

Abstract Book

International Congress on Health Sciences and Medical Technologies 2025



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**International Congress on Health
Sciences and Medical Technologies,
Tlemcen, Algeria 09-11 December 2025**

Edited by: Dr Abdeldjalil Khelassi



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Editor:

Dr Abdeldjalil KHELASSI

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Preface

The International Congress on Health Sciences and Medical Technologies Originated in 2016 as an international conference for enriching research findings and technological development in medicine. It was established for ensuring a panel for an interdisciplinary community to attend to the required quality for publishing relevant increment of medical innovation and findings. It is an annual congress containing several conferences and workshops focusing on medical technologies and health sciences, and covering all topics of medicine including applied and basic sciences and medical technologies

The International Congress on Health Sciences and Medical Technologies 2025, ICHSMT'25, is the 9th edition, following several online editions held in 2021, 2023, and 2024, add in-person established in Tlemcen, Algeria (2016, 2017, 2019 and 2022) and Algiers Algeria (2018).

The content was selected via a transparent academic criterion. We received 117 submissions, which were reviewed by 1-3 reviewers and scanned by iThenticate software. We accepted only 100, and we selected 56 abstracts presented in this book; the rate of acceptance was 85,45%. The accepted submissions were presented at five conferences:

-ICMT'25 International Conference on Medical Technologies

-ICCPH'25 International Conference on Cancer and Public Health

-ICPBS'25 International Conference on Preclinical and Basic Sciences

-ICGI'25 International Conferences on Genetic Items

-ICEEP'25 International Conference on Education Ethics and Publishing

The congress distribution by location attracted researchers from several nations and specialties as: Algeria, Germany, Iran, Switzerland, Netherland, Denmark, Malaysia, Pakistan, France, Tunisia, Brazil, Egypt, India, Iraq, Senegal, Canada, Czech, China, Australia and Benin. The congress author's affiliations were from several departments such as Pharmacy, Medicine, Microbiology, Biotechnology, Applied Molecular Genetics, Process Engineering, Living and Environment, Ecology, Physics and Chemistry, Computer Sciences, Animal Biology, Agronomy, Dental Medicine, Electronic and Industrial Engineering, Mechanical Engineering.

We are so proud to acknowledge all contributors to the establishment of this scientific event Namly:

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The chair of
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December 2025

ICCPH'25 International Conference on Cancer and Public Health

The Molecular Diagnosis of Breast Cancer: Toward Precision Medicine

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Background: Breast cancer remains the leading cause of cancer-related mortality among women worldwide. Despite significant advances in imaging and histopathology, early diagnosis and accurate tumor characterization increasingly rely on molecular approaches. These methods not only enable the detection of specific mutations but also the identification of gene and protein expression profiles associated with prognosis and therapeutic response.

Methods: The objective of our study was to evaluate the HER2 status in a series of breast carcinomas. Ten women were recruited from the Department of Pathological Anatomy at the Pasteur Institute of Algiers during the year 2011–2012, in order to identify patients who could benefit from targeted therapy. Two protocols were applied: an **IHC (Immunohistochemistry)** test to detect HER2 protein receptors, and a **FISH (Fluorescence *In Situ* Hybridization)** test to detect **HER2 gene amplification**.

Results: The IHC test results showed that 5 cases had a score of 0+/1+, indicating a negative overexpression of the HER2 membrane protein. One case showed a score of 3+, corresponding to a strong positive overexpression of the HER2 protein. Another case had a score of 2+, indicating a weak positive (equivocal) overexpression of the HER2 protein. A FISH test was performed for the cases with scores of 2+ and 3+. The results revealed **HER2 gene amplification**, characterized by an intense presence of red fluorescent signals.

Conclusion: The analysis of HER2 status has become an essential test in the management and treatment of breast tumors. IHC is a reliable and rapid method for determining HER2 status, with maximum accuracy for clearly negative or strongly positive cases. However, for cases showing intermediate expression levels, verification of HER2 status by FISH is warranted. Patients with tumors that strongly overexpress HER2 (score 3+) derive the greatest clinical benefit from trastuzumab therapy.

Keywords: Breast cancer, Immunohistochemistry, Fluorescence in situ hybridization, HER2 gene, Herceptest

Effects of Aerobic Training on Nutritional, Metabolic Status and Oxidative Stress in Women with Type 2 Diabetes

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Abstract:

Background: Physical activity has beneficial effects on physical and psychological development, reduces mortality, improves quality of life, and prevents major chronic diseases. In diabetes mellitus, certain complications and oxidative stress can be mitigated by regular physical exercise.

Methods: Eighty women with type 2 diabetes (40 overweight and 40 of normal weight) and 60 healthy controls participated in a one-year aerobic training program. Blood samples were collected to determine serum glucose, lipid profile, and redox biomarkers. Daily nutrient intake was also assessed.

Results: Overweight diabetic women showed higher energy, fat, and carbohydrate intakes, accompanied by micronutrient deficiencies, lipid abnormalities, and oxidative stress. Aerobic exercise significantly reduced serum triglycerides (TG) and LDL-C while increasing HDL-C in trained diabetic women. Furthermore, aerobic training enhanced antioxidant defenses (GSH, catalase, SOD) and reduced oxidative markers (superoxide anion, MDA, protein carbonyls) across all groups.

Conclusion: Aerobic exercise exerts a positive influence on health status in diabetes. Implementing structured exercise programs for women with type 2 diabetes is crucial to improve metabolic profile and redox balance.

Keywords: Diabetes, Overweight, Oxidative stress, Aerobic exercise, Metabolism.

Acknowledgment: This work was supported by the Algerian Research Project (PNR) from the Algerian Health investigation office (ATRSS). The authors are grateful to women who volunteer participate in this study.

Evaluation Of Some Biochemical Markers In Diabetic Patients With Kidney Complications

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Background: Diabetes mellitus becomes a major health problem. Glycemic imbalance increases mortality and causes microvascular and macrovascular complications. Diabetic nephropathy is a multifactorial illness that is one of the most prevalent diabetes complications and a leading cause of chronic kidney disease.

Methods: In order to understand the relationship between diabetes and kidney disease, we conducted a case-control study involved 100 participants aged between 40 and 80 years, 50 individuals are healthy, 50 person with type 2 diabetic nephropathy.

About 5–10mL of blood samples were taken from healthy persons and patients diabetics with kidney disease after overnight fasting. The blood leave for 30 min at room temperature allow to clot in plain tube. After coagulation, serum were separated by centrifugation at 3000×g for 10min. Serum were aspirated into Eppendorf tubes for measurements of the biochemical markers of the patients and controls. The concentrations of fasting blood sugar, uric acid, urea, creatinine and calcium were mesured by kits of prochimia using enzymatic colorimetric methods. The calculation of creatinine clearance is carried out by applying the Cockcroft and Gault formula. CRP was identified by means of the commercial ELISA sets, in accordance with manufacturers' instructions.

Results: Our results show that in patients with type 2 diabetic nephropathy compared to controls we noted hyperglycemia and a disturbance of renal function. serum urea, uric acid, and creatinine were significantly elevated. In contrast, creatinine clearance was very low in our patients.

In addition, we noted inflammation and hypocalcemia in our patients compared to controls **Conclusion:** Diabetes mellitus causes a disruption of the kidney metabolism and inflammation. This study highlights the importance of early diagnosis, consistent medical follow-up, and comprehensive care to prevent the progression to end-stage renal disease.

Key words: Creatinine, diabetic nephropathy, hyperglycemia, kidney disease, type 2 diabetes.

Analysis of pregnancy-related complications in women with diabetes

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Background: Pregnancy in a diabetic woman increases the risk of diabetes-related complications for the mother and the child. The objective of our study is to evaluate obstetric and neonatal complications in diabetic women (type 1 and type 2) during pregnancy by making a comparison with non-diabetic women.

Methods: This is a descriptive comparative epidemiological study; of 70 diabetic pregnant women (type 1 and 2) and 67 non-diabetic pregnant control women followed in the obstetrician and gynecologist department at sidi bel abbes maternity hospital.

Results: The average age of diabetic pregnant women is 33 years. 30% of women have unbalanced diabetes during pregnancy. The history of diabetic women reveals that hypertension is the complication most associated with diabetes, It is found in 28.57% of cases followed by other pathologies with a low percentage (heart disease, and pre-eclampsia). Premature birth represents the most common pathological history in diabetic pregnant women; whereas in non-diabetic pregnant women, there were more cases of miscarriage and abortion ($p < 0.05$). Concerning the last pregnancy There were more premature births in diabetic women than in non-diabetic women ($p < 0.01$). Cesarean delivery is the most frequent modality in diabetic women, while in non-diabetics it is vaginal delivery. Labor is often triggered in diabetics whereas it is much more spontaneous in the controls; Complications during the work are more common in diabetic women and absent in non-diabetics. Regarding neonatal status There were 3 cases of perinatal death and 10 cases of resuscitated, 17% macrosomia and 30% respiratory problems; whereas no complications were found in the control ($p < 0.01$). 24.28% of new-born children whose mothers with diabetes did not have a balanced blood sugar level at birth. Unlike control newborns, where blood glucose was balanced.

Conclusion: Reduction of diabetes risk during pregnancy is associated with degree of blood glucose control during pregnancy and delivery. It is also necessary to plan pregnancy in order to achieve normal levels of sugar in the blood before pregnancy.

Key words: type 1 diabetes, type 2 diabetes, pregnancy, obstetric complications, neonatal Complications

Immune Mediators Imbalance in Behçet's Disease: A Biomarker-Based Approach

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Background: Behçet's disease (BD) is an inflammatory multisystem disorder. It's characterized by mucocutaneous lesions, uveitis, arthritis, thrombophlebitis. Overproduction of pro-inflammatory cytokines seems to be involved in different pathogenic pathways leading to development of various clinical manifestations. The aim of our study was to compare plasma levels of EBI3, IL-6, IL-10, IL-37 and NO between BD patients and controls in order to determine possible prognosis biomarkers and therapeutic targets.

Methods: One hundred three BD patients and 83 controls were enrolled in this study. Freshly collected blood on heparinized tubes was used. The samples were centrifuged and supernatants were conserved at -80°C. All cytokines were measured by ELISA while NO was estimated by griess modified method. Disease severity score was evaluated from each patient. Kruskal-Wallis and Spearman tests were used for comparison or correlation study, respectively.

Results: IL-6 and EBI3 plasma levels were significantly higher in patients than controls ($p < 0,0001$). Significant IL-10 higher production was recorded in patients compared to controls ($p < 0,0001$). IL-37 levels were increased in patients but not significantly ($p > 0,05$). Also, higher NO levels were noted in patients ($p < 0,0001$). In the other hand, positive correlation was noted between disease severity and IL-6 ($p = 0,06$), EBI3 ($p = 0,06$). However, negative correlations were revealed between severity and both IL-10 and IL-37 ($p > 0,05$).

Conclusion: Our findings suggest the important role of EBI3, IL-6, IL-10, IL-37 and NO in the pathogenesis and the evolution of BD. These molecules may serve as a prognosis biomarker and immunotherapeutic target.

Our findings suggest the important role of EBI3, IL-6, IL-10, IL-37 and NO in the pathogenesis and the evolution of BD. These molecules may serve as a prognosis biomarker and immunotherapeutic target.

Keywords: Behçet's disease, nitric oxide, Cytokines, Biomarkers, therapeutic target

Involvement of TNF- α and IL-10 in the immunopathological mechanisms underlying vascular and pulmonary manifestations of Behçet's disease

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Background: Behçet's disease (BD) is a chronic, relapsing systemic vasculitis characterized primarily by recurrent oral aphthae and cutaneous lesions. Nevertheless, the disease may affect multiple organ systems, including the vascular and pulmonary systems, which can result in severe and life-threatening complications. The present study aimed to identify potential biomarkers specifically associated with pulmonary involvement in Behçet's disease and to differentiate pulmonary vasculitis from other vascular forms of the disease.

Methods: Serum samples were obtained from 14 healthy controls, 18 patients with pulmonary involvement, and 16 with vascular involvement. Cytokine levels of TNF- α and IL-10 were quantified using a sandwich ELISA assay.

Results: The results showed that serum IL-10 levels were significantly higher in patients than in controls ($P < 0.01$). Comparison between the clinical subgroups revealed significantly higher IL-10 concentrations in patients with vascular involvement compared to those with pulmonary involvement ($P < 0.001$). Regarding TNF- α , its serum levels were found to be significantly higher in patients with Behçet's disease than in controls ($P < 0.0001$). Furthermore, comparison between the two clinical forms revealed markedly higher TNF- α levels in patients with pulmonary involvement compared to those with vascular involvement ($P < 0.01$).

Conclusion: These observations confirm the major involvement of TNF- α in pulmonary severity and suggest a modulatory role of IL-10, more pronounced in vascular forms of Behçet's disease.

Keywords : Behçet's disease, cytokines, TNF- α , IL-10

Hemosialorrhea: A New Entity?

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Background: Hematidrosis is a rare eccrine sweating disorder characterized by one or more episodes of spontaneous bloody sweating on intact, non-traumatized skin. We report a case of this rare pathology with an unusual anatomical location.

