the photovoltaic station in light of climate changes and the uncertainty of energy supply, and this is the presence of several influencing factors. In this article, we have sized a photovoltaic station for the production of 2.57 MW using the PVSYST program to study and analyse the performance of the station in light of uncertainty and climatic changes, and this is in the Ouargla region - Algeria. The results showed that the scaling using the PVSYST program is better compared to the classical methods, because it gives comprehensive results for the photovoltaic system from several technical and economic aspects, and also because it contains comprehensive databases related to the climate and others with regard to choosing the type of equipment such as solar panels, batteries, transformers and their characteristics. And also the effect of climatic factors on the plant yield.

Key Words: Electrical distribution network, Dimensioning of a photovoltaic system, PVSYST software, losses.

Development of high surface area and excellent adsorption capability of methylene blue onto activated carbon produced by hydrochloric acid activation

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Abstract: The preparation of activated carbon from an agricultural raw material, Ziziphus jujuba fruit pits, by chemical activation using hydrochloric acid, with an impregnation ratio of 1/1 for the activating agent and previously crushed pits. The experiments in this study vary the carbonization temperatures. Good values of burn-off and preparation yield have been found. The second part of this study reports the ability to remove methylene blue (MB) dye from an aqueous solution. Three activated carbons obtained at three different temperatures were characterized using scanning electron microscopy (SEM) and Fourier-transform infrared spectroscopy (FT-IR). The effects of parameters such as contact time, dye concentration, and the mass of the adsorbent were used to evaluate the potential feasibility of chemically and thermally activated carbon at 600°C for the removal of methylene blue. A higher percentage of the dye was removed with a decrease in the initial dye concentration, an increase in the contact time between the carbon and the adsorbate, and also with an increase in the amount of adsorbent used. The concentrations of methylene blue in the remaining solutions were determined using a UV-Vis spectrophotometer. Key Words : pollution, adsorption, activated carbon, methylene blue REFERENCES [1] Hameed, B., Din, A. & Ahmad, A. Adsorption of methylene blue onto bamboo-based activated carbon: Kinetics and equilibrium studies. J. Hazard. Mater. 141, 819–825 (2007). [2] Hameed, B. H., Ahmad, A. L. & Latiff, K. N. A. Adsorption of basic dye (methylene blue) onto activated carbon prepared from rattan sawdust. Dyes Pigments 75, 143–149 (2007)

Key Words:

Assessment of Bioaerosol (Bacteria and fungi) Pollution in the Ouargla Region, Algeria

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Abstract: Biological aerosols, also known as bioaerosols, are particles of microbial, animal, or plant origin suspended in the air [1, 2]. They can include bacteria, fungi, spores, protozoa, and plant pollen grains [3, 4]. Bioaerosols can be found in indoor and outdoor environments [1], ranging from 0.02 to 100 μm . Inhaling certain bioaerosols can affect human health and lead to asymptomatic or apparent infections, allergies, asthma, rhinitis, and toxic reactions [5–7]. And This study focused on measuring and analyzing bioaerosol concentrations in indoor and outdoor environments in urban and industrial areas and the factors affecting them. The bioaerosol concentrations were within safe limits, except in the Hospital and the National Drilling Company, where they exceeded the recommended guidelines of the National Institute for Occupational Safety and Health and the American Conference of Government Industrial Hygienists. human factors, Geographical location, and climate were significant affecting, the study also emphasized the importance of further research on respiratory pathogens and the need for solutions to minimize Bioaerosol exposure. Key Words: Biological, Bioaerosol, Environment, Indoor, Outdoor. Reference

Key Words:

Investigation the activity of saharian plant on anti-Alzheimer by in silico inhibition.

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Abstract: Inhibiting Acetylcholinesterase (AChE) is one of the most often used anti-Alzheimer therapy in traditional medicine. One of the medicinal plants mentioned was Salvia verbenaca, and its in vitro tests produced positive outcomes. We used their results as a reference for our own research. Using autodock4 from the AMdock software. The three substances with the lowest energy were found to be: carnosol, cirsiliol and methyl carnosate had the best inhibition ability by in silico. All those results allowed us to better the earlier research.

Key Words: Autodock4, Acetylcholinesterase, (AChE), salvia verbenaca.

Tyrosinase inhibition ability of flavonoids from *Retama Sphaerocarpa* and *R. raetam* : Molecular docking, MM/GBSA calculations and ADME prediction

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Abstract: In mammals, tyrosinase is an important enzyme for melanogenesis. In fact, melanin is an organic pigment in our body that protects us from damaging ultraviolet light which can lead to distinctive skin lesions or cancer of the skin. However, excessive accumulation of melanin in certain cases leads to skin disorders such as hyperpigmentation and melanoma. Against such problems, tyrosinase represents a promising target for development of new agents. Therefore, in order to find new herbal candidates, we are interested in assessing the ability of certain flavonoids found in two Algerian medicinal plants (*Retama Sphaerocarpa* and *R. raetam*) to inhibit tyrosinase. MM/GBSA binding free energies calculations and Molecular docking study against tyrosinase was performed to assess the inhibitor potential of the selected compounds. In addition, the ADME parameters were predicted using the online server SwissADME. The molecular docking results shows that the selected compounds have a good binding affinity towards the target when compared with the reference ligand (kojic acid). These results showed that the first two compounds had low intestinal absorption and did not respect the rules of "druglikeness". On the other hand, the other compounds, in particular the Lipinski rule, have complied with these rules. Furthermore, except for compound 14., all compounds cannot cross the blood brain barrier which means that these substances are not active in the nervous system.

Key Words: Tyrosinase, flavonoids, molecular docking, medicinal plants.

DFT studies on vibrational and electronic spectra, HOMO-LUMO, MEP and molecular docking analysis of ferrocene derivative

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Abstract: This study explores the experimental and computational properties of N-Ferrocenylmethyl-N-acétamid (FMAA) using density functional theory (DFT). The molecular structure, fundamental vibrational frequencies, and intensities of the vibrational bands were interpreted through optimizations and normal coordinate force field calculations at the 6-311++G(d,p) level. These calculations were performed using the Gaussian 09 program to derive the optimized geometry and vibrational wavenumbers, as well as the IR intensities of FMAA. Computational results were then compared with the experimental values. In addition to the vibrational analysis, molecular orbital calculations, such as the HOMO-LUMO energy gap and Mapped Molecular Electrostatic Potential (MEP) surfaces, were conducted at the same level of DFT. Furthermore, the study included a molecular docking simulation to investigate the interaction of FMAA with a target protein. The molecular docking was performed using the AutoDock Tools 1.5.7 program, with the chemical compound FMAA and the protein model of COX-2 obtained from the Protein Data Bank (PDB). The results demonstrated that the ferrocene derivative has an electrostatic interaction with BSA, and the IC50 value indicated significant activity when compared to Diclofenac. Moreover, in silico studies were performed to predict the absorption, distribution, metabolism, excretion, and toxicity profiles of the designed compound. Overall, the theoretical data showed good correlation with the observed values, validating the accuracy of the computational approach in analyzing FMAA properties.

Keywords : HOMO; LUMO; DFT; Ferrocenique derivative ; COX-2.

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Synthesis and characterization of CuO nanoparticles by the green method

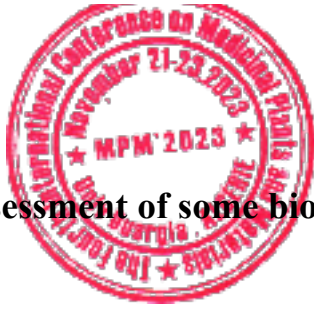
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Abstract: The use of plant materials has been considered a green route and a reliable method for the synthesis of nanoparticles owing to their environmental friendliness. In this work, we synthesized copper oxide nanoparticles (NPs) by treating copper sulfate with *Moringa oleifera* leaf extract. The resulting synthesized copper oxide NPs were characterized by scanning electron microscopy (SEM), energydispersive X-ray spectroscopy (EDS), and X-ray diffraction (XRD). The XRD analysis revealed the presence of monoclinic structures in the CuONPs, with particle sizes in the range of 16.61nm. The EDX spectra verified the existence of Cu and O as basic constituents. The SEM images of the CuONPs displayed irregular and aggregate shapes.

Key Words: Green synthesis, CuO NPs, Plant extracts, Nanoparticles, Copper oxide.



Assessment of some biological activities of *Phragmites australis* leaves extract and green copper nanoparticles

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Abstract: This study intends to use the leaves of the Algerian *Phragmites australis* aqueous extract to phytosynthesize copper nanoparticles (CuNPs) and to investigate the anti-oxidant and anti-inflammatory activities of the plant and nanoparticles. The new nanoparticles have been characterized using different techniques, for instance: UV-Vis spectroscopy, Fourier Transform Infrared Spectroscopy (FTIR), X-ray diffraction (XRD) and Scanning Electron Microscopy (SEM). Both leaves extract and CuNPs demonstrated noteworthy antioxidant properties, as evidenced by the results of the DPPH radical scavenging and FRAP essays [1]. Regarding the anti-inflammatory activity [2], protein denaturation inhibition was measured in the presence of our extract and CuNPs. The IC₅₀ levels showed an important anti-inflammatory property compared to the Diclofenac that was used as a standard. To conclude, *P. australis* leaves extract and its phytosynthesized copper NPs are a valuable natural resource that can be used as a potential source of bio-active compounds which is directed against inflammatory and oxidative stress diseases.

Keywords: *Phragmites australis*, phytosynthesized copper NPs, Antioxidant, anti, inflammatory activity.

Biosynthesis of manganese oxide nanoparticles and their in-vitro catalytic activity and in-vivo acute toxicity evaluation

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Abstract: Plant-based NP biosynthesis is now regarded as a gold standard among these green biological techniques owing to its ease of use and the diversity of plants [1]. However, MnNPs have gained importance in the synthesis and manufacturing processes because of their lower toxicity [2]. The aim of this study was to prepare manganese oxide nanoparticles (MnO NPs) using basil leaves aqueous extract and to evaluate their in vitro catalytic activity and in vivo acute toxicity in rats. Dye degradation of MnNPs was studied using photocatalytic and sonocatalytic activities. Moreover, in vivo acute toxicity testing of nanoparticles was carried up in wistar rats. The results confirmed that MnNPs had a highly effective congo red degradation potential. No deaths were noted on acute toxicity testing at any dose tested during 24 h. No signs of physiological change and behavioral toxicity. Slowly somatomotor activity was observed in the rats only in the first 3 h after NPs injection. This study confirmed that MnO NPs had a highly effective dye degradation potential with no in vivo acute toxicity at the studied concentrations, which encourages the use of these substances with a high degree of safety.

