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Ministry of Higher Education and Scientific Research
University of BATNA 1

Faculty of Matter Sciences
Department of Chemistry
Laboratory of Chemistry and Environmental Chemistry (LCCE)
Team: Chromatographic Separation, Structural and Biological Analysis of Biomolecules and Natural Antioxidants (CSSBABNA)
Algerian Chemical Society (ACS)
In partnership with the National Union of Pharmacists (SNAPO)

BOOK OF ABSTRACTS

2nd National Seminar on Phytochemistry, Pharmacology and Phytotherapy (SNPPP-2)

"Biodiversity at the Service of Start-ups"

BATNA, SEPTEMBER 25-26, 2024

Presentation

The 2nd National Seminar on Phytochemistry, Pharmacology, and Phytotherapy (SNPPP-2) "Biodiversity at the Service of Start-ups" is a scientific event organized by the Laboratory of Chemistry and Environmental Chemistry (LCCE) in collaboration with the Faculty of Matter Sciences, the Algerian Chemical Society (ACS), as well as the National Union of Pharmacists (SNAPO'S). The main objective of this scientific event is to create a space for meeting and discussion between teacher-researchers and PhD students working in the fields of chemistry, pharmacy and biology. This seminar encourages cooperation and exchanging ideas on new scientific and biotechnological researchs in these important areas.

Key Features

- Contains one plenary conference, two thematic conferences, three workshops, and **155** presentations.
- Presents several topics related to bioactive molecules with therapeutic effects, DFT calculations, docking, and *in silico* studies.

Topics

A. Extraction and purification of natural compounds.
B. Oxidative stress and plant-based antioxidants.
C. Bioactive molecules and microbial infections.
D. Pharmacological interests of medicinal plants.
E. From bioactive molecule to drug
F. Master preparation/Health.

Acknowledgments

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Plenary Conference

MEDICINAL PLANTS' USAGE: PHYTOCHEMISTRY AND BIOLOGICAL ACTIVITY

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Abstract

Herbal medicine, also called phytotherapy or phytomedicine, is the study of pharmacognosy and the use of medicinal plants, which are a basis of traditional medicine. Healing with medicinal plants is as old as mankind itself. The connection between man and his search for drugs in nature dates from the far past, of which there is ample evidence from various sources: written documents, preserved monuments, and even original plant medicines. Awareness of medicinal plants usage is a result of the many years of struggles against illnesses due to which man learned to pursue drugs in barks, seeds, fruit bodies, and other parts of the plants. contemporary science has acknowledged their active action, and it has included in modern pharmacotherapy a range of drugs of plant origin, known by ancient civilizations and used throughout the millennia. Medicinal plants are the major sources of numerous valuable chemicals and/or drugs. According to the International Union for Conservation of Nature and the World Wildlife Fund, about 50000–80000 of flowering plants are used because of their medicinal values. Medicinal plants have played a key role in the world health care with about 80% of Africansdepending on phytomedicine, which has shown a wide range of uses in the treatment of diseases. Further research indicated that medicinal plants exert their effects through a wide range of ubiquitous molecules called secondary metabolites. In this study, we will discuss the use of medicinal plants throughout times to attempt to shed light on their phytochemistry and biological activity for applications in human medicine, with case study.

Keywords: Medicinal plants, Secondary metabolites, Phytochemistry, Biological activity,

Thematic Conferences

COMPOSITION CHIMIQUE ET ACTIVITÉS BIOLOGIQUES DES ESPÈCES D'*ATRACTYLIS* EN ALGÉRIE

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Résumé

Le genre *Atractylis* comprend plusieurs espèces de plantes traditionnellement utilisées en médecine populaire. Ces plantes sont reconnues pour leurs propriétés médicinales potentielles, notamment pour le traitement de l'hépatite, des ulcères et des morsures de serpent. Cependant, leur composition chimique et leur activité biologique nécessitent une exploration plus approfondie. Cette étude vise à analyser la composition chimique des plantes *Atractylis* et à évaluer leurs propriétés biologiques. Les espèces du genre *Atractylis* poussant en Algérie ont été étudiées chimiquement en utilisant diverses techniques chromatographiques, telles que la chromatographie en colonne (CC), la chromatographie sur couche mince (TLC), la chromatographie en phase liquide haute performance (HPLC) et la chromatographie liquide sous vide (VLC). Les structures des composés isolés ont été déterminées principalement par RMN 1D (^{1}H, ^{13}C et DEPT) et RMN 2D (COSY, HSQC, TOCSY, HMBC, NOESY, ROESY), ainsi que par UV, IR, spectrométrie de masse HR-ESI-MS, rotation optique et comparaison avec les données de la littérature. Les composés identifiés incluent des polyphénols, des flavonoïdes, des lignanes, des alcaloïdes, des triterpénoïdes et des saponines. Ces résultats fournissent une base pour une meilleure compréhension des propriétés médicinales des espèces *Atractylis* et soulignent l'importance de poursuivre les recherches pour explorer pleinement leur potentiel thérapeutique.

Mots clés : *Atractylis flava*, *A. serratuloides*, *A. cancellata*, *A. humilis*, composition chimique, activité biologique

المنتجات الطبيعية: مصدر واعد للأدوية المضادة للسرطان: حالة بعض النباتات الجزائرية

NATURAL PRODUCTS: PROMISING SOURCE OF ANTICANCER DRUGS: THE CASE OF SOME ALGERIAN PLANTS

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Abstract

Cancer is ranked as the second-highest cause of death and accounts for about 10 million death in 2022 . Cancers may be caused in one of three ways, namely incorrect diet, genetic predisposition, and via the environment. Based on the severe negative effects, chemo-resistance, high expenditure and scarcity of novel anticancer compounds, anticancer drug discovery is now more inclined to the investigation of natural sources. . Natural drugs are accepted as a safer option than synthetic drugs because of their presence in the human diet and broad availability. Furthermore, natural drugs have reduced side effects and the potential to target various tumorigenesis-related signaling pathways. Essential oils and phenolic compounds are the most common molecules that are incorporated into our diet abundantly. Their complex molecular structures are related to biological functions in the human body. natural products are extensively studied for their anticancer activities, along with other biological functions . This introductory work presents to explore the relationship between natural products and cancer. Then, we will detail some experimental work on essential oils of plant species belong to three families (apiaceae, lamiaceae) from Algerian flora.

Topic A

Extraction and purification of natural compounds

ORAL COMMUNICATIONS

OPTIMIZATION OF THE EXTRACTION CONDITIONS OF THE MEDICINAL PLANT *EPHEDRA ALATA*

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Abstract

Ephedra alata is a genus of plant in the Ephedraceae family, making it an important element for their numerous medicinal properties. Our work has focused on improving the extraction conditions of the plant medicinal *ephedra alata*, a comparative study has been made of three extraction methods: the cold maceration, soxhlet and ultrasound using different solvents (ethanol, hexane, ethyl acetate). The comparison focuses on the yield and we have found that the best extraction method that was extracted by ethanol and gives a good yield in time limit is the ultrasound method (R= 7,1%; T=50 min) on the other hand, the other two extraction techniques give a low yield in a long duration such as soxhlet (R=15.11%; T= 3 hours) cold maceration (R=1.7%; T = 10 days)this means that the technique of ultrasound was the best extraction techniques among these three methods.

Keywords: *Ephedra Alata*, Extraction, Ultrasound, Yield.

MAJOR COMPOUND ISOLATION FROM CINNAMOMUM ZEYLANICUM BARK, MOLECULAR DOCKING, DFT AND ADME STUDIES

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Abstract

Spices serve as a rich reservoir of natural compounds with noteworthy chemical properties applicable in both industry and pharmacology. Among these, Cinnamaldehyde, an aromatic compound, holds particular importance due to its diverse biological effects, including its anti-hyperglycemic properties, effectiveness against various pathogens, and potent anti-inflammatory capabilities. Extracting this compound involves employing several techniques on extracts and essential oils sourced from Ceylon cinnamon (Cinnamomum zeylanicum). Our study introduces an approach to isolate Cinnamaldehyde utilizing a Soxhlet apparatus and an ultrasonic bath. Identification of the molecule was based on sensory characteristics, corroborated by structural infrared, LC/MS, and RMN spectroscopic analyses. Isolation was achieved via silica gel column chromatography of the essential oil (55%), followed by precipitation of the aldehyde with sodium bisulfite, resulting in a yield of 78%. Furthermore, we utilized theoretical methods to explore the structure-biological activity relationship, employing DFT to predict chemical reactivity through various global and local parameters. Additionally, we estimated the similarity to drugs by analyzing pharmacokinetic parameters obtained from ADMET studies. In silico molecular docking was employed to predict the binding energy of the complex formed with the 3TZF enzyme, assessing its stability.

Keywords: Aromatic Aldehyde, Sodium Bisulphite, Chromatography, DFT, ADME, Molecular Docking.

OPTIMIZATION OF TOTAL PHENOLIC EXTRACTION IN DATE FRUITS

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Abstract

Date fruits are one of the most popular fruits in Algeria du its wield growth in arid and semi-arid regions. They contain divers nutriments, and they are known by their high sugar content. Also, date fruits contain bioactive compounds such as total phenolic. These compounds have a potential health benefit, including antioxidant and anti-inflammatory activity. The aim of this study was to optimize the extraction of phenolic compounds in Ghars date fruit cultivar obtained from west of Biskra, using different extraction methods. To achieve our goal, five extraction methods were used using solid-liquid extraction: cold and hot infusion, decoction, hydrothermal extraction and maceration with methanol (80 %). The date fruit samples were collected at the full mature stage. All extractions were carried out under their appropriated conditions. The Folin-Ciocalteu assay was used to quantify the total phenolic compounds. The results were expressed as micrograms of gallic acid equivalent per gram of dry weight. For extraction yield, the Kruskal-Wallis test proved that no significant effect of extraction method on extraction yield (ρ=0,406> 0,05): decoction 66,75 %, cold infusion 52,75 %, hot infusion 65,05 %, hydrothermal extraction 45,16 % and methanolic extraction 44,04 %. Preliminary findings indicated significant variations in the total phenolic compound content among the five different extraction methods were employed according to Kruskal-Wallis test (ρ=0,025< 0,05). Decoction and hydrothermal extraction of Ghars exhibited the highest total phenolic content (305,860 ± 72,90 µg GAE/mg extract 209,523 ± 20,890 µg GAE/mg extract respectively), followed by cold infusion, hydro-methanolic extraction and hot infusion (94,140 ± 8,396 µg GAE/mg extract). In conclusion, this work highlights the importance of the choice of extraction method for quantifying total phenolic compounds in Ghars dates cultivar obtained for west of Biskra.

Keywords: Cold Infusion, Hot Infusion, Hydrothermal Extraction, Decoction, Maceration, Ghars.

EXTRACTION, PURIFICATION ET DOSAGE DE PHLOROTANINS D'ALGUE BRUNE

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Résumé

Les algues marines brunes sont parmi les végétaux qui sont riche en composés phénoliques avec différents effets physiologiques sur la santé humaine. Ces métabolites secondaires, non essentiels à l'organisme, sont présents en quantités variables chez les végétaux vasculaires (on parle de tannins) et chez les algues brunes (on parle de phlorotannins). Dans les dernières années, les travaux concernant l'extraction des composés phénoliques ont attiré un intérêt spécial. L'extraction est une étape très importante dans l'isolement, l'identification et l'utilisation des composés phénoliques et il n'y a pas de méthode d'extraction unique et standard. Cette étude est consacrée au développement d'une méthode analytique, pour la détermination de phénols dans l'algue brune *Cystoseira tamariscifolia* par spectrométrie IRTF, en utilisant l'extraction liquide-liquide et l'extraction en phase solide (EPS). Le phloroglucinol a été considéré comme étalon pour effectuer cette étude. La teneur du phloroglucinol a été obtenue par spectrométrie IRTF dans l'algue brune *Cystoseira tamariscifolia*, préalablement traitée en utilisant les bandes d'absorbance à 827, 1150, 1159 et 1611 cm^{-1} corrigées avec les lignes de base adéquates.

Mots clés : *Cystoseira Tamariscifolia*, Phloroglucinol, Extraction Liquide-Liquide, Extraction En Phase Solide, Spectrométrie IRTF.

EFFECT'S STUDY OF SOLVENT AND EXTRACTION TIME ON PHENOLIC COMPOUND CONTENT OF *NIGELLA SATIVA*

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Abstract

Nigella Sativa is a plant with wide medicinal value; hence an extraction experiment was conducted using different solvents, namely water, ethanol, and methanol, with varied extraction durations to assess their impact on the concentration of phenolic compounds. The findings indicated that the choice of solvent significantly influenced the phenolic compound content of the extracts, with ethanol proving to be the most effective solvent, exhibiting a total phenolic compound concentration (TPC) of 30.859 mg/ml, surpassing water (29.081 mg/ml) and methanol (26.8 mg/ml). The distinct polarity of each solvent influences its capacity to solubilize the phenolic compounds of Nigella. Maceration extraction was studied over durations of 3, 6, and 9 hours. The phenolic compound concentration progressively increased over time, reaching a plateau after 9 hours (TPC = 32.51 mg/ml). This suggests a gradual release of phenolic compounds from the plant matrix. Therefore, the choice of solvent and extraction time is crucial to maximize the extraction of phenolic compounds from Nigella sativa. Ethanol and a duration of 9 hours appear optimal. These valuable results enhance extraction techniques and help to exploit the plant's beneficial properties for health. They pave the way for promising applications in pharmaceutical and nutraceutical fields.

Keywords: *Nigella Sativa*, Extraction, Antioxidants.

EXTRACTION, GC/MS ANALYSIS, AND ANTIDIABETIC ACTIVITY STUDY OF ESSENTIAL OILS FROM TWO MEDICINAL PLANTS OF SOUTHERN ALGERIA

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Abstract

The utilization of medicinal plants for therapeutic purposes has been deeply rooted in traditional medicine practices. In this study, we focus on the extraction, Gas Chromatography-Mass Spectrometry (GC/MS) analysis, and evaluation of antidiabetic activity of essential oils derived from two indigenous medicinal plants native to the southern region of Algeria. The extraction process employs hydro-distillation technique to ensure optimal yield and preservation of bioactive compounds. Subsequently, GC/MS analysis is conducted to identify and quantify the chemical constituents present in the essential oils, providing insights into their phytochemical composition. Furthermore, the antidiabetic potential of these essential oils is investigated through in vitro assays utilizing UV-Vis spectroscopy. The assay methodology is designed to assess the ability of the essential oils to modulate key parameters associated with diabetes. Complementing these experimental analyses, computational studies are performed using induced fit docking and Molecular Dynamics Simulation (MDS) techniques, spanning a simulation period of 100 nanoseconds. Through in silico simulations, we aim to elucidate the molecular interactions between bioactive components of the essential oils and target proteins implicated in diabetes pathogenesis. The integration of experimental and computational approaches provides a comprehensive understanding of the therapeutic potential of these medicinal plants in managing diabetes. This multidisciplinary investigation contributes to the advancement of natural product-based drug discovery and underscores the significance of traditional knowledge in modern scientific research.

Keywords: Medicinal Plants, Essential Oil Extraction, GC/MS Analysis, Antidiabetic Activity.

PHYTOCHEMISTRY AND PHYTOBIOLOGY STUDY OF MEDICINAL PLANTS: *PULICARIA LACINIATA* (CROSS. ET. KRAL)

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Abstract

Different extracts of *Pulicaria laciniata* were obtained after maceration and then liquid-liquid extraction using increasingly polar solvents. The obtained phases were tested for their contents of phenolic compounds, flavonoids and tannins using colorimetric methods. Six methods evaluated the antioxidant activity of the extracts: DPPH, ABTS, FRAP and Fe^{2+} chelating, superoxide anion and phosphomolybdate, and some biological activities such as Alzheimer's, obesity and diabetes were also evaluated by using some enzymes such as acetylcholine esterase lipase, alpha-amylase and alpha-glucosidase. On the other hand, we concluded in this research to separate about 14 compounds using different chromatographic techniques. Now we have reached to identify the structures of six compounds, including five flavonoid compounds separated for the first time from the specie *P. laciniata* and a new sesquiterpene lactone compound for the genera *Pulicaria*. Also, nine compounds were identified from the chloroform extract by gas chromatography coupled with mass spectrometry.

Keywords: *P. Laciniata*; Alzheimer's, Obesity, Diabetes, Flavonoid, Sesquiterpene Lactone.

STUDY OF SECONDARY METABOLITES OF PLANT FROM THE GENUS ANABASIS (CHENOPODIACEAE)

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Abstract

Chenopodiaceae is one of the most important families, it contains approximately 114 genera and 1400 species that are essentially halophytes. The plants of this family are known for their richness in very important bioactive molecules such as flavonoids, phenolic acids, essential oils, sesquiterpenes, diterpenes, triterpenes, saponins and alkaloids. However, *Anabasis* genus has received the attention of the scientific community because of its characteristic biologically active secondary metabolites. The previous phytochemical investigation of this genus resulted in the isolation of alkaloids, saponins, and flavonoids. Some *Anabasis* plants are widely used as folk medicine for the treatment of diabetes and cardiovascular diseases. The phytochemical study of different extracts obtained from the roots (diethyl ether, butanol) and aerial parts (diethyl ether, Ethyl acetate) confirms the presence of cinnamic amide as the major compounds in the roots and saponins as the major ones in the aerial parts, in addition, other compounds such as: flavonoids, coumarins, and triterpenes are also detected. The chromatographic analysis in a normal (SiO2) and in reversed (RP-18) phases carried out on this different extract allowed us to isolate cinnamic amide and saponins as following: *N*feruloyloctopamine, *N*-feruloylnormetanephrine, *N*-feruloyl tyramine, (3β)-Oleanolic Acid 3-(β -D-glucopyranosiduronic Acid 6-Methyl Ester, chikusetsusaponin IVa methyl ester. All the compounds isolated from this plant were found in different genera of the family chenopodiaceae mainly the genera Chenopodium and salsola and they are isolated for the first time from the genus *Anabasi*s.

Mots clés : *Anabasis*, Chenopodiaceae, Extraction, Cinnamic Amide, Saponines.

STRUCTURAL ELUCIDATION, ANTI-INFLAMMATORY AND ANTIOXIDANT ACTIVITIES, DFT CALCULATIONS, AND ADMET PREDICTION OF PHLOROACETOPHENONE 4-*O*-B-D-GLUCOPYRANOSIDE.

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Abstract

Phenolic compounds are associated with potential biological functions responsible for many therapeutic effects. However, very little information has been reported on the structure-activity relationships of these molecules and the underlying mechanisms of action. The present work investigates the *in vitro* antioxidant activity of the natural compound phloroacetophenone 4-*O*-β-D-glucopyranoside **(1)** with different mechanisms of action, including free radical scavenging, reduction of transition metals, and lipid peroxidation. On the other hand, the antioxidant structure-activity relationship was studied using three main mechanisms of action (HAT, SET-PT, and SPLET) and the molecular electrostatic potential (MESP), the thermodynamic parameters (BDE, IP, PDE, PA, and ETE), HOMO and LUMO, spin density distribution were calculated in different solvents (gas phase, benzene, water, and methanol) using DFT approach at B3LYP/6-31G (d,p) basis set. Furthermore, the anti-inflammatory activity of this molecule was assessed *in vitro* using the inhibition of ovalbumin denaturation method. Also, the *in silico* pharmacokinetic parameters, drug similarity and compatibility with medicinal chemistry of the compound **(1)** were predicted using SwissADME. According to the obtained results, phloroacetophenone 4-*O*-β-D-glucopyranoside **(1)** exhibits strong *in vitro* antioxidant activities in all the tested methods compared to the reference molecules. The theoretical calculations are in excellent accordance with the experimental tests. In addition, a moderate ovalbumin denaturation effect was observed. For ADMET prediction, this molecule possesses a high potential for human intestine absorption, low skin permeability, and a strong permeability to cross the central nervous system. Furthermore, it can be concluded that phloroacetophenone 4-*O*-β-D-glucopyranoside may constitute an excellent antioxidant agent with several industrial and pharmacological applications.

Keywords: Phloroacetophenone 4-*O*-β-D-glucopyranoside, Antioxidant, anti-inflammatory, DFT calculations, ADMET prediction.

QUANTITATIVE ANALYSIS BY LC-MS/MS AND PHARMACOLOGICAL EVALUATION OF AN ENDEMIC GEOPHYTE

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Abstract

Plants were extensively reported and depicted, to produce a wide range of molecules with several activities. The present study was geared towards, assessing phenolic compounds screening by LC-MS/MS validated method. Moreover, antioxidant, anticholinesterase and anti-hyper glycemic activities were evaluated. The antioxidant activity was tested by different methods, namely DPPH, ABTS, CUPRAC, FRAP, metal chelating, and phosphomolybdenum, while the evaluation of anti-hyper glycemic effect using α-glucosidase and α-amylase and anticholinesterase potent using acetylcholiesterase and butyrylcholinesterase enzymes were carried out, on *Bellevalia* species bulb extracts previously prepared, occur: AcE (acetone extract), ME (Methanol extract) and CE (Chloroform/Ethanol (50:50) extract). Phenolic profile was assessed by LC-ESI-MS/MS using 53 standards. The highest total phenolic and flavonoid content was observed for AcE. The different extracts were substantial in phenolic acids. Indeed, quinic acid and vanillic acid were the main compounds. AcE displayed the highest antioxidant potent, among all the tested extracts in DPPH, ABTS, CUPRAC, FRAP and phosphomolybdenum, nevertheless none of extracts exhibited metal chelating activity. Regarding anticholiesterase activity, only AcE acted by inhibiting acetylcholinesterase. In respect to butyrylcholinesterase activity, AcE, CE and ME exhibited a strong inhibitory effect, while modest anti-hyper glycemic activity was observed. Preliminary results gathered from the present study suggest that *Bellevalia* species could be a good antioxidant and cholinesterase inhibitor molecules source.

Keywords: Geophyte, Phenolic Acids, LC-MS/MS, Anticholinesterase, Anti-Hyperglycemic.

POSTER COMMUNICATIONS

PHYTOCHEMICAL STUDY OF CRUDE EXTRACT PREPARED FROM AN ALGERIAN MEDICINAL PLANT

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Abstract

The genus Filago Loefl is a genus of flowering plants belonging to the Asteraceae family, it comprises about 45 species grouped into four subgenera. Plants of this genus are annuals, herbaceous perennials or shrubs and widely distributed in Eurasia, North Africa, North America and Australia, with the largest number of species in the Mediterranean region. Filago species have interesting medicinal potential in traditional medicines and have been studied for different pharmacological effects including: anticancer (especially breast cancer), antioxidant, antibacterial, antifungal and antiviral effects. The studied species is a small herbaceous plant of flowering plant in the family Asteraceae. It is native to Sicily, Malta, Morocco and Algeria. Since the chemical constituents in medicinal plants usually explain the use of the plants in traditional medicine; The present study was designed to investigate the presence of various phytochemicals in crude extract prepared from a species which has not been the subject of any phytochemical or biological studies. The phytochemical screening results reveals the presence of various secondary metabolites known for their biological activities including: Alkaloids, Flavonoids, Terpenoids, Saponins, Quinones and Coumarins. TLC analysis of methanolic extract was also performed and clearly showed the presence of promising and interesting spots with deferent colors.

Keywords: Filago, Phytochemical Screening, Chemical Investigation, Biological Activity.

PHYTOCHEMICAL STUDY OF VARIOUS EXTRACTS FROM A HALOPHYTIC ALGERIAN PLANT

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Abstract

The genus Halogeton belongs to the Salsoleae tribe of the family Chenopodiaceae comprises about 120 species, this genus is characterized by widespread herbaceous or shrubby plants, especially in brackish soils of temperate and subtropical regions of Europe, Asia, Africa and North America. The studied species is a small plant, highly-branched halophytic shrub, distributed in saline lake shores and meadows with saline soils. In Algeria, it's distributed in pre-Saharan regions namely Beni-ounif, Biskra, Laghouat and Msila. Since the pharmacological activity of medicinal plants can be predicted by the identification of their phytochemicals and with the aim of discovering new biologically active secondary metabolites likely to be used against various diseases; The present study is devoted to the phytochemical screening, extraction and chemical investigation of deferent plant extracts including petroleum ether, ethyl acetate and n-butanol extracts. The results of the preliminary phytochemical analysis revealed the presence of various classes of bioactive compounds known for their pharmacological properties such as flavonoids, terpenoids, saponins, tannins, quinones and coumarins. Additionally, the use of various chromatographic technics allowed the isolation of several secondary metabolites in the pure state including saponins, flavonoids and β-Sitosterol.

Keywords: Halogeton, Phytochemical Screening, Medicinal Plants, Phytoconstituents.

PHYTOCHEMICAL STUDY AND VALORIZATION OF THE ESSENTIAL OIL EXTRACTED FROM GENUS *APIUM GRAVEOLENS* L CULTIVATED IN EASTERN ALGERIA

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Abstract

The present study delves into the phytochemical investigation and potential applications of the cultivated *Apium Graveolens* L. species in Eastern Algeria. *Apium Graveolens* L., commonly known as celery, holds culinary and medicinal significance. This research aims to contribute to understanding its phytochemical composition and explore its possible applications. The essential oils extracted from the species' seeds are analyzed using hydro distillation, yielding a notable 1.8% yield in their composition. Photochemical screening identifies secondary metabolites, including Quinones, Coumarins, Anthracene Derivatives, Polyphenols, and Flavonoids. Gas Chromatography/Mass Spectrometry (GC/MS) analysis also showed discernible variations in significant component percentages. Notably, D-Limonene commands a majority share at 52.38%, accompanied by Eucarvone (7.82%), β-Selinene (17.28%), α-Selinene (3.82%), and Sedanenolide (9.04%). The essential oils derived from *Apium graveolens* L. seeds exhibit fluid consistency, a pale-yellow color, and a delicate camphor fragrance, contributing to its potential as a valuable natural resource for various applications. In conclusion, the results contribute to a comprehensive understanding of the *Apium graveolens* L. species, offering insights into its potential applications in culinary and medicinal fields. This research sheds light on the valuable phytochemical constituents of the species, paving the way for further exploration and utilization of its properties in various industries.

Keywords: *Apium graveolens* L, phytochemical constituants, essential oil, hydrodistillation, Souk Ahras.

COMPOSITION ET CARACTERISATION CHIMIQUE DE LA PLANTE *RHAMNUS ALATERNUS* L.

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Résumé

Le présent travail concerne une étude phytochimique poussant dans les régions d'Algérie et appartenant à la famille Rhamnaceae. C'est une famille cosmopolite, comprend 45-55 genres et environ 900 espèces, distribuée dans les régions tropicales et parfois tempérées. Les plantes *Rhamnus* largement utilisées en médecine traditionnelle contre purgative, digestif, diurétique, laxatif, hypotensif et pour traitement de divers symptômes hépatiques et les maladies du foie et du pancréas, possèdent des activités biologiques intéressantes telles que antibactérienne, anticancéreuse et antioxydante,…ect, ceci s'explique dans une certaine mesure par la richesse de cette famille en composés triterpéniques, phénoliques sous forme de flavonoïdes, quinones et les anthraquinones. L'investigation phytochimique de l'extrait acétate d'éthyle de l'espèce *R. alaternus* a abouti à l'isolement de quatre composés : émodine (1), apigénine (2), quercétine (3) et lupéol (4). Leurs structures moléculaires ont été établies grâce à la combinaison des différentes méthodes spectroscopiques RMN 1D (^{1}H, ^{13}C *J*-modulé et DEPT) et 2D (COSY, HSQC et HMBC), la spectrométrie de masse ESI-MS et la comparaison avec les données de la littérature.

Mots Clés : Rhamnaceae, *Rhamnus Alaternus*, Métabolites Secondaires, RMN 1D Et 2D.

EXTRAIT POLAIRE DE C*ERASTIUM HOLOSTEUM* (CARYOPHYLLACEAE) : ANALYSE HPLC, ACTIVITES ANTIOXYDANTES ET CONTENU BIOACTIF

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Résumé

Le genre *Cerastium* appartient à la famille des Caryophyllacées. Il est représenté par cinq espèces dans la flore d'Algérie. L'infusion des parties aériennes de la plante est utilisée dans la médecine populaire espagnole pour purifier le sang, réguler la circulation et traiter la goutte, ainsi que comme agent contre les dermatites et comme expectorant. Il est également utilisé comme cholagogue, dermatologique, anti-infectieux, lithotritique, diurétique, digestif et antihypertenseur. L'étude phytochimique de l'extrait hydro-alcoolique des parties aériennes de l'espèce *Cerastium holosteum* par l'analyse HPLC analytique et la comparaison avec les données de la littérature a conduit a prouvé existences de six composes phénoliques connus. Dans l'étude biologique, nous avons évalué l'activité antioxydante *in vitro* de l'extrait hydro-alcoolique de *C. holosteum*. Les propriétés antioxydantes ont été testées en utilisant le système d'élimination des radicaux DPPH et *β*-carotène, les teneurs totales en phénols et en flavonoïdes ont été déterminées. Les données expérimentales ont démontré que cet extrait possède d'activité antioxydante significativement remarquable par rapport aux standards.

Mots clés : Caryophyllacées, *Cerastium Holosteum*, HPLC, DPPH, L'activité Antioxydante.

NATURAL SUBSTANCES FROM ERYNGIUM SPECIES GROWS IN ALGERIA

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Abstract

The genus Eryngium, is the largest genus in the family Apiaceae belonging to the subfamily Saniculoideae, it is known by its richness in different kind of active metabolites. Previous phytochemical investigations on this genus had shown the presence of essential oil and non-essential oil compounds such as terpenoids, triterpenoid saponins, flavonoids, coumarins, polyacetylenes, steroids and rosmarinic acid derivatives. The traditional uses recorded for the eryngium genus are numerous, it has been used as ornamental, vegetable and medicinal plants. Some recent bioactivity investigations have confirmed these medicinal uses (extracts showed apparent anti-inflammatory, antioxidant activity and inhibition of the snake and scorpion venoms). In this participation, we describe a chemical composition of some eryngium species grows in Algeria (phytochemicals and pharmacological activities of isolated compounds).

Keywords*:* Eryngium, Phytochemical Investigation, Essential Oil, Polyacetylenes, Medicinal Plants, Biological Activity.

CHEMICAL COMPOSITION, ANTIOXIDANT ACTIVITY OF THE AERIAL PARTS OF *CYTISUS PURGANS* SUBSP. BALANSAE (BOISS)

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Abstract

Within the Fabaceae family, *Cytisus* is a widely distributed genus around the Mediterranean Sea, and 8 of the approximately 70 species that comprise this genus are found in northern Algeria. *Cytisus purgans* subsp. balansae (Boiss.) Maire is an uncommon species found in Algeria (Aures, Mahdids and Lella Khadidja). The chemical analysis of this species enabled the structural elucidation of seven compounds: four isoflavones, including daidzein, genistein, isoprunetin and biochanin A. Additionally, one flavone, chrysin and one flavonol, quercetin, were positively identified. Notably, the phytosterol daucosterol was also isolated and characterized. The main methods to measure the anti-oxidant activity of natural products are the DPPH, ferric reducing anti-oxidant power (FRAP) and phosphomolybdate assays. *C. purgans* ethyl acetate and n-butanoic extracts exhibited interesting antioxidant properties. In all assays, EAE showed greater antioxidant activity. With the DPPH assay, ethyl acetate extract demonstrated the most scavenging potential with an IC_{50} value of 26.66 µg/mL. By contrast, n-butanoic extract showed similar but lower activity with an IC_{50} value of 30.91 µg/ mL. The FRAP assay measures the reducing potency of compounds or extracts, typically compared to a standard anti-oxidant. With the FRAP assay, IC_{50} values indicated a relevant reducing power for both extracts, similar to ascorbic acid used as a standard. Interestingly, *C. purgans* EAE was as effective as ascorbic acid in this assay. The total anti-oxidant capacity of *C. purgans* extracts was evaluated by the phosphomolybdate assay. ethyl acetate and n-butanoic extracts exhibited similar and substantial anti-oxidant efficacy, with values of 106.5 ± 5.81 mg AAE/g for the n-butanoic extract and 105.46 ± 8.64 mg AAE/g for the ethyl acetate extract.

Keywords: *Cytisus Purgans*, NMR, Antioxidant Activity, DPPH, Antioxidant Activity.

PHYTOCHEMICAL SCREENING OF THE SPECIES *MALOPE MALACOIDES* L.

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Abstract

Malope malacoides L. is a species within the Malope genus, which is part of the Malvaceae plant family. This genus includes three species that are native to North Africa, Europe, and the Macaronesia region. Studies on the Malvaceae family have revealed a rich variety of secondary metabolites, highlighting its importance in the fields of pharmacology and phytochemistry. These compounds include saponins, triterpenes, tannins, flavonoids, quinones, and coumarins. Additionally, members of the Malvaceae family have been shown to possess a range of biological activities, such as analgesic, anti-inflammatory, antidiabetic, antiobesity, antioxidant, antimicrobial, anxiolytic, cardioprotective, cytotoxic, hepatoprotective, and nephroprotective effects. The objective of this study was to conduct a phytochemical screening on various extracts derived from the whole plant, *Malope malacoides* L in order to characterize the different families of chemical compounds present. The results obtained highlighted the presence of saponins, triterpenes, tannins, flavonoids, quinones, and coumarins. The diversity of these compounds suggests the potential for biological properties, thus paving the way for possible medicinal applications of this plant.

Keywords: Malvaceae, *Malope Malacoides* L, Phytochemical Screening.

SESQUITERPENES ISOLATED FROM *CENTAUREA DISSECTA* TEN.

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Abstract

The genus *Centaurea* belongs to the tribe Cardueae of the Asteraceae family. This family is one of the most important botanical families of vascular plants; it contains more than 25000 species. Prior investigations into *Centaurea* species have unveiled the presence of diverse secondary metabolites, including sesquiterpene lactones, flavonoids, lignans, phenolic acids, triterpenoids, sterols, coumarins, and alkaloids. Among these, flavonoids and sesquiterpene lactones are the predominant constituents of this genus. *Centaurea dissecta* Ten ssp. affinis (Friv.) M (syn= *C. affinis* subsp. affinis Friv.) is a wild species that grows in Algeria, commonly found in forests, pastures, and rocky areas. Previous research on the aerial parts of *C. affinis* Friv (Syn = *C. dissecta*) collected in Serbia identified sesquiterpene lactones with germacranolide skeleton. However, the current study describes the isolation, employing chromatographic methods, of four elemane-type sesquiterpenes, two of which are sesquiterpene lactones, from the *n*-butanol extract of *C. dissecta*. These compounds are identified as 11,13-dehydromelitensin (**1**), 8*α*-*O*-(3,4-dihydroxy-2-methylenebutanoyloxy)-dehydromelitensin (**2**), 8*α*-*O*-(3,4-dihydroxy-2-methylenebutanoyloxy)-6*α*,15-dihydroxyelema-1,3,11(13)-trien-12-oic acid (**3**), methyl 8*α*-*O*-(3,4-dihydroxy-2-methylenebutanoyloxy)-6α,15-dihydroxyelema-1,3,11(13)-trien-12-oate (**4**). The identification process involved spectroscopic analysis, including 1D and 2D NMR (^{1}H, ^{13}C, COSY, HSQC, HMBC, and NOESY) as well as mass spectrometry (ESI-MS) and comparison with literature data.

Keywords: Asteraceae, *Centaurea*, *Centaurea Dissecta*, Sesquiterpene, NMR, ESI-MS.