Methods: A 14-year-old girl with a history of peach allergy and congestive antral gastritis presented with eczema lesions on the palms, previously treated with topical corticosteroids with good improvement. She was hospitalized for spontaneous oral cavity bleeding occurring daily for the past five years. These episodes, which last a few minutes and resolve spontaneously, occur multiple times a day without any trauma. The bleeding episodes began following significant psychological stress related to a change of city and school environment. Clinical examination of the oral mucosa between episodes, otorhinolaryngology evaluation and nasofibroscopy, revealed no abnormalities. Hemostasis workup was normal. Upper gastrointestinal endoscopy showed non-hemorrhagic micronodular bulbitis. Based on the clinical presentation, the temporal correlation with the stress event, and unremarkable complementary investigations, a diagnosis of oral hematidrosis was made. The patient was started on propranolol 10 mg/day following a cardiac evaluation, along with psychological support. A reduction in bleeding frequency was noted a few days after initiating treatment.

Results: Hematidrosis is a rare condition characterized by episodes of bleeding through intact skin. While bleeding can affect various skin sites, mucosal involvement especially in the oral cavity is extremely uncommon. Only a few cases of oral hematidrosis have been reported in the literature, often in association with other bleeding sites, such as a case involving a 15-year-old girl who presented with both oral hematidrosis and hemolacria. The exact pathophysiology remains unclear. One proposed mechanism involves an initial adrenaline induced vasoconstriction of the periglandular vessels, followed by sudden vasodilation, allowing blood to extravasate into the eccrine sweat ducts. This theory is supported by reports of clinical improvement following treatment with beta-blockers. In the absence of eccrine glands within the oral mucosa, we suggest that a similar mechanism could involve the salivary glands, potentially explaining the phenomenon in our patient. To our knowledge, this is the first reported case of isolated oral hematidrosis without any other skin or mucosal involvement. Therefore, we propose the term hemosialorrhea to describe bleeding from the oral cavity in the context of mucosal hematidrosis.

Conclusion: Hematidrosis is an exceptionally rare condition, with only a limited number of cases reported worldwide. Although the bleeding episodes can be distressing, they are generally benign and do not compromise the patient's overall health. This case highlights a unique and isolated oral presentation, reinforcing the possible role of psychological stress and the effectiveness of beta-blocker therapy. Further studies are needed to better understand the underlying mechanisms and to guide optimal management strategies.

Keywords: Hematidrosis; rare eccrine sweating disorder

Cutis Marmorata Telangiectatica Congenita Associated with Infantile Myofibromatosis: A Case Report

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Background: Infantile myofibromatosis is a rare, benign soft tissue tumor characterized by the development of nodules involving the skin, striated muscle, bone, and, in exceptional cases, visceral organs. It presents with a wide spectrum of clinical manifestations depending on the extent and location of involvement.

Cutis marmorata telangiectatica congenita (CMTC) is an uncommon congenital vascular malformation, typically presenting with livedo and telangiectasias in a diffuse or segmental distribution. We report a rare case of co-occurrence of these two distinct conditions

Methods: A 14-month-old girl, with no significant medical history, was initially diagnosed with congenital cutis marmorata telangiectatica congenita (CMTC).

At the age of one month, she developed a nodule on the left thigh. Physical examination revealed a reticular livedo with fine, regular meshes, partially blanching with pressure, non-infiltrated, involving both lower limbs. A firm, immobile 1.5 cm nodule with an erythematous surface was observed on the left thigh. Hemihypertrophy of the left thigh was noted, along with muscle atrophy of both legs.

Doppler ultrasound of the lower limbs showed an indurated, echogenic appearance of the soft tissues, with solid oval structures embedded within the muscles of the left leg. Muscle MRI revealed multiple subcutaneous and intramuscular nodular lesions with similar imaging characteristics.

Biopsy of one of the nodules, followed by histopathological examination, confirmed the diagnosis of infantile myofibroma.

Based on the clinical presentation, imaging findings, and biopsy results, a diagnosis of infantile myofibromatosis was established.

A staging workup was performed and showed no evidence of visceral involvement

Results: We report a rare case of infantile myofibromatosis associated with cutis marmorata telangiectatica congenita (CMTC). This association has been described only once in the literature, in a child presenting with multiple nodules, CMTC, and hemiatrophy. In that report, the authors suggested that the coexistence of these conditions may be coincidental.

The pathophysiological link between these two entities remains unclear. Is this simply a fortuitous association, or could there be an underlying common mechanism? Further cases and studies are needed to explore this potential relationship.

Conclusion: We report the second case in the literature of an association between cutis marmorata telangiectatica congenita and infantile myofibromatosis. This rare coexistence raises the question of a potential pathophysiological link, which remains to be elucidated.

Keywords: cutis marmorata telangiectatica congenita ; infantile myofibromatosis

Psoriasis Superimposed on an Epidermal Hamartoma: A Rare Association

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Background: Epidermal nevi are cutaneous hamartomas with an often linear and unilateral distribution following Blaschko's lines. Present from birth or appearing early in childhood, they are characterized by epidermal hyperplasia with multiple clinical and histological forms.

This case illustrates the potential complexity of diagnosis in the presence of a linear psoriasiform eruption arising on an epidermal hamartoma, and it establishes a distinct clinical entity: psoriasis superimposed on an epidermal nevus.

Methods: An 8-year-old child had a verrucous nevus on the right side of the body since the age of 3 months. Erythematous-squamous lesions appeared on this hamartoma six years later. Physical examination revealed an epidermal hamartoma on the right side of the body, sparing the face, producing pigmented plaques with a rough surface and a dirty keratotic appearance, arranged in bands following Blaschko's lines. Well-defined, rounded erythematous-squamous lesions were observed on the hamartoma, located on the neck, shoulder, axillary hollows, and umbilicus. Examination of the skin folds revealed intertrigo between the glutes. Parasitological and mycological examinations were negative. Skin biopsy of an erythematous squamous lesion suggested psoriasis. The diagnosis of psoriasis superimposed on a pre existing epidermal nevus was confirmed. The patient was treated with topical corticosteroids, resulting in clear improvement of her psoriasis

Results: We report the case of a patient with a verrucous epidermal hamartoma with Blaschko-linear arrangement, on which psoriasis lesions developed. This association is rare. The few cases reported in the literature presented typical psoriasis lesions, but these were not exclusively located on the hamartoma. Our case presented a single psoriasis lesion outside the hamartoma, located at the level of the intergluteal fold. The main challenge was distinguishing between the two entities: psoriasis developing on a pre-existing hamartoma or a hamartoma mimicking psoriasis.

The diagnosis of psoriasis was made based on the chronology of lesion appearance, the clinical picture, and histology, with the elimination of differential diagnoses such as leishmaniasis and mycotic infections.

The pathophysiological explanation for this association remains poorly understood. Several factors are implicated, mainly genetic factors, epigenetics, and the Koebner phenomenon.

Conclusion: Epidermal hamartomas can be the site of a heterogeneous group of inflammatory dermatoses with a Blaschko-linear disposition, such as psoriasis.

Keywords: Epidermal nevi; cutaneous hamartomas

Influence of the type of feeding on anthropometric parameters of infants in the Tlemcen region

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Background: Several studies have shown relevant differences in infant growth and development depending on the type of feeding. However, scientific evidence requires continuous reinforcement. The objective of this study was to compare the evolution of weight and height during the first three months of life among infants in the Tlemcen region according to their feeding type.

Methods: We conducted a descriptive cross-sectional comparative survey in maternal and child protection units of three public primary healthcare institutions in the wilaya of Tlemcen, where 595 three-month-old infants were recruited. For each infant, weight and height were measured and birth data were recorded.

Results: The exclusive breastfeeding rate was 44.9%, followed by artificial feeding (36.1%) and mixed feeding (19%). The study population included 304 male infants and 291 female infants, yielding a male-to-female ratio of 1.04. Most infants had a normal weight at birth and after three months of life. The mean weight gain was higher in male infants under mixed feeding and in female infants under artificial feeding. The mean difference in height at the end of the first trimester of life was greater in breastfed male infants and in female infants under mixed feeding. For both sexes, the evolution of weight and height during the first three months according to the type of feeding showed no statistically significant difference ($p > 0.05$).

Conclusion: It is essential to ensure that the growth of each infant, regardless of the feeding method, is closely monitored and that appropriate adjustments are made to their diet when necessary.

Keywords: infants, feeding, weight, height, Tlemcen.

Vitamin D involvement in pediatric lupus nephritis

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Background: Juvenile systemic lupus erythematosus (JSLE) is an autoimmune disease that begins before the age of 18. It is linked to polygenic factors or to a monogenic mutation. Several studies have reported vitamin D deficiency in adult and juvenile forms of lupus, where it was associated with high clinical activity. We aim to study the involvement of vitamin D in pediatric lupus patients. We assessed the association between vitamin D levels, disease activity and the occurrence of nephritis, to gain insights into how vitamin D supplementation might benefit these patients.

Methods: Our study involved 30 lupus children and 60 healthy subjects. Patients were recruited from the pediatric department of Naffissa-Hamoud Hospital in Algiers for a period of 6 months. A clinical evaluation was performed for all patients. Serum vitamin D levels were measured using chemiluminescence. Biochemical data, comprising kidney markers, were obtained from medical records.

Results: Serum vitamin D levels revealed a significant deficiency in patients not receiving supplementation compared to controls and patients receiving vitamin D supplementation ($p < 10^{-3}$). The severity of the disease was associated with a decrease in vitamin D. The clinical study indicated that the most frequent manifestations were cutaneous (86.6%), rheumatological (80%), hematological (60%), followed by renal involvement (46.6%). A strong association was found between the presence of nephropathy and vitamin D deficiency ($p < 2 \times 10^{-3}$), where vitamin D titers correlated negatively with renal markers levels, urea and proteinuria ($r = -0.3$), and creatinine ($r = -0.4$).

Conclusion: Our results suggest an association between vitamin D deficiency and increased activity of pediatric lupus, particularly in severe forms with renal involvement. The results of this preliminary study suggest that higher levels of vitamin D may be associated with better renal function. Further research is needed to explore the potential therapeutic implications of vitamin D or its agonists.

Keywords: kidney involvement, pediatric lupus, vitamin D.

Epidemiological, molecular, and histopronostic profile of invasive ductal carcinoma of the breast

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Background: Breast cancer remains the most frequently diagnosed cancer and the leading cause of cancer-related mortality among women, despite recent improvements in survival rates. Invasive ductal carcinoma (IDC) is the predominant histological subtype, representing the majority of malignant breast tumors. A comprehensive understanding of its epidemiological and molecular characteristics is crucial for enhancing diagnostic accuracy and optimizing therapeutic approaches.

Methods: This is a retrospective study of 200 cases invasive ductal carcinoma of breast with tumors with observed in the oncology department of EHU-Oran with records collected from 2018 to 2022, and analyzed using SPSS 2020 software.

Results: We analyzed 200 cases, with a mean patient age of 53,20 years, ranging from 27 to 89 years, and a mean age at puberty of 13,48 years. The age group most affected is 43-52 years old, with a figure of 28%. Of these, 53% were menopausal, with an average age at menopause of 49,34% years. In addition, 19,5% of patients had a first-degree family history of breast cancer. Topographically, the right breast was most frequently affected, accounting for 49,5% of cases. And 53,5% classified as grade II according to the SBR classification. In terms of tumour type, 52,11% belonged to luminal group B and 17,89% to triple negative. Molecular classifications, based on immunohistochemistry results, revealed that the HER2-subtype was the most frequent (68,95 %), while hormone receptors were positive in 69,5% of cases for estrogen receptors (RE+) and in 61,1% for progesterone receptors (RP+). The mean proliferation index was 25,74.

Conclusion: In conclusion, our study highlights the clinical, molecular, and risk factor profiles of invasive ductal carcinoma, and their correlation with molecular classification. These findings emphasize the importance of comprehensive evaluation to guide treatment decisions and improve breast cancer prevention, diagnosis, and management.

Keywords: Breast, cancer, invasive ductal carcinoma, Molecular classification, Retrospective

Gastric Cancer Biomarkers: From Detection to Treatment Management

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Background: Gastric cancer remains a major public health issue worldwide (C. Cissé, 2021). Although its incidence has shown a remarkable decline in developed countries over the past decades, gastric cancer continues to represent a major global health concern, ranking as the second leading cause of cancer-related mortality after lung cancer (Mellouki et al. 2014)

Methods: This is a retrospective study involving 50 patients diagnosed with gastric cancer and admitted to the Oncology Department (EHUO) over a 5-year period, from 2018 to 2023. The parameters studied included: patient age, sex, family history, symptoms, lifestyle and dietary habits, as well as biological, radiological, and histopathological assessments. Data were analyzed using Excel 2019 and SPSS 2022 software.