Key Words: Manganese oxide nanoparticles, catalytic activity, dye degradation, toxicity.

Effect of calcination temperature on the structural properties of copper chromite spinel obtained by combustion method

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Abstract: Pure spinel of copper chromite (CuCr_2O_4) was synthesised by combustion method (SCS) with different calcination temperature from 600°C to 1000°C . The effect of calcination temperature on the final properties of obtained materials was carefully examined using X-ray diffraction (XRD), Fourier Transform Infrared spectroscopy (FTIR) as characterization techniques. The XRD determine the formation of copper chromite spinel phase in the different calcination temperature. The FTIR spectra were studied to further confirm and clarify the material's structure.

Key Words: : CuCr_2O_4 , calcination temperature, spinel, combustion method, XRD, FTIR.

ELABORATION OF CuO NANOSTRUCTURED MATERIALS FOR PHOTODEGRATION OF METHYLENE BLUE

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Abstract: Elaboration, characterization and applications of copper oxide (CuO) thin films have gained significant attention from the scientific community because of their unique properties and possible applications in several domains like photocatalysis, electronics, and water pollution treatment [1–2]. In this study, p-CuO thin films were elaborated from the annealing of Cu₂O electrodeposited on an FTO glass substrate. Cu₂O thin films have been obtained from a sulphate aqueous solution at 60 °C. The obtained film was heated at 500 °C for 1 hour to form CuO. The X-ray diffraction technique was employed to evaluate the structural properties, which showed the formation of the tenorite phase of CuO without any impurities, indicating the formation of pure cupric oxide material. While atomic force microscopy was utilised to examine the morphological characteristics, the obtained results showed the formation of grains with uniform distribution on the FTO surface. Additionally, UV-visible analysis was used to study the optical properties. The determined value for the optical band gap (E_g) was 1.75 eV. As a result, it was found that the annealing of Cu₂O at 500 °C improved the absorption and minimised the optical band gap of the CuO thin films. In addition, photoelectrochemical measurements showed a high photocurrent response, which confirmed the improvement of the CuO film quality. The use of thin copper oxide (CuO) films for the purpose of photo-degrading methylene blue has been shown to yield a degradation rate of 75% within an hour. These properties render it a suitable material for use as a photocatalyst for the degradation of methylene blue.

Key Words: Electrodeposited, Thin films, Photovoltaic, CuO



Enhancing Polyoxometalates' Corrosion Inhibition of Carbon Steel in Acidic Media

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Abstract: Corrosion poses a significant challenge in the oil and gas industry, leading to safety hazards, production downtime, and substantial economic losses. The demand for effective corrosion mitigation strategies has intensified. This article presents a comprehensive overview of the role of corrosion inhibitors in safeguarding oil and gas infrastructure. The study assesses the performance evaluation of polyoxometalates as corrosion inhibitor, covering laboratory testing taking into account factors such as temperature, concentration and time of exposure. The characterization by the methods of analysis "DRX, FTIR" of polyoxometalates type keggin based on vanadium and ruthenium confirmed the structure of the POMs[1], Then, the evaluation by carrying out "the gravimetric method" confirmed that the PWRu inhibitor gave the best efficiency which reached 90% with the steel type API 5 L Grade B and 77% with the steel type API N80. In addition, Electrochemical experiments prove that the corrosion inhibition efficiency is all above 72% for these POM-based corrosion inhibitors at 40 ppm after immersion in a 1 M HCl solution for 30 min. In conclusion, this study underscores the indispensable role of corrosion inhibitors in the oil and gas sector. By providing a comprehensive understanding of their mechanisms "fig1", performance assessment, and practical applications, it serves as a valuable resource for professionals aiming to enhance the efficiency, safety, and sustainability of oil and gas operations in the face of corrosive environments.

Key Words: polyoxometalates, corrosion inhibitor, carbon steel, characterization

Synthesis, Characterization and photocatalytic activity of semiconductor ZW

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Abstract: In this study, the synthesis of catalyst based on tungsten WO₃ oxide was carried out by the molten salt method. the mixture was prepared and then calcined under a temperature of 700 degrees for 4 hours. The morphological structure of semiconductor material was explored by X-ray diffraction XRD has a pure monoclinic structure of space group P2/c. Scanning electron microscopy SEM and EDX studies to investigate the elemental composition of ZW synthesized, then by infrared analysis FTIR. By comparing the two spectrophotometers of WO₃ and ZW, we note the disappearance of the absorption jump in the range [527, 930] cm⁻¹ and the appearance of new jumps at 512 and 600 cm⁻¹ are due to vibration of the Zn – O – W bonds, and two others at 790 and 862 cm⁻¹ are attributed to the W – O bonds.[1,2]. Photocatalytic study of synthesized catalyst ZW and WO₃ under the influence of ultraviolet radiation UV (364 nm, 6W) to degrade the organic pollutant dye (methyl orange). Photocatalysis of this cationic pollutant follows first-order reaction kinetics. The rate of degradation approximately 36% by catalyst synthesized ZW and roughly 19 % by WO₃ oxide.

Key Words: Photocatalytic, catalyst, synthesized, semiconductor, kinetic

Synthesis, characterization of CuO and its use in water treatment

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Abstract: Due to their distinct physicochemical characteristics, metal oxide materials have emerged as attractive contenders for efficient wastewater treatment. Copper oxide (CuO) and other metal oxide nanoparticles have demonstrated outstanding effectiveness in the removal of emerging contaminants, heavy metals, and organic pollutants from wastewater. For the purpose of this study, we'll be using CuO nanoparticles made via cold plasma (gliding arc) to break down organic pigments. Scanning electron microscopy, X-ray diffraction, Fourier transform infrared (FT-IR), and ultraviolet-visible (UV-Vis) spectroscopy were used to describe the nanoparticles that were produced. We looked examined the effects of time, pH, nanoparticle mass, dye concentration, and temperature on the degradation of dyes by nanoparticles. An innovative material for the photocatalytic fading of colours in natural light has been found to be CuO nanoparticles.

Key Words: copper oxide, nanoparticles, cold plasma, organic pollutant, treatment

ZnO NANOTUBES ELECTRODEPOSITED ON ITO AS A NEW CATALYST FOR ENHANCEMENT OF ETHANOL ELECTRO-OXIDATION

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Abstract: Scientists pay a lot of attention to ZnO thin films because they are easy to elaborate, have great qualities, and can be used in different applications [1]. ZnO is a hopeful material for various technological advances because scientists are still looking for new ways to improve its properties [2]. The present study investigates the electro-oxidation of ethanol using a ZnO/ITO as an anode. The process involved the electrodeposition of ZnO nanostructures onto a ITO glass substrate. This was achieved by immersing the substrate in a solution composed of 0.1 M sodium nitrate (NaNO₃) and 1 mM of zinc chloride (ZnCl₂). The experimental conditions for this study were set at a temperature of 70°C, potential of -1 V, and a deposition duration of 15 min. The DRX spectra indicate that the obtained thin film has a Wurtzite hexagonal structure, with a notable alignment preference along the c-axis. Furthermore, a formation of hexagonal ZnO nanotubes aligned on the substrate with a total distribution was confirmed by SEM images. In addition, ZnO nanotubes that were electrodeposited on ITO have a notable electrocatalytic effect when used for the electro-oxidation of ethanol in an alkaline environment. These characteristics are evident in the form of strong repeatability, stability, and a notable reduction in the possibility for ethanol electro-oxidation. In summary, the findings of this study indicate that the electrode utilizing ZnO nanotubes exhibits promising potential for ethanol oxidation.

Key Words: Nanotube, ZnO, Ethanol, Electro, oxidation.

FAST AND EFFECTIVE ELECTROCHEMICAL SENSOR BASED ON (GCE / MWCNTS-AUNPS-RGO-CS) NANOCOMPOSITE FOR CATECHOL DETECTION

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Abstract: This study aimed to detect simultaneously catechol using a simple and effective electrochemical platform. A chemically synthesized reduced graphene oxide, produced with a modified Hummer's method, was subjected to analysis through Fourier Transformation Spectroscopy (FTIR), X-ray Diffraction (XRD), and Cyclic Voltammetry (CV). The nanocomposite (MWCNTs-AuNPs-rGO-Cs) was characterized using scanning electron microscopy (SEM). Subsequently, this nanocomposite was utilized to detect catechol via linear voltammetry method. Thanks to the combined conductivity of reduced graphene oxide and the outstanding catalytic properties of MWCNTs and AuNPs, the sensor demonstrated a wide linear detection range of 100-600 μM and an exceptionally low detection limit of 7.3 μM .

Key Words: rReduced graphene oxide, electrochemical sensors, performance, catechol

Zinc Oxide-Nanoparticles : Synthesis An eco-friendly approach and Biomedical Applications

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Abstract: Nanotechnology is one of the modern technologies and use in many fields[1][2], Nanomaterials exhibit excellent properties such as physical, chemical, biological, Electrochemical, Transpor and mechanical, they can be applied in a host of applications such as drug delivery, electronics, cosmetics, and biosensor[3-5]. In this papier, the biosynthesis of nanoparticles type of zinc oxide (ZnO-NPs) with sol gel method. the generation of nanoparticles involving, simpler, and eco-friendly approach, Furthermore an assessment of the activity test of ZnNPs against Bacterial tissues and compared their efficacies with some drugs as Ciprolon, Gentamicine, Paracetamol .While had efficacy against E.coli bacteria that exceeds the efficacy Ciprolon with ranged 36.5 mm.

Key Words : Nanoparticule, Biosynthis, Bacteria Tissues, Biomedical, Zinc oxide

Investigation of the microstructural, morphological and optical properties of Ag doped ZnO thin films prepared by sol-gel process

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Abstract: In this work, Ag-doped ZnO thin films were prepared by a low-cost sol-gel process on glass substrates. The effects of moderate Ag doping ($\text{Ag/Zn} < 10\%$) on the microstructural, morphological and optical of such films were investigated by Raman spectroscopy, scanning electron microscopy (SEM) and UV-Visible (UV-Vis) spectrophotometry. Raman spectroscopy analysis shows that all the films have a polycrystalline wurtzite structure. SEM micrographs reveal a dense surface with more or less spherical grains uniformly distributed. According to UV-Vis measurements, the undoped film shows the highest average optical transmission with a value of around 83% in the visible region wavelength. While, the average transmittance decreases from 80 to 78% with the increase of Ag concentration from 3 to 9%. Moreover, the direct optical band gap is found to increase with increasing Ag doping concentration. The high quality of Ag doped ZnO thin films with excellent optical properties suggests that these films may have good applications in optoelectronics.