ISOLATİON AND İDENTİFİCATİON OF NATURAL FLAVONONE FROM *SANTOLİNA CHAMAECYPARİSSUS* METHANOLIC EXTRACT

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Abstract

Santolina chamaecyparissus L. (Asteraceae) is an aromatic plant widely spread in Mediterranean region. It is used in folk medicine for their analgesis, anti-inflammatory, antiseptic, antispasmodic, bactericidal, and digestive properties. Phytochemical studies of *Santolina chamaecyparissus* yielding a number of secondary metabolites such as essential oils, flavonoids, coumarins and polyacetilenic compounds. The aim of this study is the use of chromatographic techniques to isolate functional compounds from this plant. Milled dry leaves of *Santolina chamaecyparissus*, which had been collected from Setif were extracted with absolute methanol. The extract was mixed with equal weight of silica gel and subjected to column (5x120 cm, diameter x length) chromatography using silica gel as the stationary phase and eluting with hexane and a gradients of ethyl acetate and methanol to give 400 fractions (250 ml each). Similar fractions were combined, then, the resulting new fractions were chromatographed again over slica gel column. The fractions were combined, the same components are checked by TLC layer. The crystals formed in the fractions were analyzed by ^{1}H-NMR, ^{13}C-NMR techniques. NMR spectra were interpreted and compared with previously conducted studies. It was found that the isolated compound is luteolin-7-O-glucoside.

Keywords: Methanolic Extract, H1-NMR, C13-NMR, *Santolina Chamaecyparissus*, Chromatography.

PHYTOCHEMICAL STUDY AND CHEMICAL COMPOSITIONS OF A MEDICINAL SPECIES

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Abstract

Phytochemicals or bioactive compounds are chemicals that present naturally in plants and they are derived from various parts such as leaves, flowers, seeds and roots. from ancient times, those phytochemicals including flavonoids, alkaloids, glycosides, tannins, volatile oils and terpenoids, provide defenses for plants against diseases and other environmental factors, also they are known by theirs uses and power treatments for humans against different maladies such as Asthma, Alzheimer and Cancers. In the present study we are interested in the phytochemical study of a medicinal species which belongs to the Lithospermeae tribe and the Boraginaceae family. This species is a small, branched, stiff and thorny shrub with blue-purple flowers, distributed in the Saharo-sindienn from North Africa to Iran. It known as food source for some desert animals, especially camels. It has also various traditional uses, including treating abdominal disorders, wounds, and scorpion stings. The present work describes the phytochemical screening of crude extracts (petroleum ether, ethyl acetate and *n*-butanol) prepared from this species, using differents protocles and reagents. The results of phytochemical screening indicated the presence of several compounds, including flavonoids, terpenoids, saponins, tannins, quinones, alkaloids, and coumarins. Moreover, TLC chromatography of the obtained extracts showed the appearance of several spots of natural products. We mention also the purification of two chemical compounds which are the β-Sitosterol and β-Sitosterol Glucoside.

Keywords: β-Sitosterol, Extraction, TLC, Phytochemical Screening, Boraginaceae, Bioactive Molecules.

BIOMOLECULES FROM THE SPECIES *PHILLYREA ANGUSTIFOLIA*

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Abstract

Plants have been known since ancient times as sources of traditional treatments for humans. Indeed, the power of these species lies in the phytochemical components that cause pharmacological effects on the human body. This value is due to the presence of a wide variety of secondary metabolites, including flavonoids, alkaloids, glycosides, tannins, volatile oils and terpenoids. In this context, we are interested in phytochemistry to study and investigate the divergent bioactive molecules contained in *phillyrea angustifolia* species which is belongs to Oleaceae family, the Lamiales tribe and Phillyrea genus. *Phillyrea angustifolia* is a persistent specie closely resembles the olive tree, with 1 to 2 meters' evergreen, small slender twigs, dark green leaves, whitish flowers they appear in May-June, the fruit is dark bluish similar to that of blueberry. *P.Angustifolia* is very useful to animals who use it as food and shelter and traditional humans uses as a medicinal plant and in horticulture. The present work describes the phytochemical screening of crude extracts (petroleum ether, ethyl acetate and *n*-butanol) prepared from the species *phillyrea angustifolia,* using different protocols and reagents. The results of phytochemical screening indicated and demonstrated the presence of several compounds, including flavonoids, terpenoids, saponins, tannins, quinones, alkaloids, and coumarins. Moreover, TLC chromatography of the obtained extracts showed the appearance of several spots of natural products.

Keywords: *Phillyrea Angustifolia*, Extraction, Bioactive Molecules, TLC, Phytochemical Screening.

FLAVONOÏDES DE L'ESPECE ENDEMIQUE *VICIA ONOBRYCHIOIDES*

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Résumé

Fabaceae l'un des plus grandes familles des plantes à fleurs dans le monde. Selon le Royal Botanic Garden (Edinburgh 2010), cette famille est appartient environ de 730 genres et plus de 19400 espèces. Le genre *Vicia* est l'un des genres importants de la famille de Fabaceae. En Algérie, le genre *vicia* est présenté par 83 espèces. Les études phytochimiques récentes sur les plantes de ce genre ont prouvé l'existence de plusieurs métabolites secondaires comme les polyphénols, les flavonoïdes et les saponines. L'étude phytochimique de l'extrait acétate d'éthyle des parties aériennes de l'espèce *Vicia onobrychioides* par différentes techniques chromatographie a conduit à l'isolement de trois composés phénoliques de type flavonoïdes. Les structures de ces composés ont été déterminées à l'aide de techniques spectroscopiques RMN ^{13}C et RMN ^{1}H, notamment RMN 2D (COSY, HMBC, HSQC et NOESY), spectrométrie de masse UV et EI et comparaison avec les données de la littérature. En conclusion, ces résultats remarquables nous incitent à compléter l'étude phytochimique et biologique sur cette plante par la purification et l'élucidation structurelle d'autres composés et en testant leur importance biologique.

Mots clés : Fabaceae, Vicia, *Vicia Onobrychioides*, Flavonoïdes, NOESY, RMN, Flavonoïdes, Phytochimique.

APERÇU SUR LA COMPOSITION PHYTOCHIMIQUE ET LES ACTIVITES BIOLOGIQUES D'*ARGANIA SPINOSA* L. SKEELS

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Résumé

L'Arganier, arbre endémique du Maroc et de l'Algérie, est vital écologiquement et économiquement, avec peu d'études en Algérie. Le président a lancé une instance pour son développement dans le sud-ouest et les hauts plateaux, reconnaissant son importance, tout en soulignant ses avantages. L'analyse phytochimique de la poudre de pulpe d'*Argania spinosa* montre la présence de groupes chimiques qui ont à leur tour des activités biologiques intéressantes. Celles-ci comprennent des alcaloïdes, des flavonoïdes (tels que les anthocyanines, les saponines, les coumarines, les stérols et les triterpènes), de l'acide tannique (catéchines et acide gallique) et des sucres réducteurs. Des groupes chimiques potentiellement actifs, tels que les polyphénols (comme deux formes de tanin) et les anthocyanines, peuvent justifier l'utilisation de cette plante en médecine traditionnelle principalement en raison de leurs propriétés pharmacologiques. Par conséquent, en raison de son activité biologique intéressante, cette plante est devenue le matériau de choix pour enrichir les médicaments conventionnels, Trois méthodes ont été utilisées séparément pour extraire les composés phénoliques des parties du fruits d'*Argania spinosa* : Extraction avec n-hexane (Soxhlet), Exposer les échantillons à du gaz azote, d'un mélange frais d'acétone/eau/acide formique, Extraction avec méthanol/eau dans un bain à ultrasons. Les quatre fractions ont été analysées par chromatographie à haute performance couplée à un spectromètre de masse. L'analyse de l'extrait n-Hexane a révélé l'épicatéchine comme composé majeur (4792 mg/kg), suivi de 4,4'-Dihydroxy-3,3'-imino-di-benzoic acid (2071mg/kg), du procyanidine B2 (1463 mg/kg) et du procyanidine C1(1250 mg/kg). Dans les extraits exposés à du gaz azote ont révélé la présence des Flavonoïdes, Hespéridine, Rhoifoline, Catéchine, Peltatoside, Myricétine 3-O-galactoside, Rutine ,Isoquercétine , Quercétine , Avicularine , Procyanidine B2, Quercétine 3-sophoroside, Gossypine, Prodelphinidine B4, ont été identifiés comme les principaux constituants , Dans les extraits de solvant organique a révélé Acide protocatéchique comme composé majeur Acide protocatéchique (21,1%), Flavonoïdes-O-rhamnoglucosides Isorhoifoline (7,2%), Flavonoïdes-O- glycosides Naringenine-7-O-glucoside (composé minoritaire15,3%), Cette étude met en lumière les avancées récentes dans l'exploration des propriétés médicinales de l'Argania spinosa, soulignant son potentiel en tant qu'agent thérapeutique. Son abondance en polyphénols suggère qu'elle pourrait être une source précieuse pour le développement de nouveaux médicaments.

Mots Clés : *Argania Spinosa*, Analyse Phytochimique, Polyphénols, Activités Biologiques.

CHEMICAL ANALYSIS AND *IN VITRO*, SOME BIOLOGICAL EFFECTS OF THE ENDEMIC PLANT FROM ALGERIA *THYMUS ALGERIENSIS*

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Abstract

The methanolic extract of *Thymus algeriensis*, endemic species in Algeria, was analyzed by high performance liquid chromatography coupled by ultraviolet detector then tested for its antioxidant effect by the DPPH and ABTS scavenging radical tests, FRAP test and CUPRAC test. The inhibitory power of the same extract on acetylcholinesterase, butyrylcholinesterase and α-glucosidase was also tested. Phenolic acids and flavonoids were found in the extract especially 3-hydroxy-4-méthoxycinnamique acid, anistic acid and quercetin. The results showed considerable antioxidant effects for the plant. Methanolic extract was effective on acetylcholinesterase and butyrylcholinesterase. *T. algeriensis* did not show any inhibitory effect on α-glucosidase. Interested results given by methanolic extract of the plant, which can be exploited in medicine and pharmaceutical domains as natural treatments for diseases like Alzheimer.

Keywords: *T. Algeriensis*, Methanolic Extract, HPLC / UV, Antioxidant Activity, Enzymes Inhibition.

EXTRACTION, PURIFICATION ET DOSAGE DES STEROLS DANS DES ALGUES MARINES

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Résumé

Les algues marines constituent une ressource naturelle importante à cause de leur diversité chimique. Elles sont riches en métabolites primaires et secondaires tels que les stérols. Ces derniers sont utilisés dans la classification chimio taxonomique. Il a été montré que le stérol prépondérant dans les rhodophycées est le cholestérol, dans les phéophycées, le fucostérol est le stérol dominant. Par contre, dans les chlorophycées il n'existe pas un stérol majoritaire. Parfois il varié au sein de la même famille. La chimio métrie a facilité l'exploitation et le traitement des données pour améliorer et optimiser des procédés et contrôler des produits. La méthode de calibration multivariée la plus utilisée pour le traitement des données spectroscopiques IRTF est la régression des moindres carrées partiels (PLS). Le présent travail porte sur l'établissement d'un modèle de calibration multivarié PLS-IRTF pour le dosage de stérols dans les extraits d'algues marines *Caulerpa taxifolia (*verte), *Laurencia sp (verte), Cystoseira sedoides* et *Dictyota dichotoma* (brunes). Pour établir le modèle de calibration adéquat, seize solutions étalons contenant le cholestérol, le dehydrocholestérol, l'acétate de cholestérol et le sitostérol à des concentrations différentes ont été utilisées. Les résultats de calibrage indiquent que les modèles PLS-IRTF optimisés sont adéquats pour la détermination simultanée des quatre analytes en fournissant des faibles erreurs de validation, à savoir : 0.054, 0.098, 0.0768 et 0.0573, et des coefficients de corrélation égalent à 99.96, 98.74, 99.49 et 98.4 pour des rangs de 6, 5, 4, 6 dans le cas de cholestérol, dehydrocholestérol, d'acétate de cholestérol et de sitostérol, respectivement. L'analyse des extraits d'algues dilués dans $CHCl_3$ n'est pas possible, une réaction de saponification a été réalisée afin d'alléger la matrice et purifier et isoler les stérols totaux. L'analyse prédictive a révélé des résultats qui méritent d'être confirmés par une autre technique telle que chromatographie liquide à haute performance.

Mots Clés : Produit Naturel, Algue, Stérol, Extraction, IRTF, Chimiométrie.

ANTIOXIDANT ACTIVITY AND FLAVONOIDS OF ETHYL ACETATE EXTRACT OF ATHAMANTA SPECIES

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Abstract

The genus *Athamanta* (Umbelliferae) it is kind of flowering plant of the Apiaceae family. consists of about nine species, it is an endemic plant of southeastern Europe and northern Africa, we've been interested with the phytochemical study and antioxidant activity of the ethyl acetate extract of *Athamanta* species. Air-dried and powdered aerial parts (3000 g) of this species were macerated in a hydro methanol solution (70%) at room temperature. The extract was concentrated to dryness (under low pressure), the residue was dissolved in water and extracted with petroleum ether, chloroform, ethyl acetate and *n*-butanol, successively. The ethyl acetate fraction (4.57 g) was subjected to a column chromatography on silica gel, eluted with a gradient of *n*-hexane/Acetone (100:0 to 0:100) of increasing polarity. Two flavonoids were separated and characterized by the spectroscopic methods 1D experiments (^{1}H,^{13}C). The ethyl acetate extract was tested for its antioxidant activity using four methods (DPPH, ABTS, Reducing power and Phenanthroline). This extract showed a high activity in ABTS (IC_{50}: 8.97±0.97 µg/mL), Reducing power ($A_{0.5}$: 30.21±1.75 µg/mL) and phenanthroline ($A_{0.5}$: 6.60±0.46 µg/mL) assays.

Keywords: Apiaceae, Athamanta Species, Flavonoids, Antioxidant Activity, Phytochemical Study.

COMPOSITION EN ACIDE GRAS DE SIX CULTIVARS D'ARACHIDE (*ARACHIS HYPOGEA* L.) LOCAUX

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Résumé

L'arachide (*Arachis hypogea* L.) est une plante légumineuse produite à grande échelle consommée et utilisée dans de nombreux produits alimentaires industriels sous différentes formes : graines, huile et beurre. Le travail présenté nous a permis de mieux connaître la qualité des lipides de quelques cultivars provenant de six régions de l'Algérie à savoir : El Oued, Adrar, El Goléa, Laghouat, Sebseb, et Taref. L'échantillon de Chine importé est pris pour la comparaison. Après extraction des huiles à partir des graines d'arachides, une quantité de 200 mg des lipides a été saponifiée à reflux pendant 20 minutes avec 10 mL d'hydroxyde de potassium de concentration 1 N ; l'estérification est réalisée pendant 10 minutes en ajoutant, par le haut du réfrigérant, 5 mL de tri-fluorure de bore méthanolique BF_3 à 10 %. Après refroidissement, un volume de 20 mL d'eau distillée a été ajouté. Les résultats ont montré que la majorité des cultivars des graines sont une source d'huile occupant 60% de la masse totale du fruit. Les graines d'arachide sont riches en matière grasse comparativement aux autres graines oléagineuses utilisées comme sources d'huiles végétales alimentaires. La composition en acides gras a révélé que les huiles étudiées sont riches en acides gras insaturés à savoir les acides oléique (38,25- 47,88%) et linoléique (31,93- 40,88%), ce qui en fait une huile de bonne qualité. Par ailleurs, avec la teneur élevée en acides monoinsaturés (39,64-49,87%), elle est très favorable à la nutrition humaine. En outre, il a été rapporté que cette huile affecte positivement le profil lipidique au niveau du plasma, ce qui met l'accent sur un intérêt thérapeutique avéré. Partant de ces données, il est recommandé de valoriser ces graines en vue d'applications dans plusieurs domaines.

Mots clés : Arachide, Graines, Extraction, Composition, Acide Gras.

DPPH RADICAL SCAVENGING EFFECTS OF CRUDE EXTRACTS PREPARED FROM A MEDICINAL PLANT BELONGING TO THE FAMILY FABACEAE

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Abstract

Antioxidants had a growing interest in food and pharmaceutical industries owing to their protective roles against oxidative deterioration and oxidative stress-mediated pathological processes. For this, the research for new antioxidant molecules from natural sources constitute an interesting topic for scientific research. In this context, the present study evaluates the antioxidant effect of a species belonging to the Fabaceae family. This plant is widely employed in traditional medicine to treat several viral, inflammatory and infectious disorders. A phytochemical screening was conducted using several colorimetric methods. In addition, the antioxidant activities of petroleum ether, ethyl acetate and n-butanol extracts were assessed using DPPH free radical scavenging essay. According to the results, the crude extracts contain several classes of secondary metabolites known for their interesting pharmacological and antioxidant properties. All the tested extract (petroleum ether, ethyl acetate and n-butanol) had strong DPPH free radical scavenging effects with values of IC_{50} estimated at 23,89; 10,37 and 23,41µg/ml respectively. Furthermore, it could be concluded that the plant could be a source of bioactive molecules with potential therapeutic, pharmaceutical, nutritional and cosmetic effects due to its antioxidant proprieties.

Keywords: *Fabaceae*, DPPH Radical Scavenging Activity, Secondary Metabolites.

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CHEMICAL COMPOSTION AND ANTIOXIDANT ACTIVITY OF THE ETHYL ACETATE EXTRACT PREPARED FROM A MEDICINAL PLANT

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Abstract

The importance of medicinal plants in both traditional and modern medicine remains significant, for this many researchers are interested in plants to provide new drugs with few side effects, effective in preventing the onset of oxidative diseases. In this context, the present study evaluates the chemical composition and the antioxidant effect of a species belonging to the Fabaceae family. This plant is widely employed in traditional medicine to treat several inflammatory and infectious disorders. A phytochemical screening was conducted by several colorimetric methods. Using chromatographic methods, ß-sitosterol-3-O-glucopyranosyl was purified from the ethyl acetate extract, its structure was elucidated using many spectroscopic technics, including 1D and 2D NMR (1H, 13C, DEPT, COSY, HSQC, HMBC and NOESY), mass spectrometry (ESI-MS), visible ultraviolet rays. Furthermore, the antioxidant activity of the extract was tested using two different essays (DPPH radical scavenging activity and reducing power essay). According to the results, the ethyl acetate extract contains several classes of secondary metabolites known for their interesting pharmacological properties including flavonoids, phenolic compounds and quinones. And possess strong DPPH radical scavenging effect (IC50= 10,37±0,07µg/ml) and an excellent ferric reducing power (A0,5=11,84±0,05µg/ml). Furthermore, it could be concluded that the plant could be a source of bioactive molecules with potential therapeutic, pharmaceutical and cosmetic effects due to its antioxidant proprieties.

Keywords: Fabaceae, ß -Sitosterol-3-O-Glucopyranosyl, Spectroscopy, DPPH Radical Scavenging Activity, Reducing Power Essay.

MICROWAVE ASSISTED HYDRO DISTILLATION OF *CARUM CARVI* L. ESSENTIAL OIL

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Abstract

Caraway seeds are widely used as a flavouring agent in various food products. To extract essential oils from medicinal herbs, hydro-distillation is the most commonly used method. Unfortunately, this method remains energy-intensive and generates significant CO_2 emissions. Researchers developed some alternatives and ecological methods using microwave heating. This study compared the quantities and qualities of essential oil obtained by conventional hydro-distillation (HD) and microwave-assisted hydro-distillation (MAHD) methods. The results obtained from (MAHD) method were compared with those obtained from the traditional (HD) method. It is worth noting that MAHD produced an extraction yield of 1.28% w/w while the HD process produced 1.18% w/w. The analysis of the extracts using gas chromatography coupled with mass spectrometry revealed that both extracts contain oxygenated monoterpenes, the HD extract has 77.20% of these compounds while the MAHD extract has 84.61%. Additionally, there is a notable difference in the amount of monoterpene hydrocarbons present in each extract. The HD extract has 18.59% of these compounds, while the MAHD extract has 9.65%. Carvone is the most important compound found in both extracts, with 74.80% in the HD extract and 81.37% in the MAHD extract. This study evaluated the antioxidant activity of essential oils extracted from caraway seeds using the DPPH assay. This work found that the oils had moderate antioxidant ability. Moreover, it was discovered that the extraction process impacted the yield, chemical composition, and antioxidant activity of the oils. The IC_{50} value for the MAHD extract was lower than that of the HD extract. In conclusion, this study highlights the significant impact of the extraction process on the properties of the essential oils extracted from caraway seeds.

Keywords: *Carum Carvi* L., Microwave Assisted Hydro-Distillation, Essential Oil, DPPH Assay.

POLYPHENOLS FROM THE SPECIES *CONVOLVULUS CANTABRICA* L. (CONVOLVULACEAE)

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Abstract

Convolvulus cantabrica L. is a species belonging to the family Convolvulaceae. The latter mainly includes annual or perennial herbs with around 60 genera and more than 2000 species. This important family has many genera, especially the genus *Convolvulus*, which has multiple secondary metabolisms and multiple biological activities. Among the most important secondary metabolisms such as alkaloids, coumarins, flavonoids, tannins, saponins, sterols and stilbene derivatives. The phytochemical study of the ethyl acetate extract of the aerial parts of the species *Convolvulus cantabrica* by different chromatography techniques led to the isolation of three phenolic compounds. The structures of these compounds were determined using ^{13}C NMR and ^{1}H NMR spectroscopic techniques, including 2D NMR (COSY, HMBC, HSQC and NOESY), UV and EI mass spectrometry and comparison with literature data. In the biological part, the antioxidant properties were tested using the DPPH, FRAP and β-carotene radical elimination system, the total phenol and flavonoid contents were determined on the hydroalcoholic extract. Experimental data have demonstrated that this extract has an interesting antioxidant activity.

Keywords: Convolvulaceae, *Convolvulus Cantabrica*, Secondary Metabolites, Polyphenol, GC-MS, NMR.

OPTIMISATION DE L'EXTRACTION ASSISTEE PAR ULTRASONS DES POLYPHENOLS DES FEUILLES DE *CLEMATIS FLAMMULA*

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Résumé

Clematis flammula est une plante appartenant à la famille des Ranunculaceae, utilisée en médecine traditionnelle en Algérie pour le traitement des maladies inflammatoires, Le but de la présente étude est d'optimiser l'extraction assistée par ultrasons (EAU) des composés phénoliques (PC) de cette dernière. L'influence des variables à savoir le rapport solide liquide, le pourcentage d'éthanol, la température et le temps passé aux EAU ont été étudiés. Les extraits ont été analysés en termes de la teneur phénolique totale (TPC) et les flavonoïdes totaux (TFC). Les résultats ont montré que les conditions optimales pour l'extraction des PC étaient un rapport solide liquide de 1:60/g :ml, une concentration en éthanol de 20%, un temps d'extraction de 20 min et une température d'extraction de 50°C. Avec ces paramètres d'extraction optimaux, la TPC était de 47,47±5,98 mgGAE/Gdw, ainsi que la TFC était de 12,45±0.195, qui a été significativement élevé par rapport à l'extraction par macération avec une TPC de 6,53±0.14. Ce présent travail a démontré que l'EAU a amélioré le taux d'extraction ainsi que la teneur en polyphénols de l'extrait éthanolique de feuilles de *C. flammula*, ce qui va mener à une amélioration des activités biologiques de l'extrait de cette plante.

Mots clés : *Clematis Flammula*, Polyphenols, Optimisation D'extraction, Ultrasons.

PENTACYCLIC TRITERPENES FROM *CENTAUREA GRANATENSIS*

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Abstract

The genus *Centaurea* (Asteraceae) is prevalent in all over the world. It includes more than 500 species, with approximately 42 of them growing spontaneously in Algeria. In folk medicine, this genus is recognized for its diuretic, tonic, skin cancer, rheumatism, insect bites, gastric ulcers, wounds, hemorrhoids, asthma, malaria, anti-inflammatory, and antibacterial properties. The species of this genus have been the subject of many phytochemical investigations, which showed their wealth of bioactive secondary metabolites in particular flavonoids, sesquiterpene lactones, lignans, phytosterols and triterpenes. The objective of this work is the valorization of a local plant belonging to the *Centaurea* genus named *Centaurea granatensis* through the isolation and characterization of biologically active secondary metabolites. Indeed, the maceration of the plant material in a hydro-ethanolic mixture (70/30, V/V) and the extraction with three solvents of increasing polarity resulted in three organic extracts namely petroleum ether, ethyl acetate and *n*- butanol. The chemical investigation of the ethyl acetate extract using different chromatographic methods (VLC, CC, and TLC) led to the separation and purification of several secondary metabolites. Chromatographic profiles carried out on thin layer for the isolated compounds gave invisible spots at 254 nm, which appeared orange. These compounds were elucidated mainly by 1D NMR (^{1}H, ^{13}C *J*-modulated), 2D NMR (COSY H-H, HSQC, HMBC, NOESY) and ESI-MS mass spectrometry as well as comparison with literature data, thus making it possible to identify the following pentacyclic triterpenes: lupeol, lupeol acetate and lupenone.

Keywords: *Centaurea*, Pentacyclic Triterpenes, Extraction, Lupeol, NMR.

LES ACIDES PHENOLIQUES ISOLES DE LA PLANTE MEDICINALE : *THYMUS ALGERIENSIS*

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Résumé

Dans le cadre des études phytochimiques effectuées sur les plantes médicinales dans notre laboratoire et destinées principalement à la valorisation de la flore locale par la découverte de nouvelles biomolécules, nous avons sélectionné l'espèce *Thymus algeriensis* poussa dans la région des Aurès, en fixant comme principal objectif l'extraction, la séparation et l'identification des métabolites secondaires de cette plante. *Thymus algeriensis* appartient au genre *Thymus* (Thym) de la famille Lamiaceae, une grande partie de ces plantes sont utilisées et connues depuis longtemps en tant que herbes aromatiques et médicinales. Cette famille est considérée comme l'une des principales familles productrices d'huiles essentielles et aussi une source riche en flavonoïdes et polyphénols. L'extraction, la séparation et la purification chromatographique des extraits acétate d'éthyle et butanolique obtenus à partir de la partie aérienne de *Thymus a.*, nous ont permis d'isoler et identifier plusieurs acides phénoliques. La détermination de leurs structures moléculaires est effectuée par les méthodes d'analyse spectroscopiques telles que la RMN 1D (^{1}H, ^{13}C) et 2D (COSY, HSQC et HMBC) et la spectrométrie de masse ESI-MS.

Mots Clés : *Thymus Algeriensis*, RMN ^{1}D, RMN ^{2}D, Spectrométrie De Masse, Acide Phenolique.

COMPARATIVE ANALYSIS OF PHENOLIC PROFILE AND ANTIOXIDANT ACTIVITY IN *CRATAEGUS LACINIATA* FRUIT EXTRACTS USING DIFFERENT EXTRACTION METHODS

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Abstract

Hawthorn, a member of the Rosaceae family, is found globally and valued for its abundance of bioactive compounds. It serves as a crucial dietary herb, renowned for its positive effects on digestive and cardiovascular health, mainly due to its phenolic compound content. Indeed, secondary metabolites from medicinal plants have attracted the interest of researchers as an important source of new pharmacologically active compounds potentially used in the pharmaceutical industry in drug making, due to their antioxidant and anti-inflammatory activities, these antioxidants are often associated with reduced health risks. Therefore, it is essential to extract compounds from hawthorn that are rich in various classes of these beneficial compounds. The aim of the present study was to evaluate the phytochemical composition and antioxidant capacity of fruits extracts from *Crataegus laciniata* obtained with conventional and non-conventional extraction. Total phenolics and flavonoids contents were measured spectrophotometrically, and identified by UPLC analysis. Antioxidant activities of the fruits were evaluated using ABTS ((2,2′ -azino-bis(3-ethylbenzthiazoline-6-sulphonate) , ferric reducing antioxidant power (FRAP) and β-carotene bleaching assay. Phytochemical investigation of *Crataegus laciniata* fruits extracts revealed its richness in phenolic compounds, with total phenlic content reaching 51.10±0.87 µg AGE /mg E, and total flavoinoids content of 10.69±0.21 µg QE/mg E. Moreover, UPLC analysis revealed the presence of phenolic acids and flavonoids, including quercetin, myricetin, rutin and chlorogenic, gallic, ferulic, cinnamic acids. On the other hand, antioxidant activities of the fruits revealed an interesting antioxidant activity, reaching an IC50 of 33.59±1.06 µg/mL and 44.61±1.65 for ABTS, 105.43±1.97 and 48.29±0.66mg TE /g Extract for FRAP, and IC_{50}= 84.99 ± 3.81µg/ml for β-carotene bleaching assay. In the light of the above-mentioned findings, *Cractaegus laciniata* fruit is presented as an interesting source of bioactive compounds endowed with antioxidant capacity to be exploited in different industries: as food supplement or in application in food and pharmaceutical industries.

Keywords: *C. Laciniata*, Fruit, Phenolic Compounds, Antioxidant Activity.

ESSENTIAL OIL COMPOSITION, AND EVALUATION OF THE TOTAL PHENOL AND FLAVONOID CONTENT OF THE AERIAL PARTS OF AN ALGERIAN PLANT OF THE LAMIACEA FAMILY

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Abstract

In this study, we aimed to determine the yield of essential oils, the phytochemical composition, and the assessment of the total phenolic and flavonoid content of a Lamiaceae plant obtained from the Aures region in Algeria. Hexane was used as the organic solvent in a liquid-liquid extraction process that involved steam distillation to extract the oil and an aqueous solution as the result. The aerial parts were macerated in MeOH:H_2O to obtain the crude extract, which was then quantitatively assessed for its antioxidant capacity utilizing the concentrations of total phenol and flavonoid content. Additionally, the oil underwent a quantitative evaluation by means of gas chromatography-mass spectrometry (GC-MS) to ascertain its chemical composition. The results revealed that the extract was found to be rich in polyphenol and flavonoid (77.6 µgGAE/mg and 107.4 µgQE/mg, respectively) according to the results of the quantitative analysis. 77 chemicals were found in the GC-MS results, with eucalyptol accounting for 11.44%, α.-Terpinylacetate for 9.62%, and (+)-2-Bornanone for 8.96% of the total.

Keywords: Lamiacea, GC-MS, DPPH, Polyphenol, Flavonoids.

BIOACTIVE POLYPHENOLS FROM *JUNIPERUS OXYCEDRUS* AERIAL PARTS: QUANTIFICATION, IDENTIFICATION, AND ANTIOXIDANT ACTIVITY

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Abstract

Juniperus oxycedrus is a small coniferous tree or shrub native to the Mediterranean region and the Middle East, with a variety of biological activities. The aim of this work is to study the antioxidant activity of *juniperus oxycedrus* extracts obtained by three extraction techniques and determinate its phenolic profile by chromatographic technique. The aerial parts of *juniperus oxycedrus* have been extracted with ethanol by three techniques (maceration, Soxhlet and Ultrasound-Assisted Extraction) and investigated for their antioxidative potential using DPPH (1,1diphenyl-2-picryl hydrazyl) radical scavenging method. The results were compared with BHA activity that is used as standard molecule. The phenolic profile of extract obtained by UAE technique was determinate by Liquid Chromatography with tandem mass spectrometry (LC-MS/MS). The highest DPPH activity was shown by UAE, followed by Maceration and then Soxhlet. All extracts have lower antioxidant activity than BHA .LC-MS/MS results of the aerial parts of *Juniperus oxycedrus* shows the presence of 15 phenolic compounds and catechin present the most abundant compound. The results of this study revealed that the extraction method has a significant impact on antioxidant activity of aerial parts of *juniperus oxycedrus*. further studies are required to study the effect of time (min), extraction temperature and liquid/solid ratio (ml/g).

Keywords: Phenolic Compound, *Juniperus Oxycedrus*, Antioxidant Activity, LC-MS/MS.

EXTRACTION, SEPARATION AND PURIFICATION OF BIOACTIVE COMPOUNDS FROM ALGERIAN PLANT

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Abstract

Onobrychis crista-galli (L.) Lam plant of genus *Onobrychis* growing in Aures region. The genus *Onobrychis* belonging to the subfamily Papilionoideae of the family Fabaceae, we were interested in the isolation of new phytochemicals using CC, TLC, MPLC and HPLC.A phytochemical study of crude extracts obtained from of the *Onobrychis crista-galli* (L.) Lam (Fabaceae) led to the isolation and structure identification of fifteen known compounds. Their structures were established mainly by extensive use of spectroscopic techniques, including 1D (^{1}H, ^{13}C and DEPT) and 2D homo- and heteronuclear NMR experiments (COSY, HSQC and HMBC) data, and of mass spectrometry HR-ESI-MS and chemical correlations with known compounds that have been described in the literature.

Keywords: *Onobrychis Crista-Galli* (L.) Lam, Fabaceae, NMR 1D And 2D.

Topic B

Oxidative stress and plant-based antioxidants.

ORAL COMMUNICATIONS

UNRAVELING THE INHERENT ACTIVITIES OF SUPEROXIDE DISMUTASE AND CATALASE IN THE DIFFERENT STAGES OF EXTRACTION OF *P. LENTISCUS*

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Abstract

Pistacialentiscus (Anacardiaceae) is a plant locally used for therapeutic purposes. The aim of this study was to unravel the inherent catalase (CAT) and superoxide dismutase (SOD) activities in fresh leaves, the powder obtained after grinding and the ethanolic extract of *P. lentiscus*, compared to curcumin. The activity of these enzymes in the presence of *P. lentiscus* and curcumin, was determined by measuring the inhibition of decomposition of hydrogen peroxide by CAT and SOD by the NBT assay. The measurement of the activity of these two enzymes in fresh leaves, the powder obtained after grinding and the ethanolic extract allowed us to estimate their activities in the different steps of the extraction. This study has revealed that curcumin has activated catalase to a maximum of 21% at 50µg/ml, and SOD (39.14%) at 100µg/ml. The measurement of the activities of these two enzymes in curcumin suggests that it acts on the active site of catalase while the observed activity on SOD might be a combination of both enzymatic and scavenging potentials. On the other hand, *P. lentiscus* fresh leaves has showed high SOD activity at 25µg/mL (2U SOD/min/mg), while the powder and extract had no activity. In contrast, the extract CAT activity was the highest at 100µg/mL (100U CAT/min/mg). The inherent activities of these two enzymes is very relevant and provides proof to the high antioxidant potency to *P. lentiscus* fresh leaves and extract. It also stresses the importance of the extraction method on the level of activity of these two enzymes. The high inherent antioxidant activity of this plant offers a promising alternative for synthetic additives in the food, cosmetic and pharmaceutical industries.

Keywords : *Pistacialentiscus*, Curcumin, Catalase, Superoxide Dismutase, H_2O_2.

