



وزارة التعليم العالي و البحث العلمي

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Ministry of higher education
and scientific research

UNIVERSITY M'HAMED BOUGARA-BOUMERDES

Faculty of Sciences
Department of Biology

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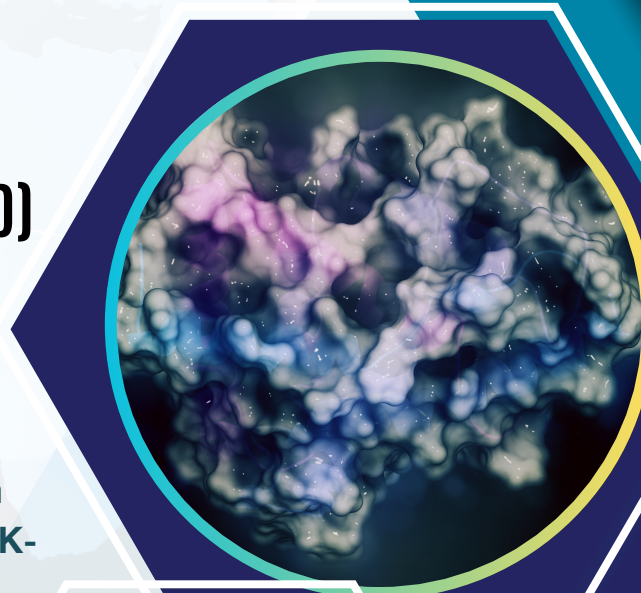
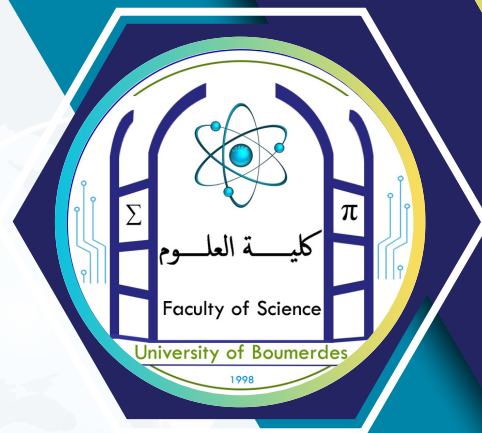
THE 1ST NATIONAL SEMINAR ON
BIOMOLECULES AND HEALTH (HYBRID)

EDITORS

Narimen BENHABYLES BOUTTABA -Sarah
BOUMAIZA HAMLADJI- Ouahiba BOUCHENAK-
Nourelhouda GHOZALI, Abdelhakim DAOUI.

CHAIRWOMAN OF NSBH'25

Narimen BENHABYLES BOUTTABA



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Preface

THE 1ST NATIONAL SEMINAR ON BIOMOLECULES AND HEALTH (HYBRID)



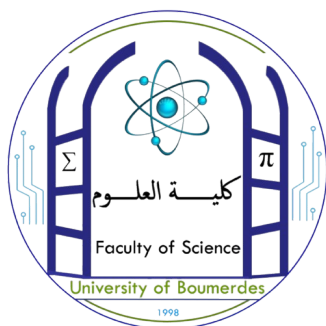
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EDITORS

- 1.Narimen BENHABYLES BOUTTABA
- 2.Sarah BOUMAZA HAMLADJI
- 3.Ouahiba BOUCHENAK
- 4.Nourelhouda GHOZALI
- 5.ABDELHAKIM Daoui

CHAIRWOMAN OF NSBH'25

Narimen BENHABYLES BOUTTABA

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nsbh@univ-boumerdes.dz

Seminar chairs

CHAIRWOMAN OF NSBH'25

Narimen BENHABYLES BOUTTABA

ORGANIZING COMMITTEE PREIDENT

Sarah BOUMAZA HAMLADJI

SCIENTIFIC COMMITTEE PREIDENT

Ouahiba BOUCHENAK

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nsbh@univ-boumerdes.dz

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Objectives of the seminar

While herbal medicine is gaining significant global attention, it cannot merely be regarded as a trend. Our era is profoundly influenced by the pursuit of a healthier lifestyle, a return to nature, and essential values. However, the success of phytotherapy is largely due to the level of technical and scientific mastery achieved in this field. Advancements in agronomy, chemistry, and pharmacology have allowed for the development of safer, more suitable, and effective therapeutic and galenic forms.

Algeria, with its diverse climate, soils, and geology, boasts a particularly rich flora of medicinal and aromatic plants. Traditional medicine remains widely practiced, with several herbal remedies, either individually or in combination, recommended for treating illnesses. The work of ethnopharmacologists highlights the growing success of ancient pharmacopoeias as part of a global "green wave," emerging as an alternative to chemical medicine. This approach has also been embraced by the pharmaceutical industry for the extraction of active principles from medicinal plants, providing a foundation for innovation in the development of new medicines. This method not only accelerates research and development but also ensures that these plant-derived medicines are administered in forms that optimize efficacy while minimizing the side effects often associated with synthetic medications.

Plant-based medicines are composed of a "complex" of molecules derived from one or more plant species. Today, various galenic forms—some more innovative than others—are available, making the traditional infusion seem somewhat outdated. However, changes in these forms can sometimes alter their effect on metabolism or the bioavailability of active principles. Thanks to modern manufacturing and Analytical techniques, alongside interdisciplinary collaboration, phytotherapy is poised for brilliant progression.

This scientific meeting aims to promote biomolecules derived from medicinal plants and their application in biological, pharmacological, and pharmaceutical fields.

Topics

Topic 1: Applications of biomolecules in the pharmaceutical industry.

Topic 2: Biological and pharmacological valorization of biomolecules in health.

Topic 3: biomolecules in nutrition.

Topic 4: Innovations in biomolecules and nanotechnology.

Topic 5: Role of biomolecules in addressing antibiotic resistance

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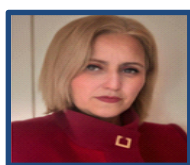
Dr. Benhabyles Bouttaba Narimen Holds a PhD in Biological Sciences, specialising in Physiology, Physiopathology and Genomics, from Houari Boumediene University of Science and Technology. She is a Class A Senior Lecturer in the Faculty of Science, Department of Biology, at M'hamed Bougara University in Boumerdes. She is responsible for the molecular biology licence and genetics master's degree programmes and is a member of the scientific committee of the Biology Department. Dr Benhabyles is a member of the Bioinformatics, Applied Microbiology and Biomolecules Research Laboratory (LBMA), Biomolecules team, and was previously a member of the research team at the Biological Resources Valorisation Laboratory (VALCOR). Dr Benhabyles Narimen's field of research is phytochemistry and the valorisation of bioactive molecules in the therapeutic field. Her various research projects have resulted in national and international publications, around 20 papers and the completion of a CNEPRU research project and two PRFU research projects, one of which she is the team leader.

<https://www.researchgate.net/requests/h63b85e6c2b3e4da6d009bfd0?openDialog=1>

<https://scholar.google.com/citations?user=QiPXQicAAAAJ&hl=fr>

Citations : 94, indice H : 5.

ORCID ID : [0009-0001-1052-2318](https://orcid.org/0009-0001-1052-2318)



Pr. Bouchenak Arab Ouahiba Professor at the University of Boumerdès, she is a teacher-researcher specializing in animal physiology, with particular expertise in endocrinology. With a rich scientific background and solid experience in higher education, she dedicates her work to the study of biomolecules and their impacts on health.

From 2020 to 2024, she led the BMAB laboratory, which she helped to energize thru a multidisciplinary approach combining fundamental research and biomedical applications.

Team leader and author of numerous scientific articles published in specialized journals, she is committed to promoting rigorous, innovative research that is open to contemporary issues in biology and health sciences. Her work is part of an approach aimed at linking fundamental biological mechanisms to public health issues, while training the next generation of researchers.

ResearchGate: <https://www.researchgate.net/profile/Bouchenak-Ouahiba>



Dr. Boumaza Hamladji Sarah is a Senior Lecturer (Maître de conférences A) at the Faculty of Science, University of Boumerdès, where she teaches and supervises research within the Laboratory of Bioinformatics, Applied Microbiology and Biomolecules, as part of the “Biomolecules and Health” research team. She holds an Engineering degree in Biological Engineering from the University of Boumerdès, a Master’s degree in Neurobiology – specialization in Neuropsychopharmacology from Université Segalen Bordeaux II (France), and a PhD in Ecology of Vector Systems from the University of Boumerdès. Her scientific work focuses on the valorization of natural biomolecules and the study of their biological effects. Her research adopts an interdisciplinary approach at the crossroads of microbiology, phytochemistry, and environmental health, with a particular interest in medicinal plants, their antimicrobial and antioxidant properties, and their potential applications in public health.

ResearchGate: https://www.researchgate.net/profile/S-Boumaza?ev=hdr_xprf



Pr. Kebbouche-Gana Salima is a Full Professor with 25 years of experience at Université M'hamed Bougara de Boumerdes, specializing in biotechnology, industrial microbiology, and extremophiles. She served as a Senior Researcher and team leader at the Valorization and Conservation of Biological Resources (VALCOR) Laboratory from 2009 to 2018 and currently directs the Bioinformatics, Applied Microbiology, and Biomolecules Research Laboratory (BMAB). From 2016 to 2024, she held the position of Vice-Rector for Development and Strategic Orientation at the university. Additionally, she chaired the Scientific Council of the Faculty of Sciences from 2014 to 2016, led the Agronomy Department from 2012 to 2014, and served as Deputy Head of Biology from 2003 to 2011. Pr. Kebbouche-Gana has significant experience in international cooperation projects, especially between UMBB and the Walloon Region (U.L.B. Brussels) and University of Alberta. She has acted as Project Leader for a PNR project with MERS and has participated in nine CNEPRU and PRFU projects. She has supervised 16 PhD students and has an impressive scientific output, including one book, two book chapters, and 68 publications in both international and national journals.

Email: s.ganakebbouche@univ-boumerdes.dz - WhatsApp Number: 00213771251839

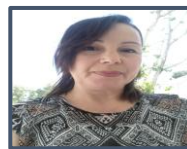
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- ✓ ORCID ID : <https://orcid.org/0000-0001-5263-2999>
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- ✓ Scopus Author ID: 56527412100
- ✓ Web of Science ResearcherID: R-7906-2019.
- ✓ https://scholar.google.com/citations?user=8j-Z_v8AAAAJ&hl=fr –

Citation : 1159 ; Citations : indice H : 19, Indice i10 : 23

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Pr. Bitam Idir is a Specialist in Transmissible Diseases and Emerging Tropical Pathologies. President CPNE-SNV National Council for Scientific Research and Technologies, An organ of the Presidency of the Republic. Founding member of the Scientific Council of African Research Founding member of the Algerian Association for Environmental Heritage and Human Development



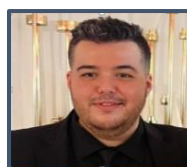
Pr. Bendali Farida is a professor in Microbiology at the Applied Microbiology Laboratory, Natural and Life Sciences Faculty, Bejaia University. She got a "DEUA" in "Quality Control and Food Analyses" in 1993, Ingenier Diplôme in Quality Control and Analyses in 2000 and a PhD on Microbiology in 2003. All from Bejaia University. She has 35 publications, more than 50 conferences papers and one book chapter. She supervised 18 theses and was member of 6 scientific projects (CNEPRU, PRFU, AND) and chief of 3 of theme. She had also coordinated an Algerian-Tunisian project. She was a vice-Dean in charge of postgraduate studies, Scientific Research and Foreign exchanges for 10 years (2012-2022). She is the head of the group "Microbial Interactions, Biofilms and Probiotics". Her scientific interests are on lactic acid bacteria, probiotics, prebiotics and antimicrobials from Microorganisms and plants.



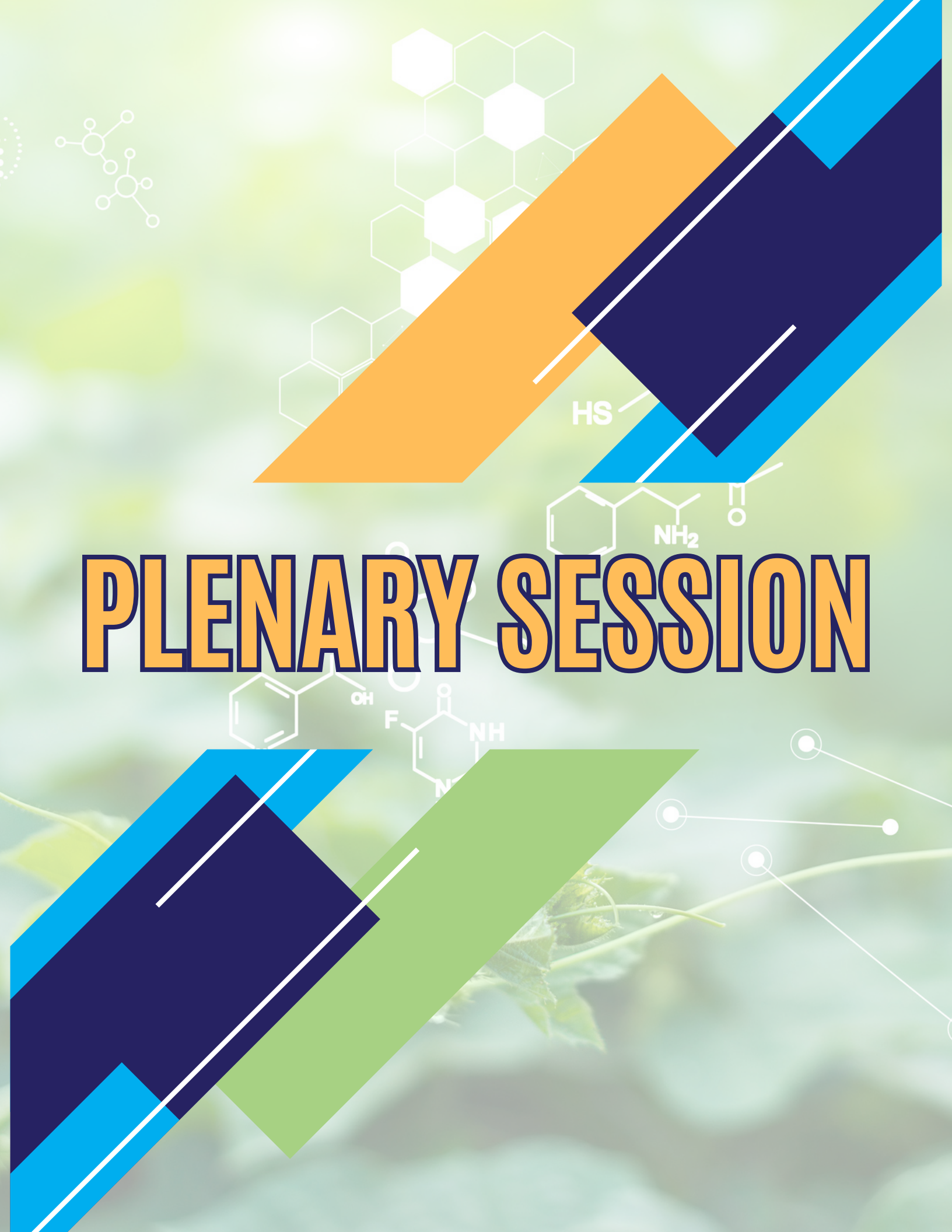
Dr. Boumehira Ali Zineddine holds a Doctorate in Sciences in Microbiology from the University of Science and Technology – Houari Boumediene (USTHB), Algeria. He began his professional career as a Research Officer at the Pasteur Institute of Algeria, before joining the Research Center in Physico-Chemical Analyses (CRAPC). After a period at the University of Algiers, he is currently a Teacher-Researcher and Head of the Research Team “Biotechnology and Bioprocess Development – BIOTECH-BRIDGE” at the National Higher School of Agronomy (ENSA), Algeria. Dr. Boumehira has authored and co-authored several scientific articles, books, book chapters, and patents, and has led or contributed to innovative, nationally labeled research projects. He is also actively involved in national and international research programs focusing on the design and application of biomolecules for biomedical and therapeutic innovations.



Pr. Bitam Arezki Professor and researcher in the field of human nutrition, particularly nutritional diseases, and has several international publications in this same field to his credit. Responsible for more than 3 doctoral programs at ENSA El-Harrach with about fifteen supported doctors. He is also the author of 4 general biochemistry books. The research focuses on nutrients capable of addressing nutritional deficiencies. Currently, an expert at the ATRSS agency in Oran, he holds the position of Deputy Director in charge of doctoral training at ENSSMAL in Del Ibrahim.



Dr. NAIT BACHIR Yacine holds a Ph.D. in Pharmaceutical Engineering and serves as an Associate Professor (HDR, Class A) at the University of Blida 1, Algeria. He is currently leading two main research lines: 1- Natural bioactive-based formulations, focusing on the design and optimization of para-pharmaceutical, dermocosmetic, and functional food products derived from medicinal plants. 2- Advanced drug delivery systems, particularly nano- and microencapsulation technologies, aimed at improving the stability, bioavailability, and targeted delivery of natural compounds and conventional drugs. His research combines pharmaceutical engineering, process engineering, materials science, natural products chemistry, and pharmacology to bridge the gap between traditional medicine and modern therapeutic innovation



The background features a blurred image of green leaves. Overlaid on this are several chemical structures: a benzene ring with a hydroxyl group (c1ccccc1O), a pyridine ring with a fluorine atom and an amide group (Fc1ccncc1=O), a cyclohexane ring with an amine group (C1CCCCC1N), and a thiol group (HS-). Additionally, there are geometric shapes: a large orange triangle pointing down-right, a dark blue triangle pointing up-right, and a green triangle pointing down-left. These triangles are outlined with white lines. There are also some abstract white lines and dots in the top left and bottom right corners.

PLENARY SESSION



Biomolécules d'origine algérienne et santé publique

Pr BITAM Idir

Centre de Recherche en Agropastoralisme, Djelfa

Email address: idirbitam@gmail.com

0559775322

Résumé

L'Algérie possède une biodiversité exceptionnelle couvrant des écosystèmes sahariens, méditerranéens et montagneux, offrant un réservoir considérable de biomolécules naturelles. Ces composés, issus des plantes médicinales, microorganismes, algues, et venins d'animaux endémiques (scorpions, serpents, abeilles), présentent un intérêt croissant pour la recherche pharmacologique, cosmétique et agroalimentaire.

Les études récentes ont mis en évidence plusieurs activités biologiques majeures : antimicrobienne, antioxydante, anticancéreuse et immunomodulatrice. Les venins de scorpions du genre *Androctonus* et *Buthus*, les extraits polyphénoliques de plantes sahariennes (*Artemisia herba-alba*, *Nigella sativa*, *Rosmarinus officinalis*), ainsi que les peptides issus de microorganismes halophiles, constituent des pistes prometteuses pour le développement de nouveaux agents thérapeutiques.

La valorisation de ces biomolécules nécessite une approche intégrée combinant bioprospection, analyses chimiques et biologiques, ainsi que des stratégies de protection et de transfert technologique. La mise en place de plateformes nationales de recherche et d'innovation pourrait renforcer la position de l'Algérie dans le domaine des biotechnologies vertes et médicales.

Mots-clés : Biomolécules, Algérie, biodiversité, biotechnologie, pharmacologie, valorisation.



Les fibres diététiques des cladodes d'*Opuntia ficus-indica*, de bons prébiotiques pour la santé intestinale

Bendali Farida¹, Barache Nacim¹, Yettou Manil², Kaid Kenza², Mahdeb Amokrane³

¹Université de Bejaia, Faculté des Sciences de la Nature et de la Vie, Laboratoire de Microbiologie Appliquée, Béjaia 06000, Algérie.

²Université de Bejaia, Faculté des Sciences de la Nature et de la Vie, Département de Microbiologie, Béjaia 06000, Algérie.

³INRAA, station Oued Ghir, Béjaia 06120, Algérie

Résumé

Opuntia ficus-indica est une plante succulente de la famille des *Cactaceae*, facilement reconnaissable par ses “cladodes”. Ces dernières sont riches en molécules bioactives telles que les fibres diététiques. Cependant, peu de travaux ont été consacrés à l’étude du potentiel prébiotique de ces fibres. Les objectifs principaux de ce travail sont (a) investigation de la fermentabilité de la poudre de cladodes d'*Opuntia ficus-indica* par une souche probiotique de *Lactiplantibacillus plantarum*, (b) détermination des effets bénéfiques des fibres diététiques des cladodes sur la souche probiotique, et (c) examen de l’influence de l’âge de la plante, la méthode de stérilisation et la concentration de la poudre sur les effets observés. Pour ceci, neuf concentrations de la poudre de cladodes, âgées de 3-6 mois et plus d’une année, ont été testées après la détermination des caractéristiques physicochimiques de la poudre. Par la suite, leurs effets sur la croissance bactérienne, propriétés de surface et adhésion, activités antibactériennes et anti- biofilm ont été déterminés. Les résultats ont montré une augmentation du taux de croissance de la souche de lactobacille et un renforcement de son potentiel probiotique (forte activité antibactérienne et anti-biofilm et forte adhésion). Les effets ont été dépendants de l’âge de la plante, de la méthode de stérilisation utilisée ainsi que de la concentration. En général, les jeunes cladodes montraient de meilleurs effets, corrélés avec la concentration et la filtration-stérilisante était plus appropriée que l’autoclavage. Dans l’ensemble, ces résultats montrent l’effet prébiotique des fibres diététiques des cladodes d'*Opuntia ficus-indica* et de ce fait son potentiel bénéfique pour la santé intestinale.

Mots clés: *Opuntia ficus-indica*, cladodes, *Lactiplantibacillus plantarum*, effet prébiotique, activité antibactérienne, adhésion.



Le Moringa comme source naturelle de biomolécules contre les anémies nutritionnelles

Pr. Bitam Arezki

Ecole Nationale Supérieure des Sciences de la mer et de l'aménagement du littoral (Dely-Ibrahim)

Email address: arezki.bitam@edu.ensa.dz

Résumé

L'anémie est un problème de santé publique crucial en Algérie, principalement due à la carence en fer. Elle touche particulièrement les femmes, en particulier celles en période d'activité génitale et pendant la grossesse, en raison de sa prédominance dans les études.

Parmi les végétaux étudiés riches en fer, on cite le *moringa oleifera* Lam. qui est dit un « arbre de vie » ou « plante miracle ». Le moringa est une excellente source de fer, un minéral crucial pour la fabrication des globules rouges. Il facilite l'absorption du fer grâce à la présence de vitamine C rendant ce minéral plus efficace. Il est aussi source de vitamines B et de protéines qui sont également importantes pour la synthèse de l'hémoglobine.

Le moringa est riche en biomolécules variées, notamment des protéines complètes, des glucides, des acides gras, des fibres et des vitamines.

Les feuilles séchées se distinguent par des propriétés physico-chimiques, phytochimiques et biologiques importantes. Des données significatives sur leur qualité nutritionnelle constituent un indicateur clé de leur potentiel en tant que ressource alimentaire. En intégrant ces feuilles dans les formulations alimentaires, il est possible d'améliorer la qualité nutritionnelle des régimes tout en répondant aux enjeux de la sécurité alimentaire.

Elles peuvent fournir des glucides (44,80 %), des protéines (21,80 %) et des acides aminés essentiels, des lipides (6,1 %), ainsi qu'un apport en minéraux, en vitamines et en fibres.

Mots-clés : moringa-biomolécules-anémies-santé-bienfaits.



Microbial Biomolecules from the Algerian Desert: A Natural Reservoir for Innovative Biotechnological Solutions to Global Antibiotic Resistance

[Boumehira Ali Zineddine](#)^{(1, 2)*}, [El-Enshasy Hesham Ali](#)⁽³⁾, [Enoch Y. Park](#)⁽⁴⁾, [Hacène Hocine](#)⁽²⁾

⁽¹⁾ *Research Laboratory in Food Technology and Human Nutrition (LRTANH), National Higher School of Agronomy - ENSA, Algiers, Algeria*

⁽²⁾ *Universiti Teknologi Malaysia (UTM), Johor 81310, Malaysia.*

⁽³⁾ *Université Research Institute of Green Science and Technology, Shizuoka University, Shizuoka, Japan.*

⁽⁴⁾ *University of Sciences and Technology Houari Boumediene, FSB, LBCM, Bab Ezzouar, Algiers, Algeria.*

Email address : ali.boumehira@edu.ensa.dz

Abstract

The global rise of antimicrobial resistance has become one of the most critical challenges to human health, exacerbated by a prolonged stagnation in the discovery of new antibiotics. Arid ecosystems, shaped by extreme selective pressures, harbour microorganisms with exceptional biosynthetic and metabolic diversity. As part of several national and international research projects dedicated to the discovery of new antimicrobial agents, we explored the microbial diversity of saline soil samples from the Touat Basin in Adrar (south-western Algeria). Several microbial strains were isolated from this environment, among which strain ADR1 showed remarkable bioactivity. The ethyl acetate extract of its fermentation broth showed strong cytotoxic activity against the human cell lines HepG2 and MCF-7, reducing cell viability to $62.88 \pm 0.01\%$ and $73.17 \pm 0.09\%$, respectively, at a concentration of 1 mg mL^{-1} , according to the MTT test. Fractionation and NMR analyses identified two anticancer antibiotics, β - and γ -rubromycins, as the main metabolites. Optimisation of bioprocess parameters led to the selection of the most effective medium and culture conditions, resulting in maximum yields of 27.41 mg L^{-1} for β -rubromycin and 580.35 mg L^{-1} for γ -rubromycin in a 16 L bioreactor. These results reveal that the Algerian desert is an unexplored reservoir of microbial biodiversity, capable of generating bioactive compounds with highly original structures. The integration of this work into international collaborative projects highlights the potential of microorganisms isolated from desert soils to inspire new innovative biotechnological strategies to address the global crisis of antibiotic resistance.

Keywords: Algerian desert, Secondary metabolites, Bioprocess optimization, Biotechnological innovation, *Streptomyces*.



Innovative Biomolecule-Based Formulations: Nanotechnologies, Microencapsulation and Functional Foods

NAIT BACHIR Yacine

Department of Biology, Faculty of Natural and Life Sciences, University of Blida 1, Algeria

Abstract

Bioactive molecules of natural origin (extracted from medicinal plants, algae, microorganisms, or agro-industrial by-products) currently occupy a strategic position in the pharmaceutical, parapharmaceutical, dermocosmetic, and food industries. They represent a rapidly growing global market driven by the increasing demand for natural, safe, and effective products.

However, the industrial exploitation of these biomolecules faces two major challenges: chemical instability, often due to the coexistence of reactive compounds, and poor bioavailability, resulting from their low water solubility and rapid degradation during processing or digestion.

To overcome these critical limitations, several innovative technological approaches have been developed, among which encapsulation has emerged as a particularly promising strategy. This technique protects, stabilizes, and delivers bioactive compounds using biocompatible and biodegradable matrices, thereby enhancing their stability, controlled release, and biological efficacy. In this context, nanotechnology offers remarkable opportunities for the encapsulation of natural bioactives through the design of intelligent nanosystems capable of targeting specific tissues, prolonging biological activity, and minimizing side effects. Microencapsulation, on the other hand, enables the transformation of fragile biomolecules into stable dosage forms (such as microparticles, microcapsules, emulsions, or gels) suitable for diverse applications ranging from pharmaceuticals to nutraceuticals and cosmetics.

Finally, the integration of encapsulated biomolecules into innovative therapeutic systems and functional foods paves the way for a new generation of high-value products that combine nutrition, prevention and therapy, embodying the holistic concept of “food as medicine”.

Keywords: Bioactive molecules, Encapsulation, Nanotechnology, Microencapsulation, Nutraceuticals



Oral communication

The background features a soft-focus green foliage pattern. Overlaid on this are several geometric shapes: a large orange triangle pointing down-right, a dark blue triangle pointing up-right, and a green triangle pointing up-right. White chemical structures are scattered throughout, including a hexagonal lattice, a branched molecule, a thiol group (HS-), an amine (NH₂), a hydroxyl group (OH), and a fluorinated heterocycle.



Enrichissement du fromage Gouda par *Urtica dioica*

Lefkir Samia ^{*1}, Laoufi Razika², Youyou soraya¹ et Yahiaoui Karima¹.

¹ Laboratoire de Recherche Technologie Alimentaire, Université M'Hamed Bougara de Boumerdes, Avenue de l'indépendance 35000 Boumerdes

² Laboratoire des technologies douces, valorisation, physicochimie des matériaux biologique et biodiversité, Université M'Hamed Bougara de Boumerdes, Avenue de l'indépendance 35000 Boumerdes

Email address: s.lefkir@univ-boumerdes.dz

Résumé

Le Gouda est un fromage apprécié, caractérisé par sa pâte semi-dure, sa texture souple et son goût doux et crémeux. Sa composition équilibrée et ses propriétés technologiques en font une base idéale pour le développement de produits innovants à valeur ajoutée. En réponse à la demande croissante pour des aliments fonctionnels, l'industrie fromagère explore l'enrichissement de ses produits avec des ingrédients d'origine végétale, en particulier des plantes médicinales aux propriétés nutritionnelles et thérapeutiques. L'ortie (*Urtica dioica*) se distingue par sa richesse en minéraux (fer, calcium, magnésium), vitamines, antioxydants et composés bioactifs, et est traditionnellement reconnue pour ses effets anti-inflammatoires, reminéralisants et diurétiques.

