The 15th International Congress of the International Society for Ethnopharmacology

05-08 May, 2015, Petra Panorama Hotel
Petra – Jordan

Abstract Book
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يتحمل المؤلف كامل المسؤولية القانونية عن محتوى مصنفه ولا يعيّن هذا المصنف عن رأي دائرة المكتبة الوطنية أو أي جهة حكومية أخرى.
The 15th International Congress of the International Society for Ethno-Pharmacology

May 2015

Dear Delegates at the 15th ISE Congress

It is a very great pleasure for us as President of the International Society for Ethnopharmacology and the Chairman of scientific and organizing committees to welcome you to our 15th International Congress of the International Society for Ethnopharmacology in Petra, Jordan. It is the first time the ISE is holding a congress in the Middle East, and we hope this will be a way to highlight and support the many scientists in the Middle East working on ethnopharmacology, and to foster stronger interaction and collaboration between scientists here and in the rest of the world. Journal of Ethnopharmacology is considering publishing a special issue on ethnopharmacology from the Middle East and Northern Africa.

Ethnopharmacology as a field is growing and with the new technologies available we have the tools to provide scientific evidence for traditional medicine and practice. It is good if ethnopharmacologists all over the world apply their skills to improve traditional medicine and thereby the treatment of patients.

This congress is a result of your participation, and the effort of members of the steering and executive committees. Not only this, it is also a result of partners public and private Jordanian as well as international institutions that contributed to the success of the congress. We hope that we will have a wonderful Congress, with interesting science and good friendship, new and old.

Once again, we welcome you in the Hashemite Kingdom of Jordan. A country full of love, goodness and peace.

Anna Jäger
ISE President

Mohammad Sanad Abu-Darwi
Chairman
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INVITED SPEAKERS

- Prof. Dr. Abdel Omri / Director of Drug and Vaccine Delivery Systems Facility, Laurentian University, Canada. "Antimicrobial activity of Ginseng". http://laurentian.ca/faculty/aomri.

- Prof. Dr. Alain Meybeck / AM Phyto-Conseil, France. "Natural Products in Cosmetology".

- Prof. Dr. Alain Touwaide / Scientific Director of the Institute for the Preservation of Medical Traditions, Washington, DC, USA. "The Historical Arabic Achievement: From Inherited Knowledge to New Developments". http://medicaltraditions.org/institute/people/directors.

- Prof. Dr. Anna K. Jager / Faculty of Health and Medical Sciences, University of Copenhagen, Denmark. "Herbal products for management of type-2 diabetes". http://research.ku.dk/search/profile/?id=321817.

- Dr. Caroline Weckerle / Institute of Systematic Botany, University of Zurich, Switzerland. "Interrelations of plants and people: the influences of environment and cultural plant use". http://www.systbot.uzh.ch/Personen/ProfessorenundDozenten/CarolineWeckerle.html

- Prof. Dr. Cristina Pereira Wilson / School of Sciences, Department of Biology, University of Minho, Portugal. "Traditional and modern herbal medicinal products in treatment of cancer". http://www.bio.uminho.pt

- Prof. Dr. Dirk Selmar / Institute of Plant Biology, Technische Universität Braunschweig, Germany. "Horizontal Transfer of Natural Products: An important source of contaminations of plant phytopharmaceuticals and plant derived commodities". https://www.tu-braunschweig.de/ifp/selmar

- Prof. Dr. Fatma Afifi / Faculty of Pharmacy, University of Jordan, Jordan. "Traditional Arabic Herbal Medicine in the 21st century: Importance in the treatment of chronic diseases". http://www.ju.edu.jo/sites/academic/fatueafi

- Prof. Dr. Geoffrey A. Cordell / Ph.D. Professor Emeritus, University Illinois, Adjunct Professor, Univ. Florida, and President, Natural Products Inc., USA. "Ecopharmacognosy and the Globalization of Traditional Medicines". http://foto.pharm.uic.edu/mcp/people/cordell_ga.html


- Prof. Dr. Ian Cock / Biomolecular and Physical Sciences, Nathan Campus, Griffith University, Australia. "Selection of Australian plants for medicinal testing:"
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- Prof. Dr. Jacobus Nicolaas Eloff, University Pretoria A comparison of products with commercial potential in enhancing animal production based on ethno-vet information and random selection of plants. www.up.ac.za/phyto


- Prof. Dr. Mohammed Hhamouchi/ Arab Federation Aromatic and Medicinal Plan Morocco. Arab-European intercultural ethnopharmacology. http://fapam.um5s.ac.ma/

- Prof. Dr. Muriel Cuendet / Faculty of Science, Univ. of Geneva, Switzerland"HDA inhibitors from nature for cancer chemoprevention. http://www.unige.ch/sciences/pharm/fatho/static/Staff/pages-perso/cuendet.php?id=504

- Prof. Dr. Pulok K. Mukherjee / School of Natural Product Studies, Jadavpur Unive India"Evidence Based Validation of Indian Traditional Medicine Way Ft http://www.jaduniv.edu.in/htdocs/newindex.htm

- Prof. Dr. Rudolf Bauer / Institute of Pharmaceutical Sciences, University of Graz, Austria. Arab-European intercultural ethnopharmacology. http://www-classic.uni-graz.at/phgwww/bauer-englisch.htm

- Prof.Dr. Thomas Efferth / Dep. of Pharmaceutical Biology, Johannes Gutenberg University Mainz, Germany"Molecular mechanisms of medicinal plants from North and Near East". http://www.pharmazie.uni-mainz.de/Ak-Efferth/index.php

- Prof. Vincenzo De Feo/ Professor of Medical Botany, University of Salerno, Italy."Ethnobotanical approach to drug discovery: strengths and limitatic http://www.unisa.it/docearti/vincenzodefeo/index

WORKSHOPS

1- Scientific Writing Workshop: (Dr. Michael Heinrich / University of London

2- Kew-led Workshop: The usefulness of Kew’s Medicinal Plant Names Services to Pharmacologists and related disciplines. (Dr. Elizabeth Dauncey (Liz) / Medicin Names Services, The Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AB, UK.
Natural Molecules, Tryptophan Metabolism and their Applications in Neuroprotection for Brain diseases

**Invited Speaker** Dr. Guillemin G.J.

**Castellano-Gonzalez G.**, *Braidy N.*, *Lim C.K.*, *Essa M.M.* and *Guillemin G.J.*

1 Neuropharmacology group, MND and Neurodegenerative diseases Research Centre, Macquarie University, Aus.  
2 Centre for Healthy Brain Ageing, School of Psychiatry, Faculty of Medicine, University of New South Wales, Australia.  
3 Dept. of Food Science and Nutrition, College of Agriculture and Marine Sciences, Sultan Qaboos University, Oman.  
4 Ageing and Dementia Research Group, Sultan Qaboos University, Oman.

**Abstract:** The major degrading biochemical pathway of tryptophan is the kynurenine pathway (KP), which can be further metabolised by Kynurenine 3-Monoxygenase (KMO) to 3-Hydroxykynurenine (3-HK) Quinolinic acid (QA), or by Kynurenine Amino Transferase (KAT), to Kynurenic acid (KYNA). QA N-methyl D-aspartate (NMDA) receptor agonist, and 3-HK, a free radical generator and they are neurotoxic and both have been found increased in the brain of Alzheimer patients. Conversely, KY neuroprotective against QA-induced neuronal cell-death. Therefore, the enzymes KMO and KAT play an important role on the balancing of neuroprotective vs. neurotoxic KP metabolites. This study has screened a collection of natural compounds for their ability to regulate different KP enzymes, mainly to inhibit KMO activity, which will not only decrease the production of neurotoxic metabolites, but also increase the neuroprotective KYNA. We have previously shown that the KP is over activated in AD brain and the accumulates in amyloid plaques and within dystrophic neurons. We also demonstrated that QA increases tau phosphorylation and other showed it also increases amyloid plaque formation. We also recently demonstrated the QUIN accumulates in the substantia nigra of Parkinson patients. Primary cultures of human astrocytes, as the main source of KYNA within the brain, were used to examine the activity of natural compounds in KYNA production. Tryptophan, Kynurenine and KYNA were quantified by HPLC and GC/MS. Primary cultured human macrophages, which express all KP enzymes, will be used to assess KMO activity and 3-HK will be quantified using a newly developed method by GC/MS. EGCG, the major catechin of green tea, has shown to increase the production of KYNA in human primary astrocytes, whereas Curcumin and Pomegranate extracts, decrease KYNA but increase Kynurenine, which is implicated in immuno-tolerance. Further studies with Curcumin and Pomegranate for its possible anti-inflammatory activity will be done in macrophages. In conclusion, the identification of a novel combination of non-toxic molecules targeting KMO and with activity in macrophage derived cell phenotype may lead to new therapeutic strategies to treat neurodegenerative diseases such as Alzheimer’s disease, Parkinson disease and other neurodegenerative diseases.

**Keywords:** Alzheimer’s, curcumin, epigallocatechin, kynurenine pathway, Parkinson’s, polyphenols.

Ergosterol Found in Mushrooms and Yeast is an Antioxidant Substance Useful for Cosmetics

**Invited Speaker** Prof. Dr. Meybeck, Alain

AM Phyto-Consul. 20ter rue de Bezons, 92400 Courbevoie. France.

**Ergosterol Found in Mushrooms and Yeast is an Anti-Senescence Compound Useful for Cosmetics**

Cells which have lost irreversibly their ability to divide while remaining viable, are called senescent. The role they play in ageing is thought to be important, not only because cells which do not replicate themselves cannot participate in tissue renewal, but also because senescent cells secrete enzymes, pro-inflammatory cytokines, or growth factors, which exert negative effects on their environment. UVB stress induced premature senescence in human keratinocytes has allowed to show that pre-treatments with Vitamin D as well as its precursors 7-dehydrocholesterol and ergosterol can prevent the appearance of senescent cells characters by the expression of the senescence associated beta-galactosidase. Baker’s Yeas Mushrooms such as Poria, Ganoderma, Cordyceps, Polyporus, or Agaricus all contain ergosterol, a special ergosterol rich fractions could be developed for anti-senescence skin care cosmetic products.
Extracts of *Microsorum scolopendria* Could be Used as New Anti-Aging Cosmetic Active Ingredients

A study was undertaken in order to determine whether extracts of the Polynesian plant Metua Pua’a have interesting activities on skin. Metua Pua’a is the local name of *Microsorum scolopendria*, which is a very popular medicinal plant in Tahiti. The total extract of *Microsorum s.* up-regulates Heme Oxygenase 1, an enzyme which protects cells from oxidative stress and which exerts several other activities like the photoimmunoprotection of skin by UVA through the liberation of carbon monoxide CO. Moreover, the ecdysteroid fraction of *Microsorum s.* completely protects BJ dermal fibroblasts from stress induced premature senescence. It seems therefore that extracts or fractions of extracts of *Microsorum scolopendria* could protect skin against oxidative stresses and that they could be used to formulate better anti-aging cosmetic products.

*Hippophae rhamnoides* Winter Twigs Extracts Could Lighten Skin Pigmentation

It has been found that *Hippophae rhamnoides* winter twigs extracts have the highly valuable property to inhibit pigment formation in skin cells. Different extracts and fractions were submitted to special tests on cultures of melanocytes (epidermal pigment producing cells) which allow to evaluate the amount of melanin pigment synthesized. The active molecules of the extracts seem to be indole derivatives.

**Keywords:** Anti-aging, cosmetics, *Hippophae rhamnoides*, *Microsorum scolopendria*, mushrooms, natural products, skin pigmentation.
1.1. Cytotoxic and Cytostatic Activity of Asparagus Aphyllus, Crataegus Aronia and Ephedra in Hepatocytes and Thp-1-Derived Macrophages in Mono- and Co-Cultures In Vitro

Abdalsalam Kmail1,2, BadiaaLyousse1, Hilal Zaid1 and Bashar Saad1

1Physiology-Pharmacology, University of Fez, P.O.Box 1796 Fez Atlas, Fez, Morocco. 2Qasemi Research Center- Al-Qasemi Academic College and Faculty of Arts and Sciences, Arab American University & P.O.Box 240, Jenin, Palestine.

Abstract: Based on knowledge from traditional Greco-Arab herbal medicine, this in vitro study aimed to evaluate cytotoxic and cytostatic effects of three traditionally used anti-diabetic and anti-cancer medicinal plants in human THP-1-derived macrophages, HepG2 cells and their co-cultures using MTT assay; LDH assay. Cells were treated for 24h (cytotoxic effects) and 72h (cytostatic effects) with increasing concentrations (0-1000 µg/ml) of water extracts from Asparagus aphyllus (AA-extract), Crataegus aronia (CA-extract), and Ephedra alata (EA-extract). No significant cytotoxic effects were seen with the CA-extract three extracts up to concentration of 500 µg/ml. A slight cytotoxic effect was observed with CA-extractin HepG2 mononucleuses at concentrations higher than 500 µg/ml. Significant cytostatic effects were measured with CA-extract and EA-extract in mononucleuses and co-cultures. The cytotoxic activity of the extracts was more potent in co-cultures reaching IC50 of 178 µg/ml and 380 µg/ml for CA-extract and EA-extract, respectively. These results indicate that the traditionally known anti-cancer effects of extract and EA-extract might be mediated in part through cytostatic effects.

Keywords: Asparagus aphyllus, Crataegus aronia, cytotoxic, cytostatic, Ephedra alata.

1.2. Antimicrobial and Antioxidant Activities of Scandix australis

Ustundag M.1, Aydin B.1, Karabaek O.1, Ayik Leyla1

1Gazi University, Faculty of Science, Department of Biology, 06500, Ankara. 2Gazi University, Polatli Faculty of Science and Literature, Department of Biology, 06900, Ankara, Turkey.

Abstract: Genus Scandix, belong to Apiaceae family, is represented by eight species and nine taxa in Turkey. The aim of this study is to evaluate the antimicrobial and antioxidant activity of ethano methanol extracts of Scandix australis. Antimicrobial activity of the extracts were analysed by agar diffusion method against nine bacterial and three fungal pathogen microorganisms. In addition, the extract was subjected to in vitro antioxidant activity evaluation by the 2,2-diphenyl-1-picrylhydrayzyl (DPPH) scavenging, iron chelating methods and total phenolic contents. The extracts were shown antimic activity against Bacillus cereus NRRL B-3711, Bacillus subtilis ATCC 6633, Staphylococcus aureus ñ 25923, Pseudomonas aeruginosa ATCC 27853 and Enterococcus faecalis ATCC 29212 (inhibition diameters 11-18 mm). IC50 values of methanol and ethanol extracts were 79.90 ± 6.68 and 98.53 ± 3.56 µg/ml in DPPH radical scavenging activity; 0.63 ± 0.04 and 9.33 ± 0.51 mg/ml in ferrous ion chelating activity, respectively. Total phenolic contents of the methanol and ethanol extracts were found to be 74.38 ± 3.36 mg equivalent of gallic acid per g of extract, respectively. The tested plant showed promising antioxidant activity.

Keywords: Antioxidant activity, Bacillus cereus, Pseudomonas aeruginosa, Scandix australis.