ÉTUDE COMPARATIVE ET EVALUATIVE SUR LE POTENTIEL ANTIOXYDANT ET ANTI-INFLAMMATOIRE D'EXTRAITS ORGANIQUES DE STACHYS OFFICINALIS L. DU NORD-EST DE L'ALGERIE

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Résumé

Stachys officinalis L. (*Betonica officinalis* L.) est distribuée en nord d'Afrique, sud-ouest d'Asie et en Europe. Elle est utilisée en médecine traditionnelle Européenne pour le traitement de plusieurs maladies tel que les troubles du foie, les maladies anti-inflammatoires, les tumeurs génitales et la faiblesse cardiaque. L'objectif de cette étude est la quantification des composés phénoliques, l'évaluation du pouvoir antioxydant et l'effet anti-inflammatoire d'extraits organiques (éther de pétrole, chloroforme et hexane) des feuilles de cette plante, récoltée de la willaya de Jijel. Les teneurs en polyphénols totaux, flavonoïdes et flavonols des extraits ont été déterminés par les méthodes spectrophotométriques. L'activité antioxydant a été évaluée par différentes méthodes (DPPH, ABTS, FRAP, CUPRAC et pouvoir chélateur du fer). L'activité anti-inflammatoire a été estimée par inhibition de la dénaturation protéique. Les résultats révèlent la richesse d'extrait d'éther de pétrole en phénols (223.18 µg EAG/mg E), etl'extrait de chloroforme en flavonoïdes et flavonols. L'extrait d'hexane montre la bonne activité antioxydant pour les cinq méthodes testées, et une forte inhibition de la dénaturation des protéines (99.92%), par rapport aux autres extraits. En conclusion, Stachys officinales L. à une activité antioxydant et anti-inflammatoire intéressante, ainsi constitue une source importante de polyphénols. Cependant, d'autres recherches sont nécessaires pour bien comprendre les activités biologiques de cette plante.

Mots-clés : Stachys Officinalis L., Extraits Organiques, Activité Antioxydant, Activité Anti-Inflammatoire.

STUDY OF THE ANTIOXIDANT, ANTI-INFLAMMATORY AND ANTIBACTERIAL ACTIVITY OF METHANOLIC EXTRACT OF *MORINGA OLEIFERA* LEAVES

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Abstract

Medicinal plants such as *Moringa oleifera* generally have several therapeutic virtues. This study aimed to evaluate the antioxidant, anti-inflammatory and antimicrobial activity. The polyphenol content was determined by the Folin-Ciocalte method and the flavonoid content was determined by the aluminum trichloride method. Antioxidant activity was assessed by the 2, 2-diphenyl- 1-picrylhydrazyl (DPPH) free radical test and β Caroten . The extract showed a content of total phenolic compounds of 3.39± 0, 176 ug EAG/mg extract for methanolic extract, a flavonoid content of 7.826± 0.208 ug EQ /mg of extract, and a value of with IC_{50} values of 0.167± 0.002mg/mL the effect of BHT with $IC5_0$: 6.29 ±1.12 ug/ml. The β-carotene bleaching assay indicated a strong inhibition percentage of the lipid peroxidation with a value of 85.65± 04.5. The anti-inflammatory test with Protein denaturation inhibition power, the results showed that at low concentrations the anti-inflammatory activity is average compared to diclofenac. The antimicrobial activily was evaluated for 04 bacterial strains (Gram-: Eschericha Coli ATCC 25922, Pseudomonas Acruginosa ATCC 27853, and Gram+: Staphylococcus Aureus ATCC 25923, Bacillus Subtilis ATCC 6633) and (Candida albicans). by the then difusion method. The results showed good antiradical and inflammatory effects but a low antimicrobial power.

Keywords: Anti-Inflammatore Activity, Antimicrobial Activity.Antioxidant Activity, *Moringa Oleifera*, Dosage of Polyphenols, Flavonoidsanf Methanolic Extract.

DETERMINATION OF OXIDATIVE STRESS AND ANTIOXIDANT ENZYME ACTIVITY IN WHEAT

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Abstract

The overproduction of reactive oxygen species during abiotic stress in plants causes oxidative stress that damage the cell normal functions. For reactive oxygen species (ROS) scavenging, plants developed a defense system with antioxidant enzymes. The aim of this study was to evaluate the response of *durum wheat* plants to oxidative stress by drought in leaves and roots at different concentrations (0 (control), S1, S2). We assessed oxidative stress by the contents of hydrogen peroxide (H_2O_2) and malondialdehyde (MDA), as well as protein content. also, we determined the antioxidant enzymatic activity of the superoxide dismutase (SOD), catalase (CAT), and guaiacol peroxidase (GPX) enzymes. The results demonstrated a decrease in protein content of roots and leaves, starting with the stress intensity, however the MDA content and H_2O_2 levels increased this due to the formation of reactive oxygen species. The SOD, and GPX enzymatic activity increased in roots treated. On the other hand, the activity of CAT increased in leaves exposed to S2 level of stress. These results indicate that these antioxidant enzymes can act simultaneously in the elimination of reactive oxygen species.

Keywords: Wheat, Oxidative Stress, Antioxidant Enzymes, Abiotic Stress, ABA.

POSTER COMMUNICATIONS

PHRAGMITES AUSTRALIS LEAF AQUEOUS EXTRACT AS A REDUCING AND CAPPING AGENT FOR CU NPS SYNTHESIS FOR ANTIOXIDANT ACTIVITY

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Abstract

This study intends to use the Algerian *Phragmites australis* leaf aqueous extract to synthesize copper nanoparticles (CuNPs) and to investigate their antioxidant activity. Standard protocols were used to evaluate the phyto-compounds present in our plant before using it as a capping and reducing agent for Cu NPs synthesis. The biosynthesized nanoparticles were then characterized using different techniques such as UV-Vis spectroscopy, Fourier Transform Infrared Spectroscopy (FTIR), and Scanning Electron Microscopy (SEM). Conventional protocols were used to assess their antioxidant activity. Results of the phytochemical screening demonstrate the richness of the extract with different molecules such as polyphenols, flavonoids and tannins. Moreover, the bioformulated Cu NPs revealed an important antioxidant activity in comparison with ascorbic acid. To conclude, *P.australis leaf aqueous extract* used as a reducing and capping agent for copper NPs is a valuable natural resource of bioactive compounds that can be used against free radical disorders.

Keywords : *Phragmites Australis* , Characterization , Phytosynthesized Copper Nps, Anti-Oxidant Activity

EVALUATION OF PHENOLIC AND FLAVONOID CONTENT AND THE ANTIOXIDANT ACTIVITY OF *N*-BUTANOL EXTRACT OF AN ENDEMIC ALGERIAN *FICUS*

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Abstract

Natural antioxidants play an essential role in the prevention of many age-related disorders and the promotion of health. *The Ficus* genus of the Moraceae family, with more than 800 species, is frequently used for the treatment of various illnesses. *Ficus* species are rich sources of polyphenolic and flavonoid compounds, which are known as potent antioxidants that help in the prevention and therapy of various oxidative stress-related diseases such as neurodegenerative and hepatic diseases. This study aimed to determine the total flavonoid content (TFC) and the total phenolic content (TPC) and evaluate the antioxidant activity of *n*-butanol (*n*-BuOH) extract. Total Flavonoids were inspected based on the formation of the flavonoidaluminium complex. The total polyphenol (TPC) was investigated using the folin-ciocalteu method. Antioxidant activity was investigated using the 2, 2'-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging method. The results showed that the *n*-BuOH extract exhibited the best radical scavenging activity, found to be 84.13% at 0.5 mg/ml with an IC50 value of 0.218 mg/ml in comparison to the standard ascorbic acid used. Results further suggest a strong correlation between antioxidant activities and flavonoid contents.

Keywords: *Ficus*, Moraceae, Antioxidant Activity, DPPH Assay, Phenolic Content, TPC, Flavonoid Content,TFC.

MITIGATION OF PESTICIDE HEPATOTOXICITY BY *ROSMARINUS OFFICINALIS* ESSENTIAL OIL IN RATS

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Abstract

Pesticides, chemical substances also called phytosanitary products were used in the agricultural sector to increase crop yields by protecting plants during their development and conservation from various pests. however, in recent years, the intensive use of these substances has led to the appearance of multiple ecological, environmental and health problems. Their traces in water and food are likely to cause metabolic, oxidative, neurological and hormonal alterations. The aims of our study is to demonstrate experimentally the toxicity of propineb and to evaluate the effectiveness of *Rosmarinus officinalis* essential Oil to modulate metabolic imbalance induced by propineb, a fongicide widely used in Algria.For the methods a 28 Albinos wistar rats were divided into 4 groups of 7 rats each. One served as control, the others groups underwent a per os treatment of propineb (Pr) at a rate of 200 mg/kg/day b.w. and/or 0,5 ml/kg of *Rosmarinus officinalis* essential Oil (REO) for 30 days. Our results show that exposure to propineb was found to elicit a perturbation in biochemical parameters essentially marked by hyperglycemia, hyperlipidemia, a significant increase in hepatic blood test and an impairment of several antioxydant defense systems. Furthermore, propineb showed histological changes in liver tissues. However, the administration of *Rosmarinus officinalis* essential Oil notably allows to restore all the parameters measured in this study. No significant difference is recorded compared to the control group, in addition to the improvement of organ tissues architecture. These findings show the powerful antioxidant and hepatoprotective effect of rosemary against oxidative stress induced by propineb.

Keywords: *Rosmarinus Officinalis*, Essential Oil, Oxydative Stress, Toxicity, Propineb

TOTAL PHENOLIC, TOTAL FLAVONOID CONTENTS AND ANTIOXIDANT ACTIVITY OF *INULA VISCOSA*

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Abstract

Medicinal plants are considered an important source of human health because of their therapeutic capabilities in treating various diseases. Therefore, the purpose of the study was to estimate the total phenolic (TPC) and flavonoids (FC) content, antioxidant activity of chloroform extract (ChE) of *Inula viscosa* were determined. Chloroform was obtinated out by scale liquid-liquid extraction. Total polyphenols and flavonoids content were estimated using the Folin-Ciocalteu reagent and $AlCl_3$ methods, respectively. The stability of natural antioxidant at different concentrations are evaluated using 2, 2- diphenyl -1- picrylhydrazyl (DPPH•) stable radical and iron chelation methods. The yield of ChE obtained was 3.79%. Total polyphenols and flavonoid amounts were 377.76 ± 0.61 µg EGA/mg and 23.03 ± 0.35 µg EQ/mg of extract, respectively. Chloroform fraction exhibited potentactivity in scavenging DPPH (IC_{50}= 4.83 ± 0.06 µg/ml) and in iron chelation (IC_{50} = 4362.05 ± 3.24 µg/ml). The presence of polyphenols and flavonoids could to some extent justify the observed antioxidant effect in the current study, thus opening new prospects for research and innovative phytopharmaceuticals developments.

Keywords: *Inula Viscosa*, Polyphenols, Flavonoids, Antioxidant Activity, DPPH, Iron Chelation.

PHYTOCHEMICAL SCREENING AND EVALUATION *IN VITRO* OF ANTIOXIDANT ACTIVITY OF ETHANOLIC EXTRACT FROM RED GRAPES FRUIT

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Abstract

Fruits serve as vital source of exogenous antioxidants, pivotal in mitigating oxidative stress induced by free radicals, thereby reducing the likelihood of illness. Consequently, the body's antioxidant level's assume paramount importance. For this reason, this work aimed to identify specific bioactive compounds, alongside assessing the total antioxidant capacity (TAC) and hydrogen peroxide radical scavenging **of ethanolic extract** from red grapes fruit **of** *Vitis vinifera* L**,** renowned for its global prevalence, as in Algeria. The obtained results revealed the existence of polyphenols, flavonoids, tannins and quinones, while terpenoids, anthraquinones, saponins, cardiac glycosides and mucilage were notably absent. Furthermore, the antioxidant activity of the extract through TAC assay indicated an inhibitory concentration of 50% of free radicals (IC_{50}) at 0,014±0.377 mg/mL of **ethanolic e**xtract. However, the scavenging ability against H_2O_2 showed an IC_{50} of 19,3383 ±0,3823 mg/mL of **ethanolic** extract. In conclusion, our findings imply that this fruit may be a reliable source of phenolic compounds with significant antioxidant potential.

Keywords: *Vitis Vinifera* L.**, Ethanolic Extract,** Phytochemical Screening, Antioxidant Activity.

INVESTIGATION OF ESSENTIAL OIL EXTRACTION, GC/MS EVALUATION, AND ASSESSMENT OF ANTIOXIDANT PROPERTIES IN TWO MEDICINAL PLANT SPECIES INDIGENOUS TO SOUTHERN ALGERIA

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Abstract

The utilization of medicinal plants for therapeutic purposes has been deeply rooted in traditional medicine practices. In this study, we focus on the extraction, Gas Chromatography-Mass Spectrometry (GC/MS) analysis, and evaluation of Antioxidant activity of essential oils derived from two indigenous medicinal plants native to the southern region of Algeria. The extraction process employs hydro-distillation technique to ensure optimal yield and preservation of bioactive compounds. Subsequently, GC/MS analysis is conducted to identify and quantify the chemical constituents present in the essential oils, providing insights into their phytochemical composition. Furthermore, the Antioxidant potential of these essential oils is investigated through in vitro assays utilizing UV-Vis spectroscopy. The assay methodology is designed to assess the ability of the essential oils to modulate key parameters associated with free radicals. Complementing these experimental analyses, computational studies are performed using induced fit docking and Molecular Dynamics Simulation (MDS) techniques, spanning a simulation period of 100 nanoseconds. Through in silico simulations, we aim to elucidate the molecular interactions between bioactive components of the essential oils and target proteins implicated in stress oxidative.The integration of experimental and computational approaches provides a comprehensive understanding of the therapeutic potential of these medicinal plants in managing stress oxidative. This multidisciplinary investigation contributes to the advancement of natural product-based drug discovery and underscores the significance of traditional knowledge in modern scientific research.

Keywords: Medicinal Plants, Essential Oil Extraction, Gc/Ms Analysis, Antioxidant Activity.

IN VITRO ANTIOXIDANT ACTIVITY OF METHANOLIC EXTRACT AND DECOCTION OF MEDICINAL PLANT SEEDS

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Abstract

Antioxidants can protect against the cell damages caused by free radicals, known as oxidative stress. Most of interesting of the natural antioxidants are of plant origin and are found especially in fruits and vegetables. In this study, the antioxidant capacity of two medicinal plants seed extracts: crude methanolic extract (CrES) and decoction (DeES), was investigated by determining their reducing power and scavenging radical rate on 2,2′-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid (ABTS). These extracts were analyzed for polyphenol (TPC) and flavonoid (TFC) content. The results showed that CrES and DeES have TPC of 145.45±3.49 and 94.07±1.04 mg GAE/g, and their TFC of 35±0.06 and 5±0.41µg QE/mg, respectively. CrES exhibited the strongest ABTS radical scavenging ability and the highest reducing power with IC_{50} value corresponding to 19.63±0.22µg/ml and 33.14±0.02µg/ml, followed by DeES with IC_{50} of 35.04±1.47 µg/ml and 64.23±0.79 µg/ml, respectively. The therapeutic potential of this plant could be due to its phytochemical content.

Keywords: ABTS, Antioxidant Activity, Flavonoids, Medicinal Plant, Polyphenols,Reducing Power.

EVALUATION BIOLOGIQUES DES ALCALOIDES D'UNE PLANTE MEDCINALE LOCALE A L'EGARD DU STRESS OXYDATIF

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Résumé

Les maladies inflammatoires chroniques de l'intestin (MICI) sont déclenchées par une réponse immunitaire incontrôlée associée à un déséquilibre du microbiote intestinal, génétique et environnemental. L'objectif de notre étude consiste à déterminer l'effet anti-inflammatoire de l'extrait d'alcaloïde d'une plante médicinale locale à différentes doses (25, 50, 100 mg/kg) sur un modèle animal de souris BALB/C induit par le DNBS. L'évaluation du développement de la maladie est réalisée par une analyse macroscopique, histologique et biochimique, mesurant la malondialdéhyde (MDA), le glutathion réduit (GSH), la catalase (CAT), l'oxyde nitrique (NO) et la myéloperoxydase.L'extrait a amélioré significativement de manière dose-dépendante la gravité de la colite induite par le DNBS, réduisant ainsi la perte de poids corporel, l'incidence de la diarrhée, le raccourcissement du colon et la restauration de son intégrité suite à une diminution de l'infiltration des cellules immunitaires, empêchant les dommages macroscopiques et microscopiques. L'extrait a également réduit l'activité de la myéloperoxydase (MPO), du MDA, du NO, et a augmenté le glutathion (GSH) et la CAT dans l'homogénat du colon. L'effet protecteur de l'extrait a également été confirmé dans l'évaluation histologique, montrant la préservation de la cytoarchitecture colique.Selon nos résultats, l'extrait présente des propriétés intestinales anti-inflammatoires et peut être utilisé pour prévenir les dommages induits par le DNBS.

Mots-clés : MICI, DNBS, Inflammation Intestinale, Souris, Colite, Anti-Inflammatoire.

Study of Metribuzin Toxicity-Induced Infertility and Testis Oxidative Stress: An Antidote Activity of *Ocimum basilicum* L. Aqueous Extract

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Abstract

Oxidative stress, one of the primary contributors to male infertility, refers to an imbalance between production of reactive oxygen species (ROS) and antioxidant defense mechanisms of the body. The aim of this study was to evaluate the antidote activity of basil extract against metribuzin induced infertility and oxidative stress in testis cells in Wistar rats. Eighteen healthy adult male Wistar rats were randomly divided into 3 groups (n=6); the first group used as a control group. The second group exposed to metribuzin in drinking water (220 mg/kg/day) for 60 days. The third groupe exposed to metribuzin and received oral dose of basil extract (200 mg/kg/day). The testis was carefully sampled, washed, weighted, and then stored at -20°C for oxidative stress parameters. Furthermore, the testis was placed in formaldehyde (10%) for histological analysis. Results of the in-vivo rats study showed that metribuzin exposure caused a testicular hypertrophy, oxidative stress (GSH, MDA, SOD, GPx, GSTs and CAT), and alteration of the testis histological section compared to the control group. In addition, treatment of metribuzin group with leaves aqueous extract of basil improved all of the previous parameters. The beneficial effect of the basil plant is shown by the improvement in oxidative stress markers confirms the effectiveness of these compounds in protecting against metribuzin-induced infertility.

Keywords: *Ocimum Basilicum* L., Metribuzin, Oxidative Stress, Infertility,Rats.

IN VITRO FREE RADICAL SCAVENGING ACTIVITIES OF DIFFERENT ORGANIC FRACTIONS OF THE AERIAL PART OF THE *ERODIUM* PLANT IN RELATION TO THE TOTAL CONTENT OF PHENOLIC COMPOUNDS AND FLAVONOIDS

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Abstract

Erodium is a medicinal plant that belongs to the Geraniaceae family and has a traditional application in the treatment of various medical conditions. The objective of this study was to assess the total phenolic and flavonoid contents and to evaluate the in vitro antioxidant potential of distinct fractions obtained from the aerial part of the *Erodium* plant. Total polyphenols and flavonoids were quantitatively determined using the Folin-Ciocalteu and aluminum trichloride methods. Anti-free radical effects were assessed through multiple assays, including DPPH, ABTS, and SNP. The quantification of phenols and flavonoids in *Erodium* fractions revealed a descending order: ethyl acetate (850.51 ± 0.34 µg GAE/mL and 159.38 ± 2.11 µg EQ/mL), n-butanol (711.51 ± 0.42 µg GAE/mL and 139.13 ± 1.55 µg EQ/mL), chloroform (371.55 ± 1.70 µg GAE/mL and 36.13 ± 0.82 µg EQ/mL). All fractions exhibited significant antioxidant activity against DPPH and ABTS, with ethyl acetate showing the best results with IC50 value of 4.12 ± 0.01 µg/mL for DPPH and 2 ± 0.06 µg/mL for ABTS. In the SNP test, n-butanol had the highest activity with an A0.5 value of 3.62 ± 0.15 µg/mL. In conclusion, all the fractions were rich in phenolic compounds and flavonoids and showed significant antioxidant activity, particularly the polar fractions. It would be very interesting to carry out future research to identify the active compounds responsible for their antioxidant effects.

Keywords: Erodium, Antioxidant Activity, Polyphenols, Flavonoids, DPPH, SNP.

ÉVALUATION DE L'ACTIVITE ANTIOXYDANTE DES COMPOSES PHENOLIQUES DU MIL CULTIVE (*PENNISETUM GLAUCUM* (L) R .BR) DANS LA REGION D'AIN SALH

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Résumé

Les polyphénols sont des métabolites secondaires des plantes qui suscitent un intérêt croissant ces dernières années du fait de leurs effets biologiques multiples telle leurs propriétés antioxydantes. Notre étude a pour objectif de vérifier l'effet d'un traitement des solvants sur les composés phénoliques et Les tanins Des graines feuilles et déchets qui poussent dans la région d'in salh appelée millet ou *Pennisetum glaucum*. L'objectif de cette étude est d'évaluer l'effet du solvant. L'extraction des composés phénoliques a été réalisée par quatre systèmes de solvants : méthanol pur et méthanol dilué avec de l'eau distillée (8/2) et Acétone pure et Acétone dilué avec de l'eau distillée (7/3). L'activité antioxydante de différents composés phénoliques des graines et dès la feuille et des déchets a été évaluée par deux méthodes de DPPH et FRAP. Les résultats de l'analyse des extraits ont clairement montré, que ces variétés locales sont des sources prometteuses en composés phénoliques en général. La teneur phénolique totale lors de l'extraction variait de 0 ,00 à 3,45 (mg TAE/g) dans la farine de *Pennisetum glaucum*. Tandis que les valeurs de tanins variaient de 0,00 à 11,60 (EC/g) mg. Les résultats d'analyse de variance (ANOVA) pour tester s'il existe des différences significatives dans l'effet des parties de plantes sur les différentes propriétés des extraits étudiés, ont montré qu'il existe une différence significative dans les valeurs moyennes de toutes les propriétés étudiées sauf pour les valeurs moyennes des tanins, à un niveau significatif de 5%.

Mots clés : *Pennisetum Glaucum*, Composés Phénoliques, Tanins, Pouvoir Antioxydant.

THYMOL'S THERAPEUTIC POTENTIAL IN CCL4-INTOXICATED RATS: EFFECTS ON TRANSAMINASE ACTIVITIES AND OXIDATIVE STRESS

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Abstract

Globally, research has focused on harnessing the potential of natural substances with biological activities to promote health, with medicinal plants serving as a primary source of such compounds. Thymol, found primarily in thyme (Thymus vulgaris), has gained recognition for its therapeutic potential. This study aims to evaluate the effects of thymol on transaminase activities and oxidative stress markers in correlation with its hepatocurative effects in vivo, using female Albino Wistar rats intoxicated with carbon tetrachloride (CCl_4). The rats were treated with thymol for 7 days at doses of 100 and 200 mg/kg/day. Results show a significant increase in plasma levels of hepatic biochemical parameters in intoxicated rats, with ALT levels rising by 5.80 times and AST levels by 10.48 times compared to the negative control group. This intoxication is also accompanied by a significant increase in hepatic and plasma levels of oxidative stress markers, with MDA levels rising by 18.56 times and 2.86 times, respectively. Therapeutic treatment with thymol at both doses led to a notable decrease in transaminase activity. The most pronounced effects were observed in the group treated with 100 mg/kg, showing reductions of 86.42% for ALT and 79.99% for AST, and in the group treated with 200 mg/kg, with reductions of 88.10% for ALT and 90.44% for AST. Additionally, curative treatment of rats with thymol for 7 days restored plasma and hepatic oxidative stress. Treatment using 200 mg/kg of thymol resulted in a significant decrease in plasma and hepatic concentrations of MDA by 87.57% and 85.19%, respectively. In conclusion, thymol exhibits a dose-dependent regulatory effect on plasma transaminase levels, demonstrating significant therapeutic potential against CCl_4-induced toxicity in vivo. The dose of 200 mg/kg/day emerges as a promising therapeutic model.

Keywords: Carbon Tetrachloride, Hepatocurative, Hepatotoxicity, MDA, Thymol.

CHEMICAL CARACTERIZATION AND BIOLOGICAL ACTIVITIES OF A NEW PLANT-BASED RENNET

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Abstract

The production of dairy products and cheese is one of the most important industries with interesting economic income. Indeed, the first step of cheese manufacturing diagram requires the coagulation of milk using rennet from several animal and microbial origins. For several decades, a worldwide shortage of calf rennet has been observed. Industries were turned to the use of many rennet substitutes such as bovine and porcine pepsins but a commercial failure has been noticed due to their extensive proteolytic nature and several social limitations (the product is not halal). This failure led the researchers to develop various microbial coagulants, which were highly effective and available but dairy industries were reluctant to use them due to the reduced yield and the low quality of the products. In order to confirm the effectiveness of this product a series of experiments was conducted. According to the results this formula is rich in secondary metabolites and possess several antioxidant and antibacterial activities and had strong coagulant properties. VEGA-FRO is a natural, organic and halal vegetable rennet intended for cheese industries and people interested in dairy products production. It is an innovative product obtained by the combination of several herbs and plants endemic to Algeria that possess nutritional, pharmaceutical and coagulant properties.

Keywords: Plant-Based Rennet, Dairy Products, Biological Activities, Chemical Characterization.

PROPRIETES ANTIOXYDANTES DU CAROUBE : UNE ARME NATURELLE CONTRE LE STRESS OXYDATIF

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Résumé

Le stress oxydatif est un état de déséquilibre entre la production d'oxydants (réactives de l'oxygène (ERO)) et la disponibilité des antioxydants endogènes pour éliminer ces ERO, ce qui entraîne une production excessive d'oxydants, susceptible d'entraîner diverses maladies chroniques. Les antioxydants d'origine végétale, notamment ceux issus du fruit de caroube provenant de l'arbre *Ceratonia siliqua L.* jouent un rôle crucial dans la défense contre ce stress. Cette présentation offre une étude approfondie sur les mécanismes d'actions des composés phénoliques du *Ceratonia Siliqua L.* face au stress oxydants en synthétisant les derniers résultats de recherche. Une myriade de polyphénols est présente dans la pulpe du fruit de caroube. Les classes de métabolites secondaires comprennent les acides phénoliques, les flavonoïdes et les tanins. Les tanins constituent la principale classe de métabolites secondaires présents dans la caroube et sont responsables de son goût astringent. Plusieurs chercheurs ont fait état de l'action antioxydant et piégeuse de radicaux des extraits de caroube, établie par divers modèles in vitro et in vivo. Des extraits aqueux et alcooliques de gousses mûres ont été évalués pour leur capacité à piéger différentes formes d'espèces réactives de l'oxygène et leur potentiel antioxydant global. Les essais d'extinction in vitro des radicaux libres, à savoir le 2,2-diphenyl-1-picrylhydrazyl (DPPH) et le 2,2′-azino-bis [3-ethylbenzthiazoline-6-sulphonic acid] (ABTS), ont montré que les extraits de caroube possèdent des effets significatifs. En résumé, les extraits de pulpe de caroube offrent des alternatives naturelles aux additifs synthétiques dans le domaine médical et agroalimentaire. Ils agissent comme des agents antioxydants et des conservateurs potentiels, luttant contre le stress oxydant. Ainsi, la caroube représente une ressource précieuse pour développer des stratégies diététiques ou des suppléments destinés à lutter contre le stress oxydatif et à promouvoir la santé globale.

Mots-clés : Composés Phénoliques, Caroube, *Ceratonia Siliqua L.*, Stress Oxydant, Radicaux Libres.

EVALUATION OF ANTI-INFLAMMATORY, ANTI-HEMOLYTIC AND FREE RADICAL-SCAVENGING ACTIVITIES OF THE AQUEOUS EXTRACT OF *CAPPARIS SPINOSA* LEAVES

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Abstract

Capparis spinosa is a Mediterranean shrub that is used in traditional medicine to cure various illnesses. In this study, the anti-inflammatory, the anti-hemolytic and the antioxidant properties of the aqueous extract of the leaves of this plant were investigated. The anti-inflammatory activity was determined *in vivo* by evaluating the anti-edematous effect of the extract by using croton oil-induced ear edema. The anti-hemolytic effect of the extract was investigated using the 2,2'-Azobis (2-amidinopropane) dihydrochloride (AAPH) methods. The antioxidant properties were investigated *in vitro* by exploiting the ability of the extract to scavenge 2,2′-azinobis-3-ethylbenzothiozoline-6-sulfonic acid (ABTS) and hydroxyl radicals. Results revealed that the local treatment of mice with 2 mg/ear of the extract inhibited significantly the ear edema with 75%. Under the oxidative action of AAPH, the extract had also significantly protected the erythrocyte membrane from hemolysis. The best effect was exerted by 100 µg/ml of the extract with HT50 of 132.2 ± 8.14 min. In addition, the extract showed a strong scavenging activity against ABTS radical and hydroxyl radicals. The IC50 were 68.44 ± 2.49 µg/ml and 608.09 ± 6.68 µg/ml, respectively. These results indicate that *Capparis spinosa* leaves has an interesting anti-inflammatory, anti-hemolytic and antioxidant activities, which support the use of this plant in traditional medicine and suggest that it may contain phytochemicals that have the potential to be active agents as anti-inflammatory, anti-hemolytic and antioxidants.

Keywords: Anti-inflammatory activity, anti-hemolytic activity, antioxidant, *Capparis spinosa*, scavenging activity.

DETERMINATION OF THE ANTIOXIDANT ACTIVITY OF VLC FRACTIONS OF *GENISTA* SP AERIAL PARTS USING DPPH ASSAY

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Abstract

Currently, products derived from nature play an important role as a potential source of medicine. Many pharmaceutical agents have been discovered by screening natural products from plants, based on ethnopharmacological data which provides a substantially increased chance of finding active plants relative to a random approach.The genus *Genista* (family Fabaceae, subfamily Papilionoideae), with its cosmopolitan distribution, has attracted the human interest since ancient times, as it is used in folk medicine and mainly in the Mediterranean area for the treatment of respiratory diseases, rheumatic disorders, diabetes, and ulcer, while it is also well known for its yellow pigment. The chemical composition of the Genista species revealed the presence of an important secondary metabolites. The extracts of Genista sp may act as an important source of bioactive phytochemicals for the treatment of many human ailments, mainly inflammation and pain, estrogen related pathology, hyperglycemia, cancer and microbial infections. Therefore, the present work summarizes and discusses the antioxidant activity aiming to highlight the recent advances in current knowledge on the aerial part of Genista sp as a source of bioactive compounds. The crude hydroethanolic extract was fractionated by vacuum liquid chromatography, 14 VLC fractions were tested against the stable DPPH (2,2-diphenyl-1-picryl-hydrazyl-hydrate) free-radical. The ability to scavenge DPPH radical was measured in these experiments by the discoloration of the solution. BHA, BHT, α-TOC were used as standards. Based on our results, we determined that fractions G29 and G30 indicated higher antioxidant activity with IC_{50} values ranging from 10.98 to 14.77 g/mL against DPPH. respectively compared to standard compoundsThis study indicated that the aerial part of *Genista* Sp may be a new potential resource of natural antioxidant compounds.

Keywords: *Genista*, *Fabaceae*, Antioxidant Activity, DPPH Radical, Bioactive Compounds, VLC Fractions.

TOTAL PHENOLIC CONTENTS AND ANTIOXIDANT ACTIVITIES OF *ANETHUM SPECIES* GROWING IN SETIF REGION (ALGERIA)

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Abstract

The excess level of reactive oxygen species (ROS) disturbs the oxidative balance leading to oxidative stress, which in turn, causes cancer and cardiovascular diseases. These effects of ROS and oxidative stress can be balanced by dietary antioxidants. In recent years, there has been an increasing trend in the use of herbal products for health care. In the present study, the phenolic contents and antioxidant activities of the aqueuous (AqE) and ethyl acetate extract (EAE) obtained from the seeds of *Anethum species*, collected in Setif region were compared. The phenolic contents of the extracts were determined using Folin-Ciocalteu method. Antioxidant activities of the extracts were determined by DPPH (1,1-diphenyl-2-picrylhydrazyl radical) assay to detect the free radical scavenging activity and by thiobarbituric acid (TBA) assay to detect their liposome lipid peroxidation. Total phenolic contents of AqE and EAE extracts were 50.62 ± 0.91 µg/mg and 26.19 ± 0.21 µg/mg in dry weight expressed as gallic acid equivalents (GAE). Both extracts showed a slightly antioxidant activities with the DPPH test. However, in the TBA test, activity of AqE extract was higher than that determined with the EAE extract. Our findings revealed that *Anethum species* tested could be used as a promising source of natural antioxidants.

Keywords : *Anethum Species*, Antioxidant Activities,Aqueuous Extract, Ethyl Acetate Extract, Dpph, Tba.

THE ANTIOXIDANT ACTIVITY OF A MEDICINAL PLANT FROM KHENCHELA REGION

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Abstract

The use of synthesis antioxidant molecules is being dangerous anyway, because of the potential toxicological risks. In fact, new source of natural antioxidant molecules are required. The phenolics, natural compounds largely present in the vegetable kingdom, are recognized for their antioxidant activity and still little exploited by different industry. This work aimed at investigating the phenolic composition, antioxidant activity of methanolic crude extract obtained from the leaves of a medicinal plant. To determine the antioxidant activity, the DPPH radical scavenging assay was performed. The results revealed that the extract had a total phenolic content of 146,83±0,87 µg of gallic acid equivalent per mg of extract (GAE/mg E) and a total flavonoids content of 104,52± 0,36 µg of quercetin equivalent per mg of extract (QE/mg E). Moreover, the extract had antioxidant activity with an IC50. These findings suggest that the extract may have potential as a natural antioxidant source and this justifies their uses in traditional medicine.

Keywords: Dpph, Flavonoïde, Polyphénol, Extract, Quercetin, Gallic Acid.

CHEMICAL SCREENING, H2O2 SCAVENGING AND TOTAL ANTOXIDANT CAPACITY OF *POLIANTHES TUBEROSA* L. EXTRACT

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Abstract

Polainthes tuberosa (Asparagaceae) is a medicinal and ornamental plant, known in the world by its therapeutic effect and its easy culture. The organic extract was obtained by liquid-solid maceration of its leaves powder using dichloromethan. the extraction step was completed by a preliminary phytochemical screening, which revealed the presence of polyphenols, flavonoïdes, tanins, terpenoides, quinones, saponines and cardiac glucosides, and the absence of both anthraquinones and mucilages. The antioxydant activity has been evaluated using the hydrogen peroxyde scavenging method, the inhibitrice concentration of the DCM extract was estimated to 2.563±0.195 mg/ml. The total antioxydant capacity method was also used where the effectif concentration was estimated to 0.197 ±0.005 mg/ml.

Keywords: *Polainthes Tuberosa* L, TAC, H_2O_2, DCM Extract Antioxydant Activity.

Extraction et évaluation de l'activité antioxydante de l'extrait éthanolique des fleurs de l'espèce *Moringa oleifera*

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Résumé

Moringa oleifera aussi appelé arbre de vie, appartenant à la famille des *Moringaceae*, d'origine d'Inde, cultivé dans de nombreux pays tropicaux d'Asie et d'Afrique. Cet arbre présent dans la région du sud algérien est très peu connu et très peu étudié. Il est largement utilisé dans la médecine traditionnelle et connue pour son énorme potentiel thérapeutique traitant plus de 300 maladies**.** Ce travail a donc comme objectif principal la valorisation de cette plante en évaluant l'activité antioxydante d'extrait obtenus après l'extraction avec l'éthanol. L'extrait obtenus par un rendement de 33.8%, été testé comme un agent antioxydant en différentes concentrations sur les microplaques, contre les radicaux DPPH et ABTS. Les résultats obtenus montrent une excellente activité antioxydante et un pouvoir réducteur élevé avec le DPPH et ABTS avec une (IC_{50}=7,21±0,60 et IC_{50}=5,87±0,02) mg/ml comparant avec les standards BHA, BHT et TROLOX. Ces résultats démontrent la richesse de cette espèce en composés bioactifs qui sont connus pour leur rôle anti-radicalaire.