Ce travail présente une étude sur l'enrichissement du fromage Gouda avec des feuilles d'ortie séchées, réalisées à différentes concentrations (0,125 %, 0,25 % et 0,5 %). Les caractéristiques physico-chimiques, microbiologiques et sensorielles des fromages élaborés ont été évaluées, accompagnées d'une analyse phytochimique de l'ortie.

Les résultats des analyses physico-chimiques et microbiologiques indiquent que la qualité des fromages produits respecte les normes AFNOR. La teneur en polyphénols totaux dans l'extrait d'ortie a été mesurée à 226,28 mg EAG/g MS, tandis que l'extrait a révélé une activité antioxydante de 0,162 mg/ml.

L'évaluation sensorielle a montré que l'échantillon enrichi à 0,125 % d'ortie, a été le plus apprécié par les dégustateurs, tant pour sa texture que pour son goût et son apparence générale. Ces résultats confirment l'acceptabilité de l'enrichissement du fromage Gouda avec de l'ortie, ouvrant des perspectives pour le développement de produits fromagers innovants et fonctionnels.

Mots clés : Gouda ; ortie (*Urtica dioica*) ; analyses physico-chimiques ; analyses microbiologiques ; analyse sensorielle ; analyses phytochimiques.



New Insights into the Role of Red Blood Cells in Antibacterial Immunity

Lamia Ysmail-Dahlouk ^(1,2), Sara Dahou ^(1,2), Soumeiya Benamar ⁽²⁾, Houria Benarradj ⁽²⁾,
Souad Zoudji ⁽²⁾, Rabia Messali ⁽²⁾, Mourad Aribi ⁽²⁾

(1) University of Boumerdes

(2) Laboratory of Applied Molecular Biology and Immunology, W0414100, University of Tlemcen, 13000 Tlemcen, Algeria

Abstract

Macrophages are crucial sentinel cells in antibacterial immunity, detecting invading bacteria and undergoing activation characterized by morphological and functional changes. Lipid rafts facilitate clustering of pattern recognition receptors and signaling molecules essential for this activation. Additionally, red blood cells (RBCs) have emerged as modulators of the innate immune response. This study investigates the reciprocal interactions between macrophages and RBCs during *Pseudomonas aeruginosa* infection, focusing on lipid raft modulation and the production of reactive oxygen species involved in antibacterial defense.

PBMCs were isolated from healthy donors, and monocytes were differentiated into macrophages. Macrophages and RBCs were either infected with *P. aeruginosa* or left uninfected, then cultured in monoculture or co-culture. Lipid raft content was assessed in both cell types, while the oxidative burst was evaluated by measuring hydrogen peroxide (H₂O₂) and hypochlorous acid (HOCl) levels in the culture supernatants.

RBCs significantly increased lipid raft levels in *P. aeruginosa*-infected macrophages compared to macrophages cultured alone. Conversely, macrophages decreased lipid raft levels in infected RBCs compared to RBCs cultured alone. Moreover, RBCs enhanced H₂O₂ and HOCl production in both infected and uninfected macrophages, whereas macrophages did not significantly affect reactive oxygen species production in RBCs.

These findings reveal a pivotal role for RBCs in modulating innate immunity by enhancing macrophage activation through increased lipid raft formation and stimulation of the oxidative burst. The observed reduction of lipid rafts in RBCs by macrophages indicates a complex bidirectional interaction. Understanding these mechanisms offers promising avenues for developing new therapeutic strategies against bacterial infections.

Keywords: Red blood cells, macrophages, *Pseudomonas aeruginosa*, lipid raft, oxidative burst.



Detection of Free-Living Amoebae in Contact Lens Storage Solutions: Morphological and Molecular Approach

[El Haddad Djillali](#) ^{*(1)}, Eddaikra Naouel ⁽²⁾, Toubal Souheyla ⁽¹⁾, Boukacem Chaima ⁽³⁾, Sadaoui Nesrine ⁽¹⁾, Boumaza Sarah ⁽¹⁾, Benhabyles Narimen ⁽¹⁾, Bouchenak Ouahiba ⁽¹⁾

⁽¹⁾ *Bioinformatics, Applied Microbiology, and Biomolecules Laboratory, Faculty of Science, M'Hamed Bougara University of Boumerdes, Boumerdes 35000, Algeria*

⁽²⁾ *Laboratory of Parasitic Eco-epidemiology and Population Genetics, Department of Parasitology, Pasteur Institute of Algeria, Algier 16 000s, Algeria.*

⁽³⁾ *Department of Biology, Faculty of Science, M'Hamed Bougara University of Boumerdes, Boumerdes 35000, Algeria*

Email address: d.elhaddad@univ-boumerdes.dz

Abstract:

Free-living amoebae are ubiquitous protozoa that can cause severe human diseases, such as granulomatous amoebic encephalitis associated with *Acanthamoeba* spp. This study aimed to detect amoebae in contact lens storage solutions and case biofilms, using both morphological and molecular identification methods.

A total of 104 samples were analyzed. Cultures were incubated at two temperatures (30 °C and 37 °C), and morphological identification was carried out through observation and staining, focusing on cyst wall characteristics. Results indicated that a one-week incubation period was optimal for obtaining cystic forms. Swabbing of lens cases proved to be an effective recovery method, while Giemsa staining allowed detailed visualization of cyst membranes.

In addition, molecular identification was performed using standard PCR with the *Acanthamoeba*-specific JDP primer, yielding a 20% positivity rate in 13 tested samples.

Overall, the findings highlight a correlation between poor hygiene practices during lens wear and storage and an increased risk of free-living amoebic cyst contamination. These results stress the need for raising awareness among contact lens users, as well as ophthalmologists and opticians, to reduce the risk of amoebic infections.

Keywords: *Acanthamoeba*, morphological identification, PCR, contact lens solution, biofilm, ocular hygiene.



Antimicrobial potential of Algerian *Origanum majorana*'s essential oil

[Hafid Nourehouda](#)^{*1}, [Bouchenak Ouahiba](#)¹, [Bouhenna Mounir Mustapha](#)², [Khiari Ouiza](#)¹,
[Oussaid Sounia](#)¹

¹*Laboratoire de Bio-informatique, Microbiologie Appliqué et Biomolécule, Université
M'hamed Bougara, 35000 Boumerdes, Algérie*

²*Centre de Recherche Scientifique et Technique en Analyse Physico-Chimique, 42000 Tipaza,
Algérie*

Email address: [*n.hafid@univ-boumerdes.dz](mailto:n.hafid@univ-boumerdes.dz)

Abstract

The aim of this study was to assess the antimicrobial activity of Algerian *Origanum majorana*'s essential oil using the disk diffusion method and to determine the inhibitory concentrations (IC50 and MIC) against bacterial and fungal strains, respectively. The oil expressed a notable antimicrobial effect against most of the tested strains, the bacteria exhibited inhibition zones ranging from 10 to 31 mm and IC50 values from ≤ 15.6 to 1051.9 $\mu\text{g/ml}$ for bacteria. Regarding the antifungal activity, the minimal inhibitory concentration (MIC) of the oil showed good results for *Malassezia furfur*, *Candida albicans*, *Candida glabrata*, *Trichosporon* sp., and *Aspergillus niger*, ranging from 0.125 to 0.250 $\mu\text{l/ml}$.

Keywords: *Origanum majorana*, Algeria, antimicrobial, antifungal, E.Coli, essential oil.



Effect of extraction solvent on kinetics and antimicrobial activity of *Rosmarinus officinalis L.* extracts

[Karima Dahmani](#)^{1,2}; Chaima Boussefet¹; Soumia Zerrarka¹; Rym Hayet Trad³; Nasrallah Nouredine¹.

¹ Faculty of Mechanical Engineering and Process Engineering, University of Science and Technology (USTHB), El Alia, Bab Ezzouar, PO Box 32, 16111 Algiers, Algeria.

² Faculty of Technology, Process Engineering department, M'hamed Bougara University, Boumerdes, Algeria.

³ Microbiological Laboratory; Saidal Manufacture; Dar El Baida; Algiers, Algeria.

Email address: k.dahmani@univ-boumerdes.dz

Abstract

Rosemary (*Rosmarinus officinalis L.*) is renowned for its antioxidant and pharmacological properties, including antibacterial, antidepressant, and anti-inflammatory effects. These properties are attributed to the presence of bioactive compounds, such as phenolic compounds, which can serve as a basis for the development of new drugs and contribute significantly to human health and well-being. Therefore, it is important to study and optimize the extraction of these bioactive compounds. This work aims to examine the effect of the solvent on the extraction kinetics of phenolic compounds and to investigate their antimicrobial potential against six microbial strains; four bacteria (*Escherichia coli*, *Pseudomonas aeruginosa*, *Salmonella enterica*, *Staphylococcus aureus*, and *Bacillus spitzanii*) and a pathogenic yeast *Candida albicans*. The kinetic study was conducted with three types of solvents: distilled water, alcohol, and a mixture thereof. Maceration was carried out at a constant temperature of 65°C for 3 hours. The results showed that the hydroalcoholic extract exhibited accelerated kinetics and a high extraction yield. The highest concentrations of phenolic compounds and flavonoids were approximately 35 mg AGE/g dry matter and 8000 µg Que/g dry matter, respectively. The highest antimicrobial activity was observed with the alcoholic extract, compared to the other samples. All the microbial strains tested have showed resistance to the aqueous extract. However, moderate activity was observed with the hydroalcoholic extract, with the exception of *Bacillus spitzanii* and *Candida albicans*, which exhibited resistance. In conclusion, this work highlights the importance of the solvent used for the extraction of phenolic compounds and its effect on biological activity, as well as the economic potential of rosemary as a source of antimicrobial agents.

Keywords: *Rosmarinus officinalis L.*, Flavonoid, phenolic compounds, antimicrobial, kinetic.



Poster communication



Phytochemical potential and polyphenol quantification in a medicinal Lamiaceae species

Nadia Bouabida 1, Nawel Aouadi 2, Nadjma Dadoun 3

1 Department of Biology, University of M'Hamed Bougara Boumerdès-Algeria.

2 Laboratoire de Bioinformatique et Microbiologie Appliquée et Biomolécules (BMAB)-
faculty of Sciences- University of M'Hamed Bougara Boumerdès-Algeria.

3 ¹Laboratoire Valorisation et Conservation des Ressources Biologiques (VALCORE),
Faculté des Sciences. Université M'hamed Bougara. Boumerdes, Algeria

Email address: nadiabouabida@yahoo.com

Abstract

Melissa officinalis L. (lemon balm) is a traditional medicinal plant renowned for its therapeutic properties. The identification and quantification of its natural compounds are crucial for evaluating its pharmacological potential. This study aims to profile the bioactive compounds and quantify the total polyphenol content in the leaves of *M. officinalis*.

Using standard phytochemical assays for qualitative screening, we identified major classes of bioactive compounds. The total polyphenolic content was then extracted using methanol-assisted maceration and quantified via the Folin-Ciocalteu method.

Phytochemical screening confirmed the presence of several bioactive classes, most notably a high abundance of polyphenols and flavonoids. The extraction of polyphenols resulted in a yield of 7.17%. Subsequent quantification of the extract revealed a total polyphenolic content of 58.6 ± 0.087 μg GAE/ml.

These findings underscore the significance of *Melissa officinalis* in phytotherapy and preventive health. Its valorization could pave the way for developing natural treatments for oxidative stress-related diseases, leveraging its potent antioxidant properties.

Keywords: *Melissa officinalis*, polyphenols, bioactive compounds, phytochemical screening.



Assessment of Plasma Urea Levels in Saharan Goats during the Lactation Period

Kamilia HENNA ^(1,2), Zaina AMIRAT ⁽²⁾, Farida KHAMMAR ⁽²⁾ and Salima CHARALLAH ⁽²⁾

¹*Department of Biology, Faculty of Sciences - University of M'hamed Bougara Boumerdes (FS UMBB) (INIM), Boumerdes 35000*

²*Department of Biology and Physiology of Organisms, Faculty of Biological Sciences, Research Laboratory on Arid Zones (LRZA), University of Sciences and Technology Houari Boumediene (USTHB), BP 32 El-Alia, Algiers, Algeria*

Email address: k.henna@univ-boumerdes.dz

Abstract

Lactation induces an acute imbalance between nutritional requirements and feed intake, thereby affecting protein metabolism. Among the biomolecules that reflect this metabolic process, plasma urea plays a key role in milk production through its recycling in the rumen, a crucial feature in goats. In fact, this breed produces relatively small quantities of milk, with an average daily yield of 0.56 kg, reaching its peak during the 6th week of lactation. The aim of this study is to demonstrate the effect of lactation on uremia. The study was conducted on 14 multiparous females kept in confinement at the Béni-Abbès research station (30°07' N, 2°10' W; 425 m elevation). Blood samples were collected from the jugular vein at 8:00 a.m. before feeding on day 0 (parturition), and then weekly for twelve weeks postpartum (W1 to W12 PP). Urea levels were measured using an enzymatic colorimetric method with a BiO LiS 24i Premium autoanalyzer (Tokyo Boeki Medisys INC). The mean plasma urea level fluctuates from the day of parturition until the first week of lactation, then remains relatively stable until the 6th week. A significant increase ($P < 0.05$) of 70% is observed in the 7th week, reaching a peak of 0.26 ± 0.06 g/L, which remains elevated through the 8th week. This is followed by a sharp decrease ($P > 0.05$) during weeks 9 and 10, and then a gradual increase up to the 12th week of lactation. To better understand the regulatory mechanisms of this parameter during these two critical phases, it would be relevant to correlate these results with climatological parameters and hormonal profiles, such as thyroid hormones and estrogens.

Keywords: Uremia, Lactation, Goat, Sahara



Tourneuxia sp Attenuates Doxorubicin-induced Cardiotoxicity via regulating inflammation in mice

Ahlem Medjani¹, Souad Ameddah², Ahmed Menad³

*Laboratoire de Biologie et Environnement, Faculté des Sciences de la Nature et de la Vie,
Université des Frères Mentouri Constantine1, Algérie.*

Email address: medjaniahlem4@gmail.com

Abstract

Doxorubicin (DOX) is an effective agent for the treatment of many neoplastic diseases. Cardiotoxicity is the major side effect of this drug and limits its use. Natural products are gaining popularity as a means of preventing DOX-induced cardiotoxicity. n-butanol extract of the north africa endemic genus *Tourneuxia* belonging to the Asteraceae family was studied in male Wistar albino mice for its protection against cardiotoxicity induced by doxorubicin. Male Wistar albino mice were randomly divided into five groups. group I (control), received 0.9% NaCl (1 mL/kg, orally) for 15 days. Group II (Butanol extract): treated orally with 200 mg/kg of Butanol extract for 15 days. Group III (Doxorubicin): Received six intraperitoneal injections with a dose of 2.5 mg/kg every 48 hours over two weeks (cumulative dose 15 mg/kg). Group IV (Vitamin E+DOX): pretreated with Vitamin E (100 mg/kg, orally) for 15 days, before DOX injection by the same protocol in group III. Group V: (Butanol extract +DOX): pretreated with Butanol extract (200 mg/kg, orally) for 15 days, before DOX injection. In vivo results revealed that the administration of doxorubicin in male Wistar albino mice caused inflammatory responses, as indicated by a highserum levels of pro-inflammatory cytokines, such as TNF- α and IL- β . a significant increase in MPO activity in cardiac tissues. Butanol extract pretreatment significantly reduced TNF- α and IL- β levels in the heart.

It is concluded that n-butanol extract of the genus *Tourneuxia* possessed protective effect against doxorubicin induced cardiotoxicity in mice by inhibiting the inflammatory response, successfully regulated the inflammatory mediators (IL- β , TNF- α , and MPO).

Keywords: *Cardiotoxicity, Doxorubicin, Inflammation, Tourneuxia genus.*



Harnessing Chitosan Polymorphs: A Comparative Study on Bioactivity and *In Vivo* Efficacy for Pharmaceutical Development)

Ouafaa Medjdoub^{1□}, Hassiba Laribi²

¹Gué de constantine, Algiers, Algeria

² Algiers, Algeria

Email address: medjd.medjd2508@gmail.com

Abstract

Harnessing Chitosan Polymorphs: A Comparative Study on Bioactivity and *In Vivo* Efficacy for Pharmaceutical Development.

The biomedical potential of chitosan is vast, but its efficacy is intrinsically linked to its physicochemical form. This study investigates how different chitosan polymorphs (α , β , γ) influence critical biological activities for pharmaceutical applications. We performed a comparative analysis of their antioxidant, anti-inflammatory, antimicrobial, and hemolytic properties against a commercial benchmark, culminating in *in vivo* validation. Our findings reveal a clear structure-activity relationship. The γ -chitosan polymorph emerged as a superior all-round candidate. It demonstrated potent antioxidant activity, showing the lowest IC₅₀ value (438 μ g/mL) in the DPPH radical scavenging assay. Furthermore, γ -chitosan exhibited the strongest *in vitro* anti-inflammatory effect and exceptional hemocompatibility, causing minimal red blood cell lysis (4.46% at 1 mg/mL). Critically, in a carrageenan-induced paw edema model, γ -chitosan application resulted in a rapid 39% reduction in inflammation within 10 minutes. In a wound healing study, both β - and γ -chitosan significantly accelerated re-epithelialization, achieving complete tissue resolution by day 14 without adverse effects. This work underscores that the γ -chitosan polymorph, with its optimal combination of high bioactivity, low cytotoxicity, and proven *in vivo* efficacy, presents a compelling advantage over conventional chitosan for developing safer and more effective pharmaceutical formulations, particularly for wound healing applications.

Keywords: Chitosan Polymorphs, Hemocompatibility, Wound Healing, *In vivo* Anti-Inflammatory, Pharmaceutical Applications.



Eco-Friendly Fabrication of Hematite (α -Fe₂O₃) Nanoparticles from Natural Resources: Promising Nanomaterials for Health Applications

*¹Youcef BAHLOUL, ¹Afaf DJARAOUI, ¹Abderaouf ZINE

¹Laboratory of Physical and Chemical Studies of Materials (LEPCM), Physics Department, Faculty of Matter Science, University of Batna 1, Batna, Algeria.

Email address: * youcefseminaire@gmail.com

Abstract

Nanostructured iron oxides are increasingly explored for biomedical applications due to their low toxicity, biocompatibility, and multifunctional properties. In this work, hematite (α -Fe₂O₃) nanoparticles were synthesized using a green chemistry approach based on natural resources as precursors, stabilizing agents, and **pH** regulators.

Plant-derived extracts such as eucalyptus leaves and orange peels were employed to mediate nanoparticle formation, enabling control over size and morphology while introducing bioactive surface functionalities. Perspectives for further development include the use of hardwood ash as a natural alkaline medium and nettle leaves as an iron source, opening pathways for fully bio-sourced synthesis.

The nanoparticles were structurally and optically characterized by X-ray diffraction (XRD), Fourier-transform infrared spectroscopy (FTIR), and UV–Visible spectroscopy. The results confirmed the formation of crystalline α -Fe₂O₃ with an optical band gap of about 2.1 eV, suitable for interaction with visible light.

Thanks to their eco-friendly preparation and versatile surface chemistry, these hematite nanoparticles show potential for biomedical applications such as antimicrobial activity, biosensing, and targeted drug delivery. This study demonstrates how combining natural resources with nanotechnology contributes to sustainable health-oriented materials.

Keywords: Hematite, Green nanomaterials, Biomedical applications, Antimicrobial



Algerian olive cultivars: Tocophérols content and antioxidant activity.

Lynda Medjkouh/Rezzak^{1,2} □, Fairouz Brahmi³

¹University of Laghouat, Faculty of Sciences, Department Agricultural sciences

²Laboratoire de Biochimie Appliquée, Faculté des Sciences de la Nature et de la Vie,
Université de Bejaia, 06000, Algérie;

³University of Boumerdes, Faculty of Sciences, Department of Biology

Email address: l.medjkouh@lagh-univ.dz □

Abstract

Tocopherols are the main form of vitamin E. They are present in significant quantities in olive oil, playing a key role in combating oxidation. They protect the oil from oxidation, contribute to its flavor, aroma, and stability, and are responsible for some of its health benefits, including protection against free radicals and cardiovascular disease.

Olive oil primarily contains alpha-tocopherol, which accounts for the majority of total tocopherols. The tocopherols in olive oil have several properties, including:

- Protecting the fatty acids in olive oil from oxidation, which improves the quality and shelf life of the oil;
- Contributing to the oil's stability against oxidation and influencing its organoleptic properties, such as taste and aroma;
- As vitamin E, tocopherols have strong antioxidant properties, protecting the body's cells from damage caused by free radicals and thus contributing to the prevention of various chronic diseases, including cardiovascular disease. The tocopherol content in olive oil is strongly influenced by many factors such as the variety of olive tree, the nature of the soil and the type of climate, the year of production and the cultivation method, the maturity of the olives at harvest and the storage conditions of the oil.

The antioxidant activity of several olive oil varieties is tested using numerous antioxidant and antiradical methods. The results show a strong correlation between the tocopherol levels of the samples and their antioxidant capacity.

Keywords: olives oil, tocopherols, antioxidant activity, scavenger activity.



Algerian lichens as a promising reservoir of bioactive molecules

Hadjer ZENGAH¹, Khadidja BELHOUALA^{1,2}, Bachir BENARBA^{1,3}

¹ Laboratory Research on Biological Systems and Geomatics, Mustapha Stambouli University of Mascara, Mascara, Algeria.

² University of Ain Temouchent, Ain Temouchent, Algeria

³ Thematic Research Agency in Health and Life Sciences, Algeria

Email address: hadjer.zengah@univ-mascara.dz

Abstract

Lichens are symbiotic partners of fungi in photosynthesis, producing a vast array of secondary metabolites with exceptional biological potential. Owing to the diversity of lichens in Algeria, this investigation aims to provide an updated overview of Algerian lichens and highlight their pharmacological value through a comprehensive analytical study. This process included reviewing the previous literature to compile available data from phytochemical analyses, and pharmacological studies. The results indicate that Algerian lichens biosynthesize a wide range of secondary metabolites, including depsides (atranorin and lecanoric acid), depsidones (salazinic acid and physodic acid), dibenzofurans (usnic acid), anthraquinones (parietin and emodin), terpenoids (fumarprotocetraric acid and euteronic acid), polyphenolic acid derivatives, and xanthones. These substances exhibit diverse pharmacological effects, such as antioxidant, antimicrobial, antifungal, anti-inflammatory, cytotoxic, and anticancer properties. For instance, usnic acid exhibits high antimicrobial and anticancer activity, while salicinic and physodic acids exhibit both antifungal and antioxidant activity. Recent studies on Algerian species such as *Evernia prunastri*, *Ramalina farinacea*, and *Roccella phycopsis* have revealed antioxidant activity and inhibitory effects on skin-related enzymes (tyrosinase, elastase, and lipoxygenase), justifying their potential use in medicine and cosmetics. Taken together, although most of the available information is still preliminary and diffuse, the pharmacological diversity of secondary metabolites makes Algerian lichens potential natural resources for drug discovery and therapeutic innovation. Systematic and bioassay-guided studies are urgently needed to translate this chemical richness into guaranteed biomedical uses.

Keywords: Lichens, metabolites, Bioactivity, Cancer, Algeria.



Comparative Analysis of the Inhibitory Effects of Medicinal Plant-Mediated Zinc Oxide Nanoparticles on Bacterial Strains

Nouzha Fodil¹, Serra Djaaboub², Amrouche Abdelilah³.

¹ Laboratory for Sustainable Management of Natural Ressources in Arid and Semi-arid Areas, 45000, Naâma, Algeria.

² Laboratory of the Valorization of Plant Resources and Food Security in Semi-arid Areas of South West Algeria, 08000, Bechar, Algeria.

Email address: fodil@cuniv-naama.dz

Abstract

Antibiotics are among the most important medical discoveries of the 20th century, saving millions of lives by treating bacterial infections. However, the rise of multi-drug-resistant (MDR) bacteria has become a major global concern since the early 21st century, raising the threat of untreatable infections. In parallel, technological and industrial progress has improved quality of life through efficiency, durability, and cost-effectiveness, but often at the expense of the environment, leading to pollution, waste, and resource depletion. The convergence of bacterial resistance and ecological challenges highlights the urgent need for innovative, sustainable solutions.

Green applications have thus gained attention, emphasizing eco-friendly methods and renewable resources. Among them, the biosynthesis of zinc oxide nanoparticles (ZnO NPs) using aromatic plants represents a promising strategy. This approach combines natural resources with nanotechnology to create efficient antibacterial agents while minimizing environmental impact. By linking innovation with ecological responsibility, such applications offer dual benefits: addressing public health concerns and supporting sustainable development. The present study investigates the antibacterial effect of ZnO NPs synthesized via a plant-mediated green method using *Nepeta nepetella* and zinc sulfate as precursor. Antibacterial activity was tested using the Kirby-Bauer method against four strains: *Bacillus subtilis* and *Staphylococcus aureus* (Gram-positive), and *Escherichia coli* and *Klebsiella pneumoniae* (Gram-negative). Statistical analysis was conducted with ANOVA and Tukey tests. Results showed a significant effect ($p < 0.05$), with the lowest concentration of ZnO NPs (10 µg/ml) exhibiting the strongest antibacterial activity against all tested strains.

These findings highlight not only the biological efficiency of green-synthesized ZnO NPs but also their potential economic relevance. By proving effective at low concentrations, they offer a cost-effective and environmentally responsible alternative in combating bacterial resistance, strengthening their significance within sustainable nanotechnology.

Keywords: Green synthesis, Antibacterial resistance, Nanobiotechnology, Medicinal plants.



Cracking the Melanoma Code: Multi-Omic Biomarkers for Personalized Therapy and Non-Invasive Monitoring in Cutaneous Melanoma

Ikram Hamdada¹, Khedidja Benseddik^{1,2}, Zohra Touala Chaila¹, Rym Khadidja Abderrahmane¹, Ahlem Messal¹, Abdallah Boudjemaa¹

¹ *Laboratory of Molecular and Cellular Genetics (LGMC), University of Science and Technology Mohamed Boudiaf, Oran, Algeria*

² *Higher School of Biological Sciences of Oran (ESSBO), Oran, Algeria*

Email address: ikram.hamdada@univ-usto.dz 

Abstract

Cutaneous melanoma is a heterogeneous and aggressive skin cancer. Despite therapeutic advances with MAPK inhibitors, resistance frequently emerges, and functional biomarkers remain scarce. Innovative strategies combining omics' technologies and non-invasive monitoring are needed to improve patient stratification and outcomes.

We propose a multi-omics approach integrating germline sequencing, tumor and circulating tumor DNA (ctDNA) profiling, transcriptomics, and proteomics. Comparative analyses between tumor-derived and circulating biomarkers will evaluate the utility of ctDNA as a liquid biopsy. Bioinformatic pipelines will merge datasets to construct predictive signatures, and an algorithm will be developed to support theragnostic decision-making.

This project is expected to identify novel biomarkers linked to therapy response and resistance. ctDNA is anticipated to provide a non-invasive tool for monitoring progression and relapse, complementing tissue biopsy findings. Multi-layer integration of genomic, transcriptomic, and proteomic data will generate comprehensive signatures and clarify resistance mechanisms. Importantly, this study will create the first Algerian molecular dataset for melanoma, addressing the underrepresentation of North African populations in cancer research.

This multi-omics strategy aims to deliver a predictive theragnostic model that integrates liquid biopsy and computational algorithms to guide personalized therapy.

Keywords: Biomarkers; Cutaneous melanoma; Multi-omics; Personalized medicine.



Étude du pouvoir antioxydant et antibactérien de quelques des extraits de la propolis Algérienne

^[1] Hakima Oulebsir-Mohandkaci et ^[1] Hibat-Allah Brahimi,

^[1] Laboratoire de valorisation et conservation des ressources biologiques (VALCORE), Faculté des sciences, Université M'hamed Bougara, Boumerdes, Algérie

Email address: ha.brahimi@univ-boumerdes.dz.

Résumé

La propolis est une substance naturelle issue de la résine végétale transformée par les abeilles, reconnue pour ses nombreuses activités thérapeutiques. Sa composition qui varie en fonction de l'origine botanique et de la race d'abeille, en fait l'un des produits de la ruche les plus célèbres depuis l'Antiquité en raison de ses effets bénéfiques sur la santé humaine, ainsi que de son potentiel thérapeutique et de ses multiples propriétés biologiques. Cette étude visait à déterminer la teneur en polyphénols de la propolis et à évaluer ses activités antioxydante et antibactérienne. Le dosage des polyphénols est effectué par méthode colorimétrique et l'activité antioxydante est évaluée par le test DPPH. L'activité antibactérienne est également évaluée dans le milieu de culture de Müller-Hinton (MH) à l'aide de la méthode du disque contre des souches bactériennes Gram-négatives et Gram-positives (*Escherichia coli* et *Staphylococcus aureus*), et toutes les mesures sont réalisées en triplicata. Nos résultats ont montré que tous les extraits éthanoliques et aqueux testés présentaient une teneur élevée en substances bioactives poly phénoliques (71,40 mg EAG/g et 52,10 mg EAG/g). En effet, la propolis présente un pouvoir antioxydant exprimé en IC₅₀, ce qui signifie qu'elle a une grande capacité à piéger les radicaux libres (0,785 mg/ml et 0,401 mg/ml). De plus, les résultats de l'essai *in vitro* indiquent que la propolis inhibe la croissance d'*Escherichia coli* et de *Staphylococcus aureus*. Ces résultats montrent que les deux types d'extraits possèdent des activités antioxydante et antibactérienne significatives.

En conclusion, la propolis et ses extraits confirment leur importance en tant que produits naturels issus de la ruche, pouvant être exploités dans divers domaines médicaux, pharmaceutiques et alimentaires.