1.3. In Vivo Evaluation of Hepatoprotective, Antiasthmatic and Antiallergic Activities of Methanolic Extracts of Leaves of Hyoscyamus albus L. (solanaceae) and Umbilicus rupestris L. (crassulaceae)

Afaf Benhouda, Mouloud Y., Hachani K., Nassiba C., Hadjar B., Souhila B. and Djahid

Biotechnology’s Laboratory of the Bioactive Molecules and the Cellular Physiopathology, Departme. Biology, University of Batna. 1Laboratory of Anapathology, university hospital center Chu, Batna, Alg
Abstract: Our objectives were to investigate the anti-hépatotoxique activity against a chemical pr which is CCL4 and to test the antiasthmatic activity by histamine and the antiallergic activity by mi the extracts of the leaves of H. albus and U. rupestris. The qualitative analysis revealed that HAM and URMeOH are rich in alkaloids, terpenoids and the flavonoids and polyphenols. The results c hépatoprotectif effect of the extracts HAMEOH and URMeOH against the CCL4 showed that extracts generate aeduction in a significant way (P≤ 0.05) of biochemical parameters TGO, TGP, ALP, BT as well as the quercetin which was used as standard which decreased in a significant way (P≤ these parameters. The histological study shows the presence of necrosis, cells infiltration and congestion of the centrolobulaire vein in group of CCL4 where necrosis it is absent at the other g treated except that of URMeOH (100mg/kg b.w.). The results of the antiasthmatic activity showe the protective effect of extracts is maximum after 4 hours of treatment against histo where (65%) of HAMEOH (100mg/kg), (72%) of HAMEOH (200mg/kg), of (63%) of URM (100mg/kg) and of (73%) of URMeOH (200mg/kg). The results of the antiallergic activity sh that there is a significant reduction (P≤0.05) in leucocytes count of HAMEOH (100mg/kg); (10.23±2.027), of HAMEOH (200mg/kg) group (8.8±0.8287), of URM MeOH (100mg/kg); (10.5±1.398), of URMeOH (200mg/kg) group (9.8±0.7071) and of group treated with dexametha (8.475±1.127) compared to the control which presents (15.2±1.643).

Keywords: Antiallergy, antiasthmatic, antihepatotoxic, Hyoscyamus albus, Umbilicus rupestris, meta

1.4. In Vitro Antimicrobial Activity of Some Medicinal Plants Grown In Jordan

Ahmad, H. Al-Gabbisheh
Al-Balq'a Applied University, Department of Allied Medical Sciences, Zarka University College, Zau Jordan.

Abstract: The resistance of microorganisms to conventional antibiotics has necessitated the searc efficient and cost effective alternative compounds any for treating infectious diseases. Plant essentia are potential sources of novel antimicrobial compounds. The present study aimed at evaluating the in antimicrobial activity of methanolic extract of some medicinal plants against gram-positive and negativa bacteria was evaluated using the traditional well diffusion method. The chemical compositic the essential oils derived from Laurus nobilis, Mentha spicata, Thymus piperrilla, Avena sativa, Orin syriacum, Teuericum polium, Allium cepa and Aloe vera grown in Jordan were characterized by Chromatographic analysis. The methanolic extract of Mentha spicata presented the highest anti-activity and was effective against all bacterial strains tested; while the extraction of Origanum syri exhibited no antimicrobial activity against gram-negative bacteria used.

Keywords: Antimicrobial activity, metahanolic extract, plant oil.

1.5. Toxicological Evaluation of Moringa oleifera Seeds and Leaves in Wistar Rat

Ajivy, Temitayo1, Moody J.1 and Akintayo, C.2
1Department of Pharmacognosy, Faculty of Pharmacy, University of Ibadan, Nigeria. 2Department of Physiology, College of Medicine and Health Sciences, Afe Babalola University, Ado-Ekiti, Nigeria.

Abstract: Miracle tree (Moringaoileifera) as it is popularly called, has been found useful both medic and economically, and so its consumption both as raw and as other preparations have increased a g and has made the fast growing plant a highly valued and cultivated one in the tropics and sub-tropi with little reference to its toxicity profile and evaluation. Hence, this study evaluated the toxicity prof the leaves and seeds of M. oleifera and the corresponding effects on vital organs of animal model usi Biochemical, Heamatological and Histopathological indices. Daily doses of 100, 200, 400 and 1000 mg body weight of crude methanol extracts of M. oleiferal leaves and seeds were administered orally to 8 g of 5 rats per group each including 2 control groups of 5 rats per control group for 28days. Haematolog Biochemical and Histopathological indices were evaluated by standard methods. Data were analyzed one way analysis of variance and statistically significant difference was considered at p<0.05 or 0.01. Histopathological changes were observed in the heart, liver, lungs, spleen and kidneys of rats tr with the extracts at all doses tested. Some noticeable physical changes like agitation, confusion disorientation were observed at the highest dose tested (1000 mg/kg) of the seed extract. A signifi increase (p<0.05) in neutrophil, White blood cell (WBC) and platelet were observed, however, w significant decrease in Aspartate amino transferase (AST), Alanine amino transaminase (ALT), All
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phosphatase, (ALP) was also observed. The results suggested that the leaf and seed extracts of *moringa oleifera* could boost immunity and offer hepatoprotective effects.

**Keywords:** Biochemical and hematological indices, hemolysis, histopathology, *moringa oleifera*.

1.6. Evaluation of Bioactivity of the *Croton lechleri* Müll. Arg. Latex in Microorganisms

Pacheco, S.G¹., Secundino, C.A²., Santos, A.P.A³., Teles, C.B.G⁴., Aleoni, G.⁴ and Capelli, L.⁴


**Abstract:** *Croton lechleri* Müll. Arg. (Euphorbiaceae) consists of large trees with beige-gray outer red latex, simple and alternate leaves, beige flowers in racemes and yellow-green fruits. It is distributed in the northwest of the South American continent, in altitudes that range from 100 to 2,500 m; being fou the Amazon rainforest. It is known as "sangha-d’agua" due to the its preference for areas near to water and latex, which is used by Latin American populations to treat ulcers of the digestive system and wounds in general. The latex also has anti-inflammatory, antibacterial and antifungal activity; being an anti-coagulant compound; furthermore, some people use in combating insect bites, rashes and hemorrhoids. According to recent survey, 99% of Brazilian endemic medicinal plants have not yet identified their active compo indicating pharmacological potential to be explored. There are species (including the ones of *Croton g*) which are rich in bioactive compounds with properties of industrial interest (pharmacological antimicrobial). The indiscriminate use of antibiotics increased the resistance of microbial strains consequently, its virulence was enhanced. Therefore, more studies must be carried out in order to: (1) new active ingredients for the manufacture of medicinal products. The aim of this study was to evaluate antimicrobial activity of *C. lechleri* latex. Plant material was provided by Sta. Marcelina, Hospital, Velho, Rondônia state. The antimicrobial activity was determined by agar diffusion method. For the *Staphylococcus aureus*, *Escherichia coli* and *Psuedomonas aeruginosa* and *Candida albicans* were used. The plates were incubated and analyzed in the 24-hour period for bacteria and 48-hours for yeast. The inhibited efficiently the growth of *S. aureus* (ATCC 25923) with halo ca. 18 mm and *P. aeruginosa* (*³* 27853) of 10 mm. The latex showed no activity against the strains of *E. coli* and *C. albicans*.

**Keywords:** Anti-inflammatory, bioactive compounds, *Croton lechleri*, medicinal plant, strains, trees.

1.7. Essential Oil Composition and Bioactivity of Wild *Ziziphora canescens* Benth. Lebanon

Abou Jawdé C.¹., Baydoun S.², and Arnold Nelly¹,²

¹Faculty of Agricultural Sciences and Nutrition, Holy Spirit University, Kaslik, Lebanon. ²Research Center for Environment and Development, Beirut Arab University, Lebanon.

**Abstract:** *Ziziphora canescens* is an aromatic plant that belongs to the Lamiaceae family. As a native of the East Mediterranean region, the plant grows wild and is considered abundant in Mount Her Lebanon. Although the plant is widely used in the Lebanese traditional medicine in the treatment of coughs, stomachaches and other various infectious ailments, no studies have, to date, been conduct prove this popular use. The aim of the study was to analyze the chemical composition of essenti extracted from the aerial flowering parts of the plant and to evaluate its antimicrobial potential. The aerial parts of *Ziziphora canescens* were collected at the flowering stage and hydrodistilled by Clev apparatus for 3 hrs. The yield was evaluated, while the essential oil was analyzed by GC and GC – MS antimicrobial susceptibility was measured by disc diffusion method. The essential oil of the fresh flowering parts of *ziziphora canescens* Benth. yielded 1.5% (w/w) on fresh weight basis. Sixty components accounting for 96% of the total oil were identified. *Eucarvon* (15.57%), 1,8 Cineol (5.18%), *A. Benth.*, *C. lechleri*, *M. argyi* were the major constituent.

The antimicrobial activity and the Minimum Inhibitory Concentrations (MIC) of the essential oils determined against Gram-positive and Gram-negative bacteria as well as fungi. The bioassays showe the oil exhibited moderate to high antimicrobial activity. The results presented in this study may suggest the essential oil of *ziziphora canescens* Benth. Possesses antimicrobial properties and therefore, c
used as a natural antimicrobial in the treatment of various infectious diseases caused by bacteria and as well as a substitute of commercial antibiotics.

Keywords: Essential oil, cineol, germacrene, Lebanon, Ziziphora canescens.

1.8. Antimicrobial Activity of *Thymus vulgaris* Extracts on *Acinetobacter baumannii* Isolates from Iraqi Patients

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**Abstract:** Three hundred and fifty samples were collected from Baghdad Teaching Hospital/Medical. The sample included a mid stream urine from patients with urinary tract infections, swab from wound and burn inflammation, and blood samples were taken from patients suffering from septicemia. Twenty *Acinetobacter baumannii* isolates were obtained. These isolates were identified by using microscopic examination, biochemical tests, and Api 20 E system. The antibiotic sensitivity were studied to the thirteen antibiotics which were: (Ampicillin, cefotaxime, Cefteriaxone, Cephalexin, Gentam Trimethoprim, Pipracillin, Cepfime, Ciprofloxacin, Cefazidime, Tetracycline, Aztronan Amikacin). The resistance percentage were: Ampicillin (92%), cefotaxime (88%), Cefteriaxone (84%), Gentamicin (84%), Trimethoprim (76%), Pipracillin (76%), Cefepime (t Ciprofloxacin (64%), Cefazidime (60%), Tetracycline (50%), while Aztronan and Amikacin moderate resistance, 48% and 16%, respectively. Some virulence factors of the *Acinetobacter baumannii* isolates were investigated, they failed in the ability to produce protease and lipase, and only ten isolates were detected as bacteriocin producers. Antimicrobial properties of the thymus essential oil on *Acinetel baumannii* isolates was done. Among the three types of thymus extracts tested, cold-water, hot water, and ethanolic extracts, only the ethanolic extract showed antibacterial activity on the growth of *Acinetobacter baumannii* isolates with different concentrations.

Keywords: Ampicillin, antibacterial activity, cephalexin, *Thymus vulgaris*, tetracycline.

1.9. *Mentha pulegium* Essential Oil Against Hospital Strains

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**Abstract:** Plants are very used by the pharmaceutical industry because side effects of drugs so conc users turn to natural treatments. *Mentha pulegium* (pulegium means repulse fleas) is also an aromatic belonging to the family Lamiaceae and widespread in northern Europe, the Mediterranean region and called by locals Fliou, it is a great emmenagogue, digestive, tonic and sudorific, leaves and flowers commonly used to repel insects, but also against colds and flu, reduce asthma attacks, combat feve regulate menstruation, used also in some culinary preparations to flavour sauces, desserts and drinks work focuses on the activity of the essential oil of the plant on hospital strains, for that the extraction done by hydrodistillation, and it revealed an important yield (1.36% w/w). The antimicrobial activity evaluated by aromatogramme against a sample of 130 strains: 102 enterobacterium, 16 staphylococcus, 12 streptococci. The essential oil is moderately active against 83.84% of the strains with ++ (2 cross) i 84.31% sensitive, and resistance of *Pseudomonas aeruginosa*, Staphylococcus aureus: 81.25% sensitive and 66.67% of Streptococci are sensitive. The essential oil of *Mentha pulegium* has good ac against bacteria, with the use of contact method. The yield of essential oil from our plant is important chemical composition published by previous researches of this essential oil and the secondary metabol of Mentha open more possibilities to search for new biological activities.

Keywords: Essential oil, hospital strains, *Mentha pulegium*, pharmaceutical industry.
1.10. Antimicrobial and Antioxidant Effects of *Silene aegyptiaca*

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Abstract: Genus *Silene*, belong to Caryophyllaceae, is represented by 165 taxa in Turkey. The aim of the present study is to establish the antimicrobial and antioxidant properties of methanol and ethanol extracts obtained from *Silene aegyptiaca*. Antimicrobial effects of the extracts were studied by using agar diffusion method against 9 bacterial and 3 fungal pathogen test strains. Antioxidant activities of the extracts were assayed by using ferrous ion chelating and 2-diphenyl-1-picrylhydrazyl (DPPH) scavenging activity. Furthermore, total phenol, β-carotene and lycopene contents of these extracts were also determined. Methanol and ethanol extracts showed moderate antimicrobial activity against only *Bacillus cereus* ATCC 63711, *Bacillus subtilis* ATCC 6633, *Enterococcus faecalis* ATCC 29212 and Klebsiella pneumonia ATCC 13883 strains. IC₅₀ values for scavenging of DPPH radical were 183.34 ± 9.25 (for methanol extract) and 114.46 ± 1.60 (for ethanol extract) µg/ml. For the ferrous ion chelating activity the IC₅₀ values were 4.33 ± 0.19 (for methanol extract) and 3.43 ± 0.11 (for ethanol extract) mg/ml. Total phenolic, β-carotene and lycopene contents were 59.08 ± 2.00 mg GAE/g; 1.267 ± 0.007 µg/g; 0.330 ± 0.003 µg/g for the methanol extract and 102.42 ± 0.52 mg GAE/g; 1.018 ± 0.017 µg/g; 0.612 ± 0.005 µg/g for the ethanol extract, respectively. These results indicate that the extracts of *S. aegyptiaca* could be a potential antioxidant agent source.

Keywords: Antimicrobial, antioxidant, β-carotene, *Silene aegyptiaca*, Turkey.

1.11. Antibacterial Activity of *Centaurea dimorpha* (Asteraceae)

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Abstract: The research interests concerns the chemical composition and some biological activities of the antibacterial agent *Centaurea dimorpha*, an endemic species that belongs to Asteraceae family which is about 1300 genera and 25000 species (Bremer, 1994). The large genus *Centaurea* (Asteraceae) contains about 500 species which are predominately distributed around the Mediterranean area and Western Asia (Mabberlay, 1997). The antibacterial activity of *Centaurea dimorpha* extracts (ethyl acetate and n-B) were determined using disk diffusion method against standard and clinical bacterial strains.

Keywords: Antibacterial, biological activity, *Centaurea dimorpha*.