Results: The results showed that the mean age was 60 ± 12 years, with a male predominance (72%) and a sex ratio M/F = 3. The most affected age group ranged between 55 and 64 years. Most patients presented with epigastric pain (86%), weight loss (72%), and asthenia (56%). Their diet was generally rich in salt and chili, and 28% were infected with *Helicobacter pylori*. Tobacco use was observed in 56% of patients and alcohol consumption in 11%. A family predisposition was suspected in 30–39% of gastric cancer cases. Anemia was present in 66% of patients, including severe anemia (< 8 g/dL), with some presenting hematemesis and melena. Elevated levels of tumor markers CA19-9 (56%) and CEA (61%) were found to correlate with tumor stage and the presence of metastases, confirming multiple secondary sites, including hepatic metastases (29%). This highlights the importance of performing biochemical assays of certain parameters such as AST, ALT, alkaline phosphatase, and alpha-fetoprotein as part of the initial assessment. The most frequent histological type was gastric adenocarcinoma (53%), predominantly located in the antrum-fundus region (22%), with a moderately differentiated ulcerative-proliferative form (42%), classified as cT4 Nx M1b (22%).

Conclusion: The causes and risk factors of gastric cancer are multiple and diverse: *Helicobacter pylori* infection, dietary habits, tobacco use, alcohol consumption, and genetic predisposition. Cancer biochemistry plays a crucial role in developing and conducting biological investigations to ensure the diagnosis, monitoring, and therapeutic management of patients with gastric or other types of cancer, as well as in advancing the development of biotherapies.

Keywords: Cancer, stomach, biochemical, oncology, metastasis.

Inflammatory Blood Ratios as Predictive Markers for the Onset of Preeclampsia: A Single-Center Study at the EHU of Oran, Algeria.

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Background: Preeclampsia is a major cause of maternal and perinatal morbidity, characterized by hypertension and organ dysfunction during pregnancy. Increasing evidence suggests that systemic inflammation plays a key role in its pathogenesis. In this context, blood inflammatory ratios such as the neutrophil-to-lymphocyte (NLR), monocyte-to-lymphocyte (MLR), and platelet-to-lymphocyte (PLR) ratios have been proposed as potential predictive markers. This case-control study aimed to compare these inflammatory ratios between women with normal and preeclamptic pregnancies.

Methods: This study was conducted in the Gynecology and High-Risk Pregnancy (GHR) Department of the EHU of Oran between March 2024, and May 2024. We analyzed data from patients divided into two groups: women with normal pregnancies (control group, $n = 30$) and those diagnosed with preeclampsia (case group, $n = 30$). Means of sociodemographic and clinical parameters, as well as the NLR, PLR, and MLR ratios, were calculated and compared between the two groups using the independent-samples t -test, with the level of statistical significance set at $\alpha = 0.05$.

Results: The mean age of women with preeclampsia was 32.26 ± 7.39 years, compared to 30.86 ± 5.49 years in the control group. Significant differences were found for gestational age ($p = 0.03$), systolic blood pressure ($p = 0.001$), and diastolic blood pressure ($p = 0.001$) between the two groups. A highly significant difference in pre-delivery NLR values was observed between cases and controls ($p = 0.009$), suggesting that this ratio may serve as a potential predictive marker for preeclampsia. Conversely, no significant differences were found in MLR and PLR values ($p > 0.05$), either before or after delivery.

Conclusion: This study provides new insights into the use of inflammatory markers for the early detection of preeclampsia, thereby contributing to a better understanding of the underlying immunological mechanisms of this condition and offering potential avenues for more effective preventive management.

Keywords: preeclampsia, pregnancy, inflammation, systemic inflammatory ratios, NLR.

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Acetylcholinesterase inhibitory activity of extracts of *Helianthemum apenninum* (L.) Mill. and *Rochelia disperma* (L.f.) K.Koch

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Background: The aim of this study was to evaluate the acetylcholinesterase (AChE) inhibitory activity of two wild plants harvested from different areas in Algeria. These plants are used in traditional medicine for burns [1].

Methods: The different plant extracts were obtained by Soxhlet extraction using ethyl acetate, methanol and methanol-water as solvents. The AChE inhibitory activity was evaluated spectrophotometrically using the Ellman's method [2].

Results: The findings showed that the ethyl acetate extract of *Helianthemum apenninum* (47.29 % of inhibition) and methanol extract of *Rochelia disperma* (45.36 % of inhibition) showed almost the same AChE inhibitory activity. They possessed moderate AChE inhibitory activity at 400 and 500 µg/mL. Interestingly, all the *Rochelia disperma* extracts exhibited inhibitory activity against AChE.

Conclusion: *Helianthemum apenninum* and *Rochelia disperma* extracts had the ability to inhibit AChE, which can be highly related to its phytochemical constituents. Phytochemical investigations combined with bioassay fractionation are needed to characterize the active constituents of the studied extracts.

Keywords: Wild plant extracts, phytochemicals, acetylcholinesterase, Ellman's method.

Reference

- [1] Rubio-Moraga, Á., Argandoña, J., Mota, B., Pérez, J., Verde, A., Fajardo, J., Gómez-Navarro, J., Castillo-López, R., Ahrazema, O., & Gómez-Gómez, L. (2013). Screening for polyphenols, antioxidant and antimicrobial activities of extracts from eleven *Helianthemum* taxa (Cistaceae) used in folk medicine in south-eastern Spain. *Journal of Ethnopharmacology*, 148(1), 287-296.
- [2] Ellman, G.L., Courtney, K.D., Andres Jr, V., & Featherstone, R.M. (1961). A new and rapid colorimetric determination of acetylcholinesterase activity. *Biochemical pharmacology*, 7(2), 88-95.

Characterisation of bioactive compounds in hexane extract of *Agrimonia eupatoria* L. leaves using ATR-FTIR spectroscopy

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Background: *Agrimonia eupatoria* L. is a plant known for its traditional medicinal uses. Its therapeutic properties are due to its rich composition of various molecules. The objective of our study is the phytochemical characterisation of the bioactive compounds present in the hexane extract of *A. eupatoria* obtained using the Soxhlet method.

Methods: Qualitative phytochemical analyses based on colorimetric methods were carried out, as well as the determination of contents in phenolic compounds such as total phenols, total flavonoids, flavonols, condensed and hydrolysable tannins. In addition, spectroscopic analysis was performed using ATR-FTIR to identify the functional groups present in the obtained extract.

Results: The results of the quantitative phytochemical analysis revealed a wide variety of phenolic compounds in our extract. The hexane sample revealed the phenolic content of the following analysed compounds: 1.716 mg GAE/gDM for polyphenols, 0.113 mg QE/gDM for flavonoids, 0.03 mg QE/100gDM for flavonols, 0.62 mg CE/gDM for condensed tannins and 1.18 mg TAE/gDM for hydrolysable tannins. ATR-FTIR spectroscopy analysis revealed the presence of functional groups characteristic of active substances such as phenolic compounds, phenolic- derived aromatic compounds, monoterpenes (pinene), and sesquiterpenes.

Conclusion: The obtained data highlight the importance of *Agrimonia eupatoria* L. as a source of bioactive molecules such as polyphénols and pave the way for its pharmacological valorization. In the future, it would be interesting to study other extraction methods using more polar solvents.

Keywords: *Agrimonia eupatoria* L., extraction, phytochemical analyses, phenolic compound, ATR-FTIR.

Contribution to the evaluation of some probiotic properties of bacteria of the genus *Lactobacillus*.

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Background: Lactic acid bacteria are distinguished by their beneficial effects on health. They are used to produce bacteriocins and proteins for therapeutic purposes. These bacteria prevent the multiplication of microorganisms by generating inhibitory compounds such as bacteriocins and by reducing pH through the production of lactic acid (Ameen and Caruso, 2017). They also naturally possess some resistance to many antibiotics, primarily due to their cellular structure and physiology (Temmerman et al., 2003). This resistance is, in most cases, non-transmissible because it is linked to the strain's chromosomal genetic characteristics. The objective of this study is to contribute to characterizing the probiotic properties of *Lactobacillus* strains by studying their antibiotic resistance and highlighting their inhibitory power against pathogenic bacteria.

Methods: Fourteen *Lactobacillus* strains were selected from a collection isolated from artisanal products (hammoum, honey) of various origins in Tiaret province. The sensitivity of the lactic acid strains to antibiotics was determined using the MRS agar diffusion antibiogram method (Bauer et al., 1966), and the inhibitory power was tested according to the method described by Mami et al. (2010).

Results: The results show that the strains have natural resistance to vancomycin, oxacillin, gentamicin and are sensitive to other antibiotics. The demonstration of the inhibitory power showed that the strains (HMTK20, HMTK21, HMTK58, MTK30, MTK31) inhibit *Escherichia coli* and the strains (HMTK20, HMTK21, MTK31) inhibit the pathogenic strain *Bacillus cereus*.

Conclusion: The strains exhibit natural antibiotic resistance and significant inhibitory potency against the pathogenic bacteria *Escherichia coli* and *Bacillus cereus*, which is an important criterion for potential applications as probiotics or biopreservatives.

Keywords: Lactic acid bacteria, *Lactobacillus*, antibiogram, inhibitory potency.

Ethnobotanical study of medicinal plants used in the treatment of respiratory system infections in the region of Relizane, Algeria

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Background: Respiratory diseases, ranging from allergies to cancer, account for approximately 5.5 million medical consultations annually. With 80% of the world's population relying on traditional medicine, the use of medicinal plants is growing in importance. This study aims to establish a database of medicinal species used in the treatment of respiratory infections.

Methods: Using 100 questionnaire sheets, a series of ethnobotanical surveys were carried out in the field during the year 2022/2023 with users, herbalists and traditional practitioners.

Results: The analysis of the collected data made it possible to inventory 35 species belonging to 19 families, the most important of which in terms of their specific population are: Lamiaceae, Apiaceae, Asteraceae and Fabaceae. The results of this study also showed that the foliage is the most used part, and the majority of remedies are prepared in the form of decoction and infusion and administered exclusively orally. In addition, asthma, respiratory allergies, coughs, undefined lung infections, spasms and colds are the most treated symptoms.

Conclusion: These results can be considered as a source of information for scientific research in the field of phytochemistry and pharmacology.

Keywords: Respiratory infections, Ethnobotany, Medicinal plants, Traditional medicine, Relizane

References

- [1] El Hilah, F. B. A., Dahmani, J., Belahbib, N., & Zidane, L. (2015). Étude ethnobotanique des plantes médicinales utilisées dans le traitement des infections du système respiratoire dans le plateau central marocain. *Journal of Animal & Plant Sciences*, 25(2), 3886-3897.
- [2] Papazian, L., & Roch, A. (2008). *Le syndrome de détresse respiratoire aiguë*. Edition Springer. 153 p.

A Tailored Gluten-Free Energy Bar for Celiac Patients: Nutritional and Phytochemical Characterization

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Background: The growing consumer interest in nutritious and health-promoting foods drives the need for innovative product development. This study focused on formulating a gluten-free energy bar with high nutritional and bioactive value using carob (*Ceratonia siliqua*), moringa leaves (*Moringa oleifera*), and pumpkin seeds (*Cucurbita pepo*).

Methods: The formulation was optimized to obtain a balanced product. The final product was evaluated through nutritional analyses, phytochemical analyses (secondary metabolites), antioxidant analyses (DPPH method), as well as a sensory analysis designed to measure its acceptability.

Results: The results reveal an interesting composition with 48 g/100 g of carbohydrates, 9 g/100 g of proteins, 23 g/100 g of lipids, and an energy value of 449 kcal/100 g. Furthermore, the plants used were distinguished by a high content of polyphenols and flavonoids, associated with significant antioxidant and antimicrobial activity.

Conclusion: Overall, the results highlight the strong nutritional, functional, and sensory potential of the developed energy bar, underscoring the value of leveraging local plant resources in the design of new health foods.

Keywords: energy bar, carob, moringa, pumpkin seeds, antioxidants, gluten-free, food.

Ethnobotanical survey on the use of some medicinal plants. Case of Sidi Bel-Abbès

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Background: Algeria is distinguished by its rich flora and ethnobotanical heritage. In several rural regions, such as Sidi Bel Abbès, populations continue to use plants for their therapeutic properties. However, these ancestral practices are now at risk of disappearing due to a lack of scientific documentation and changing lifestyles.

Methods: The present study is a scientific contribution to the valorization and documentation of traditional knowledge related to the use of medicinal plants by the local population of the Sidi Bel Abbès region, located in northwestern Algeria. A field-based ethnobotanical survey was conducted using 50 questionnaire forms, aiming to gather as much information as possible about four widely used medicinal plants in the region: mint, lavender, rosemary, and garlic.

Results: The results revealed a clear predominance of therapeutic use, mainly in the treatment of digestive disorders, followed by urogenital, respiratory, neurological, and joint ailments. Leaves were identified as the most commonly used plant part, while infusion was the most frequent preparation method. Oral administration, particularly in the form of herbal teas (tisanes), was the most widely practiced route.

Conclusion: Data analysis led to the establishment of a local catalog of documented medicinal plants, detailing their uses, parts used, preparation methods, and the types of illnesses treated. These findings provide a valuable source of information for national ethnobotanical research and contribute to the preservation of Algeria's phytotherapeutic heritage.

Keywords: Medicinal plants – Ethnobotany – Phytotherapy – Traditional knowledge – Sidi Bel Abbès

Functional Exopolysaccharides from Extremophilic *Bacillus*: Emerging Biomedical Applications

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Background: Microorganisms inhabiting extreme environments such as saline, thermal, or alkaline ecosystems are known to produce unique bioactive compounds with remarkable stability. Among them, extremophilic *Bacillus* strains synthesize exopolysaccharides that exhibit promising biomedical applications.