Mots clés : propolis, pouvoir antioxydant, pouvoir antibactérien, DPPH, *Staphylococcus aureus*, *Escherichia coli*.



Evaluation de l'activité anti-inflammatoire de *Phlomis bovei*

Bouchenak O¹., Benhabyles Bouttaba N¹., Laoufi R²., Boumaza S¹., Hafid NH¹., Khiari O¹.,
Oussaid S¹.

¹ Laboratoire de Bioinformatique, Microbiologie Appliquée et Biomolécules

² Laboratoire Technologies Douces, Valorisation, Physico-chimie des Matériaux Biologiques
et Biodiversité

Email address: o.bouchenak@univ-boumerdes.dz

Résumé

Ce travail constitue une contribution à la valorisation de la plante médicinale *Phlomis bovei* (Lamiacées), à travers une étude phytochimique et une évaluation de son activité anti inflammatoire. Le criblage réalisé sur la poudre et l'infusé à 10 % a révélé la présence de divers métabolites secondaires tels que les flavonoïdes, anthocyanes, tanins catéchiques, alcaloïdes, mucilages et saponines. L'extraction hydro-éthanolique a donné un rendement satisfaisant (24,34 %), avec des teneurs élevées en polyphénols (241,6 µg EAG/g MS) et en flavonoïdes (62,48 mg EQ/g MS). Sur le plan biologique, l'extrait présente une activité antioxydante notable, bien que moins puissante que celle du BHT (IC₅₀ = 10 µg/ml contre 0,008 µg/ml), indiquant une capacité modérée à neutraliser les radicaux libres. L'extrait aqueux de *Phlomis bovei* a montré une réduction significative de l'œdème des pattes de rats induit par la carraghénine, avec un taux d'inhibition élevé dès le premier jour (36,31 %), nettement supérieur à celui observé avec le diclofénac (6,21 %).

L'ensemble des données met en évidence l'intérêt de cette plante comme source naturelle de composés bioactifs, et encourage la poursuite des recherches pour le développement de formulations thérapeutiques et cosmétiques.

Mots clés : *Phlomis bovei* ; phytochimique ; Activité biologique ; Polyphénols ; flavonoïdes ; formulations thérapeutiques.



Antioxidant potential of *Chrysanthemum macrocarpum* hydro-methanolic extract

[TOUBAL Souheyla](#) ^{*(1)}, [EL HADDAD Djillali](#) ⁽¹⁾, [SADAoui Nesrine](#) ⁽¹⁾, [BOUMAZA Sarah](#) ⁽¹⁾, [BENHABYLES Narimen](#) ⁽¹⁾, [CHAOUCH Razika](#) ⁽²⁾, [TAMCHICHET Abir](#) ⁽²⁾,
[BOUCHENAK Ouahiba](#) ⁽¹⁾

⁽¹⁾ *Laboratoire de Bio-Informatique, Microbiologie Appliquée et Biomolécules, Faculty of Sciences, University M'Hamed Bougara of Boumerdes, Boumerdes 35000, Algeria*

⁽²⁾ *Department of Biology, Faculty of Sciences, University M'Hamed Bougara of Boumerdes, Boumerdes 35000, Algeria*

Email address: * so.toubal@univ-boumerdes.dz

Abstract

The present study highlights the antioxidant activity of the hydro-methanolic extract obtained from the aerial parts (flowers and stems) of *Chrysanthemum macrocarpum* Cos. The extraction was carried out using an 80:20 methanol-water mixture, followed by phytochemical screening and quantification of total polyphenols and flavonoids. The antioxidant potential was evaluated through three complementary methods: DPPH°, FRAP, and ABTS+. The results revealed a significant presence of bioactive compounds, including flavonoids, tannins, and saponins. Quantitatively, the extract contained 44.57 ± 2.29 mg GAE/g DM of total polyphenols and 106.93 ± 4.15 mg QE/g DM of flavonoids. Regarding antioxidant assays, *C. macrocarpum* demonstrated remarkable free radical scavenging and reducing power with IC50 values of 5.49 mg/mL (DPPH°), 0.60 mg/mL (FRAP), and 0.29 mg/mL (ABTS+). These findings suggest that *Chrysanthemum macrocarpum* represents a promising natural source of antioxidant molecules with potential applications in preventing oxidative stress-related disorders.

Keywords: *Chrysanthemum macrocarpum*, antioxidant activity, DPPH, FRAP, ABTS, phenolic compounds, flavonoids.



Therapeutic Potential of *Aristolochia longa* L. Roots: Phytochemical and Biological Evaluation

EL HADDAD Djillali ^{*(1)}, TOUBAL Souheyla ⁽¹⁾, SADAoui Nesrine ⁽¹⁾, BOUMAZA Sarah ⁽¹⁾, BENHABYLES Narimen ⁽¹⁾, BENYAHIA H'nia ⁽²⁾, DAHMANE Maissa ⁽²⁾, KHALFI Ahlem ⁽²⁾, BOUCHENAK Ouahiba ⁽¹⁾

⁽¹⁾ Bioinformatics, Applied Microbiology, and Biomolecules Laboratory, Faculty of Science, M'Hamed Bougara University of Boumerdes, Boumerdes 35000, Algeria

⁽²⁾ Department of Biology, Faculty of Science, M'Hamed Bougara University of Boumerdes, Boumerdes 35000, Algeria

Email address: * d.elhaddad@univ-boumerdes.dz

Abstract

This study aimed to investigate the phytochemical composition and biological properties of the roots of *Aristolochia longa* L., a medicinal plant widely used in traditional medicine. The work included phytochemical and physicochemical characterization, as well as the assessment of in vitro antioxidant, anti-inflammatory, and antimicrobial activities. Ethanolic extraction was performed, yielding 29.66%, and the extract was analyzed by infrared spectroscopy. Phytochemical screening revealed the presence of tannins (total and gallic), flavonoids, mucilages, saponins, and carbohydrates, while anthocyanins, iridoids, quinones, and proteins were absent. Physicochemical parameters indicated a low water (9.1%) and ash content (2.8%). The extract was rich in phenolic compounds (752.16 mg GAE/g extract) and flavonoids (438.4 mg QE/g extract). The antioxidant potential was confirmed through DPPH and FRAP assays, with IC₅₀ values of 21.05 mg/ml and 21.97 mg/ml, respectively. The anti-inflammatory activity, evaluated by the BSA protein denaturation test, was significant, showing an IC₅₀ of 4.02 mg/ml. antimicrobial evaluation by agar diffusion demonstrated strong activity against Gram-negative bacteria (*Escherichia coli*, *Pseudomonas aeruginosa*, *Enterococcus faecalis*), but limited efficacy against the Gram-positive strain *Staphylococcus aureus*. Overall, the results highlight the therapeutic potential of *Aristolochia longa* L. roots as a natural source of bioactive compounds with antioxidant, anti-inflammatory, and antimicrobial properties, reinforcing its importance for pharmaceutical applications.

Keywords: *Aristolochia longa* L., phytochemistry, antioxidant, anti-inflammatory, antimicrobial.



Contribution à l'évaluation du potentiel thérapeutique de *Carthamus* *Caerulus* L..

[Nedjma DADOUN](#)¹□, [Fatima Zohra HOUARI](#)², [Aldjia TAOUDIAT](#)³, [Nadia BOUABIDA](#)⁴,
[Aouadi Nawal](#)⁵, [Karima BOUCHRIFI](#)⁴, [Ibtissem GHARES](#)⁴ et [Nora BENTALHA](#)⁴

¹Laboratoire Valorisation et Conservation des Ressources Biologiques, Université M'hamed
Bougara. Boumerdes, Algeria

²Ecole d'Agronomie de Mostaganem, Algeria

³Akli Mohand Oulhadj University of Bouira, Faculty of Natural and Life Sciences, Department of
Agronomy

⁴Department of Biology, University of M'Hamed Bougara Boumerdès-Algeria.

⁵Laboratoire de Bioinformatique et Microbiologie Appliquée et Biomolécules (BMAB)-faculty of
Sciences- University of M'Hamed Bougara Boumerdès-Algeria

Email address: dadounnedjma1@gmail.com□

Abstract

Les espèces du genre *Carthamus* sont traditionnellement reconnues en médecine populaire pour leurs propriétés pharmacologiques variées : antioxydantes, anti-inflammatoires, antimicrobiennes, hypolipémiantes et anticancéreuses. Ces effets sont attribués à leur richesse en flavonoïdes, acides phénoliques, lignanes et acides gras insaturés. Dans le cadre de la valorisation de la flore algérienne, cette étude s'intéresse aux extraits méthanoliques de *Carthamus caeruleus* L., une plante médicinale locale. L'objectif est de caractériser ses composés bioactifs et d'évaluer ses activités antioxydantes et antibactériennes. L'extraction par macération a permis une analyse phytochimique qualitative et quantitative. Les résultats ont révélé une teneur importante en composés phénoliques. Toutefois, l'activité antioxydante mesurée par IC50 demeure modeste comparée à celle de l'acide ascorbique. Par ailleurs, aucun effet antibactérien significatif n'a été observé sur les souches testées (*Staphylococcus* sp., *E. coli*, *Pseudomonas* sp.). Ces résultats soulignent le potentiel thérapeutique de *Carthamus caeruleus* L. dans le cadre de la phytothérapie, tout en mettant en évidence la nécessité de recherches approfondies pour confirmer son efficacité et élargir ses applications biomédicales.

Keywords : Phytothérapie, *Carthamus caeruleus* L., composés phénoliques, activité antioxydante, activité antibactérienne.



Valorization of Curcumin in Health: Behavioral and Physiological Benefits During Resocialization After Adolescent Social Isolation

[Hassina BELBLIDIA](#)¹□, [Djamila AROUNE](#)¹

¹ *Université M'hamed Bougara UMBB, Département de Biologie, Faculté des Sciences, 35000 Boumerdès, Algérie*

Email address: h.belblidia@univ-boumerdes.dz

Abstract

Adolescence represents a sensitive developmental period during which social experiences critically shape brain and behavioral trajectories. Social isolation (SI) during this stage is a well-established model to induce long-lasting alterations in cognition and emotional regulation. Curcumin, a natural polyphenolic biomolecule with anti-inflammatory and neuroprotective properties, has recently gained attention as a potential strategy to counteract stress-related behavioral and physiological disturbances. The present study investigated whether subsequent resocialization, alone or combined with curcumin supplementation, could mitigate SI-induced impairments in adolescent male NMRI mice. Animals were exposed to SI for three weeks (postnatal days 35–56) followed by either continued group housing (GH), resocialization (Re-Soc), or resocialization with daily curcumin treatment (Re-Soc+Cur, 100 mg/kg, oral gavage) for an additional three weeks. Behavioral outcomes were assessed immediately after the resocialization period, focusing on memory (spatial memory test), anxiety-like behavior (open field), and depression-like behavior (forced swim test). In parallel, circulating corticosterone levels and plasma C-reactive protein (CRP) were measured as indices of stress reactivity and systemic inflammation. We found that SI mice display impaired spatial memory, increased anxiety-like behavior, and enhanced immobility in the forced swim test compared to GH controls. Resocialization reduced anxiety- and depression-like behaviors but only partially restored memory performance. Remarkably, curcumin supplementation during resocialization not only improved memory scores but also normalized corticosterone and CRP levels, suggesting a stronger recovery of both cognitive and emotional functions. Together, these results highlight curcumin as a promising biomolecule that enhances the efficacy of resocialization by providing complementary anti-inflammatory and neuroprotective actions.

Keywords: *Curcumin, NMRI mice, behavior, inflammation*



Assessment of antimicrobial potential of total polyphenols and chlorophyll pigments of *Pistacia lentiscus* L. leaves.

[Benhabyles Bouttaba N.¹](#), [Boumaza S.¹](#), [Laoufi R.²](#) [Bouchenak O.¹](#), [Saadaoui N.¹](#), [Toubal S.¹](#), [El Heddad D.¹](#)

¹Faculty of Science, Laboratory of Bioinformatics, Applied Microbiology and Biomolecules, University M'hamed Bougara Boumerdes, Boumerdes 35000, Algeria.

²Faculty of Science, Laboratory of Technologies Soft and Valorization of Biological Materials and Biodiversity, University M'hamed Bougara Boumerdes, Boumerdes 35000, Algeria

Email address: n.benhabyles@univ-boumerdes.dz

Abstract

Natural substances occupy an increasingly prominent place in therapy. The aim of this work is to study the phytochemical aspect and evaluate the antimicrobial activity of total polyphenols and chlorophyll pigments extracted from the leaves of *Pistacia lentiscus* L. widely used in Algerian traditional pharmacopoeia for its therapeutic virtues. First, we proceeded to the extraction of total polyphenols by maceration in methanol of 5 g of plant powder which allowed us to obtain a methanolic extract with a yield of 70.53%. The phytochemical screening showed a wealth of this plant in flavonoids, in saponins, in leuco-anthocyanin and in glucosides. The quantitative analysis of these active compounds in the methanol extract by Folin Ciocalteu method has allowed to determine a concentration of 0.017 g / ml. Qualitative characterization performed by thin layer chromatography (TLC) revealed the presence of a multitude of varieties of other phenolic compounds among others citric acid and perchloric acid. Of more we realized the extraction of chlorophyll pigments (from 10 g of the plant powder) by a method based on their differential solubility in various organic solvents. Spectral and chromatographic by TLC characterization of the pigments revealed the presence of chlorophyll *a*, chlorophyll *b*, xanthophyll and carotene. The antimicrobial activity was evaluated, *in vitro*, by agar diffusion method on a panel of five bacteria (*Staphylococcus aureus*, *Streptococcus faecalis*, *Escherichia Coli*, *Pseudomonas aeruginosa*, *Klebsiella pneumonia*) and (*Candidas albicans*). The results of polyphenols effect on the bacteria tested have shown that *Staphylococcus aureus* is the most resistant and *Escherichia coli* the most sensitive with respective diameters of 23.24±0.94 mm and 10.62±0.48 mm. However, the evaluation of antimicrobial activity of the pigment extracts showed that chlorophyll *a* has a significant antimicrobial effect against all the strains tested, in particular *Staphylococcus aureus* with a diameter of 23.24±0.94 mm. The carotene and xanthophyll extracts moderately have inhibited the growing of bacteria tested. By against, the fungal strain tested has shown resistant to all the extracts studied except for chlorophyll *a*. These results suggest that the leaves of *Pistacia lentiscus* L. have significant antimicrobial properties, which suggests their application in pharmaceutical industry.

Key words: Antimicrobial activity, phytochemical study, chlorophyll pigments, *pistacia lentiscus* L. total polyphenols.



In Vitro and In vivo assessment of the anti-inflammatory activity of Xanthoria parietina extrats

KHIARI Ouiza ¹, BOUCHENAK Ouahiba ¹, YAHIAOUI Karima ², OUSSAID Sounia ¹,
HAFID Nourhouda ¹ and LAOUFI Razika ³

¹ Laboratory of Bioinformatics, Applied Microbiology and Biomolecules, University of hamed Bougara of Boumerdes, 35000 Boumerdes, Algeria

² Food Technology Laboratory, University of M'hamed Bougara of Boumerdes, 35000 Boumerdes, Algeria.

³ Laboratory for Soft Technologies, Valorisation, Physico-chemistry of Biological Materials and Biodiversity, University of Mhamed Bougara of Boumerdes, 35000 Boumerdes, Algeria.

Email address: o.khiari@univ-boumerdes.dz

Abstract:

Lichens, these neglected organisms, are a symbiotic association between a fungus and either an alga or a cyanobacterium. Their production of special secondary metabolites that exhibit notable biological activities makes them fascinating. This study aimed to evaluate the anti-inflammatory activity of the hydro-acetonic (HAXP) and hydro-methanolic (HMXP) crude extracts of *Xanthoria parietina*, a widely distributed foliose lichen in the Boumerdes Province. The assessment of in vitro anti-inflammatory activity of HAXP and HMXP extracts based on the bovine serum albumin denaturation method was compared with the standard anti-inflammatory drug diclofenac. Five concentrations were used (125, 250, 500, 1000 and 2000 µg/ml). This test showed maximum protection at 2000 µg/ml, with 91.30%, 65.22%, and 98.73% inhibition for HAXP, HMXP, and diclofenac, respectively. The oral administration of 100 mg/kg and 200 mg/kg body weight (bw) of HAXP and HMXP extracts significantly reduced the edema induced by carrageenan. After 4 hours, the dose of 100 mg/kg had more effective inhibition with 52.90% and 48.96%, respectively, although the dose of 200 mg/kg bw showed an inhibition of 42.72% and 39.67%, respectively, compared to 69.7% of inhibition produced by the standard anti-inflammatory drug Diclofenac at 25 mg/kg bw. The histological feature revealed clear differences between the groups. The negative control presented with an advanced acute inflammation, showing vasodilatation and significant plasma infiltration. The diclofenac-treated group suggested a better-regulated immune response, with reduced plasma infiltration and moderate neutrophil-based granular infiltration. On the other hand, the groups treated with HAXP and HMXP extracts demonstrated only slight plasma and granular infiltration, indicating a remarkable decrease in inflammation and healing progression. Consequently, we concluded that both the in vitro and in vivo assessments confirmed that the hydro-acetonic extract of *Xanthoria parietina* possessed more potent anti-inflammatory activity compared to its hydro-methanolic extract across different concentrations.

Keywords: Lichens, *Xanthoria parietina*, anti-inflammatory activity, Carrageenan.



Enquête ethno-pharmacologique et inventaire des plantes médicinales anti-diabétique dans la région de Boumerdes

Boumaza-Hamladji S.¹, Benhabyles Bouttaba N.¹, Bouchenak O.¹, Toubal S.¹, El Heddad D.¹, Hadji M, Oukacine T, Timizar A

¹Faculty of Science, Laboratory of Bioinformatics, Applied Microbiology and Biomolecules, University M'hamed Bougara Boumerdes, Boumerdes 35000, Algeria.

Email address: s.boumaza@univ-boumerdes.dz

Résumé

Le diabète sucré est une maladie ancienne qui prend aujourd'hui une ampleur épidémique. Cette étude menée dans la wilaya de Boumerdes a pour objectif d'identifier les plantes médicinales les plus utilisées dans le traitement traditionnel du diabète. Une enquête ethnopharmacologique a été réalisée auprès de la population diabétique, des herboristes et des pharmaciens. Les résultats montrent une augmentation annuelle de 11,7 % des cas de diabète de type 2 entre 2017 et 2024. La population étudiée est majoritairement féminine (64,4 %) et âgée de plus de 50 ans (66,3 %). Le recours à la médecine traditionnelle est fréquent (62,1 % des patients). Au total, 14 familles botaniques ont été recensées, dont les Lamiacées, les Apiaceae et les Asteraceae. Les plantes les plus utilisées par les patients sont : l'olivier (25,7 %), l'armoise (11,7 %), la cannelle (7,8 %) et la sauge (6,3 %). L'infusion (45,9 %) et la décoction (37,2 %) sont les modes de préparation les plus répandus. Selon les herboristes, les plantes les plus demandées sont le basilic (22 %), l'olivier (16 %), la sauge (13 %), le gingembre (11 %), la marjolaine (10 %) et la réglisse (6 %). Du côté pharmaceutique, l'insuline (60 %) et la metformine (40 %) sont les médicaments les plus cités. Les tisanes les plus consommées sont à base de feuilles d'olivier (35 %), de romarin (20 %), de thé vert (18 %), d'eucalyptus (13 %), de fenugrec (10 %) et de fenouil (5 %). Ces données constituent une base solide pour de futures recherches sur l'isolement de molécules antidiabétiques issues des plantes médicinales.

Key words: Enquête-ethnopharmacologique; Diabète de type2; Herboristes; Plantes antidiabétiques ; Boumerdes.



Valorisation des biomolécules extraites de "*Petroselinum crispum*"

Faïza BELAKEHAL^{1□}, Sirine Amina TAKARLI², Khaoula MAKHLOUF³

□^{1,2,3}Département des Sciences de la Nature et de la Vie (SNV), Université d'Alger 1
Benyoucef Benkhedda, 2 Rue Didouche Mourad, Algérie.

Email address: f.belakehal@univ-alger.dz

Résumé

Les médicaments de synthèse ont révolutionné le traitement de nombreuses maladies, mais ils sont souvent associés à des effets indésirables ou à une toxicité à long terme. Face à ce défi, les plantes médicinales de plus en plus reconnues pour leurs multiples vertus, offrent une alternative prometteuse pour le développement de formulations thérapeutiques innovantes. Le persil (*Petroselinum crispum*), une plante aromatique et médicinale couramment utilisée, est choisi comme objet d'étude dans le but de valoriser les biomolécules extraites.

Notre démarche inclut l'extraction des molécules bioactives par macération hydro-éthanolique, suivi du criblage phytochimique par les techniques classiques et enfin la recherche de l'activité antioxydante et anti-inflammatoire *in vitro*. Les résultats obtenus ont permis de mettre en évidence la richesse du persil en métabolites secondaires, avec une teneur élevée en polyphénols (99,96 mg EAG/g d'extrait) et en flavonoïdes (42,78365 mg EQ/g d'extrait). L'évaluation des propriétés biologiques de l'extrait de persil a démontré une activité anti-inflammatoire allant jusqu'à une inhibition de 60% de l'inflammation et une activité antioxydante significative. Ce produit représente une avancée prometteuse, soulignant le rôle du persil comme ingrédient clé dans la conception de futurs traitements phytothérapeutiques.

Mots clés : *Activité biologiques, plantes médicinales, Petroselinum crispum, biomolécules.*



Caractérisation phytochimique et évaluation des activités antioxydante et antimicrobiennes de l'huile essentielle d'une plante aromatique désertique, *Brocchia cinerea* (Delile) Vis.

H. Neghliz¹, T. Benabdelkader¹ et F. Jullien²

Laboratoire de Biodiversité, Biotechnologie, Environnement et Développement Durable,
Faculté des Sciences, Université M'Hamed Bougara de Boumerdes, Algérie.

²Université de Lyon, 42023 Saint-Etienne, France. Université de Saint-Etienne, Jean Monnet,
42000 Saint-Etienne, France. Laboratoire de Biotechnologies Végétales Appliquées aux
Plantes Aromatiques et Médicinales, FRE CNRS 3727, EA 3061, 23 rue du Dr Michelon,
42000 Saint-Etienne, France.

Email address: h.neghliz@univ-boumerdes.dz

Résumé

Les huiles essentielles sont des sécrétions odorantes naturelles élaborées par les différents organes (feuilles, fruits, racines, pétales, etc.) des plantes aromatiques. Elles représentent un marché mondial en pleine croissance avec une prévision de plus de 14 milliards de dollars en 2024. Actuellement, environ 150 huiles essentielles sont couramment commercialisées en raison de la grande variété des activités biologiques intéressantes qu'elles peuvent exercer.

Dans le but de la valorisation des plantes aromatiques et médicinales désertiques du grand sud de l'Algérie, cette étude s'intéresse à *Brocchia cinerea* une plante désertique aromatique. Les parties aériennes fleuries de *B. cinerea* ont été récoltées d'une population sauvage dans la daïra de Djamâa (El-Mghaier) en Algérie. Lors de cette étude nous avons obtenu l'huile essentielle par hydrodistillation avec un rendement de 0.2% (m/m, poids sec). Cette huile a été analysée par GC/FID et GC/MS, où un total de 74 composés a été identifié, représentant 85.0 % du contenu total de l'huile. Les principaux constituants étaient le β -thujone (20.1%) suivi du cis-chrysanthenyl acetate (10.5%), camphor (8.7%) et cis-chrysanthenol (8.6%).

Le test antioxydant a montré que notre huile a présenté un faible pouvoir de piégeage du radical DPPH avec une valeur d'inhibition $I=14.49\%$ en comparaison avec les standards huile essentielle d'*Origanum compactum*, BHT et BHA (73.61, 76.80 et 84.91%, respectivement).

Notre huile de *B. cinerea* a révélé de très bonnes activités antimicrobiennes par disque sur milieu solide envers les cinq souches pathogènes cibles (4 bactéries et une levure) avec des zones d'inhibition entre 8 et 45 mm de diamètre.

Les résultats de cette étude suggèrent que *B. cinerea* peut être considéré comme une source intéressante d'une huile essentielle antimicrobienne pour les industries thérapeutiques ou agroalimentaire.

Mots clés : *Brocchia cinerea* ; Astéracées ; Huile essentielle ; Activité antioxydante ; Activités antimicrobiennes.



Biological properties of polyphenolic extracts from different parts of *Sophora japonica* L.

[Benhabyles Bouttaba N¹](#), [Boumaza S¹](#), [Laoufi R²](#), [Bouchenak O¹](#), [Saadaoui N¹](#), [Toubal S¹](#),
[El Heddad D¹](#), [Bennadji S³](#), [Boukabouya S³](#),

¹Faculty of Science, Laboratory of Bioinformatics, Applied Microbiology and Biomolecules,
University M'hamed Bougara Boumerdes, Boumerdes 35000, Algeria.

²Faculty of Science, Laboratory of Technologies Soft and Valorization of Biological
Materials and Biodiversity, University M'hamed Bougara Boumerdes, Boumerdes 35000,
Algeria

Email address: n.benhabye@univ-boumerdes.dz

Abstract

The present work contributes to the quantification of polyphenols and flavonoids, the evaluation of the in vitro antioxidant activity and the in vivo anti-inflammatory activity of the different extracts prepared from the leaves, pods and seeds of *Sophora japonica* L. The extraction yields of polyphenols from the leaf extract (83.33%) and pods (79.16%), are high compared to the seed extract (24.33%). The quantification of polyphenols by the Folin-Ciocalteu method of the extract of pods, leaves and seeds gave the value of the order of 0.112 mg EAG/g of extract, 0.088 mg EAG/g of extract and 0.022 mg EAG/g of extract. The antioxidant effect was determined by the DPPH test, the FRAP method and the β -carotene bleaching test. The evaluation of the antioxidant activity showed that the different extracts of *Sophora japonica* L. have strong antioxidant activity. Furthermore, the anti-inflammatory effect was evaluated in an animal model using the method of plantar edema caused by carrageenan in mice with a subcutaneous injection on the left hind legs. The results of this study show that the methanolic extract of the leaves and seeds of *Sophora japonica* L. has a slightly lower edema reducing effectiveness than Diclofenac.

Mots clés: *Sophora japonica* L, polyphenols, antioxidant activity, anti-inflammatory activity.



Algerian Quinoa Phenolic Extract As A promising source of preservatives

Hayat Chibane-amellal², Fatima Halladj¹ Karima Ait-Kaci Aourahoun³, Bairi Yasmine, Hamouche Amina and Yacef Yousra

^{1,3}Biodiversity, Biotechnology, Environment and Sustainable Development Laboratory, Faculty of Sciences, Department of Biology, University M'Hamed Bougara of Boumerdes, 35000, Boumerdes, Algeria

^{1,2} Laboratory of Soft Technology, Valorization, Physical-chemistry of Biological Materials and Biodiversity, Faculty of Sciences, University M'hamed Bougara of Boumerdes, 35000, Boumerdes, Algeria

Email address: f.halladj@univ-boumerdes.dz

Abstract

Aware of the toxic effects of chemical preservatives, many efforts are focused on finding natural alternatives. In this sense, the present study aims to evaluate the potential of phenolic extract of quinoa variety cultivated and commercialized in Algeria as a natural promising preservative. A physico-chemical evaluation showed that the cultivated quinoa variety has a high moisture content ($14,17 \pm 0,15$ %), a high carbohydrate ($32,57 \pm 0,35$ mg/g) and protein ($42,00 \pm 6,00$ mg/g) content. It also has a high concentration of total polyphenols (2,16 mg EAG/gMS) compared to the commercialized variety (1,49 mg EAG/g MS). In terms of antioxidant activity, polyphenolic extract of the cultivated variety shows a higher IC₅₀ ($4,24 \pm 0,18$ mg/ml) than the commercialized variety with a lower IC₅₀ ($6,80 \pm 0,28$ mg/ml). Antimicrobial activity is observed for natural extracts of local cultivated quinoa that limit the growth of many microorganisms (*Pseudomonas aeruginosa* and *Micrococcus luteus*). These results support the use of natural polyphenolic extract of local quinoa in improving the safety of food products.

Keywords: quinoa, polyphenols, antioxidant activity, antibacterial, preservative



Evaluation of antioxydant, anti-inflammatory and antimicrobial activities of phenolic compounds obtained from *Portulaca oleracea* L.

[Boudjema Khaled^{1,2*}](#), [Kahouadji Hadil²](#), [Mokhfi Meriem²](#) and [Benkadi Asma³](#)

¹Research laboratory of food technology, Faculty of Technology, University of Boumerdes, 35000, Boumerdes, Algeria.

²Laboraty of applied biochemistry, Department of Biology, Faculty of Sciences, University of Boumerdes, 35000, Boumerdes, Algeria.

³Research and development center, 16000, Algiers, Algeria

Email address: * boudjemasidi@yahoo.fr

Abstract

Portulaca oleracea L. is a medicinal plant belonging to the Lamiaceae family. The aims of this study are to conduct a phytochemical screening of secondary metabolites, to extract the phenolic compounds from the aerial part and to evaluate their biological activities such as antioxidant, anti-inflammatory, and antimicrobial activities. The phytochemical screening revealed the abundance of flavonoids, tannins, alkaloids, sterols, and terpenes, which are known for their biological benefits. The ethanolic extract thus obtained showed values of 0.25 ± 0.097 mg GAE/g Dry Weight and 2.27 ± 1.43 QE/g Dry Weight for total polyphenols and flavonoids contents respectively.