1.12. The *In Vitro* Antioxidant and Chelation Effect of *Rechardia Picroide* Extract

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Abstract: The present study was conducted to evaluate the antioxidant and chelation effects of *Rech picroide* extracts. The entire plant was submitted to extraction and fractionation using solvents increasing polarity to give crude extract (CrE), chloroformic extract (ChE), ethyl acetate extract (EAE) aqueous extract (AqE). The highest total polyphenols and flavonoids amounts were recorded in CrE (889.56 µg gallic acid equivalent / mg of extract and 102.81 µg quercetin equivalent / mg of ex respectively). Antioxidant activity was evaluated using β-carotene / linoleic acid bleaching, DPPH scavenging and ferrous chelating assays. All extracts (CrE, EAE, AqE and ChE) inhibited considerable carotene oxidation, with significantly similar percentage (88.82 ± 0.35 %, 87.73 ± 0.80 %, 86.71 ± 0.9 85.90 ± 0.33 %, respectively). DPPH scavenging assay showed that EAE exhibited a strong effect with IC₅₀ of 0.008 ± 0.000, followed by AqE and EAE (IC₅₀= 0.045 ± 0.000 and 0.057 ± 0.000 mg for EAE). Moreover, AqE exhibited an excellent effect on ferrous ion chelating (EC₅₀= 0.058 ± 0.003 µg/ml).
was lower than EDTA by only 9-folds, as a standard. However, ChE presented the lowest effect with EC_{50} of 0.642 ± 0.046 mg/ml. These results showed that Rechardia picroide might exhibit a high against peroxidation of lipids and also might be used as a potential source of natural scavenging agent.

**Keywords:** β-carotene, bleaching assay, DPPH scavenging assay, medicinal plants, oxidative stress.

### 1.13. Antioxidant and Antimicrobial Activities of *Mentha Rotundifolia* Essential

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**Abstract:** The objective of this study was the evaluation of the chemical composition, antioxidant and antimicrobial activities of *Mentha rotundifolia* essential oils, a medicinal plant belonging to the Larr family, largely used in Algerian folk medicine. The essential oil extracted by hydrodistillation from aerial parts of the plant using a Clevenger-type apparatus yielded 0.7 % (v/w). This essential oil analyzed by GC and GC/MS, forty three compounds were identified, representing 100% of the essential oil. The major constituent was trans-piperitenone oxide (66.39%). To cross validate antioxidant activity of the essential oils three tests have been carried out, DPPH radical-scavenging (DPPH test), ferric reducing power assay (FRAP), ferrous ion chelating. Concerning the DPPH test, the EC_{50} was 1755± 0.006 µg/ml whereas for the second test the EC_{50} was 1625.5 ± 0.004 µg/ml. However, ferrous ion chelating test showed no activity of the essential oil. This oil seems to have weak antioxidant activity when compared to the standard antioxidant (BHA and EDTA). This is probably due to the nature of the constituents which lack phenol compounds. Antimicrobial effects of the essential oils were evaluated using agar diffusion assay against two chosen clinical isolates, three bacteria and three fungi. The results showed a strong antifungal activity and a moderate antibacterial activity of the Eos.

**Keywords:** Antimicrobial, antioxidant activity, essential oils, GC/MS, *Mentha rotundifolia*.

### 1.14. Extracts of Weeds – A Promising Solution to the Ever Increasing Problem of Drug Resistant Pathogens

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**Abstract:** Plant materials are used globally as home remedies, over the counter herbal drugs and materials for the pharmaceutical industries. They proved to have promising activities against several resistant human pathogens. In the present study, the antimicrobial activity of some common weeds of eastern India, *Lippia nodiflora* and *Clerodendron infortunatum* leaf extracts were assayed against epidemiologically studied most prevalent urinary tract infecting bacteria of Eastern India – *E. coli Klebsiella pneumoniae*. The leaves of both the plants were collected, cleaned and dried before grinding into a coarse powder. Leaf extracts in different solvents, namely, ethanol, methanol, acetone and water were also checked. Minimum Inhibitory Concentrations was measured for each leaf extract. Extracts of leaf powders are screened for qualitative determination of different secondary metabolite phenols, and flavonoids following standard protocols. Their antioxidant activity was also checked using DPPH scavenging activity method and FRAP assay. HPTLC analysis, confirmed presence of common antioxidants. All the leaf extracts exhibited significant inhibitory zone against both the clinical isolates. Antioxidant activity was also strongly significant in both the plant leaf extracts. HPTLC analysis showed presence of quercetin and significant presence of gallic acid in *L. nodiflora*. Further studies on extracts will help in more systemic and proper identification of the potent compounds which on purification will help in better understanding of their pharmacological potentialities. These putative compounds can be utilized for drug designing or drug remodeling and can be an answer to the increase in antibiotic resistant pathogens.

**Keywords:** antimicrobial activity, *Clerodendron infortunatum, E. coli*, leaf extracts, *Lippia nodiflora*.

The 15th International Congress of the International Society for Ethno-Pharmacology
1.15. Rosemary and Eucalyptus Essential Oil – Alternative Drugs for Vaginal Candidiasis

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Abstract: Regarding the post-antibiotic era and problems of prevention or effective treatment of cor

vaginal infections, there is an increasing necessity in the investigation of drugs of natural origin, incl

essential oils. The aim of this study was to screen in vitro antifungal activity of Rosmarinusofficinalis I

Eucalyptusglobulus Labill. commercial essential oils (MeiLab, Belgrade, Serbia) against two vi

isolates of Candida albicans(I and II). Antimicrobial activities of essential oils and standard antib

(cefuroxime, tetracycline, ampicillin and streptomycin) were determined using broth dilution assay i

well microplates according to CLSI procedures. Chemical composition of the essential oils was eval

by gas chromatography – mass spectrometry (GC-MS). In the rosemary essential oil, 25 compo

(99,6%) were identified, with eucalyptol (26,0%), camphor (13.9%) and α-pinene (12.4%) as

compounds. Among 16 identified compounds (99,8%), eucalyptol (59.6%) was also the dom

compound in the eucalyptus essential oil, followed by p-cimene (15.6%) and limonene (14.9%).

analyzed oils showed MIC/MFC values at the same concentration of 2.50µL/mL, against C. albicans II. However, the rosemary essential oil was more effective than eucalyptus oil against C. albicans stt

showing MIC/MFC values at 5 µL/mL and 10µL/mL, respectively. Whereas antimicrobial resistance i

increasing nowadays, the obtained results could be a pointer for the further investigation ns and

development of new substances with antimicrobial effects, which could be used as the basis of vagin

or gels for regular application in gynecology.

Keywords: Antibiotic, eucalyptus oil, essential oil, rosemary, vaginal candidiasis.

1.16. In Vitro Antifungal Activity of Essential Oil of Artemisia absinthium

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780, Soumaa, Baida, Algeria.

Abstract: The essential oil composition of the leaf of Artemisia absinthium from region of Cherchell

south of Algeria) was investigated by GC, GC-MS. 27 constituents were identified correspond to 84.6:

the total oil. The major components are Thujone (60,82%), Chamazulene (16,62%), p-cymene (4,29%)

2-carène (4.25%). The antimicrobial activity of oil was tested in vitro by two methods (agar diffusio

microdilution) on three plant pathogenic fungi. This oil has been tested for antimicrobial activity a

three pathogenic fungi (Botrytis cinerea, Fusarium culmorum and Helminthosporium sp). The st

activity was evaluated by two method: Method of diffusion in gelose and the minimum inhib

concentration MIC. This oil exhibited an interesting antimicrobian activity. A preliminary study sh

that this oil presented high toxicity against this fungi. These results, although preliminary show a

antifungal activity, to limit and inhibe stop the development of those pathogen agent

Keywords: Antifungal activity, Artemisia absinthium, chemical study, extraction process.

1.17. Antimicrobial Activity of Mentha quatic Essential Oils and Olive Oil

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Abstract: In Algerian traditional medicine Olea europaeaL. And Menthaaquaticaare used especia

l treatment of Respiratory diseases “bronchitis”. This study aimed to investigate the antibacterial activ

of these two species. The analysis and identification of compounds of olive oil Menthaaquaticessential oils were performed using the (GC-MS). This analysis led to the identificat

16 compounds and 43 compounds respectively. The two different oils have a variant antibacterial ac
against bacterial strains like “Staphylococcus aureus ATCC 25923, Pseudomonas aeruginosa ATCC2 and Escherichia coli ATCC 25922 and Streptococcus pneumonia”.

Keywords: Antibacterial activity, chemical, essential oil, Mentha aquatica, Olea europaea,

1.18. Phenolic Content and Antioxidant Activity of Cistanche tinctoria (Orobanchaceae) Aqueous and Methanolic Extracts

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Abstract: Antioxidants are substances that delay or prevent lipid peroxidation and oxidative stress, the factors known to be involved in the inflammation and aging processes, as well as in a number of diseases. Most of interest of current research relates to study the natural antioxidant molecules objective of this study was to study a phytochemical and antioxidant activity of Cistanche tinctoria antioxidative activities of this species were also evaluated to suggest it as a new potential source of natural antioxidants. The in vitro antioxidative activity of aqueous and methanolic extracts were evaluated by different methods: Free radical scavenging using 2,2-diphenyl-1-picrylhydrazyl (DPPH), evaluation of xanthine oxidase, deoxyribose degradation assay, β carotene bleaching test and The reducing/antioxidant power (FRAP) assay. In addition to the in evaluation of the antioxidative contents of flavonoids and total phenolic compounds were determined. The phytochemical tests revealed that the flavonoids, tannins, saponins and mucilage. The capacity of reducing powe in methanolic extract, a relationship was observed between the antioxidant activity potentially total phenolic and flavonoid levels of the extract. The aqueous and methanolic extracts of Cistanche tinctoria were found to be effective antioxidants by in vitro assays, and can therefore be proposed as potential sources of natural additives for the food and/or pharmaceutical industries.

Keywords: Antioxidant activity, β Carotene, Cistanche tinctoria, DPPH, Phenol.

1.19. Effect of Ziziphus Lotus Fruit Extract on Ethylene Glycol-Induced Lithiasis Rats

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Abstract: In Morocco, Ziziphus lotus is commonly used as a phytotherapeutic agent. In order to evaluate the antilithiatic effect of this medicinal plant, an aqueous extract of Ziziphus lotus (AEZL) has been studied in male Wistar rats model. 30 rats were randomly divided into five groups of six animals each. Gr 1 served as a vehicle control and maintained on regular rat food and drinking water ad libitum and received distilled water (0.5 ml/100 g p.o.). All remaining groups received calculi inducing treatment for 28 days to acelerate lithiasis followed by only 0.75% v/v ethylene glycol for 25 days. Group II served as control and received distilled water (0.5 ml/100 g p.o.). Group III served as curative treatment and received AEZL at doses of 150 mg/kg from 14th day to 28th day of calculi induction. Group IV served as preventive treatment group and received AEZL at doses of 150 mg/kg from 1st day to 28th day after calculi induction. Group V served as a Therapeutic control and received a drug “Cystone” at dose of 0.5 mg/kg from 14h to 28. After 28 days, various biochemical parameters were measured in 24h urine samples. The results indicate that extract treatment decreased the elevated levels of oxalate and calcium in urine of rats. Preventive and curative groups compared to control group (P<0.001). Significant difference on the levels of oxalate and calcium were observed between preventive and therapeutic interventional trials. Qualitative analysis of crystals showed that untreated rats excreted large CaOx monohydrate and few dihydrate crystals while the animals excreted mostly small CaOx dihydrate crystals. Significant similarity was observed between preventive and therapeutic anti-urolithiatic effect of AEZL and anti-urolithiatic effect of Cystone. The results of this study demonstrated that AEZL have an anti-urolithiatic effect with preventive and therapeutic treatments in this experimental condition.

Keywords: Ethylene glycol, urinary parameter, urolithiasis, Ziziphus lotus, rats.
1.20. Aphrodisiac Activity of Ipomoea hederacea Jacq. Seed Methanolic Extract on Isolated Human Cavernosum

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Abstract: Ipomoea hederacea Jacq. (IH) seeds have been used by local communities in Pakistan treatment of erectile dysfunction, but there have been no scientific reports to confirm this effect. We now investigated the potential of plant seed extract for aphrodisiac activity. Air-dried seeds of Ipomoea hederacea Jacq. were extracted with 80% methanol. The effects and the underlying mechanisms of the extract were studied on isolated human cavernosum obtained from patients whom were undergoing change operation. The IH extract caused a relaxation of phenylephrine (Phe)- and KCl-precontracted human cavernosal strips. The relaxant activity of the IH extract was not modified by Nω-nitro-L-arginine (L-arginine synthase inhibitor). Glybenclamide (blocker of K+ channels) or tetraethylammonium (bl of Ca2+ sensitive K+ channels) potentiated the relaxant activity of the IH extract on the Phe-precontracted cavernosal strips and this effect disappeared in the presence of DL-propargylglycine (PAG, an inhibitor). The IH extract potentiated the relaxant effect of glyceryl trinitrate on KCl-precontracted cavernosal strips. In this case LNA restored the sensitivity, but not the maximal relaxation unless PAG was added. The present study has demonstrated that the IH extract caused a relaxation of human cavernosum by stimulating the release of H2S and acts as a PDE5 inhibitor, but not as an opener of a or K+ channels. These results confirm the therapeutic claim of the seed of the plant for its aphrodisiac activity in man.

Keywords: Extract, Ipomoea hederacea, Jacq tetraethylammonium, relaxant activity.

1.21. Effect of Nerium oleander Distillate Administration on Serum Nitric Oxide Levels

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Abstract: Nerium oleander grown in the Mediterranean region, and it is grown in the parks and garde well. Nerium oleander is used in the folk medicine, but it is well known that chemical extracts of Nerium oleander is very toxic to animal and humans when digested. However, it is reported that distills Nerium oleander (NOD) has no acute toxic affect in rats, and its beneficial effect has been reported i experimentally induced diabetic rats via improving micro circulation. In this study, it has been hypothe that NOD may increase nitric oxide levels, hence it perfuse the tissues. The aim of current research investigate the effect of NOD (IP, single dose) on the serum nitric oxide levels in rats. In addition, eff distillate on the thiobarbituric acid reactive substances, catalase and routine biochemical parameter: determined. Collected Nerium oleander was distillated and collected. Totally 20 male Wistar albino were used. After 5 rats were served Control (0. Hour), single dose 7.5 mL NOD was inj intraperitoneal only to each rats. Before (0. Hour) and after administration, blood samples were collected 4 and 8 hours from heart under anesthesia, and immediately rats were euthanized by cervical dislocation. Serum nitric oxide, thiobarbituric acid reactive substances and catalase levels were measured by E reader, biochemical values (Creatine kinase-MB, creatine kinase, alkaline phosphatase, alaminotransferase, aspartate aminotransferase, total protein, albumin, total bilirubin, cholesterol, triglyc high density lipoprotein, low density lipoprotein, creatinine, uric acid, blood urea nitrogen) were mea by autoanalyzer. NOD decreased (P<0.05) serum thiobarbituric acid reactive substances levels, wher increased (P<0.05) catalase levels during experimental period. In addition, NOD increased (P<0.05) bilirubin, low density lipoprotein and cholesterol levels at 2, 8 and 8 hours, respectively. It may be that NOD has potent antioxidative effects and it may be used in the treatment of oxidative damage situations.

