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(CUPMAP)

Curr. Pers. MAPs

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JOURNAL INFORMATION

Journal Name	Current Perspectives on Medicinal and Aromatic Plants
Journal Abbreviation	*Curr. Pers. MAPs*
Scope & Subjects	Agriculture, Biology, Molecular Biology & Genetics, Chemistry, Biochemistry, Botany, Ethnobotany, Environmental Science, Forestry, Horticulture, Health Care & Public Health, Nutrition & Food Science, Pharmaceutical Sciences
ISSN	ISSN: 2619-9645 | e-ISSN: 2667-5722
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Current Perspectives on Medicinal and Aromatic Plants (CUPMAP)
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Current Perspectives on Medicinal and Aromatic Plants (CUPMAP) is an open access, peer-reviewed and refereed international journal published by MESMAP scientific group. The main objective of the CUPMAP is to provide an intellectual outlook on the scientific researches on Medicinal and Aromatic Plants. CUPMAP have distinguished goals to promote interdisciplinary scientific studies in which results could easily be used in industrial production on MAPs. This international scientific journal publishes research papers related to Medicinal and Aromatic Plants in the fields of science and technology such as Biology, Molecular Biology and Genetics, Chemistry, Agriculture, Biochemistry, Botany, Ethnobotany, Environmental Science, Forestry, Horticulture, Health Care & Public Health, Nutrition and Food Science, Pharmaceutical Sciences, and so on. CUPMAP publishes original research papers, applied studies, and review articles in MAPs science and technology. Special Issues devoted to important topics in the MAPs science and technology could also be published.

CUPMAP Journal publishes **Biannually** (on June and December) in both **print** and **on-line versions**. The publication language of the journal is **English**. Journal of CUPMAP welcomes article submissions and **does not charge any article submission or processing charges**.

Having well known board members distinguished scientists from different disciplines with huge experiences on MAPs all over the world, CUPMAP will be indexed in many databases after first issue. The goal of the journal is to be indexed in Thomson Routers in a short time.

CUPMAP is inviting papers for Volume 7 Issue 1, which is scheduled to be published on June, 2024. Last date of submission: June 01, 2024. However, an early submission will get preference in case of review and publication process. Please submit your manuscripts according to instructions for authors by the Journal online submission system.

Sincerely,
Prof. Dr. Nazım ŞEKEROĞLU
Editor-in-Chief
Current Perspectives on Medicinal and Aromatic Plants (CUPMAP)
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AIM AND SCOPE

Current Perspectives on Medicinal and Aromatic Plants (CUPMAP) is an **open access**, double-blinded **peer-reviewed** and **refereed international** journal published by MESMAP scientific group. The main objective of the CUPMAP is to provide an intellectual outlook on the scientific researches on Medicinal and Aromatic Plants. CUPMAP have distinguished goals to promote interdisciplinary scientific studies in which results could easily be used in industrial production on MAPs. CUPMAP Journal publishes **Biannually** (June and December). The authors should ensure that they have written entirely original works, and if the authors have used the work and/or words of others that this has been appropriately cited or quoted. All submissions are screened by **iThenticate similarity** detection software and our maximum allowed score is **24%** for the document in which the References section truncated.

This international scientific journal publishes high-quality research articles related to Medicinal and Aromatic Plants in the fields of science and technology such as Biology, Molecular Biology and Genetics, Chemistry, Agriculture, Biochemistry, Botany, Ethnobotany, Environmental Science, Forestry, Horticulture, Health Care & Public Health, Nutrition and Food Science, Pharmaceutical Sciences, and so on.

CUPMAP areas of interest include;

- Agricultural Practices of MAPs & NWFPs
- Aromatherapy & Phytotherapy & Phytochemistry
- Biodiversity
- Biology & Biochemistry & Biotechnology
- Botany & Ethnobotany & Ethnopharmacology
- Conservation, Management and Sustainable Uses of MAPs & NWFPs
- Essential Oils & Secondary Plant Metabolites
- Herbal & Traditional Medicines
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- Legislations on MAPs & NWFPs
- Literature on MAPS
- Marketing of MAPs and Products
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- Natural Cosmetics
- Non-Governmental & Non-Profit Organizations (NGO & NPO) on MAPs
- Pharmacognosy & Phytopharmacology & Toxicology
- Standardization and Quality of MAP Products
- Traditional & Modern Herbal Products

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All the original articles and review papers published in CUPMAP journal are **free to access** immediately as early online and on the day of publication on the journal's website. **There is no article processing charges or submission fees for any submitted or accepted articles.**

PEER REVIEW PROCESS

Peer Reviewing Instructions for the "Current Perspectives on Medicinal and Aromatic Plants (CUPMAP)" Journal

Introductions

The primary aims of peer review are to decide whether or not an article should be published (based on quality and relevance to the journal), and to improve the article before publication. All submissions first go through an internal peer review process: an assigned editor makes an initial decision to accept or to reject the manuscript (e.g., topic is outside the scope of the Journal, important flaws in scientific validity, etc.). If the editor believes the article may be of interest, it is sent out for external peer review. The reviewers are selected by area of expertise (reviewers who grant high quality reviews within the requested time are preferred). The editorial board is frequently consulted. Once reviews are obtained, the editor makes a judgment considering the critiques and recommendations from reviewers, and other factors such as relevance to the Journal's aims and usefulness to clinicians or researchers.

Peer Reviewer Selection

Reviewers are selected according to their background and experience in some aspect of the subject. The most desirable reviewers identify the strengths and weaknesses of the submitted paper, and analyze it from different viewpoints. The peer reviewers are asked to read and analyze the assigned manuscript and provide a written opinion of its quality, novelty, relevance and suitability for publication in the "Current Perspectives on Medicinal and Aromatic Plants (CUPMAP)" Journal. Peer reviewers also make suggestions to assist the authors in improving the article. Reviewers must not only analyze and comment on the paper, but also provide opinions about general concerns such as clarity and quality of the writing, validity of scientific approach, and whether the article provides new information.

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Ethical Guidelines for Journal Peer Reviewers

When a selected individual accepts a peer reviewing assignment, the reviewer implicitly agrees to the ethical standards that are commonly accepted in biomedical publishing. Ethical guidelines for reviewers, authors, and editors are reported by the International Committee of Medical Journal Editors in the 'Uniform Requirements for Manuscripts Submitted to Biomedical Journals' available from: www.icmje.org

Reviewers for the "Current Perspectives on Medicinal and Aromatic Plants (CUPMAP)" Journal must agree to:

Produce as careful and objective a review as possible Respect the editor's deadline. Consider with an open mind innovation or approaches different from those of one's own.

Provide a balanced critique targeted not only to identify the strengths and weaknesses of the paper, but also to provide useful feedback to the authors to improve their manuscript, without being overly critical of minor points.

Avoid scientific misconduct such as the misappropriation of intellectual property.

Each manuscript should be treated as an extremely confidential document.

The privacy of the authors' ideas must always be guaranteed.

Direct comments about ethical concerns confidentially to the editors.

Contacting an author with questions about the manuscript is not allowed.

All critiques, including the latter, must be reported in the written critique.

Declare any conflict of interest (real or perceived) identified to the editor before the end of review. Not every potential conflict necessitates a rejection.

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Reject an assignment if the following conflicts are present: Financial interests (e.g. paid consultancies, stock holdings), significant professional or personal relationships or rivalries, antipathy toward study question/approach, political or special interest affiliations (e.g. religious or deep convictions that conflict with the manuscript topic).

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Reviewer Guidelines

Potential reviewers are contacted by e-mail, which contains the manuscript title, abstract, and assignment deadline. The selected reviewer accepts or declines the assignment within 7 days. Failure to reply within the prescribed time will be treated as an implicit rejection. It is acceptable to propose an extended deadline when the given deadline (usually 4 weeks from the task acceptance date) cannot be met. The selected reviewers usually have extensive experience as faculty members, researchers, and published authors. Sometimes reviewers from other specific areas are selected. This selection is always well thought-out, and we encourage such potential reviewers to consider the assignment if they can make a contribution to some aspect of the work. The following points must be provided by the reviewers in the written response:

General Overview

Organized Critique

Assessment of Strengths and Weaknesses: the following should be evaluated: Literature review is up-to-date; Methods align with study purpose or research questions; Methods described in sufficient and appropriate detail; Research design or study approach is adequate; Approach to data analysis is appropriate; Thoughtful consideration given to the study limitations; Manuscript provides new information that is likely to be of interest to our readers.

Possible Improvements

Commonly Overlooked Areas: Reviewers should carefully note: title, abstract, tables and figures, references.

Editor's Final Decision

After the peer review process has ended and an adequate number of reviews has been received, the assigned editor makes the final decision about the manuscript (accept, invite a revision, or reject) based on a consideration of all the reviewer comments, general critique, and other external factors (e.g., the article is consistent with the Journal purpose, similar articles recently published, number of accepted articles awaiting publication, potential impact of the article, etc.). Editors may consult with each other when making the decision. A decision summarizing the opinions of editors and reviewers will be sent to the corresponding author.

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ETHIC RULES AND PLAGIARISM

Publishers Ethic Rules

"Current Perspectives on Medicinal and Aromatic Plants (CUPMAP)" is an international journal, which publishes at the highest scientific level on original research articles dealing with Medicinal and Aromatic Plants in the fields of science and technology such as Biology, Molecular Biology and Genetics, Chemistry, Agriculture, Biochemistry, Botany, Ethnobotany, Environmental Science, Forestry, Horticulture, Health Care & Public Health, Nutrition and Food Science, Pharmaceutical Sciences, and so on. Originality, high scientific quality, and citation potential are the most important criteria for a manuscript to be accepted for publication. Manuscripts submitted for evaluation should not have been previously presented or already published in an electronic or printed medium. The journal should be informed of manuscripts that have been submitted to another journal for evaluation and rejected for publication. The submission of previous reviewer reports will expedite the evaluation process. Manuscripts that have been presented in a meeting should be submitted with detailed information on the organization, including the name, date, and location of the organization. All authors submitting their works to "Current Perspectives on Medicinal and Aromatic Plants (CUPMAP)" for publication as original articles attest that the submitted works represent their authors' contributions and have not been copied or plagiarized in whole or in part from other works. It is necessary to agree upon standards of expected ethical behavior for all parties involved in the act of publishing: the author, the journal editor, the peer reviewer and the publisher. "Current Perspectives on Medicinal and Aromatic Plants (CUPMAP)" ethic statements are based on COPE's Best Practice Guidelines for Journal Editors.

Ethic Committee Report

The studies have to be prepared according to scientific rules and ethics. The results of any research (especially biology, veterinary, aquaculture and zootechnics) to be published as a manuscript need to have the report of a committee of ethic and that report's copy should be attached with the manuscript itself. Inclusion of the approval letter from the relevant Ethics Committee or Institution's Review Board regarding the research protocol and the rights of the subjects. The author or all the authors whose studies are to be published in the journal will own all kind of liabilities in terms of their manuscripts.

Publication Decisions

The editor is responsible for deciding which of the articles submitted to the "Current Perspectives on Medicinal and Aromatic Plants (CUPMAP)" should be published. The editor may be guided by the policies of the CUPMAP's editorial board and constrained by

such legal requirements as shall then be in force regarding libel, copyright infringement and plagiarism. The editor may confer with other editors or reviewers in making this decision.

Fair Play

An editor at any time evaluates manuscripts for their intellectual content without regard to race, gender, sexual orientation, religious belief, ethnic origin, citizenship, or political philosophy of the authors.

Confidentiality

The editor and any editorial staff must not disclose any information about a submitted manuscript to anyone other than the corresponding author, reviewers, potential reviewers, other editorial advisers, and the publisher, as appropriate.

Disclosure and Conflicts of Interest

Unpublished materials disclosed in a submitted manuscript must not be used in an editor's own research without the express written consent of the author.

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Contribution to Editorial Decisions

Peer review assists the editor in making editorial decisions and through the editorial communications with the author may also assist the author in improving the paper.

Promptness

Any selected referee who feels unqualified to review the research reported in a manuscript or knows that its prompt review will be impossible should notify the editor and excuse himself from the review process.

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Any manuscripts received for review must be treated as confidential documents. They must not be shown to or discussed with others except as authorized by the editor.

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Reviews should be conducted objectively. Personal criticism of the author is inappropriate. Referees should express their views clearly with supporting arguments.

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Reviewers should identify relevant published work that has not been cited by the authors. Any statement that an observation, derivation, or argument had been previously reported should be accompanied by the relevant citation. A reviewer should also call to the editor's attention any substantial similarity or overlap between the manuscript under consideration and any other published paper of which they have personal knowledge.

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Authors of reports of original research should present an accurate account of the work performed as well as an objective discussion of its significance. Underlying data should be represented accurately in the paper. A paper should contain sufficient detail and references to permit others to replicate the work. Fraudulent or knowingly inaccurate statements constitute unethical behavior and are unacceptable.

Data Access and Retention

Authors are asked to provide the raw data in connection with a paper for editorial review, and should be prepared to provide public access to such data (consistent with the ALPSP-STM Statement on Data and Databases), if practicable, and should in any event be prepared to retain such data for a reasonable time after publication.

Originality and Plagiarism

The authors should ensure that they have written entirely original works, and if the authors have used the work and/or words of others that this has been appropriately cited or quoted. All submissions are screened by a similarity detection software. We are using iThenticate plagiarism solution and our maximum allowed score, for the document in which the References sections truncated, is 24%. Higher scores are not allowed and the

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Multiple, Redundant or Concurrent Publication

An author should not in general publish manuscripts describing essentially the same research in more than one journal or primary publication. Submitting the same manuscript to more than one journal concurrently constitutes unethical publishing behavior and is unacceptable.

Acknowledgement of Sources

Proper acknowledgment of the work of others must always be given. Authors should cite publications that have been influential in determining the nature of the reported work.

Authorship of the Paper

Authorship should be limited to those who have made a significant contribution to the conception, design, execution, or interpretation of the reported study. All those who have made significant contributions should be listed as co-authors. Where there are others who have participated in certain substantive aspects of the research project, they should be acknowledged or listed as contributors. The corresponding author should ensure that all appropriate co-authors and no inappropriate co-authors are included on the paper, and that all co-authors have seen and approved the final version of the paper and have agreed to its submission for publication.

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CUPMAP INSTRUCTIONS FOR THE AUTHORS

- Please read all of the following manuscript preparation instructions carefully.
- Manuscript should be written in **English.**
- Maximum length for articles is **15 pages**. Articles over 15 pages in length can only be considered on an exceptional basis.
- Manuscripts can only be submitted through the CUPMAP **online** manuscript submission and evaluation system https://dergipark.org.tr/tr/pub/cupmap
- The journal management requires that all authors register to **ORCID** at http://orcid.org/register and get a free ORCID ID.
- All submissions are screened by **iThenticate** similarity detection software and our maximum allowed score is **24%** for the document in which the References section truncated.

Manuscript Types

Original Articles: This is the most important type of article since it provides new information based on original research. The manuscript should include an abstract with the following subheadings: "Introduction", "Materials and Methods", "Results and Discussion", and "Conclusion".

Short Communications: Short communication is for a concise to present scientific reports related to scope of the journal. Short communication is not intended to publish preliminary results, but if these results are of exceptional interest and are particularly topical and relevant will be considered for publication. It should include an abstract with the following subheadings: "Introduction", "Materials and Methods", "Results and Discussion", and "Conclusion".

Review Articles: Reviews prepared by authors who have extensive knowledge on a particular field and whose scientific background has been translated into a high volume of publications with a high citation potential are welcomed.

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CUPMAP STRUCTURE OF THE MANUSCRIPT

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Word document, Cambria, 12-point, single line space. Page margins are 2.5 for all sides.

Length
Maximum length for articles is 15 pages. Articles over 15 pages in length can only be considered on an exceptional basis.

Title
A concise title of the paper, avoid Abbreviations and formulae where possible.

- Use bold 14-point Cambria font. Use title uppercase, and make title in centered.
- Name(s) and SURNAME(s) of author(s) [Use centered, bold 12-point Cambria font, Use uppercase for surnames.]
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Abstract
Each article is to be preceded by a succinct abstract, of up to 250 words, that highlights the objectives, methods, results, and conclusions of the paper. The abstract should state briefly the purpose of the research, the principal results and major conclusions. The abstract body is typed in Cambria, 10 pt.

Key Words
Provide a maximum of 6 (six) key words or phrases in order of importance, separated by commas and typed in Cambria, 10 pt.

Headings
Use bold, uppercase, 12 Cambria font for headings.

Introduction
This should define the problem and, if possible, the frame of existing knowledge. Please ensure that people not working in that particular field will be able to understand the intention. The word length of the introduction should be 150 to 300 words.

Materials and Methods
Materials and methods should be clearly presented to allow the reproduction of the experiments.

Results and Discussion

A combined Results and Discussion section is often appropriate. Results should be clear and concise and give the significance of the results of the work. Data must not be repeated in figures and tables. Implications for further studies or application may be discussed.

Conclusion

A short Conclusions section should be added if results and discussion are combined.

Tables and Figures

- Tables should have a short descriptive title.
- The unit of measurement used in a table should be stated.
- Tables should be numbered consecutively.
- Figures should be prepared in GIF, TIFF, JPEG or PowerPoint.
- Tables and Figures should be appropriately cited in the manuscript.