The evaluation of antioxidant activity using the DPPH free radical scavenging method indicated a weak antioxidant power, with an IC_{50} value of $41.14 \pm 0,17$ mg/ml. Moreover, the test in vivo demonstrated a significant anti-inflammatory effect, with a protection rate of 70.32% for a dose of 300 mg/kg .In Addition, ethanolic extract exhibited moderate antibacterial activity with inhibition diameter values of $12,33 \pm 0,47$ mm and $12,33 \pm 0,47$ against *Staphyloccocus aureus* ATCC 6538 and *Basillus substillus* ATCC 6633 respectively.

As conclusion,these results demonstrate that phenolic compounds from the studied plant possess important biological activities which might be useful for therapeutic and pharmaceutical applications.

Keywords: *Portulaca oleracea* L., phenolic compounds, antioxidant activity, anti-inflammatory activity, antimicrobial activity, phytochemical screening.



Biotherapeutic Potential of *Lavandula dentata* Essential Oil: Chemical Profile and Biological Evaluation

Mounira KARA ALI^{*1,2}, Wahiba KARA ALI³ and Noredine KACEM CHAOUICHE²

¹Departement of biology, Faculty of Sciences, M'hamed Bougara Boumerdes University, Algeria

²Laboratoire de Mycologie, de Biotechnologie et de l'Activité Microbienne (LaMyBAM), Frère Mentouri, Constantine 1, University, Algeria

³Laboratoire de Biologie et de l'Environnement, Department of Animal Science, Faculty of Natural and Life Sciences Frères Mentouri, Constantine 1, University, Algeria

Email address: kara_mounira.fs@univ-boumerdes.dz

Abstract

Lavandula dentata is a medicinal plant widely used in Algerian traditional medicine. Its essential oil (EO) is recognized for its therapeutic properties; however, its biological potential remains insufficiently investigated in Algeria. This study investigated the physicochemical characteristics and biological activities of *L. dentata* EO from Douaouda (Tipaza, Algeria), focusing on antimicrobial, analgesic, antidiabetic, anti-Alzheimer, and anticoagulant effects. EO was extracted by hydro-distillation (yield: 0.4%) and characterized by AFNOR standards and GC/MS. Antimicrobial activity was evaluated using disc diffusion and MIC assays against six bacterial and two fungal strains. Analgesic activity was assessed in vivo (400 mg/kg). Enzyme inhibition assays targeted α -amylase and butyrylcholinesterase, while coagulation activity was examined via PT and aPTT tests. GC/MS revealed 18 constituents, dominated by 1,8-cineole (41.48%) and β -pinene (33.43%). The EO met AFNOR quality standards. It displayed strong antimicrobial activity (inhibition zones: 16.6–38.5 mm; MIC: 125–250 μ l/ml) and significant analgesic effects in vivo. Enzyme inhibition was notable (α -amylase IC_{50} = 135.08 μ g/ml; butyrylcholinesterase IC_{50} = 125.34 μ g/ml). A dose-dependent anticoagulant effect was observed, with PT prolonged to 21 s and aPTT up to 250 s. *L. dentata* EO shows promising pharmacological activities, supporting traditional uses and potential therapeutic applications. Further studies should focus on isolating active compounds, clarifying mechanisms, and assessing safety for pharmaceutical development.

Key words: Biological activities. Essential oil, GC/MS, *Lavandula dentata*



Rendement d'extraction des fractions polyphénoliques et activité antimicrobienne de l'extrait aqueux de *Moringa oleifera*.

[Bekri M¹](#), [Chaael A²](#), [Bouchenak O³](#).

¹Laboratoire des Microorganismes Bénéfiques d'Aliments Fonctionnels et de Santé. Faculté des Science de la Nature et de la Vie, Université Abdelhamid Ibn Badis Mostaganem.

³Laboratoire de Bio-Informatique, Microbiologie Appliquée et Biomolécules. Faculté des Sciences, Université M'Hamed Bougara, Boumerdes.

Résumé

Les plantes médicinales constituent une source essentielle de molécules bioactives. Parmi elles, *Moringa oleifera* est reconnue pour sa richesse en polyphénols, qui lui confèrent des propriétés biologiques intéressantes, notamment antimicrobiennes. Ce travail a pour but de déterminer le rendement d'extraction de différentes fractions de *Moringa oleifera* et d'évaluer l'activité antimicrobienne de son extrait aqueux. Des extractions successives sont réalisées à l'aide de solvants de polarités croissantes. Les rendements obtenus étaient variables : éther diéthylique (20,2 %), acétate d'éthyle (16,5 %), fraction aqueuse (10,1 %) et fraction butanolique (8,8 %). Le rendement d'extraction dépend étroitement du solvant utilisé, l'éther diéthylique offrant la fraction la plus abondante. L'activité antimicrobienne est évaluée par la méthode de diffusion sur gélose effectuée sur quatre souches bactériennes : *Escherichia coli* 138, *Escherichia coli* 1750, *klebsiella pneumoniae* 294, *Staphylococcus aureus* 290. Les résultats montrent que cette plante possède une activité notable sur les différentes souches utilisées particulièrement marquée contre *E. coli* 1750, confirmant son intérêt thérapeutique et soutenant son utilisation traditionnelle. Ces résultats suggèrent que les composés hydrosolubles présents dans l'extrait aqueux, notamment les polyphénols, jouent un rôle déterminant dans l'activité antimicrobienne observée. Ces données renforcent le potentiel de cette plante comme source de molécules bioactives d'intérêt pharmaceutique et nutraceutique.

Les mots clés : *Moringa oleifera* ; activité anti-bactérienne ; polyphénols; rendement d'extraction ; extrait aqueux



Nutritional biomolecules as modulators of oxidative stress and inflammation in obesity-associated NAFLD

Asma BOUAZZA ¹□, Ines GOUAREF ¹ and Elhadj Ahmed KOCEIR ¹¹ Bioenergetic and Intermediary Metabolism team, Biology and Organisms Physiology Department, Faculty of Biological Sciences, University of Sciences and technology, Houari BOUMEDIENE "USTHB"

Email address: bouazza.asma@gmail.com □

Abstract:

Non-alcoholic fatty liver disease (NAFLD) represents one of the most prevalent complications of obesity and metabolic syndrome, strongly associated with insulin resistance, oxidative stress, and chronic low-grade inflammation. Since no pharmacological treatment has shown universal efficacy, nutritional strategies based on bioactive compounds represent a promising approach. The present study investigated the effects of vegetal oils on hepatic steatosis and metabolic parameters in an experimental model of obesity-induced NAFLD. Forty male Wistar rats were randomized into four groups: control, high-fat diet (HFD), HFD supplemented with vegetal oils (03 ml/day). After 12 weeks, both supplementations significantly attenuated hepatic triglyceride accumulation (−38%, $p < 0.05$) compared with HFD. Markers of oxidative stress showed improvement (↑ SOD +29%, ↑ GSH +21%, ↓ MDA −31%), while inflammatory cytokines TNF- α and IL-6 decreased by 27% and 24%, respectively. Histological analysis revealed reduced steatosis scores and improved hepatocyte architecture in supplemented groups. These results demonstrate that dietary biomolecules such as omega-3 fatty acids exert hepatoprotective effects in obesity-related NAFLD by targeting oxidative stress and inflammation. This highlights their potential role as adjunctive strategies in the nutritional management of metabolic liver diseases.

Keywords: NAFLD, Obesity, Polyphenols, Omega-3, Nutritional biomolecules



Encapsulation of Bioactive Polyphenols from Olive Mill Wastewater for Nutritional Applications

Meriem MEKRI¹✉, Sara CHIKHI¹, Mehdi MIHOUBI¹, Imane BENZERROUK², Rayan DERDER², Abdelmalek BADIS².

¹*Centre de Recherche Scientifique et Technique en Analyses Physico-Chimiques (CRAPC).
Zone industrielle, BP 384 Bou-Ismaïl, Tipaza, Algérie.*

²*Products Chemistry and Biomolecules Laboratory (LNPC-BioM), Saad Dahleb University,
Faculty of Technology, Department of Industrial Chemistry, 19000-Blida, Algeria.*

Email address: meriemmekri@gmail.com✉

Abstract:

Olive mill wastewater (OMW), a major by-product of olive oil production, is an abundant source of bioactive polyphenols such as hydroxytyrosol and tyrosol. However, their instability against heat, light, and oxidation limits their direct use in food systems. In this study, polyphenols extracted from OMW were encapsulated in a biopolymeric matrix based on alginate and chitosan to enhance their stability and functionality.

Encapsulation efficiency exceeded 70%, confirming the ability of the alginate–chitosan system to effectively entrap phenolic compounds. The microcapsules were characterized by several analytical techniques. Fourier Transform Infrared Spectroscopy (FTIR) revealed clear interactions between polyphenolic groups and the polymeric wall materials. Thermogravimetric Analysis (TGA) demonstrated improved thermal stability of encapsulated extracts compared to free polyphenols. Scanning Electron Microscopy (SEM) showed spherical microcapsules with smooth and homogeneous surfaces, without visible cracks, highlighting their structural integrity.

These findings demonstrate that encapsulation is an efficient strategy to valorize OMW polyphenols, providing enhanced stability and potential for incorporation into functional food formulations. The results also contribute to the sustainable use of olive by-products within a circular bioeconomy framework.

Keywords: *Olive mill wastewater, polyphenols, encapsulation, FTIR, TGA, SEM, functional foods.*



Magnetic NiO and CoO Nanoparticles as Emerging Agents in Cancer Therapy

Djanette Blizak Meriem¹, Hayet Missouni², Samia Remli³ and Farida Iachachene⁴

¹Bioinformatics, Applied. Microbiology and Biomolecules Laboratory, University

M'Hamed Bougara Boumerdes, Boumerdes, Algeria

²Higher Normal School of Kouba, Physical Science Department, Vieux-Kouba–Algeirs, Algeria

³Research unit materials, Processes and environment (URMPE), M'hamed Bouguara University Boumerdes, Algeria

⁴Earth Physics Laboratory, University M'Hamed Bougara Boumerdes, Boumerdes, Algeria

Email address: d.blizak@univ-boumerdes.dz

Abstract:

Research into the applications of metal oxide nanoparticles in the medical field generally focuses on silver and titanium oxides. However, nickel oxide (NiO) and cobalt oxide (CoO) are beginning to stand out for their therapeutic potential against cancer. These two materials possess several fascinating properties. At the nanoscale, their surfaces are highly reactive. Their electronic structures allow them to produce significant quantities of reactive oxygen species (ROS). The accumulation of this oxidative stress inside cancer cells damages mitochondria and affects DNA, causing cell death. Another interesting characteristic of NiO and CoO is their magnetic nature. Using an external magnetic field, they can be concentrated at the tumor site or heated to produce local hyperthermia, which improves therapeutic efficacy. In this study, we examine how structural factors, such as size, shape, optical properties such as band gap, and synthetic methods, influence their activity. In vitro results obtained to date are encouraging. Questions remain regarding their toxicity, long-term stability, and in vivo behavior. Research on NiO and CoO nanoparticles lags behind that on iron oxides. However, their particular combination of magnetic and redox properties makes them a suitable choice for cancer treatments with multiple effects.

Keywords: NiO, CoO, nanoparticles, Magnetic properties, Reactive oxygen species, Cancer therapy



***In vitro* and *in vivo* anti-inflammatory effect of *Chrysanthemum macrocarpum* hydro-methanolic extract**

TOUBAL Souheyla ^{*(1)}, EL HADDAD Djillali ⁽¹⁾, SADAoui Nesrine ⁽¹⁾, BOUMAZA Sarah ⁽¹⁾, BENHABYLES Narimen ⁽¹⁾, CHAOUCH Razika ⁽²⁾, TAMCHICHET Abir ⁽²⁾, BOUCHENAK Ouahiba ⁽¹⁾

⁽¹⁾ *Laboratoire de Bio-Informatique, Microbiologie Appliquée et Biomolécules, Faculty of Sciences, University M'Hamed Bougara of Boumerdes, Boumerdes 35000, Algeria*

⁽²⁾ *Department of Biology, Faculty of Sciences, University M'Hamed Bougara of Boumerdes, Boumerdes 35000, Algeria*

Email address: * so.toubal@univ-boumerdes.dz

Abstract

This study evaluates both *in vitro* and *in vivo* anti-inflammatory activities of the hydro-methanolic extract of *Chrysanthemum macrocarpum* Cos, a medicinal plant endemic to the Algerian Sahara. Phytochemical screening revealed a richness in flavonoids, tannins, coumarins, and saponins. The *in vitro* assay, based on the inhibition of bovine serum albumin (BSA) denaturation, demonstrated a significant concentration-dependent effect. Although the extract was less active than the reference drug (diclofenac), it showed considerable inhibition, confirming its protein-stabilizing capacity. For the *in vivo* test, carrageenan-induced paw edema in rats was used to assess anti-inflammatory potential. The extract exhibited a significant reduction of paw edema compared to the negative control group. At the highest tested dose, the inhibition percentage approached that of the standard drug, indicating a promising anti-inflammatory effect in living systems. These results suggest that *Chrysanthemum macrocarpum* could serve as a valuable source of natural anti-inflammatory compounds with potential pharmaceutical applications.

Keywords: *Chrysanthemum macrocarpum*, anti-inflammatory activity, BSA method, carrageenan-induced edema, medicinal plants, *in vivo* study.



L-Threoascorbic Acid Boosts Survival and Immune Response in the Context of *Staphylococcus aureus* Infection

Lamia YSMAIL-DAHLOUK ^{a,b}, Sara DAHOU ^{a,b}, Mourad ARIBI^b

^a University of boumerdes

^b Laboratory of Applied Molecular Biology and Immunology, W0414100, University of Tlemcen, 13000 Tlemcen, Algeria

Abstract

Endothelial cells (EC), are one of the first innate immune cells against invasive pathogens including *Staphylococcus aureus* (*S. aureus*) but are also one of the main means of spreading the infection, leading to persistent chronic infections and endothelial dysfunction. Vitamin C (ascorbic acid, AscH2) is widely involved in immunity. Here, we studied its immunomodulatory effect on human ECs during *S. aureus* infection.

The *ex vivo* effects of AscH2 were performed on primary human umbilical vein endothelial cells (HUVECs) infected or not with *S. aureus*.

AscH2 has shown to ameliorate human endothelial cell dysfunction/necrosis induced by *S. aureus*, and promotes its survival while inducing endothelial cell repair/cell cycle activation. Furthermore, it inhibits *S. aureus* invasion through upregulation of bactericidal activity and immunomodulation of cell metabolic pathways, as well as IL-1 β and soluble intercellular adhesion molecule 1 (sICAM-1) production by *S. aureus*-infected endothelial cells. Our findings should open new therapeutic strategies to counter infection by *S. aureus*.

AscH2 inhibits *Staphylococcus aureus* invasion by enhancing bactericidal activity and modulating immune responses via cellular metabolic pathways. It also regulates the production of IL-1 β and soluble intercellular adhesion molecule-1 (sICAM-1) in endothelial cells infected with *S. aureus*. These findings offer promising new avenues for therapeutic strategies against *S. aureus* infections.

Keywords: AscH2; Bactericidal activity; HUVEC; cell survival and function; Immunomodulatory effect; *S. aureus* infection.



Biomolecular Markers of Health: Hormonal and Biochemical Responses of Saharan Fauna during Lactation

Kamilia HENNA ^(1,2), Zaina AMIRAT ⁽²⁾, Farida KHAMMAR ⁽²⁾ and Salima CHARALLAH ⁽²⁾

¹*Department of Biology, Faculty of Sciences - University of M'hamed Bougara Boumerdes, Boumerdes*

²*Department of Biology and Physiology of Organisms, Faculty of Biological Sciences, Research Laboratory on Arid Zones, University of Sciences and Technology Houari Boumediene, Algiers, Algeria*

Email address: k.henna@univ-boumerdes.dz

Abstract:

Within the Saharan fauna, black goats represent an indigenous breed well adapted to livestock farming in the arid environment of the Algerian Sahara. Several ecophysiological and metabolic studies have shown that parturition and lactation cause abrupt changes in hormonal and biochemical balance, which significantly influence maternal metabolism, a key process in milk production. This study aims to assess the plasma variations of prolactin (PRL), cortisol (CORT), and glucose during parturition and early lactation in this breed. The study was conducted on 14 females kept at the Béni-Abbès research station (30°07' N, 2°10' W). Blood samples were collected on the day of parturition (D0), daily during the early postpartum period (D1–D4 PP), and then weekly throughout the first three months postpartum (W1–W12). Hormone assays were performed using radioimmunoassay techniques with specific antibodies. Statistical analyses were carried out using the Kruskal-Wallis and Dunn's tests (GraphPad Prism). Mean prolactin levels increased progressively with slight fluctuations from D0 to W2 postpartum, reaching a peak at W3, and then gradually declined until W12. As for cortisol (CORT), it increased progressively from D2 PP to W2 PP, showing two peaks at weeks 3 and 9. Blood glucose levels increased by 12%, reaching a maximum at W1 PP, then slightly decreased at W2 and remained stable until W4 PP. To better understand the regulatory mechanisms of these metabolites during these two critical phases, it would be valuable to correlate these results with meteorological parameters.

Keywords: Prolactin, Cortisol, Metabolic energy, Lactation, Saharan fauna.



Antioxidant and antimicrobial activities of biosurfactants produced from newly isolated yeast strain

DERGUINE-MECHERI Louiza^{1*}, KEBBOUCHE-GANA Salima¹,
ANGAR-IGHIL ALI Yassmina^{1,2}

¹*Laboratoire de Bioinformatique, Microbiologie Appliquée et Biomolécules, Faculté des Sciences, Université M'Hamed Bougara de Boumerdès, Boumerdès, Algérie.*

²*Laboratoire de traitement et mise en forme des polymères fibreux (LTMFP), Faculté de technologie, Université M'Hamed Bougara, Boumerdes.*

Email address: * l.derguinemecheri@univ-boumerdes.dz

Abstract

This study focused on the screening and preliminary identification of biosurfactant-producing yeasts isolated from soil samples, thermal water, and other hydrocarbon-contaminated sources collected from various regions in Algeria. A total of 12 isolates were cultivated on a medium supplemented with diesel, and their biosurfactants production potential was assessed using four complementary tests: emulsification index (E24), oil displacement, drop collapse and hemolytic activity. Isolate coded YL1 exhibited high emulsifying capacity. Morphological, microscopic, and biochemical identification indicated that it belongs to the *Rhodotorula* genus. The antimicrobial activity of the crude biosurfactant extract showed notable effectiveness against several pathogenic strains. In contrast, the antioxidant activity, evaluated using the DPPH assay, was found to be less effective. These findings suggest a promising potential for pharmaceutical applications, particularly as natural antimicrobial agent.

Keywords: Yeast, biosurfactants, screening, antimicrobial activity, antioxidant activity.



Antimicrobial and Anti-Inflammatory Effects of *Pistacia lentiscus* Essential Oil: Insights into Its Potential Role in Behçet's Disease

Nourelhouda GHOZALI^{a,b}, Feriel BOUZID^b, Tarek BENABDELKADER^a, Hayet NEGHLIZ^a, Zohra HADJIMI^b, Djamel MESSAOUDENE^a, Faiza MOUHOU, Mohamed Islam KEDIHA^c, Malika TERAHI^d, Sakina MOULAY^e, Nazim LARABA^e, Houda BELGUENDOUZ^b.

^a Laboratory of Biodiversity, Biotechnology, Environment, and Sustainable Development, FS, UMBB, Boumerdes, Algeria.

^b Team “Cytokines and NO synthases: Immunity and pathogenesis”, LBCM, FSB, USTHB, Algiers, Algeria.

^c Neurology department, CHU Mustapha Bacha, Algiers, Algeria.

^d Ophthalmology department, Nafissa Hammoud Hospital Algiers, Algeria.

^e Internal medicine department, CHU Lamine Debaghine, Algiers, Algeria

Abstract

Behçet's disease (BD) is a rare, chronic inflammatory vasculitis characterized by recurrent oral and genital ulcers, skin and ocular lesions, and systemic involvement. Its pathogenesis involves complex interactions between genetic predisposition, immune dysregulation, and microbial factors. Alterations in the oral microbiota, particularly involving *Streptococcus* and *Staphylococcus* species, contribute to mucosal inflammation and increased nitric oxide (NO) production. This study aimed to evaluate, *in vitro*, the antimicrobial and anti-inflammatory activities of *Pistacia lentiscus* essential oil (EO) as a potential natural therapeutic tool for BD. The EO was extracted by hydrodistillation and tested against bacterial strains isolated from the saliva of BD patients using microplate assays. Additionally, peripheral blood mononuclear cells (PBMCs) from 11 BD patients and 7 healthy controls were cultured with varying concentrations of the essential oil (0,16; 0,64 and 1.28 $\mu\text{L/mL}$), and NO levels were measured using the modified Griess method. Results showed that *Pistacia lentiscus* essential oil exhibited notable antibacterial effects, particularly against *Staphylococcus* isolates, and induced a dose-dependent reduction in NO production, indicating significant anti-inflammatory potential. The concentration of 1.28 $\mu\text{L/mL}$ demonstrated the most favorable balance between efficacy and cytocompatibility. These findings suggest that *Pistacia lentiscus* essential oil could serve as a promising complementary agent for modulating oral microbiota and controlling inflammation in Behçet's disease.

Keywords: Behçet's disease, *Pistacia lentiscus*, essential oil, nitric oxide, anti-inflammatory, antimicrobial.



Antibacterial and Antibiofilm Effects of the Extract of *Teucrium polium* Against Multidrug-Resistant Pathogenic Bacteria

Hezil Djamila^{*(1)}, Rouane Asma⁽¹⁾, Benamrouche Samira⁽¹⁾, Benseghir Hassane⁽²⁾, Djeziri Mourad⁽³⁾, Benammar Leyla⁽²⁾, Alileche Khoukha⁽³⁾

¹Université de Boumerdès, Faculté des Sciences, Département de Biologie.

²Université de Batna2, Faculté des Sciences Naturelles et de la Vie, Département de Microbiologie.

³ Centre Scientifique et Technique de Recherche en Analyses Physiques et Chimiques CRAPC, BP384, Bou-Ismaïl, 42004 Tipaza, Algérie
Email address: d.hezil@univ-boumerdes.dz

Abstract

The global rise in bacterial multidrug resistance and biofilm-associated infections represents a critical challenge for public health. This study aimed to investigate the antibacterial and antibiofilm activities of the aqueous extract of *Teucrium polium*, a medicinal plant widely used in Algerian traditional medicine. Antimicrobial activity was evaluated using the agar well diffusion method, and the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) were determined against four bacterial strains: *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Salmonella spp.* The extract exhibited notable antibacterial activity, with mean inhibition zone diameters of 16.66 mm for *S. aureus*, 16.33 mm for *E. coli* and *Salmonella spp.*, and 13.66 mm for *P. aeruginosa*. The lowest MIC values were recorded for *E. coli* (<0.5%) and *S. aureus* (1%), with corresponding MBCs of 0.5% and 1%. For *P. aeruginosa*, both MIC and MBC were 4%. No antifungal activity was observed. These results demonstrate that *T. polium* possesses strong antibacterial potential, likely due to its high content of phenolic and flavonoid compounds. The findings support its possible application as a natural source of antimicrobial agents effective against multidrug-resistant bacteria and biofilm-related infections.

Keywords: *Teucrium polium*, Antibacterial activity, Antibiofilm, Multidrug resistance, MIC, MBC.



Phytochemical characterization and antimicrobial activity of Essential Oil of Chamomile (Chamaemelum nobile L.) from Boumerdes

ROUANE Asma^{1,2*}, HEZIL Djamila¹, MOUHOU Faiza^{2,3}, FOUZIA Soumaya^{2,3}, BELBLIDIA Hassina³, MIR Soumia³, ARDJA Fatima³, BOUMELLIL Salima³

⁽¹⁾M'Hamed Bougara University, Boumerdès, Faculty of Sciences, Department of biology, Laboratory of Valorization and Conservation of Biological Resources (VALCORE), 35000 Boumerdès, Algeria ;

⁽²⁾Houari Boumediene University of Sciences and technology, Bab Ezzouar, Faculty of Biological Sciences, Laboratory of Research on Arid Zones (LRZA), 16 111, Algiers, Algeria ;

⁽³⁾M'Hamed Bougara University, Boumerdès, Faculty of Sciences, Department of biology, 35000 Boumerdès, Algeria ;

Email address:* a.rouane@univ-boumerdes.dz

Abstract

Chamomile (*Chamaemelum nobile* L.) is a medicinal plant of Asteraceae family, extensively used in the Bouzegza Keddara region of Boumerdès, recognized for its soothing, antibacterial, and anti-inflammatory properties. This study aims to scientifically validate its traditional use by characterizing its phytochemical profile and biological activities. The essential oil extraction via hydrodistillation yielded 0.94%, exhibiting a density consistent with AFNOR standards (0.885) and characteristic organoleptic properties. The in vitro antimicrobial activity, assessed by the disk diffusion method against Gram-negative bacteria (*Escherichia coli*, *Pseudomonas aeruginosa*), Gram-positive bacteria (*Staphylococcus aureus*), and a yeast (*Candida albicans*), demonstrated a moderate inhibitory effect [6 - 33,56 mm], highlighting the natural therapeutic potential of this essential oil. These findings support the integration of chamomile in the development of innovative pharmaceutical, cosmetic, and food formulations. This approach promotes effective and environmentally friendly solutions, valorizing local phyto-genetic resources as viable alternatives to conventional chemical agents.

Keywords: *Chamaemelum nobile* L., Chamomile, hydrodistillation, essential oil, antimicrobial activity.



Evaluation of the biological effect of the extract from the root of *Archium lappa* haversted in boumerdes

Laoufi Razika ^{1 *}, Maamri Sarra ^{1,2}, Alileche khoukha ³, Benhabyles Narimen ⁴, Lefkir Samia ⁵, Djeziri Mourad ^{3,5}, Sadaoui-Smadhi Nesrine ⁴, Boudjema Khaled ⁵

¹ *Laboratory of Technologies Soft and Valorization of Biological Materials and Biodiversity, Faculty of Science*

University M'hamed Bougara of Boumerdes, Algeria

² *Laboratoire des sciences fondamentales, Université AmarTelidji, Laghouat, Algeria*

³ *Center for scientific and technical research in Physico-chemical analysis, BouIsmaïl. Tipaza. Algeria*

⁴ *Laboratory of Bioinformatics, Applied Microbiology and Bimolecular, Faculty of Sciences, M'Hamed Bougara University of Boumerdes, Algeria*

⁵ *Laboratory of Food Technology Research, M'Hamed Bougara University of Boumerdes, Algeria*

Email address: r.laoufi@univ-boumerdes.dz

Abstract

The *Archium lappa* is a medicinal plant widely used in folk medicine in various countries. It is rather rare and not very widespread in Algeria. This plant is used in the treatment of numerous pathological conditions. The present work aims to estimate the anti-inflammatory and antioxidant efficacy of the methanolic extract of *Archium lappa* roots. The phytochemical study allowed for the isolation of the main metabolites, notably polyphenols, flavonoids, and tannins. From 3 g of *Archium lappa* root powder, the polyphenolic extract shows a high yield of 26% and a concentration of 340.6 ± 0.31 mg GAE/mL. The results of the antioxidant activity of the methanolic extract using the DPPH test showed that the roots of the great burdock have a strong antioxidant property with an IC₅₀ of 0.0374 ± 0.05 µg/mL compared to ascorbic acid (0.0304 ± 0.02 µg /mL). The in vivo study of edema induction by carrageenan injection in mice showed that the methanolic extract of the roots of *Archium lappa* plant has a maximum effective, non-significant effect in edema inhibition ($66.11 \pm 0.034\%$), compared to ibuprofen ($66.19 \pm 0.122\%$) at the same time. The results of this work allowed us to deduce that the methanolic extract from the roots of *Archium lappa* plant exhibits good antioxidant and anti-inflammatory properties, which allows us to use it in biotechnology and cosmetology.

Keywords: *Arctium Lappa*. L, antioxidant, anti-inflammatory, ibuprofen, polyphenols.



In Vitro and In Vivo Evaluation of Anti-Inflammatory Activity in Bunium bulbocastanum: Protein Denaturation Inhibition and Bioactive Potential

[Sounia OUSSAID^{1*}](#); [Ouahiba BOUCHENAK¹](#); [Imen CHAFAA²](#); [Nourhoda HAFID¹](#); [Ouiza KHIARI¹](#)

1- *Research Laboratory of Bioinformatics, Applied Microbiology and Biomolecules. M'hamed Bougara University– Boumerdes – Algeria*

2- *Laboratoire d'Anatomie, Cytologie et Pathologie Vétérinaire. Département de microbiologie et pathologie vétérinaire, Institut Pasteur, Alger*

Email address: s.oussaid@univ-boumerdes.dz

Abstract

Bunium bulbocastanum, commonly known as wild celery, holds significant importance in traditional medicine due to its demonstrated antioxidant, anti-inflammatory, and antidiabetic properties.

In the present study, we investigated the anti-inflammatory potential of a methanolic extract from *Bunium bulbocastanum* using a protein denaturation inhibition assay. Our results revealed that the hydro-methanolic extract exhibited concentration-dependent inhibition of protein denaturation, achieving 65.4% inhibition at optimal concentrations.

Notably, in vivo studies confirmed that *Bunium bulbocastanum* also possesses marked anti-inflammatory properties, supporting its ethnopharmacological use.