Keywords: bilirubin, catalase, cholesterol, lipoprotein, Nerium oleander, serum, urea.
1.22. Bioactivity of *Cymbopogon* *itrates* Essential Oil

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Abstract: Our ethnopharmacological studies in several Angolan regions, showed that *Cymbopogon citratus* (DC) Staf.f., is applied in folk medicine to treat feverish and anti-inflammatory conditions, as w effective against some skin infections. To validate the bioactivity of *Cymbopogon citratus* several st were performed. The essential oil samples of *Cymbopogon itrates*, obtained through hydro-distill were analysed by GC and GC-MS. Constituents were identified from their retention indices on two diphases GC columns (polydimethylsiloxane and polyethylene glycol) and from their mass spectra [1] bioactivity of *C. itrates* and its major natural volatile compound were tested against several bac strains, *Leishmania infantum*, *Leishmania tropica* *Leishmania major* and *Plasmodium falciparum* (N Different viability tests were performed according the tested specimen. Broad-spectrum antibac activity was exhibited by the *Cymbopogon itrates* essential oil against both Gram-positive and C negative bacteria. What is more interesting from this study is that MRSA isolates were more sensitive towards the test substance, compared to the non-MRSA. When tested against a S. Aureus MRSA, res to amoxicillin-clavulamic acid combination, penicillin G and meticillin, *Cymbopogon itrates* essent exhibits a significant increase in bactericidal activity when compared with commercial antibiotics essential oil at 50 µg/ml was able to kill 65% of the *L. infantum* and *L. major* promastigotes and 81% *L. tropica* promastigot, and the IC50 concentration for the *P. falciparum* was 5.34 µg/ml. C. i essential oil may represent valuable sources for lead or active molecules against *Leishmania*, resistant bacterial strains and malaria infections.

Keywords: Antibacterial activity, *Cymbopogon* *itrates*, MRSA, *Leishmania*, nosocomial infections.

1.23. *Thymelaea Microphylla* Acetone Extract Protects Endothelial Cells Against Tnf-Induced Inflammation

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Abstract: *Thymelaea microphylla* Coss. & Dur. is an endemic medicinal plant growing in Alq arid zones, widely used in folk medicine as an anti-inflammatory agent. Endothelial dysfunction is charactenized by a shift of the actions of the endothelium toward reduced vasodilatation proinflammatory state and prothrombic properties and it is associated with most form cardiovascular diseases. Up-regulation of adhesion molecules, generation of chemokines production of reactive oxygen species participate in the inflammatory response and contribut prothrombic state. In this work, we evaluated the capacity of *Thymelaea microphylla* acetone extr suppress the endothelial dysfunction induced by TNF-α in human umbilical vein endothelial (HUVECs) by evaluating adhesion molecules gene expression. And intracellular oxidative stress Furthermore *T. microphylla* extract was tested in a battery of redox-based assays differing in mechanisms involved and the chemical environment used, in order to evaluate the antioxidant/ra scavenger capacity of the extract. Acetone extract was prepared from dried leaves and flowers *microphylla* previously collected from the region of M’sila in Algeria. HUVECs, isolated from fresh h umbilical cords, were incubated with different concentrations of acetone extract (20 and 40 µg/ml in DMSO v/v) for 24h and then exposed to TNF-α (20 ng/ml) for 2h. After this incubation time, E-se gene expression was evaluated by RT-qPCR as marker of endothelial dysfunction. As expected, T induces an up-regulation of RNA expression of E-selectin in endothelial cells. The pretreatment acetone extract from *T. microphylla* caused in a dose-dependent way a significant decrease i expression of E-selectin gene in HUVECs when compared to control cells exposed to TNF-*microphylla* was also able to improve intracellular redox status. Furthermore, the acetone extract shov good *in vitro* antioxidant/free radical scavenger activity (DPPH, SOD mimetic, TEAC, FRAP, etc) results of the study revealed that the extract of *T. microphylla* possesses antiinflammatory effects the contribute towards the prevention of cardiovascular diseases.

Keywords: Acetone extract, antioxidant, chemical environment, evaluation, *Thymelaea microphylla*.
1.24. Comparison of Effects of Single and Repeated Doses Of *Withania Somnifera* Extract in Mice

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**Abstract:** *Withania somnifera* root is an important Ayurvedic Rasayana herb now often referred Indian ginseng. It is often used in traditionally known Ayurvedic formulations as an herbal adaptogen promoting physical and mental health or for increasing longevity. Effects of a single and 5, 7, and 10 oral doses (10, 20 and 40 mg/kg) of a well standardized *Withania somnifera* root extract against foot stress triggered transient hyperthermia and hotplate test for analgesics in mice were compared. Treated mice were then subjected to tail suspension and pentobarbital hypnosis tests on the 11th and 12th day of experiment. Body weight changes during the course of the experiment were quantified also. Daily oral dependant efficacy of the tested extract in stress induced hyperthermia test increased with incre. number of treatment days, and its dose dependant inhibitory effect on immobility time in tail suspe were also observed after its 11 daily doses. Daily handling and intermittent foot shock triggered loss body weights and elevations in basal core temperatures were completely reversed even after its 10 daily doses, and analogous was also its effect in protecting stress triggered hypersensitivity of mi pentobarbital induced hypnosis and sedation. Repeated daily oral doses of the *Withania somnifera* extt highly effective in suppressing diverse stress triggered metabolic and thermoregulatory disturbances a anxiolytics and antidepressants like efficacies also increases with increasing numbers of treatment. These observations reaffirm that *Withania somnifera* is an adaptogenic herb, and suggest that itsmini effective doses for therapeutic purposes will depend on the preexisting allostatic load of a given patient.

**Keywords:** Adaptogenic herb, rasayana herb, repeated doses, thermoregulatory, *Withania somnifera*.

1.25. Pharmacokinetic Effects of Herbal Medicines in Brazil: Effects on Glutathione Levels

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**Abstract:** The Brazilian Unified Public Health System (SUS) has issued a list of traditional herbal medicines of clinical interest. Plant xenobiotics may cause pharmacokinetic (PK) disturbances due to inhibition / induction of phase 1 and 2 metabolism. Herbal medicines coadministered with conventional drugs may cause adverse reactions due to herb-drug interactions. We have reported our preliminary data on six popular herbal drugs of the list of clinical interest of SUS on glutathione levels. A literature search been carried out in order to identify the plants that have not been studied for their effects on Phase 1 and 2 metabolism (Mazzari and Prieto, 2014). Six herbal medicines species namely *Malvaviscus luteus* (flower and herb), *Lamium album* (herb), *Equisetum arvense* (herb), *Passifloraincarnata* (herb) and *Artemisia absinthium* (herb). The extracts were obtained by infusion of the plant material in water, as per the popular use. The maximum non-toxic concentration (MNTC) of each extract determined by using the Sulforhodamine B assay (SRB) in HepG2 cells (Houghton et al., 2007). Et was used as positive control. Detection of GSH levels in HepG2 cells was made by using a moe recycling assay (Allen et al., 2000). ButhionineSulphoximine (BSO) was used as positive control review highlighted that more than half of the selected herbal medicines lack of any PK data. This is a big gap in knowledge and an opportunity for future research. Moreover, preliminary results on six po species showed that glutathione levels were significantly reduced by *Equisetum arvense, Lamium a Passifloraincarnata, and Malvaviscus luteus*. This has potential clinical consequences: for exa conventional drugs which are metabolized by this route –such as paracetamol–may interact with these five herbal medicines and cause hepatotoxicity. Further fieldwork in Brazil will be perform source the remaining herbal medicines. The PK profile of herbal medicines of interest to the SUS ha showed to alter glutathione levels and they could potentially change the expression of phase 1 and 2 metabolic enzymes. Therefore, these herbs need pre-clinical assessment in order to avoid risks of herb interactions. Our results highlight both the gap in this knowledge and the surprising potential risk traditionally used plants.

**Keywords:** *Equisetum arvense*, Glutathione, hepatotoxicity, herbal medicine, *Lamium album*.
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1.26. The Antioxidant and Lipid Peroxidation Activities of Daphne gnidium L. Extracts

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Abstract: Daphne gnidium is largely used for treatment of rheumatism and inflammation in folk medicine of mediterranean countries. The extraction of flavonoids with solvent allowed their separation into three sub-fractions (chloroform, ethyl acetate and aqueous extracts). Total phenolic constituents of Daphne gnidium shoots extracts (DGSE) were performed using “Prussian bleu assay” and the antioxidant activity of the extracts was assayed through some in vitro models such as FTC (ferric thiocyanate) method and hydroxyl radical scavenging assay. The total phenolic contents of shoots extracts of Daphne gnidium as gallic acid equivalents were found to be highest in chloroform extract (CHE) (5.95 ± 0.61 mg GAE/g extract) followed by crude extract (CE) (5.55 ± 0.61 GAE/g extract) and ethyl acetate extract (EAE) (5.46 ± 0.39 mg G extract). In comparison with butylated hydroxyl toluene (BHT) (64.549 ± 0.007 %), at 2 mg/ml, the antioxidant activity, by linoleic acid peroxidation, was found to be highest with chloroform extract, followed by ethyl acetate and crude extracts. The chloroform extract showed the highest antioxidant activity (IC₅₀ = 0.42 ±0.01) followed by ethyl acetate extract (IC₅₀ = 0.57 ±0.03) and crude extract (IC₅₀ = 1.47 ±0.02) in the hydroxyl radical scavenging assay. In conclusion, the present results provide evidence that DGSE acts as lipid peroxidation inhibitors and radical scavengers.

Key words: Antioxidant, Daphne gnidium, free radicals, lipid peroxidation oxidative stress, polyphenols.

1.27. Effect of Silymarin Against Methotrexate Induced Gastrointestinal Injury

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Abstract: Silybum marianum L. Gaertn is a plant of which belong to family of Asteraceae. Silymarin is obtained from seeds of silybum marianum, and it has complex compound and itsmainly is silybin including isosilybin, silychristin, silydianin andtaxifolin. Silybin is known as the most antihapatotoxic substance in silimarins complex(1).Silymarin also shows vigorous antioxidant effect, reductant of free radicals and also has stabilization effect on cell membranes. The effect of silymarin was indicated in many studies and of these effects was reported in the role of cell protection (2, 3, 4). In this study, the protective effect of silymarin was investigated against methotrexate - induced gastrointestinal injury. The subjects are di into 4 groups each containing 10 Swiss-Albino mice as control (0.9% NaCl, IP, SID, 7 days), methotrexate (15 mg/kg, IP, SID, 5 days), silymarin(100 mg/kg, IP, SID, 7 days) and methotrexate + silymarin (methotrexate at 15 mg/kg, IP, SID, 5 days + silymarin at 100 mg/kg, IP, SID, 7 days). Followin experimental period, blood and tissue samples were collected from the animals for biochemica pathological examinations. Plasma, intestinal and gastric malondialdehyde and total sialic acid levels was significantly higher (P<0.05) and whole blood glutathione concentrations was lower (P<0.0 methotrexate group when compared to control group. Plasma, intestinal and gastric total sialic acid levels of methotrexate group were significantly increased compared to control and methotrexate+silymarin group. Histopathological, gastric tissue of methotrexate treated mice showed degeneration, necrosis, desquamation and widespread edema. However, these alterations were less severe in methotrexate+silymarin group. Conclusion, silymarin could be protective effect against methotrexate-induced gastrointestinal injury antioxidant mechanism.

Keywords: Gastrointestinal injury, glutathione, malondialdehyde, methotrexate, silymarin.
1.28. Anti-Inflammatory Effect of *Loranthus europaeus* Extract on Wound Skin in Rabbit

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**Abstract:** *Loranthus europaeus* Jacq. is a hemiparasitic mistletoe of South-Eastern Europe, Anatoli South Russia has an important medicinal plant, the dried plant fruit powder of *L. europaeus* was extracted overnight in 80% methanol by maceration. Chemical detection of active compounds plant was performed. The anti-inflammatory effect of the extracted was evaluated in healing skin wounds in comparison with synthetic pharmacological medication Piroxicam Gel. Simple preparation was applied by mixing the compound with Vaseline and Glycerin. After healing of the wound, Histopathological study was nec to support the results. Results the healing was indicated by disappearance of edema and reduction in size, enhancement of fibroblast proliferation, angiogenesis, keratinization and epithelialization as compare with the control groups. *L. europaeus* the extracts is one of the promising plants for the skin. Flavonoids plant have the ability of suppression of acute inflammation and seemed to be the most active compone healing the wound.

**Keywords:** Anti-inflammatory, glycerin, *Loranthus europaeus*, skin wound, vaseline.

1.37. Xanthine Oxidase Inhibitory Effect of *Tamus communis* Roots Extract

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**Abstract:** In the course of our phytochemical studies of plant *Tamus communis* L., The methanol extract (138 g) was chromatographed on a silica gel column. The column was eluted with chloroform then with chloroform/methanol mixtures of increasing polarity. A total of 52 fractions (400 ml each) were collected and grouped according to their TLC behaviour into 11 main fractions (I-XI). Total phenolic and flavonoid contents in these extracts were determined by a colorimetric method. Values varied bet 73,143±0,009 and 29,214±0,003 mg/g equivalent gallic acid/g lyophilisate. All the extracts showed an inhibitory properties on xanthine oxidase, the IC50 ranges from 0,02948481±0,01703 mg/ml to 0,23685279±0 mg/ml. The extracts exhibited an additional superoxide scavenging capacity by using both enzymatic methods and IC50 values range from 0,03957896±0,02312 mg/ml to 0,1412141±0,08630 mg/ml. Results show that *Tamus communis* L. extracts have strong anti-oxidant effects and may have some clinical benefits.

**Keywords:** Antioxidant, superoxide scavenger, *Tamus communis*, xanthine oxidase.

1.29. Antioxidant Activity of Phenolic Extracts of Punica Granatum Peels in Alg

**Guene Hadjiri^1, Bakchiche B.^2, and Gherib A.^2**


**Abstract:** *Punica granatum* (Punicaceae) commonly called roman is used in traditional Al medicine. In the present study, two dry extracts were prepared from the fruit peel of this species. Quantitative estimation of total phenol and flavonoid content by a colorimetric assay show the ethanolextracts are rich in these components. Assessment in vitro antioxidant activity using DPPH, Ferrous ion chelating assay, reductive power, ABTS assays and phosphomolybdenum. Results shown that our extracts possess a potential antioxidant power in comparison with standards.

**Keywords:** Flavonoides, DPPH assay, polyphenols, punicagranatum, reductive power.
1.30. In Vitro Screening of Secondary Metabolites and Evaluation of Antioxidant and Antimicrobial Properties of *Gelidium sesquipedale* Thuret et Bornet Sea Weed from Algeria

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**Abstract:** In vitro antioxidant, antimicrobial and cytotoxic activities of hydromethanolic extract of red seaweed *Gelidium sesquipedale* Thuret et Bornet and its fraction were investigated. Phytochemical screening, total phenolic and flavonoid contents were also investigated. For phytochemical screening, some common and available standard tests were done. Phytochemical screening revealed the presence of alkaloids, anthocyanes, saponins, flavonoids, tannins and C-heterosids. The maximum total phenol and flavonoid content was observed in the diethyl ether fraction (101 GAE/g) and in the ether acetate (5.63 QE/g) respectively. The high DPPH radical scavenging was observed in chloroform fraction. The diethyl ether and n-butanol fraction showed good reducing power. The extracts exhibited high antioxidant activity by β-carotene/linoleic acid bleaching assay during the incubation time. Antimicrobial activity examined against 8 bacteria and one yeasts. Only one bacterial strain (*Enterobacter cloacae*) was inhibited by seaweed extracts, and chloroform fraction was generally more active than others.