Acknowledgements

Acknowledgements of financial support, advice or other kind of assistance should be given at the end of the text under the heading "Acknowledgements". The names of funding organizations should be written in full.

Author Contribution

The authors should indicate the contribution of the authors.

Conflict of Interest

All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential conflicts of interest include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding.

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References should be styled and punctuated according to the following examples:

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Surname, N.N., and Surname, N.N., Year. The full title of the article. Journal Full Name, volume (issue), first and last page. DOI number
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Thesis
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Special Issue of 3rd ICONAHE

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February, 2024 - GAZİANTEP

Democratic Republic of Algeria
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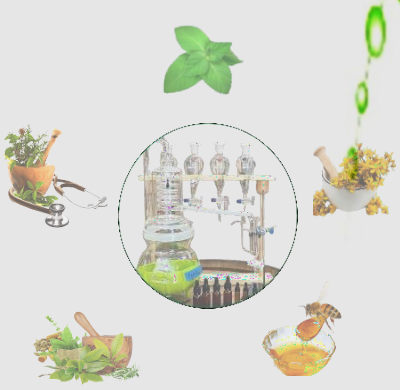
International Conference on Natural Health

The 3rd ICONAHE

International Conference on "Natural Health"

November26th-28th, 2023

ABSTRACT BOOK



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Editorial

Dear Colleagues,

The Third International Conference on « Natural Health » (3rd ICONAHE), hosted by the Pharmacognosy & Api-Phytotherapy Laboratory at Abdelhamid Ibn Badis University, Mostaganem, Algeria, held from November 26th-28th, 2023, marked a significant gathering of researchers, practitioners, and experts from various corners of the world. The scientific agenda of the conference encompassed a wide spectrum of topics, including the utilization of medicinal and aromatic plants (MAPs) and their extracts in pharmacological activities, innovative extraction methods, ethnobotany, and the socioeconomic importance of MAPs at both national and international levels. Attendees from over twenty countries convened to present their latest research findings, engage in knowledge exchange, and establish new collaborations. It is our earnest aspiration that the interactions and dialogues fostered during the conference have not only enriched the understanding of participants but also stimulated innovative approaches to addressing the multifaceted challenges within the realm of MAPs.

It is with great pleasure to announce the publication of a special issue dedicated to the proceedings of the Third International Conference on Natural Health (3rd ICONAHE) in Current Perspectives in Medicinal and Aromatic Plants (CUPMAP). This issue covers the abstracts presented by invited, oral and poster presenters in the 3rd ICONAHE, serving as a platform to highlight the cutting-edge research activities and experiences shared during this notable event.

We would like to thank all participating scientists for their scientific contributions to the congress and the board of CUPMAP journal for their contribution to the publication of scientific information. We look forward to the continuation of fruitful collaborations and the opportunity to reconvene with esteemed colleagues at future scientific meetings.

Best Regards,

Prof. Dr. Nazim SEKEROGLU

Editor-in Cheif of CUPMAP

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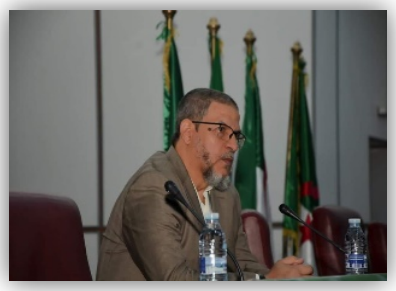

Dear colleagues

I was very happy to meet you in the Third International Conference on « Natural Health » (3rd ICONAHE) to present your research activities and share your experiences in this high-profile event with us. The conference was held on November 26-28, 2023 in Abdelhamid Ibn Badis University, Mostaganem, Algeria, which will be organized by Pharmacognosy & Api-Phytotherapy Laboratory.

The scientific program covered all related aspects of medicinal plants in the following main topics: Using medicinal plants and their extracts in the pharmacological activities, phytotherapy, natural products, biological activity and toxicity, ethnobotany, and innovative extraction methods, importance medicinal and environmental socioeconomic medicinal plants at the national and international scale, apitherapy, medicinal plant in ethno-veterinary practice and animal nutrition. Participants more than twenty countries met and planned further collaborations each other.

We hope that participants all over the world have an amazing experience and good memories to take back their home. We would like to thanks for all ICONAHE 2023 participants for their valuable contributions and hope to meet those respected scientists in the next ICONAHE.

Welcome to Mostaganem and we wish you a pleasant stay

Bests regards

Conference chair

Prof. Dr. Noureddine DJEBLI

The 3rd ICONAHE

Abdelhamid Ibn Badis University, Mostaganem-ALGERIA-
November 26th-28th, 2023

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Prof. Dr. Nazım ŞEKEROĞLU
Editor in Chief of CUPMAP

PLENARY ABSTRACTS

Current Perspectives on Medicinal and Aromatic Plants

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EVIDENCE-BASED ETHNOPHARMACOLOGY – AN IMPORT STEP IN THE GLOBALIZATION OF AFRICAN TRADITIONAL MEDICINES

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Abstract

The emergence of antibiotic resistance has prompted and catalysed the broad-based screening of plantsand their derived products as potential new antimicrobial agents. Using the terms ["antimicrobial" and "herbal"] a Scopus search reveals that >4 000 papers were published in the past decade on this topic. This vibrant research activity on the topic is indeed justified, yet no new potent antimicrobial agent of botanical origin has been commercialised, despite this hive of research activity on the topic. This may firstly be ascribed to the reductionist approach which is mostly followed in screening platforms. Ironically, most natural products have followed the research approach of "one molecule one target", the very same approach which has contributed to antimicrobial resistance.

Often, traditional use of a natural products is used as the basis and motivation for a study, yet, what is experimentally conducted in the laboratory is far removed from the traditional use, the very premise onwhich the study was designed. Furthermore, most studies are acutely focused on the planktonic microbial form with an emphasis on cidal properties of these extracts, often eclipsing microbial biofilmsand quorum sensing as potential research topics. The presentation provides an overview of 25 years of research studies in this area highlighting the challenges experienced and the opportunity which bee- derived products (e.g. propolis) may yield in future research endeavours.

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EXPLORATION OF WILD PLANTS *LANTANA CAMARA* LINN. AS A SOURCE OF PHENOLIC, FLAVONOID, AND TANNIN

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Abstract

Backgrounds: *L. camara* Linn. as an invasive plant and is considered a dangerous plant. However, these plants contain secondary metabolites that are beneficial for health. Secondary metabolites contained in *L. camara* Linn leaves. including phenolic, flavonoids, and tannin. We hope that in the future, *L. camara* Linn. can be used as a source of phenolic, flavonoids, and tannin. The aim of this research was to determine the content of gallic acid equivalent of phenolic (GAEP), quercetin equivalent of flavonoid (QEF), and tannic acid equivalent of tannin (TAET) in *L. camara* Linn. leaf extract.

Methods: Leaves collection of *L. camara* Linn. originating from Jalan Tondano Kamangta Suluan, Tombulu District, Minahasa Regency, North Sulawesi Province, Indonesia (1°21'46.6"N 124°54'13.0"E). *L. camara* Linn. leaves were extracted with ethanol, organoleptic test, and pH test. Apart from that, levels of the GAEP, QEF, and TAET were also measured. Measurements of GAEP, QEF, and TAET levels were carried out using a spectrophotometer.

Results: The GAEP content of *L. camara* Linn. leaf extract is 0.288±0.002 mg/g. The QEF content of *L. camara* Linn. leaf extract is 0.428 ± 0.004 mg/g, while the content of TAET is 0.384 ± 0.009 mg/g. The content of secondary metabolite levels can be used as a reference for studying *L. camara* Linn. as a source of GAEP, QEF, and TAET.

Conclusions: The secondary metabolite content can be used as a reference for studying *L. camara* Linn. as a source of GAEP, QEF, and TAET. The new paradigm states that *L. camara* Linn. not only is it considered a wild plant that is dangerous for the environment, but it can be used as a source for GAEP, QEF and TAET exploration.

Keywords: *Lantana camara* Linn., organoleptic, quercetin equivalent flavonoid, gallic acid equivalent phenolic, tannic acid equivalent tannin.

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SUB-LETHAL EFFETS OF PESTICIDES AND VETERINARY MEDICINES ON BEES

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Abstract

The use of chemicals is a common pracrice in agricultre. Bees and other pollinators are not the target insects, still are exposed to substances used. The effects could be direct or inderect. Due to the large quantities of pesticides use, mainly because of the intensification of the agriculture, honey bees and other pollinators are highly affected. The same applies to the bee products and as a concequence environment and human health are under threat. These types of chemicals/ pesticides include insecticides, acaricides, fungicides, herbicides and antibiotics. Bees come into contact with these chemicals via air particles, via food (through pollen, nectar and water) or via contact with the nesting materials. Usually pesticides remain in the envirometn for long time thus they can end up to the bees' products in different ways. The commercial value of the bee products could then be diminished, if we consider that bee products are used not only as food, but also as cosmetics and medicins. However, as pesticides we also consider the chemical beekeepers use inside the honey bee colony, the veterinary medicines. By definition the substances recommended to be used as veterinary medicines are not lethal to bees or the brood, when used at recommended doses, although it is possible that certain sub-lethal and even lethal effects are caused by the repeated and/or prolonged application of a recommended substance. Acaricides in specific conditions can also have toxic side-e effects on bees and whole colonies. It is well documented that although lethal effects are direct and well quantified, sublethal and chronic effects are difficult to be monitored or quantify, still we have developed several tools for efficient risk assessment and this is the direction we should work, for the better life on the planet Earth!

Keywords: Agriculture, pesticides, acaricides, bees, lethal, sublethal.

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PRODUCTION OF CHAMOMILE, *MATRICARIA RECUTITA* L. IN SLOVAKIA

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Abstract

In Slovakia, chamomile, *Matricaria recutita* L., is very popular herb species. The rich chemical composition of the plant implies wide curative effects and uses. The essential oil of chamomile has been used for anti-inflammatory and softening effects on the digestive tract and in therapy for gastric ulcers, gastritis, respiratory tract inflammations, pharyngitis, and laryngitis. Externally, the oil is used for treatment of inflammations of the ophthalmic mucosa and uterus and for treatment of hemorrhoids. Chamomile is a Central European annual plant found wild along readsides, in fields and gardens as a weed. The aims of this report are initiated to chamomile large scale cultivation and essential oil isolation. The Slovakian R&D is orientated to the production of chamomile varieties with improved genetic material and mechanization of harvesting and post-harvesting processing. Development of mechanical harvesters and distillation apparatus of essential oil was important in order to increase of productivity and reduce large numbers of workers, who are required for hand picking of flowers. The presentation will show current trends: - in chamomile breeding with an emphasis on the content of the essential oil and its composition (/-/-α-bisabolol and chamazulene), - mechanization of the collection of flower anthodia and – technology of essential oil isolation. The high level of these parts of large-scale production of this herb directly influences to quality of raw material for the manufacture of pharmaceutical and cosmetic preparations.

Keywords: α-Bisabolol, chamazulene, cultivation, essential oil, harvesters, technology.

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SYNTHESIZING AND INVESTIGATING THE ACTION OF METAL COMPLEX WITH AMINO ACIDS

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Abstract

The aim of the study is to obtain different types of complexes between metals such as Zn (II), Cu (II), Fe (III) and Al (III) with the amino acids glycine and cysteine. The study continues with the characterization of the complexes through different spectroscopy techniques. Also, the studied complexes were tested for their antioxidant acticity. The stoichiometry of the reaction between the metal ion M (II), respectively M(III), and the ligand used L, was : M: L=1: 2 , for Me (II)=Zn, Cu, Ni, and L=Cys), respectively L:M=1:2 for Me (II)= Zn,Cu and L= Gly, as well as Me:L=1:3 for Me(III)= Fe, Al and L=Gly.

The coordination of the carboxyl group and the nitrogen atom of the amino group demonstrated the bidentate ligand role. The valence vibration of the the C=O bond and symmetric and asymmetric vibrations of the N-H bond appeared at longer wavelengths for the complexes compared to the ligand, confirming the reaction's stoichiometry. Complexes show higher antioxidant activity in comparation with bidentate ligand and antioxidant etalon. Due to their antioxidant activity, they can be used successfully as pharmaceutical agents.

Keywords: Metals, glycine, cysteine, spectroscopy, antioxidant.

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BIOLOGICALLY ACTIVE COMPOUNDS ISOLATED FROM ALGAE

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Abstract

Scientific efforts that had been taken during last decades undoubtedly proved that algae are aninestimable and what is more important nowadays, renewable source of hundreds of chemical compounds having many biological activities, including polysaccharides, phenolic compounds and their derivatives, pigments, proteins, lipids and fatty acids. Substances isolated from seaweeds could be usedas ingredients in many branches of industry.

Algae, organisms forming biomass in the process of photosynthesis, have now become one of the most promising cheap raw materials for industry and renewable source of energy. Some algae can be consumed or used as an ingredient in animal feed, and extracts of algae biomass contain many bioactiveingredients with potential application in pharmacy, cosmetology or agriculture. Interesting organic compounds, like plant growth promoters, animal feed additives or cosmeticsingredients can be isolated from the biomass of algae by different extraction methods. Such fine chemicals can be obtained from algae like carotenoids, phycobilins, fatty acids, polysaccharides, vitamins, sterols, polyphenols, lipids, or proteins.

This lecture presents all aspects of industrial application of macroalgae biomass derived from the natural environment. The methods of isolation of specific organic compounds originated from algae extracts will be discussed. Additionally the biological activity and role of algae extracts and their components inplant growth and development will be presented with special respect to crop plants.

Keywords: Algae, bioactive compounds, antioxidant activity, biostimulants in agriculture, biotic and abiotic stress in plants.

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CLINICAL USE AND TRIALS OF PHOTOCHEMICALS AS CHEMOTHERAPUTIC AGENTS IN ONCOLOGY

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Abstract

Cancer is considered as a serious health problem almost all around the world. It possesses a significantly increased mortality rate over the past few decades. This means that the standard therapeutic strategies have not been capable of increasing cancer survival sufficiently. Further, these strategies cannot sufficiently improve cancer survival. Furthermore, these strategies have had to be applied both individually and in combination with other treatment strategies and in many cases can be limited by multi-drug resistance, genotoxicity, cytotoxicity, and non-specific toxicity from the use of chemo-drugs. Phytochemicals also called as natural dietary agents have gained a great interest in cancer research due to exhibiting a synergistic effect towards the cancer cells through targeting diversecell signaling pathways, modulating cell cycle, promoting apoptosis, inhibiting angiogenesis and metastasis, supporting immune attacks, regulating reactive oxygen species and detoxification. Several pharmaceutical companies have attempted to develop effective anticancer drugs obtained from plant- based phytochemicals, which have enormous potentials to prevent and combat the cancer. Although, plants contain a wide variety of phytochemicals, a small portion of them have been validated for use in clinical oncology e.g., vinca alkaloids, taxane diterpenoids, epipodophyllotoxin lignans, camptothecin quinolone alkaloid derivatives, homoharringtonine and combretastatins, whereas vinflunine ditartrate, anhydrovinblastine, NK-611, tafluposide, DHA-paclitaxel, paclitaxel poliglumex, salvicine, curcumin, indirubin and triptolide have been currently under trial. In this regard, complementary and alternative treatment strategies are needed to achieve more effective cancer treatment than conventional approaches. From this perspective, use of phytochemicals in cancer therapy is likely to have a positive effect on the treatment strategies and contribute to the quality of life for cancer patients. However, further investigations are required to identify specific molecular mechanisms of the medicinal and aromatic plant-based bioactive compounds as chemotherapeutics. Consequently, more researches are required to fully understand how these compounds act as anticancer agents, as it will be useful in developing therapeutic cocktails of diverse bioactive agents that would target various molecules to offer better therapeutic effects.

Keywords: Anticancer, molecular mechanisms, signaling pathways, phytochemicals, carcinogenesis, complementary and alternative treatment.

ORAL ABSTRACTS

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BIOLOGICAL ACTIVITIES AND PHYTOCHEMISTRY OF *TARAXACUM* sp. AS A PHYTOTHERAPEUTIC AGENT

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Abstract

Aim of the study: The objective of this study is to provide a comprehensive and up-to-date analysis of the research advancements and trends concerning the genus *Taraxacum*, focusing on its traditional usage and pharmacological properties. This should clarify the possibility of using this plant to make a desirable herbal treatment for the market. *Methods:* Information on the biological, phytochemical, and medicinal properties of the *Taraxacum* species was gathered through the collection, analysis, and classification of documents. This approach relied on an exhaustive examination of the documents that have been cataloged by scientific search engines.

Results: Since the XIX century, a number of authors have abandoned traditional knowledge in search of scientific justifications for how *Taraxacum* combats diseases and their symptoms. Among other things, this included its usage as a diuretic, cholagogue, antioxidant, analgesic, anti-inflammatory, anti-rheumatic, anti-allergic, anticoagulant, choleretic, angiogenic, and antibiotic. For generations, people have relied on the wild plant dandelion (*Taraxacum* sp.) for the alleviation and treatment of a variety of illnesses. This application is made possible by the organs of the plant's presence of sesquiterpenes, flavonoids, saponins, phenolic compounds, and sugars, among other substances.