Mots-clés : *Moringa Oleifera*, Extraction, Activité Antioxydante.

ETUDE COMPARATIVE DE L'ACTIVITE ANTIOXYDANTE D L'HUILE ESSENTIELLE DE *CINNAMOMUM ZEYLANICUM* (AVANT ET APRES SON ADSORPTION SUR UN MATERIAU NATUREL (ARGILE))

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Résumé

L'étude des huiles essentielles et de leurs composés bioactifs, a suscité un intérêt croissant auprès des secteurs pharmaceutiques et agroalimentaires. En effet l'utilisation de ces additifs naturels (très connus par leurs activités biologiques) a pour objectifs d'assurer la sécurité, de maintenir et/ou d'améliore les propriétés sensorielles des produits de consommation. Toutefois leur faible stabilité, leur grande sensibilité à l'oxydation, et leur forte volatilité, présentent de vrais obstacles pour leur développement industriel. Pour surmonter ces problèmes, notre travail consiste premièrement à l'extraction de l'huile essentielle de *Cinnamomum Zeylanicum* par entrainement à la vapeur d'eau. Après la caractérisation physico-chimique de l'huile et l'étude de son activité antioxydante vis-à-vis le radical libre DPPH°, notre étude s'est portée sur l'immobilisation (adsorption) de l'huile essentielle de *Cinnamomum Zeylanicum*, sur un matériau naturel (argile) dans le but d'une part de la protéger contre la dégradation physico-chimique (oxydation), induite par son exposition à l'oxygène, à la lumière, à l'humidité et la température, et d'autre part de contrôler sa libération dans un environnement approprié. Les résultats trouvés indiquent : Une capacité puissante de l'huile à neutraliser les radicaux libres DPPH° (IC_{50} = 1.4mg/ml). L'huile de *Cinnamomum Zylanicum*a a été adsorbée sur l'argile avec un rendement égale à 23% (adsorption compétitive avec l'éthanol) La cinétique de désorption de l'huile, montre sa libération facile dans le milieu réactionnel (t = 24 heures).

Mots-clés : Huile Essentielle, *Cinnamomum Zylanicum*a, Argile, Adsorption, Relargage, Activité Antioxydante.

STUDY OF THE RADICAL SCAVENGING PROPERTIES OF *SALVIA ROSMARINUS* ESSENTIAL OILS

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Abstract

Salvia rosmarinus is a spontaneous aromatic plant widely grown in Algeria, belonging to the Labiatae family (Lamiaceae) and commonly called 'Lazir' or 'Eklil' by the local population. It is still used in traditional medicine as an antispasmodic, as an ingredient in beauty products and as a preservative for food products. Its biological activities have been the subject of several studies, particularly on essential oils, due to their wide range of uses in various fields (food, phytotherapy, cosmetics, medicine, etc.). The aim of this study was to compare the antioxidant activity of spontaneous and cultivated Salvia rosmarinus essential oils, harvested from region of Laghouat and extracted using the Clevenger hydro-distillation method. The antioxidant activity was demonstrated by the DPPH test; vitamin E was used as a standard. The results showed that these essential oils have a similar power, less powerful than vitamin E. Moreover, for the EEV, we found a value of 0.061 mg/ml, and 0.057 mg/ml for spontaneous and cultivated Salvia rosmarinus respectively, which confirms that the two oils, S.R.S and C.R.S have the same antioxidant capacity.

Keywords: *Salvia Rosmarinus*, Antioxidant Activity, Essential Oil, DPPH Test, Vitamin E.

Topic C

Bioactive molecules and microbial infections.

ORAL COMMUNICATIONS

INNOVATIVE TECHNIQUES FOR ENHACED EXTRACTION OF ESSENTIAL OILS FROM MEDICINAL PLANTS

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Abstract

The extraction of essential oils from medicinal plants has seen advancements through innovative techniques, aiming to boost efficiency and uphold compound quality. Methods such as ultrasound extraction, microwave extraction, supercritical liquid extraction, and combined extraction with ultrasound waves have emerged, offering advantages over traditional methods like steam distillation and hydrodistillation. These modern techniques mitigate the risk of essential component loss, preserve compound quality, and potentially reduce reliance on costly organic solvents. Ultrasound extraction employs high-frequency sound waves to enhance the extraction process, while microwave extraction utilizes microwave energy for accelerated extraction rates. Supercritical liquid extraction employs supercritical conditions to extract desired compounds, and combined extraction with ultrasound waves merges ultrasound with another method for heightened efficiency. These innovative methods have demonstrated efficacy in yielding essential oils and plant extracts with high efficiency and improved quality. They find application across diverse industries such as medicine, food, cosmetics, and agriculture, where essential oils and plant extracts are valued for their functional properties and natural antimicrobial activity.

Keywords: Essential oils, Medicinal plants, Extraction techniques, Ultrasound extraction, Antimicrobial activity

ÉVALUATION DU POTENTIEL ANTI MICROBIEN DES EXTRAITS FOLIARES DU GATTILIER :VITEX AGNUS CASTUS L DE LA RÉGION DE TIMIMOUN

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Résumé

L'activité antimicrobienne de l'huile essentielle et des extraits aqueux et organique des feuilles de VITEX AGNUS CASTUS L., a été évaluée par la méthode de diffusion sur disque, celle-ci se traduit par l'apparition d'une zone d'inhibition autour du disque de papier préalablement imprégné de l'extrait. Les résultats sont exprimés par les diamètres (mm) des zones d'inhibitions (ZI) de la croissance microbienne Les résultats de l'activité antimicrobienne de l'huile essentielle foliaire de VITEX AGNUS CASTUS L. ont montré une forte à très forte activité inhibitrice sur la prolifération des bactéries Gram$^+$: *Bacillus subtilis* (ATCC 9372) et *Staphylococcus aureus* (ATCC 4537), dont les zones d'inhibition (ZI) respectives sont de 15,5 ± 0,57 mm et 26 ± 0 mm. Elle provoque aussi une très forte action antifongique (33 ± 0 mm) vis-à-vis de *Candida albicans* (ATCC 24433). Par ailleurs, les souches de référence Gram$^-$: *Escherichia coli* (ATCC 25922) et *Pseudomonas aeruginosa* (ATCC 27853) se montrent résistantes vis-à-vis de cette huile essentielle. Nous relevons que l'extrait aqueux des feuilles présente une forte activité antibactérienne (18 ± 0 mm) à l'encontre de la souche Gram$^+$: *Staphylococcus aureus*, celle-ci est sensible intermédiaire. Alors que les germes Gram$^-$: *Escherichia coli* et *Pseudomonas aeruginosa* et la souche fongique *Candida albicans* se montrent résistantes vis-à-vis de cet extrait. L'extrait organique provoque juste une activité antifongique modérée (13 ± 1,41 mm) vis-à-vis de *Candida albicans*. L'huile essentielle ainsi que les extraits polyphénoliques des feuilles, de par leur richesse en principes actifs naturels, exercent un effet antimicrobien sur les souches bactériennes Gram$^+$ et fongique testées, et pourraient constituer une source potentielle de nouveaux antibiotiques. Ceci justifie l'utilisation multiple de VITEX AGNUS CASTUS L. en médecine traditionnelle et dans la défense contre les agents pathogènes afin de pouvoir subsister aux contraintes imposées par le climat et le milieu en zones arides.

Mots clés : VITEX AGNUS CASTUS L., potentiel anti microbien, médicine traditionnelle, zones arides.

EVALUTION DE QUELQUES ACTIVITÈS BIOLOGIQUES D'ATRIPLEX HALIMUS L.

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Abstract

According to data provided by the World Health Organization, 80% of the world's population treats their health problems with traditional remedies.The African flora in general, and Algerian in particular, is full of important reserve of medicinal and aromatic plants. The Algerian flora numbers nearly 3000 species belonging to several botanical families of which 15% are endemic . As part of the discovery of new antioxidants, anti-inflammatories and antibacterials from natural sources, we have chosen a medicinal plant traditionally used in the treatment of diseases linked to oxidative stress, infections and inflammations, which is ATRIPLEX HALIMUS L. The present work aims to evaluate the antioxidant, anti-inflammatory and antibacterial activities of ATRIPLEX HALIMUS L. collected from Batna. Two techniques were used to assess the extract's antioxidant activity in vitro: the bleaching of β-carotene and the DPPH test. The anti-inflammatory activity was determined by protein denaturation method and the antibacterial test was carried out by the technique of diffusion of the discs on the agar where three bacterial strains studied "*Escherichia coli, Pseudomonas aeruginosa, and Staphylococcus aureus*". The extract revealed interesting anti-radical and anti-oxidant activities. It shows also an important inhibition of ovalbumin denaturation with an inhibition percentage of 95.79 ± 1.75% with the concentration (1 mg/ml).On the other hand, our extract shows a weak antibacterial activity against *S. aureus* The Extract possess a strong anti-inflammatory activity and an important antioxidant activity. It would be interesting to support this work throw the purification and identification of the different molecules.

Keywords : *Atriplex halimus* L, Antioxidant Activity, Antibacterial Activity, Anti-Inflammatory Activity, In Vitro.

MISE EN ÈVIDENCE ET CARACTÈRISATION DES SUBSTANCES BIOACTIVES , ANTIFONGIQUES À PARTIR DES BACTÈRIES SYMBIOTIQUES D'UNE LÈGUMINEUSE (*CICER ARIETINUM)*

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Résumé

Le *Fusarium*, agent de la fusariose vasculaire, est un champignon qui devient avec sa pathogénicité en vers beaucoup de culture, un problème économique de grande importante, puisque il a montré sa faible peu sensibilité aux antifongiques chimiques dont l'application contribue fortement a la pollution de l'environnement. L'objectif de ce travail rentre dans le cadre de chercher des molécules bioactifs antifongiques comme alternatives des molécules chimiques. Cette étude permet de mettre en évidence, évaluer et caractériser une activité antifongique chez les bactéries vivant en symbiose avec les plantes. Dans ce contexte, 16 bactéries nodulaires du pois chiche contre 5 champignons pathogènes de genre *Fusarium* sont utilisés. Le test de pathogénicité mis en évidence une activité inhibitrice très importante sur la germination du pois-chiche de deux souches fongiques (PC2 et F7), et 5 souches nodulaires R2, R9, M2, B3, B10 antagonistes vis-à-vis des 5 isolats fongiques. La confrontation entre bactéries et champignons a permis de classer les molécules antifongiques entre diffusibles (R2 et B3), protéique (R2, M2, B3, B10) et volatile (B3, R2, M2), constitutives (B3, R9, B10) et inductibles (R2, M2). La vérification de l'effet antifongique des bactéries sur le *Fusarium* le plus pathogène, est réalisée par incubation de chacune des bactéries avec chacun des champignons en présence des graines de pois chiche. Les résultats ont montré que les bactéries ont été efficaces pour réduire l'incidence des pathologies fongiques et améliorer la germination du pois chiche. Les résultats obtenus avec d'autres tests de caractérisation de la substance bactérienne antifongique permettent d'ouvrir une voie prometteuse pour la sélection et l'utilisation des bactéries symbiotiques des légumineuses comme outil de la lutte biologique contre le *Fusarium* dans la culture du pois chiche et d'autres légumineuses.

Mots clés: *Fusarium*, substance bioactive, antifongique, lutte biologique, *Cicer arietinum*.

POSTER COMMUNICATIONS

A COMPARATIVE STUDY OF THE ANTIMICROBIAL EFFECTS OF EXTRACTS FROM *THYMELAEA MICROPHYLLA*

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Abstract

Thymelaea Microphylla, called "METHNANE" is a medicinal plant belongs to the Thymelaeaceae family, it is widely distributed in Algeria, in the arid and desert zones. In the current study, the antimicrobial activity of ethyl acetate and methanol extracts from aerial parts of *T. microphylla* (collected from El-Ghicha, region of Laghouat) is performed by solid and liquid medium diffusion methods. All the extracts were obtained by two methods, using Soxhlet and by maceration. *The yields of the extracts were found to be 2.6% and 13.8% (m/m) for ethyl acetate, methanol extracts, respectively, using the Soxhlet method, 1.7% and 10.1% (m/m) for ethyl acetate, and methanol extracts, respectively, using the maceration method. The antimicrobial potential of the extracts was assessed for three bacterial strains (Y. enterocolitica, S. enteritidis and K. pneumoniae) and a yeast strain (C. albicans ATCC26790). Depending on the solid medium diffusion method, the results showed a* significant variation in the inhibition zone diameters, ranging from 0 to 10.33 mm for ethyl acetate extracts and from 6 to 11 mm for methanol extracts. *S. enteritidis was found to be resistant to ethyl acetate extracts obtained by the maceration method. C. albicans showed sensitivity and lower MIC values compared to bacterial strains (0.52 to 2.083 mg/ml), while an MBC was observed for ethyl acetate obtained by Soxhlet method against K. pneumoniae.*

Keywords: *Thymelaea microphylla*, antimicrobial activity, antibacterial activity, antifungal activity, MIC, MBC.

POLYPHENOL CONTENTS, ANTIOXIDANT AND ANTIMICROBIAL ACTIVITES OF PUNICA GRANATUM PEEL EXTRACTS

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Abstract

Since ancient times, POMEGRANTE PEEL (PUNICA GRANATUM) extract has been used for the treatment of common illnesses such as inflammation, diarrhea, and infertility. Recent research has highlighted other types of biological activities for POMEGRANTE PEEL, like; antioxidant, antimicrobial, anti-inflammatory,anticancer, antidiabetic and others. In this study pomegranate peel methanolic extract (PPME), was screened for: its polyphenol and flavonoid contents, and for its antioxidant, antibacterial and antifungal activities. Antioxidant activity was investigated using ferrozine and nitric oxide methods. Concerning antimicrobial activity, Antibacterial test was screened by using disc diffusion method and antifungal test by well diffusion method. PPME was tested against a panel of bacterial and fungal strains. In results, PPME was rich in polyphenol and flavonoids, it was very active in iron chelation (EC 50 = 0,614 mg/ml) and in nitric oxide test. PPME has inhibited growth of bacteria with inhibition diameters between 9 and 26 mm. It was very active Gram-positive bacteria. However, in antifungal test PPME was less active. PUNICA GRANATUM PEEL is considered a very rich source of antioxidant and antimicrobial molecules that can be purified and used in treatment of infections, inflammation and different diseases.

Mots clés: *Punica granatum*; pomegranate peel, methanolic extract; antioxidant activity; antibacterial activity; antifungal activity.

ETUDE DE L 'ACTIVITÈ ANTIBACTÈRIENNE (IN VITRO) DE L'HUILE ESSENTIELLE DE THYMUS ALGERIENSIS BOISS & REUT

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Résumé

L'objectif de notre étude entre dans la valorisation des plantes répandu dans notre payé en évaluant l'activité antibactérienne de l'huile essentielle obtenu par hydrodistillation des parties aériennes d'une plante aromatique *Thymus algeriensis* Boiss. & Reut. récoltés au niveau de la région de El Kantra en mois d'Avril. Cette activité a été mise en évidence par la méthode de diffusion des disques sur gélose (arommatogramme) vis-à-vis 4 bactéries pathogènes clinique (*Staphylococcus aureus*, *Acinetobacter baumannii*, *Enterobacter cloacae* et *Pseudomonas aeruginosa*) et 3 souches de références (*Pseudomonas aeruginosa* ATCC 1117, *Escherichia coli* ATCC 25922 et *Staphylococcus aureus* ATCC 25923). Une détermination de la concentration minimale inhibitrice (CMI) a été effectué par micro-dilution de l'huile essentielle sur des plaques de 96 puits ainsi que la détermination de la concentration minimale bactéricide (CMB) de l'huile essentielle qui a été réalisée en faisant un repiquage des zones d'inhibition formées par les CMI et ne présentant aucune croissance bactérienne. L'extraction de l'huile par hydrodistillation à fourni un rendement de 0.5 %, les résultats de l'aromatogramme ont montré que l'huile essentielle de *Thymus algeriensis* possède une activité antibactérienne importante sur la plupart des souches testées (*Staphylococcus aureus*, *Acinetobacter baumannii*, *Enterobacter cloacae*, *E. coli* ATCC 25922 et *Staphylococcus aureus* ATCC 25923) avec des valeurs de diamètre d'inhibition allant de 9.10 à 22.97 (mm), alors qu'il ne présente aucune activité inhibitrice sur les souches de *Pseudomonas aeruginosa*. Les valeurs de la CMI des souches bactériennes sensible à l'huile essentielle étaient comprises entre 12,5 mg/ml et 25 mg/ml. D'après nos résultats, on peut dire que l'huile essentielle de notre plante à un bon pouvoir antibactérien sur les souches bactériennes testées, et on peut l'exploiter ultérieurement après des études complémentaires comme une alternative aux substances chimiques contenant dans les médicaments qui présente des risques sur la santé humaine.

Mots clés : *Thymus algeriensis*, l'huile essentielle, activité antibactérienne, hydrodistillation, CMI, CMB.

ACTIVITÈS ANTIMICROBIENNES DES EXTRAITS ORGANIQUES ET AQUEUX DE ANABASIS OROPEDIORUM MAIRE.

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Résumé

Les antibiotiques sont devenus de plus en plus inefficaces face à la résistance microbienne, notamment dans les hôpitaux. Il est intéressant de noter ces dernières décennies, qu'il existe une forte demande en matière de bioprospection des métabolites secondaires, en particulier pour le traitement des maladies cliniques résistantes aux médicaments. Ce travail se concentre sur l'une des plantes des régions aride à svoir : ANABASIS OROPEDIORUM MAIRE *(Chenopodiaceae)* dite Ajram en médecine traditionnelle, son habitat naturel est constitué des zones sableuses et calcaires des pays d'Afrique du Nord et de la Palestine. Ce travail est le premier à mettre la lumière sur le caractère thérapeutique des alcaloïdes des parties aériennes de la plante Ajram récoltée dans la province de Laghouat. Des extraits aqueux et organiques des parties fleurs et tiges ont été préparés à l'aide du Soxhlet et la macération par ultrason. Le rendement le plus élevé a été donné par l'extraction aqueuse avec 13,3% pour les tiges et le plus faible a été enregistré pour les extraits organiques dichlorométhane des tiges et des fleurs avec 0,06%. L'activité antimicrobienne a été estimée sur quatre souches microbiennes : *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa* et *Candida albicans*. Grâce à la méthode de diffusion sur disque (mesure du diamètre d'inhibition), les résultats obtenus ont montré des zones d'inhibition intéressantes. Les souches d'*Escherichia coli* (le diamètre d'inhibition =9mm), *Staphylococcus aures* (9mm) et *Candida albicans* (10mm) ont montré une sensiblilité à l'extrait dichlorométhane spécifique de la fleur, tandis que les souches de *Pseudomonas aeruginosa* (10mm) et de *Staphylococcus aures* (9mm) sont sensibles à l'extrait hexanique spécifique de la tige. Les souches ont également montré une résistance aux extraits aqueux.

Mots clés: *Anabasis oropediorum* Maire, extraits organiques, extraits aqueux, activité antimicrobienne, diamètre d'inhibition.

DETERMINATION OF THE ANTIMICROBIAL ACTIVITY OF VLC FRACTIONS OF *GENISTA. SP* ROOTS

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Abstract

The genus *Genista* is one of the most important genera in the Fabaceae family, which includes about 11 endemic species in Algeria. The cosmopolitan distribution of this genus has attracted the human interest since ancient times, as it is used in folk medicine and mainly in the Mediterranean area. Therefore, the present study focuses on the antimicrobial activity aiming to highlight the recent advances in current knowledge on the roots of GENISTA. SP as a new source of bioactive compounds. The crude extract of this plant's roots was obtained by maceration in a hydroethanolic mixture, and after evaporation, fractionation of extracts was accomplished through VLC (vacuum liquid chromatography). 5 VLC fractions were evaluated using Disc diffusion assay to show the antimicrobial effect using GRAM positive and GRAM negative strains of bacteria *Staphylococcus aureus* ATCC 25923, *Escherichia coli* ATCC 25922 and 1 fungus *Fusarium oxysporum*. The extract inhibited the growth of all tested microorganisms with different inhibition percentage. We can conclude that the root of this Algerian endemic plant has an antimicrobial compounds.

Key words: *Genista*, Fabaceae, endemic, antimicrobial, disc diffusion, inhibition.

ANTIBACTERIAL AND ANTIFUNGAL PROPERTIES OF PYRROLO-IMIDIDZOLE DERIVATIVES

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Abstract

Here we describe pyrrolo-imidazole derivatives with antibacterial and antifungal activity. A novel series of pyrrolo-imidazole derivatives, labeled as compounds a-c, was synthesized using multicomponent reactions. All the compounds presented here were obtained with high yields and under easy experimental conditions. Synthesized compounds were characterized by IR, ^{1}H NMR and ^{13}C NMR. Synthesized compounds were screened against E.coli and K. pneumonia for antibacterial activity, as well as against C. albicans for antifungal activity. We were able to obtain compounds with moderate to good results compared to the reference compounds (Gentamitcin and Nystatin).

Keyword: Multicomponent reaction, Antibacterial activity, Antifungal.

STUDY OF THE PHYSICOCHIMICAL PROPERTIES AND ANTIMICROBIAL ACTIVITY OF A HONEY FROM THE ANNABA REGION

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Abstract

Honey is a natural substance produced by honey bees, and it originates from floral nectar and some plants exudates. Honey composition and quality characteristics are variable and are mainly affected by different factors such as soil composition, nectar source, climatic conditions, beekeeping practices, processing type, and storage conditions. Floral origin is quite influential on the physicochemical properties of honey such as electrical conductivity, color, moisture, pH, mineral content, and acidity level, against *Pseudomonas aeruginosa, Klebsiella pneumonia, Escherichia coli ATCC 25922, Staphylococcus aureus* was determined in vitro. The antibacterial activity of honey was investigated at its variable concentrations (25, 50, 75 and 100 %). The highest antimicrobial action was seen against *K. pneumonia* at 100 % concentration of the honey while showing zone of inhibition of 36,66 ± 4.16 mm, *S. aureus* 35.00±1.00, *E. coli ATCC 25922* 34.64 ± 2.52. However, the lowest antibacterial action was observed against *Pseudomonas aeruginosa* 33,00± 1.73. The overall order of growth inhibition by the honey at its 100 % concentration for the implicated bacterial species appeared as: *K. pneumonia* > *S. aureus* > *E. coli* >*P. aeruginosa*. Honey shows antibacterial action at concentration (25, 50, 75 %). The moisture and ash content varied from 17,80 % and 0.23, respectively. The reducing sugar content of this honey sample was highest with 81,95 %, the results of the electrical conductivity and the free acid content analysis varied from of 0.30 mS/cm and 27.00 meq/Kg respectively. The result of pH analysis produces the following value 3,70. The antibacterial activity depends on the species of bee, the metabolism and the floral sources in specific geographical regions.

Keywords: Honey, Antimicrobial activity, Microbial, pathogens, physicochemical, properties, Algeria.

SYNTHÈSE ET EVALUATION BIOLOGIQUE DE NOUVEAUX DÉRIVÉS DES PYRIMIDINES ANALOGIQUES À LA CURCUMINE

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Résumé

Avec l'augmentation entre autres des maladies inflammatoires chroniques, des cancers, et la maladie d'Alzheimer…; les chercheurs s'intéresse à la synthèse de nouveaux produits ayant des propriétés biologiques diverses, selon cette thématiques Nous avons mis au point la synthèse de nouveaux dérivés des pyrimidine analogues à la curcumine, en mettant en jeu des réactions de condensation et de cyclisation de la curcumine dans des conditions de catalyse acide et basique avec les agents nucléophile tels que l'urée, thiourée, et le pyrole. La détermination structurale des hétérocycles synthétisés a été faite par les méthodes spectroscopiques telles que RMN-1H et RMN-13C et la spectroscopie de masse, I'IR effectué confirme les différentes bandes caractéristiques, Une étude antibactérienne a été réalisée sur nos produits vis-à-vis de quelques bactéries. Il ressort de cette étude des activités très intéressantes.

Mots clés : Pyrimidine, Curcumine, Agents nucléophile, Méthodes Spectroscopiques, Antibactérienne.

CHARACTERIZATION OF SILVER CARBONATE NANOPARTICLES BIOSYNTHEIZED USING MARINE ACTIONOBACTERIA AND EXPLORING OF THEIR ANTIMICROBIAL AND ANTIBIOFILM ACTIVETY

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Abstract

Bacterial resistance to different antimicrobial agents is growing with alarming speed, especially when bacterial cells are living in biofilm. Hybrid nanoparticles, synthesized through the green method, hold promise as a potential solution to this challenge. In this study, 66 actinomycete strains were isolated from three distinct marine sources: marine sediment, the algae *Codium bursa*, and the marine sponge *Chondrosia reniformis*. From the entirety of the isolated strains, one strain, S26, identified as *Saccharopolyspora erythrea*, was selected based on its taxonomic position and significant antimicrobial activity. Using the biomass of the selected marine *Actinobacteria*, the green synthesis of eco-friendly silver carbonate nanoparticles (BioAg2CO3NPs) is reported for the first time in this pioneering study. The BioAg2CO3NPs were characterized using different spectroscopic and microscopic analyses; the synthesized BioAg2CO3NPs primarily exhibit a triangular shape, with an approximate size of 100 nm. Biological activity evaluation indicated that the BioAg2CO3NPs exhibited good antimicrobial activity against all tested microorganisms and were able to remove 58% of the biofilm formed by the *Klebsiella pneumoniae* kp6 strain.

Keywords: isolation; marine *Actinobacteria; Saccharopolyspora erythrea*; silver carbonate nanoparticles; antimicrobial; antibiofilm

INVESTIGATION OF THE INHIBITORY EFFECT OF NARINGENIN AGAINST THE KLEBSIELLA PNEUMONIA CARBAPENEMASE NDM IN VITRO AND IN SILICO

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Abstract

Carbapenems are bactericidal antibiotics often used as a last treatment option for severe infections caused by isolates producing by ESβLs producers[1]. However, extensive use of these molecules has facilitated the emergence of carbapenem resistant bacteria and hence the production of carbapenemases[2]. *NDM*-1 (New Delhi metallo-beta-lactamase-1) is one of the most recently reported metallo-enzymes[3]. This study will provide novel *carbapenemase* selective *inhibitor*, naringenin, towards NDM-1 extracted from *K.pneumonia*. PCR analysis showed that 21 isolates harboured bla_{NDM}. This investigation confirms the widespread distribution of carbapenemases in both community and hospital in Algeria. This is alarming as it represents a significant health issue. Therefore, there is a pressing need for new and promising inhibitors. An enzyme assay was performed to determine its IC_{50} using nitrocefin as a substrate at 25 µM. The IC_{50} values, determined by linear computerized regression analysis after logit/log transformation, is 91.53±0.86 µM. results reflect a good inhibitory effect, which caused by sterically hindered. To investigate the mechanism of interaction between NDM and Naringenin, docking and ADMET analysis were conducted using Autodock v1.5.6. and SwissADME softwares, respectively[4,5]. Naringenin exhibited a good potential inhibition against NDM active site. Its binding energy is -7.84 kcal/mol. Furthermore, it showed three effective H-bonds Tyr126 and Arg 204. According to the Lipinski's, Ghose's, Veber's, Egan's and Muegge's rules naringenin was found to be fully compatible with these rules, which indicated that it is able to be administered orally. In addition, this compound meets the ADMET modules. However, Naringenin exhibited negative results on Ames mutagenesis and therefore cannot be considered as a mutagenic agent. furthermore, no toxicity was shown with the human ether-a-go-gorelated gene (hERG I) inhibitor, and no hepatotoxicity and skin sensitization, which allows it to be good safety drugs. However, *in vivo* tests are essential to validate Naringenin as carbapenemase inhibitor.

Keywords: ADMET, Carbapenemase, Docking, Naringenin, *NDM*.

IN SILICO INVESTIGATION OF HORSE CHESTNUT TREE B-AESCIN TARGETING FIVE OF SARS-CoV-2 VARIANTS

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Abstract

The emergence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) variants, including Alpha, Beta, Gamma, Delta, and the recent Omicron variant, has posed significant challenges to global health. In response to this evolving threat, this study explores the antiviral potential of B-aescin, a natural biomolecule, against these variants. B-aescin, derived from horse chestnut seeds, has demonstrated promising antiviral properties in previous studies against related coronaviruses, prompting further investigation into its efficacy against the diverse spectrum of COVID-19 variants. Through comprehensive computational analysis, utilizing techniques such as molecular docking and molecular dynamics simulations, we investigate the interaction between B-aescin and key viral target the S protein specific to each variant, which play crucial role host cell entry. Our analysis considers various factors, including binding affinity, interaction dynamics, and structural compatibility within the active sites of the target proteins. Our findings reveal promising inhibitory effects of B-aescin against the investigated variants, with distinct binding patterns and affinity profiles observed for each variant-specific target. Notably, B-aescin demonstrates a higher affinity towards certain variants, suggesting differential susceptibility to this natural compound among the variant strains. These results provide valuable insights into the molecular mechanisms underlying the antiviral activity of B-aescin and its potential as a therapeutic agent against COVID-19 variants.

Keywords: SARS-CoV-2, COVID-19, Variants, Spike Glycoprotein, Antiviral, Biomolecules, B-aescin, Molecular dynamics.

ANTI-MICROBIAL PROPERTIES OF *PISTACIA LENTISCUS* L. FRUIT EXTRACT.

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Abstract

Description of the subject: *Escherichia coli*, *Salmonella*, and other bacteria pose significant risks of foodborne illnesses, even with the application of synthetic preservatives to combat food spoilage. However, concerns remain due to the potential for cumulative toxicity from these preservatives and the growing problems of bacterial resistance. Consequently, research community and industry are actively investigating natural alternatives that show promise in addressing these challenges. *P. LENTISCUS* L. (Anacardiaceae), an evergreen shrub native to the Mediterranean region, is well recognized in traditional medicine due to its well-documented richness in health-promoting phytochemicals including flavonoids, flavonols, tannins, anthocyanins, proanthocyanidins, saponins, essential and fixed oils and various other phytochemicals. Objective: Objective: This study aimed to assess the bacteriostatic activity of an ethanolic extract obtained from *Pistacia lentiscus* fruit (PLF) against a range of bacterial strains, including *Acinetobacter baumannii, Bacillus subtilis, Enterococcus faecalis, Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa, Pseudomonas spp., Salmonella spp., and Staphylococcus aureus*. Additionally, the study sought to elucidate the phenolic composition of the extract. Methods: Diffusion of the discs on agar medium was used to evaluate the anti-microbial activity of extract, in addition, the physicochemical properties and HPLC analysis were carried out. Further, an erythrocyte model was used to analyze the toxicity of the extract. Results and discussion: The obtained results revealed that the ethanolic extract of (PLF) has a considerable content of polyphenols and flavonoids (422,16±8,25 µg GAE/ mg extract; 9,550,25µg QE/mg extract) respectively. In addition, the results of the antibacterial tests show that ethanolic extract of (PLF) significantly inhibited the growth of all strains by causing inhibition zones of 10 to 18 mm diameter. Besides, no toxicity of the extract was recorded. Conclusion: This study provides the application of extracts from *Pistacia lentiscus* fruit as potential substitutes for synthetic antimicrobials in the food industry.

Keywords: anti-microbial activity, *Pistacia lentiscus* L. fruit, *Escherichia Coli.*

ISOLATION, ENUMERATION, AND CHARACTERIZATION OF TRADITIONALLY FERMENTED OLIVE MICROORGANISMS

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Abstract

Table OLIVES are obtained from the fruit *Olea europea L*, directly immersed in brine, and undergo traditional fermentation due to the microbial metabolism mainly of bacteria and yeasts. However, traditional practices do not take hygiene measures into account. The aim of this study is to control the Algerian fermented green olives contamination and to identify the flora involved in the fermentation. Three traditionally fermented green OLIVE samples was collected from eastern Algerian cities (Skikda, Bordj Bou Arreridj and Mila), the enumeration of alteration germs was performed by serial dilution on Plate Count Agar medium (PCA) for total aerobic mesophilic flora and Mac Conkey (MC) medium for coliform. The isolation and identification of fermentation flora were made on Oxytetracycline-Glucose (OGA), Man Rogosa Sharpe (MRS) and M17 mediums. The enumeration of altered germs shows unsatisfactory quality for total aerobic mesophilic flora (185*10 4 UFC/ml) that may be due to contamination during the preparation stages. However, total coliform (absence) quality was satisfactory. A small number of yeasts (three) were obtained, which shows that the fermentation is largely due to lactic bacteria. Identification of isolated fermentative strains shows that the yeasts belong to the genus *Geotricum*. Among the ten purified strains of lactic bacteria, four are related to the genus *Lactobacillu*s, four to *Pediococcus*, and two to *Lactococcus*. This work can be further extended to establish a more advanced biochemical and molecular identification of isolates and a demonstration of their production characteristics as bioactive substances.

Keywords: Fermented green OLIVES, traditional processes, contamination, lactic acid bacteria, yeasts.

DEVELOPING OF A NOVEL ANTIBACTERIAL POLYMER:POLYGLYCIDYL METHACRYLATE GRAFTING ONTO POLYVINYL CHLORIDE AND MODIFIED BY AgNPs

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Abstract

In the quest to combat bacterial infections while simultaneously enhancing material properties, a novel antibacterial polymer has been developed through an innovative approach. This study is dedicated to the synthesis and characterization of this antibacterial polymer, achieved by grafting polyglycidyl methacrylate (PGMA) onto polyvinyl chloride (PVC) and subsequently modifying it with silver nanoparticles (AgNPs). The synthesis process involves the grafting of PGMA onto PVC, followed by the opening of the epoxide cycle of the resulting PGMA-g-PVC copolymer using iodomethane, leading to the creation of a new polymer with thiol functionalities at the chain ends. The remarkable affinity between the sulfur film and the AgNPs facilitates their successful grafting onto the copolymer. The resulting polymer exhibits exceptional antibacterial activity against a wide spectrum of pathogens, thereby showcasing its potential for diverse biomedical and industrial applications.

Keywords: antibacterial polymer, polyglycidyl methacrylate, polyvinyl chloride, silvernanoparticles.

EXTRACTION OF MYRISTICA FRAGRANS ESSENTIAL OIL AND SCREENING OF ITS ANTIOXIDANT AND ANTIMICROBIAL ACTIVITY AGAINST SIX FOOD-RELATED MICROORGANISMS

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Abstract

Owing to their wide range of biological activity, essential oils (EOs) are heavily used in the food, medicinal, cosmetic, and agricultural sectors [1]. These latter happens as a result of their composition's volatile, bioactive secondary metabolites. Due to the rising demand for these EOs in the current market, it is predicted that the market would grow to $16.0 billion in US dollars by 2026 [2]. Among the wide number of plant EOs we cite MYRISTICA FRAGRANS belonging to the *Myristicaceae* family. Traditional medicine made extensive use of this medicinal plant to treat a variety of diseases, including cholera, rheumatism, anxiety, diarrhea, and parasites [3, 4]. In the current study, MYRISTICA FRAGRANS EO was extracted using a Clevenger Type apparatus and its organoleptic and physico-chemical properties was ascertained. Following that, six food-related bacteria, including *Bacillus subtilis*, *Listeria monocytogenes*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Candida albicans* were used to test the antimicrobial efficiency of this EO. In addition, The DPPH scavenging method was also used to examine its antioxidant properties. The results of the antimicrobial test showed that this EO had a noteworthy inhibitory effect against the strains that were tested, with MIC values ranging from 1.1 to 4.4 mg/ml. With an IC 50 of 0.54 mg/ml, it was discovered that this EO demonstrated a strong antiradical effect in relation to the antioxidant activity data. The food sector may find great use for these findings in managing undesirable food-borne diseases.