This study aimed to extract, characterize, and evaluate the antibiofilm potential of exopolysaccharide produced by an extremophilic *Bacillus* strain.

Methods: *Bacillus* exopolysaccharide was extracted from the culture supernatant through cold ethanol precipitation, followed by dialysis purification and lyophilization. The extracted exopolysaccharide was characterized using FTIR spectroscopy to identify functional groups, while protein, sulfate, and phosphate contents were quantified by colorimetric methods. The antibiofilm activity was assessed against *Staphylococcus aureus* ATCC25923, *Klebsiella pneumoniae* ATCC70603, and *Candida albicans* ATCC10231 during 1, 3, and 24 hours of incubation with *Bacillus* exopolysaccharide.

Results: FTIR analysis confirmed the presence of hydroxyl, carboxyl, and sulfate functional groups typical of polysaccharides. The biochemical composition revealed 45 µg/mL of proteins, 300 µg/L of sulfate groups, and 500 µg/L of phosphate groups, indicating a complex structure enriched in charged moieties that may enhance bioactivity. The exopolysaccharide demonstrated time-dependent antibiofilm activity, reaching maximum inhibition rates of 59.4% against *Staphylococcus aureus* ATCC25923, 41.9% against *Klebsiella pneumoniae* ATCC70603, and 34.6% against *Candida albicans* ATCC10231 after 24 hours of treatment. These results suggest that exopolysaccharide from extremophilic *Bacillus* strain can effectively disrupt biofilm formation by both Gram-positive and Gram-negative bacteria as well as fungal species.

Conclusion: The study highlights the biomedical relevance of an exopolysaccharide derived from extremophilic *Bacillus* strain. Its rich biochemical composition and strong antibiofilm potential make it promising candidates for biomedical and pharmaceutical applications, especially in the development of antimicrobial coatings and biofilm-preventive materials.

Keywords: Extremophilic, *Bacillus*, Exopolysaccharide, Antibiofilm, Biomedical Applications.

COX-2 Inhibition Underlies the Anti-Inflammatory Activity of *Ammoides Verticillata* Essential Oil: Evidence from *in Vivo* and Computational Analyses

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Background: Inflammation is a complex biological response implicated in various chronic disorders, and cyclooxygenase-2 (COX-2) plays a pivotal role in mediating the synthesis of pro-inflammatory prostaglandins. Owing to the adverse effects associated with synthetic COX-2 inhibitors, plant-derived essential oils have emerged as promising natural alternatives. This study aimed to investigate the anti-inflammatory potential of *Ammoides verticillata* essential oil (AVEO), a carvacrol-rich chemotype, through complementary *in vivo* and *in silico* approaches, with a particular focus on COX-2 inhibition.

Methods: The *in vivo* anti-inflammatory activity of AVEO was evaluated using the carrageenan-induced paw edema model in rats, with doses of 50, 100, and 200 mg/kg administered orally. Edema inhibition was recorded over 5 hours and compared to the standard drug diclofenac. In parallel, molecular docking studies were conducted using Schrödinger software to predict the binding affinity and interaction profiles of major AVEO constituents (carvacrol, thymol, *p*-cymene, γ -terpinene, and limonene) within the active site of COX-2. The compounds were subsequently examined by MM/GBSA calculations to further reinforce docking findings and the top-performing compounds were subjected to molecular dynamics (MD) simulations to assess the stability and strength of protein-ligand complexes.

Results: *In vivo* experiment demonstrated a dose-dependent reduction in paw thickness, with the 200 mg/kg dose producing a significant anti-inflammatory effect (52.23%) comparable to that of diclofenac. Molecular docking analysis revealed strong binding affinities of AVEO's principal constituents, particularly carvacrol and thymol, toward the COX-2 active site (-7.381 and -6.939 Kcal/mol, respectively), where they formed stable hydrogen bonds with key catalytic residues such as Ser530. The MM/GBSA free energy analysis further substantiated these interactions, indicating energetically favorable binding of AVEO's main compounds. Moreover, MD simulations confirmed the stability of the carvacrol-COX-2 and thymol-COX-2 complexes, reinforcing their potential as potent natural COX-2 inhibitors.

Conclusion: The combined *in vivo* and *in silico* findings highlight the potent anti-inflammatory potential of *Ammoides verticillata* essential oil, primarily attributed to its phenolic monoterpenes. These results support the traditional use of this species and position AVEO as a promising natural source of COX-2 inhibitors, warranting further exploration for safe and effective anti-inflammatory therapeutics.

Keywords: *Ammoides verticillata*, essential oil, Anti-inflammatory activity, COX-2 inhibition, molecular docking.

Therapeutic Compresses Impregnated with Botanical Oils for the Treatment of Superficial Burns.

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Background: Burns are a common medical issue requiring appropriate care to promote healing and prevent complications. This study developed non-woven compresses impregnated with a mixture of plant-based oils (*Pistacia lentiscus* and *Calendula officinalis*), intended for the treatment of superficial burns in a domestic setting.

Methods: The compresses were impregnated with the oil mixture using a standardized procedure. Physico-chemical and microbiological quality was analyzed. The compresses were then applied to superficial burns to evaluate tolerance and their effects on the healing process.

Results: The compresses demonstrated excellent tolerance and promoted visual improvement of superficial burn lesions. Physico-chemical analysis revealed a pH of 3.32; color and odor were consistent and defect-free, indicating good stability and user tolerance. Microbiological analysis showed a very low total bacterial load ($<10^3$ CFU/g). No critical pathogens (*E. coli*, *S. aureus*, *P. aeruginosa*, *C. albicans*) were detected, and yeast and mold levels were minimal and within regulatory limits. These results confirm the compresses' safety for domestic and clinical use.

Conclusion: These plant oil-impregnated therapeutic compresses represent an innovative approach for treating superficial burns. Rigorous quality controls ensure their safety, reliability, and effectiveness, providing a promising alternative to improve healing and patient comfort.

Keywords: therapeutic compresses, *Pistacia lentiscus*, *Calendula officinalis*, superficial burns, plant-based oils

References

Rezai, S., Rahzani, K., Hekmatpou, D., & Rostami, A. (2023). Effect of oral *Calendula officinalis* on second-degree burn wound healing. *Scars, Burns & Healing*, 9, 20595131221134053.

Evaluation of the Biological Activities of the Hydroethanolic Leaf Extract of *Zizyphus lotus* (L.) Lam

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Background: *Zizyphus lotus* (L.) Lam., a shrub widely distributed across the Mediterranean region, is traditionally used in folk medicine for its wound-healing, anti-inflammatory, and antimicrobial properties. Its leaves and fruits contain diverse secondary metabolites such as polyphenols, flavonoids, and tannins that contribute to its pharmacological value. The biological properties of this plant largely depend on the extraction method and solvent polarity, which determine the yield and composition of bioactive compounds

Methods: The aqueous extract (EAQ) of *Zizyphus lotus* leaves was obtained by maceration using distilled water. The extract was evaluated for its total polyphenol and flavonoid contents, as well as its biological activities. Antioxidant activity was assessed using DPPH and β -carotene bleaching assays. Anti-inflammatory activity was determined through protein denaturation inhibition, while antimicrobial potential was tested against Gram-positive and Gram-negative bacteria, and *Candida albicans*.

Results: The aqueous extract (EAQ) yielded 8.93% and was particularly rich in flavonoids (12.46 ± 0.07 mg QE/g). Although its total polyphenol content was slightly lower than that of the ethanolic extract, EAQ demonstrated strong antioxidant capacity in the β -carotene bleaching assay (58.19% inhibition) and remarkable anti-inflammatory potential, achieving 95% inhibition of protein denaturation at 1.25 μ g/ml. In addition, EAQ exhibited greater antibacterial activity against Gram-positive bacteria, indicating the effectiveness of water in extracting hydrophilic compounds with potent biological activity.

Conclusion: The aqueous leaf extract of *Zizyphus lotus* showed notable antioxidant, anti-inflammatory, and antibacterial activities, confirming its promising potential as a natural source of bioactive compounds for therapeutic applications

Keywords: *Zizyphus lotus*; aqueous extract; antioxidant activity; anti-inflammatory activity; antibacterial activity.

Harnessing *Hyssopus officinalis* stems to counteract gastric mucosal injuries: A novel phytotherapeutic avenue

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Background: Gastric mucosal injury from ethanol continues to represent the pathophysiological mechanisms of ulcer development, it remains a challenge in clinical practice. Natural agents like *Hyssopus officinalis* L. stems, which contain antioxidant polyphenols, are a viable but underutilized strategy for limiting that damage. *Hyssopus officinalis*, an aromatic herb of the Lamiaceae family, is traditionally used in herbal medicine and is increasingly recognized for its antioxidant and gastroprotective properties.

Methods: Gastric lesions were induced in rats through the administration of absolute ethanol, and the protective effect of the ethyl acetate fraction of *Hyssopus officinalis* stems was evaluated at different doses. Acute oral toxicity was assessed in mice using OECD guidelines. The extent of mucosal damage was quantitatively determined by macroscopic and histological examinations and the main phenolic and flavonoid constituents of the extract were identified with HPLC-ESI-MS/MS.

Results: Acute toxicity testing in mice confirmed the safety of the tested doses, with no signs of toxicity or mortality. The ethyl acetate fraction of *Hyssopus officinalis* stems (AET) produced a significant gastroprotective effect against ethanol-induced gastric lesions with respect to protection, achieving 78% and 76% prevention at the doses 500 mg/kg and 250 mg/kg respectively. Omeprazole (80 mg/kg) produced 86% protection. HPLC-ESI-MS/MS analysis identified 16 compounds out of 20 reference standards with the main components being hydroxycoumarin and hesperetin.

Conclusion: These findings highlight the potent gastroprotective capacity of the ethyl acetate extract of *Hyssopus officinalis* stems, likely linked to its high content of hydroxycoumarin and hesperetin. The comparable efficacy to omeprazole, together with its safety in acute toxicity testing, supports its potential as a promising natural therapeutic candidate for gastric mucosal protection.

Keywords: Ethanol-induced gastric injury, Gastroprotection, Acute toxicity, *Hyssopus officinalis*.

Exploring the Pharmacological Potential of Passiflora edulis Seeds: A Stilbene-Rich Extract for Alzheimer's Disease Treatment

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Background: Alzheimer's disease is a neurodegenerative condition that leads to the progressive and irreversible degradation of nerve cells, gradually impairing cognitive and memory functions. Medicinal plants are increasingly recognized as a promising source for developing new therapies aimed at slowing the progression of this disease. The seeds of *Passiflora edulis*, as by-products of the industry, present interesting potential for pharmaceutical applications, with valuable biological activities related to Alzheimer's disease.

Methods: The objective of our study was to produce a stilbene-rich extract from *Passiflora edulis* seeds. We analyzed its content of bioactive compounds through quantitative assays of secondary metabolites, such as flavonoids and tannins. Additionally, we evaluated the *in vivo* anti-Alzheimer activity of this extract using neurological tests focused on the behavior and memory of mice.

Results: The results of the phytochemical of the PEAS fraction revealed the presence of secondary metabolites and phenolic compounds associated with the biological activities of the extract. HPLC-MS analysis identified major phenolic compounds, including trans-piceatannol (PE-1), scirpusin B (PE-2), and scirpusin A (PE-3). An improvement in memory and behavioral performance was observed in mice, confirmed by histological studies and immunofluorescence targeting amyloid plaques.

Conclusion: These findings suggest that the fractions derived from *P. edulis* seeds, along with their stilbenes, could represent promising candidates for the development of new treatments for neurodegenerative diseases, particularly Alzheimer's disease.

Key words: *Passiflora edulis*, Alzheimer's disease, stilbene, acetylcholinesterase, *in vivo*, mice.

References

Mostefa, N., Djebli, N., Khanh, P. N., Ha, N. X., Anh, H. T. N., Ha, V. T., ... & Cuong, N. M. (2023). Anti-Alzheimer's activity of polyphenolic stilbene-rich acetone fraction of the oil-removed seeds of *Passiflora edulis*: *in vivo* and *in silico* studies. *Chemistry & Biodiversity*, 20(5), e202201051.

Computational Investigation of the Antimicrobial Potential of Bioactive Compounds from the Essential Oil of *Inula montana* Aerial Parts

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Background: The increasing emergence of resistance to conventional antimicrobial agents necessitates the search for novel natural alternatives. Previous experimental studies have indicated the promising antimicrobial potential of *Inula montana* essential oil. This study aims to provide a theoretical investigation to elucidate the molecular mechanisms behind this activity and to evaluate the pharmaceutical potential of its key bioactive constituents through advanced *in silico* methods.

Methods: A comprehensive theoretical investigation was conducted. First, the electronic properties and chemical reactivity of the major essential oil constituents were analyzed using Density Functional Theory (DFT) calculations at the B3LYP/6-311+G(d,p) level to determine frontier molecular orbital (HOMO-LUMO) energies and global chemical reactivity descriptors. Subsequently, molecular docking studies were performed to assess the binding interactions and affinities of these compounds with key antimicrobial targets. Finally, the pharmacokinetic and toxicological profiles were predicted using ADMET analysis.