Conclusion: Taraxacum has long been regarded as a safe and effective natural medicine with little commercial potential. Human clinical trials are necessary to demonstrate the effectiveness and safety of *Taraxacum* as a valuable commercial source of natural products. However, these trials should only be conducted once the extraction of pure and highly reactive compounds can be achieved on a large scale that is both economically viable and meets quality standards.

Keywords: *Taraxacum* sp., phytochemistry, biological activities, therapeutic agent, economic importance.

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ALGERIAN PROPOLIS: POTENTIAL APPLICATIONS AND FUTURES PESPECTIVES

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Abstract

Propolis is a sticky and gummy material collected by honeybees from different parts of plants and trees. Propolis pharmacological properties have been largely investigated such as antimicrobial, antioxidant, anti-inflammatory, anticancer etc. The cited properties bring researchers attention on the huge potentialof this substance. Propolis has pharmacological qualities that make it an interesting substitute for manufactured and synthetized drugs. Propolis is also thought to be a risk-free drug with no side effects.Propolis chemical composition is very complex and variable. More than 850 compounds have been reported and identified. Several propolis types have been identified all over the worlds based on their chemical composition and botanical origin. Few studies have been performed on Algerian propolis in the last two decades. However, it is still unknown and its use is very limited. We reported in the presentpresentation our main results concerning our investigation of pharmacological properties, chemical composition, potential applications and futures perspectives of Algerian propolis.

Keywords: Algerian propolis, pharmacological properties, chemical composition, potential applications, futures perspectives.

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DPPH RADICAL SCAVENGING ACTIVITY OF AQUEOUS EXTRACTS OF SOME COMMON ALGERIAN SPICES AND AROMATIC HERBS IN DIFFERENT CONDITIONS

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Abstract
Spices and herbs are key dietary ingredients with powerful medicinal properties used across cultures worldwide. This work investigated antioxidant activity by the terms of the DPPH scavenging ability method and total phenolic content of aqueous extracts for some widely used Algerian spices and aromatic herbs, under different conditions.

The IC_{50} for DPPH of infused samples at 90°C varied from 0.518 g/100 ml (dry garlic) to 5.23 g/100 ml (Tumeric) in term of water-sample weight ratio, while it ranged from 0.017 mg/ml (Mint) to 5.72 mg/ml (dry Garlic) in term of diluted infusions. The total phenolic content of samples ranged from 1.63 (fresh Garlic) to 8.47 (Mint) mg Gallic acid equivalent/g spice or herb, with negative correlation coefficient (r = -0.71) in relation to DPPH IC_{50} in term of diluted infusions. Cold infusions showed decreasing in antioxydant activity over time with correlation coeficient ranged from r= - 0.79 to -0.96 for Cumin, Cinnamon, dry Ginger and Black pepper while it increased for dry Garlic (r = 0.40) and Tumeric (r = 0.78). Moreover, Cinnamon, Cumin, Laurel, dry Garlic, Mint and Black pepper exhibited decreased antioxidant activity of hot extracts over time with correlation coeficient ranged from r = - 0.19 to -0.98, whereas positive correlation was observed with Tumeric (0.31) and dry Ginger (r = 0.76). Significant difference in DPPH scavenging ability ($p< 0.05$) were observed between cold and hot extracts of each plant with the exception of Laurel and Tumeric. A high DPPH scavenging activity with a high content of total phenolics were found for dried Garlic and dried Ginger compared to the fresh ones. Dry Garlic and Ginger exhibited higher DPPH scavenging activities and phenolics content than the fresh ones ($p< 0.01$), with a high negative correlation between DPPH activity and total phenolics (-0.82).

The results of this study indicated that aqueous extraction procedure (hot, cold), extraction time and the dry or fresh state of plant should be considered to achieve absolute efficacy of studied spices and aromatic hebs for their nutritional and medicinal functions as radical scavengers.

Keywords: Antioxydant, DPPH, total phenolic content, spices and aromatic herbs, time, temperature.

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TUNISIAN MEDICINAL AND TOXIC SPECIES AS PROMISING BIORESOURCES: RESEARCH, USE, INTERNATIONAL COOPERATION, AND INVESTMENT CHALLENGES

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Abstract

Our studies of some Tunisian medicinal and toxic species, carried out in cooperation with Spanish and Italian research groups, have shown several interesting compounds and activities. When tested against human solid tumor cell lines (HBL-100, T-47D, etc.), the traditionally used extracts of *Nicotiana glauca* and *Artemisia campestris* demonstrated *in vitro* antiproliferative activity with GI50 values ranging from 12 to 93 µg/ml. Furthermore, we have found that *A. campestris*, tested at 50 µg/ml using Astrocytes, promotes apoptosis and increase the ERK phosphorylation. This can be an exciting therapeutic way to target the molecular mechanism of multiple pathologies. In other hand, analysis of the abovegound of both wild and cultivated *Astragalus gombiformis* (a desert species), showed that are chemically similare. Despite numerous Tunisian studies, these and other plants have not been fully investigated, and the findings are still not valorized. This raises a number of concerns about effective collaboration, research, use (safety, extracts, chemicals,..), and investment in medicinal plants.

In Tunisia, the number of medicinal plant products prescribed by doctors for therapeutic purposes is rising. In fact, we are currently looking into how physicians, pharmacists, and patients themselves use therapeutic herbs, both cultivated and wild. Numerous challenges are acknowledged in international collaboration and investment in medicinal plants.

In this approach, we believe that the creation of databases on medicinal plants should be the first step. In addition, a few private businesses have begun to sell herbal products in pharmacies. In actuality, valuing research findings and converting agricultural products ought to involve a wide range of stakeholders, particularly those from the Maghreb region and/or Mediterranean countries. This would enable group researchers, companies, and physicians to collaborate on a national and worldwide level.

In this context, we discuss the potential strategies to exploit Tunisian species as an interesting bioresources, giving an overall SWOT context of the domain.

Keywords: Medicinal plants, valorisation, research, cooperation.

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CURCUMIN AND THE POTENTIALBENEFICIAL EFFECTS ON ENDOMETRIOSIS: A REVIEW

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Abstract

Endometriosis is a common benign, hormone-dependent chronic inflammatory gynecological condition defined by the development of glands and stroma outside the uterus. Despite the disease and economic cost, its origin remains unclear. It is stated that the condition is formed and developed by a variety of pathogenetic elements, including menstrual, genetic, epigenetic, anatomical, hormonal, immunological, inflammatory, environmental, and lifestyle. Nutrition has become a topic of interest in the pathogenesis of endometriosis, as well as in the prevention and treatment of its symptoms. Some dietary components and phytochemicals are used as both disease prevention and treatment agents. Curcumin, derived from the rhizomes of the turmeric (*Curcuma longa*) plant, is the primary bioactive component with a potential role in endometriosis through several molecular processes. This review aims to summarize the *in vivo*, and *in vitro* studies on the potential action of curcumin in endometriosis and its complications. Suitable articles published in the last five years were sourced through the PubMed and Science Direct databases. A preliminary review was conducted taking into account the novel formulations and doses of curcumin. A limited number of human clinical studies have been found. According to the results of studies, since curcumin has anti-inflammatory, anti-oxidant, anti-tumor, anti-angiogenic, and anti-metastatic properties, it has potential beneficial effects as a dietary component or pharmacological agent in the prevention and treatment of endometriosis according to form and dosage. However, it needs to be supported by future clinical studies on human endometriosis to determine its effectiveness.

Keywords: Curcumin, endometriosis, oxidative stress, anti-inflammatory.

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MULTIVARIATE ANALYSIS OF TRADITIONAL KNOWLEDGE FOR TREATING CUTANEOUS LEISHMANIASIS IN NORTH-EASTERN ALGERIA

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Abstract

Leishmaniasis is a real public health problem, in cutaneous leishmaniasis (CL) incidence Algeria ranks second in the world. Therefore, it is crucial to develop a traditional knowledge about medicinalplants related to this pathology. An ethnobotanical survey was carried out to identify potentially antileshmanial plant species used for the traditional treatment in North-East Algeria. Interviews were held with 21 herbalists in two provinces Annaba and El-Tarf, using a list of 26 variables according their traditional knowledge on cutaneous leishmaniasis. Mutiple correspondence analysis (MCA) and hierachical clustering analyses (HCA) wereperformed to describe the specificity of association between species within the correlation between variables.

A total of 19 species were cited in this survey, including 13 plant families. Among them, the most important families were Lamiaceae (5 species), Amaryllidaceae (2 species) and Asteraceae (2 species). Firstly, species were ranked according to their frequency of citation reported by informants. According the RFC value, the most cited species are *Teucrium polium* L. (57.14%), *Allium sativum* L. (23.80%), and *Juniperus phoenicea* L. (14.28%). Secondly, a data matrix for species generated demonstrates the variation in frequency among items/variables. The first dimension showed a high association with for three variables Ta_F, Oa_F and Dec_MP, with respectives values of R^2: 6.261E-01, 5.501E-01 and 4.772E-01 ($p<0.05$).

With the respect of the MCA analysis, cluster analysis of species produced a tree with three clusters. The differentiation between cluster provided is based on the on the administration form *per os* [*yes* forG1 and *no* for G2 and G3]. This article demonstrates the importance of quantitative tools in order to describe a new strategy for exploratory data analyses.

Keywords: Leishmaniasis, RFC, association, correspondence, cluster, quantitative.

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ETHNOBOTANICAL STUDY OF TRADITIONAL DIABETES TREATMENT IN NORTH-EASTERN ALGERIA

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Abstract

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

Keywords: Diabetes, phytotherapy, ethnobotanical survey, medicinal plants.

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IN VITRO EVALUATION OF THE ANTI-INFLAMMATORY POTENTIAL OF LAUREL LEAVES ESSENTIAL OIL, BOVINE SERUM ALBUMIN AND OVALBUMIN DENATURATION ASSAYS COMPARISON

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Abstract

Protein denaturation has been identified as the cause of inflammation. *In-vitro* bioassay of laurel essential oil anti-inflammatory potential consisted of investigating the effect of the plant against protein denaturation (Bovine Serum Albumin, BSA) and egg albumin (ovalbumin). The essential oil extracted from *Laurus nobilis* L. leaves by hydrodistillation was investigated at concentrations of 2, 5,10, 20, 30, 50, 80, 100, 200 and 400 µg/ml using both BSA andovalbumine denaturation inhibition tests. The diclofenac sodium was assayed in similar conditions as a positive control. The results showed that *Laurus nobilis* L. leaves essential oil exhibited a higher anti-denaturation activity of BSA and ovalbumin compared to diclofenac sodium. However, IC_{50} values were lower in BSA assay compared to ovalbumine assays. The essential oil gave an IC_{50} of 51.5±0.65 µg/ml in BSA assay against 217±0.91µg/ml in ovalbumine assay; while, dihlofenac anti-denaturation activity revealed an IC_{50} equal to 64±1.145 µg/ml against 397±4.94 µg/ml, respectively. Both essays reveal the anti-inflammatory potential of laurel essential oil which is almost close to that of diclofenac sodium. Nevertheless; intial concentrations of BSA and ovalbumine have to be adapted in order to give values of the same range.

Keywords: Antiinflamatory potential, *in vitro,* BSA, ovalbumin, *Laurus nobilis*, essential oil.

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IS CIGARETTE CONSUMPTION ASSOCIATED WITH DECREASED WORK PRODUCTIVITY IN WORKERS?

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Abstract

Backgrounds: Workers' health, which impacts workplace productivity, is a concern for all companies. Employers and society benefit when workers make positive lifestyle changes, such as quitting smoking. Although the harmful effects of smoking on health have been clearly demonstrated, there is still debate about the impact quitting smoking has on workers' health. Indonesia is one of the countries in Southeast Asia whose population is mostly smokers, especially among young people. The number of smokers in Indonesia is enormous. Cigarettes can be obtained from the market, but residents make some manually. In addition, filtered kretek cigarettes are in great demand by most active smokers in Indonesia. It is a fact that most Indonesians smoke kretek. This study aims to determine changes in respiratory organs in rat models after treatment with low-dose filter cigarette smoke which results in decreased productivity.

Methods: We have conducted a study using two groups of Sprague-Dawley rats with filtered kretek cigarettes. The first group of rats, as our control group, are designed without exposure to cigarette smoke and breathe fresh air. While the second group, as the treatment group, was exposed to cigarette smoke with one cigarette/per day for about 13 weeks.

Results: The study showed that the treated group of rats had dull yellow fur on the back and abdomen, was less clean, and the hair distribution was less frequent than the control group. Changes in organ size were also found, such as bronchial length, bronchial width, bronchiolar width, and us bronchiolar circumference in the rat group treated at week 13. In addition, mucus was found in the bronchioles and respiratory bronchioles in the treated rat group, but no mucus was seen in the control group.

Conclusions: Changes in several organs in rats given filtered kretek cigarettes resulted in damage to the respiratory organs. This can also happen to workers who smoke filtered kretek cigarettes, resulting in decreased work productivity.

Keywords: Cigarettes consumption, workers 'health, respiratory organs.

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CARDIOPROTECTION OF PROPOLIS AGAINST OXIDATIVE DAMAGES DURING HYPOTHERMIC PROLONGED ISCHEMIA

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Abstract

The pathogenesis of ischemia-reperfusion (I-R) depends on the oxidative stress it generates, that may occur during myocardial transplantation. Therefore, the use of antioxidants can minimize the deleterious effects of ischemia and even more of reperfusion. Propolis is a natural substance rich in polyphenols having an important antioxidant activity. The protective effect of propolis during cardiac ischemia was studied on hypothermic ischemia model that was applied on isolated and preserved mice hearts at 4 °C for 8 and 24 hours in the KrebsHenseleit solution supplemented with propolis. Release levels of cardiac markers troponin I (Trop I), creatine phosphokinase (CPK) and lactate dehydrogenase (LDH) followed by histopathological study were evaluated. Oxidation biomarkers, advanced oxidation protein products (AOPP) and malondialdehyde (MDA) as well as antioxidant status, superoxide dismutase (SOD), catalase (CAT), glutathione (GSH) and glutathione S-transferase (GS-T) were evaluated in the heart tissue. Mitochondrial parameters like mitochondrial respiration, calcium retention capacity and production of reactive oxygen species (ROS) were determined. Propolis supplementation protected effectively the heart by reducing oxidized lipid and protein levels, restoring the activity of antioxidant enzymes and preserving the myocardial tissue integrity altered by ischemia. In all conditions of mitochondrial respiration, propolis significantly reduces the rate of ROS production. Low concentration propolis improves the mitochondrial synthesis of ATP and protects the phosphorylation system from ischemic damage. It also decreases the opening of mitochondrial permeability transition pore mPTP during a calcium overload. Algerian propolis have a non-temperature depending antioxidant action that protects cardiac tissue from oxidative damage induced by prolonged cold ischemia.

Keywords: Hypothermic ischemia, prolonged preservation, ischemia-reperfusion, propolis, mitochondria, oxidative stress, heart.

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RETENTIFY: FREE SPREADSHEET TOOL FOR ENHANCING GC-MS ANALYSIS OF PLANT VOLATILES BASED ON RETENTION INDICES

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Abstract

The GC-MS is an invaluable tool in the work of researchers studying complex samples of plant origin. Despite technological progress, misidentifications of analytes still occur, especially in untargeted analyses. The usual method to confirm GC-MS identifications is by employing linear retention indices (LRIs). Ideally, GC-MS software should automatically validate LRIs using accurate library data. Nonetheless, existing solutions in this field either come with high additional cost or have various limitations. As a result, the LRI validation is usually done manually after an MS library or even skipped in some cases. Such manual examination is time-consuming, especially when dealing with datasets containing numerous components. On the other hand, omitting RI validation can lead to numerous misidentifications and erroneous compositions of essential oils, plant extracts, and herbal medicines. To address this issue, a user-friendly spreadsheet tool has been developed for use after an MS library search. This tool offers several features, including (1) calculation of experimental retention indices (RIs), (2) searching for reference RIs of MS hits in the trustworthy collection of Babushok et al. (NIST), considering the appropriate column selectivity, (3) computing relative errors of experimental LRIs and indicating potential mismatches using a color scale (red/yellow/green). The use of the tool was demonstrated in the example of lavender essential oil analysis.

Keywords: terpenes, VOCs, essential oil, retention index, GC-MS processing, reliable analysis.

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EVALUATION OF THE POTENTIALLY HEALING, ANTIBACTERIAL AND TOXICOLOGICAL EFFECTS OF *URTICA DIOICA*

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Abstract

Burns represent traumatic conditions associated with substantial morbidity and mortality, constituting a public health concern. This is primarily attributed to their high occurrence, potential for severe consequences, the resulting complications, and the challenges involved in both treatment and prevention. Indeed, the World Health Organization (WHO) reported that annually around 11 million individuals experience burn injuries, leading to 180,000 deaths. Despite the advancements in modern medicine, the challenge of expediting healing with minimal side effects persists, compounded by socio-economic and cultural factors. There is a renewed interest in exploring the therapeutic potential of medicinal plants and traditional medicine, especially for treating burns. This study aims to assess the potential healing and toxicological effects of crude *Urtica dioica* leaves extract through *in vivo* experimentation, while also investigating its potential antimicrobial properties. Our findings indicate the safety of the ethanolic extract of the nettle plant. Acute toxicity evaluation on female albino Wistar rats treated topically with various concentrations, like 1 g/kg, 2 g/kg, or 5 g/kg, showed no mortality or morbidity during the 14-day observation period. Nettle leaf extract demonstrated significant anti-inflammatory and wound-healing properties when applied to 3rd-degree thermal burns in male Wistar rats. Moreover, it exhibited a proliferative effect on hair, activating skin hair follicles compared to untreated groups. However, no antimicrobial activity was observed against the tested type strains. In conclusion, our plant extract exhibits noteworthy healing effects without inducing toxicity in the organism.