Key Words:



La_{2-x-y}Nd_xCe_yCuO₄ (x ≤ 0.20 AND y = 0.15): SYNTHESSES AND PROPERTIES OF THE TRANSFORMATION T _ "pseudo-S"

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Abstract:

Key Words: biogas, methane , anaerobic digestion , organic waste .



Synthesis and Characterization of Porous Hybrid Chloroferrates Matter for Water Purification

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Abstract: In acidic settings, halometalate compounds crystallize from metal halides. For chloroferrate compounds, iron is in the form of ions, which are stable in acid solutions. In the presence of carboxylic acids, alkali metals, alkyl ammonium, or amines give rise to amine salts, which encapsulate these species in cavities from the resulting crystallization during compensation ionic charges or à chloroferrates oxalate (alkali or alkyl ammonium or amine) hydrate. Water contamination caused by organic compounds and heavy metals is becoming one of the most serious environmental issues. Several ways for removing them from water have been investigated. Because of their essential physiochemical properties, ionic nanoparticles of chloroferrate are used in wastewater treatment. Its primary application is in the retention of organic molecules as an encapsulation for water treatment. $[DaH_2][(H_2O)_3FeCl_3]Cl_2$ is an organic salt generated when Fe(II) is oxidized by ambient oxygen. The presence of the organic ligand in the pores of the material was highlighted by obtaining this salt. These organic ligands occupy distinct crystallographic locations. In the future, it may be possible to further adjust the reaction parameters in order to include the ligand into the composition.

Key Words:



A comparative study between sand samples from the dunes of the northern Algerian Sahara

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Abstract: The present study aims to investigate the physicochemical characteristics of the sand sample from the northeast Algerian Sahara by using Fourier-transform infrared spectroscopy (FT-IR), X-ray diffraction (XRD), and Scanning Electron Microscope (SEM/EDX). The XRD and FT-IR analysis confirmed the dominance of Quartz minerals with a high crystalline nature, furthermore, a calcite and feldspar mineral has been detected. The chemical analysis of sand sample by using the EDX technique revealed a high purity of sand sample with 94% of SiO₂ with the presence of a very low amount of other oxides as iron and Aluminum oxides. The scanning electron microscope micrographs show the presence of different shapes and sizes of grains of sand. These results corroborate that this sand has good proprieties for use in photovoltaic applications, but it needs some enrichment to be used for advanced high-tech applications. Key word: Quartz; Sand dune; photovoltaic silicon; physicochemical characteristics

Key Words:



Synthesis and thermoelectric properties of oxides Nd-substituted NaCoO₂

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Abstract: The thermoelectric (TE) materials are one of the promising candidates for environmental friendly technologies. Thermoelectric materials can directly convert waste heat into electric energy. New mixed oxides of Na_{0.74-x}Nd_xCoO₂ (x = 0, 0.1) materials were successfully synthesized using a sol-gel method and characterized by several techniques such as: X-Ray Diffraction (XRD), Scanning Electron Microscopy and various thermoelectrical properties (Resistivity, Seebeck coefficient and Power factor). The results showed that the undoped Na_{0.74}CoO₂ pellet sintered at 1123K for 12h crystallized with hexagonal symmetry, while the doped samples shows the formation a second phase (NdCoO₃). SEM analysis showed that the porosity of the samples decreases with increasing Nd content. The resistivity of the undoped sample and doped sample with x=0.1 increases with increasing temperature range while the resistivity of the sample with x=0.1 increases in the temperature range 307K ≤ T ≤ 419.5K and then decreases with rest of temperature range. The Seebeck values of the samples are between 61.6-137.5 μV/K and positive at all temperature range. The highest power factor value of 0.4425 mW/mK² at 1070.5K is obtained for x=0.1 sample. Key Words :sol-gel, thermoelectric materials, X-ray diffraction, oxides mixes, Scanning Electron Microscopy. REFERENCES [1]EmineAltin., Erdinc Oz., SerkanDemirel., Ali Bayri., Magnetic and thermoelectric properties of B-substituted NaCoO₂, Applied Physics A: Materials Science and Processing 119 (2015) 1187. [2]Lei Wang., Ming Wang., Dongliang Zhao., Thermoelectric properties of c-axis oriented Ni-substituted NaCoO₂ thermoelectric oxide by the citric acid complex method, Alloys and compounds 471(2009) 519. [3]RizwanAkram., Jansher Khan., SaimaRafique., MozaffarHussain., Asghari., Maqsood., Akhtar Ali Naz., Enhanced thermoelectric properties of single phase Na doped Na_xCoO₂ thermoelectric material, Materials Letters 300 (2021) 130180.

Key Words:



Action analgésique des parties aériennes de *Launaea nudicaulis*

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Abstract: Le terme de douleur désigne un spectre de sensations dont les caractéristiques peuvent être très différentes et dont l'intensité peut aller du désagréable à l'insupportable [1]. Au niveau mondial, la découverte de nouveaux antalgiques est devenue une priorité pour nombre de sociétés pharmaceutiques. *Launaea nudicaulis*, de la famille des Asteraceae, est utilisée en médecine traditionnelle Algérienne pour traiter plusieurs maladies principalement pour calmer les douleurs. La présente étude visait à évaluer *in vivo* l'activité analgésique des parties aériennes *L. nudicaulis* chez des souris induites par acide acétique. Le test du writhing est un test utilisé pour étudier l'effet analgésique périphérique [2]. Selon les résultats obtenus, après injection de l'acide acétique au lot témoin de souris, au bout de 15 min on décompte 29.66 ± 0.5 crampes abdominales, l'administration par voie intra-péritonéal des parties aérienne de *L. nudicaulis* aux différentes doses engendre une inhibition significative ($p < 0.05$) dans l'apparition des crampes abdominales par rapport au lot témoin. Ces réduction de nombre des crampes abdominales ont été doses-dépendantes. Nos résultats confirment et valident l'indication thérapeutique traditionnelle auprès de la population locale de la partie aérienne de *Launaea nudicaulis*.

Key Words: *Launaea nudicaulis*, douleur, Biskra, périphérique

EFFICACY OF TRADITIONAL HERBAL FORMULATION IN PROMOTING EXCISIONAL WOUND HEALING

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Abstract: Wound healing is a complex process that involves various biological mechanisms, and natural products have gained attention as potential sources of therapeutic agents [1]. In this study, we aimed to investigate the wound-healing potential of the aqueous extract obtained from *Arum arisarum*, a plant species very known in Algeria for its traditional medicinal uses [2]. Furthermore, we employed LC-MS/MS to profile the chemical constituents present in the aqueous extract. The aqueous and ethanolic extract of *Arum arisarum* were prepared using ultrasound-assisted extraction, and the LC-MS/MS analysis was conducted to identify and quantify the metabolites present in the extracts. The obtained chromatograms and mass spectra were compared with available databases to determine the chemical composition. The LC-MS/MS profiling of both extracts extract revealed the presence of various bioactive compounds, including caffeic and coumaric acids, also cinnamic and ferulic acids. These metabolites possesses antioxidant potential, as well as anti-cancer, anti-inflammatory, and antimicrobial properties. Additionally, the wound-healing potential of traditionnal ointments of 5 % aqueous extract was evaluated using in vivo model involving excision wound model in animal. The ointments enhanced wound closure rates and improved histological parameters in the extract-treated groups compared to the control groups. Overall, this study provides valuable insights into the chemical composition of the aqueous and ethanolic extracts of *Arum arisarum* through LC-MS/MS profiling. Furthermore, it highlights the promising wound-healing potential of the extracts, suggesting its potential application in the development of novel therapeutic interventions for wound management

Key Words: *Arum arisarum*, extraction, LC, MS/MS, excision wound, ointment, healing agent.



OBTAINING OF NATIVE GLUCOSAMINE FROM FOOD WASTE: EXTRACTION, CHARACTERIZATION & BIOLOGICAL EVALUATION

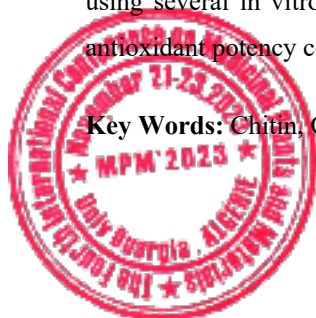
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Abstract: Glucosamine is a naturally occurring bioactive substance obtained from waste from co-products of shrimp waste [1], corn powder and peanut shells and through a chemical process involving demineralization, deproteinization and deacetylation (Fig.1). The purpose of this study was to optimize and evaluate the production conditions of glucosamine and to characterize them. Experiments have focused on the effects of interactions of five factors. Our result is made on the study of bibliographies in the same context. From the synthesis of the bibliography results [2-3], it can be concluded that: The optimal values obtained experimentally demineralization with a concentration of HCl (1.5N), agitation temperature 50 to 80° for 2 to 3h. The highest degree deacetylation value 88% under optimized condition of 70% sodium hydroxide at temperature 121-122°C for 3-4 h. The evaluation of the antioxidant activity of chitin, chitosan and glucosamine was studied using several in vitro tests: trapping activity against the radical DPPH. Results indicate that chitosan reflects a higher antioxidant potency compared to chitin and glucosamine.

Key Words: Chitin, Chitosan, Glucosamine, Waste, Coproduct, Extraction.



Composition chimique et activités Anti-inflammatoires de l'hydrolat des racines de *carthamus caeruleus* et de son composant majeur l'oxyde de carline provenant de l'ouest algérien.