However, further research is needed to isolate and characterize the specific bioactive compounds responsible for these effects, and develop optimized herbal formulations for potential therapeutic applications.

Keywords: Pharmacology, anti-inflammatory activity; protein denaturation; medicinal plants.



Formulation of a Dermocosmetic Kit Based on Natural Extracts and Evaluation of Its Biological Activities.

Messaoudene D^{1,2}, Sefroun M². And Ben Hamida S².

¹ Laboratory of Biodiversity, Biotechnology, Environment and Sustainable Development, FS, UMBB, Boumerdes, Algeria.

² Department of Biology, M'hamed Bougera University, Boumerdes, Algiers

Abstract

This study aims to valorize local Natural resources by developing a cosmetic kit composed of a serum based on glycolic acid extracted from sugar beet (*Beta vulgaris*), and a cream enriched with vegetable oils derived from jojoba (*Simmondsia chinensis*), argan (*Argania spinosa*), and prickly pear (*Opuntia ficus-indica*). The first stage involved extracting glycolic acid through a controlled oxidation process and isolating vegetable oils using Soxhlet extraction. The resulting materials were then characterized through physico- chemical analyses, followed by the formulation of the final cosmetic products. Biological evaluations revealed promising properties: both the glycolic acid serum and the plant-based cream exhibited significant antioxidant, anti-inflammatory, and antimicrobial activities, particularly against pathogenic strains such as *Staphylococcus aureus*, *Escherichia coli*, and *Candida albicans*. This work highlights the potential of combining natural active ingredients in skincare formulations and opens up promising perspectives for the development of effective, safe, and eco-friendly cosmetic products.

Keywords: glycolic acid; medicinal plants; vegetable oils; cell renewal; dermocosmetic formulation.



Polyphenolic composition and antioxidant capacity of *Solenostemma argel*: influence of plant parts and their combination

SADAoui-SMADHI Nesrine 1*, TOUBAL Souheyla 1, EL HADDAD Djillali 1, AKMOUSSI-Sihem 1, Aouadi Nawal 2, BENHABYLES BOUTTABA Narimen 1, ABBOU Belkis 2, HAMDY Belkais 2, KHEMILI-TALBI Souad 1

¹ Laboratoire de Bioinformatique, Microbiologie Appliquée et Biomolécules (BMAB), Faculté des Sciences, Université M'Hamed Bougara de Boumerdès, 35000, Algeria.

² Département de Biologie, Faculté des Sciences, Université M'Hamed Bougara de Boumerdès, 35000, Algeria.

Email address: * n.sadaoui@univ-boumerdes.dz

Abstract

This study investigates the polyphenol content and antioxidant potential of hydromethanolic extracts from the leaves, flowers, and their combination in *Solenostemma argel* (Delile) Hayne, a medicinal plant known for its therapeutic properties.

Total phenolic and flavonoid contents were quantified, and antioxidant activities were assessed using DPPH and ABTS assays.

The combined extract exhibited the highest levels of phenolic and flavonoid compounds, suggesting a synergistic effect. Antioxidant activity varied depending on the assay, with the mixture generally demonstrating enhanced free radical scavenging capacity.

These findings highlight the relevance of combining plant parts to optimize antioxidant efficacy in phytotherapeutic applications.

Keywords: *Solenostemma argel*, polyphenols, flavonoids, antioxidant activity, DPPH, ABTS.



Valorization of Phenolic Biomolecules from Date Flesh: Bioactive Composition and Pharmaceutical Potential

Ali Mansouri^{1*}, Kamel Derouiche².

¹*P.O. Box 197, Aïn Beïda 04001, Algeria.*

²*Constantine, Algeria.*

Email address: mansali2014bio@gmail.com*

Abstract:

Background: Dates, the sweet fruits from the Phoenix dactylifera tree, boast a complex nutrient profile, providing a rich source of carbohydrates, dietary fiber, minerals, vitamins, and bioactive compounds like phenolic compounds. Due to their abundant quality molecules, dates serve as a valuable natural resource for both nutritional and pharmaceutical uses.

Methodology: This research focused on 19 different date varieties. Phenolic compounds were extracted from the fruit flesh using an Ultra-Turrax homogenizer with a hydromethanolic solvent blend. The study assessed the following parameters: total phenolic content (TPC) through the Folin–Ciocalteu method, condensed tannin content (CT) via the vanillin assay, flavonoid content (FLV) using the aluminum chloride–sodium nitrite colorimetric method, and antioxidant activity through the DPPH radical scavenging assay (IC₅₀ value).

Results: The extracts were found to contain significant amounts of bioactive compounds, including 215.32 mg GAE/100 g of total phenolic compounds (TPC), 166.81 mg QE/100 g of flavonoids (FLV), and 27.39 mg CE/100 g of condensed tannins (CT). The antioxidant activity was impressive, with an IC₅₀ value of 827.59 µg flesh/mL, and when standardized to phenolic content, an IC₅₀ of 1.97 µg GAE/mL.

Conclusion: The high levels of flavonoids, robust antioxidant activity, sugars such as sucrose, glucose, and fructose, along with plentiful micronutrients, including minerals like selenium and B-complex vitamins (as noted in previous studies), highlight the potential of dates as an excellent natural resource for pharmaceutical applications, including their use as a base for medicinal syrups.

Keywords: Date flesh, bioactive compounds, flavonoids, antioxidant activity, nutraceuticals, medicinal syrup



Impact of *Mentha spicata* and *Citrus aurantium* Extracts on the Physicochemical Characteristics and Oxidative Stability of Margarine

Aldjia TAOUDIAT¹, Yamina BENMIRI² et Nadjma DADOUN³

¹Akli Mohand Oulhadj University of Bouira, Faculty of Natural and Life Sciences,
Department of Agronomy

² Mohamed Boudiaf University, M'sila, Department of Biochemistry and
Microbiology

³ M'hamed Bougara University Of Boumerde, Faculty of Science, Laboratory of
Valorization and Conservation of Biological Resources

Email address: a.taoudiat@univ-bouira.dz

Abstract:

The study aims to evaluate the use of ethanolic extract of *Citrus aurantium* and *Mentha spicata* as a substitute of vitamin E used as antioxidant in margarine preservation.

Mint and sour orange phenolic extract were obtained by using conventional soxhlet extraction. The results indicate yields of 15.4% for the leaf extract of *Mentha spicata* and 18.16% for the *Citrus aurantium*. The extracts had good total phenolic and flavonoid contents. It exhibited excellent antioxidant activity, as measured by 1,1-diphenyl-2-picrylhydrazyl (DPPH) assay. The 50% inhibitory concentrations of free radicals (IC₅₀) are 18,23mg / l for *Mentha spicata* and 21,18mg / l for *Citrus aurantium*.

The evaluation of the oxidative stability by the rancimat test showed that the margarines elaborated with extracts were more resistant to oxidation than the margarine reference with vitamin E. In addition, the physicochemical properties were not modified. *Citrus aurantium* and *Mentha spicata* contain bioactive substances that could be used in different food sectors.

Keywords: *Citrus aurantium*, *Mentha spicata*, antioxydant activity, margarine.

The background features a soft-focus image of green leaves. Overlaid on this are several abstract geometric shapes: a large orange triangle pointing down-right, a dark blue parallelogram, and a light green parallelogram. Thin white lines and dots connect some of these shapes, creating a network-like pattern. Faint chemical structures are visible, including a hexagonal lattice in the upper left, a molecular structure with circles in the upper left, and a structure with 'HS' and 'N' labels in the center. The text 'ONLINE ORAL COMMUNICATIONS' is centered in a bold, orange, outlined font.

ONLINE ORAL COMMUNICATIONS



Antimicrobial activity of extracts of *Juniperus oxycedrus*

Aicha Khemkham¹□, Fatima Mohammedi¹, Fatiha Djaroub¹

¹Faculty of Sciences of Nature and Life, Ziane Achour University, City
05 Juillet Route Moudjbara BP:3117 Djelfa, Algeria

aicha.khemkham@univ-djelfa.dz □

Abstract

This study investigates the antibacterial activity of the essential oil and aqueous extract of *Juniperus oxycedrus* from the Djelfa region. The essential oil was extracted using the Soxhlet method, yielding 1%, while the aqueous extract yielded 14.66%. Antibacterial activity was evaluated in vitro against five bacterial strains using three methods: aromatogram, microatmosphere, and solid medium dilution for the determination of minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC). The essential oil demonstrated notable antibacterial activity against *Staphylococcus aureus* (10 mm inhibition zone), *Klebsiella pneumoniae* (12 mm), and *Proteus mirabilis*, while the aqueous extract showed no antibacterial effect. The microatmosphere method revealed no activity for the essential oil. MIC testing indicated limited activity, with only *Proteus mirabilis* showing sensitivity at a dilution of 1/10. MBC results confirmed the bactericidal potential of the essential oil. These findings suggest that *Juniperus oxycedrus* essential oil possesses antibacterial properties, particularly against certain pathogenic strains.

Keywords: essential oil, *Juniperus oxycedrus*, aqueous extract, aromatogram.



**Acidified fresh cheese fortified with pumpkin (*Cucurbita pepo* L.):
nutritional properties and antioxidant potency during
refrigerated storage.**

Rima Ayad ¹□, Radia Ayad ^{2,3}, Ahlem Abbaci ⁴, Sabrina Kouahi ⁴,
Amina Alioua⁴

¹Laboratory of Biotechnology, Environment and Health, Department of Applied Microbiology and Food Sciences, Faculty of Nature and Life Sciences, University of Jijel, 18000 Jijel, Algeria. ²Laboratory of Phytochemistry and Pharmacology, Department of Chemistry, Faculty of Exact Sciences and Informatics, University of Jijel, 18000 Jijel, Algeria. ³Research Unit: Valorization of Natural Resources, Bioactive Molecules and Physicochemical and Biological Analyses, Faculty of Exact Sciences, University of Constantine 1, 25000 Constantine, Algeria. ⁴ Laboratory of Quality Control and Analyses, Department of Applied Microbiology and Food Sciences, Faculty of Nature and Life Sciences, University of Jijel, 18000 Jijel, Algeria

rima.biotech@gmail.com □

Abstract

In recent years, rising consumer expectations have resulted in a significant shift in the composition of foods. The production of nutritious and functional foods is currently in high demand. The purpose of this study is to create acidified fresh cheeses enriched with powders derived from the pulp and seeds of pumpkin (*Cucurbita pepo* L.) and to assess the impact of this integration on nutritional and sensory properties, as well as antioxidant activity, over a 21-day refrigerated storage period. Throughout the storage period, the enriched cheeses had higher levels of protein, carbohydrates, phenolic compounds, and antioxidant activity than the control cheese. The sensory test revealed that pulp-enriched cheeses were more appreciated.

Keywords: Acidified fresh cheese, *Cucurbita pepo* L., antioxidant activity, nutritional properties



**LAB-Derived Bacteriocins as Next-Generation Biomolecules
Against Antibiotic Resistance.**

Soumia HORRI ¹, Mourad ZOGHLAMI ²

¹ *Department of Biological Sciences, Faculty of SNV, Mustapha
Stambouli University, Laboratoire de Bioconversion, Génie
Microbiologique et Sécurité Sanitaire (LBGMSS), Mascara, Algeria*

² *Department of Agronomic Sciences, Faculty of SNV, Mustapha
Stambouli University, Mascara, Algeria*

¹ Soumia.horri@univ-mascara.dz

Abstract:

The alarming rise of antibiotic resistance represents one of the greatest threats to global health, limiting therapeutic options and increasing the risk of untreatable infections. In this context, biomolecules with antimicrobial properties have gained growing attention as alternatives to conventional antibiotics. Among them, bacteriocins produced by lactic acid bacteria (LAB) are ribosomally synthesized peptides with potent inhibitory activity against multidrug-resistant pathogens.

The aim of this study is to explore LAB isolated from camel milk as natural producers of bacteriocins and to evaluate their potential in overcoming multidrug-resistant pathogens. Methodologically, the approach involves microbial isolation, molecular identification, purification, and biochemical characterization of bacteriocins, followed by in vitro testing against relevant resistant strains.

Anticipated results include the discovery of novel bacteriocins with broad-spectrum antimicrobial activity, stability under diverse conditions, and mechanisms of action distinct from conventional antibiotics. Their importance lies in providing safe, effective, and eco-friendly solutions to the pressing challenge of antibiotic resistance. From a broader perspective, LAB-derived bacteriocins could serve as prototypes for the development of next-generation antimicrobials. Their use would reduce reliance on synthetic antibiotics and limit the emergence of resistant strains.

Keywords: Bacteriocins, Biomolecules, Antibiotic resistance, Antimicrobial peptides



**Gold and Silver Nanoparticle Complexes of Rutin and B-Escin as
Dual Inhibitors of SARS-CoV-2 Main Protease and RdRp**

Ilyes Zatla^{1*}, Lamia Boublenza¹

*¹ Laboratory of Microbiology applied to the Food industry,
Biomedical and the Environment, Faculty of Natural and Life
Sciences, Earth and Universe Sciences. Department of Biology.
University of Tlemcen, Algeria.*

ilyes.zatla@aol.com

Abstract

Nanoparticle-assisted drug delivery has emerged as a promising approach for enhancing antiviral activity of natural compounds against SARS-CoV-2. In this study, we evaluated the inhibitory potential of two phytochemicals—Rutin, a polyphenolic flavonoid from *Prunus avium* (sweet cherry), and B-escin, a triterpenoid saponin from horse chestnut seeds—when complexed with gold (AuNPs) and silver nanoparticles (AgNPs). Molecular docking and molecular dynamics simulations were performed against two essential SARS-CoV-2 enzymes: the main protease (Mpro) and RNA-dependent RNA polymerase (RdRp). B-escin displayed the strongest binding affinities across all complexes, with binding energies of -9.02 kcal/mol (Mpro–AuNP) and -9.04 kcal/mol (RdRp–AgNP). These high affinities were mediated by multiple hydrogen bonds and van der Waals interactions, underscoring its potential as a potent enzymatic inhibitor. Rutin, while showing weaker affinities (-6.81 to -7.70 kcal/mol), contributed additional binding stability through hydrophobic contacts and π – π stacking interactions within enzyme pockets. The consistent superiority of B-escin in both Mpro and RdRp complexes highlights its potential as a lead phytochemical scaffold, while nanoparticle conjugation may further enhance bioavailability and stability. Together, these findings suggest that Rutin and B-escin, in synergy with metallic nanoparticles, could form the basis of novel nanobiotechnological strategies against SARS-CoV-2 replication.

Keywords: SARS-CoV-2, COVID-19, Rutin, B-escin, Main protease, RdRp, Gold nanoparticles, Silver nanoparticles, Molecular docking, Antiviral agents



Phytochemical Composition and Activity of *Thymus pallescens* de Noé Against Clinical Dermatophytes of *Trichophyton* and *Candida*

SETTI AHMED Kheirae¹, TEFIEL Hakim ¹, BAREK Fatima¹,
CHAHBAR Mohamed¹, KHAROUBI Omar², MEKHALEF
BENHAFSA Fouad³

¹-Tissemsilt University Laboratory of Agronomy Environment

²- University of Ahmed Benbella, Faculty of LNS, department of
Biology, Laboratory of BTE-BD-PR, Oran,

³-Centre de Recherche Scientifique et Technique en Analyses Physico-
chimiques CRAPC, BP 384, Bou-Ismaïl, 42004, Tipaza, Algeria,

⁴Laboratory of Advanced Materials and Physicochemistry for the
Environment and Health (MAPES), Djillali Liabes University, P.B. 89
Sidi Bel Abbès 22000, Algeria ⁵Laboratoire de Structure, Elaboration et
Application des Matériaux Moléculaires (SEA2M
corresponding-author setti.sciences@yahoo.fr

Abstract:

Background Onychomycosis is a fungal infection of the nail unit leading to brittle, discolored, and thickened nails, caused by dermatophytes like *Trichophyton rubrum*. The antifungal efficacy of variety of oils has been demonstrated. The aim of the present study was to investigate the *in vitro* antimicrobial properties of essential oil of thyme (*Thymus pallescens* de Noé) obtained by hydrodistillation against *Trichophyton rubrum* and *Candida albicans*. **Material and methods** *Trichophyton rubrum* and *Candida albicans* were isolated and inoculated in Sabouraud and thyme essential oil at different concentrations. **Results** Chromatographic analysis showed that the major compounds of *T. pallescens* de Noé oil were respectively carvacrol (69.85%) and γ -terpinene (11.44%). The essential oil of *Thymus pallescens* de Noé revealed significant antifungal activity.

Conclusion The finding results suggest that the essential oil of *Thymus pallescens* can be used as alternative antifungal natural substances especially when the etiological agents are resistant to conventional antifungal drugs.

Key words: Onychomycosis, *Trichophyton rubrum*, *Candida albicans*, *Thymus pallescens* de Noé, antifungal activity.



Myrtle (*Myrtus communis*): A Promising Source of Antioxidant and Antiparasitic Agents

Meryem Benmarce¹□, Assia Haif², AbdElKarim Laatamna³

¹ Laboratory of Applied Microbiology, Ferhat Abbas University Setif 1, Algeria

² Service of Surgery of the Child and the Adolescent CHU of Setif, Ferhat Abbas University Setif 1, Algeria

³ Faculty of Nature and Life Sciences, University of Djelfa, Moudjbara Road, BP 3117, Djelfa, Algeria

benmarce.meryem@yahoo.fr□

Abstract:

Objectives: This study aimed to evaluate the antioxidant activity and antiparasitic potential of an aqueous extract obtained from *Myrtus communis* leaves.

Methods: Bioactive compounds were extracted from *Myrtus communis* leaves using decoction of water. The antioxidant activity of the extract was assessed spectrophotometrically by measuring its ability to scavenge DPPH• free radicals. Additionally, the scolicidal activity of the extract was tested *in vitro* across various concentrations.

Results and Discussion: The aqueous extract of *M. communis* demonstrated high DPPH• radical scavenging activity, with a median inhibitory concentration (IC₅₀) of 0.012 ± 0.0003 mg/mL. This value, significantly lower than that of the standard (BHT), indicates superior antioxidant activity. Furthermore, the myrtle extract exhibited notable antiparasitic activity, whose efficacy was dependent on dose and exposure time.

Conclusion: The results of this study highlight that the aqueous extract from *M. communis* leaves possesses significant antioxidant power and potent scolicidal activity, suggesting its potential for therapeutic applications.

Keywords: Antioxidant activity, aqueous extract, *Myrtus communis*, scolicidal.



**Effet antibactérien des extraits hydro-organiques de
Solenostemma argel seuls et en association avec des antibiotiques :
Perspectives intéressantes pour le traitement des infections aux
bactéries multirésistantes.**

Ryma Kebbab¹□, Samia Dermeche² et Aida Basseddik³

¹Laboratoire de Recherche Sciences et Environnement-C1810200-Université de Tamanghasset, Algérie. ²Laboratoire de Biochimie Analytique et Biotechnologies, Université Mouloud Mammeri, Tizi-Ouzou, Algérie. ³Laboratoire de biotoxicologie, pharmacognosie et valorisation biologique des plantes, Université Dr Moulay Taher de Saïda, Saïda, Algérie.

ryma.kebbab@yahoo.fr

Résumé

L'antibiorésistance constitue un danger mondial majeur pour la santé publique, c'est pourquoi la recherche de nouvelles biomolécules antimicrobiennes est toujours d'actualité pour tenter de palier à ce problème. Dans cette perspective, cette étude vise à valoriser une espèce végétale : *Solenostemma argel* en étudiant l'activité antibactérienne de ses extraits seuls et en association avec des antibiotiques. Les infusés de feuilles de *S. argel* hydrométhanolique et hydroacétonique ont été analysés quantitativement par dosage de polyphénols et flavonoïdes totaux, puis évalués pour leur effet antibactérien *in vitro* vis-à-vis d'isolats cliniques multirésistants.

Les résultats ont montré que l'extrait hydroacétonique était le plus riche en polyphénols totaux (911,20±5,69mg EAG/g) et en flavonoïdes (150,98±1,44mg EQ/g). Les tests antibactériens ont révélé que les isolats de *Staphylococcus aureus* et *Pseudomonas aeruginosa* étaient les plus sensibles à l'extrait hydrométhanolique avec des diamètres de zone d'inhibition de 13 mm et 11 mm respectivement, et une CMI de 0,625 mg/mL, suivies d'*Escherichia coli* (Diamètre d'inhibition : 09 mm et CMI : 2,5 mg/mL). Les souches *Klebsiella pneumoniae* et *Enterococcus faecalis* étaient les plus résistantes (Diamètre d'inhibition : 06 mm et CMI >5 mg/mL). L'association des deux extraits avec les antibiotiques a permis d'enregistrer de variables effets, parmi lesquels la synergie était observée majoritairement sur les souches *Staphylococcus aureus*, *Pseudomonas aeruginosa* et *Enterococcus faecalis*. L'utilisation d'extraits de *S. argel* seuls ou en association avec des antibiotiques offre des perspectives intéressantes pour le traitement des infections causées par des bactéries multi-résistantes.

Mots clés : *Solenostemma argel*, Polyphénols, Activité antibactérienne, Antibiorésistance, Synergie.



**In Silico Molecular Docking Analysis of antidiabetic potential of
p-coumaric Acid Compound**

Abdelkrim MLOUKI¹✉, Abdelhafid NANI¹, Hafssa BOUKHEIRA¹,
Khawla DJILLALI¹, and Saïda TAYEBI¹

¹*Department of Biological Sciences, Faculty of Natural and Life
Sciences, Ahmed Draia University, 01000, Adrar, Algeria,*

mlou.abdelkrim@univ-adrar.edu.dz✉

Abstract:

Diabetes mellitus is a chronic metabolic disorder marked by persistent hyperglycemia resulting from insufficient insulin production, insulin resistance, or both. Due to the several adverse effects and limitations of current antidiabetic medications, alongside the increasing prevalence of diabetes mellitus, there is a growing interest in developing innovative, safer, and more effective therapeutic agents. Thus, Bioactive compounds, primarily phenolic acids, commonly found in human food, have been demonstrated to exhibit significant antidiabetic properties. In this study, molecular docking analysis was conducted to evaluate the binding capacity of *p*-coumaric acid as a potential inhibitor /activator of three proteins: glucokinase, cytochrome P450 2E1, and the insulin receptor, which are crucial in various glucose metabolism processes and significantly contribute to the development of diabetes mellitus. The structures of the three target proteins and *p*-coumaric acid were obtained from the PDB and PubChem databases, respectively. These structures were then prepared and assigned charges for docking using AutoDock Tools software. The binding energy calculations revealed that *p*-coumaric acid exhibited strong interactions with all of the proteins studied, with glucokinase (4NO7) showing the highest binding affinity of -6.8 kcal/mol, followed by cytochrome P450 2E1 (3E6I) and insulin receptor tyrosine kinase (1IR3), which displayed binding affinities of -5.6 and -5.7 kcal/mol, respectively. Significant interactions were recognized with binding site residues, accompanied by a suitable number of hydrogen and hydrophobic bonds. Based on the results obtained, *p*-coumaric acid may be regarded as a potent antidiabetic agent. The habitual consumption of cereals rich in *p*-coumaric acid may help manage diabetes mellitus and its associated complications.

Keywords: *Diabetes Mellitus, p-coumaric Acid, Antidiabetic Activity, Molecular Docking, Target Proteins.*



A natural preservative against antibiotic residues in broiler chicken meat using bioactive molecules from olive mill wastewater

Malak Seghiri ¹□, Samira Becila¹, Rabeh Arhab ²

¹ *Équipe Valorisation et Optimisation des Ressources d'Origine Animal et Santé, Laboratoire de recherche en Sciences Alimentaires, Formulation, Innovation, Valorisation et Intelligence Artificielle (SAFIVIA), Institut de la Nutrition, de l'Alimentation et des Technologies Agro-Alimentaires, Université frères Mentouri Constantine 1, Route de Aïn El Bey, Constantine , Algérie.*

² *Natural Substances, Biomolecules and Biotechnological Applications Laboratory, Larbi Ben M'hidi University OEB. Algeria*
seghirimalak@gmail.com□

Abstract:

Olive mill waste water represent the liquid fraction generated by the oil mills during the extraction of olive oil, they are produced in large quantities in the producing countries especially in the Mediterranean basin. What characterizes this effluent is its high toxicity towards the environment due to its heterogeneous and complex composition, it is considered as a biological reservoir of organic, mineral and bioactive molecules with antioxidant and antimicrobial properties. The valorization of olive mill waste water is an innovative alternative to fight against the pollution of this discharge, improve the performance of the living animal on the one hand, have quality meat, in addition to reducing the import costs of raw materials on the economic level. In Algeria, the demand for animal proteins is constantly increasing, however the consumption of this product is low and the cost of purchase high. Faced with this problem, one of the most appropriate solutions is to resort to the poultry sector, being imperative. The study of the antibacterial activity of polyphenols from the olive mill waste water showed a positive result against resistant strains including staphylococci, bacilli ... other than the hygienic characterization of the chicken meat after slaughter revealed the absence of any antibiotic residue in the meat of the batch that consumed the new formula with the OMWW. Intestinal absorption and reduction of clinical symptoms of infectious diseases, in addition to a lesion picture of coccidiosis less pronounced compared to the standard batch.

Keywords: olive mill wastewater; valorization ; antibiotic residue, chicken. Polyphenols.



**Functional Characterization of Extremophilic Actinobacteria:
Probiotic Potential for Health and Nutrition**

Djenet CHATBI ¹, Mohammed El Amine BENDAHA ²

¹ University of Mustapha Stambouli, Faculty of Natural and Life Sciences (SNV), Laboratory of Bioconversion, Microbiological Engineering and Health Safety Mascara, Algeria

² University of Mustapha Stambouli, Faculty of Natural and Life Sciences, Mascara, Algeria

¹ djenet.chatbi@univ-mascara.dz

Abstract

Extremophilic Actinobacteria have emerged as valuable resources in biotechnology and metabolic engineering, due to their unique genetic properties and the production of biomolecules. These microorganisms possess specialized metabolic pathways that enable survival under harsh environmental conditions, making them excellent candidates for novel biotechnological applications. This study focuses on the characterization of Actinobacteria strains to evaluate their functional attributes and potential probiotic capabilities. The experimental methodology begins with the isolation and identification of Actinobacteria strains collected from extreme habitats. Subsequently, whole-genome sequencing and comprehensive annotation are employed to detect functional genomic elements, including genes associated with probiotic traits. The genomic data is further analyzed to determine the biotechnological roles of these genes, thereby providing insights into the strains' capacities to confer human and animal health benefits. The findings have shown that Actinobacteria are recognized for their probiotic potential, particularly due to their ability to withstand the challenging conditions of the gastrointestinal tract. Moreover, they produce biomolecules that have significant nutritional value, including vitamins, digestive enzymes, and antimicrobial agents that inhibit pathogenic microorganisms. Certain strains also demonstrate the ability to enhance intestinal barrier integrity. Actinobacteria serve as a next-generation source of nutritional biomolecules. Their stability under extreme environmental and industrial processing conditions highlights their potential in developing advanced functional foods, nutraceuticals, and health supplements tailored to contemporary nutritional needs.

Key words : Health-promoting bacteria, biomolecules, probiotics, functional foods



**Enrichissement Impact De La Consommation De Curcuma Sur
La Pression Artérielle Et Le Profil Anthropométrique Chez Des
Patients Hypertendus**

**Daniela Meziane¹□, Ines Gouaref¹ Malika Boucelma² Elhadj Ahmed
Koceir¹**

*¹ Laboratoire de Biologie et Physiologie des Organismes,
équipe de Bioénergétique et Métabolisme Intermédiaire, Faculté des
Sciences Biologiques, USTHB, 16123, Alger, Algerie.*

*² Service de Médecine interne, EPH Bachir Mntouri Kouba, 16208,
Alger, Algerie.*

daniela.meziane.97@gmail.com □

Abstract:

L'hypertension artérielle (HTA) est une pathologie chronique touchant près de 30 % de la population algérienne. Le curcuma, riche en molécules bioactives, est reconnu pour ses vertus anti-inflammatoires et antioxydantes. L'objectif de ce travail est d'évaluer la consommation de curcuma et son impact sur l'évolution de l'HTA. Cette étude a inclus 83 patients hypertendus. La consommation d'épices (curcuma, poivre noir, paprika, cumin, cannelle) a été évaluée à partir d'un questionnaire des fréquences alimentaires. Les données anthropométriques (IMC, tour de taille, rapport taille/hanche) et cliniques (pression artérielle systolique et diastolique) ont été recueillies lors des consultations.

La consommation régulière de curcuma a été rapportée par 46 patients (55,4 %), soit la plus faible proportion comparée au poivre noir (100 %), au cumin (86,8 %), au paprika (73,5 %) et à la cannelle (69,9 %). Les consommateurs de curcuma présentaient une pression artérielle systolique et un tour de taille significativement plus bas que les non-consommateurs. Aucune différence significative n'a été observée pour l'IMC, le rapport taille/hanche et la pression diastolique. Les proportions de diabète et de troubles articulaires étaient également plus élevée chez les non-consommateurs. Malgré que largement utilisé, le curcuma reste moins consommé par rapport d'autres épices. Nos résultats suggèrent qu'une consommation régulière pourrait améliorer la pression artérielle et l'adiposité abdominale, contribuant ainsi à la prévention des complications de l'HTA. En outre, Son association avec le poivre noir semble potentialiser ses effets. Des études complémentaires sont nécessaires pour confirmer ces observations.