**Key words:** Antimicrobial, antioxidant activity, *Gelidium sesquipedale*, phytochemical screening.

1.31. Effect of Purified Honeybee (*Apis mellifera* L.) Venom Containing Cosmetics on Acne Vulgaris

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**Abstract:** Acne vulgaris is a chronic dermatologic problem with multiple factors involved in its pathogenesis. Alternative solutions to acne treatment were instigated by antibiotic resistance despite the extensive use. Purified bee venom (PBV) has been proposed as a promising candidate for that purpose. Present study was designed to confirm the antibacterial effect of PBV and access the efficacy of containing cosmetics in subjects with acne vulgaris. The skin bacterium *P. acnes* was incubated with PBV at various concentrations and bacterial growth was evaluated using the CFU assay. The mechanism of employed in the killing of *P. acnes* was examined by transmission electron microscopy. In addition, a total of 12 subjects were randomized in a double-blind, controlled trial to receive either PBV containing cosmetics or cosmetics without PBV for 2 weeks. Evaluations were included lesion counts and skin microorganism. PBV exhibited antimicrobial activity in a concentration-dependent manner, reducing number of *P. acnes* CFU by approximately 6 logs at a concentration of 0.5 μg. When PBV concentration was higher than 1.0 μg, no *P. acnes* colonies were spotted on an agar. Transmission electron micrographs of untreated *P. acnes* illustrated the normal pleomorphic structure, whereas the PBV treated bacterium lost the integrity of surface architecture. Significant difference (p=0.027) in the grading based on numbers in lesion counts for inflammatory and noninflammatory was observed in favor of group vs. control group. In terms of average decrement of skin microorganism, subjects receiving containing cosmetics experienced a significant 57.5% decrease of ATP levels, whereas partici receiving cosmetics without PBV experienced nonsignificant decrease of 4.7%. The in vitro act antimicrobial activity of PBV were translated in vivo. PBV containing cosmetics provided a certain degree of efficacy in terms of lesion counts and skin microorganism concentration compared with cosmetic without PBV in subjects with acne vulgaris.

**Keywords:** Acne vulgaris, antibacterial effect, cosmetics, honeybee, South Korea.

1.32. Composition and Antimicrobial Activity of the Essential Oil of *Achillea millefolium* L. Growing in Algeria

**Brahmi M., Berka B., Boudjella H.** and **Hassani A.**
Abstract: The volatile constituents of Achillea millefolium L. growing in Algeria has been studied. The latency and number of crossings were statistically significantly increased (P < 0.01) in test groups as compared to disease control group. The alteration in histopathology revealed new compounds and known compounds.

Keywords: Achillea millefolium L, antimicrobial activity, essential oil, GC, GC/MS.

1.33. Comparative Neuroprotective Activity of Benincasa Hispida Seeds And Mesocarp Against Neurodegenerative Disorder, Dementia

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Abstract: The possible potential neuroprotective activity of hydroalcoholic extract of Benincasa hispida seeds and mesocarp was investigated in the present study. Seven groups of animals (n=6) were used which Group 1 was administered with normal saline; Group 2 with disease control agent Scopolamine (1.4 mg/kg/day); Group 3 with Scopolamin + Donepezil (1 mg/kg/day); Group 4 with Benincasa hispida seed extract (250 mg/kg/bodyweight); Group 5 with Benincasa hispida seed extract (500 mg/kg/body weight) Group 6 with Benincasa hispida mesocarp extract (250 mg/kg/body weight); Group 7 with Beni. hispida mesocarp extract (500 mg/kg/body weight). The apparatus used for present study was Morris maze. Animals were given 2-4 trials per day for 4-5 days until they escape onto the platform. The time spent in platform quadrant, escape latency and number of crossings were statistically significant increased (P <0.01) in test groups as compared to disease controlled group. The alteration in histopathology like shrunken and darkly stained nucleus of neurons were observed which was significantly recovered Benincasa hispida mesocarp (500 mg/kg/body weight) treated group. Hence, Benincasa hispida mesocarp could be considered as a therapeutic agent to prevent or slow down the development of neurodegenerative diseases such as Dementia and AD at an early stage.

Keywords: Benincasa hispida, dementia, India, neuroprotective, scopolamine.

1.34. In Vitro Evaluations of Anti- Hypoglycemic, Cytotoxicity and Chemical Identification of Methanolic Sweet Basil Extract

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Abstract: Despite the enormous achievements in conventional medicine, diabetes reached epidemic proportions globally. Its highest prevalence is in the Arab world especially in the Gulf region. Several medicinal plants can treat diabetes type II. Based on knowledge obtained from the Greco-Arab and is herbal medicine as well as from our previous studies, the aim of this study was to evaluate the α-glucose transporter-4 (GLUT4) in the anti-diabetic effects of the aerial parts of sweet basil and to identify potential sources of bioactive derivatives in methanol extract. Chemical analysis of the methanolic extract by GC/MS using the silylation derivatization technique revealed new compounds and known compounds.
Cytotoxic and anti-diabetic properties of the extract were evaluated using L6-GLUT4myc muscle stably expressing myc epitope at the exofacial loop (GLUT4). No cytotoxic effects were observed in ti
cells up to 0.25 mg/ml extract as measured with MTT and LDH-leakage assays. GLUT4 translocation
plasma membrane was elevated by 3.5 and 7 folds (+/- insulin) after treatment with sweet basil extra
20 h. Our findings suggest that the observed anti-diabetic properties of sweet basil extract are po
mediated in part through one or more of the identified compound.

Abstract: Antihypoglycemic, cytotoxic, extract, in vitro, traditional medicine, sweet.

1.35. Influence of Glucosamine Sulfate on Osteoarthritis in Rabbits

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Abstract: The objective of this research was to evaluate the effect of glucosamine sulfate on morphol
and histological changes investigated on a duration of eight weeks in osteoarthritis in rabbits following collagenase-induced osteoarthritis. A total of 32 New Zealand White
and female rabbits were used in this study. All animals were kept in standard conditions at Res
Institute of Livestock Production in Nitra. Animals were divided into 4 groups: healthy control g
osteoarthritic untreated group and two experimental groups. After collagenase-induced osteoarthritis
oral administration of glucosamine sulfate (80 mg.kg⁻¹ and 160 mg.kg⁻¹ of live weight) was performed
the end of the eight week, the rabbits were sacrificed and their both right and left knees with pro
femur and distal tibia were harvested. The parameters tested were gross morphology and histology. The
statistical indicators were calculated from obtained data using Statgraphics software and analysis of
variance. Morphological changes in osteoarthritic group without treatment were seen on both, media
lateral region, but markedly on medial condyle. Articular cartilage was characterised by a rough
hypertrophic appearance with severe erosions. The severity of cartilage damage was generally low.
Glucosamine treated groups in comparison with osteoarthritic group. The gross morphological exami
of healthy control revealed very little or no changes. Gross morphological grading of cartilage da
showed significantly lower extent of damage in glucosamine treated groups. Histological evidence
for cartilage degeneration was observed in the collagenase-induced osteoarthritic knees of treated and untreated groups. In osteoarthritic controls the articular cartilage showed degenerative changes, including: surface, loss of superficial layer, erosion, fissures, irregular arrangement and form of chondrocytes. Osteoarthritic groups treated with glucosamine signs of cartilage degeneration of femoral condyles limited. The results of this study showed that, oral glucosamine did not completely prevent the development of joint damage in the rabbit model of collagenase-induced osteoarthritis, however the results o
morphological and histological findings demonstrate a significant and substantial decrease in severity of damage caused in condyle cartilage and in chondrocytes.

Keywords: Articular cartilage, glucosamine sulfate, osteoarthritis, rabbits.

1.36. Hexane Fraction of Ivy Gourd (Coccinia grandis L. Voigt) Root Exerts Lipi
Lowering Effects in Mice Fed a High-Fat Diet

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Abstract: Ivy gourd (Coccinia grandis L. Voigt) root has been claimed to possess anti-obesity proper
sparing evidence remains scarce. We have previously found that the hexane fraction of ivy gourd
extract (IGH) inhibits adipocyte differentiation in 3T3-L1 cells. In this study, we then investigated the ob
esity effects of the IGH in vivo. Male C57BL/6J mice were fed a high-fat diet (HFD) prepared bas
AIN-76 formula or a HFD containing 2% (w/w) IGH for 4 consecutive weeks. At the end of study p
their feces, blood samples, livers and fat tissues were collected for biochemical determinations. The
consumption of HFD containing 2% (w/w) IGH for 4 weeks resulted in a significant decrease of tr
lyglycerides (TG) and non-esterified fatty acid concentrations as well as hepatic TG and total chole
(TC) levels. In the treated animals, dietary IGH potently down-regulated peroxisome proliferator acti
receptor-y (PPARγ) gene expression in white adipose tissue without attenuating its lipid accumula
Expression of hepatic genes involving in lipid metabolism, however, was not affected by IGH at the d
used. An increase in fecal excretion of TG and TC along with a decrease in activity of lipogenesis-n
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enzymes including fatty acid synthase, glucose-6-phosphate dehydrogenase and malic enzyme in thewere also observed upon the intake of IGH. Taken together, these biochemical changes were consideraccount for the serum and liver lipid-lowering effects of IGH in our HFD-induced obesity mouse nThe findings from the present study that this active fraction of ivy gourd root could reduce the bloo liver lipid levels thus suggest its potential application as an anti-hyperlipidemic agent for obesity prevc and/or management.

Keywords: Coccinia grandis, diet, obesity, root, serum.

1.37. Antimicrobial, Cytotoxicity and Anticancer Activities of Methanolic Extract Goniothalamus Velutinus from Brunei Darussalam

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Abstract: G. velutinus, locally known as Limpanashitam, is an endemic species of Borneo. It is widely by the natives in traditional medicine. There are reports on the isolation of chemical compounds fro velutinus but none reported the bioactivities of the plant’s extract or the isolated compounds. The a our study were to screen the methanolic extract of bark of G.velutinus for antibacterial, antifungal, shrimp cytotoxicity test (BST) and anticancer activities, and to isolate the bioactive compound(s). Material and methods: Antibacterial and antifungal tests were done by disc diffusion method using commercially available bacteria (Escherichia coli, Pseudomonas aeruginosa, Bacillus subtilis, Staphylococcus aureus) and two fungal strains (Candida albicans, Aspergillus brasiliensis). The minimum inhibitory concentration (MIC) was determined by agar twofold dilution method. Anticancer activity was carried out by 3-(4,5-dimethylthiazol-2-yl) tetrazolium bromide (MTT) assay using human embryonic kidney cell line (HEK 293), human adenosarcoma epithelial cell lines (A549), Epidermoid cervical carcinoma cells (CaSkI), human B lymphoma cell (Namalwa), T lymphocyte cells (Jurkat). Results and conclusion: Antimicrobial revealed that extract is active against Gram positive bacteria B. subtilis, B. spizizenii and S. aureus with MIC values of 2, 5 and 5 μg/mL respectively, while there is no activity against Gram negative bacteria. How the extract did not show any antifungal activity. The MTT assay showed the IC₅₀ value of 9.33 μg/mL, which can be considpromising. On the basis of this test, the extract was further examined for anticancer activities by MTT assay which exhibited IC₅₀ values of 25.3, 27.3, 9.1, 26.2 and 25.1 μg/mL for A549, CaSkI, HEK, Namalwa, Jurkat respectively. Furthermore, 4', 6-diamidino-2-phenylindole (DAPI) staining showed that the cell displayed bright blue fluorescence with high intensity compared to untreated cells due to condensation chromatin. The results from this study showed that the methanolic extract of G. velutinus is active against many cancer cell lines, which is in line with reported anticancer activity of various Goniothalamus species.

Keywords: Antimicrobial, cytotoxicity, extract, Goniothalamus Velutinus, Limpanashitam.

1.38. Antimicrobial, Anticancer and Antidiabetic Agent from Leaves of Nepenthes Bicalcarata

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Abstract: The present study was conducted to determine the antimicrobial, antidiabetic and anticancer properties of methanolic extract of leaves (ME) of Nepenthes bicalcarata and to isolate the bioactive compound (BC) responsible for the observed activities. Materials and methods: Antimicrobial screen were conducted on three gram positive bacteria, two gram negative bacteria and two fungi using diffusion method. The minimum inhibitory concentration (MIC) was determined using 2-fold agar diffusion method. Cytotoxicity was evaluated using Brine shrimp lethality test (BSLT) and 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay using human embryonic kidney cell line (HEK 293) and human Burkitt lymphoma cell (Namalwa). Antidiabetic activity was done using alloxan (120 mg/kg body weight) induced diabetic Wistar male where they were orally treated on alternate days for eight weeks with a dose of 200 mg of ME/kg weight and 15 mg of BC/kg body weight. The fractionation and isolation of BC was carried out on silica gel using column chromatography technique with petroleum ether and diethyl ether (1:1) as the eluent so
The purification was done using the same solvent system but at a ratio of 15:1. Structure elucidation identification was determined using NMR spectroscopy. Results and conclusions: Antimicrobials revealed that both ME and BC were active against Staphylococcus aureus, Bacillus subtilis, B. spizizenii, and Candida albicans and Saccharomyces cerevisiae with MIC values ranging from 256 to 1024 µg/ml for BC, and 2 to 8 µg/ml for BC. BSLT showed LC50 values of 76.7 and 4.10 µg/ml for ME and BC, respectively. MTT assays gave IC50 values of 27 - 156 µg/ml for ME and 0.75 - 1.91 µg/ml for BC. The results showed that the leaves of N. bicalcarata contains plumbagin which has antimicrobial, antiancy and antidiabetic properties.

**Keywords:** Anticancer, antidiabetic, antimicrobial agent, extract, leaves, Nepenthes Bicalcarata.

### 1.39. In Vitro Antidandruff Activity of Biotransformed Extract of *Calendula officinalis*

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**Abstract:** The present study was conducted to determine the in vitro anti-dandruff activity of biotransformed material (extract) of *Calendula officinalis* flowers. The collected flowers about 200 g macerated in cow urine (1 L) for time period of 28 days. After the completion of this time period, the biotransformed material (Extract) was harvested, lyophilized and powdered (20 g). Regular aqueous extract of the flowers was also prepared for comparative study. Various concentrations, such as 12.5, 25, 50, 100, and 500 mg/ml, of aq. extract and biotransformed material (extract) of *Calendula officinalis* flowers prepared and tested. The in vitro activity was done using strain of Malassezia (Pityrosporum) furfur compared with marketed ayurvedic, homeopathic and allopathic (Kitoconazole 2 %) formulations. Regular extract and the biotransformed material were screened for phytochemicals. It showed the presence of flavonoids, prominently. The strains responsible for the biotransformation process were also evaluated and identified as Bacillus subtilis and Bacillus thuregenesis. The biotransformed material (extra) of *Calendula officinalis* flowers shows promising activity against Malassezia (Pityrosporum) furfur, in the zone of inhibition of about 6 mm at 100 mg/ml 30 mm and at 500 mg/ml, respectively. The results found promising as compared to the regular aqueous extract, marketed formulations including Kitocon 2 % preparation. The study shows the improved potential of the cow urine biotransformed extract over the normal extract of the same plant. It was evident that the dandruff growth was significantly inhibited treatment with biotransformed material (extract). Hence, in vitro studies of microbial biotransformed *Calendula officinalis* flowers was found to have a potential anti-dandruff activity between 100 mg/500 mg/ml, compared with its aqueous extract, marketed ayurvedic, homeopathic and allopathic formulations.