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Abstract: La demande croissante des produits naturels minimise l'utilisation des produits chimiques de synthèse. De ce fait, notre travail avait pour objectif principal de contribuer à la valorisation de l'hydrolat des racines de *Carthamus caeruleus*, une plante de la famille des astéracées et de l'oxyde de carline provenant de cet extrait. L'effet synergique in vitro de l'oxyde de carline en association avec le diclofénac visant à réduire la dose minimale efficace et à minimiser les effets secondaires a également été soumis à des tests. L'hydrolat extrait des racines de *Carthamus caeruleus* a été analysé au moyen de la GC et de la GC/MS. L'activité anti-inflammatoire a été évaluée en utilisant la méthode de dénaturation des protéines, avec le diclofénac servant de témoin positif. L'extrait d'hydrolat de *C. caeruleus* était principalement composé d'un composé acétylénique, l'oxyde de carline (78,2 %), qui a été isolé et identifié grâce aux méthodes spectroscopiques de RMN 1H, 13C et IR. Les résultats des activités biologiques ont démontré que l'hydrolat ainsi que l'oxyde de carline présentaient un pouvoir anti-inflammatoire intéressant. De même, les associations de l'oxyde de carline avec les témoins positifs ont montré une amélioration significative de leur activité, avec une réduction substantielle des concentrations inhibitrices et des doses des anti-inflammatoires synthétiques. Des recherches complémentaires sont nécessaires afin d'évaluer l'applicabilité de ces associations de contrôle dans le cadre de l'industrie pharmaceutique.

Key Words:

Effect of experimental factors on the rate of biosynthesis of silver nanoparticles

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Abstract: The synthesis and application of metal nanoparticles has become increasingly attractive. Therefore, it is necessary to study the various factors needed to collect and describe these particles. It is known that the nature and concentration of plant extract, the concentration of mineral salt, temperature, temperature and reaction time affect the rate of production of nanoparticles, their quantity and other properties. Thus, the aim of the current work was to determine the impact of experimental factors on the production rate of AgNPs using seed extract on the production rate. Key Words :AgNPs, production rate, experimental factors, UV-vis.. REFERENCES [1] JohnSamuel Godwin Christopher, Banerjee Saswati and PanneerSelvamEzilrani, "Optimization of Parameters for Biosynthesis of Silver Nanoparticles Using Leaf Extract of Aeglemarmelos", Braz. Arch. Biol. Technol. v.58 n.5: pp. 702-710, Sept/Oct 2015. [2] Kanchi, Suvadhan, Ahmed, Shakeel, " Green metal nanoparticles : synthesis, characterization and their Applications", Hoboken, NJ : Wiley-Scrivener, 2018. [3]NixsonManosalva and al, "Green synthesis of silver nanoparticles: effect of synthesis reaction parameters on antimicrobial activity", World Journal of Microbiology and Biotechnology (2019) 35:88.

Key Words:

Total phenolic, total flavonoids contents and antibacterial activity of seeds extracts of *Lawsonia alba* from Algeria

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Abstract: *Lawsonia alba* (Henna) is widely used in folkloric medicinal for a treatment of various skin diseases such as Eczema (atopic dermatitis), boils and sores. The aim of the present study is to determine the antibacterial activity, total phenolics, and flavonoids content of extracts from the seeds of *Lawsonia alba* grown in Algeria and selected from two different regions (Adrar and Biskra). Total phenolics content ranged from 27.48 to 90.60mg gallic acid equivalents (GAE)/g dry weight, the flavonoids content varied from 1.457 to 6.267 mg quercetin equivalents (Q)/ g dry weight. The antibacterial activities of *Lawsonia alba* seeds extracts, determined by disk diffusion method (zone of inhibition), were compared to antibiotics (TM, CS, OXA, VA, C, AMX and AMC). The pathogenic bacterial strains used were *Staphylococcus aureus* (ATCC 25923), *Escherichia coli* (ATCC 25922) and *Pseudomonas aeruginosa* (MTCC 424). The antibacterial assay of the extracts revealed no inhibition zones with the Gram-negative bacteria tested. However, the extracts demonstrated activity against *S. aureus*. The zones of inhibition due to the extracts ranged from 9.5 – 17.5 mm. Keywords: Antibacterial activity, *Lawsonia alba*, phenolic compounds, flavonoids, seeds.

Key Words:

Evaluation of ZnNPs effects by Using Polyherbal Aqueous Extract in Wistar Rats

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Abstract: The goal of this study was to investigate the effect of ZnNPs (a green synthesis formulation) on the physiological, biochemical, and oxidative stress in rats. Ten female albino Wistar rats were randomly separated into two groups (n=5): control, zinc nanoparticles. Rats were given all types of treatments orally for 21 days. Various parameters were calculated, including biochemical, hematological, and oxidative stress markers. Histopathological lesions of pancreas tissues were noticed. Characterizations of nanoparticles were analyzed using standard techniques. UV-Vis Spectroscopy revealed that ZnNPs exhibit a peak at 230 nm, and SEM indicated that the produced ZnNPs are a smaller size than 21.5 nm. The FTIR spectra revealed a peak in the range of 400-700 cm⁻¹. In vivo results revealed little a change in the zinc nanoparticles group's lipid profile and metabolic markers. The antioxidant defense systems of the liver, kidneys and pancreas were also not damaged, with little change in MDA levels, GSH levels and SOD activity slightly reduced compared to control. Furthermore, hematological measurements demonstrated that zinc nanoparticles reduced MCV and HCT levels significantly (P<0.01). When zinc nanoparticles rats' pancreas tissues were compared to control rats', histopathological examination revealed a no difference. Finally, it appears that the use of ZnNPs synthesized by polyherbal extract can have a beneficial effect, it has an antioxidant capacity that prevents or slows down oxidation by neutralizing free radicals, thus improving the functioning power of the tissue to stop the disruption of the cell membrane.

Key Words: ZnNPs, Polyherbal Aqueous, Wistar Rats, Oxidative stress, Physiological effects, Biochemical effects

GREEN MANUFACTURING OF NANOPARTICLES AND THEIR EFFICIENCY IN WASTEWATER TREATMENT

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Abstract: Recently, Nano science has gained attention in different sciences, because his ability to applied it's in multiple fields such as wastewater treatment. This science allows the manufacture materials with size at the nano- scale rang called nanoparticles . Based of many various reasearch, there are three methods for synthesis the nanoparticles such as physical, chemical and biological or green method, but the last are the best due to eco-friendly, cost-effective and Sustainable approach. In this approach, we can use several plant parts to synthesis metal nanoparticles with a different types ,sizes and shapes,which characterized by many analytical methods such as UV–vis spectroscopy, FTIR, , SEM, EDX , XRD, and other techniques. Judging from many previous studies ,these nanoparticles have a effect in wastewater treatments due to they have a large area and small sizes, which provide a great adsorption capacity. Where they were used effectively to remove different pollutants from the wastewater such heavy metals, that are toxic for ,enverment human and other living organisms . So, the application of nanomaterial is really the future of water and this treatment technology provides spped , efficiency and cost-effecting ,better than the traditional methods.

Key Words: nanoparticles, green synthesis, heavy metals, wastewater treatment.

Green Synthesis of copper Oxide Nanoparticles Using Biomass "Banana peels"

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Abstract: A green approach based on physiologically reliable processes has been devised for the manufacture of CuO nanoparticles. Aqueous copper (II) chloride solution and extract from Banana peels were used to make CuO nanoparticles in an environmentally friendly technique. The generated CuO nanoparticles were characterized using a UV-visible spectrophotometer, scanning electron microscopy, transmission electron microscopy, and Fourier-transform infrared spectroscopy. The existence of peaks in the FTIR indicates that CuO nanoparticles are present. When the extract was introduced to the copper chloride solution, the solution moved from pale yellow to brown, indicating that it had changed. During SEM research, nanoparticle clusters were created with an average size of 40 nm. The average size of CuO nanoparticles isolated after ultrasonication of the dispersion is 40 nm. Banana peels were revealed to be an excellent choice for producing CuO nanoparticles in a simple and ecologically friendly manner.

Key Words: green synthesis, copper oxide nanoparticles, Banana peels.

In vitro antioxidant activities of silver/silver oxide (Ag/Ag₂O) nanoparticles produced from the leaves extracts of *Mentha piperita*.

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Abstract: In this study, green synthesis of silver/silver oxide nanoparticles (Ag/Ag₂O NPs) was achieved by bioreduction of silver nitrate using *Mentha Piperita* plant leaves extract. The effect of different silver nitrate concentrations on the nanoparticles' silver formation was studied. The obtained nanoparticles were characterized by UV-Vis, FT-IR, XRD and SEM techniques are used for this purpose. The antioxidant activity of samples was evaluated by three methods: the DPPH test (2,2-diphenyl-1-1- picirylhydrazil), the FRAP (Ferric reducing antioxidant power) and TAC (Total Antioxidant Capacity) test. UV-Vis spectra showed maximum absorption in the range of 253–300 nm related to the silver. FTIR spectra exhibit a weak peak at 565 cm⁻¹ attributed to silver NPs vibration, confirming the nanoparticles formation. The X-Ray Diffraction (XRD) analysis confirmed the crystalline nature of (Ag/Ag₂O NPs) with an average size ranged in 31–42 nm. SEM showed that the green synthesizing silver nanoparticles having in general as cubical shape. Among the examined extracts, (Ag/Ag₂O NPs) with 1g concentration showed the highest antioxidant activity with value of 2.749, 21.60 and 18.69 mg/ml for DPPH, FRAP and TAC tests respectively. As a result, the use of peppermint leaves extract offers its ease, fast, low cost and friendly to the environment compared to other methods. The research outcomes of the numerous assays measuring antioxidant capacity clearly demonstrate that the silvers nanoparticles produced by the *M. Piperita* are potent natural antioxidants beneficial for the health preservation due to their antioxidant capabilities.

Key Words: Biomaterials, Green synthesis, Nanoparticles, *Mentha Piperita*, AgNO₃, XRD.

Biosynthesis of Zinc oxide nanoparticles from essential oil of mint leaves

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Abstract: Zinc oxide nanoparticles (ZnO NPs) are metal oxide nanomaterials that are valuable and widely used inorganic compounds due to their unique physical and chemical properties. They have high chemical stability, extended radiation absorption spectrum, high electrochemical coupling coefficient and high photostability, and their molecular formula is ZnO [1]. ZnO-NPs are widely manufactured and used in a variety of commercial and additive products, including ceramics, cements, plastics, glasses, salves, lubricants, adhesives, sealants, pigments, batteries, ferrites, flame retardants, cosmetics, and food products in sunscreen, as a nutritional zinc [2,3]. The aim of this study was to develop a green synthesis of ZnO-NPs using essential oil of mint leaves. and characterised by UV-Vis spectroscopy, X-ray diffractometry and Fourier transform infrared spectroscopy.