Results: The DFT calculations revealed a low HOMO-LUMO gap in the key bioactive compounds, indicating high chemical reactivity and a strong potential for biological interaction. Molecular docking results demonstrated strong binding affinities and stable interactions between the bioactive constituents and the active sites of the target enzymes, suggesting a potent inhibitory mechanism. Furthermore, the ADMET predictions indicated favorable pharmacokinetic properties, including good oral bioavailability and a low toxicity profile for the most active compounds.

Conclusions: This *in silico* study provides a robust theoretical foundation for the observed antimicrobial efficacy of *Inula montana* essential oil. The results confirm that its bioactive constituents exhibit high reactivity, strong binding to essential microbial targets, and promising drug-like properties. These findings highlight the significant potential of these natural compounds to serve as credible leads for the development of new antimicrobial agents, offering a viable alternative to synthetic chemicals in combating microbial resistance.

Keywords: *Inula montana*, essential oil, antimicrobial activity, DFT, molecular docking, ADMET.

New Insights into the Antimicrobial and Anti-inflammatory Potentials of the Essential Oil from the Aerial Parts of *Inula montana*

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Background: The growing resistance to synthetic drugs has renewed interest in natural sources of bioactive compounds. In this context, the essential oil obtained from the aerial parts of *Inula montana* was explored for its antimicrobial and anti-inflammatory potential.

Methods: The antimicrobial activity was evaluated against seven bacterial strains and three yeast species using the agar diffusion and minimum inhibitory concentration (MIC) methods. Gentamicin and Amphotericin B served as positive controls. The anti-inflammatory activity was assessed via the protein denaturation inhibition assay, with diclofenac sodium as a reference.

Results: The obtained results were promising, showing variable antimicrobial effects depending on the tested strains, along with a noticeable anti-inflammatory activity reflected by significant inhibition of protein denaturation.

Conclusion: These findings underline the potential of *Inula montana* essential oil as a natural agent with dual antimicrobial and anti-inflammatory properties, offering an alternative to conventional synthetic products.

Keywords: *Inula montana*, essential oil, antimicrobial activity, anti-inflammatory activity.

COMPUTATIONAL DESIGN OF ENHANCED PHENOLIC ANTIOXIDANTS: A MECHANISTIC STUDY USING A VALIDATED TWO-LAYER ONIOM APPROACH

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Background: Phenolic antioxidants are crucial compounds that protect biological systems and industrial products from oxidative damage by scavenging free radicals. While the O-H Bond Dissociation Enthalpy (BDE) is a key thermodynamic parameter for assessing their efficacy via the Hydrogen Atom Transfer (HAT) mechanism, a comprehensive understanding requires investigating alternative mechanisms and solvent effects. Furthermore, the rational design of novel antioxidants, particularly based on Vitamin E scaffolds, is often limited by the computational cost of high-level methods for large molecular systems.

Methods: To address these challenges, we employed an efficient two-layer ONIOM (QM/MM) approach. The high-level layer (QM) was treated with DFT at the B3LYP/6-311++G(3df,3pd) level of theory, while the low-level layer used the PM6 method. This methodology was rigorously validated against full DFT calculations and available experimental data. We systematically calculated key thermodynamic parameters for a series of phenols and designed Vitamin E derivatives:

Results: Our validated ONIOM approach successfully identified the HAT mechanism as predominant in lipid environments for Vitamin E derivatives. We quantitatively established that electron-donating groups, particularly in ortho positions, significantly lower BDE values, enhancing antioxidant activity through synergistic electronic and steric effects. Solvent analysis revealed a mechanistic shift towards SPLET in aqueous environments. All newly designed compounds exhibited favorable drug-like properties and high radical stability, as confirmed by spin density delocalization analysis.

Conclusion: This study establishes the validated ONIOM (B3LYP:PM6) protocol as a powerful and efficient tool for the rational design of antioxidants. We provide a comprehensive, multi-mechanistic understanding of phenolic antioxidant activity, leading to the proposal of novel Vitamin E derivatives with superior predicted potency.

Keywords: Phenolic Antioxidants, BDE(O-H), ONIOM Method, Vitamin E Derivatives, HAT Mechanism, SET-PT, SPLET, Drug-Likeness.

Evaluation of the microbial activity of the plant *Myrtus communis* L. (myrtle)

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Background: *Myrtus communis* L., commonly known as myrtle, is a Mediterranean shrub renowned for its medicinal properties, particularly its antimicrobial effects. This study focuses on the phytochemical composition of fresh myrtle leaves collected from Sétif Province and investigates their potential antimicrobial activity against two bacterial strain : Gram-negative ;*Salmonella typhimurium* (ATTC 14028)and Gram-positive ; *Staphylococcus aureus* (ATTC 25923) as well as two fungal strain *Aspergillus fumigatus* (MH109539) and *Aspergillus flavus* (MH204304) The plant's bioactive compounds, including essential oils, flavonoids, and tannins, are believed to contribute to its antimicrobial properties. By evaluating the effectiveness of myrtle leaf extracts against these pathogens, the study aims to explore its potential as a natural antimicrobial agent, addressing the growing need for alternative treatments in the face of rising antibiotic resistance and fungal infections.

Method: The antimicrobial activity of the plant extracts was evaluated using the disc diffusion. Briefly, fresh microbial cultures were adjusted to 0.5 McFarland turbidity and uniformly spread over the surface of Mueller–Hinton agar plates using sterile cotton swabs. Sterile paper discs were impregnated with a defined volume of each plant extract and carefully placed on the inoculated agar. Standard antibiotic discs served as positive controls, while solvent-only discs were used as negative controls. The plates were maintained at 4 °C for 2 h, then incubated inverted at 37 °C for 24 h. After incubation, antimicrobial efficacy was assessed by measuring the diameter of the clear inhibition zones. Larger zones indicated stronger inhibitory activity of the tested extracts.

Results: The yield of the aqueous extract was estimated at 24,5%. The inhibition diameters were measured. The inhibition diameters of the pure extract was observed in ranged from 6 mm to 10 mm against *S. typhimurium* and *S.aureus* and the antifungal activity against *A. fumigatus* and *A. flavus* shows significant results.

Conclusion: The findings show that the plant extracts exhibit variable inhibition against the tested strains, indicating that they have significant antimicrobial activity. These results imply that *Myrtus communis* may be a promising source of natural antimicrobial agents.

Keywords: *Myrtus communis* L. (myrtle) , antibacterial , antifungal , aqueous extract

Antimicrobial activity of essential oil from *Eucalyptus camaldulensis* leaves

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Background: Essential oils are widely recognized for their therapeutic potential, particularly their antibacterial and antifungal properties. *Eucalyptus camaldulensis* is one of the medicinal plants traditionally used for its antimicrobial effects. The present study aimed to evaluate the antibacterial and antifungal activity of *E. camaldulensis* leaf essential oil.

Methods: Fresh leaves of *E. camaldulensis* were collected from Mila Province (Algeria), and the essential oil was obtained by hydrodistillation, yielding 0.27%. The antimicrobial activity was assessed using the disc diffusion method against six bacterial strains: two Gram-positive (*Staphylococcus aureus* ATCC 25923, *Bacillus subtilis* ATCC 6633) and four Gram-negative (*Escherichia coli* ATCC 25922, *Pseudomonas aeruginosa* ATCC 27853, *Salmonella typhimurium* ATCC 14028, and *Klebsiella pneumoniae* ATCC 700603). Antifungal activity was evaluated against four fungal strains: *Aspergillus niger* (MH109542), *Aspergillus fumigatus* (MH109539), *Candida albicans*, and *Penicillium* sp.

Results: The essential oil inhibited the growth of all bacterial strains except *P. aeruginosa*. The inhibition zones ranged from 8 ± 0.3 mm to 14.5 ± 0.5 mm. The strongest antibacterial effects were observed against *S. typhimurium* and *S. aureus*, with inhibition zones of 14 ± 1.0 mm and 14.5 ± 0.5 mm, respectively. Antifungal activity was moderate compared to the positive control, with the highest inhibition recorded against *Candida albicans* (11.16 ± 0.29 mm) and *Penicillium* sp. (11.5 ± 0.49 mm).

Conclusion: The essential oil of *E. camaldulensis* demonstrates promising antibacterial and antifungal potential, supporting its relevance as a natural source for developing new antimicrobial agents. Further studies should focus on clinical validation and formulation optimization for practical applications.

Keywords: *Eucalyptus camaldulensis*, essential oil, antibacterial activity, antifungal activity, disc diffusion

References

Barboucha, G., Rahim, N., Boulebd, H., Bramki, A., Andolfi, A., Salvatore, M. M., & Masi, M. (2024). Chemical composition, in silico investigations and evaluation of antifungal, antibacterial, insecticidal and repellent activities of *Eucalyptus camaldulensis* Dehn. leaf essential oil from ALGERIA. *Plants*, 13(22), 3229.

Public Health and Hospital Food Safety: Detection of Gram-Negative Bacilli in Cooked Meals from Oran's Hygiene Laboratory

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Background: This study investigated the presence of multidrug-resistant Gram-negative bacteria in hospital meals over a 2.5-month period (February 12 to May 8, 2024) at the Hygiene Laboratory of Oran, in the wilaya of Oran.

Methods: The identification of Gram-negative bacteria was initiated with Gram staining, subsequently accompanied by biochemical identification utilising the API 20E and API 20NE galleries (bioMérieux, France). The assessment of antimicrobial susceptibility was conducted employing the disk diffusion method in accordance with CLSI guidelines.

Results: A total of 28 bacterial isolates were recovered from 48 dishes. Identification was performed using Gram staining and the API 20E system, which revealed *Serratia liquefaciens* (77.3%), followed by *Pseudomonas aeruginosa* (13.6%), *Serratia odorifera* (4.5%), and *Proteus vulgaris* (4.5%).

Antimicrobial susceptibility testing demonstrated high levels of resistance across several antibiotic classes. *S. liquefaciens* showed resistance to β -lactams, and extended-spectrum β -lactamase (ESBL) phenotypes were observed, along with resistance to aminoglycosides (gentamicin, amikacin) and fluoroquinolones (ciprofloxacin). *S. odorifera* also exhibited ESBL production, in addition to resistance to sulfonamides (trimethoprim–sulfamethoxazole). *P. vulgaris* was resistant to multiple β -lactams (ticarcillin, ticarcillin–clavulanic acid, amoxicillin–clavulanic acid, cefotaxime), as well as sulfonamides and aminoglycosides (amikacin).

In contrast, the non-fermenting strain *P. aeruginosa* displayed resistance to several β -lactams, fluoroquinolones (ciprofloxacin), and polymyxins, with all isolates demonstrating resistance to colistin.

Conclusion: These findings highlight the emergence of multidrug-resistant bacteria in hospital-prepared cooked meals. Such results call for urgent implementation of preventive strategies and stricter monitoring to anticipate and limit the spread of antimicrobial resistance.

Keywords: Gram-negative bacilli; resistance; antibiotics; food.

Analysis of antibiotic resistance profiles in *Pseudomonas aeruginosa* strains isolated from burn patients

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Objective: This study aimed to determine the prevalence and molecular characteristics of multidrug-resistant (MDR) *Pseudomonas aeruginosa* (PA) producing extended-spectrum β -lactamases (ESBLs) and metallo- β -lactamases (MBLs) among burn patients in Algeria.

Methods: From April 2016 to October 2019, forty-seven non-redundant PA isolates were collected from burn patients hospitalized in the Burns Department of the Military Hospital of Algiers. Antimicrobial susceptibility testing was performed using the agar diffusion method and the Phoenix automated system. ESBL and MBL production was assessed phenotypically, while resistance genes were detected by PCR. Molecular typing was conducted using enterobacterial repetitive intergenic consensus (ERIC)-PCR.

Results: Among the 47 non-redundant MDR PA strains isolated, 59.57% were phenotypically ESBLs-positive, and 100% were phenotypically MBL-positive. Out of the 28 ESBL-producing strains, 23 (82.14%) were blaCTX-M2 positive; 18 (38.29%) were blaPER positive, and 16 (34.04%) were blaTEM positive, while 5 (17.9%) were co-harboring blaCTX-M2, blaTEM, and blaPER genes. Since all isolates were MBL-positive, all 47 strains were screened for the blaNDM-1, blaIMP, blaVIM genes that produce MBLs; however, none of these genes were detected. Additional screening for the oprD gene demonstrated that 45 (95.74%) of the isolates were positive for this gene. Finally, ERIC PCR revealed 6 distinct PA clones among the blaCTX-M2 positive strains.

Conclusion: This investigation represents the first report of CTX-M-2- and PER-producing *P. aeruginosa* in Algeria and, more broadly, in North Africa. The emergence and dissemination of such ESBL-producing MDR strains highlight a serious threat to burn patient management. Molecular characterization of resistance determinants is crucial for understanding their epidemiological spread and guiding effective antimicrobial therapy.

Keywords: *Pseudomonas aeruginosa*; burn patients; multidrug resistance; ESBL; CTX-M-2; PER; Algeria.