Keywords: Burns, *Urtica dioica*, healing, toxicity, anti-inflammatory, proliferative effect, antimicrobial activity.

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VALORIZATION OF POMEGRANATE PEELS BY-PRODUCT USINGAN OPTIMIZED ULTRASOUND-ASSISTED EXTRACTION

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Abstract

Pomegranate (*Punica granatum* L.), a *Punicaceae* plant family, is originated from the Middle East. It isa small tree with one of the healthiest fruits cultivated worldwide, with high concentrations of polyphenols. The manufacture of fruit juice is the main industrial use of pomegranate, where the yield is often significantly lower than half of the fruit. This resulted in a significant amount of waste, includingpeels that are a natural by-product with many virtues. In the last decades, many studies pointed-out the pomegranate peel's advantages as an inedible by-product from the pomegranate industry with a high antioxidant potential.
Objectives: The current study aimed to value the promeganate peel extract (PPE) as a rich source of polyphenols using an optimized Ultrasound-Assisted Extraction (UAE). Methods: The extraction was carried out using dried pomegranate powder (particle size <125µm) in a hydroethanolic solvent (0.03%; w/v). The ultrasound-assisted extraction was optimized by varying the hydroethanolic solvent concentration (20-100%), amplitude of the ultrasounds (20-10%) and the sonication period (5s - 5min). After that, the prepared pomegranate peel extract was assessed for its total phenolic content and antioxidant activity, using two tests measuring its ability to scavenge free radicals and to reduce iron.

Results: Our data revealed that the best total phenolic content was obtained using 20% of hydroethanolic solvent and an amplitude of 80% during 5 min. The PPE contained 345.42 ± 4 mg EAG/gp of polyphenols and displayed antiradical activity towards ABTS (3.34 0.28 mmol Eq trolox/g powder), and a good iron reducing power (6.25 ± 0.21 mmol Eq Fe^{2+}/g powder).

Conclusion: This study showed that the pomegranate peel extract is a potential source of polyphenols, known for their antioxidant properties. And the use of new optimized methods is promising for better valorization of this natural by-product.

Keywords: Pomegranate peel extract (PEP), by-product, ultrasound-assisted extraction, UAE, optimization, polyphenols, antioxidant activity.

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ANTIOXIDANT AND ANTI-INFLAMMATORY PROPERTIES AND THEIR CORRELATION WITH TOTAL FLAVONOIDS OF *GREWIA BICOLOR* FROM CAMEROON

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Abstract

Grewia bicolor is a tropical African plant widely used traditionally in the treatment of various infections such as skin lesions. This study focused on the phytochemical constituents and the *in vitro* antioxidant and anti-inflammatory activities of *G. bicolor* leaf extracts and their correlation with the chemical constituents. The leaves were extracted successively using acetone and methanol (MeOH) by maceration. Silica gel column chromatographic separations yielded three flavonoids namely catechin (1), leucocyanidol (2), and isoquercitrin (3). Standard methods were used to determine the total phenolic and flavonoid content of the extracts. The antioxidant activity of the extracts was assessed using the DPPH (2,2-diphenyl-1-picrylhydrazyl) free radical scavenging method. The anti-inflammatory activity of the extracts was determined by investigating the inhibition of the denaturation of serum bovine albumin. The isolated compounds were identified as catechin, isoquercetin, and leucocyanidol by using 1D-2D-^{1}H-^{13}C nuclear magnetic resonance and mass spectrometry. The MeOH extract, with an IC_{50} value of 21.56 µg/mL, exhibited strong DPPH free radical scavenging activity compared to the acetone extract (IC_{50} = 68.31 µg/mL). In addition, acetone and MeOH extracts had good anti-inflammatory activity *in vitro* with IC_{50} values of 40.67 and 30.67 µg/mL, respectively. In conclusion, the findings of this study support the use of this plant in traditional medicine to treat inflammatory disorders. The DPPH free radical scavenging activity and anti-inflammatory activity of *G. bicolor* can be correlated to the presence of flavonoids.

Keywords: : Phytochemicals, DPPH assay, anti-inflammatory activity, flavonoids.

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PENNISETUM GLAUCUM: USES IN TRADITIONAL FOOD RECIPES IN SOUTHERN ALGERIA

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Abstract

Pearl millet *Pennisetum glaucum* (L.) R. Br. "Bishna" (Poaceae family); prehistorically, man took it as food in in Southern Algeria (Sahara regions). Since then, these tiny grains have been accorded remarkable importance in various fields of research's, such as agronomy, food science agricultural and biological Sciences biology, nutritional science, natural science humaines and sociale science, in order to highlight their benefits. Our post-graduate studies in sociology in southern Algeria, contributed to the collection of data on the traditional knowledge of plants uses, including millet. The research showed that millet was a staple food for the early desert dwellers and the most important source of self- sufficiency and commodities for trade. Moreover, it is still the basis of healthy dishes in southern societies. Millet is used in different dishes on social and religious occasions. Dates are the main ingredients in these dishes. Studies have shown the numerous health benefits of millet, its therapeutic nutritional value, its richness in micronutrients, and recently, it has been included in the list of medicinalplants. The Food and Agriculture Organization considers (FAO) its use primarily for human consumption. Millet is an important source of calories and an essential component of food security in the semi-arid regions of developing countries. Therefore, we will approach the most important millet recipes, studied throughout our ethnobotanical research in the Algerian oases.

Keywords: *Pennisetum glaucum* "Bishna" millet, sociocultural study, ethnobotanic, Sahara desert oases, Algeria.

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PROTECTIVE EFFECT OF JUJUBE HONEY AGAINST GASTROINTESTINAL DYSFUNCTION IN MICE

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Abstract

Honey has been greatly valued to have dietary advantages and excellent therapeutic health properties, in particular for wound healing, gastrointestinal diseases and as an antibacterial agent. It's reported that gastrointestinal disorders are among of the most frequent human diseases with ineffective therapy. The aim of this investigation was to study the gastroprotective effect and antidiarrheal activity of jujube honey in mice, respectively against ethanol-induced gastric ulcer and castor oil-induced diarrhea and to investigate its therapeutic mechanism action. The mice orally administreted by ethanol or castor oil was post-treated with jujube honey, diluted jujube honey and vehicles or references drugs in different group of experiment. Stomach's tissues were examined for ulcerative lesions and histopathological evaluation. For clinical inflammatory assessment, plasma nitric oxide and C-reactive protein were determined. The levels of catalase and superoxide dismutase enzymes were used to evaluate oxidative stress. The treated group with diluted jujube honey showed an significant antidiarrheal action characterised by important delayed onset of diarrhea, decrease in fresh faeces frequency and total feces amount of fecal output in castor oil-induced-diarrhea group. Delay in charcoal meal intestinal transit is the most plausible mechanism that could explain jujube honey's antidiarrheal properties. Additionally, it reduced the inflammatory reaction by decreasing white blood cell counts and C-reactive protein and nitric oxide plasma concentrations in irritable stomach group. Furthermore, the group treated with jujube honey demonstrated higher antioxidant enzyme activities of superoxide dismutase and catalase. Moreover, diluted jujube honey is more efficient in maintaining the stomach mucosa integrity. Our investigation indicate that jujube honey, particularly when diluting, could exert a gastroprotective and antidiarrheal effects, by alleviating inflammatory response and strengthening antioxidant activity through its biologically active molecules.

Keywords: Jujube honey, protective effect, bioactive compounds, diarrhea, gastric ulcer.

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MOLECULAR DOCKING STUDIES OF GLYCYRRHIZIC ACID (GA), GLYCYRRHETIC ACID (GE) FROM *GLYCYRRHIZA GLABRA* AS POTENTIEL INHIBITORS OF CYCLOOXYGENASE-2 (COX-2) FOR THE TREATMENT OF INFLAMMATORY DESORDERS

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Abstract

Background: *Glycyrrhiza glabra* is a well-known medicinal plant with valuable secondary metabolites and pharmacological properties. Licorice, contains many bioactive components like Glycyrrhizic acid,a triterpenoid saponin extracted from the root of licorice , along with its aglycone glycyrrhetinic acid, are known in the literature for their wide range of pharmacological properties including anti-inflammatory, hepatocarcinogenesis, antiviral, and interferon-inducing activities. The 3D structures of both compounds were docked into the active site of the COX-2 enzyme using autodock software. The docking calculations were performed by autodock software by supplying proteins, ligands, and a grid file.

Result Analysis: After docking calculations, the orientation was critically evaluated, and the best pose, which showed a binding energy of -8.73 kcal/mol, was selected for further analysis. On the other side, glycyrrhizic acid (2) was also investigated and docked into target 3LN1. The best orientation, which shows binding energy of -6.28 kcal/mol, was selected. Finally, on the basis of binding energy and interaction of ligands with proteins, it is summarised that glycyrrhetinic acid (1) is more potent than glycyrrhizic acid (2).

Conclusions; Docking study shows that the glycyrrhetinic acid (1) has more anti-inflammatory potential than glycyrrhizic acid (2).

Keywords: Glycyrrhizic acid, glycyrrhetinic acid, cyclooxygenase-2, molecular docking.

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FACTORS OF RECURRENCE IN UROLITHIASIS

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Abstract

Objectives - The aim of our study is to determine predictive factors for recurrence among adult stone formers and the associated risk of each factor. Patients and methods: The series consisted of 615 adult patients in western Algeria. We determined parameters as age, sex, body mass index (BMI), living area, family and medical history, lifestyle (diet, water intake, physical activities) and number of stone occurrences. We used a logistic regression analysis to determine the predictive factors of recurrence (and odds ratio, OR). Results: The sex-ratio M/F=1.9, the mean age= 44 ± 13 years and the mean BMI=26 ± 4 kg/m2. The rate of consanguinity was noted among 25.7% patients whereas 57% were living in urban areas and 35.1 % had a family history of urinary stones, 24.4% had two stone occurrences and 24.7% at least three ones. Dietary excesses were noted among: 23.7% (sugar) and 32.3% (salt) patients. 64.9% practice physical activity. Recurrence was predominant among men (53% vs. 40.7% among women; p=0.004) and those who have a good level of education (51.3% vs. 48.7% others; p=0.012). Logistic regression analysis showed that the risk factors for recurrence are: high blood pressure (OR=2.25; p=0.007), consumption of less than 1L of water per day (OR= 1.87; p=0.004) and physical activity (OR=1.68; p=0.027) probably due to insufficient hydration during exercises. Conclusion: By identifying stone formers who have one or more of these risk factors, it is possible to reduce the rate of recurrence and thus, reduce the cost of managing urolithiasis in ourcountry.

Keywords: Urolithiasis, recurrence, risk factors, adult stone formers, western Algeria.

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IMPROVED CONSERVATION OF SALT-FREE DRIED TOMATOES BY ADDING EXTRACTS AND POWDER OF *MALVA SYLVESTRIS* L.

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Abstract

Malva sylvestris L. (*M.S.*) is an herbaceous, perennial, natural plant from Chlef region, belonging to the *Malvaceae* family. Rich in mucilage, it is an excellent emollient, used to treat inflammations of the mucous membranes such as digestive, urinary, and respiratory. Its high content of bioactive compounds make it a potential food conservative. That's why we conducted this study with the following objectives:
(i) determination of the total phenol content and antioxidant activity of the hydroethanolic extract of *M. S* .(ii) Study of the effect of incorporating *M.S.* extracts and powder at different concentrations on the conservation of salt-free dried tomatoes. Determination of total polyphenols showed that the hydroethanolic extract of leaves contained (600 mg ethyl gallate EGA/g), higher than for stems (375 mg EGA/g). The evaluation of the anti-free radical activity against the 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical of the leavesextract has an IC_{50} value around 4 mg/ml. Enriching dried tomatoes with *M.S.* powder increased conservation time beyond two months without adding salt. 62% of tasters said they preferred dried tomatoes with *M.S.* powder. This study has shown that *Malva sylvestris* L. powder is a conceivable choice for free-salt dried tomatoes, and could be considered as good ingredient for conserving food and exploited in food industry.

Keywords: *Malva sylvestris* L., tomato, polyphenols, antioxidant, conservation.

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ASSESSMENT OF THE IMPACT OF A TRADITIONAL PREPARATION ON PLATELETS INCREASE IN ANIMAL MODELS

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Abstract

Thrombocytopenia is a hematological disease that causes low platelet counts in patients. This disorder is multifactorial and could be due to cancer and viral infections. Phytotherapists recommend a diet composed of *Glycine max*, *Cucurbita maxima* and *Vigna unguiculata* L. for treating thrombocytopenia. This study aims to investigate the platelet stimulation properties of this supplement mixture using a cyclophosphamide (50 mg/kg) induced thrombocytopenic rat model. *In vivo* results showed that the diet could significantly improve platelet counts in thrombocytopenic Wistar rats, as well as total white blood cell counts. In conclusion, our study suggests a potential role of this diet in increasing the number of thrombocytes.

Keywords: Thrombocytopenia, Glycine max ,L., Vigna unguiculata L, Cucurbita maxima, cyclophosphamide, diet.

POSTER ABSTRACTS

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BECHAR AND SAIDA HONEYS AS ANTIMICROBIAL AGENT AGAINST NOSOCOMIAL PATHOGENS

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Abstract

Expanding antibiotic resistance in microbial pathogens induce the discovery of alternative therapeutic tool, particularly the natural ones. The effect of honey in health care was reported from the ancient medical literature. Nowadays, the antimicrobial effects of honey, particularly for the precautionary of pathogen and resistant strains, has been tested. In this research study, the antibacterial power of two honeys collected from Saida and Bechar to inhib three major nosocomial infectious agent was determined by well-agar diffusion technique and minimum inhibitory concentration (MIC) determination.

All honey samples, showed antimicrobial activity against all nosocomial pathogens strains tested. The MIC values of Bechar honey against *E. coli* and *S. aureus* varied from 6.25% to 12.5% (v/v) whereas for *C. albicans* the MIC was 3.12%. Honeys Saida showed also antimicrobial activity but less than Bechar honey. So, the MIC values against *E. coli*, *Staphylococcus aureus* and *C. albicans* varied from 12.5% to 25% (v/v). Additionally research concerning the characterization of antimicrobial elements present in Algerian honeys as well as explanation of their molecular target might lead to use in medicine.

Keywords: Honey, antimicrobial, nosocomial pathogens, Saida, Bechar.

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POTENTIAL NEUROPROTECTIVE EFFECT OF CHESTNUT «*Castanea sativa* Mill.» HONEY AGAINST ALZHEIMER'S DISEASE MODEL MICE: - *IN VIVO* – STUDY

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Abstract

Alzheimer's disease (AD) is considered one of the most complex progressive neurodegenerative disorders, belongs to multiple illnesses that impair memory, thought, and daily functioning that are, referred to as dementia. Nowadays, only symptomatic treatments exist to block the progression of the disease, but their side effects are frequently disappointing. Therefore, many head for alternative therapies such as Api-therapy. The objective of our study, is to investigated whether a long-intake of Chestnut "*Castanea sativa* Mill." honey can prevent the neurodegeneration appear in A.D. mice model.

The experimental protocol is divided into two phases. The first phase represents the treatment, consisting of a daily intake of chestnut honey solution at 150mg/kg and 300mg/kg by gastric gavage for 45 days, followed by the induction of the neurodegeneration by Aluminum Chloride ($AlCl_3$) at 100 mg/kg combined with D-galactose at 120 mg/kg. Neurological tests were performed at the end of the experimental protocol, comprising memory and behavioral tests. The results, followed the neurological tests, showed that the A.D. model mice treated with Chestnut honey had similar results to that observed in the control group, in which the results reported positive findings concerning depression-anxiety-like behaviors and a memory amelioration, also improvement in learning ability,, these results were confirmed by the histopathological findings, in which the tissues section taken from the brain parts showed that chronic administration of chestnut honey markedly reduced hippocampal atrophy and neuronal loss, same results for the cerebral cortex and cerebellum, in which they exhibited normal histological architecture. In conclusion, this study indicates that Chestnut "*Castanea sativa* Mill." honey daily consumption at respective doses can contract the burden of A.D. disease, by preventing memory decline and brain alteration.

Keywords: Alzheimer's disease, neurodegeneration, memory decline, neurological tests, mice, chestnut honey.

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BIOACTIVITIES AND PHYTOCHEMICAL ANALYSIS OF *Acacia arabica*

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Abstract

Description: Medicinal plants constitute a vast and economically significant group. The primary healthcare needs of the majority in developing countries are predominantly addressed through traditional medicine. Furthermore, around 25% of prescriptions worldwide are plant-based. The natural substances derived from these plants have diverse interests and are harnessed across various industries, including food, cosmetics, and dermopharmaceutics. Among these compounds, secondary metabolites have particularly stood out in therapeutic applications (Bahorun, 1997).