Keywords: *Curcuma, Epice, Hypertension Artérielle , Pression Artérielle, Tour de Taille.*



Molecular Effects of Selected Bioactive Compounds from Plant-Based Mixtures on Apoptosis Induction and Cell Cycle Arrest in Cancer Cells: In Silico Drug Design Predictions and Molecular Docking.

Bachir Benarba¹, Khadidja Belhouala²□, and Atanasio Pandiella³

¹*Biology Department, Mustapha Stambouli University, Mascara, Algeria*

²*Agri-good Department, Belhadj Bouchaib University, Ain Temouchent, Algeria*

³*Instituto de Biología Molecular y Celular del Cáncer and CIBERONC, CSIC-Universidad de Salamanca, Spain*

khadidja.belhouala@univ-temouchent.edu.dz□

Abstract:

For decades, cancer has been the leading cause of death, but there are no certified drugs that can safely inhibit its progression. This study utilizes an in-silico model to predict the action mechanisms of phenolic compounds mixture previously shown to possess colon, prostate, and lung cancer. Through ADMET profiling, drug-likeness evaluations, molecular docking analyses, and bioinformatics tools, four compounds namely kaempferol, chrysin, vanillin, and p-hydroxybenzoic acid, were identified as meeting ADMET and Lipinski's criteria for drug-likeness while exhibiting minimal hepatotoxicity and mutagenicity. Moreover, docking predictions indicated strong binding affinities of kaempferol and chrysin for CDK1 (-17.72 ± 0.02 and -17.61 ± 0.01 kcal/mol) and caspase-8 (-9.30 ± 0.00 and -8.18 ± 0.12 kcal/mol), vanillin for MMP9 (-9.83 ± 0.04 kcal/mol), and p-hydroxybenzoic acid for Ca₂ (-8.91 ± 0.01 kcal/mol). Further validation through MMGBSA analysis confirmed their strong interactions with target proteins. These compounds may influence transcription by either inhibiting promoter-transcription factor binding or inactivating the final gene product. Specifically, kaempferol and vanillin were predicted to target CDK1 and MMP9, leading to cell cycle arrest and apoptosis. RMSD analysis supported kaempferol and vanillin as the most promising ligands. Overall, these findings suggest potential mechanism of action for phenolic compounds, providing valuable insights for future in vitro and in vivo cancer research and highlighting their possible role in cancer therapy.

Keywords: Kaempferol; vanillin; apoptosis; cell cycle arrest; molecular docking



Antimicrobial Activity of Ammi visnaga Essential Oil Against Multidrug-Resistant Klebsiella–Enterobacter–Serratia Clinical Isolates

Rahima TOUAITIA ¹, Sara GHERAIBIA ²

¹ Department of Natural and Life Sciences, Faculty of Exact Sciences and Natural and Life Sciences, University of Tebessa, Tebessa 12000, Algeria.
rahima.touaitia@univ-tebessa.dz

² Laboratory of Applied Biochemistry, Faculty of Sciences of Nature and Life, Ferhat Abbes University - Setif 1, Setif 19000, Algeria.
gheraibiasara@hotmail.com

Abstract

The global spread of multidrug-resistant (MDR) Gram-negative bacteria represents a major health challenge, with the *Klebsiella–Enterobacter–Serratia* (KES) group being of particular concern in nosocomial infections. These opportunistic pathogens are frequently resistant to β -lactams and, increasingly, to last-resort antibiotics such as carbapenems and colistin. In Algeria and across North Africa, recent surveillance data have revealed alarming resistance rates, underscoring the urgent need for alternative antimicrobial strategies.

In this study, fifty KES clinical isolates were collected from patients with hospital-acquired infections. Species identification was performed using API 20E biochemical profiling, and antibiotic susceptibility was determined according to EUCAST standards. Results showed extremely high resistance levels, with $\geq 96\%$ of isolates resistant to ampicillin, ceftazolin, and cefotaxime, while only chloramphenicol (70% susceptible) and trimethoprim–sulfamethoxazole (60% susceptible) retained partial activity. To investigate plant-based alternatives, essential oil from *Ammi visnaga* (Khella), a traditional North African medicinal plant, was extracted by hydrodistillation and tested via aromatogram and broth microdilution methods. The essential oil demonstrated remarkable activity, with inhibition zones ranging from 18 to 47 mm and minimum inhibitory concentrations (MICs) as low as 0.0097 $\mu\text{g/mL}$ against *Klebsiella pneumoniae*. Notably, its efficacy surpassed that of several conventional antibiotics. These findings highlight the strong in vitro antimicrobial potential of *A. visnaga* essential oil against MDR KES isolates. This study not only confirms the need for continuous AMR surveillance in the region but also supports the exploration of traditional medicinal plants as promising natural antimicrobials or adjuvant therapies. Ongoing work will focus on phytochemical characterization, in vivo validation, and safety profiling.

Keywords: Antimicrobial resistance, *Ammi visnaga*, essential oils, multidrug-resistant bacteria, *Klebsiella*, *Enterobacter*, *Serratia*



Antibacterial resistance: prevalence and consequences

Merah Oumeima^{1,2*}, Chaouche Sara¹ & Nour Maissa Malak¹

Faculté des sciences, Département de Biologie, UMBB, Boumerdès.

*2-Laboratoire de Bioinformatique, Microbiologie Appliquée et
Biomolécules, Boumerdès*

** o.merah@univ-boumerdes.dz*

Abstract

Antibiotic resistance is one of the most significant global health challenges, resulting in treatment failures and the spread of infections. In the private sector, the risk of antibiotic-resistant bacteria increases due to the unregulated use of antibiotics.

This study aimed to identify and characterize the bacterial pathogens responsible for genitourinary infections in a private laboratory setting in Algeria “Boumerdès city”, and to evaluate their antibiotic resistance profiles. A total of 930 clinical samples, including urine, vaginal swabs, sperm cultures, and urethral swabs, were collected and analyzed between May 2024 and May 2025. Bacterial identification was performed using morphological, biochemical, and cultural methods, including the use of chromogenic media.

Out of 930 samples, 17.63% showed bacterial growth indicative of infection. The predominant pathogen was *Escherichia coli* (59.45%), followed by *Klebsiella pneumoniae* (8.01%), *Proteus mirabilis* (7.54%), and other species such as *Enterobacter aerogenes*, *Streptococcus agalactiae*, and *Staphylococcus aureus*. Antibiotic susceptibility testing revealed a significant presence of extended-spectrum beta-lactamase (ESBL) producing strains among *E. coli* (13.6%) and *K. pneumoniae* (29.41%), with high resistance rates to penicillins, cephalosporins, quinolones, aminoglycosides, and trimethoprim-sulfamethoxazole. Multidrug-resistant strains were frequent, highlighting the challenge of effective treatment.

Comparison with recent Algerian and French data showed similar bacterial distributions and resistance patterns, although antibiotic pressure and resistance rates were generally higher in Algeria. The findings underscore the urgent need for continuous surveillance and rational antibiotic use to combat the spread of resistant bacteria in community settings.

Keywords: Genitourinary infections; *E.coli* ; antibiotic resistance; extended-spectrum beta-lactamase; private laboratory.



Assessment of Antioxidant Activity in Date Palm (*Phoenix dactylifera* L.) Fruits and Leaves: A Comparative Study
HAMDI aicha^{1,2,□}, FOUJILI Assia³, ABDELLATIF Maram³, ALIA Kheira³

¹ *Sciences fondamentaleslaboratory, University Amar Telidji-Laghouat 03000, Algeria*

² *AppliedChemical and Physical Sciences Laboratory, Ecole Normale Supérieure, Laghouat 03000, Algeria*

³ *Département de sciences naturelles, Ecole Normale Supérieure, Laghouat 03000, Algeria*
hamdi.bio@gmail.com [□]

Abstract:

Phoenix dactylifera L. (date palm) is widely recognized for its nutritional richness and diverse health-promoting properties. This study investigated the total phenolic content (TPC) and antioxidant capacity of fruits and leaves from four Algerian cultivars—Deglet Nour, Mish Daqla, Ghars, and Qattar—collected from three distinct regions. Extracts were prepared using methanol and 80% aqueous methanol. The TPC was quantified by the Folin–Ciocalteu assay, while antioxidant activity was evaluated using the DPPH radical scavenging method. Results revealed considerable variation among cultivars and plant parts: TPC values ranged from 37.21 to 372.31 mg GAE/100 g DW in fruits, and from 1,819.35 to 13,993.5 mg GAE/100 g DW in leaves. All extracts demonstrated strong antioxidant activity, with IC₅₀ values of 0.0034–0.024 g/L in fruits and 0.0018–0.0085 g/L in leaves. These findings underscore the remarkable antioxidant potential of date palm, particularly its leaves, positioning them as promising natural sources of bioactive compounds with potential applications in nutrition, preventive health, and functional food development. Further research is warranted to explore their therapeutic efficacy and industrial exploitation.

Keywords: *Phoenix dactylifera* L, total phenolic content, DPPH, antioxidant activity, bioactive compound



The background features a light green bokeh of foliage. Overlaid are several geometric shapes: a large orange triangle pointing down-right, a dark blue parallelogram, and a green parallelogram. Thin white lines and dots connect some of these shapes, forming a network. Faint chemical structures are visible, including a hexagonal lattice at the top and a molecule with an 'N' atom near the bottom center. The text 'ONLINE POSTER COMMUNICATIONS' is centered in a bold, orange, outlined font.

ONLINE POSTER COMMUNICATIONS



Preparation and Evaluation of a Herbal Milk Formulation Containing Plant Extracts for Antioxidant and Photoprotective Effects

Narimane Lammari¹□, Mehdi Louaer¹, Hadjira Rabti^{2,3}, Samia Boudiaf¹, Nesrine Meghezzi¹, Taha Menzri¹, Rania Metarfi¹, Chaouki Bensouici⁴, Ouahida Louaer¹ and Abdeslam Hassen Meniai¹

¹ *Environmental Process Engineering Laboratory, Constantine 3 University, Constantine, Algeria*

² *Laboratory of Investigation and Research Specialized in Health, Environment and Innovation (LIRSSEI), Ferhat Abbas-Setif 1 University, Setif, 19000, Algeria*

³ *Department of Pharmaceutical Engineering, Faculty of Process Engineering, Salah Boubnider-Constantine 3 University, Constantine, 25000, Algeria*

⁴ *Centre de Recherche en Biotechnologie (CRBt), 25000 Constantine, Algeria*

narimane.lammari@univ-constantine3.dz □

Abstract:

The use of medicinal plants is rapidly expanding, particularly in the field of dermatology and cosmetic applications. Phytocompounds are increasingly incorporated into skincare formulations due to their natural origin and broad spectrum of biological activities. The present study aimed to develop a plant-extract-based cosmetic milk with antioxidant and photoprotective properties. Three plants were investigated : white mugwort (*Artemisia herba-alba*), lemon balm (*Melissa officinalis* L.), and moringa (*Moringa oleifera* L.). The research was conducted in three stages: (i) optimization of maceration conditions using a Box–Behnken design, (ii) evaluation of antioxidant and photoprotective activities of the extract, and (iii) formulation and characterization of the herbal milk. Results revealed that mugwort extract exhibited strong antioxidant and photoprotective activities. The formulated herbal milk was further assessed for physicochemical and sensory parameters, including pH, appearance, spreadability, viscosity, and skin tolerability, all of which complied with acceptable standards. These findings highlight the potential of the developed herbal photoprotective milk as a safe and effective natural cosmetic formulation to promote healthy and radiant skin.

Keywords: skincare, milk, antioxidant, photoprotective, white mugwort, lemon balm, moringa



Valorizing Therapeutic Plants: The Role of Fenugreek Seed Extract in Probiotic Growth and Adhesion

[Rabah Zineb](#)¹, [Boubakeur Badra](#)² and [Khadem Hafidha](#)³

¹*Nature and life sciences faculty, Tiaret university. Algeria*

[*Zineb.Rabah@Univ-Tiaret.Dz](mailto:Zineb.Rabah@Univ-Tiaret.Dz)

Abstract

The study investigates the prebiotic effect of phenolic extract from germinated fenugreek seeds, focusing on the potential therapeutic applications of this plant. Specifically, it assesses the impact of the extract on the growth and adhesive properties of two probiotic bacteria: *Streptococcus thermophilus* and *Enterococcus durans*. The objective was to explore how the extract could enhance the prebiotic potential of these lactic acid bacteria.

The research demonstrates that the phenolic extract significantly promotes the growth of both probiotic strains, indicating its beneficial role in supporting their proliferation. Furthermore, the study examines the adhesive properties of the bacteria, including auto-aggregation and co-aggregation capabilities, as well as membrane permeability, which are essential factors for the effectiveness of probiotics in gut health.

Keywords: Probiotic-Prebiotic- fenugreek seeds- adhesion- growth



Zoonotic mycobacteria in Algerian barbary macaque: a hidden threat to human and animal health

**BELLIL Dassine⁽¹⁾, GHAROUT-SAÏT Alima⁽¹⁾, DJOUDI Ferhat⁽¹⁾,
BELLIL Zahra⁽¹⁾, MENDIL Ouidad⁽¹⁾, MANSEUR Lyticia⁽¹⁾**

(1) Université de Bejaia, Faculté des Sciences de la Nature et de la Vie,
Laboratoire d'Ecologie Microbienne, 06000 Bejaia, Algérie.

dassine.bellil@snv.univ-bejaia.dz

Mycobacteria include both pathogenic and non-pathogenic species, some of which are opportunistic and pose a risk to public health in both humans and animals due to the severity of the diseases they can cause. Our research focuses on identifying mycobacterial strains in barbary macaque through bacteriological analyses.

A total of 198 bird droppings samples were examined at the Microbial Ecology Laboratory of the University of Bejaia. The samples underwent a decontamination process, were then inoculated on Lowenstein-Jensen medium, and incubated. The isolates were identified based on their morphological characteristics and colony appearance on the culture medium.

The results of our bacteriological analysis revealed 41 strains of non-tuberculous mycobacteria in the bird droppings.

This study highlights the diversity of these mycobacteria among birds in the Bejaia region and suggests their potential role in the spread of these pathogenic agents.

key words: Mycobacterium spp., Barbary macaque, Zoonoses, public health, Algeria.



Evaluation des activités antioxydante et antimicrobienne des extraits du pourpier « *Portulaca Oleracea* L. »

Samia Dermeche¹□, Ryma Kebbab², Samia Bedouhene¹, Nassima Senani¹

¹ Université Mouloud Mammeri de Tizi-Ouzou, Faculté des Sciences Biologiques et des Sciences Agronomiques, Département de Biochimie-Microbiologie, Laboratoire de Biochimie Analytique et Biotechnologies, Tizi-ouzou, Algérie.

² Université de Tamanghasset, Faculté des sciences et Technologie, Département des sciences de la nature et de la vie, Laboratoire de recherche Sciences et Environnement : Bioressources, Géochimie-Physique Législation et Développement Socio-Economique, BP 10034-Sersouf, Tamanrasset-Algerie.

samia.dermeche@ummt0.dz□

Résumé

Le présent travail porte sur l'évaluation des activités biologiques (antioxydante et antimicrobienne) des extraits du pourpier *Portulaca Oleracea* L., collecté dans deux régions différentes de la wilaya de Tizi Ouzou, à savoir Tirmatine et Mekla. Le dosage des polyphénols totaux a été mesuré par la méthode colorimétrique au réactif de Folin-Ciocalteu. L'activité antimicrobienne des extraits a été évaluée à l'aide de la méthode de diffusion sur gélose. Les résultats ont montré des teneurs en polyphénols des extraits qui varient de $1,82 \pm 0,09$ à $49,52 \pm 0,44$ mg/gMS. Le test au radical 2,2-diphényl-1-picrylhydrazyle (DPPH), confirmant l'efficacité antioxydante des extraits de la plante, a montré des valeurs IC₅₀ intéressantes qui varient de $10,25 \mu\text{g/mL}$ à $69,77 \mu\text{g/mL}$. Quant à l'évaluation de l'activité antimicrobienne, elle a révélé un faible potentiel antibactérien et antifongique malgré la contenance des extraits en polyphénols exhibant un pouvoir antiradicalaire remarquable. Les résultats obtenus sont prometteurs et méritent d'être approfondis.

Mots clés : *Portulaca Oleracea* L, Antiradicalaire, Antimicrobien, Polyphénols.



Évaluation de la toxicité de l'huile essentielle de *Mentha pulegium* vis-à-vis de la chenille processionnaire du Pin *Thaumetopoea pityocampa*

Amel Hammani¹, Nassima Behidj², Salima Guerroudj³, Amel Saidi⁴

¹Laboratoire de recherche Technologie douce, Valorisation, Physico-chimie des Matériaux biologiques et Biodiversité Faculté des Sciences, Université M'hamed Bougara, Boumerdès

² Laboratoire de Caractérisation et Valorisation des Ressources naturelles, Faculté des sciences Nature et de la vie Sciences, Mohamed El Bachir El Ibrahimi Université, Bordj Bou Arreridj, Algérie

³Laboratoire de sciences Biologique et Agronomique, Amar Telidji Université de Laghouat

⁴Laboratoire de gestion et valorisation des ressources naturelles, et assurances qualité. Université de Akli Mouhaned Oulhadj Bouira
am.hammani@univ-boumerdes.dz

Résumé:

Dans le but de rechercher des moyens de lutte biologique contre les espèces ravageuses, le présent travail porte sur l'étude de l'effet insecticide de l'huile essentielle de *Mentha pulegium* qui a été évalué in vitro vis-à-vis les, de la chenille processionnaire du Pin *Thaumetopoea pityocampa* en premiers stade larvaire à travers deux modes d'exposition : le test par contact et le test par inhalation. Les résultats obtenus montrent que l'huile essentielle exerce une toxicité significative, Après 24 heures, la mortalité varie de 53,33 % à 50 µl/ml à 91,67 % à 150 µl/ml par inhalation et de 20 % à 50 µl/ml à 86,67 % à 150 µl/ml par contact, dépendante à la fois de la dose et du temps d'exposition. Les concentrations létales obtenu pour les deux test contact et inhalation sont 18,824 µl/ml et 47,589 µl/ml respectivement. Ces observations mettent en évidence le potentiel insecticide de *M. pulegium*, attribué à sa richesse en composés bioactifs tels que la pulegone et le menthone. Ainsi, cette huile essentielle constitue une alternative prometteuse et respectueuse de l'environnement dans les stratégies de gestion durable des insectes nuisibles

Mots clés: *Thaumetopoea pityocampa*, l'huile essentielle, *Mentha pulegium*, insecticide.



Biochemical and Histological study of the in vivo Anti-inflammatory activity of a new Phytolectin Extracted from *Trimania Nivea* at the kidney level of Wistar rats treated with Methionine.

Monna Taki Ellah Bousaoula¹, Youcef Necib¹, RachaRym Aouissat¹, Sana Boufeker¹, Ahlam Bahi¹.

*¹Laboratory of Microbiological Engineering and Applications,
Department of Biochemistry and Molecular and Cellular Biology,
University of Constantine 1, Constantine, Algeria.*

monnatakiellah@gmail.com

Abstract

Lectins have been defined as non-immune origin proteins that can specifically and reversibly bind with sugars, they are sugar-specific binding proteins or glycoproteins with multiple combining sites capable of agglutinating cells. This unique property of lectins makes them an invaluable tool for many medical and biological problems, including the creation of antiviral, antimicrobial, antitumor, and immunomodulatory drugs, as well as the determination of blood groups and the diagnosis of various diseases. Many lectins have been isolated and characterized from higher fungi Desert truffles, which are edible mycorrhizal fungi constituted a popular food in many cultures due to their medicinal and nutritional properties, and they have become very attractive as a functional food.

In this context and for the enhancement of our heritage, a functional study of lectins purified from *Trimania Nivea*, a mushroom originating from Western Sahara, by extraction followed by precipitation and gel filtration chromatography, lyophilized and contained in this plant, and the correlation of these results with in vivo anti-inflammatory on Wistar rats by assessment of enzymatic parameters (SOD, CAT, MDA..), will be reported in our work.

Keywords: Lectin, *Trimania Nivea*, Anti-inflammatory Activity, Methionine, Enzymatic parameters, Rats.



L'émergence du génotype bla 23 de la carbapénémase parmi les isolats d'entérobactéries résistantes aux carbapénèmes chez des patients atteints des infection du site opératoire : Étude d'un hôpital d'Algérie (CHU SIDI BELABES)

FEKHAR NASSIMA ^{*1,2,3}, Bousmaha leila ^{1,2}, MAROUKI ahmed^{1,2}, ABDALAOUI fatiha^{1,2} (1), ADLA khawla nihad^{1,2} Bénali Beghdadli ², Belaguid soumia ^{2,3}, Benmouloud khadra ^{2,3},

¹ Biology Department -Faculty of Natural and Life sciences Environment and Health ² Laboratory-Faculty of medicine Univerity of Sidi Bel Abbès-Algeria. ³ Department of biology, Faculty of Nature and Life Sciences, Tahri Mohamed University, Bechar Algeria.

* nassima.fekhar27@gmail.com

Abstract:

Les *entérobactéries* résistant aux carbapénamase (BLA) s'est répandu dans le monde entier et il est devenu une menace pour la santé publique. Dans le monde entier et il est devenu très endémique dans de nombreuses zones géographiques. Ce pathogène est à l'origine d'une morbidité et d'une mortalité dans les hôpitaux. L'objectif de cette étude était de déterminer la Prévalence du gène BLA23 et de déterminer son profil de résistances aux antibiotiques. Un questionnaire fut rempli par les patients concernés indiquant l'âge, le sexe, Type d'intervention, Service de séjour, la survenue d'infection poste opératoire. 50 isolats Provenant d'échantillons microbiologiques de routine ont été collectés à l'hôpital hassani Mohammed entre Janvier et juin 2024. Les isolats ont été identifiés par des méthodes conventionnelles. La sensibilité aux antibiotiques des isolats ont été réalisés en utilisant la méthode de diffusion du disque selon les normes du CA-SFM, 09 antibiotiques a été utilisée pour déterminer la sensibilité aux carbapénèmes. Les résultats montre une que les 65% des souches étaient multirésistant ; 90 % résistant à la céfoxitine, céfazoline, et imipénème ; 80% à L'amoxicilline/acide clavulanique, 70% résistant au gentamycine , 65% à 30% à l'amikacine et Trimetoprima sulfametoxazol et 20% à l'azithromycine. On outre, Le gène bla23 a également été amplifié ; Les PCR-bla23 ont permis l'amplification du gène BLA23 d'un fragment d'une bande spécifique de 813 pb correspondante au gène . 70% des isolats sont positive. La forte prévalence des carbapénémases et/ou de leurs gènes codants parmi les entérobactéries multirésistant en Algérie est alarmante, , Le génotype Bla de la carbapénémase est en train d'émerger dans les établissements de soins de santé, ce qui pourrait être la cause de l'augmentation actuelle des entérobactéries productrices de carbapénémase.

Mots clés : résistance, carbapénèmes , *entérobactéries* , gène BLA23 , infection.



Acetylcholinesterase Inhibitory Potential of *Dysphania ambrosioides* Essential Oil: Implications for Alzheimer’s Disease

Khadija Boudebbaz ¹□,

¹ *Laboratory of Pharmacology and Phytochemistry, Department of Chemistry, Faculty of Exact Sciences and Informatics, University of Jijel, 18000 Jijel, Algeria.*

khadija.boudebaz@univ-jijel.dz □

Abstract:

Dysphania ambrosioides is a medicinal plant widely used in traditional medicine for its antiparasitic and anti-inflammatory properties. This study aims to evaluate its potential as a natural inhibitor of acetylcholinesterase (AChE), a key enzyme involved in the degradation of acetylcholine and associated with neurodegenerative disorders such as Alzheimer’s disease. The essential oil (EO) of *Dysphania ambrosioides* was extracted by hydrodistillation, and its chemical composition was analyzed using gas chromatography–mass spectrometry (GC-MS). The inhibitory activity of the EO against AChE was assessed *in vitro* using Ellman’s assay, revealing a significant enzyme inhibition. To identify the molecular interactions underlying this effect, molecular docking was performed on the main identified constituents, providing insights into their affinity and binding mode with the active site of AChE. The results showed that some major EO compounds exhibit strong affinity for AChE, suggesting a competitive inhibitory effect that may slow down acetylcholine degradation and thereby improve cholinergic transmission. This study highlights the therapeutic potential of *Dysphania ambrosioides* as a natural AChE inhibitor, opening perspectives for the development of alternative treatments against Alzheimer’s disease and other neurodegenerative disorders.

Keywords: *Dysphania ambrosioides*, Essential oil, Acetylcholinesterase, Molecular docking.



***Xanthium* Fruit Extracts: Phenolic Profile, FTIR Analysis, And Biological Activities**

GUERGOUR Hassina ^{1*}; ALLOUNI Rima²; BOUGUERRA Asma³;
MEZITI Asma ¹; FATMI Widad ¹

1. *Laboratory of Health and Environment, Faculty of Life and Natural Sciences and of Earth and Universe Sciences, Mohamed El Bachir El Ibrahimi University, Bordj Bou Arreridj, 34000, Algeria*
2. *Department of Basic Studies, Faculty of Natural and Life Sciences, University Ferhat Abbas, Setif 19000, Algeria*
3. *Faculty of Life and Natural Sciences and of Earth and Universe Sciences, Mohamed El Bachir El Ibrahimi University, Bordj Bou Arreridj, 34000, Algeria*
* h.guergour@univ-bba.dz

Abstract

The genus *Xanthium*, widely distributed across the world, is traditionally valued for its medicinal properties. The present study investigated the phenolic profile, FTIR analysis, antioxidant potential, and antibacterial activities of fruit extracts from *Xanthium*. Two extracts were prepared using distilled water (EH₂O) and methanol (EMeOH). The aqueous extract provided the highest extraction yield and total phenolic content (131.24 µg GAE/mg Ex), whereas the methanolic extract was richer in flavonoids (36.68 µg QE/mg Ex) and exhibited stronger antioxidant activity, as demonstrated by the DPPH radical scavenging assay. FTIR spectroscopy revealed characteristic functional groups linked to bioactive secondary metabolites, and LC/MS analysis provided a detailed phenolic profile, confirming the presence of diverse phenolic acids and flavonoids that support the observed biological activities. Antibacterial activity was evaluated against five pathogenic strains, including both Gram-positive and Gram-negative bacteria. The aqueous extract showed remarkable efficacy against three Gram-positive strains, while Gram-negative bacteria were more resistant.

These findings highlight the richness of *Xanthium* fruit extracts in phenolic compounds and their potential as natural sources of antioxidant and antibacterial agents with therapeutic relevance.

Keywords: *Xanthium*; Asteraceae; Phenolic profile; FTIR; LC/MS; Antioxidant activity; Antibacterial activity.



Dosage des composés phénoliques et l'effet antioxydant de l'extrait hydroéthanolique de *Berberis hispanica*

Meriem Hamoudi^{1,2}, Allaoua Nouri^{1,3}, Djouher Amroun^{1,4}, Messaoud Hachemi⁵, Ghedjati Samira¹, Khenouf Seddik¹ and Saliha Dahmna¹

¹Department of organism biology, Faculty of Nature and Life Sciences, University Mostefa Benboulaïd Batna2, Batna, Algeria ² Department of organism biology, Faculty of Nature and Life Sciences, University Mostefa Benboulaïd Batna2, Batna, Algeria ³Department of Biology, Faculty of Natural Sciences, Life and Earth Sciences, University AKLI Mohand Oulhadj, Bouira, Algeria ⁴ Department of Common Core, Faculty of Nature and Life Sciences, Université Abderrahmane-Mira de Béjaïa - Campus d'El-Kseur, Algeria. ⁵ Laboratory of Biotechnology of Bioactive Molecules and Cellular Physiopathology, Faculty of Science and Nature's Life, University of Batna 2, Batna, Algeria

m.hamoudi@univ-batna2.dz

Abstract

Les substances naturelles issues des végétaux présentent des intérêts multiples mis à profit dans la biotechnologie tant dans l'industrie alimentaire, cosmétique que pharmaceutique. Parmi ces composés on retrouve une grande partie des métabolites secondaires qui se sont illustrés dans beaucoup de domaines et même en thérapie. Dans ce contexte, nous avons concentrée sur la quantification des composés phénoliques et l'évaluation de l'activité antioxydante de l'extrait hydroéthanolique des écorces des racines (EHER) de *Berberis hispanica*, une plante utilisée dans le monde et en Algérie particulièrement dans la région de Batna pour traiter le diabète sucré et les maladies cancéreuses. La recherche actuelle a été menée pour étudier la teneur phénolique par des méthodes spectrophotométriques et les activités antioxydantes par le test de piégeage du radical libre DPPH (2,2-diphényl-1-picrylhydrazyl) et la réduction du fer (FRAP) de l'extrait hydro-éthanolique des écorces des racines obtenus par la méthode de la macération à froid. D'après les résultats obtenus dans cette recherche, les teneurs en polyphénols et en flavonoïdes présentent dans (EHER) sont de de l'ui ont été obtenues par l'extrait des feuilles avec des valeurs de ($93.522 \pm 0.094 \mu\text{g EAG/mg d'extrait}$) et ($20.360 \pm 0.021 \mu\text{g EQ/mg d'extrait}$), respectivement. Les données de l'activité antioxydante obtenus montrent un effet scavenger élevé avec une $\text{IC}_{50} = 0.057 \pm 0.001 \text{ mg/ml}$ et une $\text{EC}_{50} = 0.026 \pm 0.001 \text{ mg/ml}$ pour la réduction du fer. On constate que la concentration la plus élevée des composés phénoliques correspond à une forte activité antioxydante. Les méthodes de l'activité antioxydante montrent que (EHER) du *B. hispanica* présentent des propriétés antioxydantes avec les deux tests utilisés. Par conséquent la plante *B. hispanica* représentent un candidat approprié pour la préparation de produits pharmaceutiques ou nutraceutiques.