Overview and Epidemiology of Non-tuberculous Mycobacteria Isolated from Wild Animals in Africa

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INTRODUCTION: Non-tuberculous mycobacteria (NTM) represent a group of significant pathogens with a global distribution in wildlife. Their presence at the interface between livestock and wild animals is of particular concern, as wildlife species can act as reservoirs, facilitating transmission to domestic cattle and potentially humans. These dynamic underscores the importance of monitoring NTM as a key One Health issue.

OBJECTIVE: This study aimed to conduct a comprehensive assessment of the reported prevalence and temporal trends of NTM in wildlife across African countries over a 15-year period from 2010 to 2025.

METHODOLOGY: We performed a systematic review of the scientific literature on NTM epidemiology in African wildlife. Data were retrieved from electronic databases, including PubMed, ScienceDirect, and African Journals Online (AJOL), and subsequently compiled and analyzed.

RESULTS: The systematic review identified a validated dataset comprising 57 distinct occurrence reports of NTM across a range of wild animal species in Africa. From a total of 3,384 animal observations, 706 confirmed NTM cases were identified, yielding an aggregate prevalence of 20.8% across the studied wildlife populations during the 2010-2025 period.

CONCLUSION: Our analysis confirms the environmental endemicity of NTM and establishes that wildlife populations in Africa constitute a significant reservoir. Furthermore, multivariable statistical analyses demonstrated a significant association between NTM detection and clinical disease in animals, reinforcing the veterinary and ecological importance of these pathogens.

Keywords: *Mycobacterium* non-tuberculosis, wild animals, review, Africa.

Valorization of the biological activities of a medicinal plant "*artemisia herba alba*"

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Background: Given the considerable increase in the number of diabetics (in Algeria; from 2.8 million in 2010 to over 5 million in 2019) and the side effects of antidiabetic drugs, the search for an alternative is essential. The aim of this work is to study the antioxidant and antidiabetic activity of the ethanolic extract of *Artemisia herba alba* Asso (Asteraceae), commonly known as "Chih".

Methods: The aerial part of the studied plant was harvested in April 2022 in the Ouled Khelouf region, south-east of Mila (ALGERIA). The animals used are female "Wistar" strain rats, supplied by the Institut Pasteur d'Alger and are of SPF (Specific Pathogen Free) health status. The total polyphenol content of the extracts obtained by maceration in ethanol was determined using the Singleton and Rossi (1965) method using the Folin-Ciocalteu reagent. The anti-radical potential was evaluated using the DPPH radical scavenging test. Diabetes was induced in the rats by intraperitoneal injection of a streptozotocin solution. The blood glucose level of each rat was measured from the retro-orbital sinus of the animal's eye.

The toxicity evaluation was conducted in accordance with the guidelines of the Organisation for Economic Co-operation and Development (OECD, 2001).

Results: Our results showed that the extract was included in the category of non-toxic substances (no mortality was recorded during the 14 days of treatment). The quantitative estimation of total polyphenols in the analyzed extract shows that it is rich in these metabolites (equal to 125 mg of gallic acid/mg of extract). The reducing power of the ethanolic extract is represented by an IC₅₀ equal to 1.471 mg/ml. The results of the hypoglycemic effect indicate that the studied plant has a significant hypoglycemic effect compared to the results obtained from the positive and negative control.

Conclusion: The studied plant contains molecules that can be considered as antioxidant and antidiabetic agents, in addition to being non-toxic.

Keywords: *Artemisia herba alba*, Antioxidant activity, Antidiabetic activity, Extraction.

Formulation and expectorant effect of a semi-solid topical preparation based on essential oils

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Background: The development of pharmaceutical products based on natural active ingredients has steadily increased in recent years. Cough is a common symptom of many respiratory illnesses, which can cause irritation and inflammation of the throat. Semi-solid preparations based on natural ingredients, such as plant extracts and essential oils, can be used to relieve coughs and associated symptoms. Our goal is to develop a topical semi-solid preparation based on natural active ingredients (essential oils) to treat coughs. The ingredients were chosen for their beneficial properties for the respiratory tract and their ability to relieve coughs.

Methods: Peppermint essential oil, Thyme essential oil with thymol and Rosemary essential oil were used as natural active ingredients, pre formulation assays have been explored and evaluated in order to find the basic formula using different excipients, physicochemical tests and viscosity test have been conducted to choose the basic formula. A clinical study was conducted to evaluate the efficacy of the expectorant balm. A panel of 40 participants with symptoms of chesty cough have been recruited and subject to treatment for a specified period of time.

Results: Our results showed that the balm with shea butter have shown the best results in term of organoleptic properties, pH with a value of 5 corresponding to the skin pH, ideal for a topical form, this pH can also help maintaining product stability and preventing bacterial growth. A viscosity of 8480 have been found due to the presence of shea butter which has a solid texture at room temperature due to its high content of saturated and unsaturated fatty acids. During the clinical study the time required to observe the expectorant action of the formulated balm, the reference medicine, the placebo and the positive control group was measured and compared. The comparing of the balm group with the positive control group have shown a p-value of 1.67×10^{-8} ($p < 0.05$) demonstrating the effectiveness of the expectorant balm, and while comparing the balm group with the reference group, a p-value of 0.0043 (< 0.05) have been found demonstrating that the balm has greater effectiveness and faster action against coughs.

Conclusion: the expectorant balm has a faster expectorant effect than conventional treatments due to its composition, which combines four essential oils known for their expectorant action.

Keywords: Essential oil, balm, cough, formulation.

The Biguanide Metformin Attenuate Heart, Lung and Liver Injury Induced by the β -Adrenoceptor Agonist Isoproterenol in Non-Diabetic Rats

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Background: Circulating catecholamines and oxidative stress play a critical role in cardiac dysfunction and multi-organ damage. Metformin, beyond its hypoglycemic effects, is known for its protective properties at both cellular and molecular levels, particularly through its anti-inflammatory and antioxidant mechanisms. This study aimed to investigate the modulatory effects of metformin on Isoproterenol (ISO)-induced cardiac dysfunction and associated lung and liver injury in non-diabetic rats.

Methods: Male wistar rats were assigned into four groups: control, sham, ISO and ISO pretreated with metformin (MET, 100 mg/kg, orally, twice daily for 14 days). ISO was administered subcutaneously at a dose of 5 mg/kg.

Heart, lung and liver tissues were collected on day 15 after sacrifice and processed for biochemical and histological analyses.

Results: ISO induced cardiac damage, as evidenced by a decrease in creatine kinase (CK) activity - as indicator of cardiac dysfunction in heart tissue. Histopathological examination revealed interstitial edema and increased leukocyte infiltrate in the heart, lungs and liver.

Moreover, ISO significantly increased nitrite (NO) levels ($P < 0.01$), myeloperoxidase (MPO) activity ($P < 0.001$), and malondialdehyde (MDA) levels ($P < 0.001$), reflecting neutrophil infiltration and lipid peroxidation, respectively. ISO also depleted the endogenous antioxidant glutathione (GSH) ($P < 0.01$) in target organs.

Metformin (MET) treatment significantly improved ($P < 0.01$) cardiac injury biomarkers and attenuated ISO-induced histological alterations, inflammation, and oxidative stress in cardiac, hepatic, and pulmonary tissues.

Conclusions: Based on the findings, metformin significantly mitigates the structural and functional impairments in heart, lung and liver tissues induced by isoproterenol. These results suggest that metformin may be a potential adjunct therapy to reduce tissue damage and the associated inflammatory response in cardiovascular diseases.

Key Words: Cardiac dysfunction, Isoproterenol, Metformin, Oxidative stress, Organ damage, inflammation

Encapsulation Potential of Bacterial Exopolysaccharides

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Introduction: The encapsulation potential of bacterial exopolysaccharides, particularly levan, is attracting growing interest in food and pharmaceutical biotechnology. These biopolymers, synthesized by various microorganisms, play a key role in cell protection and offer unique physicochemical properties such as gelation, viscosity, and biocompatibility, making them ideal for the encapsulation of sensitive molecules.

Methods: Levan, a fructosyl-fructose-based homopolysaccharide produced by a strain belonging to the bacterial species *Bacillus licheniformis*, was isolated after screening bacterial cultures grown in a liquid medium enriched with sucrose and mineral salts. Exopolysaccharide production was carried out for 48 hours of incubation at 55°C and pH 7, followed by purification through centrifugation and ethanol precipitation. For encapsulation, purified levan was dissolved in sterile water and mixed with vitamin B. The mixture was dripped into a 0.1 M calcium chloride solution, inducing the formation of gelled microbeads through ionic cross-linking. The microbeads were recovered by filtration, washed with distilled water, and air-dried.

Results: The encapsulation rate was evaluated by UV-Visible spectrophotometry. The microbeads were dissolved, and the released vitamin B concentration was determined using a calibration curve. Results showed an encapsulation efficiency between 45 and 55%, with a progressive release of 60% within 30 minutes and the remainder within 2 hours. The spherical and homogeneous microbeads also protected the vitamin from oxidation and heat, confirming levan's potential as an effective natural encapsulation matrix for food and pharmaceutical applications.

Conclusion: Bacterial exopolysaccharides provide effective protection for encapsulated compounds, improving their stability and viability. They enable controlled release and open new perspectives in the food, pharmaceutical, and biomedical fields due to their biocompatibility and gelling properties.

Keywords: Exopolysaccharides, encapsulation, biocompatibility.

Correction Of Redox Imbalance And Hypolipidemic Potential Of Date Kernels In Diabetic Rats

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Background: Date stone powder represents a natural by-product, which contains several bioactive molecules that correct disorders linked to diabetes during oxidative stress and cardiovascular disease. Among these substances that have attractive nutritional values and bioactive properties are fibers, antioxidants including vitamins, flavonoids and polyphenols.

Methods: The aim of the study was to evaluate the impact of a diet enriched with date kernel powder on lipid, lipoprotein metabolism and oxidative stress in Wistar diabetic rats.

The study was conducted in Wistar diabetic rats and the control Wistar rats consuming either the standard diet or a diet enriched with date stone powder. Total cholesterol, LDL and triglycerides were determined with enzymatic colorimetric method using biochemical kit spinreact. Catalase activity was measured by spectrophotometric analysis of the rate of H₂O₂ decomposition at 240 nm. Hydroperoxides were measured by ferrous ion oxidation /xylenol orange assay. Malondialdehyde and reduced glutathione were detected by using kit Sigma.

Results: In diabetics rats compared to controls, total cholesterol, LDL and triglycerides, malondialdehyde, hydroperoxides were increased; however, catalase activity and reduced glutathione were decreased. The results showed that the date stone powder in diabetic rats leads to reduce oxidative markers and lipid disorder and increase antioxidant parameters

Conclusion: Date stone powder reduce cardiovascular disease and oxidative stress, corrects redox imbalance, improves antioxidant defense by increasing antioxidants in diabetic rats.

Key words: Date stone powder, bioactive properties, diabetic rats, oxidative stress, cardiovascular disease.

Quinazoline alkaloids from Algerian *Peganum harmala* L.

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Background: *Peganum harmala* L. (Nitrariaceae) is a well-known medicinal plant rich in alkaloids, particularly β -carboline and quinazoline derivatives, which contribute to its pharmacological and toxicological properties. However, the alkaloid composition of *Peganum harmala* varies according to its geographic origin.

Methods: This study aimed to investigate the quinazoline alkaloid profile of Algerian *Peganum harmala* and to compare it with profiles from plants originating from other regions, particularly China and Spain, under similar analytical conditions.

Plant samples were collected from Northwestern Algeria, extracted using conventional solvent-based methods, and analyzed by High-Performance Liquid Chromatography coupled with Diode-Array Detection (HPLC-DAD). The chromatographic profiles, particularly those corresponding to vasicine and deoxyvasicine, were visually compared with published data obtained under comparable analytical settings.

Results: The visual comparison suggested that Algerian *Peganum harmala* exhibits lower peak intensities for quinazoline alkaloids compared to Chinese and Spanish samples, which showed more prominent peaks for vasicine and related compounds. Moreover, notable differences in the alkaloid profiles were observed, highlighting regional phytochemical variations that may be attributed to environmental factors, soil characteristics, and genetic diversity.

Conclusion: This study underscores the influence of geographic origin on the phytochemical composition of *Peganum harmala*, which could potentially impact its medicinal applications.

Keywords: *Peganum harmala* L., Quinazoline alkaloids, Vasicine, HPLC-DAD analysis.

Detection and Characterization of Multidrug-Resistant Gram-Negative Bacteria from Aquatic Environments in Western Algeria

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Background: In recent decades, the world has been facing a significant increase in antibiotic resistance due to the excessive and inappropriate use of antimicrobials in healthcare. Human activities have led to the substantial release of antibiotic compounds into the environment, particularly in aquatic ecosystems, facilitating the widespread dissemination of multidrug-resistant bacteria. This study aims to investigate the genetic basis of antibiotic resistance in selected Gram-negative bacteria (GNB) isolated from various inland water sources in western Algeria over a four-month period (January to April 2019).