Objectives: The study aims to explore the phytochemical screening, antioxidant and antidiabetic activities of *Acacia arabica* branches and leaves growing in natural conditions in the west of Algeria.

Methods: Phytochemical screening of total phenolic and flavonoid content was conducted using colorimetric assays (Singleton and Ross, 1965; Kim et al., 2003). Additionally, the DPPH radical scavenging assay (Re et al., 1999) and α-glucosidase inhibition assay (Sancheti et al., 2011) were employed.

Results: The results of this study revealed that *Acacia arabica* is rich in saponins, coumarins, alkaloids, flavonoids, anthraquinones, and tannins. Furthermore, the phenolic content was found to be significant (10.47 ± 1.2% for leaves; 8.16 ± 0.0% for branches) along with flavonoid content (6.5 ± 0.9% for leaves and 4.34 ± 0.23% for branches). The plant demonstrated notable scavenging effectiveness against DPPH radicals (88.62 ± 0.46% for leaves and 89.05 ± 0.23% for branches). The α-glucosidase inhibition assay exhibited stronger inhibitory activity in branches (79.48 ± 0.24%) compared to leaves (52.33 ± 0.38%) and acarbose (56.70 ± 0.75%).

Conclusion: Further studies in this direction could potentially lead to the discovery of phytochemicals with promising antioxidative and anti-diabetic therapeutic values.

Keywords: *Acacia arabica*, secondary metabolites, phytochemical, DPPH, α-glucosidase.

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ANTI-ADHESION ACTIVITY OF TWO PLANTS WEST ALGERIAN MEDICINAL AGAINST BIOFILM-FORMING PATHOGENS ISOLATED FROM MEDICAL DEVICES

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Abstract

Plants have commonly been used in folk medicine for treating diseases. Microbial biofilm refers to a community of microorganisms that attach to either living or non-living surfaces.Clinical biofilms can be a source of various human infections, which can pose significant public health issues. The anti-adhesion activity of specific Algerian plants used in traditional medicine has been documented. The objective of this study is to investigate the impact of three extracts (methanolic, hydro-methanolic, aqueous) derived from the leaves of two medicinal plants on biofilm-producing strains that were isolated from medical equipment. The study aims to determine the extracts' effect on the ability of these strains to adhere (anti-adhesion effect).

We followed the following protocol: first, we identified the six producing strains of the hospital biofilm, which are *Escherichia coli* (A), *Escherichia coli* (B), *Staphylococcus aureus*(C), *Pseudomonas aeruginosa* (D), *Enterobacter* (E), and *Staphylococcus aureus* (F). These strains were the subject of the anti-adhesion effect dosage study (inhibition tests expressed in %). The results obtained reveal that the three extracts of the two plants, *Pistacia lentiscus* and *Satureja calamintha*, have a remarkable anti-adhesion activity on both Gram (+) and Gram (-) strains at concentrations of 100, 50, 25, 12.5, and 6.25 (mg/ml). The inhibition test of the six strains showed that the concentrated extracts have a greater inhibitory effect on the strains, unlike the less concentrated extracts, which have weak anti-adhesion activity. *Pistacia lentiscus* leaf extracts show better anti-adhesion activity than those of *Satureja calamintha*.

Our study demonstrates a significant anti-adhesion effect of the leaf extracts from these two medicinal plants. This suggests that they could serve as a promising natural alternative to antibiotics. Furthermore, these two species have the potential to be utilized as alternative drugs derived from plant extracts. Considering their ethnobotanical knowledge in westernAlgeria, it is worth considering their application as anti-adhesive, antiseptic, and disinfectant agents for hospital premises and other medical devices.

Keywords: Anti-adhesion, medicinal plants, pathogens.

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INSECTICIDAL ACTIVITY OF NETTLE (*URTICA DIOICA* L.) AGAINST VECTORS OF INFECTIOUS DISEASES IN ALGERIA

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Abstract

Culicidae are arguably the most well-known and feared insects, both due to the vector-borne diseases they can transmit during their blood meals and the discomfort and nuisance their presence causes. The range of arthropods involved in transmitting these diseases has continuously expanded, placing new human populations in infection risk zones. To mitigate the spread of these insects and the transmission of infectious diseases, 4th instar larvae of *Culex* mosquito were exposed to two extracts from *U. dioica*, the aqueous extract and the ethanolic extract, at concentrations ranging from 3% to 10%, under laboratory conditions, to assess their larvicidal effect. The examination of *U. dioica* powder using infrared analysis unveiled the existence of multiple molecules exhibiting diverse functions, encompassing phenol (O-H), methylene (C-H), primary amines (N-H), aromatic nitro compounds (N-O), and aromatic ethers (C-O). The insecticidal activity of nettle extracts, specifically the aqueous extract and ethanolic extract, exhibited significant efficacy against L4 larvae of *Culex* mosquitoes. Analysis of the recorded mortality for two tested extracts indicates that larval sensitivity is directly proportional to the concentration used, as well as the contact time with these extracts. For the aqueous extract, better larvicidal activity was observed with an LC50 value of 11.48 mg/ml compared to 12.74 mg/ml for the ethanolic extract. Furthermore, the ethanolic extract induced a faster mortality rate in these larvae compared to the aqueous extract, with TL_{50} values of 6.25 h and 19.92 h, respectively. Nettle extracts offer a potential alternative for combatting *C. pipiens* by inhibiting the development he mosquito's immature life cycle stages.

Keywords: Culicidae, vector-borne diseases, *Culex* sp., *Urtica dioica*, aqueous extract, ethanolic extract.

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PHYTOCHEMICAL ANALYSIS AND ANTIOXIDANT ACTIVITY ASSESSMENT OF *Visnaga aucoides* Gaertn EXTRACTS MANAGING VITILIGO THERAPEUTICALLY

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Abstract

The Algerian plant diversity encompasses numerous understudied species, some of which possess valuable pharmacological properties. Among these, *Visnaga daucoides* Gaertn stands out, historically employed in traditional medicine for diverse ailments. Despite its significance, limited research characterizes this plant in Algeria. This study aims to discern active compounds and assess the antioxidant potential of *Visnaga daucoides* Gaertn. Phytochemical screening reveals the presence of phenolic compounds, notably flavonoids and tannins, in the aqueous extract. Quantitative analysis indicates a concentration of 5.116±0.004 mg mg of gallic acid equivalent (EAG)/g for total flavonoids and 1.429±0.005 mg EC/g for tannins. Employing the1,1-diphenyl-2-picrylhydrazyl (DPPH) method for antioxidant evaluation yields an inhibitory concentration (IC_{50} = 3.023 mg/ml), suggesting potential applications in the pharmaceutical industry. This research seeks to contribute to the understanding and utilization of the medicinal properties of *Visnaga daucoides* Gaertn in a manner consistent with ethical and academic standards

Keywords: *Visnaga daucoides* Gaertn, phytochemical study, antioxidant activity.

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THE STUDY OF BIOLOGICAL ACTIVITY OF ROSEMARY (*ROSMARINUS OFFICINALIS* L.)

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Abstract

Rosemary is known as a medicinal plant for its many therapeutic effects, but it is also a popular Mediterranean perennial shrub. This plant is consumed as a tea and used in cooking where its leaves can be eaten fresh or dried, it is considered as an important addition to the diet as it provides a wide range of essential nutrients for health. The aim of this research is based on the study of extracts from the aerial part of wild and cultivated rosemary, collected from two sites, on the yield of polyphenols and the physico-chemical and biological properties of this plant.

The results obtained on the yield of aqueous and ethanolic extracts are generally better when the rosemary powder was dissolved in 250 ml of solvent. The phytochemical analysis identified some secondary metabolites in the extracts of the plant. The anti-radical activity against the 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical showed that the percentage of inhibition of two aqueous and ethanolic extracts is important, which can go up to 70.5 % of inhibition. The antibacterial activity of two extracts showed an interesting effect against *Staphylococcus aureus* and *Pseudomonas aeruginosa* strains.

Keywords: Rosemary, polyphenols, phytochemical screening, antioxidant, antibacterial.

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SYNTHESIS AND PHARMACOLOGICAL INVESTIGATIONS OF 1,3,4-OXADIAZOLE-5-THIONYL DERIVATIVES OF EXTRACTED *CIS*-CLERODANE DITERPENOID FROM *CISTUS MONSPELIENSIS*

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Abstract

Two new 1,3,4-oxadiazole thione namely 5-((R)-4 ((1S,2R,4aS,8aR)-5-(hydroxymethyl)-1,2,4a-trimethyl- 1,2,3,4,4a,7,8,8a-octahydronaphthalen-1-yl)-2-methylbutyl)-1,3,4-oxadiazole-2(3H)-thione and 5-((R)-2-methyl-4- ((1S,2R,4aS,8aR)-1,2,4a,5-tetramethyl-1,2,3,4,4a,7,8,8a-octahydronaphthalen-1-yl)butyl)-1,3,4-oxadiazole-2(3H)-thione derivatives of a cis-clerodan diterpenoid extracted from the Mediterranean plant *Cistus monspeliensis* are characterized by infrared, 1H, 13C-NMR and mass spectroscopy.

The antibacterial activity was assessed using paper disk diffusion and broth dilution methods on Gram-positive bacteria *Staphylococcus aureus* (ATCC 33862) and *Bacillus cereus* (ATCC 10876), and Gram-negative bacteria *Pseudomonas aeruginosa* (ATCC 27853) and *Escherichia coli* (ATCC 25922) and showed important effects on both Gram-positive bacteria compared to the reference amikacin. Both heterocycles showed elevated inhibition effect on the nitric oxide production on murine monocyte/macrophage-like RAW 264.7 cell line (ATCC no, TIB-71) with IC_{50} NO values of 43.59 ± 1.8 and 18.64 ± 0.06 µM compared to that of the reference diclofenac (IC_{50} NO = 73.30 ± 0.40 µM).

Keywords: *Cistus monspeliensis*, clerodane diterpenoid, 1,3,4-oxadiazole-5-thione, synthesis, spectroscopic characterization, pharmacological activity.

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EFFECTS OF *CURCUMA LONGA* AND *LAURUS NOBILIS* EXTRACTS ON THE AGGREGATION OF CALCIUM OXALATE MONOHYDRATE *IN VITRO*

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Abstract

Lithogenesis involves several phases [Daudon, 2012]. However, slowing down or eliminating one or more steps in this process will be a therapeutic means to reduce the formation of crystals in the urine. Objective. This work aims to study the effect of plant extracts on the aggregation of calcium oxalate monohydrate (Whewellite). Methods: We adopted a crystallization model, proposed by Daudon, 1994, which was slightly modified. This model involves the study of inhibition of calcium oxalate monohydrate or Whewellite crystals *in vitro* by the addition of the aqueous extract (*Curcuma longa*, *Laurus nobilis*). Results. The addition of the aqueous extract of *Curcuma longa* caused a considerable inhibition of the total number of aggregates of calcium oxalate monohydrate (Whewellite). The inhibitory effect reached its maximum after the first twenty minutes at a concentration 4g/100 mL of 97.67%. As for the effects on size, the highest inhibition percentages were 89.74% and 84.61% recorded at the 30th minute with 4 and 5 g/100mL concentrations, respectively. The addition of aqueous extract of *Laurus nobilis* caused a significant inhibition on the total number of aggregates of calcium oxalate monohydrate (Whewellite) at all the concentrations tested, especially that of 4 g/100mL where the inhibition percentages ranged between 94.44 and 98.78%. Regarding effects on size, the best results were obtained with the 4 g/100 mL concentration where inhibition rates varied between 60.78 and 96.14%. Conclusion. The study of inhibition of urinary crystallization by natural substances involved slowing or stopping certain phases of crystallization. The plant tested exhibited an inhibitory power that varied according to the concentrations tested.

Keywords: Urinary stones, crystalluria, calcium oxalate, C*urcuma longa*, *Laurus nobilis*.

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EVALUATION OF BIOCHEMICAL PARAMETERS OF THE ANTIDIABETIC EFFECT OF PROPOLIS "*IN VIVO* STUDY IN WISTAR RATS"

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Abstract

Diabetes is a persistent condition arising from inadequate insulin production by the pancreas or ineffective utilization of the produced insulin by the body, leading to persistent high blood sugar (hyperglycemia). Today, apitherapy consists in treating with products of the hive. This ancient practice uses the properties of bee products to improve and maintain human health. This research is dedicated to exploring propolis, a resin renowned for its diverse therapeutic applications. The aim of this study was To contribute to the evaluation of propolis' *in vivo* antidiabetic efficacy. No effect was shown in all experimental groups of rats after the toxicity test with designated propolis dosages (150 mg/kg, 300 mg/kg, 500 mg/kg).

Diabetes was induced in all animal groups, except for the control group, using streptozotocin (STZ) at a single dose of 60 mg/kg intraperitoneally. One week following the induction of diabetes, a 21-day treatment period was initiated. This involved administering propolis by gavage. Biological parameters such as weight evolution, blood glucose levels, water consumption, as well as biochemical parameters (ALAT/ASAT), were measured throughout the experiment, and additional analyses were performed after sacrifice. Rats with diabetes (D) exhibited a statistically significant elevation in blood glucose levels relative to the control rats (T). However, an improvement in blood glucose levels was observed in diabetic rats treated with propolis at doses of 150 mg/kg and 300 mg/kg during and after the treatment.

The studied biochemical parameters (ALAT, ASAT) also revealed significant differences between diabetic rats and control rats. Additionally, diabetic rats treated with propolis showed a significant decrease in these parameters compared to untreated diabetic rats. This study indicates that propolis has superior anti-diabetic effects under current experimental conditions.

Keywords: Diabets, propolis, glycemia, rats, ASAT, ALAT.

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MACHINE LEARNING MODEL FOR EXTRACTING FEATURES AND RECOGNIZING ALGERIANE MEDICINAL PLANTS

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Abstract

Algeria has a rich biodiversity of medicinal plants, which has given the Algerian people extensive experience and a long history in using traditional herbal medicine. To this day, such herbs are still used for medical purposes. Today, it has become necessary to digitize and create a database using artificial intelligence to protect these medicinal plants from disappearing and protect the methods of its uses, the protection of their users, and the preservation of this heritage of knowledge. Therefore, we propose an intelligent system based on IoT and machine learning to process leaf image data of these medicinal plants. In this research, we will present a new approach based on Convolutional Neural Network (CNN)- based techniques to distinguish Algerian medicinal plant leaf. We will analyze images from a dataset related to traditional Algerian medicinal plants and classify them into different categories (recognition and classification of leaf). We built a dataset of 1560 images for 52 classes (species) of medicinal plants, with 30 images for each class. Our Machine Learning Model for Extracting Features and Recognizing Algerian Medicinal Plants marks a significant stride at the confluence of computer science and biology. It empowers the Algerian community to conserve its natural heritage while offering a valuable tool to facilitate the appropriate and accurate utilization of these herbs in traditional medicine

Keywords: Traditional herbal medicine, medicinal plant leaf, IoT (Internet of Things), Convolutional Neural Network (CNN), dataset, features extraction, recognition and classification machine learning model.

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IS THERE A STRONG CORRELATION BETWEEN THE ANTI-FREE RADICAL ACTIVITY AND PHENOLIC COMPOUNDS IN ETHANOLIC EXTRACTS OF ALGERIAN DATES?

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Abstract

Our study was oriented towards a therapeutic approach aimed at developing new, highly promising natural antioxidant sources that do not cause side effects. The aim was to enhance the value of a natural product that represents a national heritage: Algerian dates (*Phoenix dactylifera* L.) of the Deglet Nour variety. The phenolic profile of ethanolic extracts of date pulp and seeds was determined by HPLC-UV, and the contents of total phenols, flavonoids, condensed and hydrolysable tannins were measured. The antioxidant activity of these samples was also assessed *in vitro* by free radical scavenging capacity (DPPH) and ferric reduction (FRAP). The results revealed very high levels of phenolic compounds in the date seed extract, which also showed a strong anti-free radical capacity. Strong negative and highly significant correlations (P≤0.001) were recorded between phenolic compounds and DPPH free radical scavenging capacity: SC50DPPH/total phenols (r = -0.993), SC50DPPH/Flavonoids (r = -0.993), SC50DPPH/condensed tannins (r = -0.986), SC50DPPH/hydrolysable tannins (r = -0.989). There was also a strong positive and highly significant correlation (P≤0.001) between phenolic compounds and ferric reducing power: FRAP/total phenols (r = 0.999), FRAP/ Flavonoids (r = 1.000), FRAP/condensed tannins (r = 0.995), FRAP/hydrolysable tannins (r = 0.993). As a result, the high antioxidant capacity measured in date seeds extract could probably be explained by its high content of total phenols, flavonoids, condensed and hydrolysable tannins.

Keywords: *Phoenix dactylifera* L., free radical, phenolic compounds, antioxidant activity, HPLC.