Keywords: *Berberis hispanica*, Activités antioxydantes, Polyphénol, flavonoïdes



Screening of bacteriocins producing lactic acid bacteria isolated from traditional dairy products.

Fatma Attoura¹□, Abderrahim Cheriguene², Fadela Chougrani³

^{1,2,3} Department of Biology, Laboratory of Animal Production

Sciences and Techniques, Faculty of Natural and Life Sciences,

Abdelhamid Ibn Badis University, 27000 BP, Mostaganem, Algeria.

f.attoura17@gmail.com□

Abstract:

The intensive use of antibiotics has led to the emergence of highly resistant pathogenic strains, making it difficult to treat their infections, therefore, searching for substitutes it has become a necessity.

The current study aims to select bacteriocins producing lactic acid bacteria isolated from traditional dairy products including: Lben, Dhen, Raib having the capacity to inhibit pathogenic bacteria.

Lactic acid bacteria were isolated on MRS agar, characterized by a phenotypic and biochemical study. The antimicrobial activity of the isolates was evaluated against pathogenic Gram positive and Gram-negative bacteria using the spot-on lawn method and agar well diffusion assay.

To investigate the production of bacteriocins and their involvement in the antagonist activity the cell free supernatant (CFS) of the LAB isolates was treated to eliminate the effect of organic acids and hydrogen peroxide. Isolates whose CFS remained endowed with inhibitory potential was subject of confirmation of the proteins natural of the molecules responsible of the inhibition zones produced using the enzymes pepsin and trypsin.

The results revealed that four from a total of sixty Lactic Acid Bacteria isolates show a potential for bacteriocin biosynthesis. Antimicrobial tests revealed inhibition zones ranging from 7.5 mm to 9 mm against *Citroacter freundii* ATCC13316 and *Bacillus cereus* ATCC 10876 respectively.

This study underscores the significance of bacteriocins biosynthesis and their antimicrobial properties and emphasizes its relevance in pharmacological applications for treating infections.

Keywords: Lactic Acid Bacteria, Antimicrobial Activity, Bacteriocins, Pathogens.



Évaluation des activités antioxydants et la toxicité aiguë des extraits hydro-éthanoliques de deux graines médicinales: *Nigella sativa* L., et *Pimpinella anisum* L.

Faffa Beghadid¹, Asma Remil², Samira Meziani¹, Lallia Amara¹.

¹Biotoxicology laboratory, Djillali LIABES University, Department Biology, Faculty of Science, Sidi Bel Abbès, Algeria

² Laboratory of Process Engineering, Materials and Environment, Djillali Liabes University, Sidi Bel Abbès, Algeria

beghadid22@gmail.com □

Résumé: Les plantes médicinales constituent une source inépuisable de substances aux activités biologiques et pharmacologiques très variées. La nigelle (*Nigella sativa* L) et l'anis vert (*Pimpinella anisum* L) sont des plantes médicinales des plus utilisées depuis des siècles dans la médecine traditionnelle. Cependant, l'étude de la toxicité des plantes et de leurs extraits est une approche cruciale qui vise à identifier, caractériser et évaluer leurs effets néfastes potentiels en déterminant DL₅₀. Ce travail a porté sur l'évaluation de l'activité antioxydante et de la toxicité aiguë des extraits hydro-éthanolique de *Nigella sativa* L. (NS) et de *Pimpinella anisum* L. (PA). La préparation des extraits a été effectuée par une simple macération dont le rendement a été de l'ordre 11,81% pour la nigelle et de 9,31 % pour l'anis. L'activité antioxydante a été réalisée in vitro à selon des tests référencées (DPPH, FRAP et β -carotène), la concentration inhibitrice 50 a été calculé et les résultats obtenus ont montrés que les deux extraits possèdent une activité modérée en comparant avec le standard utilisé(Acide Ascorbique). Par ailleurs, la toxicité aiguë a été étudiée in vivo selon le protocole OCDE 425, en administrant une dose unique de 2 000 mg/kg à des rats. Aucune mortalité n'a été observée, mais l'extrait de *Nigella sativa* L a provoqué des signes transitoires de sédation et une légère diminution du poids corporel, alors que l'extrait de *Pimpinella anisum* L. et leur mélange n'ont montré aucun effet notable. Pour les poids relatif des organes (le foie et les reins) et les analyses biochimiques(hépatiques et rénales) aucun différence significative a été enregistré, Ces résultats suggèrent un potentiel antioxydant intéressant pour ces deux plantes, avec un profil de sécurité relativement bon, mais qui nécessite toutefois des investigations toxicologiques plus approfondies, notamment pour *Nigella sativa* L.

Mots clés: *Activité antioxydante, toxicité aiguë, extraits hydro-éthanoliques , Nigella sativa L., Pimpinella anisum L.*



Évaluation du profil en acides gras et en minéraux de *Sargassum vulgare* comme aliment fonctionnel potentiel

Chouh Amina^a, Derdour Mouna^a, Dali Halima^b, Nouadri Taher^c

^a Centre de Recherche en Biotechnologie CRBT, Constantine

^b Centre De Recherche Des Analyses Physico Chimique, Ptapc
Ouargla

^c Laboratoire de Génie Microbiologique et Applications, Département
de Biochimie et Biologie Moléculaire et Cellulaire, Faculté des
Sciences de la Nature et de la Vie, Université des Frères Mentouri
Constantine 1, Constantine

chouh.amina@gmail.com

Résumé :

L'intérêt croissant pour les macroalgues est aujourd'hui lié à leurs propriétés bioactives et nutritionnelles remarquables, ainsi qu'à leur abondance et à leur faible valorisation. Ces caractéristiques les rendent particulièrement attractives pour les régimes alimentaires alternatifs. *Sargassum vulgare*, une algue brune comestible traditionnellement consommée dans certaines cultures en Asie, est largement répartie dans différentes régions du monde, notamment en Méditerranée.

Dans la présente étude, *Sargassum vulgare* a été récoltée sur la côte Est de l'Algérie afin d'évaluer ses propriétés nutritionnelles. Le profil en acides gras a été déterminé par chromatographie en phase gazeuse couplée à la spectrométrie de masse (GC-MS), tandis que la composition minérale a été analysée par spectrométrie d'absorption atomique (SAA). L'analyse du profil lipidique a mis en évidence la présence d'acides gras d'intérêt nutritionnel. Parmi ceux-ci, l'acide palmitique (C16:0) représentait la proportion la plus importante des acides gras saturés (29,64 %). Les résultats ont révélé une teneur élevée en matières minérales, dominée par le magnésium (32,59 mg/g), le fer (7,77 mg/g), le manganèse (0,69 mg/g), le zinc (0,24 mg/g), le cuivre (0,10 mg/g), le nickel (0,45 mg/g), ainsi que des traces de plomb (0,49 mg/g) et de cadmium (0,20 mg/g). Ces résultats soulignent le potentiel de *Sargassum vulgare* comme source de biomolécules nutritionnelles, renforçant son intérêt en tant qu'aliment fonctionnel susceptible de contribuer aux besoins alimentaires humains et animaux, tout en offrant des bénéfices potentiels pour la santé.

Mots clés : *Sargassum vulgare*, Acides gras, Minéraux, Profil nutritionnel, Aliment fonctionnel



Assessment of the *in vivo* hepatoprotective activity of the natural and industrial Silymarin

Asma Saidi^{1,2}, Leila Bellebcir¹, Leila Hambaba²

¹ Department of natural and life sciences, faculty of natural and life sciences and earth and universe sciences, University of Mohamed Khider, Biskra 07000, Algeria

² Laboratory of Biotechnology of Bioactive Molecules and Cellular Physiopathology (LBMBCP), Department of Microbiology and Biochemistry, Faculty of Natural and Life Sciences, University Batna 2, Batna 05078, Algeria

[corresponding-author: asma.saidi@univ-biskra.dz](mailto:asma.saidi@univ-biskra.dz)

Abstract:

The pharmacological search for new natural hepatoprotector phytocompounds able to protect liver, the key organ to regulate metabolism, against the hepato-toxicity complications linked to oxidative stress seems to be of the utmost interest. The present study aimed to assess the *in vivo* hepatoprotective activity of both natural and industrial Silymarin. The natural flavolignan Silymarin was purified from *Silybum marianum* extract, as well as the industrial one was purchased from Sigma Aldrich. The possible hepatoprotector effect of these molecules were evaluated *in vivo* at a dose of 120 mg/kg per day using the paracetamol (PCM) at dose of 500mg/kg to induce the hepatic stress in *Swiss albino* mice. At the end of this experiment, the biochemical parameters were analyzed from collected blood. However, livers and kidneys were removed, fixed in formalin 10% and the prepared tissue sections were colored for the histological changes examination. The natural silymarin showed statistically ($p < 0.001$) a potent protective activity in both liver and kidneys organs against the hepatic stress caused by PCM by reducing the almost dosed parameters compared to PCM-control group. Indeed, the both tested compounds preserved the urea, creatinine and ALAT at their reduced levels. However, ASAT and PAL values were significantly ($p < 0.01$) better in the natural Silymarin-treated group than in the group treated with industrial Silymarin. In addition, the analyzed liver sections revealed the preventive effect of these biomolecules against the intensive hepatic alterations, induced by the free radicals generated following the PCM administration, by preserving the normal tissue architecture and preventing severe vascular congestion, accompanied sometimes by haemorrhage in PCM-control group, and by avoiding massive leukocytes infiltration. Conclusion: these encouraging results demonstrated again the pharmacological potentials of Silymarin, one of the most bioactive flavonoids, and confirmed its integration as active ingredient in the pharmaceutical industry.

Keywords: Natural Silymarin, Industrial Silymarin, Hepatoprotective activity, Pharmaceutical industry.



Contribution Title Modulation of Intestinal Inflammatory Response by Antioxidant Micronutrients: Experimental Study in Mice

Hadja Fatima Tbahriti^{1,2}✉, Ali Boukadoum^{1,2},

¹ Higher School of Biological Sciences of Oran, Oran Algeria

² Laboratory of Clinical Nutrition and Metabolism, Department of Biology, Faculty of Sciences of Nature and Life, University of Oran 1, Algeria

✉ tbfatima@gmail.com

Abstract:

Inflammatory bowel diseases (IBD) represent a major therapeutic challenge due to the limited efficacy of conventional treatments and their side effects. Immunonutrition offers a promising approach to modulate intestinal inflammatory response.

To evaluate the therapeutic efficacy of vitamin C alone and in combination with zinc or selenium in a murine model of dextran sodium sulfate (DSS)-induced colitis. 48 male BALB/c mice were divided into 5 groups: negative control, DSS positive control, and three experimental groups treated for 28 days with vitamin C (100 mg/kg), zinc+vitamin C, or vitamin C+selenium. Evaluated parameters included body weight, temperature, serum inflammatory markers (TNF- α , IgG2a), and colonic histopathological analysis. All treatment protocols significantly improved DSS-induced weight loss, temperature decrease, and histopathological alterations. The zinc+vitamin C combination proved most effective with optimal weight preservation (35.7 ± 2.4 g vs 21.2 ± 5.3 g DSS group), maximal TNF- α reduction (22.4 ± 4.8 vs 48.5 ± 6.3 pg/mL), and better histological integrity with minimal phagocyte infiltration (score 1.3 ± 0.3 vs 3.8 ± 0.5). This study demonstrates the therapeutic potential of antioxidant micronutrients, particularly the zinc-vitamin C combination, in modulating intestinal inflammation through antioxidant mechanisms and inflammatory marker regulation, opening perspectives for their use as adjuvant therapies in IBD management.

Keywords: *Immunonutrition, Experimental colitis, Antioxidant micronutrients, Intestinal inflammation.*



**Assessment of the Stability of Fresh Minced Beef Meat
Supplemented with *Linum Usitatissimum* Oil**

Aicha RIH, Fatima Zohra EL KADI, Fatima Zohra EL MAHI, MALIKA Bentekhici.

¹*Laboratory of Molecular Microbiology Health and Proteomics,
Biology Department,
Faculty of Natural Sciences and Life, Djillali Liabes University of*
* biologie1511@gmail.com

Abstract:

The current study's main goal is to assess the antioxidant activity, secondary metabolites, and physicochemical quality indices of linseed (*Linum usitatissimum* L.) oily extract (Luo), along with the effect of linseed oil addition on the preservation of beef mince during refrigerated storage at 6°C. The oil was extracted by the Soxhlet method from *Linum usitatissimum* seeds with a yield of 53.96%, and its physicochemical and biological quality were assessed. The results showed that the oil met international standards, with values of refractive index (1.4764), acid index (0.40 ± 0.06 mg KOH/g), saponification index (177 ± 0.66 mg KOH/g), ester index (176.6 ± 0.66 mg KOH/g), and peroxide index (1.5 ± 0.66 meqd'O₂/kg). Secondary metabolite analysis revealed that the concentrations of phenolic compounds, flavonoids, flavonols, and condensed tannins were (0.50 ± 0.04 mg GAE/ml oil), (0.39 ± 0.02 mg QE/ml oil), (0.038 ± 0.003 mg QE/ml oil), and (0.036 ± 0.002 mg CE/ml oil), respectively. However, IC₅₀ value was 0.54 ± 0.06 mg/ml, demonstrated a remarkable ability to scavenge the 2,2-diphenyl-1-picrylhydrazyl radical (DPPH-). Likewise, pH of the ground meat enriched with flaxseed oil was extremely high compared to the control meat. Ultimately, *Linum usitatissimum* oil was abundant in bioactive and antioxidant molecules. This suggests that flaxseed oil could be used to promote the food industry as a preservative.

Keywords: Antioxidant, physicochemical quality, *Linum usitatissimum* L., Beef Meat.



Green Synthesis of Silver Nanoparticles via Alginate-Glucose Reduction: A Sustainable Approach For Antioxidant Applications.

Maroua Chouia¹□, Samir Derouiche²

¹ University of El Oued, El Oued 39000, Algeria

² University of El Oued, El Oued 39000, Algeria

chouia@univ-eloued.dz□

Abstract :

This study focused on the green synthesis and characterization of silver nanoparticles (AgNPs) through a simple and efficient biological reduction approach, and on evaluating their antioxidant potential. Silver nitrate was used as the metal precursor, with alginate acting as a stabilizing agent and glucose serving as the reducing agent. The synthesized nanoparticles were characterized by Fourier-transform infrared spectroscopy (FTIR) and scanning electron microscopy (SEM). Antioxidant activity was assessed using DPPH and FRAP assays.

The results demonstrated that the alginate AgNPs displayed diverse and irregular morphologies. Moreover, the nanoparticles exhibited dose-dependent antioxidant activity, with IC₅₀ values of 844.55 µg/mL for DPPH and 401.17 µg/mL for FRAP, respectively. These findings highlight the role of alginate as an effective biopolymer in facilitating the formation of silver nanoparticles with distinctive physicochemical properties that enhance their biological activity.

Keywords: Nanoparticles, Silver, Alginate, Antioxidant activity.



Sustainable fabrication of Zinc–Manganese mixed oxides using olive pomace biomass waste: a preliminary study toward potential environmental applications

Aicha HAZMOUNE ¹, Chahra BOUKAOUS ¹

¹ *Laboratoire Médicament et Développement Durable ReMeDD, Faculty of Process Engineering, university of Salah Boubnider, Constantine 25000, Algeria*

Abstract

In this preliminary investigation, mixed zinc–manganese oxides were synthesized via two distinct wet-chemical routes hydrothermal and co-precipitation using zinc acetate and manganese chloride as starting precursors. An environmentally friendly synthesis method was made possible by the use of olive pomace extract, an abundant by-product of agro-waste, as a green reducing and stabilizing agent. The co-precipitation approach involved inducing precipitation at 80 °C for 45 minutes with stirring continuously, whereas the hydrothermal process involved treating the reaction mixture at 150 °C for 6 hours. In both cases, the resulting precipitates were thoroughly washed, dried, and subsequently calcined at 800 °C for 2 h to ensure phase formation and thermal stability. X-ray diffraction analysis revealed that the hydrothermal route produced broader and less intense peaks, consistent with smaller crystallite sizes, higher defect densities, and potential preferential orientation, while the co-precipitation route yielded sharper peaks, indicating higher crystallinity. These differences suggest that hydrothermal products, with their defect-rich nanostructures and potentially larger surface area, could be advantageous for photocatalytic and environmental remediation applications, whereas co-precipitated materials may be more appropriate for optoelectronic or functional ceramic uses where high crystalline order is required. To the best of our knowledge, this study is the first to report on the synthesis of mixed zinc–manganese oxides using this kind of agricultural waste. The findings show that leftovers from the olive industry can be used as a sustainable resource to create multifunctional Zn–Mn oxide nanoparticles, which can then be used in energy, catalysis, and environmental applications.

Keywords: *Zinc–manganese oxides, green synthesis, olive pomace, hydrothermal method, co-precipitation, nanostructures, environmental catalysis.*



Anti-Biofilm Activity of Ononis Ethanol Extract on *Pseudomonas aeruginosa* and In Silico Evaluation of Major Compounds Against LuxR and PslA to Address Antibiotic Resistance

[Sarrah Omri](#)¹, [Nafila Zouaghi](#)¹, [Boubekeur Nadjemi](#)¹

¹ *Laboratory for the study and development of water treatment technology and treatment and environmental management. Higher Normal School, Kouba, Algeria.*

[sarrah.omri18@g.ens-kouba.dz](mailto:sarra.omri18@g.ens-kouba.dz),

Abstract

This study investigates the anti-biofilm activity of the ethanol extract from Ononis plant against *Pseudomonas aeruginosa*, a pathogenic bacterium associated with biofilm-related antibiotic resistance. The extract demonstrated significant biofilm inhibition, achieving 81.8% inhibition at a concentration of 40 mg/mL. LC-MS analysis identified several major bioactive compounds. Thymol, Ferulic acid, Curcumin, Resveratrol were chosen as ligands and in silico docking studies were performed to explore their interactions with key biofilm-related targets: LuxR, a quorum sensing receptor, and PslA, a protein involved in polysaccharide matrix synthesis compared with Ciprofloxacin and Ceftazidime as reference antibiotics. The docking results revealed that the major compounds from the ethanol extract strongly bind to these targets, suggesting a potential mechanism for biofilm disruption. When compared to the common antibiotics, the compounds from Ononis plant showed comparable, and in some cases more favorable, binding interactions. These findings support the potential of Ononis plant as a natural anti-biofilm agent, highlighting its promise in addressing antibiotic resistance through disruption of biofilm formation in *Pseudomonas aeruginosa*.

Keywords: *Pseudomonas aeruginosa*, Molecular docking, Natural bioactive compounds Antibiotic resistance, LC-MS analysis.



Research and investigation of new biological alternatives to antibiotics

Saoussene ZELLAGUI, Souha BAAZIZ), Nedjoua SEKHRI-ARAFA

¹Laboratory of Immunology and Biological Activities of Natural Substances, Department of Microbiology, Faculty of Natural and Life Sciences, Constantine, Algeria

saoussene.zellagui@doc.umc.edu.dz

Abstract:

The increase of microbe multiresistance to classical drugs and the fact that most available antimicrobial drugs have only static activity, account for the search for new biological alternatives. Today, innovative studies on bioactive substances of plant origin constitute interesting alternatives in the treatment of inflammatory diseases of microbial origin. In this context, our study aims to evaluate in vitro the antibacterial effect of 4 organic extracts, from the flowers of the species *Bupleurum fruticosum* (an endemic plant of North Africa, particularly Algeria) against 7 multiresistant bacterial strains (positive- Gram and negative- Gram bacteria), isolated from different pathological samples. The antibacterial effect of these extracts was evaluated by the disk diffusion method on solid medium (Muller Hinton). The results obtained showed a moderate antibacterial activity, in fact the chloroform extract and the ethyl acetate extract acted positively on all the bacterial strains tested, with diameters of the inhibition zones ranging from (7.5 mm to 11.5 mm) and (9.5 mm to 11mm) respectively, on the other hand the butanol extract acted positively against negative Gram bacteria only with diameters between 9mm and 11mm. The hydro-alcohol extract was active only against 2 strains of *Escherichia coli* and a multi-resistant *Acinetobacter baumannii*. These results constitute a starting point for further studies to improve the therapeutic properties of this plant, in particular its antibacterial activity.

Keywords: *Bupleurum fruticosum*, antibacterial effect, organic extracts, multi-resistant bacteria, Multidrug Resistance



Plant-Derived Biomolecules as Natural Alternatives to Combat Antibiotic Resistance: Exploring the Mechanisms from Recent Literature

Ilham Karkouri^{1,2}□, Ouafa Zouari Ahmed^{1,2}, Kaouthar Houiti^{1,2}, Mohammed Laid Tlili^{1,3}, Nour Elhouda Mekhadmi^{1,4}, Mohammed Khezzane^{5,6}

¹ Department of Cellular and Molecular Biology, Faculty of Natural Sciences and Life, University of El-Oued, El-Oued, Algeria. ² Laboratory of Biology, Environment, and Health, Faculty of Natural and Life Sciences, University of El-Oued, El-Oued, Algeria. ³ Biogeochemistry of Desert Environments Laboratory, Ouargla University, Algeria. ⁴ Laboratory of the Development and Technology of Saharan Resources (VTRS), Echahid Hamma Lakhdar El Oued, Algeria. ⁵ Faculty of Sciences of Gafsa, University of Gafsa, Campus Sidi Ahmed Zarroug, Gafsa 2112, Tunisia. ⁶ Laboratory of Biodiversity and Application of Biotechnology in Agriculture, University of El Oued, El-Oued, Algeria.

karkouri-ilham@univ-eloued.dz

Abstract

Phytochemicals are natural bioactive compounds found in plants, known for their potential therapeutic properties, including antimicrobial effects. The alarming rise in antibiotic resistance necessitates the exploration of effective and sustainable alternatives to conventional antimicrobials. This literature-based review focuses on plant-derived bioactive compounds and their molecular mechanisms in addressing antibiotic resistance. A comprehensive analysis of peer-reviewed studies published between 2020 and 2025—retrieved from Google Scholar and PubMed—was conducted using keywords such as *"phytochemicals and antibiotic resistance," "plant-derived antimicrobials,"* and *"mechanism of action of phytochemicals."* Findings indicate that phytochemicals such as flavonoids, alkaloids, polyphenols, and tannins exert antibacterial activity through multiple mechanisms: disrupting bacterial membranes, inhibiting key enzymes like DNA gyrase, interfering with nucleic acid replication, generating oxidative stress, and targeting quorum sensing pathways. These secondary metabolites, extracted from plants, exhibit broad-spectrum activity against resistant pathogens, offering a promising multi-target strategy to overcome antimicrobial resistance. By understanding these mechanisms, researchers can better integrate phytochemicals into rational drug design and modern pharmacotherapy. Future directions should emphasize in vivo validation and improved formulation strategies to enhance bioavailability and therapeutic efficacy.

.Keywords: *Antibiotic resistance, Phytochemicals, Pharmacotherapy, Bioactive compounds.*



Synergistic effect of Propolis ethanolic extract and vancomycin against *Staphylococcus aureus* (MRSA) isolated from diabetic foot infection

Fatma SADDAR^{1,2}, Mourad BOUKOUCHA²

¹Biomolecules and Application Laboratory, Faculty of Exact Sciences and Natural and Life Sciences, Echahid Cheikh Larbi Tebessi University, Tébessa, Algeria

²Department of Applied Biology, Faculty of Exact Sciences and Natural and Life Sciences, Echahid Cheikh Larbi Tebessi University, Tébessa, Algeria

fatma.saddar@univ-tebessa.dz

Abstract

Diabetic foot infections (DFIs) are a major public health problem worldwide. Multi-resistant *Staphylococcus aureus* (MRSA) is one of the main pathogens isolated. This increased resistance to conventional molecules makes the failure of antibiotherapy very frequent. And consequently, the use of new alternative strategies has become essential. Our study focused on the evaluation of the synergistic effect of propolis ethanolic extract (PEE), and vancomycin on 03 bacterial isolates resistant to Vancomycin (R). Minimum inhibitory concentrations (MICs) in liquid medium were determined for propolis and vancomycin and combinations of sub-MICs were performed to evaluate the synergistic effect (Checkerboard assay). A synergistic effect was significantly appreciated between the sub-MIC combinations of the two substances compared to each substance alone. The results show that the sub-MICs was 32 µg for vancomycin and 390 µg for PEE and Significant diminution of the MICs was observed with propolis. The addition of this nutraceutical improved the effect of vancomycin and showed a synergistic bactericidal effect (fractional inhibitory concentrations index ≤ 0.5 and a decrease ≥ 2 log CFU/mL) for the combination of propolis plus vancomycin compared with the antibiotic alone. Propolis ethanolic extract is able to restore in vitro antibiotic susceptibility when added to vancomycin against DFIs. This study showed that propolis could enhance the efficiency of vancomycin used in DFIs and could represent an alternative solution.

Keywords: Diabetic foot infection, *Staphylococcus aureus*, propolis extract, Vancomycin, synergistic effect



Antibiotic Resistance in *Enterobacter cloacae* Isolates from Respiratory Infections in Patients with Chronic Respiratory Diseases

Fatiha ABDELLAOUI^{1,2}, Ahmed MARROKI^{1,3}, Leila BOUSMAHA-MARROKI^{1,2}, Nassima FEKHAR^{1,2,4}, Khaoula Nihed ADLA^{1,2}, and Bénéali BEGHDADLI².

¹Department of Biology, Faculty of Natural and Life Sciences (SNV), University Djillali Liabès of Sidi Bel Abbès, Algeria.

²Environment and Health Research Laboratory (LRES), Faculty of Medicine, University Djillali Liabès of Sidi Bel Abbès, Algeria.

³Laboratory of Microbial Genetic, Faculty of Natural and Life Sciences, University Oran1, Oran 31100, Algeria.

⁴Université Tahri Mohamed of Béchar, Algeria

fatiha.abdellaoui@univ-sba.dz □

Abstract:

Antibiotic resistance in *Enterobacter cloacae* is a growing concern, particularly in respiratory infections among patients with chronic respiratory diseases. Species of the genus *Enterobacter* have taken an important place as opportunistic pathogens responsible for nosocomial infections. The objective of this study was to investigate the prevalence and resistance profile of *E. cloacae* isolates from respiratory infections in patients with chronic respiratory disorders. The work was carried out in the Department of Pneumology, Ain Témouchent, and included patients suffering from COPD, asthma, and bronchiectasis. Among them, COPD was the most common condition (53.33%), while comorbidities such as hypertension (26.66%) and diabetes (16.66%) were also observed. Furthermore, most patients received antibiotic therapy, with cefotaxime being the most frequently prescribed (68.75%). The microbiological analysis showed that 43.33% of cultures were positive, and *E. cloacae* accounted for 38.46% of the bacterial isolates. The resistance profile revealed that this bacterium was predominantly resistant to β -lactam antibiotics, and importantly, 60% of isolates displayed resistance to more than two antibiotics within this family, confirming their multidrug-resistant phenotype. In conclusion, the high levels of resistance, underline the urgent need for antimicrobial stewardship and continuous epidemiological surveillance to ensure more effective therapeutic strategies.

Keywords: Antibiotic resistance, *Enterobacter cloacae*, Chronic respiratory diseases, β -lactam antibiotics.



Innovative Eco-Friendly Control Strategies Targeting Culex Mosquito Larvae (*CULICIDAE*; *DIPTERA*; *NEMATOCERA*)
A. Larafa^{1,2*}, W. Naili^{1,2}, N. M. Bouherour^{1,2}, D. Khaleefa Mansour^{1,2}, A. Boumaza² & M. Cherairia²

¹*Laboratory of Biology, Water and Environment*

²*University May 8, 1945 Guelma, Faculty of Natural and Life Sciences and Earth and Universe Sciences, Department of Biology, Guelma, Algeria.*

Abstract:

Animals and humans are increasingly susceptible to various diseases, particularly parasitic infections, which can be transmitted directly or via insect vectors. Mosquitoes (Diptera: Culicidae) are of significant medical and veterinary importance, as they serve as vectors for numerous pathogens, including protozoa, viruses, bacteria, and nematodes. Diseases such as malaria (transmitted by Anopheles), filariasis, yellow fever, dengue fever, Japanese encephalitis in humans, and bovine malaria and brucellosis in animals pose serious health risks. These risks are exacerbated by climate change, which favours the proliferation of mosquito populations. To address this challenge, numerous vector control strategies have been employed, including chemical insecticides and plant extracts. However, concerns about environmental damage and insecticide resistance have driven the development of innovative, eco-friendly alternatives. Among these, the synthesis and application of bio-nanoparticles have gained considerable interest for controlling mosquito vectors such as Culex species.

Green-synthesized nanoparticles demonstrate high larvicidal efficacy by causing mortality and developmental disruption of mosquito larvae at low, environmentally safe concentrations. These nanoparticles can be engineered for controlled insecticide delivery, adhering to the mosquito's body or being ingested to release active agents slowly, enhancing effectiveness and minimizing ecological impact.

Integrating these eco-friendly strategies offers a sustainable, effective approach to Culex mosquito larval control. These methods minimize the drawbacks of traditional chemical insecticides, ensure safety for aquatic ecosystems, and promote long-term sustainability in vector management programs aimed at reducing the transmission of mosquito-borne diseases harmful to both humans and animals.