Keywords: Essential oils, Antimicrobial activity, Antioxidant activity, *Myristica fragrans*, foodborne pathogens

PHENOLIC COMPOSITION, ANTIMICROBIAL ACTIVITY OF M. ALYSSON

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Abstract

This work aims at evaluating the antimicrobial activity of M.alysson extracts (aqueous and BuOH) on 05 strains of bacteria and 02 fungal strains by agar diffusion method. The quantification of total polyphenols using the Folin-Ciocalteu method and of the flavonoids revealed the richness of the M .alysson in polyphenols (106,29±0,69 mg EAG/g of BuOH). The analysis by LC/MS revealed the presence of phenylethanoids in the extracts of M.alysson . The results revealed that the extracts are showed antibacterial activity against the whole tested Bacterial strains and the BuOH has been the most active extract and it has revealed an interesting antibacterial activity against the most strain. Only inhibition of Klebseila pneumonia strain have shown very significatif correlation between polyphenolic content of aqueus extract and antibacterial activity. The results of the antifungal activity showed the inefficiency of all the extracts against the fungal strains.

Keywords: M. alysson, antimicrobial activity polyphenols, LC/MS

CHEMICAL COMPOSITION AND IN VITRO ANTIMICROBIAL ACTIVITY OF SYZYGIUM AROMATICUM ESSENTIAL OIL

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Abstract

Objective: The aim of this study was to evaluate chemical composition and antibacterial activity of essential oil extracted from cloves (HECG) grown in the Ghardaïa region of southern Algeria, against various reference microorganisms. Methodology: HECG was extracted using the conventional hydrodistillation method. The identification of the chemical compounds was performed by gas chromatography coupled with mass spectrometry (GC/MS). Antibacterial activity was evaluated against four micro-organisms, including gram-positive bacteria (*Staphylococcus aureus*, *Bacillus subtilis*) and gram-negative bacteria (*Escherichia coli*, *Pseudomonas aeruginosa*), using the aromatogram method as well as the determination of Minimum Inhibitory Concentration (MIC), Minimum Bactericidal Concentration (MBC) by the agar dilution method. Results and Discussion: The yield of essential oil extraction was 6 %. Through chromatographic analysis, 99.56% of its constituents were identified, with eugenol emerging as the predominant component at 92.94%, followed by eugenol acetate at 5.03%, and caryophyllene at 0.88%. The results revealed strong antimicrobial activity, characterized by zones of inhibition varying between 12 and 25 mm for bacterial strains. MIC values against bacterial strains ranged from 0.06% to 1%. CMB values ranged from 0.06% to over 2%. Conclusion: This study highlights the therapeutic action of HECG, which could be used as an antibacterial in various formulations, notably as a highly effective preservative and antiseptic.

Key words: Essential oil; Antibacterial activity; Clove, Extraction; Bacterial strain.

ANTIBACTERIAL ACTIVITY OF TETRACLINIS ARTICULATA ESSENTIAL OIL AND ITS NANOEMULSION

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Abstract

Essential oils are naturally derived aroma compounds, with wide-spectrum biological activities [1]. However, Essential oils have been described as strong natural antimicrobial agents [2]. The crescent interest in the use of essential oils as natural antimicrobials and preservatives in different fields has been driven in the last years by the growing consumers' demand for natural products with improved microbial safety [1]. Nevertheless, the strong reactivity and hydrophobicity of essential oils provide a significant obstacle to their direct integration into multiple preparation. Nanotechnology is a tool used to improve the Essential oils properties, which can be incorporated as nano-sized delivery systems in order to overcome their limitations [3]. *TETRACLINIS ARTICULATA* (*CUPRESSACEAE*), locally called "Al araar" is an endemic, medicinal and aromatic species of northwestern Africa (Morocco, Algeria and Tunisia) [4]. Various parts of this tree are used in folk medicine for its multiple therapeutic effects, it is mainly used against childhood respiratory, intestinal infections, gastric pains, diabetes and hypertension [5]. Many studies have been reported that the essential oil of *TETRACLINIS ARTICULATA* has a high antibacterial potential [6]. The main object of this study is to determine the antibacterial activity of the essential oil of Algerian *TETRACLINIS ARTICULATA* extracted from its dried leaves, and its nanoemulsion. The essential oil obtained shown high antibacterial activity against the majority of the strains tested with CMI equal to 2 µg/mL. The prepared formulation was transparent with tiny droplets about 23,9 nm diameter of the smallest ones, and had good stability under normal storage conditions.

Keywords: Essential oil, *Tetraclinis articulata*, nanoemulsion, Antibacterial activity.

EVALUATON OF THE ANTIMICROBIAL ACTIVITY OF EXTRACTS FROM APLANT OF THE LAMIACEAE FAMILY

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Abstract

Continuing our laboratory's research on medicinal plants, we initiated an experimental study of a plant native to the Jijel region, belonging to the Fabaceae family. This widely distributed family worldwide comprises approximately 240 genera, encompassing over 7000 species. Chemical investigations carried out on plants belonging to this family have uncovered the existence of secondary metabolites with biological significance, including saponins, triterpenes, and flavonoids. These secondary metabolites find applications in the pharmaceutical industry, serving both as natural sweeteners and pharmaceutical agents, owing to their hepatoprotective, antibiotic, UV-protective, anti-antigenic, anti-inflammatory, antidotal, anti-ophthalmic, antiallergic, and antitumor properties. The biological part reports the antimicrobial activity of ethyl acetate extract against three fungal strains (Candida albicans, Aspergillus niger, and Penicillium digitatum) and eleven bacterial strains, three Gram-positive and eight Gram-negative. The results showed an important antimicrobial activity with the tested ethyl acetate extracts and essential oils. However, it's worth noting that there were certain bacterial dynasties with which there was no observed antimicrobial activity.

Keyword: Fabaceae, secondary metabolites, antibacterial and antifungal activity.

EXAMEN DE L'EFFET COMBINE DES DIFFERENTES VARIETES DE MIEL D'ALGERIE SUR LES PROPRIETES ANTIMICROBIENNES

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Résumé

Avec l'augmentation de la prévalence des bactéries résistantes aux antibiotiques, les produits naturels sont de plus en plus appréciés pour leur activité antibactérienne. En raison de sa puissante activité in vitro contre les bactéries résistantes aux antibiotiques et des résultats prometteurs obtenus lors de l'application du miel sur des plaies, de nombreux chercheurs ont cherché à caractériser plusieurs propriétés antibactériennes du miel. 10 échantillons de la combinaison de miel naturel algérienne ont été testés pour leurs effets antimicrobiens aux faibles concentrations sur trois souches bactériennes sont *Staphylococcus aureus ATCC 25923* ; *pseudomonas aeruginosa ATCC 27853* ; *escherichia coli ATCC 25922*. La sensibilité des souches aux différents antibiotiques a été testé par la méthode de l'antibiogramme par diffusion sur gélose Mueller Hinton (MH), Les disques d'antibiotiques Utilisés sont : Gentamicine (CN) 500 µg et Imipénème (IPM) 10 µg. Les résultats montrent que les mélanges de miel donnent des valeurs des zones d'inhibition très élevées par rapport au miel unique contre les souches étudiées. Avec des diamètres [15 ; 32] mm pour *S-aureus*, [14 ; 20] mm pour *pseu-aeruginosa* et [12 ; 15] mm pour *E-coli*. D'autre part, les diamètres d'inhibition des antibiotiques testés contre ces souches sont très comparables à ceux de notre échantillon de miles.

Mot clé : Le Miel, Activité Antibactériennes, Souche Bactéries, Zone D'inhibition.

ÉVALUTION DE LA RÉSISTANCE AUX ANTIBIOTIQUES CHEZ LES ENTÉROBACTÉRIES ISOLÉES DES CAFARDS HOSPITALIERS

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Résumé

Les Cafards sont des ravageurs indésirables, qui vivent souvent auprès de l'homme, et leur existence dans les hôpitaux pose un problème majeur de santé publique, car ils peuvent participer dans la propagation des bactéries pathogènes. Augmentant ainsi le risque des infections nosocomiales .Parmi ces bactéries, on trouve les entérobactéries .Le but de cette étude est l'isolement des entérobactéries de la surface externe et de l'intérieur des Cafards, et de déterminer leur niveau de résistance aux antibiotiques. Quarante cafards ont été collectés à partir de deux hôpitaux de la wilaya de Biskra, pendant dix jours. L'isolement et la purification des bactéries a été réalisé sur des milieux sélectifs : Hektoen, MacConkey et Chromagar et l'identification a été faite selon les méthodes usuelle de microbiologie. Les profils de résistance aux antibiotiques des isolats ont été déterminés par l'antibiogramme selon EUCAST 2022. Au total, 35 BGN ont été isolées à partir des 40 cafards, dont 15 souches **(43%)** étaient des **entérobactéries**. **46% des souches sont identifiées comme *Klebsiella* sp. et *Serratia* sp., suivies de *Enterobacter* sp. (40 %), et *E. coli* et *Proteus* sp. à 7 %.** D'après l'antibiogramme, les isolats de la surface externe des cafards ont montré le taux de résistance le plus élevé (91,6%) pour les antibiotiques Amoxicilline, Ceftazidime et Gentamicine, tandis que pour les isolats de l'intérieur des cafards, le taux de résistance le plus élevé était de 33,33% vis-à-vis la Ceftazidime. Un taux de résistance de 8,33% vis-à-vis l'Ertapénéme a été révélé, cette résistance reste importante à signaler. Tous les isolats, restent sensibles vis-à-vis Imipénème. A la fin on conclue que les Cafards peuvent être des vecteurs mécaniques et biologiques d'entérobactéries multirésistantes dans les hôpitaux, ce qui menace la santé publique. Cela souligne la nécessité de trouver des solutions pour la lutte contre ces ravageurs.

Mots clés : Cafards, Infections nosocomiales, Multi résistant, Entérobactérie, Antibiotique.

ANTIBACTERIAL AND ANTIFUNGAL ACTIVITY EVALUTION OF NOVEL SUBSTITUTED IMIDAZO –PYRIMIDINE AND IMIDAZO-PURINE DERIVATIVES

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Abstract

Imidazo-pyrimidines and imidazo-purines are a noteworthy class of N-heterocyclic compoundsthat have gained considerable attention due to their crucial biological properties The chemical structures of the newly synthesized compounds were confirmed by infrared spectroscopy (FT-IR),mass spectral analysis, proton (1H) and carbon (13C) nuclear magnetic resonance (NMR). The synthesized compounds were evaluated for their in vitro antimicrobial activity against representative strains of Gram-negative bacteria (Escherichia coli ATCC 25922 and Pseudomonas aeruginosa ATCC 27853, Gram-positive bacteria (Staphylococcus aureus ATCC 25932), and Candida albicans ATCC 14053 fungus strain using well-diffusion method. Gentamicin and nystatin were used as a positive control for the antibacterial and antifungal assays, respectively.

Keywords: Imidazo-pyrimidines; imidazo-purines; Nitrogen heterocycles; antibacterial; antifungal activity**.**

Topic D

Pharmacological interests of medicinal plants.

ORAL COMMUNICATIONS

ANTIDIABETIC ACTIVITY OF FLAVONOID-RICH FRACTIONS OF *SALVIA ROSMARINUS* SPENN. (*ROSMARINUS OFFICINALIS* L.) IN NORMAL AND DIABETIC MICE

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Abstract

The aim of the present study was to evaluate the action of flavonoid-rich fractions of *Salvia Rosmarinus* Spenn. namely n-butanol fraction (BUT) and diethyl ether fraction (DE), on chronic and post-prandial hyperglycemia. The antidiabetic action of tested fractions was studied both *in vitro* and *in vivo*. The *in vitro* study was conduct through the inhibitory tests on α-glucosidase of *Saccharomyces cerevisiae*. The *In vivo* study was carried out on both normal and diabetic mice. Two different tests were carried out: post-prandial and chronic hyperglycemia test. The action of tested fractions on post-prandial hyperglycemia were carried out by sucrose and maltose inhibition tests on normal mice. However, the antidiabetic effect of same fractions on chronic hyperglycemia were tested on diabetic mice during 20 days. Both tested fractions at 400 mg/kg showed a significant action on chronic hyperglycemia, especially the DE fraction, where plasma glucose levels decreased significantly ($p < 0.001$) from 5th day of treatment, reaching 60.38% as maximum glucose level reduction. The BUT fraction reduced also significantly ($p < 0.05$) the plasma glucose level, with 51.93% as maximum glucose level reduction. Similarly, BUT fraction at 400 mg/kg decreased significantly ($p < 0.01$) the total cholesterol level with 51.85% and LDL-cholesterol with 45.13% ($p < 0.05$). Concerning post-prandial test, both fractions (BUT and DE) presented a potent inhibitory effect on α-glucosidase *in vitro*. The maximum inhibitory action showed by DE and BUT fractions was, 77% and 72% at 250 µg/ml, respectively. *In vivo* test, BUT fraction showed an important impact on post prandial hyperglycemia at 800 mg/kg, with 40.77% and 28.2% as a maximum glucose level reduction, in sucrose and maltose test, respectively. The present results clearly demonstrated that the flavonoid-rich fractions of *Salvia rosmarinus* exhibit a potent antidiabetic action, both on chronic and post-prandial hyperglycemia.

Keywords: *Rosmarinus officinalis*, Streptozotocin, Diabetic mice, Postprandial hyperglycemia, Flavonoids, Antidiabetic effect.

INVESTIGATION OF THE ANTI-INFLAMMATORY ACTIVITY VIA *IN VITRO* AND *IN VIVO* APPROACHES

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Abstract

Inflammation is a complex physiological response associated with various pathological conditions. This study delves into the assessment of the anti-inflammatory properties of methanolic extract of the plant *Atractylis aristata* using both in vitro and in vivo methodologies. The in vitro evaluation employed the Bovine Serum Albumin (BSA) denaturation method to quantify the anti-inflammatory activity at varying concentrations (1.5625, 0.78125, 0.390625, 0.1953125, and 0.09765625 mg/ml). Furthermore, the in vivo analysis employed the carrageenan-induced paw edema model at a specific dosage of 0.08 mg/ml to gauge the anti-inflammatory efficacy. Results demonstrated notable inhibition of paw edema, indicative of AaME's potential in attenuating inflammation. Additionally, the highest percentage of BSA inhibition (70.84±0.10%) was recorded at the concentration of 1.5625 mg/ml. These findings underscore the promising therapeutic prospects of methanolic extract of the plant *Atractylis aristata* in mitigating inflammatory responses, thus warranting further elucidation of its underlying mechanisms and exploration of clinical implications.

Keyword: *Atractylis aristata*, Anti-inflammatory, Bovine Serum Albumin (BSA), carrageenan-induced.

EXPLORING THE THERAPEUTIC PROPERTIES PRESENT IN *QUERCUS ILEX*

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Abstract

Quercus ilex, is commonly known as the holm oak. It is an evergreen oak tree native to the Mediterranean region. The importance of this specie lies in its various aesthetic, ecological and practical contributions. It's also famous to exhibiting bioactive potential attributed to its diverse phytochemical composition. The objective of this work is to determine the different constituents of *Quercus ilex* and to evaluate their therapeutic properties, such as antioxidant and anti-inflammatory activity. The different parts (ML, coty, teg) of the plant contain considerable contents of phenolic compound as PTS and flavonoids. Leaves are the richest one. Regarding *in-vitro* antioxidant activity, all extracts of this plant exhibit a significant activity. ML and teg show the highest potential. The AE and HME of *Q. ilex* revealed no toxicity on macrophages. The leaf extract (HME) demonstrates a dose-dependent inhibition of LPS-induced oxidative stress and inflammatory response. This is achieved through the direct down-regulation of iNOS and COX-2 expression, consequently suppressing the production of pro-inflammatory cytokines. Notably, this anti-inflammatory effect is attributed to the inhibition of the NF-kB signaling pathway. *Quercus ilex* extract exhibits a subtle anti-inflammatory effect when applied topically. The most pronounced activity is demonstrated by ML-HME (34% inhibition of edema). On the other hand, treatment with the leaves (250 and 500 mg/kg) reduces the MPO activity, the neutrophil index in filtration, after inducting inflammation in the rat colon with TNBS.

Key words: Phenolic compound, bioactive potential, toxicity, Holm oak.

ANTI-INFLAMMATORY AND ANALGESIC ACTIVITY OF ETHANOLIC EXTRACT OF PROPOLIS

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Abstract

Nonsteroidal anti-inflammatory drugs are the main drugs used for the treatment of inflammation and pain. However, these drugs have considerable side effects. As a result, the search for new molecules that are more effective and with fewer adverse effects appears crucial. The aim of this study is to evaluate, *in vitro* and *in vivo*, the anti-inflammatory and analgesic effect of the ethanolic extract of propolis. The results showed that ethanolic extract of propolis has an anti-inflammatory effect, *in vitro*, by inhibiting the denaturation of proteins and also the activity of proteases. *In vivo*, this extract induces a significant decrease in the right hind paw edema induced by subcutaneous injection of carrageenan, in comparison with diclofenac sodium. This extract has also an analgesic effect by inhibiting torsions and abdominal cramps induced by the injection of acetic acid and, by inhibiting the licking and stretching of the paw, induced by the injection of formaldehyde in the plantar aponeurosis. These results showed that the ethanolic extract of propolis is a good natural analgesic and anti-inflammatory agent.

Keywords: Propolis extract, anti-inflammatory, analgesic, inflammation, pain.

EVALUATION DE LA TOXICITE AIGUË ET ETUDE DE L'EFFET GASTRO PROTECTEUR DE *CRATAEGUS LACINIATA*

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Résumé

L'étude est porté sur l'évaluation de la toxicité et de l'effet gastro-protecteur des feuilles et des fruits de *Crataegus Laciniata* en médecine traditionnelle algérienne. Les résultats obtenus montrent que les feuilles sont plus riches en polyphénols que les fruits. La plante est classée non toxique avec une DL_{50} de 2000 mg/kg chez la souris. Les analyses biochimiques et histopathologiques n'ont montré aucune différence significative entre les groupes traités par l'extrait et le groupe témoin en termes de marqueurs hépatiques et rénaux. L'extrait éthanolique maintient une architecture hépatique et rénale normale. Des effets gastro-protecteurs sont observés avec une réduction des taux de MPO dans l'homogénat gastrique à différentes doses. La quantification de la teneur en composés phénoliques et flavonoïdes de l'extrait de feuilles de *Crataegus laciniata* a révélé sa richesse en composés bioactifs atteignant 308,25 ± 1,77 mg AGE/g d'extrait pour les composés phénoliques et 22,46 ± 0,34 mg QE/g d'extrait pour les flavonoïdes.

Mots clés : La toxicité aiguë, effet gastro-protecteur, *crataegus Laciniata*, phénols totaux

EVALUATION DE L'ACTIVITE HEMOSTATIQUE D'UNE PLANTE MEDICINALE DE LA FAMILLE ZYGOPHYLLACEAE

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Résumé

La recherche des composés bioactifs dans les plantes médicinales conduit au développement de nouveaux agents anti-inflammatoire, antimicrobienne, anticancéreuse et anti hémorragie moins coûteux, dotés d'une sécurité et d'une efficacité améliorées. Le Zygophyllaceae c'est une famille des plantes médicinales utilisé comme remède populaire dans le monde entier pour le traitement de divers troubles, des maladies liées au stress oxydatif, les microbes et l'inflammation mais aucune donnée absolue n'était disponible sur l'activité hémostatique pour notre plante, ce qui nous a poussée à évaluer cette activité pour nos extraits. Trois extrais de polarité croissante sont obtenues (Ether de Pétrole, Acétate d'éthyle et n Butanol) de la partie aérienne de notre plante. La quantification de la teneur des polyphénol totaux et flavonoïdes été effectué par spectrophotométrie en utilisons la méthode de Folin-ciocalteu et trichlorure d'aluminium. In-vitro l'activité hémostatique a été évaluée par la méthode de calcification du plasma. Les résultats de screening phytochimique des extraits montrent la présence de plusieurs métabolites secondaires connus par leurs propriétés biologiques, des teneurs modérées en polyphénols et flavonoïdes ont été estimées. Un meilleur effet hémostatique a été enregistré pour la concentration maximale testée de 1 mg/mL avec un temps de coagulation correspondant à (68.6 ± 3.72 s) pour l'extrait n-BuOH et (84.2 ± 5.09 s) pour l'extrait EA. Ces deux extraits pourraient être utilisé pour arrêter l'hémorragie et le saignement.

Mots clés : Screening phytochimique, plante médicinale, hémostatique, Zygophyllaceae, polyphénol.

EVALUATION DE L'ACTIVITE ANTIDIABETIQUE DE L'HUILE DES NOYAUX DE DATTES ALGERIENNES (PHOENIX DACTILIFERA L) COMPARATIVEMENT A CELLE LA METFORMINE CHEZ LE RAT RENDU DIABETIQUE

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Résumé

Le Diabète de type 2 nécessite un traitement agressif pour atteindre les objectifs ultimes envers l'insulinorésistance. Dans ce contexte, la metformine, un ancien agent largement répandu, se distingue non seulement par ses propriétés anti-hyperglycémiantes mais aussi pour ses effets au-delà du contrôle glycémique, tels que l'amélioration de l'hémostase et le stress oxydatif. Pour cela, nous avons évalué si l'huile des noyaux de dattes *Phoenix dactilifera* L. (HND), améliore le contrôle glycémique comparativement à l'effet de la metformine chez des rats wistar rendus diabétiques. Une fois le diabète s'est installé, les rats diabétiques sont partagés en 2 groupes pour le traitement par gavage pendant 28 jours, via l'extrait de l'huile des noyaux de dattes et de la metformine consécutivement. A la fin de l'expérimentation, les rats de chaque lot sont sacrifiés et le sang est prélevé pour déterminer l'activité antidiabétique in vivo de l'HND comparativement à la metformine via le test de la tolérance au glucose, le dosage de l'insulinémie et l'évaluation de l'insulinorésistance. L'administration de l'extrait de l'HND et de la metformine altère significativement la tolérance au glucose après 60 min avec un léger avantage en faveur de la metformine. Par ailleurs, les teneurs sériques en insuline chez les rats diabétiques traités par l'HND et de la metformine augmentent significativement après avant traitement et les cellules étaient moins sensibles à l'insuline : insulinorésistantes, avec une légère dominance pour la metformine. Ceci est exprimé via l'indice de HOMA-IR qui est inversement proportionnel à l'insulinémie et qui confirme l'insulinorésistance chez les rats diabétiques avant traitement. L'HND a significativement renforcée l'action hypoglycémiante et la sensibilité des cellules à l'insuline après qu'elle a été rompue avant traitement et elle a un effet qui est quasiment identique à celui de la metformine.

Mots clés : Huile de noyaux de dattes, metformine, stress oxydant, diabète, rat.

ADME/T ANALYSIS, MOLECULAR DOCKING INVESTIGATIONS, ANTI-INFLAMMATORY AND ANTIPYRETIC EFFECTS OF SOME SAPONINS ISOLATED FROM THE SPECIES *SCABIOSA STELLATA*

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Abstract

This study is devoted to the determination of the chemical composition and the assessment of *in vivo* anti-inflammatory and antipyretic activities of the *n*-butanol extract obtained from the species *Scabiosa stellata* L. The acute oral toxicity, the *in vivo* anti-inflammatory activity by the model of carrageenan-induced paw edema, and the antipyretic activity by brewer's yeast-induced pyrexia method were tested on male Wistar rats. Furthermore, Three saponins were isolated from the *n*-butanol extract of *S.stellata* using several chromatographic methods. The isolated compounds were subjected to molecular docking studies with cyclooxygenase-1, cyclooxygenase-2, 5-Lipoxygenase, and nuclear factor-kappa B enzymes to explain the observed *in vivo* anti-inflammatory and antipyretic activities, and their pharmacokinetic and toxic parameters were predicted. According to the results, the chemical study of the *n*-BuOH extract of the species *S. stellata* led to the isolation and structural elucidation of three known saponins. All the isolated compounds well interact with the active site of cyclooxygenases 1 and 2, and 5-Lipoxygenase, and NF-κB protein and showed excellent binding affinities. For the ADMET prediction, the isolated saponins demonstrated low intestinal absorption and poor skin, blood-brain barrier, and central nervous system permeability. None of the tested molecules had an inhibitory effect on cytochrome P450 (CYP) enzymes. However, all the molecules had low clearance values and a high drug half-lifetime (t1/2). The compounds had a possible toxicity with LD_{50} values lying in class V and VI and did not possess any hepatotoxicity, mutagenicity, or cytotoxicity. The oral administration of the *n*-butanol extract at various concentrations (500, 1000, and 2000 mg/kg), induced toxic symptoms and the mortality of all the treated animals with the dose of 2000 mg/kg. A significant increase in biochemical parameters and significant alteration in the hematological parameters compared to the control group were observed in the survived groups. The histological examination of the liver, kidney, and lungs confirmed the observed toxic signs. Therefore, the LD 50 of this extract was estimated to be higher than 500 mg/kg. In addition, the administration of *n*-butanol extract at the dose of 50 mg/kg prevents acute paw edema and decreases significantly the body temperature during all phases of the test compared to the standard drug (Paracetamol) administrated at 50 mg/kg. Furthermore, it can be concluded that the plant *S. stellata* may be helpful in the treatment of inflammation and pyrexia. However, prudent use of this species is recommended due to its richness in saponins known for their toxic effects.

***Keywords*:** *Scabiosa stellata*, Saponins, Acute toxicity, Anti-inflammatory, Antipyretic Molecular docking, ADMET prediction.

POSTER COMMUNICATIONS

BOTANICAL SAFEGUARDS FOR PANCREATIC BETA CELLS: INVESTIGATING THE PROTECTIVE POTENTIAL OF MEDICINAL PLANT COMPOUNDS AGAINST APOPTOSIS

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Abstract

Apoptosis of pancreatic beta (B) cells plays a pivotal role in the development and progression of insulin-related disorders, such as diabetes mellitus. Hence, exploring potential strategies to protect and preserve these vital cells is of utmost importance in advancing therapeutic interventions. This research delves into the application of medicinal plant molecules as a potential safeguard against apoptosis of pancreatic B cells using a beta cell line isolated from the islet of Langerhans of a 10-week-old, female mouse with insulinoma. The study employed Streptozotocin, a well-known diabetogenic agent, to induce apoptosis in the beta cell line, mimicking the cellular stress conditions observed in diabetic pathology. Additionally, plant extracts possessing reputed medicinal properties were incorporated into the experimental setup to assess their protective effects on pancreatic B cells. These plant extracts were meticulously selected based on their historical significance in traditional medicine and contemporary evidence suggesting their potential in cellular protection. Through a series of in vitro experiments, the beta cell line was exposed to Streptozotocin both alone and in combination with various plant extracts. Cell viability, mitochondrial membrane potential, were evaluated to quantify the protective effects of the medicinal plant molecules on pancreatic B cells under stress-induced conditions. The results of this study shed light on promising medicinal plant molecules that demonstrate significant protection against apoptosis in pancreatic B cells. The elucidation of their mechanisms of action paves the way for potential therapeutic targets in combating diabetes mellitus and other insulin-related disorders. This research contributes to our understanding of the molecular basis of cellular protection offered by natural compounds and opens new avenues for the development of novel treatments to preserve beta cell function.

Keywords: Medicinal plants; Pancreatic B cells; Streptozotocin; Cellular protection; Diabetes.

INVESTIGATION DE L'ACTIVITE ANTI-UROLITHIATIQUE ET ANTIOXYDANTE DE L'EXTRAIT METHANOLIQUE D'*ATRIPLEX HALIMUS*

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Résumé

Le présent travail a pour objectif d'évaluer l'activités antioxydante et antiurolithiasique de l'extrait méthanolique AHMeOH de feuilles de la plante *Atriplex halimus*.A propos de l'activité antiurolithiasique, six groupes de rats Wistar ont été traités respectivement avec de l'eau distillée, 1% d'éthylène glycol dans de l'eau distillée, de l'AHMeOH (100 mg/Kg p.c.), de l'AHMeOH (200 mg/kg p.c.) débutant le premier jour, de l'AHMeOH (100 mg/Kg p.c.) /Kg),AHMeOH (200 mg/kg pc) après 15 jours d'administration de l'éthylène glycol. Juste après 28 jours d'expérience, des échantillons d'urine ont été collectés et le volume et le pH ont été mesurés. Ensuite, les dosages suivants ont été réalisés : oxalate urinaire, urée, créatinine et acide urique, ainsi que des échantillons de sang sont prélevés au niveau du sinus oculaire après une anesthésie locale pour le dosage de : l'urée, la créatinine et l'acide urique. Les résultats montrent que le groupe témoin présente des lésions sévères tandis que les groupes traités avec AHMeOH montrent une réduction de manière significative ($P \leq 0,05$) la formation de calculs rénaux.L'évaluation *in vitro* de l'activité antioxydante de l'extrait a été réalisée par deux méthodes, le test réducteur ferrique et le pouvoir reducteur du peroxyde d'hydrogène. La concentration (2 mg/ml) confère la meilleure activité de test réducteur ferrique par rapport à autres concentrations avec une différence très significative ($P \leq 0,05$). La méthode de réduction du peroxyde d'hydrogène donne la meilleure activité avec la concentration (1,75 µg/ml) par rapport aux autres concentrations.

Mots clés : *Atriplex halimus*, activité antioxydante, activité antiurolithiasique, ethylène glycol, extrait méthanolique.

CONTRIBUTION TO THE EVALUATION OF THE ANTI-DIABETIC ACTIVITY OF ROOTS BARK EXTRACTS OF *CAPPARIS SPINOSA* L.

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Abstract

The aim of this study was to quantify polyphenols and flavonoids and to assess the anti-diabetic and anti-hyper-glycaemic effects of the methanol extract of *Capparis spinosa* roots bark in rats. Polyphenol and flavonoid levels were quantified using the spectral method. Diabetes was induced by a single intra-peritoneal injection of alloxane monohydrate solution at 150 mg/kg bw. Four groups of diabetic rats were used. Group 1: was treated with distilled water (negative control). Group 2: was treated with glibenclamide 5 mg / kg (positive control). Group 3 and 4: were treated with 100 and 200 mg/kg bw of EfMeOH respectively. A 5th group of non-diabetic rats was added as a reference and given distilled water. During this period, animals in all groups were fed the same standard diet. Body weight and blood glucose levels were estimated on days 4, 7 and 10 of treatment. On day 10, blood samples were taken for biochemical estimations of urea, creatinine, triglycerides, cholesterol and liver transaminases. Quantitative analysis showed that the two extracts tested were rich in flavonoids and polyphenols. Evaluation of the anti-diabetic activity against alloxane-induced diabetes showed that the extracts demonstrated highly significant anti-hyper-glycaemic activity.

Keywords: anti-diabetics, anti-hyper-glycaemic, *Capparis spinosa*, polyphenols, flavonoids.

IN VIVO ANTI-INFLAMMATORY AND ANALGESIC EFFECTS OF ETHANOLIC EXTRACT FROM HAWTHORN FRUIT

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Abstract

This study aims to evaluate the anti-inflammatory and analgesic effects of the ethanol extract of hawthorn fruit (*Crataegus oxyacantha* L.). The ear stimulated with xylene and croton oil is used to estimate anti-inflammatory activity and, by counting the number of abdominal contractions stimulated by intraperitoneal acetic acid, to evaluate the analgesic activity in mice. Xylene-stimulated ear results showed significant inhibition rates at both 200 and 600 mg/kg, which were estimated to be 41,81± 5,606 % and 53,45 ± 2,944 %, respectively, compared to indomethacin (69,74±5,606%). In addition, inhibition rates for both concentrations of the croton oil-stimulated ear test were estimated at 75,81 ± 3,025 % and 80,29 ± 2,999 %, respectively, compared to indomethacin (78,49 ± 4,60%). However, the results showed that the same two concentrations (200 and 600 mg/kg) had moderately significant efficacy in reducing the percentage of torsion with a value of 33,47 ± 9,242 % and 38,63 ± 1,56%, respectively, compared to aspirin (85,123 ±1.866%). In conclusion, our results suggest that this fruit has anti-inflammatory and analgesic properties.

Keywords : *Crataegus oxyacantha*, Ethanolic extract, Anti-inflammatory, Analgesic activity.

IN VITRO APOPTOSIS INDUCED MITOCHONDRIAL DYSFUNCTION AND CYTOTOXIC EFFECT OF ISOCOSTIC ACIDE ISOLATED FROM ALGERIAN *DITTRICHIA VISCOSA* (L.) GREUTER

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Abstract

The present study aims to evaluate the effect of isocostic acid (1), a sequiterpene isolated from Algerian *Dittrichia viscosa* (L.) Greuter, by determining its ability of inducing the superoxide anion production, mitochondrial swelling, and the investigation of its cytotoxic activity against three cancer cell-lines: Human brain cancer (U118), colon cancer (Caco-2), ovarian cancer (SKOV-3), and healthy cell line Primary Human dermo Fibroblast (HDF). From DPPH scavenging assay, results showed that isocostic acid provided a pro-oxidant effect, which was confirmed by the ability of this compound to increase superoxide anion generation, at different concentrations (10^{-1}, 10^{-3}, and 10^{-5}µM respectively), leading to cell apoptosis. Furthermore, the effect of isocostic acid on the increase of mitochondrial permeability was demonstrated by mitochondrial swelling. However, antiproliferative activity showed that compound (1), was able to inhibit the cell proliferation at all concentrations (25µg, 50µg, 100µg, and 200µg) causing a dose-dependent cytotoxicity, with different potency. Nevertheless, the most sensitive cell line was U118, in which cell viability decreased clearly between 100µg (41.7321±2.0903%) and 200µg (3.8973±0.63123%) with IC_{50}:72.32 µg/ml. These results revealed and confirmed the importance of this species, especially by the ability of compound (1) to have an apoptotic character and to act as cytotoxic agent, representing a potent anticancer sequiterpene from Algerian *Dittrichia viscosa* (L.) Greuter.

Keywords : *Dittrichia viscosa* (L.) Greuter.; isocostic acid; cytotoxic activity; mitochodria.

ETUDE DE L'EFFET DETOXIFIANT DE LA PLANTE MEDICINALE *ATRIPLEX HALIMUS* CHEZ LE LAPIN *ORYCTOLAGUS CUNICULUS* TRAITE PAR UN HERBICIDE SELECTIF DE LA FAMILLE DES TRIAZINONES

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Résumé

L'objectif de ce travail est d'évaluer la toxicité subchronique de la métribuzine sur l'aspect hématologique et histologique chez le lapin *Oryctolagus cuniculus.L* et la détoxification par une plante médicinale *Atriplex halimus.* Dans la partie expérimentale, une étude a été réalisée sur 12 lapins qui ont été répartis en quatre groupes : G1 (témoin), G2 (traité par la métribuzine) G3 (traité par la plante *Atriplex halimus*), et G4 (traité par la métribuzine et la fusion du la plante *Atriplex halimus.* La pesée des animaux a été effectuée chaque3 jours. Après 21 jours successifs du traitement on a fait un prélèvement du sang pour l'étude hématologique, et des organes (testicules et riens) pour l'étude histologique. Les résultats obtenus révèlent une toxicité hématologique qui s'explique par une diminution des globules rouges, l'hémoglobine et hématocrite et augmentation du nombre des globules blancs et les plaquettes. L'évaluation histologique montre une déformation au niveau des tubes séminifères des testicules, et des reins. En conclusion, la présente étude a montré que l'exposition au métribuzine a des effets toxiques sur plusieurs aspects (hématologiques et histologiques). En revanche, l'administration de la plante médicinale *Atriplex halimus* induit une amélioration nette au niveau hématologique et histologique.