Key Words: Nanoparticle; ZnO-NPs; synthesis; characterizations;

References:

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Contribution of Screening and Quantum Effects on the Operator of Electronic Collisions in Semi-classical Plasma

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Abstract: The plasma radiation is decomposed either by refraction or by diffraction and we observe bright or dark lines depending on whether they are in emission or absorption. From the intensity of this spectrum or the profile of the lines, we wish to deduce information on the physical conditions (temperature, densities, speed fields, electric field, magnetic field, etc.) by a broadening and/or a shift. The contribution of this disturbance can be presented in the formalism of spectral lines isolated by a term called the electronic collision operator. The evaluation of this operator has been made in the case of ionic emitters, in the non-screening limit, using hyperbolic paths for the colliding electrons. In this work, we have developed a new usable formula of the electronic collision operator where we have used the impact approximation for electrons in its semi-classical version. In the quantum mechanics the trajectory concept has not a meaning which leads to use the quantum scattering cross sections in the estimation of electronic collision operator. Two points of view have been presented in the description of our operator: taken into account quantum effects in the interaction, and conceded the screening effect in the collision. For a suitable regime of temperatures and electron densities we compare our approach to a collision operator obtained according to the Coulomb interaction.

Key Words : screening field effect, quantum effect, electronic collision operator.

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Problem of screening Binary interaction with the use of distorted quantum mechanics and noncommutative geometry in plasma

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Abstract: Fundamental physical phenomena have been described by a quantum mechanics at the atomic and subatomic levels. Classical physics could not solve some problems, which made a group of European researchers interested in developing quantum mechanics to solve many difficult systems such as the photoelectric effect, black body radiation, or the existence of spectral lines, etc. Quantum mechanics has succeeded in describing the structure of the atom. In addition, it has proven to be very important in explaining the behavior of elementary particles to the point of forming the basis of modern physics. Two most mathematical rules have been formed to study certain questions related to this branch are: the Heisenberg formalism, and the Schrödinger equation. Feynman developed his accurate technique in 1942, which is represented by path integrals; it is an alternative to Heisenberg's methods and the Schrödinger equation. In order to exploit quantum mechanics to understand plasma pressures, we have treated the behavior of two particles with kinetic and spinless coupling potentials in the framework of Non-relativistic quantum mechanics. In addition, we take into account the collective effects using Debye potential and following the path integral technique to find a good translation of the effective interaction in plasma environment.

Key Words: Propagator, Debye potential , Noncommutative geometry, Minimal length.



TITANIUM DIOXIDE-NANOPARTICLES : BIOSYNTHESIS, CHARACTERIZATION AND THEIR APPLICATION FOR SOLAR PHOTOCATALYTIC DEGRADATION OF METHYL ORANGE

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Abstract: Nanoscience enables researchers to develop novel and cost-effective nanomaterials for energy, healthcare, medical, electronics, cosmetics, and biosensor applications [1-2]. Nanoparticles synthesis becoming increasingly for their superior physical, chemical, electronic, biological, Electrochemical, Transport and mechanical properties. Good knowledge of these characteristics allows the development of application in all essential sensitive areas of human and environmental service. In this study, Titanium dioxide nanoparticles (TiO₂ NPs) were synthesised successfully using Pistachio vera extract as the reducing agent and characterized by uv-vis spectroscopy and fourier transform infrared spectroscopy[2-5]. In this study, Titanium dioxide nanoparticles (TiO₂ NPs) were synthesised successfully using Pistachio vera extract as the reducing agent, characterized by uv-vis spectroscopy and fourier transform infrared spectroscopy. The results confirmed obtain the optimum conditions at a concentration of C=60 mg, the yield was R=67.69%, and at a time of T=60min the yield was 92.41%, and at pH =3, the yield was 66.83%. Key words :Biosynthesis, Titanium dioxide -Nanoparticles, Photocatalytic, Methyl orange.

Key Words:

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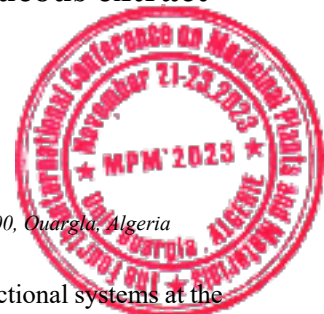
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Multi-method eco-friendly synthesis of ZnO-nanoparticles using aqueous extract

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Abstract: Nanotechnology is defined as the field of science of designing materials, engineering of functional systems at the small molecular or atomic more dimensions of about 1nm to 100nm. it is excellent candidate applied such as drug , electronics, cosmetics, and biosensor and Computers, this is due to physical, chemical, biological, Electrochemical, Transport and mechanical properties[1-3] .The sol-gel process is a especially chemical method for the synthesis metal oxide nanoparticles more of various nanostructures, In this method, the molecular precursor as metal alkoxide is dissolved in water or alcohol and converted to gel. Precipitation of nanoparticles from solution is one of the most widely employed synthesis methods . In this papier, the green synthesis of nanoparticles type of zinc oxide (ZnO-NPs) with zinc acetate / zinc sulfate by multi-process of which sol gel method and Precipitation method. the generation of nanoparticles involving, simpler, and eco-friendly approach.

Key Words : Zinc oxide-Nanoparticle, Biosynthis, Eco-friendly approach, Sol-gel, Precipitation

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EXTRACTION OF VITAMIN C FROM POMEGRANATE SKIN IN THE SETIF REGION

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Abstract: The pomegranate tree is among the most widely used medicinal plants for a long time. These different parts are considered as an old remedy due to their richness in bioactive molecules such as polyphenols, tannins, gallic acid and hydroxy benzoic acid. The principal objective of this study is to verify the presence or absence of vitamin C in *Punica granatum* barks and to evaluate the antioxidant and antibacterial activity of their extract. and materials This work allowed us to master the simplest analytical techniques starting with the extraction of vitamin C from pomegranate peels using solid-liquid extraction methods: Maceration and infusion. A series of chromatographic (TLC, column separation, HPLC), spectrophotometric (UV, IR) and electrochemical analyses were then undertaken to confirm the presence or absence of ascorbic acid in pomegranate peels. A study of the antioxidant (DPPH test) and antibacterial activity was carried out on the extract obtained. Results and discussions The first result shows that maceration with a 100% ethanol solvent is the best extraction protocol from the point of view of yield, non-toxicity, as well as the good solubility of the vitamin C which will be identified and characterized by analytical methods. Through these studies we proved the presence of ascorbic acid in pomegranate peels using qualitative methods (Thin layer chromatography, column chromatography, infrared and visible ultraviolet spectrophotometry) and a quantitative method (High performance chromatography) from which it was shown that a mass of 60 g of pomegranate peel powder contains 0.52 g/l of vitamin C (0.86% of the dry mass) Conclusion The aim of all this work is to encourage researchers to use this part of the pomegranate fruit in order to benefit from its richness in bioactive substances and for a more gentle therapy without side effects.

Key Words: Pomegranate, Extraction, Separation, Ascorbic acid, chromatography



Theoretical Investigation On The Biological Activities Of 2-Methoxy-6-(Pyrimidin-2-Yl-Hydrazonomethyl)- Phenol- Transition Metal Complexes [M(HL)₂]_x (M = Mn, Fe, Co, Ni And X = +1, 0)

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Abstract: This theoretical investigation using DFT/B3LYP calculations is dealing with the molecular structures and biological activities of complexes [M(HL)₂]_x (M = Mn, Fe, Co and Ni ; x = +1 and 0 ; HL = 2-methoxy-6-(pyrimidin-2-yl-hydrazonomethyl)- phenol). The complex of Fe as described experimentally [1]. The HOMO-LUMO gaps explain that the possible charge transfer interactions that take place within the molecules are responsible for the molecular reactivity of the studied molecules. The chemical hardness, the chemical potential, and the electrophilicity indexes show clearly the improvement of the biological activities of [M(HL)₂]_x. The TD-DFT theoretical study performed on the optimized geometry [Co(HL)₂]₊ allowed us to predict the UV-Vis spectra and to identify quite clearly the spectral position and the nature of the different electronic transitions according to their molecular orbital localization.

Key Words: DFT calculations, Metal-ligand coordination, Biological activities, Electronic transitions.



ETUDE PHYTOCHIMIQUE ET EVALUATION DE L'ACTIVITE ANTIOXYDANTE DE L'EXTRAIT AQUEUX DE OUDNEYA AFRICANA R.

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Abstract: Oudneya africana R. connue sous le nom de « Henat l'ibel » est une plante médicinale endémique, qui appartient à la famille des Brassicacées, qui se trouve notamment en Sahara septentrional et largement utilisée en médecine traditionnelle algérienne. Le présent travail vise à l'étude phytochimique et d'évaluer l'activité antioxydante de l'extrait aqueux de cette plante. La teneur en polyphénols totaux et en flavonoïdes totaux a été quantifiée par des méthodes colorimétriques. Les résultats de l'analyse phytochimique ont montré une richesse de la plante en polyphénols (57,61 µg/mg EAG/mg Ex), en flavonoïdes (2.35 µg EQ/mg Ex). L'évaluation du pouvoir antioxydant in vitro a été déterminée par les tests de DPPH, ABTS, test de pouvoir réducteur et le test de blanchissement β-carotène. Les résultats ont révélés des capacités anti-radicalaires plus élevée vis-à-vis les radicaux DPPH et ABTS, respectivement (135,6 µg/mL et 17,4 µg/mL). L'extrait a exercé un pouvoir réducteur important ($A_{0.5} = 24,82 \mu\text{g/mL}$) et inhibe remarquablement le blanchissement de βcarotène (AA%= 42,95 %). En conclusion l'extrait aqueux de Oudneya africana a des effets antioxydants puissants, qui supportent leur utilisation en médecine traditionnelle.

Key Words: Oudneya africana ; extrait aqueux ; polyphenols ; flavonoides ; activité antioxydante



CONTRIBUTION À L'ÉTUDE DES CORPS GRAS, DES NOYAUX DE QUELQUES VARIÉTÉS DE PALMIER DATTIERS (SUD-EST DE L'ALGÉRIE).