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MORINDA LONGISSIMA AMELIORATES MERCURIC CHLORIDE-INDUCED LIVER DAMAGE IN RATS

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Abstract

Mercury is a hazardous substance that damages many different tissues and organs. Mercury has been found to have harmful effects on the immunological system, cardiovascular system, liver, kidneys and central nervous system in previous research. Hormonal instability and gastrointestinal issues are also linked to mercury exposure**.** The present study was to determine the impact of *Morinda longissima* ethanolic extract on mercuric chloride ($HgCl_2$)-mediated hepatic oxidative stress in rats. Five groups of healthy female Wistar rats, each including five individuals. Group A received saline treatment, while Group B received an intraperitoneal injection of HgCl2 alone at a dose of 1.5 mg/kg body weight. Group C received 100 mg/kg body weight of tocopherol. Group D and E received 150 and 300 mg/kg body weight of *Morinda longissima* extract, respectively. 24 h after treatment, all groups received an intraperitoneal injection of $HgCl_2$ except the group A. Hematoxylin and eosin (H&E) staining was performed when the tissue was sectioned into thick slices. Histopathological changes showed that liver injury was caused by mercury toxicity. The findings of this study concluded that *Morinda longissima* improved to some extent the altered liver histopathology. *Morinda longissima* exhibited remarkable ameliorative effects on hepatic cytotoxicity mediated by mercuric chloride.

Keywords: *Morinda longissima*, mercuric-chloride, hepatic cytotoxicity, histopathology.

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SOLVENT FREE MICROWAVE EXTRACTION OF ESSENTIAL OIL FROM *CINNAMOMUM CASSIA* BARKS: OPTIMIZATION BY RESPONSE SURFACE METHODOLOGY, KEY CHEMICAL COMPOSITION AND ANTIMICROBIAL ACTIVITY

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Abstract

Essential oil (EO) was often extracted by traditional hydro distillation method (HD). However, this technique generally took long extraction time, which meant that more energy was consumed. In this study, a green extraction method of solvent-free microwave (SFME) was used to isolate EO from *Cinnamomum cassia* barks. The optimal process conditions were established by response surface methodology (RSM) using the central composite design (CCD). A comparision between SFME and HD was carried out in terms of kinetic, quality and quantity of obtained EO, energy consumption, and environmental impact. *Cinnamomum cassia* EOs were tested for their antimicrobial activity. Results showed that, optimized operating conditions were moisture content of 58 %, microwave power of 400 W, and microwave time of 28 min. Analysis of variance under the extraction condition illustrated high fitness of the model and the success of RSM for optimizing and reflecting the expected process condition. Meanwhile, efficient extraction of EO was obtained by using SFME (2.70 ± 0.06%) compared with HD (2.67 ± 0.05%), with shorter kinetic time (28 min versus 180 min with SFME and HD, respectively) and lower energy intensiveness, CO_2 footprints, and wastewater. Results of gas chromatography-mass spectrometry (GC–MS) revealed that SFME exhibited more valuable EO with higher percentage of oxygenated compounds compared with HD. The experimental results of antimicrobial activity showed that EO from SFME method were significantly better that EO from HD method. It was concluded that, SFME was an effective method for extracting essential oil from *Cinnamomum cassia* barks, which has an obvious antimicrobial effect.

Keywords: Solvent free microwave extraction, hydrodistillation, *Cinnamomum cassia* bark, essential oil, chemical composition, antimicrobial activity.

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IN VITRO EVALUATION OF THE ANTI-FREE RADICAL AND ANTIMICROBIAL ACTIVITY OF FERMENTED BARLEY EXTRACT

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Abstract

The nutritional value of barley (*Hordeum vulgare* L.) is considered by its phytochemical composition consisting of, phenolic acids, flavonoids, lignans, vitamin E, sterols, and folates (Malik, 2012). Barley fibers, particularly β-glucans, are beneficial to health (Baik and Ullrich, 2008). The objective of this study is to asses the anti-free radical activity *in vitro* and also polyphenol content of the fermented barley extract. The sampling of Barley (*Hordeum vulgare* L.*)* chosen for our research study was carried out in the locality of Tiaret in June 2021. The methodology was based on the extraction of the crude extract of fermented barley using the maceration technique, while the antiradical activity required the use of 1,1-diphenyl-2-picrylhydrazyl (DPPH). For antimicrobial activity, we used the agar diffusion method (Choi et all, 2006), selecting pathogenic bacterial strains *Esherichia coli* (ATCC 25922), *Staphylococcus aureus* (ATCC 33862) and *Salmonella* (ATCC 7251). Extraction yield was 5.95%, and polyphenol content 8.10 mg/100g extract. Anti-radical activity IC_{50} was of the order of 1.01 mg/ml. The diameters of the respective antibacterial inhibition zones were 25 mm with *Salmonella*, 10 mm with *Esherichia coli* and 11 mm with *Staphylococcus aureus*.
In conclusion, the results obtained showed that fermented barley had polyhenols, antiradical activity and antibacterial activity.

Keywords: fermented barley, cereal, anti-free radical activity antimicrobial activity, pathogenic strains.

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DEVELOPMENT OF BIOACTIVE AND INTELLIGENT PACKAGING FILMS BASED ON ARGININE-MODIFIED CHITOSAN/GELATIN MATRIX AND CURCUMIN

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Abstract

Multifunctional packaging was developed by adding curcumin (Cur) into chitosan/gelatin (Cs/Gn) and arginine-chitosan/gelatin (MCs/Gn) blend films. Functional properties of Cs/Gn, MCs/Gn, Cs/Gn-Cur, and MCs/Gn-Cur films were compared. Results showed the incorporation of Cur effectively changed the film's colors when they were exposed to different pH mediums. By comparing different films, MCs/Gn and MCs/Gn-Cur films presented stronger antimicrobial activity than Cs/Gn and Cs/Gn-Cur films. Meanwhile, Cs/Gn-Cur and MCs/Gn-Cur films possessed more antioxidant activity than Cs/Gn and MCs/Gn. Notably, MCs/Gn-Cur film could be used as novel multifunctional packaging in the food industry.

Keywords: Curcumin, gelatin, arginine-chitosan, multifunctional packaging.

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EXTRACTION OF THE WATER-SOLUBLE FRACTION OF THE FOOD LEGUME: CORAL LENTIL

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Abstract

Grain legumes play an important role in the global diet, especially in our country Algeria, they are the main basis of protein for humans. In our study, coral lentil seeds were cold delipidated, and after drying, the resulting product was placed in water under agitation and centrifuged to extract the water-soluble proteins. The pellet was then subjected to four successive extractions over two hours. The optical density of the extract was measured at λ = 280 nm to observe the majority of all water-soluble proteins. The Kjeldahl method was used to determine total protein content, while water-soluble protein content was calculated using the Bradford method. Our results show that the total protein content is 22.69%, the water-soluble protein content is 7.8% and the water-insoluble protein content is 14.89%. These results confirm the high protein content of coral lentil seeds.

Keywords: Food legumes, coral lentil, water-soluble proteins.

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NEUROPROTECTIVE EFFECT OF PROPOLIS EXTRACT AGAINST ALUMINIUM CHLORIDE-INDUCED ALZHEIMER'S DISEASE IN MICE

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Abstract

Despite the vast amount of bibliographic data detailing the complex and multifactorial etiopathology of Alzheimer's disease, no pharmacotherapy currently exists to cure this pathology, and the treatments available are merely symptomatic, which requires a search for more effective naturals alternatives therapies such as Apitherapy. This study aimed to investigate the neuroprotective activity of the propolis extract against aluminium chloride-induced Alzheimer's disease in model mice. A pre-therapeutic period was established for 45 days, in which female NMRI mice were divided into five groups: the control group , the Alzheimer model group, both of which received distilled water, two groups received aqueous propolis extract at 150 and 300 mg/kg, respectively (ALZ-P150 and ALZ-P300) and the standard group received revastigmine at 1.5 mg/kg as the reference drug. Subsequently, the induction of Alzheimer's disease was performed by daily oral administration of aluminum chloride ($AlCl_3$) at 100 mg/kg combined with D-galactose at 120 mg/kg intraperitoneally for the following 45 days. The evaluation of neuroprotective effect of propolis extract was based on memory tests and histopathological study of the brain. Memory tests results show an improvement of the learning and memorization capacity in aqueous propolis extract-treated groups in contrast to the Alzheimer's model mice. The histopathlogical findings revealed a significant and remarkable improvement of the cerebral tissue in the Alzheimer's mice treated with propolis extract compared to Alzheimer's model mice. Finally, from what we found as results we can conclude that the aqueous solution of propolis could probably be a new source of bioactive molecules in neuroprotection of Alzheimer's disease.

Keywords : Alzheimer's disease, propolis, neuroprotection, memory tests, histopathological study , mice.

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JUNIPER, *Juniperus communis* L., IN PHYTOTHERAPY

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Abstract

Common Juniper, Juniperus communis L., is an evergreen shrub found in dry, rocky soil in Europe and Asia, as well as in North America from the Arctic circle to Mexico. The plant usually grows from 2 to 6 feet high, but may reach a height of 25 feet. The bark is chocolate-brown tinged with red. The needle shaped leaves have white stripes on top and are a shiny yellow-green beneath. They occur on the branches in whoried groups of three. Yellow male flowers occur in whorls on one plant, green female flowers consisting of three contiguous, upright seed buds on another plant. Flowering time is April to June. The fruit is a berry-like cone which is green the first year and ripens to a bluish-black or dark purple color in the second year. Antiseptic, carminative, diuretic, rubefacient, stomachic, tonic activities are confirmed. Juniper is normally taken internally by eating the berries or making a tea from them. It is useful for digestive troubles resulting from an underproduction of hydrochloric acid, and is also helpful for gastrointestinal infections, inflammations, and cramps. In large doses, or with prolonged use it can irritate the kidnes and urinary passages. It is not recommended for those with kidney problems or with kid problems (i.e., pregnant women). The berries have also been recommended for eliminating excess water and for gouty and rheumatic paints.

As a spice, they aew often used to enhance flavour, stimulate appetite, and counteract flatulence. Dried juniper berries with their spicy, somewhat bittersweet flavour find use in marinades, sauerkraut, cabbage, and bean dishes and in seasoning wild game and other meats. Nutrition of juniper food has been used occasionally as an antiscorbutic, i.e. to be counteract vitamin C deficiency. Juniper oil with the content from 0.2 to 3.4 %, derived from the berries, penetrates the skin readily and is good for bone-joint troubles; but the pure oil is irritating and, in large quantities, can cause inflammation and blisters. Breathed in a vapor bath, it is useful for bronchitis and infection in the lungs, Juniper tar, or oil of cade, is produced by destructive distillation of the wood of another species (*Juniperus oxycedrus* L.) and is used for skin problems and for loss of hair. In regard to the qualitative and quantitative characteristics of the volatile oil, mostly monoterpenes (ca. 58 %), mainly α-pinene, myrcene, and sabinene are represented. As much as 33 % of the berries is made up of sugars, and about 10 % is resin. Newly created fields of juniper farming on agricultural land will not only return these, mostly devastated and permanently grassy, lands their meaning, where production and by-production functions (erosion prevention, biodiversity) take place, but will also be part of the activities aimed at countryside preservation. In this case permanent grass vegetation together with woody plants are growing which leads to more efficient, variable and profitable utilizing of the agricultural land and at the same time being healthy and sustainable.

Keywords: Juniper, fruits, phytomedicine, production, raw-material, land.

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LACTIC ACID BACTERIA PRODUCING POTENTIAL FOOD ADDITIVES ISOLATED FROM ALGERAIN FOOD PRODUCTS

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Abstract

Several species of lactic acid bacteria (LAB) are able to produce metabolites with high techno- functional properties, such and exopolysaccharide (EPS) with antiviral and immunomodulatory properties as well as the group B vitamins. In the present presentation, six LAB were isolated from Algerian food of animal origin (sheep milk and traditional butter) and plant origin (date palm sap and barley) and characterized with the aim to identify dextran and vitamin B2 producing bacteria of interest to generate functional food.
The strains were identified phenotypically and genotypically as *Leuconosto cmesenteroides* (A4X, Z36P, B12 and O9) and *Liquorilacto bacillusmali* (BR201 and FR123). The composition and structure of the EPS produced by the six LAB was identified by physico-chemical analyses, as dextrans composed of D-glucopyranose units with (1,6) linkages, and some of them presented three ramification types (1,4), (1,2) and (1,3). In defined medium, *Lc. Mesenteroides* A4X was the best dextran producer (4.5 g/L) and the other LABs also produced the polymer at high concentration (2.1-2.7 g/L). Dextrans are synthesized by dextransucrases (Dsr) using sucrose as substrate and, zymogram analysis to detect EPS synthesis in presence of the disaccharide, revealed that the two *L. mali* strains synthesize a Dsr with a molecular weight (Mw) of ~145 kDa, while the *Lc. mesenteroides* strains possess one or two enzymes with a Mw ranging from 170 to 211 kDa. In addition, the four *Lc. mesenteroides* strains were able to produce mannitol (~7 g/L). Furthermore, *Lc. mesenteroides* B12 and O9 strains grew in the absence of riboflavin (vitamin B2) and in this condition were able to synthesize, this vitamin at the levels of ~220 µg/L. Therefore, these new strains, specially, *Lc. mesenteroides* B12, could be a good candidate for the development of new fermented food biofortified with functional compounds.

Keywords: lactic acid bacteria, exopolysaccharides, dextran, riboflavin, mannitol, dextran sucrase.

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THE NEUROTHERAPEUTIC EFFECT OF HONEY OF SIDR FROM THE SOUTHERN ALGERIA ON THE PATHOLOGY OF ALZHEIMER'S DISEASE *IN VIVO* STUDY

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Abstract

The aim of this study is to know what is the effect of South Algerian Sidr Honey on the alterations caused by Alzheimer's disease (A.D.) which result from damage to different parts of the brain inducing an accumulation of deposits of β-amyloid protein which form amyloid plaques and neurofibrillary tangles.

Female mice are used for this experiment, to study the effect of Sidr Honey on A.D.; these mice are administered orally with Alcl3 at a rate of 100 mg/kg/day and intraperitoneally with D-galactose at a rate of 120 mg/kg/day for 45 days of challenge then they are treated intra-gastrically with Sidr honey at a rate of D1=100 mg/kg/d, D2=200 mg/kg/d and D3=300 mg/kg/d this treatment period also lasted 45 days. The marked alterations in the brain parenchyma of mice caused by the administration of aluminum and D-galactose which has a neurotoxic effect was observed, changes were registered in the hippocampus of mice affected by AD, with cortical atrophy shown by measurements taken on the brains of mice from the groups studied, the presence of cytoplasmic vacuolation in neurons and swelling of mast cells as well as nucleic vacuolizations and inclusions, these alterations characterized A.D. These affections are less important towards absent for the treated mice, this confirms the neuroprotectivety of honey-Sidr of the southern Algeria.

Keywords: Alzheimer, neurotherapeutic, honey-Sidr, *in vivo*.

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STUDY OF THE PREVENTIVE EFFECT OF *PHOENIX DACTYLIFERA* ON ACUTE TOXICITY BY LEAD, HISTOLOGICAL STUDY IN MICE

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Abstract

The multiple industrial usages, domestic, agricultural, medical and technological applications of heavy metals have led to their wide diffusion in the environment; raising concerns about their potential effects on the environment equilibrium and human health. Objective of this study was to evaluate the protective effect of date extract, to restore and prevent the effects induced by lead in high concentration according to an *in vivo* experimentation of acute intoxication followed by histological study in female NMRI mice. The results obtained from the histological study, after the administration of lead acetate by intraperitoneal injection, showed very severe lesions in the brains, liver and kidneys. In addition, the co-administration of the *Phoenix dactylifera* L. extract orally, with lead acetate, that record a recovery in body weight by comparison with intoxicated mice, this administration of the date extract, marked also the improvement in the tissue architecture, mainly nervous, renal and hepatic, compared to those of the intoxicated mice. This justifies the great importance of the date in traditional medicine and its therapeutic virtues.

Keywords: Protective effect, mice, lead acetate, brain, liver, kidney.

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IMPACT OF ADDING PHENOLIC COMPOUNDS FROM FENNEL SEEDS (*FOENICULUM VULGARE*) AS NATURAL ADDITIVES ON THE QUALITY AND STABILITY OF A J'BEN-TYPE LOCAL CHEESE

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Abstract

In recent years, numerous scientific studies have demonstrated the harmful health effects of chemical additives used by the food industry. These findings have sparked worldwide interest in finding alternative natural solutions. The objective of this research is to assess the impacts of adding a hydroethanolic extract of fennel seeds (*Foeniculum vulgare*) rich with phenolic compounds as a natural food additive at doses of (1, 2 and 3%) on physicochemical, microbiological, organoleptic quality and stability of a traditional cheese much appreciated by the Algerian population, namely J'Ben, during 15 days of positive cold storage at 4°C. The results showed that the hydroethanolic extract of *Foeniculum vulgare* possesses strong antioxidant activity, thanks to its high phenolic and flavonoid content. The addition of this extract to cheeses led to significant improvements in certain physico-chemical properties, such as pH, acidity, dry matter, organic matter and fat content, as well as levels of Malondialdehyde and antioxidant efficacy of experimental cheeses. Microbiological results also highlighted the extract's antimicrobial properties and remarkable prebiotic power, enabling J'Ben to be preserved for 15 days without contamination by certain pathogenic germs, reducing the development of undesirable bacteria responsible for spoilage and promoting the growth of beneficial lactic acid bacteria. Finally, in tasting tests, cheeses containing phenolic fennel extract were very well accepted by panelists, at the same level or better than the control cheese, depending on certain criteria such as taste, texture, structure and the smell. All these highly conclusive results support the use of the hydroethalonic extract studied as a 100% natural food additive with antioxidant and antimicrobial properties that can improve the shelf life and dietary quality of cheeses and processed products during storage.