**Keywords:** Biotransformation, *Calendula officinalis*, Malassezia furfur.

### 1.40. The Study of Antihypoxic and Sedative Activity of the Dry Extract *Asperula odorata* L.


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**Abstract:** Sweet Woodruff (*Asperula odorata* L.) is a perennial herb that is spread throughout the territory of Ukraine. This herb is widely used in folk medicine of Ukraine as a sedative medicine at neuvasthenia, hysteria, depression, applied locally at allergic rash, and it is also used at metritis and ec in homeopathy. The subject matter of the current research is to investigate the antihypoxic and sedative activity of a dry sweet woodruff herb extract. The air-dried herb of *Asperula odorata* has previously degreased with chloroform and then treated with the mixture of ethyl acetate-alcohol (8:2) to obtain extract. The dry extract has been obtained by the extraction of exhausted herbal material by heated alcohol. The HPLC analysis has been used to identify the phenolic compounds in the dry extract. Antihypoxic activity of the dry extract at the dose of 50 and 100 mg/kg have been studied on the model of normoc
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Hypoxic hypoxia with hypercapnia. "Bilobil®" (KRKA, Slovenia) has been chosen as the drug comparison. The duration of mice life has been chosen as an integral indicator of antihypoxic activity. A sedative activity has been studied in the "open field" test. The yield of the dry extract has been 12%. Dry extract 16 phenolic compounds have been identified and determined quantitatively. The dry extract of 100 mg/kg has shown a potent antihypoxic activity which has been confirmed by increase in conditions of model hypoxia relative to a control which exceeds twice the reference drug "Bilobil". The dry extract at the dose of 100 mg/kg in the "open field" test has caused significant dose-dependent (p<0.05) decreasing of locomotor activity which has evidenced the sedative activity. Our data have provided a rational base for the folkloric use of the dry extract! Woodruff as a sedative and antihypoxic drug.

**Key words:** Antihypoxic activity, HPLC, phenolic compounds, sedative activity, sweet woodruff extract.

1.41. Peganum Harmala Seed Extract Modulates Anti-Inflammatory and Pro-Inflammatory Cytokines Release in Thp-1-Derived Macrophages

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**Abstract:** Peganum harmala (P. harmala) seeds have been widely used in traditional Greco-Arab medicine to treat various inflammatory diseases and recently is studied in research laboratories. How P. harmala anti-inflammatory mechanism is not fully understood. The aim of this in vitro study was to evaluate the cytotoxicity and anti-inflammatory properties of P. harmala seeds extract through modulation of both, anti-inflammatory (IL-10) and pro-inflammatory (TNF-α and IL-1, IL-6) cytokines release as well as their mRNA expression in human THP-1-derived macrophages. Cytotoxicity was examined by MTT LDH release assays. Results obtained indicate that the water extract was non-cytotoxic up to 250 μg/ml. Hence, assessing the anti-inflammatory properties of P. harmala was carried with extract concentration to 250 μg/ml. Inflammation in THP-1 cells was induced by 1 μg/ml lipopolysacharide/ml (P. harmala extracts remarkably increased IL-10 release and mRNA expression at a concentration of 64 μg/ml. In addition, P. harmala inhibited the expression and release of IL-1, IL-6 and TNF-α in a dose-dependent manner. These results indicate that P. harmala seeds probably exert anti-inflammatory properties throughout increasing the release and expression of IL-10 mRNA as well as by suppressing IL-1, IL-TNF-α mRNA expression in THP-1 cells.

**Keywords:** Antiinflammatory, cytokines, extract, in vitro, Peganum harmala, seed.

1.42. Effect of the Methanolic Extract of Hertia cheirifolia (L.) on Acute and Sub-Chronic Inflammations

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**Abstract:** Hertia cheirifolia L. is traditionally used in Northern Africa to treat various inflammatory affections. The present study was aimed to screen the methanolic extract of Hertia cheirifolia (HC) L for anti-inflammatory potential. The croton oil-induced ear oedema in mice and carrageenan-induced oedema in rats were used as acute inflammatory models. Cotton pellet induced granuloma in rat induced-air pouch in mice were conducted as sub-chronic models. Acute toxicity test was carried out using the safe doses of the plant extract. Results showed that the plant extract up to 2000 mg/kg body weight not produce any toxic effect or death. The topical application of 2mg/ear of Hertia cheirifolia metl extract produced a significant inhibition (78.7%) of coton oil induced ear swelling in mice. Moreover oral treatment of rats by plant extract inhibited the paw oedema in a dose dependant manner and exert potent anti-inflammatory action on granuloma inhibiting wet weight and dry weight of the cotton 15.24% and 23.25% respectively. On the other hand an inhibitory activity of leukocytes migration was observed in the murine air pouch. The treatment by 2mg/ml of methanolic extract of Hertia Chei

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decreased significantly the number of leucocytes in the ear pouch (62.4%). In conclusion, the methanolic extract of Hertia cheirifolia possess a strong anti-inflammatory activity and may be considered as an interesting source of effective anti-inflammatory compounds, justifying its use in folklore medicine.

Keywords: Anti-inflammatory activity, cotton pellet granuloma, ear oedema, Hertia cheirifolia.

1.43. Demonstrated a Clotting Activity in the Extract of Mollugo cerviana

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Abstract: The aim of the present work is the preparation and characterization of Mollugocerviana extract, as well as the study of its potential use as a calf rennet substitute. The work consisted of the coagulant agent extraction from Mollugo cerviana, and the characterization of the enzymatic extract obtained comparison between the cardoon floral extract and calf rennet, by studying its coagulant and proteolytic activity. One milliliter of the prepared extract presents a coagulant activity of 3.23 UP, the optimum of its activity is noticed at pH 5, and at a temperature of 60°C. The proteolytic activity of this extract is nearly double of the calf rennet. Soft cheeses obtained with Mollugocerviana extract present a better organoleptic quality, however, the yield is relatively weak. Thus, we suggest the possibility of the substitution of rennet with Mollugocerviana extract in the manufacturing of cheese, meanwhile considering the study of means for promoting a better cheese yield.

Keywords: Calf rennet substitute, cheese making, coagulant agent, Mollugocerviana.

1.44. Inhibition of Acetylcholinesterase by Six Hypericum Species from Balkan Peninsula

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Abstract: Hyperici herba belongs to one of the most exploited herbal drugs in the world. Its widespread use has created constant raise of demand. Although in most cases, Hypericum perforatum, Hypericaceae is marked as the main biological source of drug, more and more representatives is being recently subjected to research because obtained data suggest resemblance of chemical profiles of H. perforatum and Hypericum species. Also new potential biological effects are being studied. Antidepressant effect of Hyperici herba is well known. The fact that the majority of patients suffering from Alzheimer’s disease depressive episodes, creates a potential place for Hyperici herba in treatment of these patents. Thus possible anti-acetylcholinesterase activity of Hypericum extracts could double the benefit in relieving symptoms of Alzheimer’s disease. The aim of this study was to evaluate anti-acetylcholinesterase pot of water-alcoholic extracts obtained from six different representatives of genus Hypericum growing on Balkan peninsula. Plant material included: H. olympicum, H. maculatum subsp. maculatum, H. calycinum, H. hirsutum, H. linarioides, H. tetrapterum. Inhibition of enzyme was estimated spectrophotometrically modified Ellman’s method which uses acetylthiocholine iodide as substrate. The percentage of acetylcholinesterase inhibition by water-alcoholic extracts with concentration of 800 µg/mL ranged 27.27 ± 2.13 % to 61.28 ± 0.87 %, where the strongest potential was exhibited by H. linarioides, or weakest by H. tetrapterum. Generally, a high level of variation in anti-acetylcholinesterase potential noticed, but the obtained results were comparable and in some cases suggest even stronger biological potential than the H. perforatum.

Keywords: Acetylcholinesterase inhibition, alzheimer’s disease, drug, herbal drugs, Hyperici herba.
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1.45. Antioxidant Activity and Total Phenolic Content of *Origanum Glandulosum* from Algeria

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Abstract: Medicinal plants constitute an important component of flora and are widely distributed in Algeria. In the present study, the hydromethanolic extract and its fractions of aerial parts of *Origanum glandulosum* were investigated for their total phenolic contents, flavonoid contents and antioxidant activity. *In-vitro* antioxidant activities of plant extracts were performed using 2,2-diphenyl-1-picrylhydrazyl (DPPH), reducing power and β-carotene–linoleic acid tests. The results of activity tests were compared with standards via butylatedhydroxytoluene (BHT), ascorbic acid and α-tocopherol. Total phenolic and flavonoid contents of these extracts were measured by Folin Ciocalteu and AlCl3 colorimetric assays, respectively. The analysis showed that diethyl ether fraction exhibited stronger activities than hydromethanolic crude extract and other fractions. Total phenolic and flavonoid contents of the extracts varied between 4.25-352.21 mg GAE/g extract and 1.2-4.58 mg QE/g extract, respectively. The findings of the present study suggest that *O. glandulosum* extracts possess the potent antioxidant activity and hence can be a potential natural source in health and medicine.

Keywords: Antioxidant, flora, extract, medicinal plant, *Origanum glandulosum*, phenolic content.

1.46. Polyphenolic Extract of *Ichnocarpus Frutescens* Leaves Modulates Peripheral Glucose Uptake Through Glut Transporters in Experimental Type 2 Dial Rats

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Abstract: *Ichnocarpus frutescens* (L). Br. (Apocynaceae) leaves have been used extensively in the form of decoction in Ayurveda for treating diabetes mellitus and other major ailments. The overall objective of this investigation was designed to characterize the antidiabetic effects of polyphenol extract (PPE) of *I. frutescens* in streptozotocin-nicotinamide treated rats at cellular and molecular levels may be used for the prevention and treatment of diabetes mellitus. The total polyphenol extract of the plant leaf was tested for its antidiabetic activity for 30 days on cellular and molecular expression of glucose transporters in streptozotocin-nicotinamide induced diabetic rats. Glucose metabolism by the hepatocytes and adipocytes was performed by quantitative real time-polymerase chain reaction (RT-PCR) expression levels of Pck1 and Glut2 (glucose transporter 2) in the hepatocytes and Glut4 (glucose transporter 4) in the adipocytes. Oral administration of PPE significantly modifies the gluconeogenesis process through glucokinase (Gluk) and GLUT4 transporters. The up-regulation of Glut2 reveals the increased glucose transport and the down regulation of Pck-1 shows involvement of the PPE in regulating gluconeogenesis in diabetic rats. The present investigation suggests that the antidiabetic effect of PPE in *I. frutescens* is mediated through modulation of hepatic and adipocyte glucose transport with streptozotocin-nicotinamide induced type II diabetic rats. It also explains and confirms the basis for its traditional use by tribal community of southern India.

Keywords: Antidiabetic, *Ichnocarpus frutescens*, gluconeogenesis, glut, streptozotocin-nicotinamide.
1.47. Evaluation of Safe Doses with Both Antifungal and Anti-Inflammatory Activities of Artemisia Herba-Alba Asso Essential Oil from Buseirah (S. Jordan)

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Abstract: Artemisia herba-alba Asso (“desert wormwood” in English; “armoise blanche” in Fr “shaih” Arabic name), is a medicinal and strongly aromatic plant widely used in traditional medicine in many cultures since ancient times. In Jordan, this species is widely used in traditional medicine to cough, stomach and intestinal pain, as antipyretic and in the treatment of diabetes, inflammations and many diseases. Specifically in Badia region, this species is used in the form of a decoction, to relief fever and the treatment of menstrual and nervous disorders. Considering the traditional medicinal uses and the lack of scientific studies addressing the cellular and molecular players involved in these biological activities present study was designed to unveil the antifungal and anti-inflammatory activities of Artemisia h alba Asso essential oil in safe doses to mammalian cells. A. herba-alba was collected in in Buseirah (Jordan). Buseirah is Old Testament Bozrah, capital of Iron Age Edom in the 7th-6th century BC. The analysis of the essential oil was carried out by gas chromatography (GC) and gas chromatography–spectrometry (GC–MS). The antifungal activity was evaluated against yeasts, dermatophyte and Aspergillus strains. In order to deeply explore the mechanisms behind the anti-fungal effect of the essential oil, the germ tube inhibition assay was evaluated using C. albicans. The assessment of cell viability accomplished using the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay and the assessment of cell viability was accomplished using the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay at in vitro anti-inflammation of A. herba-alba oil at the periphery and central nervous system evaluated by measuring nitric oxide (NO) production using lipopolysaccharide (LPS)-stimulated macrophages and microglia, respectively. Oxygen containing monoterpenes are the main compounds of the oil, namely 1,8-cineole (20.1%), β-thujone (25.1%), α-thujone (22.9%) and camphor (10.5%). Amor fungal strains tested, the oil demonstrated strong potential against Trichophyton rubrum Epidermophyton floccosum, with MIC and MCL values of 0.32 μL/mL and Cryptococcus neoformans MIC of 0.64 μL/mL. The oil revealed an important inhibitory effect on the germ tube formation of A. albicans with inhibition of filamentation around 90% at the concentration 0.16 μL/mL. Important features of the essential oil significantly inhibited NO production evoked by LPS without cytotoxicity at concentrations to 1.25 μL/mL in macrophages and up to 0.32 μL/mL in microglia. Furthermore, evaluation of cell viability in human keratinocytes showed no cytotoxicity at concentrations up to 0.32 μL/mL. It was possible to find appropriate doses of A. herba-alba oil with both antifungal and anti-inflammatory activities and with low detrimental effect on several mammalian cell types. These findings add significant information for the pharmacological activity of A. herba-alba essential oil, specifically to its antifungal and anti-inflammatory therapeutic value, thus justifying and reinforcing the use of this plant in traditional medicine.

Keywords: Antifungal, inflammatory activity, Artemisia herba-alba, chemical, cytotoxicity, essential.

1.48. Antioxidant Activity of Aqueous Extract from Crataegus Oxyacantha Leav

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Abstract: Crataegus (Rosaceae) genus comprises more than 200 species worldwide but few species have been used medicinally. In Mediterranean region, the predominant species of this genus is C. oxyacantha syn. Monogyna, known as “Hawthorn” with protective against the treatment of mild heart diseases leaves collected at three different stages, vegetative, flowering and fruity. The aim of this work was to determine total phenols, total flavonoids, flavons and flavonols contents as well as antioxidant activity of hawthorn leaves aqueous extracts. Chemical determinations were carried out using spectrophotometric methods whereas antioxidant activity was assessed according to 1,1 diphenyl-2-picrylhydrazyl (DPPH) and 2,2’-azinobis(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) assays. The results showed total phenol content varying from 96. 168.92 mg gallic acid equivalent (GAE) g of dry weight, that of flavonoids ranged from 4.5 to 16.18 μg/L.

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quercetin equivalent (QE) g of dry weight from the extract of leaves at flowering, vegetative and stages respectively and that of flavons and flavonols ranged from 26.23 to 39.96 mg of que equivalent (QE) g of dry weight. The leaves extract at vegetative stage showed high scavenging ac against the free radical DPPH with an IC₅₀ value of 11.35 ug/ml. The leaves extract from all the stages exhibited low ferrous chelating activity with IC₅₀ = 1.4 mg/ml and reducing power activity (IC₅₀ between 251.5 and 482.55 ug/ml) than compared to BHA (IC₅₀ 41.41 ug/ml).

Key words: Antioxidant activity, *Crataegus oxyacantha*, hawthorn, phenolic content.