Mots-clés : métribuzine, *toxicité, Atriplex halimus* , étude hématologique, histologie.

ANTI-INFLAMMATORY AND FREE-RADICAL-SCAVENGING ACTIVITIES OF METHANOL EXTRACT OF *CYTISUS SP.* FROM ALGERIA.

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Abstract

This study was undertaken to investigate the quantitative phytochemical screening, anti-inflammatory, and antioxidant potential of methanol extract of aerial parts of *Cytisus sp.* The level of phenolics and flavonoids were assayed and expressed in terms of gallic acid and quercetin equivalents respectively. The antioxidant activity was checked in terms of DPPH radical scavenging activity assay. The anti-inflammatory activity of the extract was examined using the formalin-induced paw edema (acute inflammation) in *Wistar albino* rats. The extract has been found to have good phytochemical content and good antioxidant capacity. Oral administration of the extract (50 and 100 mg/kg) exhibited a dose-related and significant ($p < 0.05$) inhibition of formalin-induced rat paw edema and the effect was less than that produced by diclofenac (50 mg/kg). Our results indicate that the phenolics in the plant may be responsible for the antioxidant and anti-inflammatory activities of the extract. *Cytisus sp.* might be a valuable bioactive resource and would seem to be applicable as a natural anti-inflammatory and antioxidant agent.

Keywords: *Cytisus sp.*, Anti-Inflammatory, Antioxidant, Phenolics, Flavonoids.

PHYTOCHEMICAL INVESTIGATION AND EVALUATION OF SALIVARY A-AMYLASE INHIBITORY ACTIVITY OF *GLYCYRRHIZA GLABRA* EXTRACT.

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Abstract

Polyphenolic compounds, including phenolics and flavonoids, have been extensively studied for their potential to inhibit salivary α-amylase, an enzyme crucial in the digestion of carbohydrates. Inhibiting this enzyme can help regulate postprandial glucose levels, making it a promising target for managing conditions such as diabetes, acne and obesity. The present study aims to investigate the phytochemical composition and evaluate the salivary α-amylase inhibitory activity of three medicinal plant extracts: *Origanum majorana*, *Glycyrrhiza glabra*, and *Mespilus germanica*. The methodology involved extracting the plant materials with ethyl acetate, yielding 3.13%, 1.85%, and 5.56%, respectively. The total phenolic content (TPC) and total flavonoid content (TFC) were quantified. The salivary α-amylase inhibitory activity was evaluated in vitro using an enzymatic assay. The results showed that *Glycyrrhiza glabra* exhibited the highest TPC (0.85 mg GAE/g DW) and TFC (0.80 mg QE/gDW). The salivary α-amylase inhibition rates were 33.15% for *Glycyrrhiza glabra*, at a concentration of 1.2 mg/ml. Based on the findings, the *Glycyrrhiza glabra* extract demonstrated the most promising inhibitory activity against salivary α-amylase, likely due to its rich polyphenolic and flavonoid composition. In conclusion, the findings demonstrate the potential of this plant in diabetes management, recommending for further exploration of its active compounds for the development of novel antidiabetic drugs.

Keywords: Human α-amylase, polyphenols, flavonoids, *Glycyrrhiza glabra*, antidiabetic activity.

AMELIORATIVE EFFECTS OF NATURAL ANTIOXIDANT AGAINST BLOOD AND CARDIOVASCULAR TOXICITY OF ORAL SUBCHRONIC EXPOSURE TO ORGANIC SOLVENT.

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Abstract

The present study determines the possible protective role of *Sesamum indicum L* (sesame) grain in decreasing the oral subchronic blood and cardiovascular toxicity of Ethylene glycol monomethyl ether (EGME). The present study used 24 male rabbits (4 groups, n = 6) distributed according to the treatment. The sesame treatments were used at their recommended antioxidant doses. EGME given orally and daily at dose of 150 mg/kg for 28 days. The oral administration of different EGME alone led to dramatic, oxidative stress, blood coagulation, endothelial dysfunction markers, hematological parameters, lipid profile, and histopathological features compared with the control group. The sesame- EGME treated groups recorded significantly ameliorated blood and cardiovascular toxicity hazards compared to the groups administered with the EGME alone. In conclusion, the administration of sesame provides considerable chemopreventive and ameliorative effects against EGME toxicity.

Keywords: Ethylene glycol monomethyl ether, Blood and Cardiovascular Toxicity, *Sesamum indicum* L, protective role, Male rabbit

DETERMINATION OF SUN PROTECTION FACTOR (SPF) OF HYDRO ALCOHOLIC ULTRASONIC EXTRACTION OF MEDICINAL PLANTS IN BATNA REGION (ALGERIA).

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Abstract

The proposed work is aimed to investigate the ultraviolet (UV) light absorption capacity and sun protection factor (SPF) of medicinal plants extracts in Batna region. The plant products and their phytochemicals have recently been used for their antioxidant property, to overcome such skin allergies, hyperpigmentation, sunburn, photoaging, and skin irritation. for UV absorbance ability and photoprotective property. The hydro-ethanolic extraction of 20 medicinal plants were prepared by ultrasonic maceration extraction method and their UV absorbance was measured between 290 and 320 nm using UV spectrophotometer at 1mg/ml concentration, and determination of SPF of plants extracts. The results proved the UV absorbing and Sun protecting capacity of all the selected plant extracts. Hydro-ethanolic extract of *Punica granatum* peel showed highest SPF (26,093 ± 0,079), while *Marrubium* extract showed the lowest SPF value (21,247±0,171). These findings suggests that the extracts can be used to develop photoprotective formulation because of their activity and non-irritant nature.

Keywords: phytochemicals, ultraviolet (UV), SPF, extract.

THE IMPACT OF A PESTICIDE (VERTIN) ON THE BEHAVIOR OF RATS OF THE WISTAR STRAIN TREATED WITH GINGER

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Abstract

Our study focuses on the evaluation of the toxicity of the pesticide "abamectin , Vertin" and its effects on behaviour and some biochemical parameters (blood sugar, cholesterol). After inhalation of abamectin causes the appearance of anxiety disorders with weight regression. This work is also interested in evaluating the effect of a ginger herbal medicine on behavioral and physiological dysfunction in rabbits. The preparation of the corresponding dose depends on the weight of the rabbits, i.e. 3 milliliters per 1 kilogram of body weight. The start of ginger treatment begins on the 11th day after inhalation of Abamectine and is administered by gastric gavage of rabbits for 7 days (duration of treatment). Our results suggest that ginger may reduce pesticide-induced toxicity. Treatment with this molecule also causes hypercholesterolemia which is closely related to oxidative stress. Behavioral tests used in our study were the Open Field Test to assess the locomotors and exploratory activity of rabies and the T-Maze Test to estimate the level of learning and memorization. It should be stated that people exposed to pesticides, mainly farmers, as well as consumers of products treated with pesticides, are at real risk of having their health affected.

Keywords: pesticide, ginger, behaviour, toxicity, abamectine

ETUDE DE L'ACTIVITE ANTI-INFLAMMATOIRE DE L'EXTRAIT METHANOLIQUE DE LA PLANTE *ATRIPLEX HALIMUS* L *IN VITRO* ET *IN VIVO.*

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Résumé

La présente étude a pour but de déterminer la composition phytochimique et d'évaluer les effets anti-inflammatoire et antihemolytique de l'extrait méthanolique (E. Met) des feuilles de *Atriplex halimus* (EAH) en utilisant plusieurs modèles in *vivo* et *in vitro*. L'analyse phytochimique de l'extrait a révélé une teneur significative en composés phénoliques, flavonoïdes et tanins. Dans les tests *in vivo*, le traitement local des souris avec 2 mg/oreille d'E. Met a inhibé l'inflammation induite par l'huile de croton avec 89%. De plus, Le traitement des souris par 1 mg/poche d'E. Met réduit significativement le nombre des leucocytes migrés vers le site enflammé avec un pourcentage de 78%. En outre, *in vitro*, cet extrait a démontré une inhibition dose-dépendante de l'hémolyse des érythrocytes induite par un milieu hypotonique, avec un taux d'inhibition de 15, 72 et 98% à des concentrations de 0.5, 1 et 2 mg/mL respectivement. Les résultats obtenus indiquent que l'extrait d'*Atriplex halimus* représente une source importante de composés bioactifs ayant des effets anti hémolytique et anti-inflammatoires considérables.

Mots clés : *Atriplex halimus*, anti-hémolytique, anti-inflammatoire, polyphénols.

LIVER DYSFUNCTION AND OXIDATIVE STRESS IN DICLOFENAC-INDUCED TOXICITY: PROTECTIVE ROLE OF METHANOL EXTRACT OF *CYTISUS SP.* FROM ALGERIA

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Abstract

In the present study, *in vivo* antioxidant properties of the methanol extract (50 mg/kg, by gavage for 5 days) obtained from aerial parts of *Cytisus sp.* were investigated in term of its hepatoprotective effect of male *Wistar albino* rats against Diclofenac-induced toxicity **(**50 mg/kg, on days 4 and 5 by I.P.). Lipid peroxidation (LPO) levels, reduced glutathione (GSH) levels, and glutathione peroxidase (GPx) activities were evaluated in liver homogenates. While, aspartate aminotransferase (AST), alanine aminotransferase (ALT), cholesterol, and triglyceride parameters were analyzed in serums. Experimental results exhibited that DCF-treated group has a significant increase in the liver lipid peroxidation (LPO) levels of animals while decreased in plant extract-treated group. In addition, DCF caused significant decreases in glutathione peroxidase (GPx) activities and reduced glutathione (GSH) levels. Moreover, DCF induced hepatotoxicity by increasing serum transaminase enzymes, cholesterol, and triglyceride levels. While, these levels were restored to control value in animals treated with plant extract. The regularized levels of LPO, GSH, cholesterol, triglyceride, transaminase enzymes, and GPx activities revealed the antioxidant properties of the extract plant. The plant extract had high antioxidant potential and completely prevented the toxic effect of DCF on the above of liver and serum parameters.

Keywords: *Cytisus sp.*, Diclofenac, Hepatotoxicity, Polyphenols, Oxidative stress.

IN VITRO INHIBITION STUDY OF *SALVIA ROSMARINUS* ESSENTIAL OIL FROM THE LAGHOUAT REGION AGAINST CANDIDA RUGOSA LIPASE: TREATING OBESITY

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Abstract

Plants have been used for medicinal purposes since ancient times, Rosemary essential oil was introduced in traditional medicine for treating digestive disorders. Seeking a natural remedy for obesity with fewer side effects, we conducted In vitro studies to inhibit Candida rugosa lipase using *Salvia rosmarinus* essential oil extract obtained from Laghouat region - Algeria. In this study, we evaluated the oxidative activity of *Salvia rosmarinus* extracts by using the DPPH free radical scavenging assay and the ABTS assay. The IC_{50} values obtained for DPPH and ABTS were 73±0.3 µg/mland 63±0.02 µg/ml, respectively, which were slightly higher than those of the used standards quercetin, and trolox. The IC50 values obtained by DPPH were 7.3±0.038 µg/ml and 5.8±0.015 µg/ml for quercetin and trolox, respectively, and those obtained by ABTS were 5.6±0.025 µg/ml and 0.95±0.0045 µg/ml, respectively. The study also recorded the enzymatic inhibition of Salvia rosmarinus extract with a percentage inhibition value of 68.33%, which was considered good compared to the percentage inhibition value of quercetin of 89.96%. These results indicate promising antioxidant and lipase enzyme properties within Salvia Rosmarinus essential oil.

Keywords: Essential oil, antioxidant activity, lipase, obesity, rosemary.

ETUDE PHYTOCHIMIQUE ET ÉVALUATION DE L'EFFET THÉRAPEUTIQUE DE LA PLANTE MÉDICINALE *RHAMNUS ALATERNUS* L. CHEZ LES RATS EXPOSÉS AUX NANOPARTICULES D'OXYDE D'ALUMINIUM

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Résumé

L'objectif de cette étude était de mettre en évidence la relation entre la néphrotoxicité des nanoparticules d'oxyde d'aluminium et les effets protecteurs de la plante médicinale *Rhamnus alaternus*. L'analyse phytochimique de l'extrait brut de la partie aérienne de l'espèce végétale étudiée a révélé les métabolites secondaires suivants : Polyphénols (13µgEAG/mgES) et Flavonoïdes (27,76 µgEQ/mg ES) et évalué l'effet antioxydant par piégeage des radicaux libres DPPH donne une valeur IC50 élevée (140µg/ml). Pour réaliser cette étude, nous avons administré des nanoparticules d'oxyde d'aluminium et deux doses différentes de la plante par voie orale pendant 28 jours sur 42 rats femelles de la souche Wistar Albinos. Les rats ont été divisées en 6 groupes (7rats/ groupe), G1 (témoin), G2 et G3 (extrait 250 et 500 mg/kg/jour), G4 (oxyde d'aluminium 50 mg/kg/jour), G5 et G6 (50 mg/kg/jour de nanoparticules d'oxyde d'aluminium + extrait 250 et 500 mg/kg/jour). Les résultats obtenus à la fin de notre expérience ont montré que le traitement avec des nanoparticules d'oxyde d'aluminium pouvait réduire de manière significative le gain de poids et provoque des troubles rénaux en augmentant la glycémie, la concentration d'acide urique, de l'urée et la diminution des concentrations de protéines totales et pour la créatinine et l'albumine aucune différence significative. Une diminution des paramètres hématologiques (nombres des globules rouges, hémoglobine et hématocrite) et une augmentation du nombre de globules blancs. Le traitement des rats avec l'extrait de *Rhamnus alaternus* a provoqué une récupération significative de certains paramètres biochimiques et hématologiques, ce qui montre l'effet protecteur de cette plante contre la toxicité causée par les nanoparticules d'oxyde d'aluminium.

Mots clés : Nanoparticules, Oxyde d'aluminium, *Rhamnus alaternus*, Néphrotoxicité, Extrait, Polyphénols.

HYPOGLYCEMIC ACTIVITY OF *N*-BUTANOLIC EXTRACT FROM *CISTUS ALBIDUS* L. AGAINST *STREPTOZOTOCIN*-INDUCED DIABETES

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Abstract

The current work aims to assess the *n*-butanolic extract (*n*-BuOH) made from *C. albidus* aerial parts for preliminary acute toxicity, as well as for *in vivo* antidiabetic activity. An oral glucose tolerance test (OGTT) in diabetic rats was used to measure the hypoglycemic capacity, and streptozotocin-induced diabetes was used to assess the anti-diabetic effect. An oral dosage of *C. albidus n*-BuOH extract at a rate of 2000 mg/kg body weight did not result in any acute toxicity, according to the evaluation's *in vivo* results. Because the LD_{50} was higher than this dosage, the extract can be used safely. Taking 600 mg/kg of *n*-BuOH orally produced a notable reduction in the amount of blood sugar. Additionally, the *n*-BuOH extract induce a decrease in blood glucose by 75.0 ± 0.6 mg/dl as well as a moderate lowering of triglycerides, total cholesterol, ALT, AST and creatinine levels in treated animals, compared with diabetic controls group. Apidra® Solostar® was used as standard and showed similar results. To our knowledge, this study is the first to document the acute toxicity and *in vivo* anti-diabetic effects of an extract from *C. albidus* found in Algeria.

Keywords: *Cistus albidus* L, *n*-butanolic extract, OGTT, Streptozotocin, hypoglycemic activity.

EVALUATION DE QUELQUES ACTIVITES BIOLOGIQUES DES HUILES ESSENTIELLES DU CYPRES.

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Résumé

Les huiles essentielles sont des composés naturels qui sont aujourd'hui de plus en plus utilisés dans différents domaines. L'objectif principal de cette étude a été d'évaluer les propriétés antimicrobiennes, antioxydantes et anti-inflammatoire de deux huiles essentielles de Cyprés : sempervirens et arizonica, L'extraction des huiles essentielles des parties aériennes de *Cyprés sempervirens* par la méthode d'hydrodistillation a présenté un rendement de 0.38%. L'étude de l'activité antioxydante des huiles essentielles a été évaluée par la méthode de réduction du DPPH avec un pourcentage d'inhibition de 98,68 %. L'évaluation de l'activité antimicrobienne a été examinée par la méthode de diffusion sur disque contre trois souches bactériennes soit : *Bacillus subtilis, Staphylococcus aureus* et *Escherichia coli* et deus souches fongiques : *Candida albican* et *Aspergillus brasiliensis*. L'étude de l'activité anti-inflammatoire a été évaluée par la méthode de l'œdème induit par la carragénine sur les pattes de souris et a révélé pour l'HE de *C.sempervirens* un pourcentage de réduction d'œdème de 74.58% alors que l'HE de *C.arizonica* a enregistr une activité anti-inflammatoire très remarquable 85.21%.

Mots-clés : Huiles essentielles, activité antimicrobienne, activité anti-inflammatoire, activité antioxydante, extraction des huiles essentielles.

EFFET PROTECTEUR DE FEUILLES DE *FRAXINUS ANGUSTIFOLIA* CONTRE LA PEROXYDATION LIPIDIQUE, INDUITE PAR LE TETRACHLORURE DE CARBONE (CCL_4), *IN VIVO.*

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Résumé

Malgré les avancées significatives de la médecine moderne dans le domaine de la santé, la pharmacopée traditionnelle propose une approche complémentaire et naturelle pour la prévention et/ou le traitement de diverses affections. *Fraxinus angustifolia*, en tant que plante médicinale, est fréquemment utilisée dans le traitement de différentes maladies. L'objectif de cette étude est d'évaluer l'activité anti-peroxydation lipidique, *in vivo*, de l'extrait aqueux acétate d'éthyle de feuilles de *Fraxinus angustifolia (AEAFA).* Ce dernier a été administré (50 mg/kg) à des souris albinos, durant 7 jours, puis des dommages hépatiques ont été induits par l'administration intra-gastrique de tétrachlorure de carbone (CCl_4), chaque 72h. Les résultats ont montré un effet protecteur de l'extrait AEAFA (50 mg/kg), en réduisant le taux de malondialdéhyde (MDA) (472 ,95nmol/mg de protéine) d'une manière significative ($p \leq 0.05$) par rapport au contrôle positif (1477,2nmol/mg de protéine) et au standard α- tocophérol (891,9 nmol/mg de protéine). Ces résultats mettent en évidence l'effet protecteur exceptionnel de cet extrait contre les dommages hépatiques induits par le CCl4, ce qui approuve davantage son utilisation thérapeutique en tant que plante médicinale.

Mots clés *: Fraxinus angustifolia*, effet hépato-protecteur, tétrachlorure de carbone (CCl_4), peroxydation lipidique.

IN VITRO EVALUATION OF THE ANTI-INFLAMMATORY AND ANTI-HEMOLYTIC EFFECTS OF THE HYDRO-METHANOLIC EXTRACT OF *MORINGA OLEIFERA* SEEDS.

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Abstract

Inflammation is associated with many chronic diseases. Reducing protein denaturation can be considered a therapeutic strategy. Indeed, the agents capable of preventing protein denaturation could be effective as anti-inflammatory drugs. On the other hand, maintaining membrane stability plays an important role in regulating the inflammatory process. *Moringa oleifera* is a tree found in the southern region of Algeria, very little studied, its seeds are a valuable source of bioactive compounds with therapeutic potential. In this context, the objective of this study is to evaluate the in vitro anti-inflammatory and anti-hemolytic activities of hydro-methanolic extracts at various concentrations of seeds. The total polyphenol content was determined in the extract obtained by maceration. The anti-inflammatory activity was evaluated in vitro using the heat-induced protein denaturation method, while the anti-hemolytic activity was evaluated by a red blood cell membrane stability test. Our results demonstrate that the extract exerts a significant inhibitory effect on BSA denaturation, which achieves an inhibition percentage of 72%, as well as a more pronounced anti-hemolytic effect compared to reference molecules (diclofenac and gallic acid), with a maximum inhibition percentage (92,5%) at the optimal concentration of 90 µg/ml. In conclusion, the seeds of moringa oleifera exhibit significant anti-inflammatory potential through the inhibition of protein denaturation and its anti-hemolytic effect.

Keywords: *Moringa oliefera*, Seeds, Anti-hemolytic, Anti-inflammatory.

Topic E

From bioactive molecule to drug

ORAL COMMUNICATIONS

EXTRACTION D'UN PRINCIPE ACTIF NATUREL ET EVALUATION DE SON ACTIVITE ANTIFONGIQUE SUR UN AGENT PATHOGENE RESPONSABLE DE LA POURRITURE SECHE DES AGRUMES. ÉTUDE INSILICO DFT; DOCKING MOLECULAIRE ET ADME

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Résumé

Notre travail porte sur l'étude de l'activité antifongique d'huile essentielle du clou de *girofle Syzygium aromaticum L* et de son principe actif l'Eugenol sur une souche de *Fusarium proliferatum* agent causal de la pourriture sèche des agrumes. L'extraction d'huile essentielle (HE) de la plante a été réalisée par la méthode d'hydrodistillation. Le principe actif Eugénol a été purifié par la chromatographie sur colonne à gel de silice(CC). Sa structure chimique a été identifiée par les méthodes spectroscopiques usuelles. L'évaluation de l'activité antifongique a été effectuée par la méthode de dilution en milieu solide pour déterminer les taux d'inhibition de la croissance mycélienne de l'espèce étudiée et en milieu liquide pour déterminer les CMI (concentration minimale inhibitrice). Un fongicide chimique a été utilisé comme un témoin de référence. L'huile essentielle a été efficace à des concentrations de 100 µl / ml. Le principe actif et le témoin de référence ont montré un effet inhibiteur à 100% à 50µl /ml. Une étude théorique a été effectuée par la DFT pour expliquer la réactivité chimique du principe actif. Trouver un ligand pour un récepteur connu afin d'inhiber une enzyme est l'objectif du Doching moléculaire**.** D'après les résultats obtenus l'Eugénol est un bon inhibiteurTrichodiene Synthase de *Fusarium*sp (PDB ID:2PS6). Ceci explique bien son activité fongicide et enfin l'ADME dans but d'explorer sa pharmacocinétique et sa similarité aux médicaments.

Mots clés : *Syzygium aromaticum*, Activité antifongique, Docking moléculaire, Théorie de la densité fonctionnelle (DFT), ADME.

APPLICATION AND SYNTHESIS OF A NEW HYBRID HETEROCYCLIC DERIVATIVE BASED ON QUINOLÉINE WITH BIOLOGICAL EVALUATION

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Abstract

Heterocyclic compounds have significant biological activity in the treatment of numerous diseases such as diabetes, Alzheimer's, and cancer. The aim of this study is to synthesize and biologically evaluate a new hybrid heterocyclic derivative as an antioxidant, and to conduct an in-silico study to assess the probability of this compound being used for medicinal purposes.A new derivative based on quinoléine has been successfully synthesized through a simple condensation reaction without the need for a catalyst, resulting in an excellent yield of 98-90%. These molecules underwent antioxidant testing to demonstrate their antioxidant activity, as well as theoretical simulation studies to verify their anticancer effects. This study provides evidence that these molecules are significant bioactive compounds with medicinal effects

Keywords: Heterocyclic compounds, quinoline, antioxidant activity, theoretical simulation, in selicostudy, bioactives compounds.

SYNTHESIS OF PH-THERMOSENSITIVE NANOPARTICLES AS DRUG DELIVERY SYSTEM BASED ON BIOPOLYMERS

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Abstract

Nanoparticles based on responsive polymeric systems promise to improve the targeted drug delivery with minimum side effects. Although, extensive research is being focused on developing a typical, intelligent and sensitive polymeric network which carry and release drug with sufficient concentration on damaged tissue, such as nanoparticles should limit drug cytotoxicity in healthy tissues. In this work, the development of pH-thermo-responsive double network, with hydrophilic properties is proposed, nanoparticles are developed by the combination of two intelligent biodegradable polymers, the used method based on the copolymerization of Poly (acrylic acid) and chitosan. The influence of the acrylic acid concentration and the crosslinker on the characteristics of formulated nanoparticles and the surface properties have been investigated. Particle size, Zeta potential and size distribution analysis revealed that nanoparticles had a size of (80.84±16.6nm to 218.2±24.96nm) with negative zeta potential about (-29.7mV) and narrow size distribution. Furthermore, the developed system showed a high encapsulation efficiency about 90%. The swelling behaviors of CS-g-PAA nanoparticles have been studied, Chitosan-g-Poly (acrylic acid) nanoparticles proved pH-thermosensitive characteristics. that makes them an interesting system for drug release control. The swelling behaviors of nanoparticles were explained according to their structures. Results revealed that swelling behaviors were affected by the crosslinker and acrylic acid concentrations. In vitro drug release rate was carried out under simulated physiological conditions using different buffer solutions in basic and neutral pH at 37°C. Nanoparticles allow a drug protection in simulated gastric fluid pH=1.2, results proved that CS-grafted-PAA crosslinked with TPP respond to pH=3.6 and ensure prolonged controlled drug release.

Keywords: Chitosan, Drug delivery system, Poly (acrylic acid), pH-Thermo-responsive nanoparticles.

POSTER COMMUNICATIONS

IN SILICO DRUG DESIGN: A COMPUTATIONAL ANALYSIS OF HETEROCYCLIC COMPOUNDS

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Abstract

In silico drug design is a computational approach that enables the discovery, design, and optimization of new drug candidates. This innovative method has revolutionized the field of drug discovery by significantly reducing the time and cost associated with traditional experimental approaches. Additionally, it has contributed to the development of safer and more effective medicines. In this study, several molecular modeling techniques were employed to examine some heterocyclic compounds. Pharmacological properties ADME were screened, and drug-likeness was evaluated for all molecules. A molecular docking study was then conducted to examine the binding mode of these molecules with the active site residues of the selected targets. Interestingly, our findings indicate that all compounds exhibit high binding affinity with the studied receptors. This provides potential drug candidates that could undergo further experimental validation and optimization to improve their efficacy and safety profile, thereby accelerating the drug discovery process.

Keywords: In silico, Drug design, Heterocyclic compounds, ADME, Molecular docking.

AMELIORATION DE LA BIODISPONIBILITE DE LA CURCUMINE GRACE AUX NANOGELS POLYMERIQUES : UNE PERSPECTIVE EN PHARMACOTOXICOLOGIE

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Résumé

L'intérêt croissant pour les produits bio, motivé par les préoccupations croissantes concernant les effets secondaires des produits conventionnels, est freiné par la faible pharmacocinétique et la biodisponibilité limitée de ces produits, ce qui limite leur utilisation. Cela a conduit à une exploration accrue des nanotechnologies, qui ont connu des avancées significatives ces dernières années, visant à surmonter cette limitation et à maximiser l'efficacité de ces produits. L'objectif de ce travail est l'utilisation de nanogels comme un nouveau système de distribution de médicaments pour améliorer la biodisponibilité d'un principe actif bio en l'encapsulant dans des matrices polymères. Nos recherches révèlent que les nanogels présentaient des viscosités proportionnelles au poids moléculaire du polymère, manifestant un comportement non newtonien caractéristique des suspensions colloïdales. Remarquablement, les nanogels ont maintenu des tailles stables (~100nm) et des potentiels Zeta stables (~50mV) sur une période de stockage d'un mois, avec une protection notable contre la photodégradation. Le Test de diffusion révèle un potentiel pour une libération prolongée du médicament, démontrant une application cutanée efficace. Les paramètres de diffusion, déterminés ex-vivo à l'aide de la cellule de Frantz, ont montré des coefficients de diffusion et des coefficients de perméabilité, avec une cinétique suivant le modèle de Korsmeyer-Peppas (R^2 : 0,88-0,94). Cette étude souligne le rôle prometteur des nanogels dans l'amélioration de la biodisponibilité des principes actifs peu solubles, offrant des perspectives sur leurs implications pharmacotoxicologiques.

Mots clés: Nanogel, Curcumine, Diffusion, Transdermique.

IN-VITRO STUDY OF MORUS ALBA LEAVES EXTRACTS AS POTENTİAL A-GLUCOSDASE, A -AMYLASE INHIBITORS FOR THE MANAGEMENT OF TYPE-2 DİABETES

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Abstract

The strategies employed to regulate diabetes mellitus (DM) are largely dependent on the control of dietary carbohydrate digestion, which is influenced by α-glucosidases, salivary and pancreatic α-amylases. We extracted and quantified phenolic compounds and flavonoids in *Morus alba* fractions. The leaves of mulberry plant can also be used as hypoglycemic, hypotensive, diuretic, and antimutagenic tonics, in our folk medicine. The results indicate that the total phenols contents of our plant is significant (118.49 mg/g GAE), and the flavonoids content is also notable, with a value of (29.23 mg/g QE). Therefore, we investigated *in vitro* the antidiabetic properties of these extracts used as natural remedy that does not have any negative effects by inhibiting both enzymes and using Acarbose (Acr) as a common inhibitor. The results indicate that our plant extracts inhibit both enzymes with avrage concentration (0.5mg/ml to 1 mg/ml) against α-amylase, it gave inhibition percent values that vary between (48.14 ± 0.02 % to 83.56± 0.01 %) and the avrage concentration (0.01mg/ml to 0.1 mg/ml) against α-glucosidase gave inhibition percent values that vary between (34.54 ± 0.02 % to 70.30 ± 0.01%). These findings suggest that phenolic compounds and flavonoids from *Morus alba* may reduce metabolic disorders like diabetes mellitus.

Keywords: *Morus alba*, Phenolic compounds, Flavonoids, Acarbose, Antidiabetic.

SYNTHESIS AND CHARACTERIZATION OF NIFUROXAZIDE AND ASCORBIC ACID EUTECTIC MIXTURE

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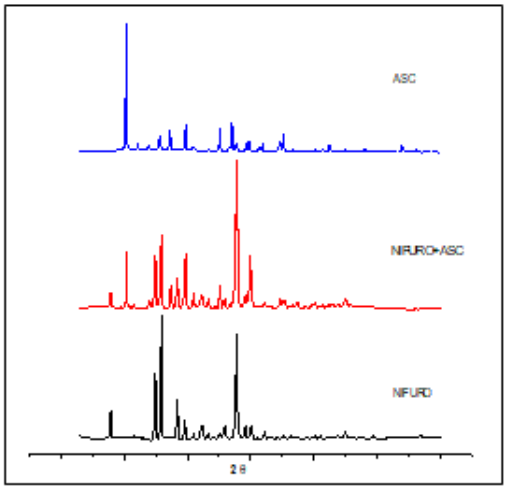
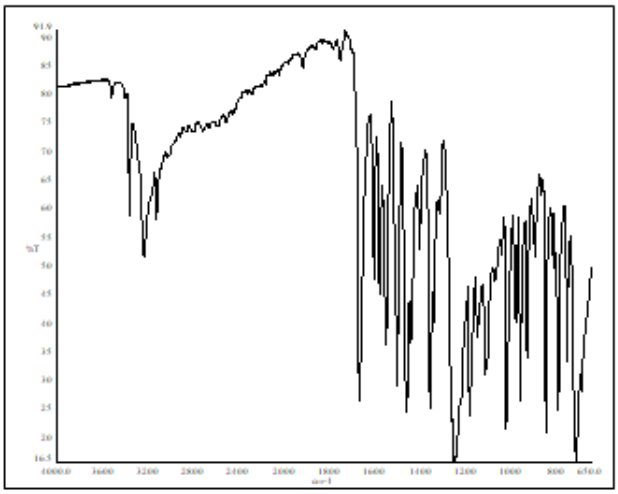
Abstract

Nifuroxazide is an antibacterial intestinal medication used for the treatment of acute diarrhea in adults caused by infections of the intestine. An eutectic mixture of Nifuroxazide-Ascorbic acid was prepared by neat grinding method with an equimolar ratio to improve the solubility and the bioavailability of the pharmaceutical active ingredient (API). We used in our work different methods of characterization toidentify and characterize the resulting mixture, we mention Fourier Transform InfraRed spectroscopy (FTIR),differential scanning calorimetry (DSC), powder x-ray diffraction (PXRD) and nuclear magnetic resonance spectroscopy (NMR).

Keywords: Nifuroxazide, Ascorbic acid, DSC, Eutectic.





Powder X-ray diffraction (PXRD) and Fourier Transform InfraRed spectroscopy (FTIR)

EVALUATING ANTIMICROBIAL EFFECTIVENESS IN ANTITRANSPIRATION CREAM FORMULATION

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Abstract

Aluminum chloride hexahydrate (ACH) is considered one of the most effective components for treating excessive sweating, or hyperhidrosis. It is a commonly used active ingredient in antiperspirants due to its astringent properties, which help to tighten the pores of the skin and reduce sweat production. It works by slowing down sweat secretion by depositing on the surface of sweat ducts. Despite controversies, aluminum salts remain the most effective components for reducing sweat flow, and their presence in antiperspirants is considered essential. Antiperspirants containing aluminum chloride are recommended as the first-line treatment for hyperhidrosis, and their effectiveness relies on their astringent action, which reduces sweat secretion by constricting mucous membranes and blocking sweat glands. In our study, aluminum chloride was manufactured, and a cream was prepared to produce an antiperspirant in all its degrees. Additionally, further physical and chemical tests were conducted, including heat and humidity tolerance and appropriate acidity levels. The product was also evaluated for its antimicrobial properties. The study confirms results indicating that hexahydrate aluminum chloride is an effective and tolerant antifungal agent, as well as active against bacteria, making it capable of combating malodors resulting from excessive microbial growth. A comparison was made between our developed ointment and commercial products, showing significantly better performance in our results.

Keyword: Aluminum Chloride Hexahydrate (ACH), Antiperspirants, Hyperhidrosis, Antimicrobial, Malodors.

DFT COMPUTATIONS AND ANTI-PROLIFERATIVE RELATIONSHIP STUDIES OF 2-IMINO-4-THIAZOLIDINONE DERIVATIVES

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Abstract

The 2-iminothiazolidin-4-one derivatives are used as anti-proliferative, anti-microbial, anti-inflammatory and anti-cancer agents. The present work includes a comparison of different calculation methods on the structure, the vibrational spectroscopy, and the electron density of these chemical compounds. First we carried out benchmarks on the 2-iminothiazolidin-4-one subunit in gas phase and in aqueous solvent using first principle approaches. These benchmarks validated the use of B3LYP/6-311++G (d,p) method for the accurate determination of the structures and the properties of 2-iminothiazolidin-4-one derivatives. Then, we applied the B3LYP/6-311++G (d,p) method to deduce the reactivity descriptors of a series of 2-iminothiazolidin-4-one derivatives targeting the anti-proliferative activity against A549 and H460 human lung carcinoma cells. Afterward, we used some of these descriptors to establish QSAR models for such activity in aqueous phase. These models were obtained by multiple regression analysis (MLR) procedures. Also, the estimation of our models is done using the leave-one-out (LOO) method. This scientific contribution would be of interest to the readers in the field of drug design, computational and theoretical chemistry as well as medicinal chemistry.

Keywords: DFT, 2-iminothiazolidin-4-one, Human lung cancer, QSAR, Anti-proliferative activity, MLR.