Methods: The collected bacterial strains were identified using the API 20E system and 16S rRNA PCR amplification. Antibiotic resistance levels were assessed through antibiogram testing, minimum inhibitory concentration (MIC) determination, and phenotypic tests. The identification of resistance genes was performed using polymerase chain reaction with specific primers.

Results: A total of 54 Gram-negative bacteria (GNB) were isolated, including 32 Enterobacteriaceae and 22 non-fermentative GNB (GNB-NF). Among the Enterobacteriaceae, five resistance phenotypes were identified: wild type (68.75%), penicillinase-producing (12.5%), extended-spectrum beta-lactamase (ESBL) (9.3%), carbapenemase-producing (9.3%), and cephalosporinase-producing (6.25%) strains. In GNB-NF, three resistance phenotypes were detected: wild type (68.18%), penicillinase-producing (27.27%), and ESBL-producing (4.55%) strains.

Molecular characterization of beta-lactam resistance phenotypes revealed the presence of the *bla*_{NDM-1} gene in *Escherichia coli* (strain Z6E1-1) and the *bla*_{OXA-48} gene in *E. coli* (Z6E1-1, Z8E2-2), *Chryseobacterium meningosepticum* (S12E2-2), and *Enterobacter sakazakii* (Z8E2-1) strains. Additionally, one strain of *Pseudomonas aeruginosa* (Z9E2-1) exhibited colistin resistance; however, molecular screening for the *mcr-1* gene was inconclusive.

Conclusion: This study reports the identification of the *bla*_{NDM-1} and the *bla*_{OXA-48} gene in the aquatic environment in Algeria. The presence of resistance genes in both freshwater and seawater raises serious public health concerns, as these water sources are widely used by humans and animals for various activities. Further monitoring and control measures are essential to mitigate the spread of antibiotic-resistant bacteria in aquatic environments.

Keywords: Water environment, Gram-negative bacilli, antibiotics, multidrug resistance, *bla*_{OXA-48}, *bla*_{NDM-1}, colistin resistance

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Endothelial nitric oxide synthase gene polymorphisms in the pathogenesis of Familial Mediterranean Fever

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Background: Familial Mediterranean Fever (FMF) is the most common monogenic autoinflammatory disease affecting Mediterranean populations. During FMF attacks, there is a massive infiltration of neutrophils into the serosal membranes, causing abdominal, chest, and joint pain. Leukocytes migration can be influenced by Nitric oxide (NO), produced by the endothelial nitric oxide synthase (eNOS) isoform. The anti-inflammatory role of eNOS- derived NO depends on polymorphisms in eNOS gene: T-786C, G894T and VNTR (4a/b) [1; 2]. The association between these polymorphisms and FMF remains unexplored, hence the objective of this study.

Methods: Our study included 47 unrelated Algerian FMF patients and 32 healthy controls. The -786T>C variant in the promoter and the G894T variant in exon 7 of eNOS gene were determined by polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP), using MspI and Eco24I endonucleases, respectively. Statistical analysis was made by SigmaXL software.

Results: Regarding the -786T>C polymorphism, the TC genotype was more recurrent in FMF patients (24/47; 51.06%) compared to controls (10/32; 31.25%), but the difference was not significant ($p=0.106$). The mutant genotype CC was not significantly different between the patients and the controls (9/47; 19.15% vs 7/32; 21.88%) ($p=0.782$). Regarding the G894T polymorphism, the GT genotype was not significantly higher in patients (22/47; 46.81%) compared to controls (13/32; 40.63%) ($p=0.648$). Other genotypes, GG and TT, were equivalent between the two groups ($p>0.05$).

Conclusion: The -786T/C and G894T variants would not be involved in the pathogenesis of FMF. However, our results need to be confirmed by including other patients and polymorphisms in eNOS gene.

Keywords: Endothelial nitric oxide synthase (eNOS), Familial Mediterranean fever, Polymorphisms, PCR-RFLP.

Investigation of the involvement of the methylenetetrahydrofolate reductase *MTHFR* C677T variant in gestational hypertension risk

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Background: Hypertensive disorders of pregnancy remain one of the leading causes of maternal and perinatal morbidity and mortality worldwide. Among them, **gestational hypertension**, defined as the new onset of elevated blood pressure after 20 weeks of gestation in a previously normotensive woman, represents a significant clinical concern. While its origin is multifactorial, increasing attention is being given to the involvement of genetic factors, particularly those related to folate metabolism. Among the genetic factors studied, the C677T polymorphism of the methylenetetrahydrofolate reductase *MTHFR* gene has received particular focus. This genetic variation can alter the enzymatic activity of methylenetetrahydrofolate reductase, disrupt homocysteine metabolism, and induce oxidative stress, potentially harmful to endothelial function.

Methods: To evaluate a possible correlation between this polymorphism and the occurrence of preeclampsia, we conducted a case-control study including 100 Algerian pregnant women: 50 with confirmed **gestational hypertension** and 50 healthy controls. Genetic analysis was performed using the PCR-RFLP technique, which enabled the identification of CC, CT, and TT genotypes.

Results: The results showed no statistically significant association between the C677T polymorphism and **gestational hypertension** ($p>0,05$). However, some clinical factors, particularly advanced maternal age and medical history, appeared to play a more decisive role in the onset of the condition.

Conclusion: These findings suggest that the C677T polymorphism alone does not constitute a major risk factor in the studied population and emphasize the need to broaden investigations to other genetic variants, considering their complex interactions with environmental, obstetric, and socio-economic factors.

Keywords: **Gestational hypertension**, *MTHFR*, C677T, Homocysteine, PCR-RFLP.

Computational Analysis of Deleterious CTNS Variants Affecting Cystinosin Structure and Function

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Background: Cystinosis is a rare autosomal recessive lysosomal storage disorder caused by pathogenic mutations in the CTNS gene, which encodes cystinosin, a lysosomal cystine transporter. Defective cystine efflux leads to its intralysosomal accumulation, driving progressive renal, ocular, and neuromuscular manifestations. Although more than 140 CTNS mutations have been reported, the mechanistic impact of many nonsynonymous single nucleotide polymorphisms (nsSNPs) on cystinosin's structure and stability remains incompletely understood.

Methods: A comprehensive computational pipeline integrating sequence-based prediction tools (SIFT, PolyPhen) with molecular dynamics simulations was applied to screen CTNS variants for deleterious effects. Structural stability, local conformational dynamics, hydrogen bonding networks, and solvent accessibility were analyzed in silico. Evolutionary conservation and protein interaction mapping were used to contextualize the functional relevance of the identified variants.

Results: Out of 12,028 CTNS variants examined, 327 nsSNPs were detected, of which 19 were consistently predicted as pathogenic across multiple algorithms. Mutations such as G308R and G308V, located in the sixth transmembrane helix, caused substantial destabilization and perturbation of local dynamics. D305G and F142S disrupted the transmembrane core essential for cystine transport, whereas G309V introduced moderate stabilization. Sixteen deleterious substitutions occurred at evolutionarily conserved residues, underscoring their structural indispensability. Collectively, these mutations were associated with altered hydrogen-bond patterns, enhanced flexibility, and increased solvent exposure, indicative of conformational destabilization.

Conclusion: This integrative in silico analysis identifies critical CTNS variants that compromise cystinosin's structural integrity and transport functionality

Keywords: CTNS gene, cystinosis, nsSNPs, molecular dynamics,

Lack of significant association between rs2070744 polymorphism of the eNOS gene and primary hypertension in an Algerian cohort

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Background: Primary hypertension (HTN) is a multifactorial disease resulting from the interaction between genetic and environmental factors. Endothelial nitric oxide synthase (eNOS), encoded by the *eNOS* gene, plays a key role in blood pressure regulation through the production of nitric oxide (NO), a potent vasodilator. This study aimed to investigate the association between the rs2070744 polymorphism, located in the promoter region of the *eNOS* gene, and the risk of primary HTN in an Algerian population.

Methods: This case-control study included 56 volunteers, comprising 30 hypertensive patients and 26 normotensive controls, matched for age and sex. Genomic DNA extracted from whole blood was genotyped using the PCR-RFLP technique. Genotypic and allelic frequencies were compared, and their association with the clinical profile was also assessed.

Results: The results showed a higher prevalence of the C/C genotype among patients, while the T/T genotype was more frequent in controls; however, these differences were not statistically significant ($p > 0.05$). Similarly, the C allele was more common in hypertensive patients (50%) than in controls (42.3%), without a significant difference. Therefore, no clear association was found between this polymorphism and the development of primary HTN in this sample. Furthermore, no association was observed between the genotypes and risk factors for HTN ($p > 0.05$).

Conclusion: Although inconclusive, these findings provide novel data on genetic variability in this population and highlight the need to increase the sample size and investigate other eNOS gene variants, particularly the rs1799983.

Keywords: Primary hypertension, *eNOS* gene, rs1799983, PCR-RFLP

Genetic Variations in the 3'UTR Region of the PD-L1 Gene: Prognostic Impact Analysis in Prostate Cancer

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Background: Prostate cancer is among the leading cancers in Algerian men, representing a significant public health burden with incidence rates steadily increasing over the past decade. Late diagnosis remains frequent, and prognostic biomarkers are still limited. PD-L1, a major immune checkpoint molecule, may be influenced by polymorphisms located in its 3'UTR region, potentially modifying post-transcriptional regulation and immune escape. Understanding the distribution and clinical relevance of such variants in the Algerian population is essential. To evaluate, in a preliminary Algerian cohort, the prognostic value of a 3'UTR PD-L1 genetic variation in prostate cancer.

Methods: Forty (40) prostate cancer patients were genotyped using PCR–RFLP. Genotype and allele frequencies were calculated, and associations with clinicopathological parameters were assessed. Survival analyses (overall and progression-free survival) were performed using the Kaplan–Meier method.

Results: Genotyping revealed the following distribution of genotypes: AA : 40 % (n=16); AG : 45 % (n=18) and GG : 15 % (n=6). The heterozygous AG genotype was the most prevalent in the cohort. No statistically significant associations were found between genotypes and tumor stage, Gleason score, or PSA levels ($p > 0.05$). Kaplan–Meier analyses showed no significant impact of genotype on overall or progression-free survival ($p > 0.05$).

Conclusion: This preliminary study indicates that the examined 3'UTR PD-L1 polymorphism does not influence prostate cancer prognosis in this Algerian cohort. Further large-scale studies incorporating multiple immune-related polymorphisms and PD-L1 expression analyses are needed to better characterize immunogenetic profiles in Algerian prostate cancer patients.

Keywords: PD-L1 expression, 3'UTR polymorphism, Prostate cancer, Cancer prognosis, Algeria.

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Soft Skills and Ethical Reasoning in Health Professionals Education

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Background: Hospital trainers today operate in a changing environment marked by digitalization, the growing complexity of healthcare, and the rise of artificial intelligence. In this context, the human dimension of the trainer becomes a crucial anchor point.

Hard skills form the basis of the hospital trainer's legitimacy. It is from this foundation that trust, pedagogy, and innovation develop. They demonstrate technical mastery and guarantee the quality of teaching.

Soft skills, supported by the right hemisphere, relate to communication, interpersonal skills, and emotional management. These are transferable skills that are becoming essential allies of hard skills, particularly for a good healthcare trainer.

Methods: This presentation aims to highlight the importance of understanding and developing soft skills among hospital trainers, particularly ethical awareness and responsibility, where trainer acts with integrity and respects the dignity of both patients and learners. Their ethics directly influence the quality of future care, the trust between trainer and learner, and the moral culture of the healthcare institutions. By cultivating this soft skill, they become moral and professional role model for young practitioners.

Pedagogy, likewise, is not merely a set of teaching techniques but a human and relational posture grounded in empathy, adaptability, and reflexivity. Aspects of relational intelligence, organization, and communication will also be discussed.

Examples drawn from several years of experience in the field of training, and the results of tests conducted to identify the learning profiles of pharmacy students for the subsequent development of personalized pedagogy based on knowledge of the cognitive profiles of future pharmacists, will also be presented.

Results: Among pharmacy students at the Faculty of Medicine in Annaba, the profile obtained from the various tests is: Reflective, with well-developed intrapersonal intelligence, and enjoys learning through reading and writing.

Conclusion: This presentation highlights the importance of integrating ethical and emotional intelligence into health education, supported by practical experience and analysis of pharmacy students cognitive profiles to guide the development of personalized, values-based pedagogy.

Keywords: soft skills, ethics, training, health education, professional training.

Development and Implementation of an Ethical Protocol for Rodent Research: Considerations Across the Lifespan, with a Focus on Neonatal Stages

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Abstract

Rodent models, particularly mice (*Mus musculus*) and rats (*Rattus norvegicus*), are indispensable in translational biomedical research, providing critical insights into human diseases such as inflammatory bowel disease (IBD). The ethical imperative of this research necessitates rigorously designed protocols that address the distinct physiological and neurodevelopmental characteristics of each life stage. This is especially critical for neonatal rodents, whose immature and plastic nociceptive systems require specialized euthanasia and analgesia strategies. Prior to the establishment of sentience, acceptable euthanasia may include physical methods like decapitation; however, as neonates mature, protocols must rapidly align with those for juvenile and adult animals, emphasizing the minimization of pain and distress. A robust ethical framework must therefore be lifecycle-informed, encompassing refined husbandry, precise handling techniques, stringent peri-operative care, and clearly defined humane endpoints. This review articulates the core components of such a protocol, integrating the principles of the 3Rs (Replacement, Reduction, and Refinement) to safeguard animal welfare. We contend that a developmentally-tailored ethical protocol is not merely a regulatory requirement but a fundamental prerequisite for ensuring scientific rigor, data reproducibility, and the moral integrity of biomedical research.