1.49. Evaluation of Biological potential of *Galiansoga parviflora*

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Abstract: This study was carried out with an objective to investigate the Antioxidant, antibacteria antifungal potentials of crude extract of *Galiansoga parviflora* cav, and its subsequent fractions in hexane, ethylacetate and methanol. The aim of the study is to assess the antimicrobial activity and to determin zone of inhibition of extracts on some bacterial and fungal strains. In the present study, the mice activity of crude extracts and fractions of *Galiansoga parviflora* cav were evaluated for potent antimicrobial activity against human pathogenic bacteria; and three fungal strains along with antioxidant capacity. The antimicrobial activity was determined in the extracts using agar disc diffusion method, against three Gram-positive Staphylococcus aureus, Staphylococcus epidermidis, Bacillus cereus; three Gram negative bacteria: Pseudomonas aeruginosa, Escherichia coli and Salmonella typhi, three fungal strains: Aspergillus niger, Candida albicans and Fusarium solani. Ethyleacetate fraction showed 100% inhibition against E. coli. Zone of inhibition of extract and fractions were compared with that of different standards like ampicillin, for antibacterial activity and nystatin for antifungal activity, and BHA used as positive control for antioxidant capacity.

Keywords: Antioxidant, antibacterial, biological, *Galiansoga parviflora*, strains.

1.50. Anti-Inflammatory and Neurobehavioral Effects of the Leaves from *Maytenus macrocarpa* (Ruiz & Pavón) Briquet in Mice

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Abstract: Studies show that several species of Maytenus have effects on nociception and inflammation pathway, also, toxic effects on neurobehavioral. Objective: To determine the anti-inflammatory effect the neurobehavioral manifestations of the leaf of *Maytenus macrocarpa* (Ruiz & Pavón) Br Experimental, pre-clinical and double-blind study. They were used 60 albino male mice with av weight of 30 g. The animals were randomly distributed into 10 groups, then, they received by orall next substances: Ethanolic extract of the leaf of *Maytenus macrocarpa* (Ruiz & Pavón) Briquet in esc doses of 500, 750, 1000, 1250 and 1500 mg/kg, distilled water (placebo group) 0.1mg/10g, Caffeïn mg/kg, Diazepam 32 mg/kg, Diclofenac 32 mg/kg and one group without any substance (control group). The neurobehavioral was explored by the Irwin test, and for to determine the anti-inflammatory activity applied the carrageenan test. To the statistical analysis were made the ANOVA test, Tukey Test, and I exact Test, it was established statistical significance with p <0.05 and confidence interval of 95%. were observed 29.31, 39.66, 31.03, 74.14 and 32.76 % of the anti-inflammation with M. macrocarpa respectively, in contrast, diclofenac showed 58.62% of the anti-inflammation (one way ANOVA, p< CI 95%). The next neurobehavioral manifestations were presented by action of M. macrocarpa: excit abnormal gait, abdominal cramps, piloerection, stereotypes and scratching (Fisher exact, p<0.0: 95%). This study demonstrated the anti-inflammatory effect of the leaf of Maytenus macrocarpa concomitants neuroexcitatory effects.

Keywords: Anti-inflammation, diclofenac, maytenus, mice, neurobehavioral manifestations.
1.51. Chemical Constituents of the Bark of *Artocarpus elasticus* with Biological Activity

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Abstract: *Artocarpus* (Moraceae) is a source of prenylated flavonoids. These compounds have previously been reported to show various biological activities. With the aim of searching for bioactive substances, the chemical constituents of the bark of *Artocarpus elasticus* were investigated and evaluated for their activity against pathogenic bacteria, fungi, and their cytotoxicity. The bark of *A. elasticus* was extracted with CH$_2$Cl$_2$ and purified by chromatography to provide three new and nine known compounds. Arto and cycloartabolixanthone inhibited the growth of strains of *Staphylococcus aureus* including methicillin-resistant *S. aureus*. They showed no activity against Gram-negative bacteria. Artonin E was also cytotoxic to bone cancer (D17), colon cancer (COLO 205) and epidermoid carcinoma (A431) cells.

Keywords: Chemical constituents, *Artocarpus*, flavonoids, *Staphylococcus aureus*.

1.52. In vitro Study of The Antibacterial of Methanolic Extract of *Anthyllis barbo jovis* from the Algerian East

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Abstract: Within the framework of the search for new therapeutic agents of vegetable origin, our study was made starting from extracts of sample collected on the site of Experimental culture of the *Anthyllis barbo jovis* in the Algerian East. The wealth of active ingredients (alkaloids, of sterols, the terpenes, the poly phenols and the flavonoids) of the *Anthyllis* plant bored-jovis was evaluated. What brings us to study the antibacterial activity and antifungal of its extracts methanolic (sheets and flowers) with respect to the bacterial stocks of *Positive Gram* and negative Gram. The inhibiting and bactericidal activities of the extracts were given with through the inhibiting and bactericidal minimal concentraion (C.M.I and C.M.B.).

Key words: Antibacterial, anthyllis bored-jovis, antibactérienne activity, extract, methanolic extract.

1.53. The Anti-Inflammatory Effect of *Colocynthis Vulgaris*

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Abstract: The genus Colocynthis grows naturally in Algerian sahara. The extract of *Colocynthis vu* (Curcurbitaceae) have been used as a folk medicine for analgesia and anti-inflammatory effect. The inflammatory process can initiated by infectious compounds, trauma or auto-ummine activities are enhanced by activation of the complement cascades. The vascular phenomena such as vaso-permeability with oedema formation are important compounds of the acute inflammatory reaction; in order to pr the scientific bases for the traditional use of *Colocynthis vulgaris* we evaluated the anti-inflammatory activity of the n-butanol extract. Our investigation revealed that the oral administration (300 mk/Kg of n-butanol extract of *Colocynthis vulgaris* to male wistar rats exhibited a significant inhibited pawoedema induced by 3 mg/Kg of carrageenin. The number of PMNS in the peripheral blood...
increased, and the *Colocynthis vulgaris* reduced significantly in a dose dependent manner the neutrophil chemotaxic to FMLP. In addition, the *Colocynthis vulgaris* exerted a great inhibitory effect on generation of O₂⁻. These results suggested that the n-butanolic extract contained a higher concentrati anti-inflammatory compounds.

**Keywords:** Anti-inflammatory effects, butanolic extract, *Colocynthis vulgaris* rats, folk medicine.

### 1.54. Evaluation of the Antimicrobial Activity of *Aristolochia longa* L. Extracts

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**Abstract:** *Aristolochia longa* L. (Aristolochiaceae) is a native plant of Algeria used in traditional medical Three extracts (methanol, acetone and water) were prepared from stem, leaves, fruits and rhizomes screened for antibacterial activity. The agar diffusion method was assessed to evaluate the efficacy of extracts against standard strains, *Pseudomonas aeruginosa* ATCC 27853, *Staphylococcus aureus* ATCC 25923 and *Bacillus cereus* ATCC 10876. The fruit methanol extract was too efficient against *P. aeroginosa*, *S. aureus* and *B. cereus* with 20mm, 18mm and 15mm inhibition zones respectively. Almost similar results were observed with the acetone extracts from the aerial parts (*P. aeruginosa* 19mm, *S. aureus* 14mm, *B. cereus* 17,5mm) and fruits (*P. aeruginosa* 17mm, *S. aureus* 15mm, *B. cereus* 17mm) when aerial parts aqueous extract was efficient against *S. aureus* (22mm) and *P. aeruginosa* (11,6mm), while effect of the fruit aqueous extract was limited to *S. aureus* (16,3mm). Rhizome’s extracts effect was except rhizome methanol and acetone extracts has an impact only on the *B. cereus* (respectively 12,5 and 9mm). This antibacterial activity of these extracts was confirmed by the microdilution method (minimum inhibitory concentrations (MIC)). No effect was observed when these extracts were tested against fungi *Aspergillus flavus* NRRL 391, *Aspergillus niger* 2CA 936, and *Condida albicans* ATCC1024.

**Keywords:** *Aristolochia longa* L., antibacterial activity, antifungal activity, MIC, extracts

### 1.55. In Vitro Effect of *Citrullus colocynthis* and *Acacia radiana* on Phosp Calcium Crystallization

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**Abstract:** In this work, we performed an in vitro crystallization study enabling the specification of k and thermodynamic conditions of formation and growth of crystalline calcic phosphates species changing the pH. We used inhibitors, which are medicinal plants which prevent, slow down or reduce crystallization phases. We chose the classical model for the study of phosphate crystallization with inhibitor and with it, in order to assess the inhibiting capacity of any chemical species used. precipitation of the solid phase of phosphates from artificial urine at different initial pH values was our object of investigation. The crystal size development was monitored by polarized microcos different time intervals. After crystallization time, the mixture was filtered, the recovered dried precipitates were analysed by FTIR. In the absence of inhibitor, the crystallization of phosphates at pH = 8.00, led to formation of struvite and amorphous carbonated calcium phosphates (ACCP), after 4 hours. In preser inhibitor at pH = 8.00 at lower concentrations of sage inhibition was partial. The addition of 1 ml of sage the mixture decreases the size of crystal, after 4 hours the size of crystals stabilized at 20.67 μm complete disappearance of brushite crystals was obtained after addition of 10 mL of *Citrullus Colocoy* only Pentahydrated octocalcic phosphates (POP) and ACCP were formed. In the presence of *A Radiana*, the inhibition of struvite growth and aggregation increased. The addition of up to a volume mL of *Acacia Radiana* resulted in total inhibition and crystalline transformation of the ACCP carboapatite (CA). Phosphate compounds encountered in urine can be dangerous and the use of inhibit prevent, slow down or reduce crystallization phases might be very helpful. In this investigation, *Citrullus colocynthis* is a promising medicinal plant.
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1.56. Fusion of a Prophetic Medicine, *N. Sativa*, with a Synthetic Antibiotic Gentamicin, as an Alternative Approach to Enhance Antimicrobial Effect Against *S. Aureus*

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Abstract: The rise of antimicrobial resistance in bacteria and the lack of new findings of new classes of antibiotics are major causes of concern in microbiology. *S. Aureus*, a common bacteria in many clinical conditions such as osteomyelitis in which gentamicin is a mainstay treatment. Here, fusing a *N. Sativa* Prophetic, Arab medicine of known anti-microbial property, *N. Sativa*, with an existing synthetic antibiotic, gentamicin, is attempted. The fusion (containing *N. Sativa* 32.5-46.6% v/v; Gentamicin 0.1% w/v) is prepared into two types of emulsions namely oil-in-water and water-in-oil emulsions. The emulsions were then tested against clinical isolates of *S. Aureus* strains retrieved from patients at the Hospital Tengku Ampuan Afzan, Kuantan, Malaysia. Antimicrobial susceptibility of *S. Aureus* was performed by spreading the bacteria out on a plate. A test disc was loaded with 20ul of emulsion and placed in the plate. The zone of inhibition was measured after 24 hours. Results of disc diffusion, as represented by the zone of inhibition, revealed a significant difference (Tukey’s test, p<0.05) against Gentamicin alone and *N. Sativa* alone control sets. The results would be useful for expanding the use of *N. Sativa*-Gentamicin-emulsions into clinical therapy, and provide a lead of how materials from ethnopharmacology could be integrated into modern practice.

Keywords: Antimicrobial, *N. Sativa*, emulsion, gentamicin, *N. Sativa*, prophetic medicine, *S. Aureus*.

1.57. Effect of Prolonged Oral Administration of Aqueous *Ruta montana* L. Extract on Fertility Potential in Albino Rats

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Abstract: The objective of this study was to evaluate the effect of aqueous extract of *Ruta montana* fertility in adult male and female rats. 40 healthy adult male and female albino rats were divided into groups (Group I to IV) of 5 rat each. 100, 300 and 600 mg/kg/day of the extract were orally administered to Groups II, III and IV respectively while Group I received distilled water and served as control. The administration was carried out for a period of 90 days. The results show the significant decrease in the epididymis, seminal vesicles and ovary weight, as well as a reduction in the number and the motility of spermatozoids in rats treated by the doses of 300 and 600 mg/kg body weight, in comparison with the control group.

Keywords: Accessory sex organs, histology, fertility, *Rutamontana*, sperm parameters.

1.58. Anxioylic Effect of Deodorised Extracts of *Mentha x piperita* L., *Lamiaceae*

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Abstract: *Mentha x piperita* L. is a well-known medicinal plant from the family *Lamiaceae*. Essential oils have been found to have significant effects on anxiety and depression. The aim of the present study was to investigate the effect of deodorised extracts of *Mentha x piperita* L. on the anxiety-like behavior in a mouse model. The results showed that the deodorised extracts of *Mentha x piperita* L. induced a significant decrease in anxiety-like behavior in the elevated plus-maze test, indicating a potential anxiolytic effect of the extracts. These results suggest that *Mentha x piperita* L. may have potential therapeutic applications in the treatment of anxiety disorders.
Abstract: Nowadays, usage of herbal remedies represent one of the dominant approaches in alternative medicine. Aromatic plants, such as peppermint (Mentha x piperita L., Lamiaceae) have long tradition both in folk and conventional medicine due to the presence of essential oil. However, peppermint essential oil is present in a very low amount in the leaves, therefore the majority of collected or cultivated material remains unused after its isolation. The aim of the presented study was to elucidate anxiolytic activity of well chemically characterized peppermint deodorized leaves extracts. All extracts macerated with 45% or 75% ethanol (EtOH) for 24 h at room temperature (1:10 w/v). For extraction of dried leaves (N1-prepared for comparison by standard procedure from peppermint leaves (45% Et and deodorized leaves (N3–45% EtOH, N4-75% EtOH) were used. Extracts were chemically characterized by HPLC/DAD analysis. Anxiolytic effect was assessed on experimental animals (Swiss Albino mice) by elevated plus maze with diazepam as a positive control. Rosmarinic acid and chlorogenic acid as well as apigenin were identified as major compounds. Examined peppermint deodorized leaves extracts influence on CNS and propose a way to exploit plant material more efficiently, either through isolation of dominant compounds or preparation of herbal remedies.

Keywords: Anxiolytic, deodorised extract, essential oil, folk medicine, Mentha x piperita, Serbia.

1.59. Antibacterial Activities of Mangostins from Garcinia Mangostana

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Abstract: α- and γ-mangostins isolated from the pericarp of Garcinia mangostana L. were tested for antibacterial activity against clinical isolates of methicillin-resistant Staphylococcus aureus colorimetric broth microdilution test. Their minimum inhibitory concentrations (MIC) and minimum bactericidal concentrations (MBC) were in the range of 1.2–2.8 μg/ml for α-mangostins and 2.8–32 μg/ml for γ-mangostins, respectively. Time-kill kinetic studies showed the bactericidal activity of α-mangostin (4MIC) within 2 hs as compared to 2–4 hs for γ-mangostin and 24–48 hs for vancomycin. Further spot checkerboard technique showed additivity or indifference between α-mangostin + vancomycin, γ-mangostin + vancomycin, and α-mangostin + γ-mangostin. Both compounds also showed anti-biofilm activity.

Keywords: Antibacterial activities, Garcinia mangostana, mangostins.