FORMULATION D'UNE SUSPENSION ANTI-REFLUX A BASE D'ALGINATE DE SODIUM ET DE CHITOSANE, GENERIQUE DE LA SUSPENSION ORALE GAVISCON®

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Résumé

Le principe du système anti-reflux de la suspension orale Gaviscon® est basé sur la complexation des macromolécules anioniques de l'alginate de sodium par les contre-ions (Ca^{2+}) libérés par le carbonate de calcium. A l'intérieur du gel formé d'alginate se trouve piégées des bulles de CO_2 qui ont été libérées par le bicarbonate de sodium et du carbonate de calcium. Tout ceci, génère la production d'un gel mousseux, faiblement dense qui va flotter au niveau de l'œsophage. Une barrière gastrique est ainsi constituée, en haut du contenu de l'estomac qui va empêcher alors les remontées d'acide au niveau de l'œsophage. Le méthyle parabène et le propyle parabène jouent un rôle important pour la préservation des propriétés saines microbiologiques de Gaviscons®. Sauf que ces deux excipients sont connus pour leur toxicité et sont même soupçonnés comme des substances potentiellement cancérigènes. Egalement, l'emploi du carbonate de calcium peut causer des effets néfastes à la santé, notamment l'augmentation du pH sanguin (alcalose) et l'hypercalcémie. Aussi, lors de la vidange gastrique, le radeau, une fois passée au niveau des intestins, au pH 6.8, se détruit facilement en libérant toute la quantité du calcium qui peut générer un problème de surdosage. Aussi, l'objectif de cette étude est la mise au point d'une suspension anti-reflux à base d'alginate de sodium et de bicarbonate de sodium, dépourvue de parabènes et du carbonate de calcium. Le but est de substituer ces deux excipients, à effet notoire, par une seule substance qui offre à la fois une source de contre-ions pour complexer l'alginate de sodium et qui en parallèle, a des propriétés antimicrobiennes. Il s'agit du chitosane. Un plan d'expériences est envisagé pour l'optimisation des paramètres de formulations.

Mots clés : Formulation, bio-polymères, reflux gastro-œsophagien, plan d'expériences.

CONCEPTION D'UN TRAITEMENT ANTI-HEMORROÏDAIRE

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Abstract

Le terme hémorroïde ou **maladie hémorroïdaire**, désigne la dilatation et l'inflammation des veines hémorroïdaires, normalement présentes au niveau du rectum ou de l'anus. Cette pathologie, bénigne, mais gênante et pour traiter il y a diverses voies sont possibles et la phytothérapie a montré son efficacité avec quelques plantes. L'objectif de notre travail était de proposer une formulation galénique adéquate et efficace à base de plante. Une étude expérimentale consiste à transformer les écorces de la plante marronnier d'inde (Aesculus hippocastanum). Après avoir subi différents traitements, des gélules seront préparées. Ensuite, nous effectuerons un contrôle de masse pour vérifier l'uniformité. Les champs d'utilisation de ces gélules sont multiples, ils exerceraient un effet protecteur et stimulant sur les vaisseaux sanguins. De plus, ils réduiraient l'inflammation. Peu d'études ont été menées concernant les hémorroïdes. Finalement, nous pouvons dire que notre objectif a été atteint. Puisque nous avons obtenu des gélules qui peuvent servir d'alternative pour traiter les hémorroïdes.

Mots clés : Maladie hémorroïdaire, Marronnier d'inde, Plante, Gélule.

IN SILICO STRUCTURE-BASED SCREENING OF NATURAL PRODUCT CHEMICAL LIBRARY TO IDENTIFY NOVEL POTENTIAL ANTI-CANCER

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Abstract

Selleckchem's library of bioactive compounds contains 1765 molecules with established biological and pharmacological activities. On the other hand, the vascular endothelial growth factor receptor 2 (VEGFR2) is the most crucial transducer of tumor angiogenesis. In this work, an *in silico* study was carried out to identify novel, more potent, and less toxic anti-cancer VEGFR2 inhibitors from this library of natural products. Virtual screening was performed by molecular docking using Molegro 5.0. We choose to work with the PDB 3WZD and the drug sorafenib as the reference ligand. Analysis of the docking results for sorafenib showed that it interacted via 4 hydrogen bonds and 9 hydrophobic bonds with the residues of the VEGFR2 active site. In terms of energy, the results show that 926 ligands scored better than sorafenib (-127,626 Kcal/mol). Only 23 compounds formed more hydrogen bonds and steric bonds than sorafenib. The 23 best poses were filtered according to physicochemical properties, pharmacokinetic properties, and toxicity (ADMET) using the Swiss ADME, preADMET, and PkCSM servers. Two hits were selected, presenting promising characteristics as potential new active VEGFR2 inhibitor candidates. These compounds will now undergo virtual screening by pharmacophore/QSAR and in vitro testing to validate the results obtained.

Keywords: VEGFR2, Docking, Virtual screening, Natural library, Sorafenib.

DFT AND MOLECULAR DOCKING STUDY OF SOME CANCER CELL INHIBITORS

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Abstract

Vascular Endothelial Growth Factor (VEGF) and its receptor play an important role both in physiologic and pathologic angiogenesis, which is identified in ovarian cancer progression and metastasis development. The aim of the present investigation is to identify a potential Vascular Endothelial Growth Factor inhibitor which is playing a crucial role in stimulating the immunosuppressive microenvironment in tumour cells of the ovary and to examine for an effectiveness of identified inhibitor for the treatment of ovarian cancer using various in-silico approaches. 3 established VEGF inhibitors were collected from various literature. In this work, we utilized the dft approach to perform various quantum chemical calculations in order to study reactivity or predict the activity and molecular docking some ligand. The hit compounds were further analyzed using AutoDock. Three compounds that gave the best results in molecular docking, , were analyzed in terms of their toxicity and drug-likeness. Based on toxicity and drug-likeness study SwissADME and PYRX are used to predict and analyze pharmacokinetic properties and Toxicity , Also essential objective to predict the conformation defined by the most favorable relative position and orientation of the ligand within its receptor.

Keywords: VEGF, AND, Cancer, Molecular docking

MOLECULAR DOCKING EXAMINATION OF ANTI-PARKINSON'S PROPERTY OF SOME REPORTED PECTOLINARIN DERIVATIVES: FROM BIOACTIVE PHYTOCHEMICALS TO LEAD COMPOUNDS

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Abstract

Parkinson's disease (PD) is a prevalent neurodegenerative disorder affecting the nigrostriatal pathway in the brain owing to the accumulation of by-product and deficiency in dopamine neurotransmitter. Patients diagnosed with PD are commonly prescribed dopaminergic agents such as L-Dopa, Safinamide, and Istradefylline. While L-Dopa stand out as one of the most reliable and effective anti-parkinsonian agents, the chronic use of such medications can lead to adverse effects complicating their pharmacotherapy. Herein, recent studies have underscored the significance of both Monoamine oxidase B (MAO-B) and Adenosine ($A_{2A}AR$) receptors as key targets in evaluating novel plant-derived drugs, including flavonoids, for the treatment of neurodegenerative disorders such as PD. In the current investigation, we intend to predict the interactions that may occur between Monoamine oxidase B and Adenosine $A_{2A}AR$ targets and pectolinarin derivatives, including its aglycone, pectolinarigenin. As a result, molecular docking simulation using *AutodockVina* software showed that pectolinarigenin may exhibit an inhibitory effect toward MAO-B (-9.4 Kcal/mol) and $A_{A2}AR$ (-7.8 Kcal/mol) targets through establishing significant interactions with key amino acids, comparing to the standard inhibitors safinamide (-9.2 Kcal/mol) and xanthine (-7.2 Kcal/mol), respectively. These finding could provide precious insight for designing lead compounds for PD treatment based on the structural framework of pectolinarigenin.

Keywords: *AutodockVina*, Glycosylation, Pectolinarigenin, $A_{2A}R$ target, MAO-B receptor.

IN-SILICO INVESTIGATION OF NATURAL COMPOUNDS

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Abstract

The term "*in silico*" is a modern word usually used to mean experimentation performed by computer and is related to the more commonly known biological terms *in vivo* and *in vitro*. Effectively, The history of the *in silico* term is poorly defined, with several researchers claiming their role in its origination. In the present work, we are intersted to in silico investigation of natural compounds using different web in silico tools. This study showed a good results.The in silico toxicological effects of natural compounds were predicted and were found to be non-toxic, indicating their potential utility in the development of new drugs.

Keywords: In silico, *in vivo*, *in vitro*, tools, non-toxic, drugs.

Topic F

Master preparation/ Health

ORAL COMMUNICATIONS

PHOTOPROTECTIVE ACTIVITY OF OLIVE MILL WASTEWATER FRACTIONS OF EXTRACT

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Abstract

Oil mill wastewater (OMW) is a major effluent resulting from olive oil extraction which is a great source for the development of new drugs. The present study focuses on the photoprotective activity of seven different fractions separated from OMW extract. The sample was collected from an oil mill in the Blida region (Algeria). A crude ethyl acetate extract was prepared from OMW according to a well-established protocol; the yield of the extract obtained was 4%. From the extract, different fractions were prepared by fractionating the total extract on an open column chromatography. The fractions obtained were subjected to a comparative examination of their photoprotective activity. All the fractions obtained show great photoprotective effects in smaller concentrations. Phytochemical study of the different fractions was assessed by evaluating the total phenolic and flavonoid compounds for all fractions studied as the main compounds found in OMW are phenols like hydroxytyrosol, tyrosol, phenolic acids like caffeic, quinic and ferulic acids which show great therapeutic activities.

Keywords: Olive Mill Wastewater, Fractionation, Phenolic Compounds, Photoprotective Activity, Sun Protection Factor.

SYNTHESIS AND ANTIMICROBIAL ACTIVITY OF NEW B-NITROALDOL QUINOLINE DERIVATIVES

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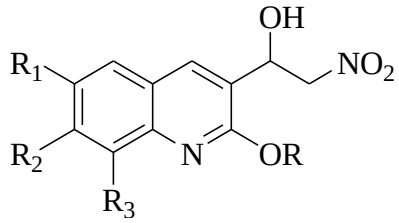
Abstract

The β-nitro alcohol derivatives are frequently used as essential intermediates in the synthesis of bioactive molecules such as (R)-isoproterenol, a potent β-adrenoreceptor, the α1-adrenergic receptor agonist (R)-phenylephrine, core fragments of ritonavir and lopinavir; HIV protease inhibitors. In this work, a new series of β-nitroaldol quinoline derivatives (**4a-4i**) has been synthesized through a Henry reaction. The resulting products were obtained efficiently and rapidly, with good yields. The structures of the compounds were determined through ^{1}H NMR, ^{13}C NMR, FTIR, and mass spectrometry analyses. Anti-microbial properties were evaluated using agar disk diffusion assay against five pathogenic strains, including Gram-negative and Gram-positive bacteria, as well as a fungal strain.

4a-4i



Keywords: Henry reaction, Nitroaldol quinoline, Antimicrobial activity.

EXPLORATION DES PROPRIETES THERAPEUTIQUES DU GINGEMBRE (*ZINGIBER OFFICINALE*) : FOCUS SUR SES ACTIVITES ANTIOXYDANTES ET ANTI-INFLAMMATOIRES

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Résumé

Le gingembre (Zingiber officinale) est une plante herbacée originaire d'Asie tropicale. Il est reconnu pour ses propriétés médicinales, notamment ses effets anti-inflammatoires, antioxydants, antiémétiques et digestifs. L'objectif de cette étude est d'explorer les différentes activités biologiques du gingembre et son potentiel dans le domaine de la médecine et de la santé Activité antioxydante : Le gingembre est riche en composés phénoliques tels que les gingérols et les shogaols, qui sont connus pour leurs propriétés antioxydantes. Ces composés agissent en neutralisant les radicaux libres, qui sont des molécules instables associées au stress oxydatif et à diverses maladies, y compris les maladies cardiovasculaires, le cancer et le vieillissement prématuré. Des études *in vitro* ont montré que les extraits de gingembre peuvent réduire le stress oxydatif en augmentant l'activité des enzymes antioxydantes endogènes la superoxyde dismutase (SOD) et la glutathion peroxydase (GPx). De plus, le gingembre peut protéger les cellules contre les dommages causés par les radicaux libres, ce qui suggère son potentiel dans la prévention et le traitement des maladies liées au stress oxydatif. Activité anti-inflammatoire : Le gingembre présente également des propriétés anti-inflammatoires remarquables. Les composés actifs du gingembre, en particulier les gingérols, ont démontré une capacité à inhiber plusieurs voies inflammatoires, y compris la voie de la cyclooxygénase (COX) et la voie de la lipooxygénase (LOX), qui sont impliquées dans la production de médiateurs inflammatoires tels que les prostaglandines et les leucotriènes. Des études *in vitro* et *in vivo* ont montré que le gingembre peut atténuer l'inflammation dans divers tissus et organes, notamment les articulations, les muscles et le système digestif. Ces effets anti-inflammatoires du gingembre peuvent être bénéfiques dans le traitement de conditions inflammatoires chroniques telles que l'arthrite, la colite et d'autres troubles inflammatoires. En conclusion, le gingembre présente un potentiel thérapeutique significatif en raison de ses activités antioxydantes et anti-inflammatoires. Cependant, des études cliniques supplémentaires sont nécessaires pour confirmer ses effets bénéfiques chez l'homme et pour déterminer les doses optimales et les modes d'administration pour différentes affections

Mot clés: Gingembre (*Zingiber officinale),* Activité antioxydante, Activité anti-inflammatoire, Composés phénoliques, Radicaux libres.

EVALUATION DE L'ACTIVITE ANALGESIQUE ET ANTIPYRETIQUE DES FEUILLES ET D'ECORCE DE *FRAXINUS ANGUSTIFOLIA*

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Résumé :

Au carrefour des disciplines, entre sciences et sciences humaines, l'ethnopharmacologie s'intéresse au savoir traditionnel des populations qui utilisent des plantes médicinales. Ces dernières possèdent des métabolites secondaires dont les composés phénoliques ; elles sont douées de plusieurs activités biologiques telles que l'activité antioxydante, anti-inflammatoire, antipyrétique et analgésique. Ces molécules bioactives font l'objet d'un nombre croissant de recherches, suite à la reconnaissance de leur rôle probable dans la prévention de diverses pathologies tels que les maladies cardio-vasculaires, les cancers, l'athérosclérose et le rhumatisme. Dans ce contexte s'inscrit ce présent travail dont l'objectif essentiel consiste à évaluer l'activité analgésique et antipyrétique des extraits des feuilles et d'écorce de *Fraxinus angustifolia*. L'activité analgésique a été déterminée par l'évaluation de l'inhibition de la douleur provoquée par l'acide acétique qui induit la contorsion abdominale et la plaque chauffante (55°C) en mesurant le temps nécessaire pour le soulèvement des pattes chez la souris et l'activité antipyrétique a été induite par l'induction d'une pyréxie chez les lapins. Les extraits éthanoliques des feuilles et d'écorce ont été testés à 100 et 200 mg/kg par voie orale pour l'activité analgésique et sous-cutanée pour l'antipyrétique. Les effets de l'administration d'acide acétylsalicylique et l'indométacine ont été utilisés comme médicament de références. Les extraits éthanoliques de *Fraxinus angustifolia* (100 et 200 mg/kg) ont inhibé significativement la réponse à la douleur provoquée par l'acide acétique, l'échauffement thermique de la plaque chauffante et l'hyperthermie chez le lapin, ceci de manière dose dépendante. Ces résultats démontrent que les extraits des feuilles et d'écorce de Fraxinus angustifolia possèdent une activité analgésique complémentaire aux activités antioxydants et anti-inflammatoires de cette plante.

Mot clés : *Fraxinus angustifolia*, activité analgésique, composés phénoliques, douleur, l'hyperthermie.

VALORISATION DES SUBSTANCES BIOACTIVES D'ORIGINE VEGETALE EN INDUSTRIE PHARMACEUTIQUE

ETUDE DE CAS: LES BOURGEONS DU PEUPLIER NOIR

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Résumé:

L'Algérie grâce à sa situation géographique et la diversité de son climat, est un pays riche en substances naturelles, l'exploitation anarchique et excessive de ses ressources peut entraîner leur épuisement. En outre, de nombreuses personnes possèdent encore une connaissance remarquable des propriétés curatives ou préventives des plantes médicinales notamment en milieu rural. L'exploitation de ces connaissances présentent un potentiel énergétique considérable. En associant les connaissances sur l'utilisation traditionnelle des plantes, la recherche scientifique sur les constituants actifs et l'exploitation des sources renouvelables des plantes médicinales pourrait être un levier de l'économie nationale. L'objet de notre étude est la valorisation du peuplier noir par les industries pharmaceutiques, l'utilisation des techniques d'écoextraction permettront une meilleure exploitation des molécules bioactives du peuplier noir. L'extrait de *Populus nigra* L. n'a montré aucune toxicité, sur plusieurs modèles cellulaire et animale. De plus l'extrait a révélé un potentiel antioxydant en utilisant plusieurs approches. La caractérisation des composés actifs des bourgeons du peuplier noir a révélé la présence de dérivés d'acides et d'esters cinnamiques, notamment les acides caféique et caféate de cinnamyle, et de flavonoïdes tels que la pinobanksine-3-*O*-acétate, la chrysine, tectochrysine, pinobanksin-5-méthyl éther et kaempférol. Pour une meilleure exploitation des substances bioactives en industrie pharmaceutique, une étude du marché a été réalisée en sélectionnant trois approches, un questionnaire en ligne, une analyse SWOT et un outil incontournable « busines model canevas ».

Mots clés: Peuplier noir, bourgeons, antioxidant, vasorelaxation et analyse SWOT, valorisation.

EXTRACTS OF CISTUS CRETICUS L. FOR A NATURAL APPROACH TO SKIN PHOTOPROTECTION

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Abstract

Excessive exposure to ultraviolet (UV) radiation is a major public health concern, leading to skin damage such as erythema, premature skin aging, and increasing the risks of skin cancers like carcinomas and melanomas. To address this challenge, our study explored natural and sustainable solutions by exploiting plant extracts from Cistus creticus L., a promising species for its photoprotective properties. To achieve this, ultrasound-assisted extraction of biomolecules was performed under optimal conditions. The obtained ethanolic extract of C. creticus was then phytochemically screened, highlighting its richness in phenols, flavonoids, flavonols, and tannins. The evaluation of biological properties was also followed, with the results showing strong antioxidant and anti-inflammatory activities, as well as an appreciable in vitro sun protection factor (SPF). The validation of anti-UV properties was then confirmed through in vivo tests on exposed murine models. These results also highlighted the effectiveness of C. creticus extracts in protecting the skin against UV-induced damage. This research opens promising prospects for natural and sustainable preventive approaches to sun protection and against photo-induced skin damage, thereby contributing to public health protection against the risks associated with UV exposure.

Keywords: Skin, Photoprotection, Anti-UV, SPF, polyphenols

POSTER COMMUNICATIONS

FORMULATION ET EVALUATION DE L'ACTIVITE ANTI-BACTERIENNE D'UNE CREME A BASE D'*INULE VISQUEUSE*

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Résumé

Dans le domaine médical contemporain, la lutte contre les maladies infectieuses reste une priorité majeure. Les antibiotiques ont révolutionné la médecine en offrant des solutions efficaces contre une gamme étendue d'agents pathogènes. En parallèle, l'industrie de la dermocosmétique s'est rapidement développée, offrant une variété de produits pour améliorer la santé et l'apparence de la peau, allant des simples crèmes hydratantes aux formulations complexes ciblant des affections dermatologiques spécifiques. Cependant, malgré leurs avantages dans la gestion des infections cutanées, les produits dermocosmétiques présentent des inconvénients potentiels tels que la toxicité cutanée et les perturbations. Dans le cadre de la promotion de la médecine traditionnelle en Algérie, notre étude vise à développer de nouvelles formulations dermocosmétiques à partir d'une plante nationale appelée Magramane, également connue sous le nom d'I*nule visqueuse*, afin de valoriser la flore locale. La plante a été récoltée dans son habitat naturel, séchée, puis macérée pour être utilisée dans la formulation d'une crème. Cette crème a ensuite été testée pour évaluer son potentiel anti-infectieux in vitro et in vivo. Le produit dermocosmétique élaboré à partir de l'*Inule visqueuse* s'est avéré être stable tant sur le plan organoleptique que physicochimique. L'huile a démontré une capacité inhibitrice de la croissance de la souche de Staphylococcus aureus étudiée, l'agent causal principal de nombreuses infections cutanées. En outre, l'application in vivo de la crème a révélé des effets antibactériens et dermoprotecteurs significatifs chez les souris traitées par rapport au groupe témoin. La crème développée à partir de l'*Inule visqueuse* s'est avérée stable et a démontré de bonnes propriétés anti-bactériennes in vitro et in vivo, ouvrant ainsi la voie à son processus de mise sur le marché en tant que crème antibactérienne innovante.

Mots clés : Plante médicinale, *Inule visqueuse*, activité antibactérienne, dermocosmétique.

FABRICATION D'UN COMPLEMENT ALIMENTAIRE « FIBRE D'ARTICHAUT »

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Résumé

Depuis longtemps, les plantes permettent de répondre aux problématiques posées par la santé de l'être humain, à cause de leurs principes actifs qui sont des composants essentiels d'une grande partie de nos médicaments et nos produits de soin aujourd'hui. Suite à notre étude ethnobotanique qui a été faite durant la période 2011-2016 et qui a révélé l'utilisation de la plante d'artichaut comme un remède dans les troubles digestifs ; notre projet a un caractère de fabrication d'un complément alimentaire à partir des « **FIBRES D'ARTICHAUT ».** La wilaya d'El-Tarif est une zone agricole avec un milieu climatique favorable à la poussée naturelle de la plante d'artichaut, ce qui permet aux familles et en particulier aux femmes rurales de la récolter facilement. Dans ce projet nous avons séparé les fibres de manière scientifique. Les fibres d'artichaut jouent un rôle important, ils offrent une protection puissante au système gastro-intestinal,

- Fibres d'Artichaut sous forme de Gélule
- Fibres d'Artichaut sous forme de poudre (sachet)
- Fibres d'Artichaut sous forme de gouttes
- Fibres d'Artichaut à miel sous forme de gouttes
- Fibres d'Artichaut sous forme de comprimé
- Fibres d'Artichaut sous forme de Micro-granules

Notre activité est dans le but de maintenir la santé de la population, et la réduction de cout d'importation avec une possibilité d'exporter le produit.

Mot clés : Complément alimentaire, Artichaut, Santé, Troubles digestifs.

PROTECTIVE EFFECT OF ZINC AGAINST OXIDATIVE STRESS INDUCED BY POTASSIUM DICHROMATE IN PREGNANT RATS

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Abstract

Among the ubiquitous heavy metals, potassium dichromate (k2Cr2O7) is one of the most toxic forms of Cr VI, causing oxidative stress. Zinc is considered an essential element and is known for its antioxidant properties in living systems. the objective of this investigation was to evaluate the effect of potassium dichromate on biomarkers of oxidative stress and mitochondrial swelling and permeability in adrenal gland and its possible remediation by zinc. 18 pregnant Albino Wistar rats were divided into 3 groups of six each are treated on the 3rd day of gestation by the subcutaneous route, the 1st group is considered as the control, the 2nd group received K2Cr2O7; the 3rd groups received K2Cr2O7 in combination with Zn. On the 20th day of gestation, our main results showed that K2Cr2O7 the increase of of lipid peroxidation and SOD, CAT, GPx and GST activities in adrenal gland mitochondria of pregnant rats. as well as an abrupt increase in mPTP opening which led to mitochondrial swelling. Moreover, the addition of Zinc successfully mitigated the harmful effect of chromium. Our results highlighted the adrenal protective action of Zinc and their ability to modulate the deleterious effects induced by chromium.

Keywords: chromium, zinc, adrenal gland, oxidative stress.

FORMULATION OF A BROWN ANTI -SPOT CREAM MADE FROM ESSENTIAL OIL

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Abstract

Red algae are sea plants largely present in the waters of the Algerian coasts. Rich in fatty acids, minerals and many vitamins, these substances are real candidates who allow to nourish, hydrate and improve the quality of the skin. The optimization of formulation parameters containing red algae essential oil as an active substance combined with other natural additives, made it possible to obtain a stable cream with interesting organoleptic and rheological criteria. The study of the effect of this cream conducted on voluntary individuals with skin problems such as ephelids showed a remarkable reduction in the freckles of their skins.

Keywords: Red algae, Formulation, Ephelids, Rheology.

UTILISATION D'UNE HUILE VEGETALE POUR LA PREPARATION D'UNE CREME COSMETIQUE, LA DETERMINATION DE SES PROPRIETES PHYSICO-CHIMIQUES ET L'ETUDE D'UNE ACTIVITE BIOLOGIQUE

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Résumé

L'usage des plantes à des fins médicales à travers les âges et les différentes cultures a trouvé ses applications. Les plantes médicinales ont constitué les tous premiers médicaments. De nombreux constituants de base de principes actifs issus de la chimie de synthèse proviennent de Plantes. Les plantes ayant des propriétés médicamenteuses peuvent également être employées pour des usages alimentaires, condimentaires, ou encore servir à la préparation de pommades cosmétologie. Dans cette optique, nous nous sommes attelés, dans le cadre de ce travail, à valoriser les plantes médicinales. Nous avons utilisés une huile de base qui est l'huile de lentisque et une huile essentielle qui est l'huile du Romarin pour la préparation d'une crème cosmétique. L'objectif de ce travail est de trouver une formule de base simple pour la préparation d'une crème cosmétique cicatrisante à base de l'huile végétale l'huile de lentisque et de l'huile essentielle du Romarin et d'exploiter ses vertus thérapeutiques, cosmétiques et alimentaires en fabriquant une crème cosmétique à l'échelle de laboratoire de l'université de l'université Chadli Bendjedid. Une extraction de l'huile essentielle a été effectuée avec un rendement de 2.8%. D'autre part un supplément de connaissance a été apporté sur les caractéristiques physico-chimiques de cette crème préparée. Le dosage colorimétrique de Folin-Ciocalteu nous a permis d'avoir une idée sur les variations qualitatives des composés phénoliques précisément les polyphénols totaux. L'activité antioxydante est évaluée en utilisant la méthode du test DPPH. La crème est basée sur d'autres composés oxydants tels l'huile essentielle du Romarin qui a une activité antioxydante importante rajoutée à celle du lentisque ce qui explique l'importance de cette activité biologique.

Mots clés: Huile de lentisque, Romarin, activité biologique.

EFFET DU DIABETE SUR LA FONCTION RENALE

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Résumé

Le diabète type2 représente un problème majeur de santé publique et expose à des complications multiples ; cardiovasculaires, rénales, oculaires, neurologiques. Il s'inscrit le plus souvent dans le syndrome métabolique qui est habituellement associé à une hyperuricémie ainsi qu'une hyper créatinémie. Nous avons mené une étude descriptive et analytique pour déterminer la relation entre le taux de l'urée, la créatinine et le diabète de type 2. Dans le cadre de notre enquête 80 femmes ont été recrutés. Elles étaient répartis en deux groupes ; 40 sujets témoins (non diabétiques et sans hyperuricémie ni hypercréatinimie) et 40 sujets diabétiques de type 2. L'âge de ces femmes était de 20 à 40 ans. Après la réalisation d'un bilan biochimique nous avons noté qu'il y'a une différence hautement significative dans les taux d'urée chez les femmes diabétiques comparativement aux femmes témoins, avec une différence très significative des taux de la créatinine chez les femmes diabétiques vs femmes témoins. L'hyperuricémie et l'hypercréatinimie sont fréquentes dans notre groupe de femmes diabétiques de type 2. Le dosage de l'urée et la créatinine doit être systématique chez les diabétiques, afin d'éviter les complications métaboliques qui lui sont associées.

Mots clés : Femmes, Diabète Type 2, Urée, Créatinine.

ETUDE DE L'IMPACT DE LA MICROENCAPSULATION PAR DES CELLULES DE LEVURE SUR LES COMPOSES PHENOLIQUES ET L'ACTIVITE ANTIOXYDANTE DU PISSENLIT (*TARAXACUM OFFICINALE*)

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Résumé

L'objectif de cette étude était de tester les effets de la microencapsulation à l'aide de cellules de levure Saccharomyces cerevisiae (intactes et plasmolysées) sur les composés phénoliques et l'activité antioxydante du pissenlit (*Taraxacum officinale*). Nous avons examiné l'impact de l'encapsulation sur l'activité antioxydante en utilisant des méthodes spectrophotométriques, et nous avons réalisé une analyse FTIR pour étudier les variations des liaisons et des interactions entre la levure et les extraits. L'activité antioxydante avant et après l'encapsulation a été évaluée à l'aide de deux méthodes, le DPPH et l'ABTS. Les résultats ont montré que l'encapsulation a entraîné une diminution de la concentration des composés phénoliques. Les cellules de levure plasmolysées ont présenté une rétention accrue des polyphénols totaux par rapport aux cellules intactes, tandis que les cellules intactes ont mieux conservé les flavonoïdes et les tanins. L'analyse FTIR a révélé une interaction entre les composés phénoliques et la levure. En ce qui concerne l'activité antioxydante, la méthode DPPH a révélé une diminution de cette activité suite à l'encapsulation, tandis que la méthode ABTS a montré une augmentation de l'activité antioxydante. Ces résultats initiaux offrent des directives pour guider les analyses futures qui cherchent à maximiser les niveaux de composés phénoliques et leurs activités biologiques, et à les employer comme médicaments tout en conservant leur efficacité.

Mots clés: *Taraxacum officinale*, Microencapsulation ,polyphenols, *Saccharomyces cerevisiae*

THE TOXIC ACTIVITY OF *EUCALYPTUS GLOBULUS* ESSENTIAL OIL AGAINST ADULT GERMAN COCKROACHES

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Abstract

Over the past century, there has been significant progress in synthesizing pesticides. Trials using bio-insecticides derived from *Eucalyptus globulus* extracts were conducted to control Blattella germanica. This study investigated the impact of the plant's essential oil on Blattella germanica, a well-established laboratory model. Male and female cockroaches were exposed to the treatment through inhalation. Different concentrations (25%, 50%, 100%) were tested to assess the mortality rate of adult cockroaches. After 7 days of treatment, 100% mortality was observed in both male and female cockroaches. These findings suggest that the essential oil of *Eucalyptus globulus* possesses toxic properties and demonstrates bio-insecticidal effects.

Keywords: *Eucalyptus globulus*, Essential oil, *Blattella germanica*, Mortality, Insecticide.

IMPACT DES ANTIOXYDANTS D'ORIGINE VEGETALES SUR L'HYPERTENSION ARTERIELLE

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Résumé

Le stress oxydatif joue un rôle fondamental dans la physiopathologie de l'hypertension artérielle (HTA) et d'autres maladies cardiovasculaires. Les antioxydants présents dans l'alimentation, notamment d'origine végétale, contribuent à neutraliser les espèces pro-oxydantes. Une alimentation variée favorise un apport adéquat en antioxydants. L'objectif de notre étude est d'évaluer l'effet des vitamines antioxydantes alimentaires d'origine végétale et de la diversité alimentaire sur le développement et la progression de l'HTA. Cette étude a inclus 63 patients hypertendus et 39 témoins. Des mesures de la pression artérielle et des paramètres anthropométriques ont été effectuées. Les apports alimentaires ont été recueillis à l'aide d'un rappel des 24 heures. Nous avons calculé l'Individual Dietary Diversity Score (IDDS). Aucune différence significative n'a été observée concernant l'apport en vitamines antioxydantes et l'IDDS entre les deux groupes. Au sein du groupe hypertendu, l'IDDS était négativement corrélé avec les pressions artérielles systolique et diastolique. L'apport en vitamine E a été négativement corrélé avec la pression artérielle diastolique.. L'apport en bêta-carotène et vitamine E d'origine végétale est significativement corrélé à l'indice de diversité alimentaire. Aucun résultat significatif n'a été trouvé pour la vitamine C et les paramètres anthropométriques. Nos résultats suggèrent que les antioxydants d'origine végétale ne préviennent pas l'apparition de l'HTA. La vitamine C ne semble pas avoir d'effets significatifs sur l'hypertension par rapport aux vitamines liposolubles. Une alimentation diversifiée est essentielle pour un bon apport en antioxydants, ce qui pourrait être bénéfique pour la gestion de l'HTA.

Mots clés : HTA, Pression Artérielle, Antioxydant, Diversité Alimentaire, Végétal, Vitamine E

NO SCARSVET: WOUND HEALING OINTMENT FOR PETS

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Abstract

The development of our medicinal plant-based ointment, which boasts healing, anti-inflammatory, and antibacterial properties, offers an effective solution for treating animal wounds. This innovative product, priced competitively, ensures rapid healing without leaving scars. Our project aims to address the treatment of open wounds, especially in cases of suppuration, post-mastectomy (breast cancer in cats and dogs), and large wounds that cannot be sutured. The ointment achieves this without side effects or chemical ingredients. The in vivo results of wound healing activity showed that the prepared ointment possesses outstanding effectiveness in scar healing compared to a negative control group. Rats treated with the ointment showed significantly faster healing, with scars becoming less prominent and smoother. More uniform and aesthetically pleasing scars marked the improvement. The ointment's anti-inflammatory properties were evident, reducing redness and swelling around the wounds. Importantly, no adverse effects were noted, highlighting the ointment's safety and efficacy. These results underscore the ointment's potential as a reliable treatment for enhancing scar healing and minimizing scar formation.

Keywords: NO SCARSVET, Oointment, *In vivo*, Wound healing.

SYNTHESIS AND CHARACTERIZATION OF NOVEL QUINOLINE EPOXIDES

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Abstract

This research focuses on the efficient synthesis and characterization of novel quinoline epoxide derivatives. Quinolines, a structurally diverse class of heterocycles, have garnered significant attention in various fields due to their valuable properties. The introduction of an epoxide functional group to the quinoline nucleus has emerged as a promising strategy to enhance their reactivity and explore novel applications. We have developed a series of synthetic methodologies to access these quinoline epoxides, employing a combination of classical and modern epoxidation techniques. Our strategies involve the optimization of reaction conditions, catalyst selection, and substrate design to achieve high yields and selectivity. Thorough characterization of the synthesized compounds using spectroscopic techniques, such as NMR and IR spectroscopy, has allowed us to confirm the successful introduction of the epoxide functional group and elucidate their structural features. This research contributes to the expanding knowledge of quinoline derivatives and their potential applications in various fields, including [mention potential applications, e.g., materials science, catalysis, or pharmaceuticals]. The developed synthetic methodologies and characterized compounds provide a valuable foundation for further exploration and innovation in this area.

Keywords: Quinoline, Epoxide ,Epoxidation reactions ,Synthetic methodologie.