Keywords: Extract, phenolic, *Foeniculum vulgare*, J'Ben, quality, conservation.

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PHYTOCHEMICAL CHARACTERIZATION AND *IN VITRO* ANTIOXIDANT POTENTIAL EVALUATION OF POMEGRANATE FLOWERS

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Abstract

Several pharmacological properties have been reported for the flowers of *Punica granatum* (Punicaceae), which contain diverse bioactive compounds such as gallic acid, ursolic acid, maslinic acid, daucosterol, and anthocyanins. The aim of this research is to assess the antioxidant impact of a pomegranate flower-derived anthocyanin extract. Phytochemical screening was conducted to search for different classes of secondary metabolites present in the flowers. The anthocyanin extract was obtained by macerating the flowers in acidified methanol. The antioxidant capability was spectrophotometrically assessed through the DPPH (1,1-Diphenyl-2-picrylhydrazyl) scavenging method, the inhibition capacity of β-carotene oxidation, and the determination of iron reducing power. Phytochemical analysis of pomegranate flowers revealed the presence of anthocyanins, flavonoids, tannins, and saponins. The anthocyanin extract from *Punica granatum* flowers effectively inhibits the DPPH free radical (84±1.28% at 2 mg/ml), delays β-carotene degradation (78±2.5% at 2 mg/ml), and exhibits weak iron reduction (OD=0.653). The anthocyanin extract from *Punica granatum* flowers possesses strong antioxidant power due to the presence of a diverse phytochemical composition and may have other beneficial effects that warrant further investigation.

Keywords: Pomegranate flowers, Phytochemical screening, DPPH, β-carotene.

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HEPATORPOTECTIVE AND NEPHROPROTECTIVE EFFECT OF *FICUS CARICA* L. FRUITS EXTRACT AGAINST CARBONTETRACHLORIDE INDUCED TOXICITY IN RATS

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Abstract

The current investigation attempts to assess the protective impact of *Ficus carica* L. fruit ethanolic extract against hepatotoxicity and nephrotoxicity caused by carbon tetrachloride (CCl_4) in rats. Five groups of rats were split apart and received respectively distilled water for the two first groups, vitamine C at 50 mg/kg, *F.carica* fruit extract at 300 and 600 mg/kg sebsequent to intraperitoneal injection of a single dose of 1.25 mg/kg of CCl_4 to all groups except the first group (control). Liver marker enzymes were assayed in serum such as aspartate aminotransferase (AST), alanine aminotransferase (ALT) and alkaline phosphatase (ALP). Sections of livers and kidneys were observed under microscope for the histopathological changes. Levels of biochemical parameters substantially increased in CCL_4 group. Whereas, treated rats (groups III, IV and V) with the vitamine C used as a standard and the plant extract at its two doses, a decreased activities of these enzymes were observed. Also, when compared to the non-treated and vitamine C-treated groups, the extract treatment in these groups led to less obvious degradation of the liver and kidney architecture, as well as reduced fibrosis and mild inflammation, indicating a dose-dependent effect. According to the current observations, the *Ficus carica* fruit extract treatment shows a protection against CCl_4 induced oxidative damage in rats with a dose dependant manner and is recommended to be an effective alternative treatment against oxidative damages caused by chemicals.

Keywords: *Ficus carica* L., liver, kidney, carbon tetrachloride, rats.

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MYCOCHIMECAL STUDY AND ANTIOXIDANT POTENTIAL EVALUATION OF HYDROMETHANOLIC EXTRACT OF MUSHROOM FROM STROPHARIACEE FAMILY

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Abstract

This study aims to enhance the virtues of edible and medicinal mushroom from *Strophariaceae* family of Algeria especialy «*Pholiota* sp.», a mycochemical characterization and an evaluation of the antioxidant potential of hydromethanolic extract (Ext-Hydro-MeOH) of fruiting bodies. The mycochemical study was realized by chemical screening tests to detect the chemical composition of extract after solide-liquide extraction. Where phenolics and flavonoids compounds were quantified following the folin ciocalteau and $AlCl_3$ methods, respectively. Antioxidant activities of *Pholoita* sp. Ext-Hydro-MeOH were evalueted using colorometric assays using 1,1-diphenyl-2-picrylhydrazyl (DPPH), 2,2'-azinobis(3-ethylbenzothiazoline-6-sulphonic acid) (ABTS) radicals. Qualitative analysis reveled that *Pholoita* sp. contained especialy alcaloids, anthocyane and other chemical compound. The polyphenols and flavonoids measurment shows that Ext-Hydro-MeOH has the highest contents for the two bioactive substances with 59,21 ± 0,00321 µg gallic acid equivalent GAE / mg Ext; 17,06± 0,001 µg RE/mg Ext respectively. Ext-Hydro-MeOH exhibit a good antioxidant activity, with IC_{50} against DPPH• as: 582,67±19,48 µg/ml and 275,42±23,26 µg /ml to inhibit the free radical ABTS•+. This study confirmed the preventive and therapeutic efficacy of this fungi and provided measurable biological evidence in its antioxidant potential.

Keywords: Edibe mushroom, *Strophariaceae*, *Pholiota* sp; chemical screening, antioxidant potential; *in vitro*.

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GASTRO-PROTECTIVE EFFECT OF THE ROYAL JELLY ON ETHANOL-INDUCED GASTRIC ULCER IN RATS

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Abstract

Gastric ulcers are a threat to public health worldwide. Different natural products have aroused interest in the treatment of this gastrointestinal disorder, without causing side effects. Royal jelly, a nutrient of the highest quality, was the subject of our study, to assess its gastroprotective potential on HCl-Ethanol-induced gastric ulcer in Wistar rats. Intragastric administration of the pretreatment was established daily for seven days in the groups treated with royal jelly extract at 150mg/kg, 300mg/kg and 500mg/kg, as well as in the standard group which got Lansoprazol at 30mg/kg as reference drug,the control and ulcer control groups received distilled water. At the end of the pre-treatment period, the ulcerogenic solution was given intragastrically to the animals, except for the control group .The pH, volume of the gastric juice, the ulcer index, the gastric protection and the macroscopic, microscopic examination of the stomach were analyzed one hour after gastric ulcer induction. The results revealed a significantly reduced ulcer index percentage ($P \leq 0.001$) in the group treated with the aqueous royal jellyextract at 500mg/kg compared to the ulcer control group and the standard group . This attenuation was inversely marked by a highly significant increase ($P \leq 0.001$) in the percentage of gastric protection in the 500mg/kg group compared to the standard group.Macroscopic and microscopic examinations of the stomach in the 150mg/kg and 300mg/kg treated groups clearly demonstrated remarkable attenuation of ulcerative and hemorrhagic lesions caused by the ulcerogenic solution. The results of this study confirm that royal jelly has highly beneficial gastro-protective properties for the future development of new api-therapeutic formulations against gastric ulcers.

Keywords: Royal jelly, gastric ulcer,gastro-protective property, histology, rats.

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BIOLOGICAL ACTIVITIES AND ANTIADHESION EFFECT OF SUB-INHIBITORY CONCENTRATIONS OF *COFFEA CANEPHORA* AND *COFFEA ARABICA* GREEN SEEDS EXTRACTS

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Abstract

Natural compounds from plants have many uses in biotechnology and other sectors. Coffee is widely regarded as the world's second most popular food. Many research studies have found that coffee has biological benefits for humans. In this work, we investigated the antioxidant, antibacterial and antiadhesion activities of *Coffea canephora* and *Coffea arabica* green seeds extracts. The antioxidant activities were assessed using 1,1-diphenyl-2-picrylhydrazyl (DPPH) scavenging and 2,2'-azinobis(3-ethylbenzothiazoline-6-sulphonic acid) (ABTS) assays. The antibacterial activity was tested against three reference bacteria according to CLSI recommendation. The antidhesion activity was tested against three reference bacteria. The n-butanolic extract of *Coffea canephora* green seeds has the highest activity with DPPH (11.31 ± 0.35 µg/ mL) and ABTS (3.96 ± 0.08 µg/ mL) assays. The n- butanol and the methanolic crude extracts of this species show the antibacterial activity against *Staphylococcus aureus* ATCC 25923 strain with MIC_s around fourty µg/mL. At $MIC_s/8$, the extracts of *C. canephora* showed 70% higher antidhesive activity against *Staphylococcus aureus* ATCC 25923. In MICs/8, C. canephora green seeds extracts presented seventy percent antiadhesive action against this strain. The results obtained provide us with a specific natural approach to search for the compounds responsible for these activities

Keywords: *Coffea canephora, Coffea arabica* green seeds, antioxidant, antibacterial, antiadhesion activities.

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SCREENING OF BIOPRESERVATION PROPERTIES OF A LACTIC ACID BACTERIA COLLECTION

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Abstract

Biopreservation is a technology where microorganisms with natural inhibitory compounds as lactic acid bacteria (LAB) are used to extend the shelf life of foods and insure their safety. This research work aims to screen biopreservation properties of bacterial strains belonging to a collection of 79 LAB for future use in biopreservation of seafood products. The strains *Lactobacillus sakei* 92, *L. curvatus* 70, *Pediococcus acidilactici* 10, *P. acidilactici* 96, *Staphylococcus xylosus* 93 and *Carnobacterium maltaromaticum* 550 that could produce bacteriocin-like molecules were tested in challenge-tests on peeled cooked shrimp against the pathogen *Listeria monocytogenes*. LAB and *L. monocytogenes* were enumerated at day 0, day 7 and day 14. An anti-spoilers test was also carried out. Among 79 strain, 13 were selected and tested on cooked shrimp juice against the seafood spoilers *Brochothrix thermosphacta* and *Photobacterium phosphoreum*. Counts were realized at day 0, day 4 and day 7. Results showed that the strains that gave the best inhibitory activities against the pathogen *L. monocytogenes* are *L. sakei* 92 and *C. maltaromaticum* 550. Two *L. plantarum* strains gave the best results concerning the inhibition of the seafood spoilar *B. thermosphacta* : *L. plantarum* 482 and *L. plantarum* 94. For further studies, selected strains could be tested against other seafood pathogens and spoilers and the bacteriocin-like molecules could be characterized.

Keywords: Biopreservation, lactic acid bacteria, bacterial inhibition, bacteriocin-like molecules, seafood spoilers.

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ANTIBACTERIAL POTENCY, AND CHEMICAL COMPOSITION OF TWO ALGERIAN PROPOLIS PROVIDED FROM TWO DIFFERENT *APIS MELLIFERA* SPECIES

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Abstract

Propolis is a mixture of resinous compounds collected by *Apis mellifera* bees from divers plants which is mixed then with salivary enzymes and other substances such as beeswax. This natural compounds exibit numerous biological activities that provide it a large spectrum of applications. The objective of the present work is to determine the total polyphenols, chemical composition by Fourier-transform infrared spectroscopy (FTIR), and test the antibacterial property of two propolis samples provided from two different Apis mellifera species. Methanolic extracts of Algerian propolis showed the lowest phenolic content (3,166- 1,108 µg EAG/g),and the FTIR analyses revealed that two methanolic extracts of propolis have different chemical composition. Moreover, the antibacterial activity demonstrated the antistaphylococcal potency of natural propolis, particularly that collected from Tlemcen; where the MIC value was equal to 0.015mg/ml against *S.aureus* ATCC 43300. To conclude, the chemical composition of these propolis indicate that these samples are sources of bioactive compounds with applications in divers pharmacological preparations.

Keywords: Propolis, *Apis mellifera* species , Algeria, antistaphylococcal potency, FTIR.

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NEUROPROTECTIVE ACTIVITY OF PASSIFLORA EDULIS ON COGNITIVE DEFICITS AND ALZHEIMER DISEASE (Exprimental study in Mice)

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Abstract

Alzheimer's disease (AD) is a neurodegenerative disease that causes progressive death of neurons and irreversible decrease in cognitive functions, and memory loss, The plant Passiflora edulis is known for its health-promoting nutritional value, the objective of our study to investigate the neuroprotective effect of *Passiflora edulis* extract against Alzheimer's disease. The mice were divided into five groups, control group, AD model group was injected intraperitoneally with D-galactose (120 mg/kg) and received the aluminium chloride ($AlCl_3$) (100 mg/kg) orally , the standard group was given donepezil at 1 mg/kg , the both treatment groups , were treated with ketone extract of *Passiflora edulis* at 100 and 200 mg/kg intragastrically. In this parallel protocol model, disease induction and treatment were done at the same time (in parallel) for 70 days, The neuroprotective activity of the plant Passiflora was assessed by memory tests and ultrastructural changes in neurons, which examined using histological studies. Results showed that taking passionflower extract improved memory and prevented changes in the ultrastructure of neurons. Overall, the results suggest that passionflower extract may have positive protective effects against cognitive deficits associated with AD.

Keywords: Alzheimer's disease, mice, neurological tests, *Passiflora edulis*, neuroprotective.

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OPTIMIZATION OF EXTRACTION CONDITION OF *CITRUS LIMON* ESSENTIAL OIL AND DETERMINATION OF CHEMICAL COMPOSITION

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Abstract

In this study, the extraction of essential oils from lemon peels (*Citrus limon*) was carried out by Clevenger type hydrodistillation and analyzed by GC/MS. The response surface methodology (RSM) was adopted to optimize three parameters of extraction process, which include the mass of the lemon peel used (40 to 60 g), the particle diameter (9 to 25 mm) and the heating power (142 to 330 W) to obtain the maximum yield of essential oil. Experimental data obtained from a central composite plane design were fitted to a second order polynomial equation, and showed that a mass of 50 g, cut into pieces of 9 mm diameter and an extraction carried out at 216 W led to a maximal yield. Regarding the ANOVA results of the quadratic model, the adjusted coefficient and the correlation coefficient were 0.966 and 0.985, respectively. A *p*-value less than 0.05 indicates that this model is significant between the experimental and predicted variables and the lack of residual adjustment was not significant ($p = 0.083 > 0.05$). Moreover, the results showed that the particle diameter and the mass have a significant effect ($p < 0.001$) on essential oil extraction yield. Additionally, the results of the GC-MS analysis revealed 24 identified compounds in lemon essential oil, constituting 99.9% of the essential oil, with the main compound being limonene, accounting for 53.88% of total content. Our study proved the high effectiveness of applying the design of experiments methodology for the optimization of operational parameters affecting hydrodistillation.

Keywords: Essential oil, *Citrus limon*, extraction, optimization, CG/MS.

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ANTI-ENZYMATIC ACTIVITIES OF WILD OREGANO ESSENTIAL OIL FROM ALGERIA

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Abstract

The plant *Origanum compactum* is used in traditional medicine the search for new biomolecules with therapeutic effects, led us to carry out a study aimed at analyzing the chemical composition of the essential oil of *Origanum compactum* and release data on its anti-urease and and inhibitory activities of essential oil against anticholinesterase activities. The GC-MS was used to analyse the essential oil of *Origanum compactum*, and inhibitory activities of essential oil against acetylcholinesterase (AchE), butyrylcholinesterase (BuChE) and urease urease were also evaluated. The chemical analysis revealed that the main compounds are carvacrol (53.38%) and thymol (21.16%). The anti-urease activity was revealed with an IC_{50} of 74.52 ± 3.35 µg/ml. *Origanum compactum* essential oil showed anti-AchE (IC_{50} = 103.25 ± 1.86 µg/ml) and anti-BuChE (IC_{50} = 69.89 ± 3.32 µg/ml).
According to these results, the essential oil of *Origanum compactum* is undoubtedly of ethnopharmacological importance; it could be a source of agents with anti-urease and anti-cholinesterase activities.

Keywords: *Origanum compactum*, essential oil, AchE, BuChE, urease.

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CONTRIBUTION TO STUDY THE MACROSCOPIC AND MICROSCOPIC APPEARANCE OF STOMACHS OF ULCERATIVE RATS PRE-TREATED WITH PROPOLIS

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Abstract

The objective of this work is to evaluate the gastro-protective effect of propolis at different doses (PU1:500 mg/kg and PU2: 1000 mg/kg) *in vivo*. The administration of propolis was daily for seven days orally (gavage). On the last day of treatment, the ulcer was induced by an ulcerogenic solution (HCl- ethanol). One hour later, the rats are sacrificed. Immediately after the sacrifice, the digestive juice and the stomach were recovered. The removed stomach is subjected to a macroscopic and histological study.The ulcerated groups pre-treated with the two doses of propolis (PU1 and PU2) had healthy stomachs similar to that of the control group. All treated ulcer groups (PU1 (0.34%), PU2 (0.91%) and LU (12.71)) have very low and highly significant gastric ulceration rates compared to the ulcer group. The groups pre-treated with propolis of different doses (PU1 (99.48) and PU2 (98.71%)) had high gastric ulcer protection percentages similar to that of the control group (C: 100%). as well as much better than thoseof the ulcerated group unpretreated (U: 0%) and pre-treated with Lansoprazole® (LU: 84%).The ulcerative groups pre-treated with propolis (PU1: 500 mg/kg and PU2: 1000 mg/kg) presented a histological appearance very close to that of the control group, where the stomach layers intact with normal thicknesses as well as the absence of extensive oedema and inflammatory infiltrate in the submucosa. Conclude that propolis has an important gastro-protective effect on the macroscopic appearance and histological of the stomach.