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Abstract: La présente étude a pour objectif d'évaluer la composition chimique de noyaux de palmier dattier . Pour ceci, nous avons procédé aux analyses chimiques de noyaux de dattes de quelques cultivars du sud-est algérien L'étude de la fraction lipidique de l'huile du noyaux , nous avons permis de déterminer les teneurs en huile ,ainsi les principaux indices (caractéristiques) physicochimiques des huiles, les valeurs trouvées appartiennent à l'intervalle des huiles végétales alimentaires. L'analyse par la chromatographie en phase gazeuse CPG des esters méthyliques d'acides gras, montre que les huiles contient des acides gras habituels: oléique, linoléique, palmitique et stéarique, les acide gras à courte chaîne comme les acide gras caprique,laurique et myristique ont été aussi détectées . La quantification des stérols et tocophérols a été déterminé par une méthode spectrophotométrique simple

Key Words: palmier dattier, noyaux, acides gras, tocophérols, stérols



ECOLOGICAL SYNTHESIS OF CUO NANOPARTICLES USING PUNICA GRANATUM L. PEEL EXTRACT FOR THE RETENTION OF METHYL GREEN

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Abstract: Currently, nanotechnology is a very interesting field of research due to the successful application of nanomaterials in numerous areas, namely medicine, electronics, environment, biology, and optics [1]. Biological methods rely on the preparation of nanoparticles by such microorganisms as plant extracts, bacteria, yeasts, and fungi [2]. Thus, the orientation towards natural products gained the widest attention owing to worldwide development, favoring good health, and mitigating the risk of disease. In this respect, the valorization of plant biomass is of paramount importance relating to the protection of the environment [3]. Within this framework, the basic objective of this work lies in using an ecological method for the elaboration of a nanomaterial for the adsorption of aqueous pollutants. In this case, it is a question of examining the possibility of using *Punica granatum L.* bark extract for the preparation of CuO nanoparticles. The synthesized CuO nanoparticles demonstrated a great performance in the adsorption of methyl green with an adsorption capacity of 28.7 mg g⁻¹ under optimal conditions (60 min, contact time; 2 g L⁻¹, adsorbent dose; pH, 6.5; 25 ± 2°C). The adsorption of methyl green on the CuO nanoparticles follows the pseudo-second order model and the adsorption isotherm is in good conformity with the Langmuir model. CuO nanoparticles can be reused with good recycle properties for three cycles. Regarding the good sorption performance of the prepared CuO nanoparticles, the use of environmentally friendly *Punica granatum* bark can constitute an ecological, simple, and economical method for the elaboration of materials in order not only to purify contaminated waters but also to enact additional environmental applications [4]. The nanoparticles obtained through plant extracts have the potential to be widely used in the medical field as dressings or therapeutic drugs. Thus, green chemistry provides a new innovative technique that does not use hazardous substances for the design and development of variable activity materials

Key Words: Copper nanoparticles ; green synthesis ; *Punica granatum L* ; biosorption ; methyl green



EVALUATION DE L'ACTIVITE ANTIOXYDANT, BIOLOGIQUE ET ANTI CORROSION, DES EXTRAIS DE QUELQUES PLANTES ET DES COMPOSES SYNTHETISE.

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Abstract: Cette étude vise à préparer de nouveaux types de la famille de thiol-thione et de leurs sels, qui sont des composés cycliques hétérogènes contenant trois atomes de soufre [1,2]. Des extraits de métabolites secondaires de certaines plantes de la famille des crucifères, connues pour leur teneur en soufre [3], sont préparés dans la région du sud-est de l'Algérie. Ensuite, l'activité antioxydante est évaluée [4], ce qui contribue à protéger le corps contre les dommages oxydatifs. L'activité anti-inflammatoire est également évaluée, qui joue un rôle important dans le traitement de nombreuses maladies chroniques. L'activité inhibitrice de la corrosion des métaux est également évaluée, ce qui contribue à prévenir l'oxydation des métaux et à les protéger contre les dommages [5]. Sur la base de ces résultats, une étude comparative est réalisée entre les composés fabriqués à partir de la famille de thiol-thione et les substances actives extraites des plantes de la famille des crucifères dans la région du sud-est de l'Algérie. Cela est fait en utilisant des méthodes chimiques et électrochimiques pour déterminer les avantages potentiels pour la santé de ces composés et les comparer aux extraits végétaux.

Key Words: Plantes sahariennes ; dithiolethiones ; Activité Antioxydant ; corrosion ; Activité anti ; inflammatoire.



PREPARATION OF ACTIVATED CARBON FROM PENULTS SHELL BY CHEMICAL ACTIVATION: OPTIMIZATION AND APPLICATION FOR REMOVAL OF BLUE METHYLENE

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Abstract: High-surface-area porous activated carbon has been prepared from date palm rachis by chemical activation using ortho-Phosphoric acid (H_3PO_4) as the agent of activation. The process has been conducted at different impregnation ratios (H_3PO_4 /precursor = 0.5–3) and carbonization temperatures (500–700°C). Activated carbon obtained at optimal conditions was characterized using scanning electron microscopy, Fourier Transform Infrared Spectroscopy, surface area measurement (BET), elemental analyses, pH zero-point charge measurement (pHPZC), Boehm titration, and elemental analysis. The activated carbon obtained has excellent textural proprieties. The activated carbon obtained was then used as an adsorbent for the removal of methyl orange from aqueous solutions in batch mode. The effects of pH, adsorbent dose, contact time, and initial concentration on the adsorption of methyl orange were examined. The pseudo-first-order model and the pseudo-second-order model were applied to the experimental data to elucidate the possible mechanisms involved in the adsorption of methyl orange onto activated carbon. The experimental data were analyzed by the Langmuir and Freundlich isotherm models. The equilibrium isotherms and kinetics were best described by Langmuir and pseudo-second-order models, respectively.

Key Words: Generalized gradient approximation (GGA), FP, LAPW, WIEN2K, density functional theory (DFT)



BIOSYNTHESIS AND CHARACTERIZATION OF ZINC OXIDE NANOPARTICLES USING SOLENOSTEMMA ARGEL AND ANASTATICA HIEROCHUNTICA EXTRACT EVALUATION THEIR ANTIBACTERIAL ACTIVITY

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Abstract: Recently, there has been a notable emergence of innovative and environmentally responsible techniques within the realm of 'Green Nanotechnology' for the synthesis of nanoparticles. These methods encompass a range of chemical, physical, and natural biological precursors, all of which have been extensively investigated to facilitate the creation of nanoparticles with precise size, shape, and functional characteristics. The environmentally conscious aspect involves the use of solvents, reducing agents, or stabilizing agents derived from natural sources due to their non-toxic and eco-friendly properties [1], [2], [3], [4]. In the context of this research, a sustainable and environmentally friendly synthetic approach was adopted to produce zinc oxide nanoparticles using extracts from *Solenostemma argel* and *Anastatica hierochuntica* plants. The confirmation of nanoparticle formation was achieved through a comprehensive analysis employing various characterization techniques. The presence of biomolecules and metal oxides was confirmed by interpreting UV-Vis and Fourier transform infrared (FT-IR) spectroscopic data. Furthermore, X-ray diffraction (XRD) analysis revealed the creation of distinct wurtzite ZnO crystalline nanoparticles. Subsequently, the antibacterial effectiveness was assessed through the utilization of the disk diffusion method

Key Words: Zinc Oxide Nanoparticles, *Solenostemma argel* and *anastatica hierochuntica* , Biosynthetic, Antibacterial Activity



AN IN-SILICO INVESTIGATION BASED ON 2D-QSAR MODELING, MOLECULAR DOCKING STUDIES AND ADMET, ON NOVEL THIAZOLOPYRIDAZINE DERIVATIVES INTENDED AS INHIBITORS FOR THE TREATMENT OF BREAST CANCER

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Abstract: Molecular modeling encompasses a range of computerized techniques that combine theoretical chemistry methods with empirical data. These techniques have a dual purpose: they can be utilized to scrutinize molecules and molecular systems, or they can be employed to predict molecular, chemical, and biochemical properties. Quantum chemistry methods play a pivotal role in this framework, especially in determining molecular geometries and predicting a diverse array of properties. In the context of this research, a quantitative structure-activity relationship (QSAR) study was conducted on 23 derivatives of thiazolo[4,5-c] pyridazine, aiming to evaluate their potential as anticancer agents targeting MCF-7 cells. This study employed multiple linear regression analysis, where a quantitative structure-activity relationship model was developed for activity prediction. The resulting QSAR model exhibited a correlation coefficient of 0.851. To validate the model, leave-one-out validation was employed. Additionally, the drug-likeness properties of seven selected molecules were assessed based on their observed activity against MCF-7 cells. The evaluation results indicated that these compounds possess drug-like characteristics. Furthermore, molecular docking studies were carried out using Autodock 4 for the compounds against Human Topoisomerase II alpha, a protein overexpressed in Breast Cancer. The thiazolo [4,5-c] pyridazine molecules underwent a comprehensive investigation of bioavailability and toxicity through in silico ADMET prediction.

Key Words: QSAR ; Molecular docking ; ADME ; Drug ; likeness ; MCF ; 7 cells.



OPTIMIZATION OF CYCLOHEXENE OXIDATION CATALYSED BY POLYOXOMETALATES AND CLAYS USING CENTRAL COMPOSITE EXPERIMENTAL DESIGN

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Abstract: Keggin type tungstovanadophosphoric acid $H_4PW_{11}VO_{40.8}H_2O$ was prepared and impregnated on acid activated bentonite under mild conditions. In acidic solution, PVW was incorporated into a clay interlayer template using the sol-gel process. The catalysts were characterized by XRD, BET and FTIR analysis. The catalytic activity was evaluated in cyclohexene oxidation. Characterization analyses indicated that PVW was distributed more uniformly in the encapsulated sample compared to the impregnated sample. The most intriguing aspect about heterogenizing homogenous catalysts is that they can be recovered. The optimal conditions for cyclohexene oxidation by PVW/AAB and PVW-SC catalysts using H_2O_2 as oxidant. The influence of catalyst weight, method preparation of catalyst, reaction temperature, time and the molar ratio Cyclohexene/ H_2O_2 were studied. To relate the process variables to the two responses, central composite design-based two-second order polynomial models were developed. The significant effects of parameters on each response were determined using the statistical analysis of variance. The significant variables influencing each response have been determined by the analysis of variance. According to the fitted models, predicted and actual responses typically are identical. An optimum conditions were estimated as 85.4 mg of catalyst, molar ratio of 2/1 (oxidant/cyclohexene) and impregnated catalyst (PVW/AAB) for preparation method under 72 °C for 10.2 h. The conversion and selectivity calculated by the model are 76 % and 100 % respectively, they are close to the experimentally measured value 70 % and 95 % respectively under the operating conditions quoted above.

Key Words: Bentonite, Silica pillared clay, Poyoxometalates, cyclohexene oxidation, Response surface methodology.