INTEREST OF HE4 DOSAGE IN THE EARLY DETECTION OF OVARIAN AND LUNG CANCER IN THE REGION OF EASTERN ALGERIA (BATNA)

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Abstract

Ovarian cancer is the 8 th cause of cancer in women and the 4 th main cause of cancer fatalities in women, accounting for 3,500 deaths in France in 2018. Following an often late diagnosis, it has the lowest prognosis of gynecologic malignancies, with an overall five-year survival rate of roughly 35%. Bronchopulmonary cancer is the first grade of cancer in humans and is a real public health problem because it is the world's first cause of death by neoplasia; these two cancers have serious consequences because their diagnosis is late, whereas early diagnosis of the disease accompanied by effective treatment helps to cure this pathology, with high chances of survival. The aim of our studies is HE4 in the early diagnosis of cancers. This case-control research was conducted on new cases of ovarian and lung cancer in eastern Algeria from December 26, 2021 to May 24, 2022. Our cases included 10 ovarian cancer patients and 19 lung cancer cases with a control group (9 controls for lung cancer and 10 controls for ovarian cancer). "ELICA" electrochemiluminiscence on immunoassay systems was used to analyze HE4, Carcinoembryonic Antigen, and alpha-fetoprotein (Elecsys 2010 and Cobas e 411). (Roche diagnostics, Penzberg, Germany). The increase in HE4 level was significant in lung cases (173.60±31 vs 106.82±48.94) while in ovarian cases it was highly significant (550.85±185.19 pmol/l vs 78.67±18.08 pmol/l), a non-significant increase in CEA level in ovarian cases (1.99±0.91 ng/ml vs. 1.86±0.58 ng/ml) but very significant in lung cases (106.95±69.32 ng/ml vs. 2.45±0.27 ng/ml) as well as a non-significant drop in AFP levels in ovarian instances (3.56±0.83 vs. 4.55±0.70) and lung cases (3.19±0.30 vs. 3.94±0.67).According to this study, HE4 has higher sensitivity and specificity and is a reasonably promising and useful biomarker for ovarian and lung cancer detection. Furthermore, considering the limitations of our investigation, future large- scale and well-designed studies are required.

Keywords: Ovarian cancer, Lung cancer, Human epididymal protein HE4, carcinoembryonic antigen ACE and alpha-fetoprotein AFP.

ETUDE DE L'ACTIVITE ANTIOXYDANTE DU SELENIUM VIS-A-VIS DU STRESS OXYDATIF INDUIT PAR LE CHROME HEXAVALENT DANS LE PLACENTA CHEZ LA RATE

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Résumé

En tant que métal toxique, le chrome a des effets sur les systèmes reproductif et endocrinien. Cette étude visait à évaluer les effets protecteurs du sélénium (Se) contre la toxicité et le stress oxydatif induits par le chrome hexavalent ($K_2Cr_2O_7$) sur le placenta chez des rates gravides *Albinos Wistar*. Nos rates *Wistar* gestantes ont été divisées en trois groupes et recevant les traitements par voie sous-cutanée (SC) au 3^e j de gestation. Le groupe I témoin reçoit le NaCl 0, 9%, le groupe II a reçu le $K_2Cr_2O_7$ (10 mg/kg (pc)) seul, le groupe III était co-traité avec le Se (0,3 mg/kg (pc)) et le $K_2Cr_2O_7$. Au 20^e j, après prélèvement du sang, les rates sont sacrifiées et le placenta a été récupéré. Nos résultats ont montré que l'exposition au $K_2Cr_2O_7$ induit une augmentation significative du taux de malondialdéhyde tissulaire (MDA), du nombre de résorptions fœtales. D'autre part, le $K_2Cr_2O_7$ a réduit de manière significative les paramètres de développement, le poids corporel maternel et du placenta, ainsi que les niveaux de progestérone (P) et d'hormone gonadotrophine chorionique (β HCG) dans le plasma, les activités de la superoxyde dismutase (SOD), de la glutathion peroxydase (GPx). Ces changements ont été confirmés par l'évaluation histopathologique du placenta. Les résultats obtenus ont montré que le $K_2Cr_2O_7$ induit des altérations histologiques au cours de la gestation. Par ailleurs, la supplémentation de Se a atténué les effets toxiques de $K_2Cr_2O_7$. Ces résultats suggèrent que, grâce à leur action antioxydante et chélatrice, le sélénium s'oppose fortement à la cytotoxicité induite par Cr dans le placenta.

Mots clés : Chrome hexavalent, Histopathologie, Stress oxydatif, Placenta, Sélénium.

DEVELOPPEMENT D'EMBALLAGES BIODEGRADABLES ET ANTIOXYDANTS A BASE DE SOURCES VEGETALES : UNE APPROCHE INNOVANTE POUR UN AVENIR DURABLE

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Résumé

La solution optimale pour résoudre les problèmes environnementaux et sanitaires liés aux plastiques traditionnels consiste à exploiter les déchets de plante pour extraire des biopolymères et des activités antioxydantes. Les emballages biodégradables à base d'antioxydants d'origine végétale constituent une alternative prometteuse aux emballages traditionnels en plastique. Ils offrent de nombreux avantages pour l'environnement et la santé, tout en contribuant à la préservation de la biodiversité. Cela permettrait d'utiliser des ressources renouvelables, de réduire les émissions de dioxyde de carbone, d'utiliser des plastiques le plus souvent biodégradables et fonctionnels « possède une activité antioxydante » ; notre objectif est la conception et la caractérisation de biomatériaux fonctionnels fabriqués à partir des sous-produits naturels. Donc notre étude a été menée pour produire un nouveau film biodégradable à partir de matières premières peu coûteuses par une méthode de coulage. Des films composites ont été fabriqués à partir d'amidon et de poudre de marc de café selon différentes proportions Les propriétés physiques, mécaniques, morphologiques et antioxydantes de ces films ont été étudiées. L'incorporation de PMC a augmenté l'épaisseur, la résistance à la traction, les composés phénoliques et les propriétés antioxydantes. L'ajout de marc de café au film composite préparé a conféré des propriétés antioxydantes et antimicrobiennes. qui, lorsqu'elles sont utilisées pour l'emballage des fruits, suggèrent que la fraîcheur des fruits est conservée pendant une période beaucoup plus longue. L'analyse détaillée des aspects économiques de la production du film a montré la faisabilité des films préparés en termes de coût.

Mots clés : emballage, biodégradable, plastique, environnement, valorisation.

EXTRACTION DE LA CAFEINE ET UTILISATION POUR DES APPLICATIONS PHARMACEUTIQUES

-Projet startup-

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Résumé :

Les plantes ont l'avantage d'être constitues d'un éventail de composés potentiels, de structures chimiques variées ayant de nombreuses activités biologiques. Les plantes médicinales restent encore le premier réservoir de nouveaux médicaments. La caféine est un composé chimique naturellement présent dans les constituants de plantes, c'est un psychotrope naturel abondamment consommé. Elle se trouve également dans divers aliments tels que les boissons énergisantes et quelques produits cosmétiques. L'objectif de notre travail était l'extraction de la caféine à partir de déchet du thé et de marc de café, puis son identification et sa caractérisation physicochimique. Dans un second temps, nous nous intéresserons à l'utilisation de ce principe actif dans quelques produits naturels pharmaceutiques. Ces produits naturels contiennent de la caféine qui contribue à augmenter la concentration, le focus et la vigilance. Il assure un booster d'énergie mental ainsi que physique. Ce travail entre dans le cadre d'un projet startup.

Mots clés : Startup, extraction, Caféine

PRODUCTION PILOTE DES POLYSACCHARIDES SULFATES ISSUS DE L'ULVA LACTUCA DANS LA DELIVRANCE DES MEDICAMENTS

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Résumé :

Dans cette étude, nous avons valorisé un biopolymère L'Ulvane extrait à partir d'une algue marine L'Ulva Lactuca, récoltée le mois de mars 2022 à la plage de Fouka marine située à 39 km à l'ouest d'alger, Algerie. Après lavage, séchage et broyage de l'algue, la poudre est macérée dans un mélange de solvants (méthanol : dichlorométhane : eau) (8 :4 :2 en volume) pendant une semaine afin d'extraire tous les pigments. L'Ulvane a été extraite sous reflux dans l'eau à 90°C pendant 3 heures, avec un rendement de 13%. La formation des hydrogels à base de l'ulvane et du chlorure de calcium, et l'encapsulation d'un principe actif antidiabétique 'la Metformine' ont été préparées à des proportions différentes (500 et 850 mg). Nous avons étudié l'influence de la nature du biopolymère sur le profil de la libération du principe actif dans un milieu aqueux, simulant le milieu gastro-intestinal, selon les normes de l'USP (spectrophotométrie UV). Les tests de libération sur les formulations comprenant le PA ont montré que :

- Les vitesses de libération des PA étaient assez courtes dans le milieu acide. Le temps pris pour la libération de plus de 90% de PA était de 1 heure et de 2 heures pour les hydrogels avec 850mg et 500 mg de PA respectivement.
- Le temps de libération diminue avec l'augmentation de la quantité du PA.
- La vitesse de libération devient assez lente seulement quand les hydrogels qui ont été transférés dans le milieu neutre de pH 6,8. Le temps pris par la libération de plus de 90% de PA était de 3 heures.

Mots clés : Hydrogel, Ulvane, ULVA Lactuca, Metformine, Libération du médicament

Democratic and Popular Republic of Algeria
Ministry of Higher Education and Scientific Research
University of BATNA 1

Faculty of Matter Sciences
Department of Chemistry
Laboratory of Chemistry and Environmental Chemistry (LCCE)
Team: Chromatographic Separation, Structural and Biological Analysis of Biomolecules and Natural Antioxidants (CSSBABNA)
Algerian Chemical Society (ACS)
In partnership with the National Union of Pharmacists (SNAPO)

CONFERENCE PROGRAM

2nd National Seminar on Phytochemistry, Pharmacology and Phytotherapy (SNPPP-2)

"Biodiversity at the Service of Start-ups"

BATNA, SEPTEMBER 25-26, 2024

DAY 1

REGISTRATION

Date: 25.09.2024
Algeria Time : 8.00 – 9.00
Location: Auditorium

OPENING CEREMONY AND SPEECHES

Algeria Time: 9.00 –9.30

Dr. Soumia Mouffouk
Chairwoman

***

Prof. Hamada Haba
Dean of the Faculty of Matter Sciences

***

Prof. Abdesslem Dif
Rector of Batna-1 University

PLENARY CONFERENCE

CHAIRS OF SESSION:
Prof. Hamada Haba, Prof. Dibi Ammar and Dr. Mellahi Dhaouadi

9.30-10.30	**Prof. Djebbar Atmani** Medicinal plants' usage: phytochemistry and biological activity

TOPIC A

Extraction and purification of natural compounds (Hall 1)

ORAL COMMUNICATIONS

CHAIRS OF SESSION: Prof. Akkal Salah, Prof. Amara Mourad and Dr. D. Z. Menaceur

Time	Presentation Title	Authors
10:30-10.40	Major compound isolation from *Cinnamomum Zeylanicum bark*, Molecular Docking, DFT and ADME studies.	Aicha Rizi
10.40-10.50	Quantitative analysis by LC-MS/MS and pharmacological evaluation of an endemic geophyte.	Rayene Ouelbani
10:50-11:00	Extraction, GC/MS analysis, and antidiabetic activity study of essential oils from two medicinal plants of southern algeria.	Lanez Elhafnaoui
11:00-11:10	Nouveau monoepoxylignane glucosyle de *Centaurea granatensis.*	Meriem Belaid
11:10-11:20	Extraction, purification et dosage de phlorotanins d'algue brune.	Bouzidi Naima
11:20-11:30	Structural elucidation, anti-inflammatory and antioxidant activities, DFT calculations, and ADMET prediction of phloroacetophenone 4-*O*-β-D-glucopyranoside.	Mouffouk Soumia
11:30-11:40	Optimization of the extraction conditions of the medicinal plant ephedra alata.	Azzouz Abdelhak
11:40-11:50	Optimization of total phenolic extraction in date fruits.	Amel Barkat

11:50-12:00	Effect's study of solvent and extraction time on phenolic compound content of *Nigella sativa*.	Dalia Nafir
12:00-12:10	Phytochemistry and Phytobiology Study of Medicinal Plants: *Pulicaria laciniata* (Cross. et. Kral).	Kamilia Bireche
12.10-12.30	**SCIENTIFIC DEBATE**	

TOPIC B: Oxidative stress and plant-based antioxidants
TOPIC C : Bioactive molecules and microbial infections
(Hall 2)

ORAL COMMUNICATIONS

CHAIRS OF SESSION: Prof. Lanez Touhami, Dr. Chaher Nassima and Dr. S. Boumaraf

Time	Presentation Title	Authors
10:30-10:40	Unraveling the inherent activities of superoxide dismutase and catalase in the different stages of extraction of *P. lentiscus*	Atmani-Kilani Dina
10:40-10:50	Étude comparative et évaluative sur le potentiel antioxydant et anti-inflammatoire d'extraits organiques de Stachys officinalis L. du nord-est de l'Algérie.	Chouikh Fatma Zahra
10:50-11:00	Study of the antioxidant, anti-inflammatory, and antibacterialactivity of methanolic extract of *Moringa oleifera* leaves.	Nouioua Wafa
11:00-11:10	Determination of oxidative stress and antioxidant enzyme activity in wheat.	Ratiba Bousba
11:10-11:20	Innovative techniques for enhanced extraction of essential oils from medicinal plants.	Abdelhak Maghchiche
11:20-11:30	Mise en évidence et caractérisation des substances bioactives, antifongiques à partir des bactéries symbiotiques d'une légumineuse (*Cicer arietinum).*	Dekkiche Samia
11:30-11:40	Évaluation du potentiel anti microbien des extraits foliaires du Gattilier: *Vitex agnus castus* L. de la région de Timimoun.	Dinar Mohamed Ouali
11:40-11:50	Evaluation de quelques activités biologiques d'*Atriplex halimus L*.	Rahma Guemmaz
11:50-12:00	Study of secondary metabolites of plant from the genus *Anabasis* (Chenopodiaceae).	Kherchouche Amina
12:00-12:30	**SCIENTIFIC DEBATE**	
12:30-14:00	**LUNCH BREAK**	

THEMATIC CONFERENCES (Hall 1)

CHAIRS OF SESSION: Prof. Atmani Djebbar, Prof. Benbellat Noura and Dr. A. Mouhamdi

14:00-14:30	**Dr. Chabani Sonia** Composition chimique et activités biologiques des espèces d'*Atractylis* en Algérie.

TOPIC D
Pharmacological interests of medicinal plants (Hall 1)

ORAL COMMUNICATIONS

CHAIRS OF SESSION: Dr. Mouffouk Chaima, Dr. Smadi Abla and Dr. Allaoua Zina

Time	Presentation Title	Authors
14:30-14:40	Antidiabetic activity of flavonoid-rich fractions of *Salvia rosmarinus* Spenn: (*Rosmarinus officinalis* L.) In normal and diabetic mice.	Messaoud Belmouhoub
14:40-14:50	ADME/T analysis, molecular docking investigations, anti-inflammatory and antipyretic effects of some saponins isolated from the species *Scabiosa stellata*	Mouffouk Chaima

14:50-15:00	Investigation of the anti-inflammatory activity via *in vitro* and *in vivo* approaches	Asma Abid
15:00-15:10	Exploring the therapeutic properties present in *Quercus ilex.*	Hadidi Lila
15:10-15:20	Anti-inflammatory and analgesic activity of ethanolic extract of propolis.	Nada Zabaiou
15:20-15:30	Evaluation de la toxicité aiguë et étude de l'effet gastro protecteur de *Crataegus laciniata.*	Nassima Chaher-Bazizi
15:30-15:40	Evaluation de l'activité hémostatique d'une plante médicinale de la famille Zygophyllaceae.	Benderradji Rima
15:40-15:50	Evaluation de l'activite antidiabetique de l'huile des noyaux de dattes algériennes (*Phoenix dactilifera*) comparativement à celle la metformine chez le rat rendu diabetique.	Bendiaf Youcef
15:50-16:00	**SCIENTIFIC DEBATE**	
16:00-16:30	**COFFEE BREAK AND POSTER COMMUNICATIONS (SESSION 1)**	

TOPIC E : From bioactive molecule to drug

TOPIC F : Master preparation/Health

(Hall 2)

CHAIRS OF SESSION: Prof. Bitam Fatma, Dr. Mouffouk Soumia and Fatiha Guenfoud

ORAL COMMUNICATIONS

Time	Presentation Title	Authors
14:30-14:40	Valorisation des substances bioactives d'origine vegetale en industrie pharmaceutique (Etude de cas: les bourgeons du peuplier noir).	Nadjet Debbache-Benaida
14:40-14:50	Extracts of Cistus creticus L: for a Natural Approach to Skin Photoprotection	Rafik Marir
14:50-15:00	Exploration des propriétés thérapeutiques du gingembre (*Zingiber officinale*) : Focus sur ses activités antioxydantes et anti-inflammatoires.	Halmi Sihem
15:00-15:10	Photoprotective activity of Olive mill wastewater fractions of extract	Chahinez Ait Si Said
15:10-15:20	Application and synthesis of a new hybrid heterocyclic derivative based on quinoléine with biological evaluation.	Ait Belkacem Amira
15:20-15:30	Extraction d'un principe actif naturel et évaluation de son activité antifongique sur un agent pathogène responsable de la pourriture sèche des agrumes. Étude insilico DFT; Docking moléculaire et ADME.	Anissa Acidi
15:30-15:40	Synthesis of pH-Thermosensitive Nanoparticles As Drug Delivery System Based on Biopolymers.	Derbali Abir
15:40-15:50	Evaluation de l'activité analgésique et antipyrétique des feuilles et d'écorce de *Fraxinus angustifolia.*	Kenza Moulaoui
15:50-16:00	Synthesis and antimicrobial activity of new β-Nitroaldol Quinoline Derivatives.	Fatiha Guenfoud
16:00-16:10	**SCIENTIFIC DEBATE**	
16:10-16:30	**COFFEE BREAK AND POSTER COMMUNICATIONS (SESSION 1)**	

DAY 2

THEMATIC CONFERENCES

CHAIRS OF SESSION: Prof. Bechki Lazhar, Prof. Flilissa Abdenacer and Dr. Chabani Sonia

8:30-9:00	**Prof. Amar Zellagui** Natural products: promising source of anticancer drugs: the case of some Algerian plants
9:00-10:00	**GENERAL ASSEMBLY OF THE ALGERIAN CHEMISTRY SOCIETY (SAC)**
10:00-10.30	**COFFEE BREAK AND** **POSTER COMMUNICATIONS (SESSION 2)**
10:30- 12:00	**WORKSHOPS**
Prof. Hamada Haba and Dr. Soumia Mouffouk (Lab 1) **Workshop 1:** Extraction, fractionation, and isolation of natural compounds.	
Dr. Chaima Mouffouk and Dr. Bouaoun Oussama (Lab 2) **Workshop 2:** Formulation and preparation of cold cream (Galen's Cerate Formula).	
Dr. Messaoud Hachemi and Bahri Laid (Lab 3) **Workshop 3:** Animal models and experimental assays.	
12:00-12:30	**CLOSING CEREMONY**
12:30-13:30	**LUNCH BREAK**

Poster Communications

SESSION 1 (25-09-2024)

TOPIC A : Extraction and purification of natural compounds

P-1	Phytochemical study and valorization of the essential oil extracted from Genus *Apium Graveolens* L cultivated In Eastern Algeria.	Abdelkader Djouamaa
P-2	Composition et caracterisation chimique de la plante *Rhamnus alaternus* L.	Aichour Samira
P-3	Microwave assisted hydrodistillation of *Carum carvi* L. essential oil.	Assami Karim
P-4	Chemical analysis and in vitro, some biological effects of the endemic plant from algeria *Thymus algeriensis.*	Benabdallah Fatima Zohra
P-5	Extraction, separation and purification of bioactive compounds from Algerian plant.	Benchadi Wassila

P-6	Isolation and identification of natural flavonone from *Santolina chamaecyparissus* methanolic extract.	Chahra Boudoukha
P-7	Chemical composition, antioxidant activity of the aerial parts of *Cytisus purgans* Subsp. Balansae (Boiss).	Badra Bouzghaia
P-8	Composition en acide gras de six cultivars d'Arachide (*Arachis hypogea* L.) locaux	Harrat Mohamed
P-9	Extrait polaire de *Cerastium holosteum* (Caryophyllaceae) : Analyse HPLC, activites antioxydantes et contenu bioactif.	Allaoua Zina
P-10	Les acides phénoliques isolés de la plante médicinale: *Thymus algeriensis.*	Mokhtari Mouna
P-11	Phytochemical screening of the species *Malope malacoides* L.	Bekache Nour El Houda
P-12	Flavonoïdes de l'espèce endémique *Vicia onobrychioides.*	Belahssini Fatima
P-13	Natural substances from *Eryngium* species grows in Algeria.	Djebara Amira
P-14	Polyphenols from the species *Convolvulus cantabrica* L. (Convolvulaceae).	Mahdadi Khaled Ben Elwalid
P-15	Phytochemical study of various extracts from a halophytic Algerian plant.	Abdelbasset Tamersit
P-16	DPPH Radical scavenging effects of crude extracts prepared from a medicinal plant belonging to the family FABACEAE.	Hazine Kenza
P-17	Biomolecules from the species *Phillyrea angistifolia.*	Djouhaina Makhlouf
TOPIC B: Oxidative stress and plant-based antioxidants		
P-18	Thymol's therapeutic potential in ccl4-intoxicated rats: effects on transaminase activities and oxidative stress.	Khither Hanane
P-19	Evaluation of anti-inflammatory, anti-hemolytic and free radical-scavenging activities of the aqueous extract of *Capparis spinosa* leaves.	Kernouf Nassima
P-20	Mitigation of pesticide hepatotoxicity by *Rosmarinus officinalis* essential oil in rats.	Amira Messaadia
P-21	Phytochemical screening and evaluation in vitro of antioxidant activity of ethanolic extract from red grapes fruit.	Barghout Nihed
P-22	Investigation of essential oil extraction, gc/ms evaluation, and assessment of antioxidant properties in two medicinal plant species indigenous to Southern Algeria.	Benamor Mohmmed Larbi
P-23	Etude comparative de l'activité antioxydante de l'huile essentielle de Cinnamomum Zeylanicum (avant et après son adsorption sur un matériau naturel (argile).	Sabour Smain
P-24	Phragmites australis leaf aqueous extract as a reducing and capping agent for Cu NPs synthesis for antioxidant activity.	Ahlem Frahtia
P-25	Study of the radical scavenging properties of *Salvia rosmarinus* essential oils.	Zegrir Anfal
P-26	Evaluation of phenolic and flavonoid content and the antioxidant activity of n-butanol extract of an endemic Algerian *Ficus*.	Aida Kemmoundji
P-27	Extraction et évaluation de l'activité antioxydante de l'extrait éthanolique des fleurs de l'espèce *Moringa oleifera.*	Nada Hiba Boukoucha
P-28	Chemical caracterization and biological activities of a new plant-based rennet.	Mouffouk Nada Aicha
TOPIC C : Bioactive molecules and microbial infections		
P-29	Polyphenol contents, antioxidant and antimicrobial activities of *Punica granatum* peel extracts.	Farida Belkhiri
P-30	Phenolic composition, antimicrobial activity of M. alysson.	Naima Benkiki
P-31	Synthèse et evaluation biologique de nouveaux dérivés des pyrimidines analogues à la curcumine.	Fath Eddine Boukhallout
P-32	Characterization of silver carbonate nanoparticles biosynthesized using marine actinobacteria and exploring of their antimicrobial and antibiofilm activity.	Ghoummid Sirine
P-33	Investigation of the inhibitory effect of Naringenin against the *Klebsiella pneumonia* Carbapenemase NDM *In vitro* and *in silico.*	Houchi Selma
P-34	Antibacterial activity of *Tetraclinis articulata* essential oil and its nanoemulsion.	Rania Larouci
P-35	In Silico Investigation of Horse Chestnut Tree B-aescin Targeting Five of SARS-CoV-2 Variants.	Ilyes Zatla
P-36	A comparative study of the antimicrobial effect of extracts from *Thymelaea microphylla*.	Aissaoui Abir
P-37	Antibacterial and antifungal activity evaluation of novel substituted imidazo-pyrimidine and	Youmbai Rabia

	imidazo-purine derivatives.	
P-38	Etude de l'activité antibactérienne (in vitro) de l'huile essentielle de *Thymus algeriensis* Boiss. & Reut.	Bouali Asma
P-39	Évaluation de la résistance aux antibiotiques chez les entérobactéries isolées des cafards hospitaliers.	Ben Djaballah Wafa
TOPIC D: Pharmacological interests of medicinal plants		
P-40	Investigation de l'activité anti-urolithiatique et antioxydante de l'extrait méthanolique d'*Atriplex halimus.*	Afaf Benhouda
P-41	Contribution to the evaluation of the anti-diabetic activity of roots bark extracts of *Capparis spinosa* L.	Asma Meddour
P-42	*In vivo* anti-inflammatory and analgesic effects of ethanolic extract from hawthorn fruit.	Assia Bentahar
P-43	*In vitro* apoptosis induced mitochondrial dysfunction and cytotoxic effect of isocostic acide isolated from Algerian *Dittrichia viscosa* (L.) Greuter.	Souheir Bensari
P-44	Etude de l'effet détoxifiant de la plante médicinale *Atriplex halimus* chez le lapin *Oryctolagus cuniculus*.L traité par un herbicide sélectif de la famille des triazinones.	Benzazia Samia
P-45	Phytochemical investigation and evaluation of salivary α-amylase inhibitory activity of *Glycyrrhiza glabra* extract.	Aridj Boubrima
P-46	Ameliorative effects of natural antioxidant against blood and cardiovascular toxicity of oral subchronic exposure to organic solvent.	Djemil Randa
P-47	The impact of a pesticide (vertin) on the behavior of rats of the wistar strain treated with ginger.	Chouba Ibtissem
P-48	Etude de l'activité anti-inflammatoire de l'extrait méthanolique de la plante *Atriplex halimus* L in vitro et in vivo.	Kada Seoussen
P-49	Anti-inflammatory and free-radical-scavenging activities of methanol extract of *Cytisus sp.* from Algeria	Nassima Boubekri
P-50	Effet protecteur de feuilles de *Fraxinus angustifolia* contre la peroxydation lipidique, induite par le tétrachlorure de carbone (CCl4), *in vivo.*	Nassima Cheraft-Bahloul
TOPIC E : From bioactive molecule to drug		
P-51	Synthesis and characterization of Nifuroxazide and ascorbic acid eutectic mixture.	Chaib Bouchra
P-52	In-silico investigation of natural compounds.	Hasna Ghanem
P-53	In silico drug design: A computational analysis of heterocyclic compounds	Ahlem Belkadi
P-54	DFT computations and anti-proliferative relationship studies of 2-imino-4-thiazolidinone derivatives	Khaoula Kouchkar
P-55	Formulation d'une suspension anti-reflux à base d'alginate de sodium et de chitosane, générique de la suspension orale GAVISCON®.	Linda Belhadji
TOPIC F : Master preparation/Health		
P-56	Synthesis and characterization of novel quinoline epoxides.	Rahima Khelaf
P-57	Etude de l'impact de la microencapsulation par des cellules de levure sur les composés phénoliques et l'activité antioxydante du pissenlit (*Taraxacum officinale*).	Imen Laib
P-58	The toxic activity of *Eucalyptus globulus* essential oil against adult German cockroaches.	Malika Saidi

P-59	Fabrication d'un complément alimentaire « FIBRE D'ARTICHAUT ».	Boughrara Boudjema
P-60	Formulation of a brown anti -spot cream made from essential oil.	Djedri-Bani.S
P-61	Utilisation d'une huile végétale pour la préparation d'une crème cosmétique, la détermination de ses propriétés physico-chimiques et l'étude d'une activité biologique.	Djelloul Mokrani Karima
P-62	Effet du diabète sur la fonction rénale.	Hamri Ahlem
P-63	Interest of HE4 dosage in the early detection of ovarian and lung cancer in the region of Eastern Algeria (Batna).	Sara Mouffouk
P-64	Extraction de la caféine et utilisation pour des applications pharmaceutiques **-Projet startup-**	Smadi Abla

SESSION 2 (26-09-2024)

TOPIC A : Extraction and purification of natural compounds

P-1	Pentacyclic triterpenes from *Centaurea granatensis.*	Belaid Meriem
P-2	Phytochemical study of crude extract prepared from an Algerian medicinal plant.	Abdelbasset Tamersit
P-3	Phytochemical study and chemical compositions of a medicinal species.	Djouhaina Makhlouf
P-4	Chemical compostion and antioxidant activity of the ethyl acetate extract prepared from a medicinal plant.	Hazine Kenza
P-5	Aperçu sur la composition phytochimique et les activités biologiques *d'Argania spinosa* L. Skeels.	Fatima Zohra Khiat
P-6	Extraction, purification et dosage des stérols dans des algues marines.	Gasmi Kamilia
P-7	Antioxidant activity and flavonoids of ethyl acetate extract of *Athamanta* species.	Boubertakh Hadjer
P-8	Optimisation de l'extraction assistée par ultrasons des polyphénols des feuilles de *Clematis flammula.*	Lydia Karou
P-9	Comparative analysis of phenolic profile and antioxidant activity in Crataegus laciniata fruit extracts using different extraction methods.	Naima Saidene
P-10	Essential oil composition, and evaluation of the total phenol and flavonoid content of the aerial parts of an Algerian plant of the Lamiacea family.	Nourelhouda Benelmufti
P-11	Bioactive polyphenols from *Juniperus oxycedrus* aerial parts: Quantification, identification, and antioxidant activity.	Messalem Rofaida

TOPIC B: Oxidative stress and plant-based antioxidants

P-12	Total phenolic, total flavonoid contents and antioxidant activity of *Inula viscosa.*	Nadjat Azzi
P-13	*In vitro* antioxidant activity of methanolic extract and decoction of medicinal plant seeds.	Douffa Younes
p-14	Evaluation biologiques des alcaloides d'une plante medcinale locale à l'egard du stress oxydatif.	Fatma Lynda Ouamar
P-15	Study of metribuzin toxicity-induced infertility and testis oxidative stress: an antidote activity of *Ocimum basilicum* L. aqueous extract.	Boulaares Islam
P-16	*In vitro* free radical scavenging activities of different organic fractions of the aerial part of the *Erodium* plant in relation to the total content of phenolic compounds and flavonoids.	Ounissi Ismahan
P-17	Évaluation de l'activité antioxydante des composés phénoliques du mil cultivé (*Pennisetum glaucum* (L) R .Br) dans la région d'Ain Salh.	Miloudi Kaouthar
P-18	Propriétés antioxydantes du caroube : une arme naturelle contre le stress oxydatif.	Bougriou Nada
P-19	Determination of the antioxidant activity of VLC fractions of *Genista* sp aerial parts using DPPH assay.	Bradai Nesrine
P-20	Total phenolic contents and antioxidant activities of *Anethum* species growing in Setif region (Algeria).	Nour El Houda Belabas

P-21	The antioxidant activity of a medicinal plant from Khenchela region.	Bouaita Rayen
P-22	Chemical screening, H_2O_2 scavenging and total antoxidant capacity of *Polianthes tuberosa* L. extract.	Djidel Saliha
TOPIC C : Bioactive molecules and microbial infections		
P-23	Activités antimicrobiennes des extraits organiques et aqueux de *Anabasis oropediorum* Maire.	Bouchra Zeghoudi
P-24	Antibacterial and antifungal properties of pyrrolo-imidazole derivatives.	Adaika Chaima
P-25	Study of the physicochemical properties and antimicrobial activity of a honey from the Annaba region.	Cheriet Dahbia
P-26	Anti-microbial properties of *Pistacia lentiscus* L. Fruit extract.	Kadi Radia
P-27	Isolation, Enumeration, and characterization of traditionally fermented olive microorganisms.	Keltoum Babouche
P-28	Developing of a novel antibacterial polymer: polyglycidyl methacrylate grafting onto polyvinyl chloride and modified by AgNPs.	Hamoudi Lamraoui
P-29	Extraction of Myristica fragrans essential oil and screening of its antioxidant and antimicrobial activity against six food-related microorganisms.	Mohamed Reda Zahi
P-30	Chemical composition and in vitro antimicrobial activity of syzygium aromaticum essential oil.	Nesrine Issaad
P-31	Evaluation of the antimicrobial activity of extracts from a plant of the Lamiaceae family.	Bendaas Ridha
P-32	Examen de l'effet combine des differentes varietes de miel d'algerie sur les proprietes antimicrobiennes.	Siad Nacira
TOPIC D: Pharmacological interests of medicinal plants		
P-33	Botanical Safeguards for Pancreatic Beta Cells: Investigating the Protective Potential of Medicinal Plant Compounds against Apoptosis.	Anfel Benmanseur
P-34	Determination of sun protection factor (SPF) of hydro alcoholic ultrasonic extraction of medicinal plants in Batna region (Algeria).	Hachemi Messaoud
P-35	Liver Dysfunction and Oxidative Stress in Diclofenac-Induced Toxicity: Protective Role of methanol extract of *Cytisus sp.* from Algeria.	Keltoum Boudraa
P-36	In vitro inhibition study of Salvia rosmarinus essential oil from the Laghouat region against Candida rugosa lipase: treating obesity.	Khadidja Bengana
P-37	Hypoglycemic **activity of *n*-butanolic extract from** *Cistus albidus* **L.** against *Streptozotocin*-induced diabetes.	Nabil Ghedadba
P-38	Evaluation de quelques activités biologiques des huiles essentielles du cypres.	Ayachi Nabila
P-39	Etude phytochimique et évaluation de l'effet thérapeutique de la plante médicinale *Rhamnus alaternus* L. chez les rats exposés aux nanoparticules d'oxyde d'aluminium	Mellahi Lamia
P-40	In vitro evaluation of the anti-inflammatory and anti-hemolytic effects of the hydro-methanolic extract of Moringa oleifera seeds.	Rahoui Walid
TOPIC E : From bioactive molecule to drug		
P-41	Evaluating antimicrobial effectiveness in antitranspiration cream formulation.	Hanfoug Khaled
P-42	Conception d'un traitement anti hémorroïdaire.	Merouani Amani
P-43	Amélioration de la biodisponibilité de la curcumine grâce aux nanogels polymériques : Une perspective en pharmacotoxicologie.	Benkacimi Manel
P-44	*In-vitro study of Morus alba* leaves extracts as potential α-glucosdase, α -amylase inhibitors for the management of type-2 diabetes.	Chaouki Athmani
P-45	*In silico* structure-based screening of natural product chemical library to identify novel potential anti-cancer.	Ouafa Meziani

P-46	DFT and molecular docking study of some cancer cell inhibitors.	Rania Bouraoui
P-47	Molecular docking examination of anti-Parkinson's property of some reported pectolinarin derivatives: From bioactive phytochemicals to lead compounds.	Zeyneb Benramdane
TOPIC F : Master preparation/Health		
P-48	Production pilote des polysaccharides sulfatés issus de l'ULVA LACTUCA dans la délivrance des médicaments.	Zakia Zeffouni
P-49	Formulation et évaluation de l'activité anti-bactérienne d'une crème à base d'Inule visqueuse.	Amarni Meriem
P-50	Impact Des Antioxydants D'origine Végétales Sur L'hypertension Artérielle.	Meziane Daniela
P-51	Etude de l'activite antioxydante du selenium vis-a-vis du stress oxydatif induit par le chrome hexavalent dans le placenta chez la rate.	Saouli Asma
P-52	Développement d'emballages biodégradables et antioxydants à base de sources végétales : une approche innovante pour un avenir durable.	Torche Assala
P-53	No scarsvet: wound healing ointment for pets.	Nour Elhouda Djaballah
P-54	Protective effect of zinc against oxidative stress induced by potassium dichromate in pregnant rats.	Brahmi Fatima
P-55	Sesquiterpenes isolated from *Centaurea dissecta* Ten.	Sonia Chabani