Keywords: Propolis, ulcer, gastro-protective, macroscopic, histological, stomach.

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EVALUATION OF THE ANTIOXIDANT ACTIVITY OF THE SPECIES *ARTEMISIA HERBA ALBA*

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Abstract

Until today, and despite the extensive development subject to synthetic chemistry, the medical field still admits the use of so-called medicinal plants. These plants maintain a significant place there, due to their proven effectiveness in various therapeutic procedures [1], [2]. Several secondary metabolites from plants have been found to have antioxidant properties [3]. They have the ability to prevent the toxic effects of oxidative stress by transferring hydrogen, chelating metal ions, or reducing oxygen, for example [4]. Belonging to the *Asteraceae* family, *Artemisia herba alba is* a medicinal plant that is traditionally used for its digestive benefits in the Mediterranean region. These properties have caught our attention and justify the choice we made for this species, aims to gain a better understanding of the biological effects of its metabolites. Our study aims to assess the antioxidant activity of the chloroform, methanol, and ethyl acetate extracts of the aerial parts of *Artemisia herba alba*. We studied the anti-radical power of this plant using various methods (DPPH radical scavenging assay, CUPRAC test, ABTS radical cation scavenging assay). The results obtained for DPPH (IC_{50} = 50.65±1.29 µg/ml), ABTS (IC_{50} = 14.35±0.48 µg/ml), and CUPRAC (IC_{50} = 41.23±1.49 µg/ml) indicate a good antioxidant efficiency of the methanol extract.
The quantitative determination of flavonoids and polyphenols shows the richness of the methanol extract (MeOH) in polyphenols and the chloroform extract in flavonoids.

Keywords: *Artemisia herba alba*, antioxydant, DPPH, ABTS, CUPRAC.

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HISTOLOGICAL STUDY OF PROPOLIS EXTRACT ON RESTORING HEPATIC DYSFUNCTION IN STREPTOZOTOCIN-INDUCED DIABETIC RATS

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Abstract

Diabetes is an incurable disease characterized resulting from metabolic disorder manifested by chronic hyperglycemia. Natural products represent today an alternative to synthetic products with side effects. Considered as the treasure of the beehive, propolis is known for its various therapeutic virtues. For this reason, our research was interested in the *in vivo* evaluation of the antidiabetic effect of propolis extract. Diabetes in the experimental groups was triggered through a sole intraperitoneal (IP) injection of streptozotocin (STZ) at a dosage of 60 mg/kg, excluding the control group (C).One week after stabilisation of hyperglycaemia, a therapeutic period of 21 days was established. Diabetic groups were treated with two doses of the aqueous propolis extract at 150 mg/kg (STZ-P150) and 300 mg/kg (STZ-P300) by gastric gavage. The standard group (STZ-STD) was administered a reference drug, glibenclamide, at a dosage of 5mg/kg, whereas the diabetic control group (STZ-C) was provided with distilled water. After one-week post-therapy, a histological study of the pancreatic, hepatic and renal tissues was performed. Biological parameters were also investigated throughout the experiment, including Body weight change, water consumption and Fasting blood glucose levels. The administration of streptozotocin resulted in a significantly higher ($P \leq 0.001$) In the levels of blood glucose across all diabetic model groups when Evaluated to the control group (C). Nonetheless, by the end of the treatment period, a noteworthy decrease in hyperglycemia was observed within diabetic group treated with an aqueous propolis extract at 300 mg/kg (STZ-P300) in comparison to the diabetic control group (STZ-C). These findings were confirmed by histological examination of pancreatic tissue, which revealed islet restauration in the treated group (STZ-P300). These results suggest a promising antidiabetic potential of propolis, which could probably be explained by the richness in bioactive molecules that this natural source enjoys.

Keywords: Diabetes, propolis, antidiabetic activity, hyperglycaemia, histology, rats.

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DEVELOPMENT OF SOLAR DISTILLATION SYSTEM FOR ESSENTIAL OIL EXTRACTION

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Abstract

The volatile nature of essential oils depends on technique used for extraction, and some of these methods pose problems for thequantity and/or qualityof oils produced, energy consumption, and the environment. This is why an innovative extraction method has been developed. Consequently, The objectives of this research were to develop an alternative essential oil extraction system using solar energy to fuel the process, following the concept of steam distillationand to determine its experimental performance. This solar distillation system for essential oils was developed at the Laboratory of Saharan Natural Resources, University of Ahmed Draia Adrar, Algeria. It consists of an insulated box with a transparent glass lid, a pot with a perforated grill, a condenser, and an essential oil recovery bottle. distillation tests were carried out in June 2023. Experimental data such as extraction time, yield, and density were recorded. The results indicated that around 60% oil was obtained in the fourth hour of distillation, while the other 40% was extracted during the last two hours of distillation. Additionally, it was found that it took 6 hours to extract the oil within the solar system, with a yield of 0.97%. In conclusion, this innovative system, which relies on a sustainable energy source, can achieve comparable levels of oil extraction efficiency as other methods, helping to limit environmental pollution problems and decrease the energy needs of developing countries. Consequently, further study is needed into extremely effective solar distillation for extracting essential oils.

Keywords: Adrar, essential oil, extraction time, solar distillation system.

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REINFORCEMENT OF A YOGHURT BREWED WITH FLOUR FROM DATES OF THE "DEGLA EL-BEIDA" VARIETY: EFFECTS ON PHYSICO-CHEMICAL, MICROBIOLOGICAL AND ORGANOLEPTIC QUALITY

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Abstract

The objective of the work was reinforce the standard stirred yoghurt with the main compounds beneficial to the health of dates of the Degla-Elbeida variety harvested in Biskra-Algeria, and to monitor the impact on variations in product quality during a 21-day cold storage period at 4°C. The ground date flour was mixed with stirred yoghurt at concentrations of 0, 5, 10 and 15%. Measurements and controls carried out periodically on the experimental fermented milk trials included pH, Dornic acidity, viscosity, *Streptococcus thermophilus* and *Lactobacillus bulgaricus* counts, as well as aftertaste, stickiness, colour and odour. It is possible to produce a stirred yoghurt enriched with up to 15% DeglaElBeida date flour with, compared with the control, a number of *Streptococcus thermophilus* and *Lactobacillus bulgaricus* germs meeting the normal 106 live germs/ml, a relatively higher acidity, but still below the accepted standard of less than 150°D up to the 14th day of cold storage, a more or less improved viscosity and a very acceptable organoleptic quality from the point of view of the sensory criteria sweet taste, aroma and colour.

Keywords: Flour, dates, Degla El Beida, stirred yoghurt, quality, storage.

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STUDY OF THE ANTIBACTERIAL EFFECT OF HONEY FROM ZIZIPHUS LOTUS L. AGAINST INTESTINAL INFECTIONS CAUSED BY BACTERIA

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Abstract

Honey is the miraculous ingredient that has baffled scientists due to its composition and how it is produced by bees. Honey has many therapeutic properties, including eliminating bacteria and resulting infections. The present study was aimed to prove the antibacterial effect of *Ziziphus lotus* honey on the intestinal infection caused by *Escherichia coli*, we obtained zones of inhibition from 8 to 43 mm by following the well diffusion method with different concentrations of honey (100%, 50%, 25%, 12.5%, 6.25%). We obtained zones of inhibition from 10 to 45 mm by following the disc diffusion method, and we acquired a percentage of inhibition from 35% to 98% with spectrophotometry method. We noted that the spectrophotometric method was the most accurate. The conducted study proved that *Ziziphus lotus* honey is effective in eliminating intestinal infections caused by *Escherichia coli* bacteria.

Keywords: Honey, *Ziziphus lotus*, *Escherichia coli*, intestinal infections.

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CORRELATION BETWEEN PHENOLIC COMPOUNDS AND ANTIOXIDANT ACTIVITY OF *TEUCRIUM POLIUM* L.

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Abstract

Teucrium polium L. (family Lamiaceae) is used to treat various pathologies such as gastrointestinal troubles, inflammation, diabetes and rheumatism. This study was aimed at determining the phenolic profile and antioxidant potential of petroleum ether, dichloromethane and methanol extracts obtained from the aerial parts of this plant. Spectrophotometric and LC-MS analyses were carried out to determine the phenolic profile of every extract. Antioxidant activity was determined by diphenyl-2-pycril hydrazil (DPPH). Results revealed that the methanolic extract had the highest phenolic content and antioxidant activity. The highest correlation coefficients were also found in the methanolic extract,, probably due to the higher content of phenolic compounds.

Keywords: *Teucrium polium* L., phenolic compounds, DPPH, LC-MS, antioxidant activity.

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CHEMICAL COMPOSITION AND INSECTICIDAL PROPERTIES OF *EUCALYPTUS RADIATA* ESSENTIAL OIL AGAINST CULEX PIPIENS LARVAE

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Abstract

Mosquitoes are recognized as carriers of significant human diseases, including malaria, yellow fever, West Nile virus, dengue, Chikungunya, and Zika. The current study seeks to assess the larvicidal impact of Eucalyptus radiata essential oil on Culex pipiens mosquito larvae. The essential oil was obtained through the steam distillation method. The chemical composition of the essential oil was examined using gas chromatography, and the toxicity of Eucalyptus radiata essential oil was assessed against fourth-instar Culex pipiens larvae following the laboratory procedures outlined by the World Health Organization. The essential oil yield was 1.12%. Gas chromatography analyses revealed thirty compounds in Eucalyptus radiata essential oil, with only five identified, including viridiflorol (5.20%), globulol (0.74%), piperitone (0.37%), and Guaiol (0.27%). The larvicidal assay demonstrated that Eucalyptus radiata essential oil exhibited insecticidal activity against the fourth instar larvae of Culex pipiens, with LC50 at 71.82 ppm and LC90 at 111.14 ppm after a 48-hour exposure. The study verified the toxicological impact of Eucalyptus radiata essential oil on mosquito larvae, suggesting its potential as a robust source for developing natural larvicidal agents and bio-insecticides in the context of pest and insect vector control.

Keywords: Plant essential oil, larvicidal activity, *Eucalypltus radiata*, toxicity.

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PREVENTIVE EFFECT OF PROPOLIS IN AN ANIMAL MODEL OF METABOLIC SYNDROME

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Abstract

The metabolic syndrome (SM) is a pathological entity that corresponds to the association of several metabolic disorders including three factors out of five in the same individual that together raise the risk of coronary heart disease, diabetes, stroke. It is a real public health problem because it presents a growing challenge in term of prevention and treatment. Propolis is a resinous substance collected by bees, rich with polyphenol known since antiquity for its countless therapeutic benefits including anti-inflammatory antioxidant, antiviral, antibacterial and antifungal properties objectie of this work was to evaluate the effect of propolis in an animal model of SM induced by cafeteria diet in swiss mice In order to achieve this objective, 21 male SWISS mice were used and assigned into three groups to receive: standard laboratory diet (RS) n= 7, cafeteria diet (CAF) n=7, cafeteria diet supplemented with propolis (CAF+ Pro) n=7, for 9 weeks. During the experiment, animal growth was monitored via weekly weighing and dieteary intake was assessed daily. At the end, blood was collected by retro-orbital puncture, after sacrifing the animals liver, kidney, epididimal and perirenal adipose depots were collected then weighted and snap frozen until use serum total cholesterol (TC), triglyceride (TG), HDLc and C reactive protein (CRP) were determined by enzymatic methods. The results obtained show that the CAF diet induced a highly significant increase in body weight, adiposity index, serum CT, TG, and LDLs levels as well as CRP compared to the (RS) group. Propolis supplementation significantly reduced the body weight of mice and leads to an improvement in the serum lipid profile by attenuating significantly hypercholetrolemia, hypertriglyceridemia and reduced the concentration of CRP. These results suggest that propolis supplementation display beneficial health effects by lowering lipid levels and anti-inflammatory properties suggesting a reduction in cardiometabolic risk

Keywords: Metabolic syndrome, cafeteria diet, propolis, metabolic disease.

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ALLERGY TO FICUS ELASTICA ROXB. EX HORNEM: ABOUT A CASE OF AIRBORNE CONTACT DERMATITIS IN AN ADULT

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Abstract

Introduction: Ficus (Moraceae) is a large pantropical genus with over 800 species worldwide. In Algeria, several Ficus species are grown for ornamental purposes, notably *Ficus elastica* Roxb and Hornem. Unlike *Ficus carica* and *Hevea brasiliensis*, recognition of the allergenic effect of ornamental Ficus species is recent and poorly documented. We report the case of a patient suffering from airborne contact dermatitis caused by *F. elastica* grown near her bedroom window.

Observation: A 37-year-old woman presented to the toxicology department of Oran University Hospital. This woman had been complaining for several months of dermatitis associated with an occasional respiratory allergy frequent during the summer months. The evolution was favorable after eviction of the plant and treatment.

Discussion: The latex of the Ficus genus is secreted by branched, non-articulated laticifers, and consists of low- Ficus latex is secreted by non-articulated branching laticifers, and consists of low-molecular-weight compounds (polyphenols, alkaloids, terpenoids and coumarins) as well as high-molecular-weight protein molecules constituting IgE-dependent thermolabile allergens. It is likely that these allergens, transported by the laticifers, are deposited on the surface of the leaves, attaching themselves to dust particles dispersed in the area and causing the patient's symptoms.

Conclusion: Allergic contact dermatitis is frequently localized to the hands following direct contact with Ficus, however the allergen can be airborne and cause distant affections.

Keywords: *Ficus elastica* Roxb et Hornem, airborne dermatitis, latex.

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EVALUATION OF PHYTOCHEMICAL COMPOSITION AND ANTIMICROBIAL PROPERTIES OF EXTRACTS FROM TWO ASTERACEAE SPECIES GROWING WILD IN SOUTH-WEST OF ALGERIA

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Abstract

The present study investigates the chemical composition, the antimicrobial activity, and the synergistic effect of two medicinal plants: *Cotula Cinerea* and *Cotula anthemoides*, widely present in southwestern Algeria (Wilaya of Bechar), both used in traditional medicine in desert areas. *Cotula cinerea* and *Cotula anthemoides*, two morphologically similar Saharan herbs but with different medicinal properties are often confused. The chemical analysis of the two plants revealed the presence of secondary metabolites in the two plants: there is a strong presence of tannins, flavonoids, reducing compounds, coumarins, and free quinines. A moderate presence of saponosides in *Cotula anthemoides*. A low presence of alkaloids in *Cotula Cinerea*.

The study of the biological efficacy of extracts from the two plants identified antimicrobial activity on four bacterial strains: *Enterococcus faecalis, Staphylococcus aureus, Escherichia coli,* and *Bacillus subtilis*, and three fungi: *Aspergillus flavus, Fusarium oxysporum* f. sp. *albedinis* and *Aspergillus ochraceus.* Moreover, the synergistic effect of these plant extracts in combination with bacterial growth *in vitro* was also evaluated in this study. The results obtained showed that the strains tested had a variable sensitivity to the extracts and the concentration zones: inhibition of 8 to 23 mm of *Escherichia coli*, 18 to 28 for *Staphylococcus aureus*, 15 to 26 mm for *Enterococcus faecalis*, and from 8 to 23 for *Bacillus subtilis.*

The results of the synergistic effect on the strains tested showed that it has significant efficacy on three strains of bacteria: inhibition of 28 mm for *Escherichia coli,* 37.8 mm for *Enterococcus faecalis,* and 26.4 mm for *Bacillus subtilis.* inhibition from 7 to 26.3 mm for *Aspergillus flavus*, from 7 to 26 for *Aspergillus ochraceus*, and from 28 to 10 mm for *Fusarium oxysporum* f. sp. *albedinis.*

Keywords: Medicinal plants, Asteraceae, phytochemical screening, antimicrobial activity, synergistic effect.

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IN VITRO EVALUATION OF THE ANTIMICROBIAL EFFECT OF CITRUS ESSENTIAL OILS

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Abstract

The Algerian plant biodiversity is very well known for its superior quality and selective production of citrus fruits. The most commercialized are oranges, mandarins, lemons and many others; and are present as fruit, juice or sold as essential oils. In favor of its terpenic compounds with preservative properties of perishable food products; the oil extracted from the various part of the fruit and obtained by different techniques; is the subject of many research to take advantage of these virtues. This work consists of the study of the antifungal properties of mandarin volatile essence , orange and lemon; in order to substitute the use of chemical additives harmful to human health. The research was conducted by evaluating the antifungal effect of essential oils extracted of different varieties of citrus; against yeasts namely: *Candida albicans, Candida tropicalis, Candida parapsilosis*, and *Candida glabrata*. Following the agar diffusion method, followed by the estimation of the minimum inhibitory concentration and finally the confirmation of the antifungal effect by the determination of the minimum fungicidal concentration.

The qualitative and quantitative overview of inhibition of different varieties of essential oils established a variable antifungal power depending on the tested citrus species.The quantitative estimation of the same product allowed to deduce variable inhibitory concentrations according to the tested fungal species. The present study has affirmed following an *in vitro* evaluation; the presence of an antifungal power of the essential oil, so this natural substance will be able to assure the total inhibition of the tested yeast species. These results obtained must be achieved by a second test in order to invest the incorporation of this ingredient to a perishable food product with the purpose to increase its shelf life.

Keywords: Citrus, essential oils, *in vitro*, antifungal, *Candida*.