PREPARATION, CHARACTERIZATION, AND MOLECULAR- STRUCTURAL MODELING OF SULFARLAM

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Abstract: In this research, we synthesized a material with the molecular formula $C_{10}H_8OS_3$ known as sulfurlam, or 5-para-methoxyphenyl-2,1-dithiol-3-thion. Sulfurlam is a member of a group of dithiolthione chemicals that are manufactured into polymer-coated tablets for use as medications. We conducted a chemical structural investigation utilizing infrared (IR) spectroscopy to ascertain the vibrations of the functional groups in order to examine the structural molecular characteristics of the material being studied. X-ray diffraction (XRD) was also used to validate the compound's crystalline structure. We used theoretical approaches to further analyze the compound's shape using molecular modeling software, notably Avogadro's program. Important structural information was obtained through this technique, including bond lengths, angle values, torsion angles, the compound's charge, and energy. We produced a geometrically enhanced and more stable molecule with the lowest energy calculated at $E = 345.077$ kJ/mol by comparing these molecular-structural attributes with experimental findings from earlier investigations and computational findings from the modeling process. According to prior studies, the compound's chemical structure, which mixes biologically active chemicals, predicts that it will have antioxidant action from a biological perspective.

Key Words: Avogadro program, sulfurlam, dithionine, and molecular modeling .



PHYSICO-CHEMICAL PROPERTIES OF BIOFUEL PRODUCED FROM PINACEA PLANT

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Abstract: Petroleum product resources are limited and their consumption is increasing very fast with globalization and high technology development since last decade . Since the prices of these products are on the rise at any given time , there is a need to search for an alternate or unconventional source of energy, which would Fuel our vehicles without any major vehicle modification .The solution to these problems can be obtained by utilizing the vegetable oils. the aim of this work is to extract vegetable oil from a Pinaceae plant growing in Algeria. then produce the correspondant biofuel via a transesterification reaction of VO with alcohol.

Key Words: Biomass ; biofuels ; biodiesel ; transesterification ; physicochemical properties



L'ENQUETE ETHNOPHARMACEUTIQUE DE LA PLANTE MEDICINALE WARIONIA SAHARAE DANS LA WILAYA DE BECHAR

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Abstract: L'enquête ethnopharmacologique est un travail de terrain qui consiste à aller à la rencontre des praticiens traditionnels pour s'enquérir de leur méthode de traitement des maladies. Cette enquête est indispensable dans la mesure où elle nous permet de nous orienter afin de cibler certains tests biologiques. L'outil de travail est élaboré en une série de questionnaires. L'étude a pour vocation de réaliser une enquête au niveau de la Wilaya de Bechar. L'objectif principal de cette enquête est de connaître la place ethnopharmacologique de Warionia saharae dans la région, pour inventorier nos savoirs thérapeutiques et traditionnels sur l'espèce locale, du moment que, l'ethnopharmacologie crée un lien direct entre les connaissances thérapeutiques recueillies sur le terrain et l'évaluation pharmacologique en laboratoire. L'enquête ethnobotanique et ethnopharmacologique menée a permis de regrouper des informations importantes sur l'espèce Warionia saharae. Les résultats de l'enquête montrent en particulier que : 1. Une grande connaissance de la toxicité de la plante avec des fortes doses (80%), des individus interrogés en parlent. Il s'agit jusqu'ici d'une utilisation à faibles doses. 2. Warionia saharae est reconnue dans la région pour son pouvoir thérapeutique contre la Brucellose et le rhumatisme. Elle est utilisée souvent pour soigner les infections et soulager les douleurs. 3. Le remède traditionnel est essentiellement utilisé pour l'arthrite, eczéma, Douleur abdominale, inflammation d'intestin, ainsi pour les maladies rénales et pour nettoyer le foienaturellement. 4. Le traitement par Warionia saharae consiste à l'utilisée seule (94%), rarement associée (20%).

Key Words: Plantes médicinales, Warionia saharae, enquête ethnopharmaceutique, remède traditionnel



BIOLOGICAL ACTIVITY AND PHYTOCHEMICAL STUDY OF BULBOUS PLANT FROM ASPARGACEAE FAMILY

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1 - Biological activity and phytochemical study of bulbous plant from Asparagaceae family

Abstract: The objectives of this study included determining the antioxidant activity of the Asparagaceae family bulbous plants and isolating some of its bioactive components. The total phenolic content and ABTS scavenging of various bulb extracts, as well as petroleum ether, dichloromethane, ethyl acetate, butanol, aqueous, and crude extracts, were quantified using spectrophotometry which was in the range (2,088- 669,882 $\mu\text{g GAE/mg ex}$) and (IC₅₀: 3,441-800 $\mu\text{g/ml}$). The results of the dichloromethane extract, which produced the best results, promote the isolation of some bioactive compounds using various chromatographic techniques, such as silica gel, ODS and Sephadex, while will identify them by the different spectroscopy methods (NMR H1 and NMR C13).

Key Words:



LUPINE SEED OIL EXTRACTION AND CHARACTERIZATION OF FATTY ACID BY GCMS

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Abstract: Lupine seed oil is rich in phenolic fatty compounds acids and vitamins of economic importance for the extraction of the pharmaceutical, cosmetic and food industries from the oil from lupine seeds by extraction with Soxhlet. In the Soxhlet device using hexane from steel to solvent proportions and extraction time in 6 hours. The result of oil production of 12% with hexane. The aim of this work was to briefly review the composition and nutritional aspects of lupine seed oil and chemical compounds to separate and determine the extracted lupine seed oil. By Gas Chromatography - Mass Spectrometry (GC-MS) and the physical and chemical properties of lupine seeds.

Key Words: Lupine seed oil, Soxhlet method, extract, oil properties.



EFFECTS OF d ORBITAL OCCUPANCY AND THE NATURE OF THE LIGAND ON THE GEOMETRY OF OCTAHEDRAL COMPLEXES : SYNTHESIS, IDENTIFICATION AND MODELING.

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Abstract: In this study, we prepared samples (hybrid materials) from reactions of organic and inorganic precursors, based on acids (gallic acid, oxalic acid, malic acid and squaric acid) and transition element cations (nickel) in the presence of amines (4,4-bipyridine, acetanilide) The aim of this research is to design different phases and to obtain hybrid systems by the technique of soft chemistry, in order to characterize the hybrid compounds prepared. This study was supposed to be based on the characterization of hybrid chemical samples synthesized by X-ray analysis and infrared spectrum theory, in order to reveal their quantitative and qualitative structures and therefore their crystalline structures, then to study them at the same time. using modern chemical programs. A group of compounds were studied in order to determine the effect of the filling of d orbitals and correlated nature on the octahedral geometry of the complexes and to compare these results with similar scientific papers of the same work.

Key Words: Soft chemistry, Hybrid materials, Transition metals, X, ray, Crystalline structure.



PHYSICOCHEMICAL CHARACTERIZATION OF NATURAL PLANT EXTRACT THYMPQIONONE MICROPARTICLES, AND ITS EVALUATION IN VARIOUS BIOLOGICAL ACTIVITIES

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Abstract: Controlled drug release has been used to improve the bioavailability properties of various drugs. These systems enable better regulation of drugs administered for treatments and reduce their side effects in therapeutic levels with minimum concentrations. Thymoquinone (TQ), dithymoquinone, thymol, and thymohydroquinone are among the bioactive chemicals found in *N. sativa* L. Researchers have focused their attention on thymoquinone (TQ), the most significant component of black cumin. TQ was the most abundant of the identified chemicals with a concentration ranged from 20.1 to 52.6 mg /100 g. Thus, the various therapeutic benefits exerted by *N. sativa* L. may be linked to TQ. In this study, gum arabic (GA) microparticles were used as a carriers to encapsulate Thymoquinone (TQ) due to their attractive physicochemical properties which can improve targeted drug delivery. Therefore, the main objectives of the current study were to develop a micromaterial-based carrier as a novel drug delivery system of TQ by using gum arabic microparticles for enhanced delivery efficiency. Then, the antioxidant and in vitro antihypertensive properties of the microoparticles (MPs) were assessed. Comparisons were made between active compounds, respective polymers and synthesised microopartilces (MPs) in terms of their antioxidant, antihypertensive and antidiabetic properties.

Key Words: Thymoquinone, Gum Arabic, Controlled release, Antihypertensive, Antidiabetic



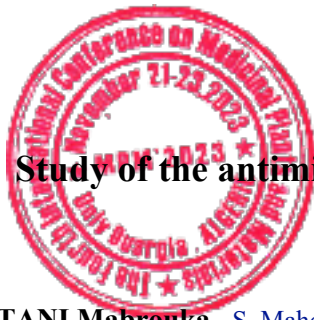
The application of spectral line broadening as a diagnostic tool

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Abstract: Spectroscopy is one of the most effective techniques for studying and diagnosing various media (solid, liquid, gas, and plasma). Analyzing the spectra obtained from experiments allows us to determine several characteristics, such as temperature, density, composition, the abundance of each element, and even the structure of the studied material. These spectral lines are not infinitely narrow but exhibit a certain width. Various factors can contribute to this broadening, including Doppler broadening, natural broadening, instrumental broadening, and broadening due to collisions of charged particles in plasma environments. In our work, we will present the applications of spectroscopy in various research fields, with a particular focus on plasma media (thin film deposition using CVD and PECVD techniques). We will also explore the use of spectral line broadening, especially the broadening caused by collisions of charged particles, as a diagnostic tool for plasma media. Keywords: line profile , Spectrale line broadening.