Keywords: Mosquitoes, Culex, Bio-nanoparticles, Biosynthesis, Insecticide resistance



Etude du profil d'antibiorésistance de certains contaminants de lait de vache et de chèvre.

AFIF CHAOUCHE T.¹, HOUALI K.²

¹Laboratoire ressources naturelles, UMM Tizi Ouzou

²Laboratoire LABAB, UMM Tizi Ouzou

Résumé

La recherche des germes contaminants dans le lait de vache et de chèvre représente une voie à suivre pour bien connaître la qualité du lait ainsi que le type d'alimentation auquel est soumis l'animal. En effet, un lait exempt de certains germes à l'instar de *Bacillus cereus* et de *Staphylococcus aureus* provient probablement d'un animal à qui une quantité importante d'antibiotiques a été administrée. Ce phénomène engendre un grand problème de santé publique, celui de la résistance bactérienne aux antibiotiques d'un côté, et la contamination par ces germes résistants et producteurs de biofilms des aliments produits par ces laits de l'autre côté. C'est dans ce cadre que cette étude a été menée. Le but de ce travail est de collecter des échantillons de lait de vache et de chèvre de différents élevages de la région de Tizi Ouzou, de rechercher les germes contaminants, essentiellement *Bacillus cereus* et *Staphylococcus aureus* et d'étudier leur antibiorésistance et formation de biofilms. Les échantillons de lait ont été collectés tout en respectant les mesures d'hygiène et acheminés au laboratoire tout en respectant les conditions de transport. A leur arrivée au laboratoire, des analyses microbiologiques sont menées le jour même. Un enrichissement puis une identification des caractères macroscopiques, microscopiques et biochimiques sont faits les premiers jours, une confirmation de l'identification au MALDI-TOF-SM est faite par la suite. Le profil d'antibiorésistance des germes isolés a été étudié en utilisant la méthode d'antibiogramme et l'évaluation de la formation des biofilms a été faite par la méthode de microplaque à 96 puits. Les résultats ont montré qu'à partir d'une centaine de prélèvements dont 72 de vache et 28 de chèvre, 76% ont été positifs, c'est-à-dire comprenant des germes contaminants. Parmi les *S. aureus* isolés et identifiés, 8 % sont des SARM et 100% sont moyennement à fortement formatrices de biofilms. Quant aux *B. cereus*, 11% sont multirésistants et 100% sont également moyennement à formatrices de biofilms. L'utilisation d'une huile essentielle de *Thymus algeriensis* a donné des résultats antibactériens intéressants, où la molécule dominante était le Thymol, après une analyse chromatographique.



L'huile essentielle a inhibé la croissance de 50% des SARM, et de 80 % des *Bacillus cereus* multirésistants. Cependant, son effet était moins important sur les biofilms.

Il ressort des résultats obtenus, que dans les élevages, les animaux sont exposés à l'administration excessive des antibiotiques. Cette dernière a abouti à une antibiorésistance qui prend de l'ampleur au fil des années. De plus, ce problème est aujourd'hui récurrent en industrie agroalimentaire, où ces contaminants affectent la santé publique et engendrent des pertes économiques.

Mots clés : *S. aureus*, *B. cereus*, antibiorésistance, formation de biofilms.



Total phenolic content, flavonoid content and Antioxidant potential of *Zygophyllum album* extracts

Wassila Saiah¹✉, Halima Saiah²

¹Laboratoire de Bioénergétique et Métabolisme Intermédiaire, Faculté des sciences biologiques, Université des

sciences et technologie Houari Boumediène.

² Laboratoire de bioressources, Faculté des sciences de la nature et de vie, Université Hasiba benbouali Chlef.

wassilausthb16@gmail.com✉

Abstract:

Plants have a large number of bioactive compounds with high antioxidant activity. Studies for the determination of the antioxidant activity of different plant species could contribute to revealing the value of these species as a source of new antioxidant compounds. Antioxidants are mindful for the defense component of the life form against the pathologies related to the assault of free radicals. The main purpose of this study was to investigate the qualitative phytochemical composition of *Zygophyllum album* extracts and its antioxidant activity. The obtained extracts (methanol and hexane) were assessed for total polyphenols content (TPC) and flavonoids as well as antioxidant potential, using the 2,2-diphenyl-1-picrylhydrazyl radical (DPPH) and ferric reducing (FRAP) assays. Results revealed that total polyphenols were of 35.82 ± 0.4 mgGAE/100 g and 133.21 ± 0.9 mgGAE/100 g, and the flavonoid contents were of 24.08 ± 0.34 and 73.47 ± 0.27 mg CE/100 g for the hexane and methanolic extracts, respectively. The *Z. album* methanoli extract exhibited an excellent DPPH radical scavenging activity with an IC₅₀ value 38.81 µg/mL and the highest absorbance in the FRAP assay. There was a strong linear correlation between antioxidant activity and the values for the total phenolic and flavonoid contents of the plant extracts. So, this research suggested that *Zygophyllum album* possesses a considerable antioxidant potential that can be regarded as promising candidate in treating oxidative stress disorders.

Keywords: Phenolic content, Flavonoid content, Antioxidant effect, *Zygophyllum album*



Appendices

Appendices 1: THE PRESIDENTIAL PROGRAM

1 st National Seminar On Biomolecules and Health (Hybrid) Program	
1 st day (November 12, 2025)	
08:00 09:00	Reception and registration of participants
09 :00 09 :30	Official opening ceremony The Rector of M'hamed Bougara Boumerdes University: Pr. Abdelbaki Nouredine The Dean of Faculty of Sciences: Pr. Daoui Abdelhakim The Chairwoman of the seminar: Dr. Benhabyles Bouttaba Narimen The Director of the laboratory of bioinformatics, applied microbiology, and biomolecules: Pr. Gana-Kebbouche Salima
Moderators : Pr. Arab Karim & Pr. Yahiaoui Karima	
	<i>1st Plenary Conference</i>
09:45 10:15	Pr. Bitam Idir (Research Center in Agropastoralism, Djelfa) Biomolécules d'origine Algérienne et santé publique.
10:15 10:30	Debate
10:30 11:00	Coffee Break/ Poster session 1 (P1-P11)
	<i>2nd plenary Conference</i>
Moderators: Pr. Chahbar Nora & Pr. Khemili Talbi Souad	
11:15 11:45	Pr. Bendali Farida (University of Bejaia) Fibres diététiques des cladodes d'Opuntia ficus-indica, de bons prébiotiques pour la santé intestinale.
11:45 12:00	Debate
12:15 13:15	Lunch
	Oral session

Moderator: Pr. Ait Kaki Sabrina & Dr. Benhabyles Bouttaba Narimen	
13:30 13 :40	OC01: Lefkir Samia (UMBB) Enrichissement du fromage Gouda par <i>Urtica dioica</i>
13:40 13:50	OC02: Ysmail-Dahlouk Lamia (UMBB) New Insights into the Role of Red Blood Cells in Antibacterial Immunity
13:50 14:00	OC03: El Haddad Djilali (UMBB) Detection of Free-Living Amoebae in Contact Lens Storage Solutions: Morphological and Molecular Approach.
14:00 14:10	OC04: Hafid Nourhouda (UMBB) Antimicrobial potential of Algerian <i>Origanum majorana</i> 's essential oil.
14:10 14:20	OC05: Dahmani Karima (UMBB) Effect of extraction solvent on Kinetics and antimicrobial activity of <i>Rosmarinus Officinalis</i> L. extracts.
14:20 14:35	Debate
14:50 15:30	Coffee break/ poster session 2 (P12-P23)
2nd day (November 13, 2025)	
Moderators: Pr. Bouanane Amel & Pr. Bouchenak Ouahiba	
	3rd Plenary conference
09:00 09:30	Pr. Bitam Arezki (National Higher School of Marine Sciences and Coastal Planning, Dely-Ibrahim, Algiers) Le Moringa comme source naturelle de biomolécules contre les anémies nutritionnelles.
09:30 09:45	Debate
	4th plenary conference
09:45 10:15	Dr. Boumhira Ali Zineddine (ENSA, Algiers) Microbial Biomolecules from the Algerian Desert: A Natural Reservoir for Innovative Biotechnological Solutions to Global Antibiotic Resistance.
10:15 10:30	Debate
10:30 11:15	Coffee break/ Poster session 3 (P24-P38)
	5th Plenary Conference

Moderator: Pr. Cherif Hamida & Pr. Blizak Djanette	
11:30 12:00	Dr. Nait Bachir Yacine (University of Blida) Innovative Biomolecule-based formulations: nanotechnology, microencapsulation, and functional food development.
12:00 2:15	Debate
12:15 13:15	Lunch
13:30 14:30	Closing ceremony

Poster session 1 President of the session Dr. Sadaoui-Smadhi Nesrine Moderators: Dr. Ak moussi-Toumi Sihem, Dr. El heddad Djillali	
P01 Bouabida Nadia (UMBB)	Phytochemical potential and polyphenol quantification in a medicinal Lamiaceae species
P02 Henna Kamilia (UMBB)	Assessment of Plasma Urea Levels in Saharan Goats during the Lactation Period
P03 Medjani ahlem (University of Constantine)	<i>Tourneuxia</i> sp Attenuates Doxorubicin-induced Cardiotoxicity via regulating inflammation in mice
P04 Medjdoub Ouafaa (University of Blida)	Harnessing Chitosan Polymorphs: A Comparative Study on Bioactivity and In Vivo Efficacy for Pharmaceutical Development
P05 Bahloul Youcef (University of Batna)	Eco-Friendly Fabrication of Hematite (α -Fe ₂ O ₃) Nanoparticles from Natural Resources: Promising Nanomaterials for Health Applications
P06 Medjkouh Lynda (University of Laghouat)	Algerian olive cultivars: Tocophérols content and antioxidant activity.
P07 Zengah Hadjer (University of Mascara)	Algerian lichens as a promising reservoir of bioactive molecules
P08 Fodil Nouzha (University of Naama)	Comparative Analysis of the Inhibitory Effects of Medicinal Plant-Mediated Zinc Oxide Nanoparticles on Bacterial Strains
P09 Hamdada Ikram (University of Oran)	Cracking the Melanoma Code: Multi-Omic Biomarkers for Personalized Therapy and Non-Invasive Monitoring in Cutaneous Melanoma
P10 Oulebsir-Mohandkaci Hakima (UMBB)	Étude du pouvoir antioxydant et antibactérien de quelques des extraits de la propolis Algérienne

Poster session 2 President Dr. Mahiddine Leila Moderators: Dr. Henna Kamilia, Dr. Aouadi Nawel, Dr Ghazali Nourelhouda	
P11 Bouchenak Ouahiba (UMBB)	Evaluation de l'activité anti-inflammatoire de <i>Phlomis bovei</i>
P12 Toubal Souheyla (UMBB)	Antioxidant potential of <i>Chrysanthemum macrocarpum</i> hydro-methanolic extract
P13 El haddad Djillali (UMBB)	Therapeutic Potential of <i>Aristolochia longa</i> L. Roots: Phytochemical and Biological Evaluation

P14 Dadoun Nedjma (UMBB) Contribution à l'évaluation du potentiel thérapeutique de <i>Carthamus Caerulus</i> L.
P15 Belblidia Hassina (UMBB) Valorization of Curcumin in Health: Behavioral and Physiological Benefits During Resocialization After Adolescent Social Isolation
P16 Benhabyles Bouttaba Narimen (UMBB) Assessment of antimicrobial potential of total polyphenols and chlorophyll pigments of <i>Pistacia lentiscus</i> L. leaves.
P17 Khiari Ouiza (UMBB) <i>In Vitro</i> and <i>In vivo</i> assessment of the anti-inflammatory activity of <i>Xanthoria parietina</i> extrats
P18 Boumaza-Hamladji Sarah (UMBB) Enquête ethno pharmacologique et inventaire des plantes médicinales anti-diabétique dans la région de Boumerdes
P19 Belakehal Faïza (University of Alger 1) Valorisation des biomolécules extraites de « <i>Petroselinum crispum</i> »
P20 Neghliz hayat (UMBB) Caractérisation phytochimique et évaluation des activités antioxydante et antimicrobiennes de l'huile essentielle d'une plante aromatique désertique, <i>Brocchia cinerea</i> (Delile) Vis.
P21 Benhabyles Bouttaba Narimen (UMBB) Biological properties of polyphenolic extracts from different parts of <i>Sophora japonica</i> L.
P22 Amellal-Chibane Hayet (UMBB) Algerian Quinoa Phenolic Extract As A promising source of preservatives
P23 Boudjemaa Khaled (UMBB) Evaluation of antioxydant, anti-inflammatory and antimicrobial activities of phenolic compounds obtained from <i>Portulaca oleracea</i> L
P24 Kara Ali Mounira (UMBB) Biotherapeutic Potential of <i>Lavandula dentata</i> Essential Oil: Chemical Profile and Biological Evaluation

Poster Session 3 President: Dr. Toubal Souheyla Moderators: Dr. Halladj Fatma, Dr. Rouane Asma, Dr Boumaza Sarah
P25 Bekri Meriem (University of Mostaganem) Rendement d'extraction des fractions polyphénoliques et activité antimicrobienne de l'extrait aqueux de <i>Moringa oleifera</i> .
P26 Bouazza Asma (USTHB) Nutritional biomolecules as modulators of oxidative stress and inflammation in obesity-associated NAFLD

P27 Mekri Meriem (CRAPC) Encapsulation of Bioactive Polyphenols from Olive Mill Wastewater for Nutritional Applications
P28 Blizak Meriem Djanette (UMBB) Magnetic NiO and CoO Nanoparticles as Emerging Agents in Cancer Therapy
P29 Toubal Souheyla (UMBB) <i>In vitro</i> and <i>in vivo</i> anti-inflammatory effect of Chrysanthemum macrocarpum hydro-methanolic extract
P30 Ysmail-Dahlouk Lamia (UMBB) L-Threoascorbic Acid Boosts Survival and Immune Response in the Context of Staphylococcus aureus Infection
P31 Henna Kamilia (UMBB) Biomolecular Markers of Health: Hormonal and Biochemical Responses of <i>Saharan Fauna</i> during Lactation
P32 Derguine louiza (UMBB) Antioxidant and antimicrobial activities of biosurfactants produced from newly isolated yeast strain
P33 Ghozali Nourelhouda (UMBB) Antimicrobial and Anti-Inflammatory Effects of <i>Pistacia lentiscus</i> Essential Oil: Insights into Its Potential Role in Behçet's Disease
P34 Hezil Djamila (UMBB) Antibacterial and Antibiofilm Effects of the Extract of <i>Teucrium polium</i> Against Multidrug-Resistant Pathogenic Bacteria
P35 Rouane Asma (UMBB) Phytochemical characterization and antimicrobial activity of essential oil of Chamomile (<i>Chamaemelum nobile</i> L.) from Boumerdes
P36 Laoufi Razika (UMBB) Evaluation of the biological effect of the extract from the root of <i>Archium lappa</i> haversted in boumerdes
P37 Oussaid Sounia (UMBB) <i>In Vitro</i> and <i>In Vivo</i> Evaluation of Anti-Inflammatory Activity in <i>Bunium bulbocastanum</i>: Protein Denaturation Inhibition and Bioactive Potential
P38 Messaoudene Djamel (UMBB) Formulation of a Dermocosmetic Kit Based on Natural Extracts and Evaluation of Its Biological Activities.
P39 Saadaoui Nesrine (UMBB) Polyphenolic composition and antioxidant capacity of <i>Solenostemma argel</i>: influence of plant parts and their combination
P40 Mansouri Ali (Om El Bouaghi University) Valorization of Phenolic Biomolecules from Date Flesh: Bioactive Composition and Pharmaceutical Potential
P41 Taoudiat Aldjia (Bouira University) Impact of <i>Mentha spicata</i> and <i>Citrus aurantium</i> Extracts on the Physicochemical Characteristics and Oxidative Stability of Margarine

Appendices 2: THE ONLINE PROGRAM

1 st day (November 12, 2025)		
Session 1 online oral and Poster communications Moderator: Dr Affif Chaouche Thanina & Dr Ouzid Yasmina Google link: meet.google.com/dho-zvew-hga		
09:40	09:50	eOC01: Khemkham Aicha (University of Djelfa) Antimicrobial activity of extracts of <i>Juniperus oxycedrus</i>
09:50	10:00	eOC02: Ayad Rima (University of Jijel) Acidified fresh cheese fortified with pumpkin (<i>Cucurbita pepo</i> L.): nutritional properties and antioxidant potency during refrigerated storage.
10:00	10:10	eOC03: Horri Soumia (University of Mascara) LAB-Derived Bacteriocins as Next-Generation Biomolecules Against Antibiotic Resistance
10:10	10:20	eOC04: Zatla Ilyes (University of Tlemcen) Gold and Silver Nanoparticle Complexes of Rutin and B-Escin as Dual Inhibitors of SARS-CoV-2 Main Protease and RdRp.
10:20	10:30	eOC05: Setti Ahmed Kheirae Phytochemical Composition and Activity of <i>Thymus palleseus</i> de Noé Against Clinical Dermatophytes of Trichophyton and Candida
10:30	10:40	eOC06: Benmarce Meryem (University of Sétif) Myrtle (<i>Myrtus communis</i>): A Promising Source of Antioxidant and Antiparasitic Agents
10:40	10:50	eOC07: Kebbab Ryma (University of Tamanghasset) Effet antibactérien des extraits hydro-organiques de <i>Solenostemma argel</i> seuls et en association avec des antibiotiques : Perspectives intéressantes pour le traitement des infections aux bactéries multirésistantes.
10 :50	11 :00	eOC08: Mlouki Abdelkrim (University of Adrar) In Silico Molecular Docking Analysis of antidiabetic potential of p-coumaric Acid Compound
11:00	11:10	eOC09: Seghiri Malak (University of Constantine) A natural preservative against antibiotic residues in broiler chicken meat using bioactive molecules from olive mill wastewater
11:10	11:20	Debate
11:20	11:30	eOC10: Chatbi Djenet (University of Mascara) Functional Characterization of <i>Extremophilic Actinobacteria</i> : Probiotic Potential for Health and Nutrition

11:30	11:40	eOC11: Meziane Daniela (USTHB) Enrichissement Impact De La Consommation De Curcuma Sur La Pression Artérielle Et Le Profil Anthropométrique Chez Des Patients Hypertendus
11 :40	11 :50	eOC12: Belhouala Khadidja (Ain timouchent University) Molecular Effects of Selected Bioactive Compounds from Plant-Based Mixtures on Apoptosis Induction and Cell Cycle Arrest in Cancer Cells: In Silico Drug Design Predictions and Molecular Docking
11:50	12:00	eOC13:Touaitia Rahima (University of Tebessa) Antimicrobial Activity of <i>Ammi visnaga</i> Essential Oil Against Multidrug-Resistant Klebsiella–Enterobacter–Serratia Clinical Isolates
12:00	12:10	eOC14: Merah Oumeima (UMBB) Antibacterial resistance: prevalence and consequences.
12 :10	12 :20	eOC15: Hamdi Aicha (Ecole Normale Supérieure, Laghouat) Assessment of Antioxidant Activity in Date Palm (<i>Phoenix dactylifera</i> L.) Fruits and Leaves: A Comparative Study
12:20	12 :30	Debate
12 :30	12 :35	eP01: Lammari Narimane (University of Constantine 3) Preparation and Evaluation of a Herbal Milk Formulation Containing Plant Extracts for Antioxidant and Photoprotective Effects
12 :35	12 :40	eP02: Rabah Zineb (University of Tiaret) Valorizing Therapeutic Plants: The Role of Fenugreek Seed Extract in Probiotic Growth and Adhesion
12 :40	12 :45	eP03: Bellil Dassine (University of Bejaia) Zoonotic mycobacteria in Algerian barbary macaque: a hidden threat to human and animal health
12 :45	12 :50	eP04 : Dermeche Samia (University of Tizi Ouzou) Evaluation des activités antioxydante et antimicrobienne des extraits du pourpier « <i>Portulaca Oleracea</i> L. »
12 :50	12 :55	eP05: Hammani Amel (UMBB) Évaluation de la toxicité de l'huile essentielle de <i>Mentha pulegium</i> vis-à-vis de la chenille processionnaire du Pin <i>Thaumetopoea pityocampa</i>
12:55	13:00	eP09: Bousaoula Monna Taki Ellah (University of Constantine 1) Biochemical and Histological study of the in vivo Anti-inflammatory activity of a new Phytolectin Extracted from <i>Trimania Nivea</i> at the kidney level of Wistar rats treated with Methionine.

13:00	13:05	eP10 Fekhar Nassima (University of Sidi Belabes) L'émergence du génotype bla 23 de la carbapénémase parmi les isolats d'entérobactéries résistantes aux carbapénèmes chez des patients atteints des infections du site opératoire : Étude d'un hôpital d'Algérie (CHU SIDI BELABES)
13 :05	13 :10	Debate
Session 2 online oral and Poster communications Moderator: Dr Ouzid Yasmina & Dr Affif Chaouche Thanina Google link: meet.google.com/myz-pitz-xgq		
13:10	13:15	eP11: Boudebbaz Khadidja (University of Jijel) Acetylcholinesterase Inhibitory Potential of <i>Dysphania ambrosioides</i> Essential Oil: Implications for Alzheimer's Disease
13:15	13:20	eP12: Guergour Hassina (University of Bordj Bou Arréridj) Xanthium Fruit Extracts: Phenolic Profile, FTIR Analysis, And Biological Activities
13:20	13:25	eP13: Hamoudi Meriem (University of Batna) Dosage des composés phénoliques et l'effet antioxydant de l'extrait hydroéthanolique de <i>Berberis Hispanica</i>
13:25	13:30	eP14: Attoura Fatma (University of Mostaganem) Screening of bacteriocins producing lactic acid bacteria isolated from traditional dairy products
13:30	13:35	eP15: Beghadid Faffa (University of Sidi bel abbes) Évaluation des activités antioxydants et la toxicité aiguë des extraits hydro-éthanoliques de deux graines médicinales: <i>Nigella sativa</i> L., et <i>Pimpinella anisum</i> L.
13:35	13:40	eP16: Chouh Amina (University of Constantine) Évaluation du profil en acides gras et en minéraux de <i>Sargassum vulgare</i> comme aliment fonctionnel potentiel
13 :40	13 :45	Debate
2nd day (November 13, 2025)		
Session 3 online oral and Poster communications Moderators: Dr Lefkir Samia et Dr Laoufi Razika Google link: https://meet.google.com/wqw-noeu-svy		
09:00	09:05	eP17: Saidi Asma (University of Biskra) Assessment of the <i>in vivo</i> hepatoprotective activity of the natural and industrial Sylimarin
09:05	09:10	eP18: Tbahrity Hadja Fatima (University of Oran) Contribution Title Modulation of Intestinal Inflammatory Response by Antioxidant Micronutrients: Experimental Study in Mice
09:10	09:15	eP19: Rih Aicha (University of Sidi belabbes) Assessment of the Stability of Fresh Minced Beef Meat Supplemented with <i>Linum Usitatissimum</i> Oil

09:15	09:20	eP20: Chouia Maroua (University of Eloued) Green Synthesis of Silver Nanoparticles via Alginate-Glucose Reduction: A Sustainable Approach For Antioxidant Applications.
09:20	09:25	eP21: Hazmoune Aicha (University of Constantine 3) Sustainable fabrication of Zinc–Manganese mixed oxides using olive pomace biomass waste: a preliminary study toward potential environmental applications
09:25	09:30	eP22: Omri Sarra (Higher Normal School, Kouba) Anti-Biofilm Activity of Ononis Ethanol Extract on <i>Pseudomonas aeruginosa</i> and In Silico Evaluation of Major Compounds Against LuxR and PslA to Address Antibiotic Resistance
09:30	09:35	eP23: Zellagui Saoussene (University of Constantine) Research and investigation of new biological alternatives to antibiotics
09:35	09:40	eP24: Karkouri Ilham (University of Eloued) Plant-Derived Biomolecules as Natural Alternatives to Combat Antibiotic Resistance: Exploring the Mechanisms from Recent Literature
09:40	09:45	eP25: Saddar Fatma (University of Tébessa) Synergistic effect of Propolis ethanolic extract and vancomycin against <i>Staphylococcus aureus</i> (MRSA) isolated from diabetic foot infection
09:45	09:50	eP26: Abdellaoui Fatiha (University of Sidi Belabes) Antibiotic Resistance in Enterobacter cloacae Isolates from Respiratory Infections in Patients with Chronic Respiratory Diseases
09:50	09:55	eP27: Larafa Amira (University of Guelma) Innovative Eco-Friendly Control Strategies Targeting Culex Mosquito Larvae (CULICIDAE; DIPTERA; NEMATOCERA)
09:55	10 :00	eP28: Afif Chaouche Thanina (University of Tizi Ouzou) Etude du profil d'antibiorésistance de certains contaminants de lait de vache et de chèvre
10 :05	10 :10	eP29: Lamouri Abdelmouman (University of Relizane) Biostimulations of phytobiotics extracts by comprehension of effect mechanism and combination with other biomolecules for valorization against diseases
		eP30: Saiah Wassila (University of USTHB) Total phenolic content, flavonoid content and Antioxidant potential of <i>Zygophyllum album</i> extracts
10 :10	10 :15	Debate
Closing of the session		

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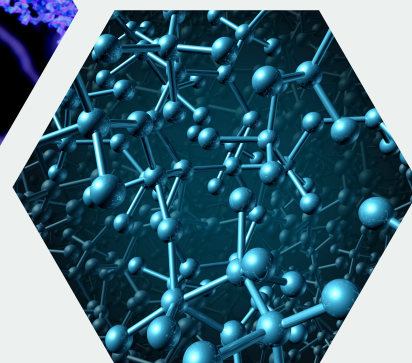
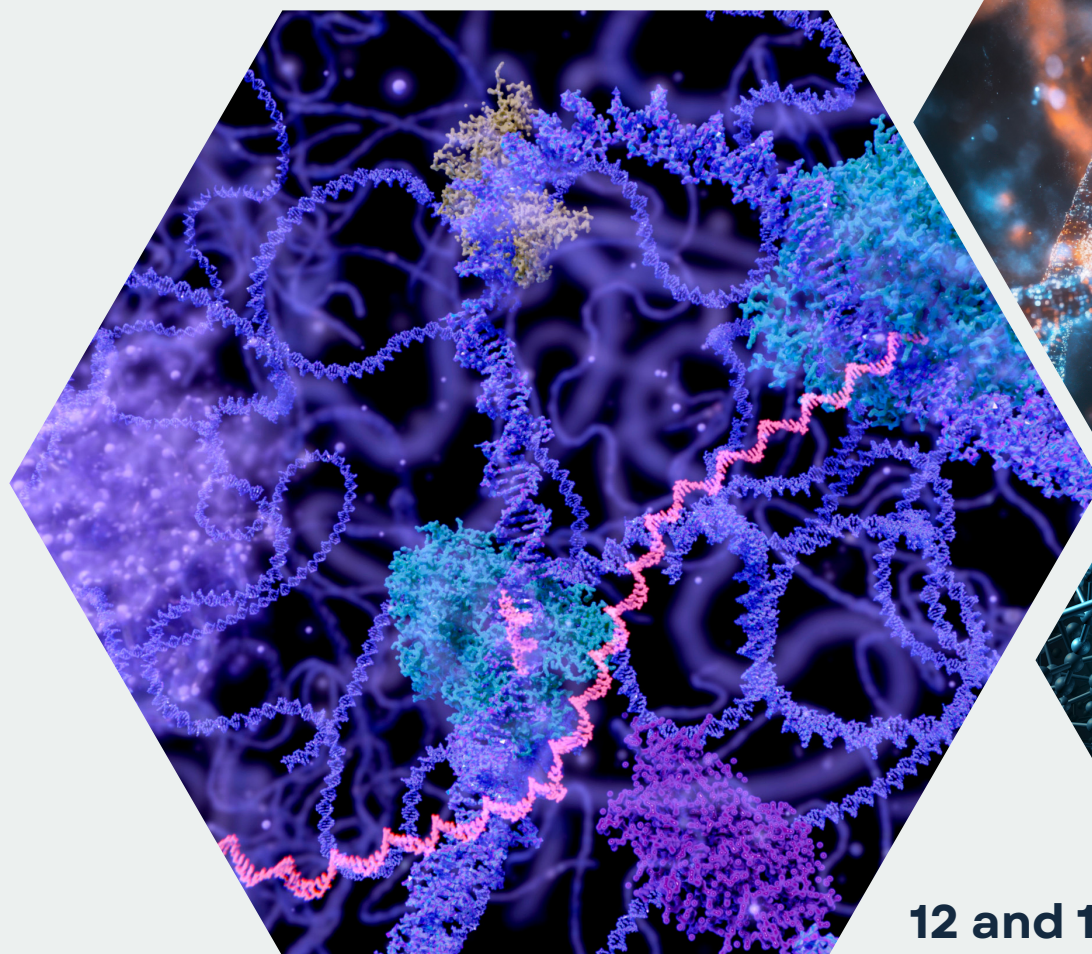
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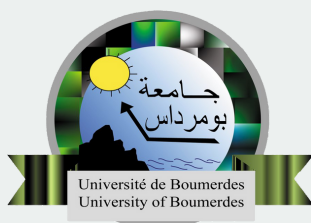
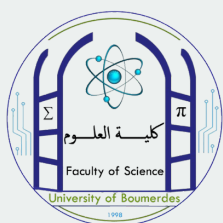
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