Keywords: Research ethics, Animal welfare protocol, Rodent models, Neonatal nociception, Humane endpoints, 3Rs principles, Lifecycle-specific care.

Nutrition of medical students at the faculty of medicine of Tlemcen during exam periods

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Background: University is a transitional period marked by increased stress, which can affect learners' academic performance. Medical science students face concerning issues regarding their health and well-being, particularly with respect to mental health. The main objective of this study is to evaluate the nutrition of students at the Faculty of Medicine of Tlemcen during exam periods in order to provide recommendations.

Methods: We conducted a descriptive cross-sectional observational study at the Faculty of Medicine of Tlemcen. Data were collected using a questionnaire distributed to students from the departments of pharmacy, medicine, and dentistry over a period of five months.

Results: Our study focused on a young population with a female predominance. Their eating habits were unbalanced, characterized by an overconsumption of sweets and sugary snacks. Fish consumption was low, while soft drinks and sweetened juices were frequently consumed. Although students generally had three meals per day, they did not meet the recommendation of at least five servings of fruits and vegetables daily. Furthermore, the use of dietary supplements was rare, hydration was insufficient, and fast-food consumption was common. The majority of students reported a decrease in appetite.

Conclusion: The results highlight the importance of promoting a balanced diet and adequate hydration, especially during periods of intense stress such as exams. Encouraging these healthy practices not only contributes to immediate academic success but also instills positive lifestyle habits that will benefit students in the long term.

Keywords: nutrition, students, medical sciences, exams, Tlemcen.

Awareness of Prescription And Sale of Antibiotics among Doctors and Pharmacists in Sétif

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Background: Antibiotic resistance (AR) is a major global problem, threatening treatment effectiveness and public health. Higher rates of AR are observed in countries with high antibiotic (ATB) consumption which promotes the evolution of resistance especially if access to these medications is easy. In this context, this survey was conducted to assess awareness of antibiotic prescription and sale among public sector general practitioners and pharmacists in Sétif and Bordj Bou Arreridj.

Methods: A questionnaire distributed to 118 doctors and 98 pharmacists This questionnaire is structured into six sections: general information, knowledge about antibiotic resistance, prescription and use of ATBs, general perceptions and practices, patient behavior toward the use of ATBs, and challenges encountered in addition of questions about the sale of ATBs for pharmacists.

Results: The majority of doctors (62.71%) reports prescribing ATBs in moderation but the results reveal a lack of knowledge of AR causes (88%) and general practitioners (55.08%) only sometimes take microbiological tests into account before prescribing an ATB. While the majority of professionals recognize the seriousness of the phenomenon, few are aware of official recommendations, and access to continuing education remains limited, only 18% of doctors have regular access to training on the rational use of ATBs. Furthermore, self-medication, premature discontinuation of treatment, and abusive patient requests are exacerbating the situation. 90% of pharmacists say they systematically check prescriptions for dose adequacy and 69% say they always advise patients on the appropriate use of ATBs. However, only 22% of professionals reported being informed of national or international recommendations regarding the use, sale and prescription of ATBs.

Conclusion: This work highlights the need to strengthen the training of healthcare professionals, establish better supervision of the sale of antibiotics, and raise public awareness about the rational use of these drugs. A concerted approach involving all stakeholders in the health system is essential to limit the spread of AR.

Keywords: Antibiotic resistance, drug prescription, antibiotherapy, automedication, awareness.

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Influence of Powder Properties, Excipient Characteristics, and Compression Parameters on Tablet Quality: Application of Heckel and Kawakita Models

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Abstract:

This study investigated how powder properties, excipient characteristics, and compression parameters influence the final quality of tablets, particularly through their interactions with the tooling. Conducted in an industrial context involving the formulation of a neuroprotective BCS Class II drug, the study addressed several formulation and process challenges. Characterization of powder properties such as particle size, density, flowability, and moisture content demonstrated their decisive impact on compressibility and tablet performance.

The compressibility of excipients was quantitatively assessed using the **Heckel** and **Kawakita** models. The Heckel model describes the relationship between applied pressure and densification, reflecting the material's plastic deformation behavior, while the Kawakita model relates volume reduction to applied pressure, highlighting the powder's packing and plasticity.

The application of the **Heckel** and **Kawakita** models enabled a quantitative evaluation of excipient compressibility, providing valuable guidance for formulation design. The modeling revealed that some excipients, although theoretically suitable for direct compression, may exhibit practical limitations when interacting unfavorably with metallic tooling surfaces.

Based on these findings, a series of formulations (F1–F6) was developed using both **direct compression** and **wet granulation** methods. The experimental results highlighted the critical influence of excipients on both the internal cohesion and the industrial robustness of the tablets. The sticking issues encountered in early trials emphasized the importance of powder–tooling interactions. By optimizing particle size, lubricant ratios, and manufacturing parameters, compliant tablets meeting technological requirements were successfully obtained.

Key words: Compression, Powder compressibility, Heckel model, Kawakita model, tooling interaction.

Automated Form-Finding of Stable Tensegrity Structures Using Hybrid Force Density and Genetic Algorithm Methods

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Background: Tensegrity structures are widely used in engineering for their unique properties of being lightweight and self-equilibrated. Current form-finding methods often require separate steps for equilibrium identification and stability verification, which can be computationally expensive and limited in handling complex configurations.

Methods: This study presents a novel hybrid approach that integrates the force density method with a genetic algorithm. The proposed method uses only structural topology and member classification as inputs to automatically generate stable configurations. A constrained optimization formulation simultaneously satisfies three key conditions: kinematic indeterminacy requirements, nonlinear self-equilibrium equations, and super-stability criteria.

Results: Numerical case studies demonstrate the method's effectiveness in identifying valid self-equilibrium configurations for both planar and spatial tensegrity assemblies. The hybrid approach shows robust performance in handling various structural topologies while maintaining computational efficiency.

Conclusion: The proposed framework provides an effective solution for automated tensegrity form-finding, offering advantages in robustness and generalizability for engineering applications requiring stable lightweight structures.

Keywords: Tensegrity Structures, Form-Finding, Force Density Method, Genetic Algorithm, Stability Analysis, Structural Optimization.

Skin Cancer Classification based on Transfer Learning

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Background: skin is the most affected part in human body because of the sun and other external factor which led to changes in the skin. These changes lead to skin cancer, which is considered a fatal disease due to the difficulty of distinguishing between lesions. That's why the percentage of death is increasing. With the development of artificial intelligence (AI), researchers were able to reach some solution that helped to identify the disease in its early stages.

Methods: Transfer learning is defined as the ability of a machine learning model to apply knowledge gained from one problem to a different but related one. This is done by capitalizing on work already done. The overall approach is to reduce the amount of taught data lower to improve efficiency, for example when the amount of data available for the main task is low, some features or model parameters, such as weights, need to be reused instead of retraining everything. To begin, we propose a deep learning approach to classify skin lesion of the publicly dataset HAM 10000 into seven classes. We have used Inception v3 based transfer learning for multi-classification.

Results: the proposed approach achieved an accuracy of 82% for the testing data and 96% for training data

In our study, the results demonstrate visually how well Inception v3 model for skin lesion classification performs. Through the use of graphs, photos and visualizations, we aim to provide qualitative perspectives about the accuracy and effectiveness of our proposed approach. To summarize, Inception v3 is now outperforming in terms of model performance, increasing accuracy and efficiency.

Conclusion: Deep learning techniques are widely used to resolve healthcare problems and early detection helped in decreasing the mortality rate, visual similarity between lesions can be classified based on deep learning model.

Keywords: Skin cancer, Transfer Learning, Inception v3, Multi-classification

3D printing technologies for the Meniscus regeneration

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Background: The human body has joints for all movements. The most complex are the knee. Its distal location, relative to the gravity body's center, induces compressive loads. This occurs during certain high-impact sports (football, skiing, hockey, etc.) or daily activities (walking, jogging, or climbing stairs), leading to injuries and trauma (sprains, ligament tears, or meniscus tears due to cartilage degeneration (arthritis).

Methods: The 3D printing, through rapid prototyping, is increasingly used to create the human knee meniscus practical models. This is particularly relevant for menisci with tears, for applications such as customized implants and in vitro testing. This process involves converting data into 3D models. The patient-specific bionics development and other biomaterials, along with the specialized printing techniques use, are crucial for accurately reproducing the meniscal tissue anisotropic structure. Therefore, the Object it's to manage this phenomenon by 3D Printer innovation prototypes with the CAD model creation. How to turn uncertainty into opportunity to someone needed help in life.

Results: Our results showed that the most damaged meniscus exhibited greater stiffness, but that its overall integrity had the greatest impact on the stress development within the cartilage. The Meniscus tears are a common orthopedic injury, often managed conservatively to prevent the osteoarthritis development due to altered biomechanics. 3D printing technologies are extremely promising, enabling the complex biomimetic creation structures that mimic natural tissues. Given the meniscus anisotropic characteristics and the precise possibility structural control during printing, the fascinating potential of these techniques to meet the each specific needs joint in personalized medicine is highlighted.

Conclusion: This work confirms this finding, radial cases, longitudinal, and complex tears were examined. The methodology and this study results can contribute to medical diagnosis for the treatment and the meniscus replacement. With these standards, any government can develop national policies, programs and plans for the highest quality services. Then, the each person collaboration is not decreed, but is built on the common interest's merits and the desire to work together. The goal is to ensure that services are people-centered and responsive to the personal needs to ensure a healthy life and promote at all ages well-being. All leads contribute to a positive development.

Keywords: Meniscal tears, 3D printing, knee joint, Computer-Aided Design data, [contact pressure](#),

References

- [1] Boumediene BELARBI, The Pr. Rapide processes Qualification "3D Printer Case";
., "Innovation in Industrial Systems & Products""; "The Pr. Rapide, Engineering Innovation Tool" - ENPO -Oran (IPSI).

Contribution to the prototypes properties made by 3D printing

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Background: –This work concerns the methodology for obtaining experimental results of 3D printed prototypes using acrylonitrile butadiene styrene (ABS) and polycarbonate (PC) under digital images.

Methods: The parts tensile and shear characterization was performed, providing us with the anisotropy extent in the selected materials. To determine the latter directional properties, we selected samples for 3D printing, with various raster orientations following the following ranges ([+45/-45], [+30/-60], [+15/-75], and [0/90]). We arranged to combine the tensile orientation by assembling the appropriate methods (Poisson's ratio, Young's modulus, yield strength, ultimate strength...). Each combination had a shear modulus specific assembly, yield strength and ultimate strength values.

Results: The results for frame and build orientation suggested a negligible effect on Young's modulus or Poisson's ratio in the tensile/ABS specimens. The article work allowed us to test tensile and shear stresses on 3D-printed specimens using DIC technology.

The shear modulus and the yield strength, in this case, are varied by up to 33%. This means that the tensile properties do not indicate the shear properties. In contrast, the frame orientation in the as-fabricated specimens revealed anisotropic behavior and a variation in the modulus and strengths of up to 20%. Changing the sample build orientation revealed a material domains variation impact similar to that.

Conclusion: The work in this article allowed us to test tensile and shear stresses on 3D- printed specimens using DIC technology. The extensive shear tests led us to results that indicate the need to conduct these tests to fully understand the behavior of 3D-printed materials.

Keywords: Digital image correlation, 3D printing, materials mechanical properties, rapid prototyping, ABS and polycarbonate.

Formulation of nanosystems stabilized by biodegradable hydrogels for therapeutic purposes

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Background: Research in the field of medical devices is rapidly expanding in order to improve patient care and best meet clinical requirements. Researchers in the field are increasingly interested in the design of new types of medical devices. For this, they use different families of biomaterials that must interact with the biological environment, bringing together very varied chemical and physical characteristics in order to offer clinicians health products perfectly suited for biomedical applications. The aim of our work revolves around the development of new degradable biomaterials that meet the main criteria of bio-functionalization and biocompatibility in order to create new biodegradable biological substitutes loaded with active anti-inflammatory molecules for local therapeutic action.

Methods: In this study, we used thermosensitive matrix biopolymers in which nanoparticles obtained by the cross-linking process are dispersed. We then proceeded to study the mechanical and textural properties through rheological characterizations using temperature ramps and viscoelasticity tests. Other tests were conducted, such as biocompatibility studies and active ingredient release, to evaluate the biodegradation kinetics of the biomaterial and the release of the active ingredient.

Results: The rheological characterization allowed us to determine the sol-gel transition temperature, which varied between 38 and 45 °C at different concentrations of biopolymers, with a storage modulus (G') ranging from 10,000 Pa to 20,000 Pa depending on the biopolymer ratios. The release kinetics of the active ingredient revealed a prolonged profile over a period of 10 hours.

Keywords: Nanosystems, hydrogel, biopolymers, rheology, therapeutic action.

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