Key Words: [Keywords: line profile , Spectrale line broadening.](#)



Study of the antimicrobial effect of some medicinal plants : (Rosmarinus officinalis and Zingiber officinalis)

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Abstract: ABSTRACT : Medicinal plants are a very valuable source for the production of chemical molecules which are in high demand in the pharmaceutical, food, cosmetics and perfumery industries [1,2,3]. In fact, aromatic and medicinal plants currently constitute an essential product of modern and traditional medicine. The exploitation of these resources suffers from a lack of precise knowledge on the potential of the plant mass and the chemical nature of its extracts[1, 4]. In this context, the aim of the current study is to characterize the antimicrobial effect of two medicinal plants Rosmarinus officinalis and Zingiber officinalis on four microbial species: Pseudomonas aeruginosa, Staphylococcus aureus, Escherichia coli, Candida albicans. The sensitivity of the microorganisms tested to the bioactive molecules of two plants was evaluated on two aqueous and methanolic extracts. As for the phytochemical screening was carried out by one of the appropriate methods for each bioactive molecule. The results obtained show that the biological activity of the two plants differs according to the chemical characteristics of each solvent, as well as according to the phytochemical activity of the plant itself. In fact, the results of the phytochemical study showed that both plants contain biologically active substances: Alkaloids, Flavonoids, Tannins and Essential Oils. As for the antimicrobial study confirmed the effectiveness of both aqueous and methanolic extracts against the studied microorganisms. However, the study showed that Rosmarinus officinalis is more effective with the methanolic extract, while Zingiber officinalis is more effective with the aqueous extract. Regarding, the sensitivity of microbial species to chemical molecules; we found that Staphylococcus aureus is the most sensitive microbial species to methanolic extract of both plants, while Candida albicans is the most sensitive species to aqueous extracts of both plants. The minimum inhibitory concentration (MIC) against the microorganisms tested varied from 0.0003 to 0.01 g/ml for the methanolic extract and from 0.02 to 0.05 g/ml for the aqueous extract. According to these results the two plants have a significant antimicrobial power. Therefore, additional tests are needed to confirm the antimicrobial performance of these two plants

Key Words: Keywords: Medicinal plants, Aqueous extract, Methanolic extract, Antimicrobial activity, CMI



Antimicrobial potential of three genotypes of Quinoa Seeds (*Chenopodium quinoa* Willd.)

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Abstract: Quinoa (*Chenopodium quinoa*.Will) is considered as one of newly emerged seed with high nutritional and biological aspects [1].This plant is rich not only in macronutrients, such as protein, polysaccharides, and fats, but also in micronutrients such as polyphenols, vitamins, and minerals. Quinoa seeds have long been considered possible dietary supplement rich in phenolic, flavonoid, antioxidant and antimicrobial compounds [3]. Extracts the seeds of this plant contain numerous diverse components which can provoke additive and/or synergic effects on biological systems; thus, their uses in traditional medicine and also food science are being authorized (Comai et al.,2007) [4]. The objective of this study was to investigate the antimicrobial properties of three seeds of quinoa (Giza1, Santa Mariya et Sajama) cultivated in south of Algeria. The antimicrobial activity and the content of quinoa saponin were determined using a disc diffusion assay and the standardized afros metric foam test, respectively. Results showed that the highest anti microbial activity was obtained by Santa Mariya seeds with a significant microbial activity of 9.2, 13.8 and 14.2 mm inhibition zone for *E. coli* , *S. aureus* and *P.aeruginosa*, respectively. While the lowest microbial activity was obtained by Giza1 seeds with a microbial activity of 8.3, 12.5 and 11.8 mm inhibition zone for *E. coli* ., *S. aureus* and *P.seudomonas*, respectively. However Sajama genotypes had the highest antimicrobial activity against *C. albicans* (10.5 mm inhibition zone). A correlation between saponin content of quinoa seeds and antimicrobial activity was found. The three genotypes of quinoa seeds tested were identified as having a significant potential of antimicrobial activity make them

Key Words: *Keywords: Quinoa, Antimicrobial Activity, Saponin, South of Algeria.*



Évaluation *in vitro* de l'activité anti-inflammatoire de l'huile essentielle de *rosmarinus officinalis* de la région de tlemcen

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Abstract: chimique qui vise l'étude de la composition chimique, de l'huile essentielle par chromatographie en phase gazeuse, et un deuxième volet biologique basé sur l'étude des propriétés anti-inflammatoire *in vitro* de l'huile essentielle de *Rosmarinus officinalis*. par la méthode de l'inhibition de la dénaturation de protéine d'œuf. L'huile essentielle de *Rosmarinus officinalis*. est caractérisée par la présence du 1,8-cinéole (15,4 %), le camphre (15 %), le bornéol (12,7 %), l₁-pinène (11 %) et le verbénone (10,7 %) comme constituants majoritaires. Par ailleurs, nous avons constaté que l'huile essentielle a montré un effet anti-inflammatoir

Key Words:



Extraction of essential oil from a species of genus *Mentha* cultivated in the Algerian Sahara

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Abstract: Les plantes médicinales aromatiques sont depuis longtemps à la base de la médecine traditionnelle dans le monde à diverses fins, y compris le traitement des maladies inflammatoires et infectieuses, en raison de leur utilisation potentielle pour améliorer la santé. La recherche sur les plantes représente un potentiel inestimable pour la découverte de nouvelles substances aux capacités anti-inflammatoires. Par conséquent, les huiles essentielles en tant que source potentielle de molécules bioactives naturelles ont commencé à attirer une large attention. C'est dans ce contexte que s'inscrit notre travail qui a pour but principal la valorisation de l'huile essentielle de *Rosmarinus officinalis* de la région de Tlemcen, afin de trouver de nouveaux produits naturels alternatifs aux médicaments synthétiques pour traiter diverses affections telles que les inflammations. L'objectif envisagé dans ce travail repose sur deux volets complémentaires : un premier volet chimique qui vise l'étude de la composition chimique, de l'huile essentielle par chromatographie en phase gazeuse, et un deuxième volet biologique basé sur l'étude des propriétés anti-inflammatoire *in vitro* de l'huile essentielle de *Rosmarinus officinalis* par la méthode de l'inhibition de la dénaturation de protéine d'œuf. L'huile essentielle de *Rosmarinus officinalis* est caractérisée par la présence du 1,8-cinéole (15,4 %), le camphre (15 %), le bornéol (12,7 %), 1-pinène (11 %) et le verbénone (10,7 %) comme constituants majoritaires. Par ailleurs, nous avons constaté que l'huile essentielle a montré un effet anti-inflammatoire.

Key Words: Essential oil, *Mentha* species, extraction, chemical composition



Modeling Vapor–Liquid Equilibria for binary system using the CPA and Modeling Vapor–Liquid Equilibria for binary system using the CPA and PC-SAFT equations of state

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Abstract: The aim of this work, on one hand, is to characterize the vapor-liquid equilibria of binary mixtures containing hydrocarbones using thermodynamic models such as equations of state and on the other hand to test the capability of these models to represent the isothermal or isobaric phase diagrams (P, x, y) or (T, x, y) over a wide range of composition. Two equations of state Cubic Plus Association (CPA) and Perturbed-Chain for Statistical Associating Fluid Theory (PC-SAFT) were used to predict or correlate the vapor–liquid equilibria of these mixtures. For all calculations of the VLE, binary interaction parameter k_{ij} was used and an attention is focused on the values of this one. Correlation show good agreement with experimental data for almost investigated systems thus Cubic Plus Association (CPA) and Perturbed-Chain for Statistical Associating Fluid Theory (PC-SAFT) can be used as thermodynamic models to represent this kinds of mixtures.

Key Words: [Modeling](#), [VLE](#), [equation of state](#), [CPA](#), [PC-SAFT](#)



Synthesis of the natural coumarins, murraol (CM-c), transdehydroosthol and swietenocoumarin G

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Abstract: The main emphasis of the work has been directed towards the synthesis of naturally occurring coumarins possessing the relatively rare tanse -3-hydroxy -3-methylbut -1-enyl side chain. Initially ,work was undertaken to establish the structure of a possibly pharmacologically –active new natural coumarins ,CM-c2 ,isolated in Japan in 1985,for which two stereo isomeric structure were possible .from previous investigation it was believed that photo-oxygenation –reduction of Osthol,7- hydroxy -8-(3-methylbut -1-enyl) coumarins , should giv,CM-c2. After improvements were made to a previously reported synthesis of Osthol photo-oxygenation –reduction was found to proceed by different pathway . However, these afforded a synthesis of a co-occurring natural coumarins ,CM-c2. A method was successfully established for the introduction into a coumarins nucleus of tanse -3-hydroxy -3-methylbut -1-enyl side chain using Palladium acetate – catalyzed Heck condition of halocoumarins with 2- methylbut -3-en-2-ol side chain. In these way a variety of 3- and 8- substituted coumarins were prepared including the naturally occurring natural coumarins ,CM-c2 ,Swietenocoumarins G and Seselin .Controlled dehydration of CM-c2 provided a synthetic route to another new natural coumarins ,trans – dehydroosthol and established the stereochemistry of the former . The relationship of CM-c2 to Murraol , a coumarin first reported in mid-1987 has been clarified. Epoxidation of tanse -3-hydroxy -3-methylbut -1-enyl coumarin using meta – chloroperbenzoic acid gave the corresponding trans -1,2-epoxy -3-ols in good yields. Attempts were made to transform these epoxy alcohols into the corresponding 2,3 –epoxy -1- ols by the Payne rearrangement but without successes However ,a study of non- coumarin model compound showed that the desired rearrangement could be brought about . Heck reactions with 3- methylbut -2-en-2-ol side chain were also studied and shown to give 1-hydroxy -3-methylbut -3-en -2-ylaryl compound.

Key Words: KEYWORDS: coumarins,CM-c2, photo-oxygenation , Osthol ,catalyzed Heck, Swietenocoumarins G ,Seselin, Murraol, Heck reactions



Synthèse, caractérisation et étude *in vitro* et *in silico* des activités biologiques de certains dérivés ferrocéniques

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Résumé : Les composés organométalliques, en particulier les dérivés ferrocènes ont connu une expansion très importante en chimie médicinale comme agents anticancéreux, antipaludiques, antimicrobiens. Les tendances actuelles ont conduit les chercheurs à explorer et à définir de nouvelles méthodes de synthèse dans le but de concevoir de nouveaux médicaments. Au cours de nos recherches, nous nous sommes concentrés sur la synthèse et l'étude de l'activité biologique de nouveaux composés organométalliques contenant le fragment ferrocène. De nouveaux dérivés de ferrocène (Le N-ferrocénylméthylaniline (FA) et son dérivé N-acétylé (NFA)) ont été synthétisés et caractérisés par diverses techniques physico-chimiques telles que la spectroscopie FTIR, 1H et RMN 13C. Les interactions de ces complexes avec l'ADN du sang de poulet (CB-DNA) ont été étudiées par des méthodes expérimentales et théoriques, y compris la voltamétrie cyclique (CV), la spectroscopie électronique (ES) et l'amarrage moléculaire (MD). Les résultats de l'amarrage moléculaire et *in vitro* suggèrent que tous les dérivés du ferrocène étudiés se lient fortement via des interactions électrostatiques au petit sillon de l'ADN.

Key Words: Interaction ADN, ferrocènes, *in silico*, *in vitro*, énergie libre de liaison, constante libre de liaison.



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