1.60. Senna A Traditional Medicine for A Modern Disease: A Randomized Do Blind Clinical Trial For Reduction of Uremic Pruritus in Hemodialysis Patients

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Abstract: Uremic pruritus is a common problem in hemodialysis patients. No effective treatment exists for uremic pruritus due to its complex pathogenesis. Systemic inflammation and elevated serum levels of interleukin-2 (IL-2) are implicated in the pathogenesis of uremic pruritus. Senna (Cassia sem. a traditional drug in Iranian traditional medicine (ITM). In the point of view of ITM it is used for red yellow bile (which is responsible for pruritus) in the blood. In vivo studies also confirmed it inflammatory properties. We performed this randomized double-blind placebo-controlled trial to evaluate the effect of senna on reduction of uremic pruritus and serum levels of IL-2 in hemodialysis patients.
hemodialysis patients with moderate to severe pruritus (visual analogue scale ≥3) of at least 6 week duration were enrolled. Patients with secondary causes of pruritus were excluded. Anti-pruritic medications stopped two weeks before the treatment phase. Enrolled patients were randomized into 2 equal groups to receive either senna or placebo tablets for 8 weeks. Severity of pruritus and serum levels of IL-2 measured before and at the end of treatment phase. Baseline demographic and clinical data, including severity of pruritus and serum levels of IL-2, were similar in two groups. At the end of treatment pruritus decreased in both groups; however, the mean reduction in severity of pruritus was significantly higher in senna than placebo group (4.95 [95%CI: -5.89 to -4.02] vs. -0.84 [95%CI: -1.89 to p<0.001]). Mean serum levels of IL-2 decreased in the senna group but increased in the placebo group; mean reduction in IL-2 serum levels in the senna group was significantly different from the mean increase in the placebo group (-10.93 [95%CI: -10.93 to -0.41] vs. 4.02 [95%CI: -5.23 to 13.28], p=0.048). Senna may be an effective treatment for uremic pruritus through reduction of serum IL-2 levels.

Key words: Cassia senna, hemodialysis, interleukin-2 (IL-2), patients, Senna, serum, uremic pruritus.

1.61. Evaluation of Antibacterial Activity of Ethyl Acetate Extract of Centaurea melitensis L.

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Abstract: Currently, the in vitro antimicrobial activity of a substance or a sample can be demonstrated with a number of conventional techniques: the liquid medium or the solid medium. The in vitro evaluation of the antimicrobial activity of Centaurea melitensis L. was performed by solid-diffusion technique. Microbial strains were used, from the results obtained; the Acetate extract of C. melitensis has a pronounced effect only against Gram-negative bacteria. In part against the resistance of Gram-positive bacteria was noted. In conclusion, these preliminary in vitro results are satisfactory and necessary for the in vivo potential of the Acetate extract of Centaurea melitensis L. and isolated products.

Keywords: Antimicrobial activity, Centaurea melitensis, acetate extract.

1.62. In Vitro Antibacterial Properties of Some Plants Extracts Against Can Albicans

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Abstract: Candida albicans (C. albicans) is a dimorphic fungus that causes severe opportunistic infections in humans. Candidiasis is a common infection of the skin, oral cavity and esophagus, gastrointestinal vagina and vascular system of humans. C. albicans infections have increased significantly over the past decades. Oropharyngeal candidiasis is a common occurrence in the course of human immunodeficiency virus (HIV) disease progression and other immunocompromised hosts. Candida species are currently the fourth most commonly recovered isolates in cases of nosocomial bloodstream infection in the United States. Twenty-five percent to 50% of the nosocomial candidal infections now occur in patients in critical units, with significant associated morbidity and mortality. The limited number of antifungal drug therapy options has led to the increase of number of drugs tolerance “multidrug resistance” fungi reported world wide, prompting intensive efforts to search for new antibiotics as well as for valuable antibacterial plants agents to be used for the treatment of infection diseases. In this study, we assessed the in vitro anti fungial activity of plant extracts (Alpinia officinarum, Malvapusilla, Junipirusphoenice, Zingiber officinalis, Citrilluscolynthis, Prosopisfarcta) against C. albicans and its potential use for antifungal treatment. Nystatin was used as standard control. Results obtained from our ongoing study shows remarkable efficacy of some selected plants extract against C. albicans (ATCC 10231 strain). The MIC value for all tested plant extracts ranged from 0.006 to 1.37 mg/ml. In addition, the MBC value for all tested plant extracts ranged from 3.3 mg/ml to 3.3 mg/ml. Taken together, our results points to some of the above mentioned medicinal plant a potential source for anti C. albicans drugs.
Keywords: Antifungal activity, Candida albicans, drug, Oropharyngeal, Palestine, plant extract, virus,

1.63. B-Caryophyllene Isolated from Aquilaria Crassna, Suppresses Growth Metastasis of Colon Cancer By Inhibiting Proliferation, Invasion, Angiogenesis

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Abstract: Aquilaria crassna is used to treat various infectious diseases in Asia. The present study reports the bio-assay (cytotoxicity) guided isolation of β-caryophyllene from the distilled essential oils crassna. Chemical composition of the essential oils was studied using GC-MS. The structure caryophyllene was elucidated using FT-IR, 1H and 13C NMR and MS spectral. Anti-colon cancer effect investigated on HCT 116 human colorectal carcinoma cells including cytotoxicity, apoptosis, tumorigenicity and antimitastatic. In addition, antiangiogenic effect was studied on rat aortic rings, tube formation, migration, chorioallantoic membrane (CAM) assay and expression of vascular endot growth factor (VEGF). The in vivo anti-colon cancer activity was also investigated on subcutaneous established in nude mice. β -caryophyllene showed potent cytotoxicity (median inhibitory concentr 9.5 ± 1.0 μg/ml), due to induction of the mitochondrial pathway of apoptosis. Interestingly, the main steps in tumor metastasis including, cell invasion, cell migration and clonogenicity were inhibited caryophyllene. Furthermore, antiangiogenesis study exhibited significant suppression of microvessel outgrowth in rat aortic rings, antiangiogenic effect was further investigated by inhibition of tube formation on matrigel matrix that involves human endothelial cells (IC50 = 14.3 ± 2.5 μg/ml). β -caryophyllene inhibited migration of endothelial cells and suppressed expression of VEGF. (100 μg/ml) sh remarkable inhibition (80.12%) of neovascularization in chorioallantoic membrane of chick embryo compound also inhibited the formation of blood vessels in matrigel plug implanted in mice. (200 mg/kg/day) of β -caryophyllene caused significant growth inhibition of the ectopic tumor model of 116 colorectal carcinoma cells. Tumor histology revealed significant reduction in vascularity Collectively, our results reviled a new mechanism of action of β -caryophyllene and suggest that it m a potential chemotherapeutic agent selectively against colon cancer.

Keywords: Aquilaria crassna, cancer, endothelial cells, mechanism, vascularization.

1.64. Skeletal Malformation of Fetuses from Pregnant Sprague dawley Rats Fed Jatropha curcas Crude Oil (JCO)

Noor Haziyah Abdul Mutalib, Yon Thannia Samat and Sabrina Sukardi

Abstract: Studies on the teratogenicity effects of Jatropha curcas has been reported in pregnant rats seeds of this plant contain curcin which is very toxic. This study was carried out to observe whether fe Jatropha curcas seeds crude oil (JCO)to pregnant rats during early and late gestation will causefetal skeletal malformations. A hundred sexually mature female rats were divided equally into 2 groups: early an gestation. Each group was then subdivided equally into 5 groups: positive control (fed retinylpalmit vehicle control (corn oil), low dose (0.175ml/kg), medium dose (0.35ml/kg) and high dose (0.7ml/kg) JCO. Rats were mated overnight and positive pregnant rats were treated accordingly on days 1-7 (group) and days 8-14 (late group). Rats were sacrificed on day 21 of pregnancy. Fetuses were weighed, processed and stained with Alizarin red. Determination of skeletal malformations was cond using Dino Capture Microscope. Data collected showed that fetuses in the high treatment gro significantly lighter and smaller as compared to other groups. Some skeletal abnormalities in fetuses all treated groups withthe oil were observe suggesting that fetotoxic effects is apparent if dams are fs during the early and late gestation periods.

Keywords: Crude oil, fetus, Jatropha curcas, teratogenicity, skeletal malformation.
Abstract: Medicinal plants are widely used all over the World as folk medicine for several purposes. They are one potential source of novel drugs used as antibacterial, antioxidant, antiulcer, anti-inflammatory and antitumor agents. In our study, we have used plants of the genus Plantago, which are distributed in the world and have been traditionally used for several purposes. Our experiments were carried on leaves of Plantago major, a species growing in Sétif area in the North-East of Algeria. Different extracts were obtained by combination of standard antibiotic (Gentamicin) with leaves extracts of Maytenus macrocarpa, Pseudomonas aeruginosa, Klebsiella pneumonia, Proteus sp and Salmonella thyphimurium. Synergetic antibacterial activity was obtained by combination of standard antibiotic (Gentamicin) with leaves extracts of Plantago major.

Keywords: Antimicrobial, antioxidant activities, extract, Plantago major, species.

1.65. Antioxidant and Antimicrobial Activities of Plantago major

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Abstract: Medicinal plants are widely used all over the World as folk medicine for several purposes. They are one potential source of novel drugs used as antibacterial, antioxidant, antiulcer, anti-inflammatory and antitumor agents. In our study, we have used plants of the genus Plantago, which are distributed in the world and have been traditionally used for several purposes. Our experiments were carried on leaves of Plantago major, a species growing in Sétif area in the North-East of Algeria. Different extracts were obtained by combination of standard antibiotic (Gentamicin) with leaves extracts of Maytenus macrocarpa, Pseudomonas aeruginosa, Klebsiella pneumonia, Proteus sp and Salmonella thyphimurium. Synergetic antibacterial activity was obtained by combination of standard antibiotic (Gentamicin) with leaves extracts of Plantago major.

Keywords: Antimicrobial, antioxidant activities, extract, Plantago major, species.

1.66. Pharmacologic Activity of Maytenus macrocarpa Leaves (Ruiz & Pav.) Briq (Chuchuhuasi) on Rodents


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Abstract: Maytenus macrocarpa (chuchuhuasi) is ancestrally used like medicinal plant by natives from Peru. The objective was to determine the phytochemical compounds, the acute toxicity and analgesic effect, the anti-inflammatory action, the activity on intestinal motility, and the effects on the cardiovascular and diuretic system, of the chuchuhuasi's leaves. The phytochemical compounds determined by colorimetric essay in vitro. Male albino mice with average weight of 30g were used in vivo essays. The acute toxicity was explored by the Irwin test. The analgesic effects were evaluated by the writhing test, tail flick test, and formalin test. The anti-inflammatory activities were determined by carrageenan oedema test, and the formalin test. The gastro-intestinal motility was measured by charcoal running test. The cardiovascular activity was determined by the electrocardiographic patterns diuretic evaluation was determined by collection of the urine in 24 hours. It was shown the phytochemical compounds: alkaloids, flavonoids, cumarines, steroids, phenols, quinones, saponins and cytokines. The acute toxicity test reveals the presence of sedation and stereotypes at doses of 4000, 1 and 14000 mg/kg. It was observed analgesic effect in the writhing test (ANOVA and Bonferroni
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p<0.05, IC 95%), also, the analgesic effect was related to the doses (500 to 2250 mg/kg), Pe correlation r=0.5746 and r²=0.3302. at doses of 1000 and 1500 mg/kg, the tail flick test shows antinociceptive effect. The phases 1 and 2 of formalin test showed antinociceptive and anti-inflammatory effect at 750 and 1000 mg/kg (ANOVA and Tukey test, p<0.05, IC 95%). The carrageenan test shows anti-inflammatory effect at 1000 and 1500 mg/kg (ANOVA and Tukey test, p<0.05, IC 95%). The chi test reveal arise of the intestinal motility (500 and 3500 mg/kg, ANOVA and Tukey test, p<0.05, IC 95%). These effects were correlated to the dose (Pearson correlation, r=0, 2607 y r²=0.06808). At doses of mg/kg, the electrocardiographic patterns shown prolonged of the p-r and q-t intervals, and, increase of voltage of the p wave, also, it was observed reduce to the heart frequency. Finally, at doses of 500 and mg/kg, it was observed increase of the urinary volume. It revealed secondaries metabolites, also, neurt effect, analgesic and anti-inflammatory activity, increase of the intestinal motility, cardiotoxic and di effects of chuchuhuasi’s leaves

Keywords: Anti-inflammatory, electrocardiography, intestinal motility, Maytenus macrocarpa, toxicit

1.67. Pre-Osteoblastic Cells Proliferative Property of Bioactive Compounds in Germinated Brown Rice: A Promising In Vitro Potentials in Osteoporosis

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Abstract: Application of brown rice in the area of biomedical research is increasing especially in the management of chronic metabolic diseases, but adequate effort has not been made to study the effect of osteoporosis. The purpose of this study was to evaluate the proliferation of cells on MC3T3-E1 osteoblastic cells at varying concentrations. Alkaline phosphatase activity (ALP), collagen and protein synthesis of the cells were quantified. A time-dependent, significant proliferative effect on the cells was observed at a concentration of 10µg/ml compared to other concentrations of 1000µg/ml for TBE and Brdu (p<0.05). No toxicity was recorded at a concentration of 1000µg/ml, using both MTT and N.R assays. An overall significant increase in alkaline phosph activity (p=0.0194) was observed. Collagen and protein synthesis increases significantly in ASG treated cells (p<0.05). Significant correlation was observed between Brdu and TBE results (r²= 0.842, p<1). GBR-bioactives stimulates bone cell proliferation in-vitro possibly by increasing ALP synthesis and leads to new DNA formation, protein and collagen synthesis, and the bioactiveshhas no toxic effect; fi research is needed to ascertain the possibility of using these compounds in the management of osteoporosis.

Key words: Cell proliferation, cellular toxicity, GBR- bioactives, osteoporosis.

1.68. Potential to Use Coptosapelta Flavescens as An Anti-Giardial Infections

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Abstract: Giardia intestinalis is an intestinal protozoan parasite that causes diarrhoea in most devel countries. In the attempt to search for Thai medicinal plants to use as anti-diarrhais agents, we found a acetone extract of Coptosapelta flavescens, the plant that is commonly used to expel intestinal w was very active against the in vitro growth of G. intestinalis with a minimal inhibitory concentrat 15.63 µg/ml. 1-hydroxy-2-hydroxymethylanthraquinone (CFQ) was purified and found to inhibit intestinalis with an IC50 of 0.42 µg/ml and this was comparable to the standard drug, metronidazole (I 0.42 µg/ml). The mechanisms of CFQ action against G. intestinalis trophozoites were then investigate found that, as early as 6 h after incubating CFQ with G. intestinalis trophozoites at its IC50 concentrat induced apoptosis and this was confirmed by the AnnexinV-FITC assay and as viewed by flow cytorn
In contrast, metronidazole produced little or no apoptosis at its IC_{50} value. Furthermore, CFQ also inhibits the adhesion of *G. intestinalis* trophozoites to a Caco-2 intestinal cell line when they were co-cultured. The percentage of *G. intestinalis* trophozoites attached to the Caco-2 cell line dropped to 46.23±26.62% at 24h, respectively. Taken together, we have provided a mechanistic explanation for the action of CFQ and metronidazole against *G. intestinalis* trophozoites. These results have provided further evidence that CFQ is a compound that has the potential for use to treat infections from *G. intestinalis*.

**Keywords:** Coptosapelta flavescens, diarrhoea, extract, *Giardia intestinalis*, metronidazole.

### 1.69. Effects of Methanolic Extract From *Piper nigrum* Linn. on Uterine Contraction in Rats

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**Abstract:** *Piper nigrum* Linn. (Pepper) has been used worldwide as a spice and seasoning. In Thailand, white pepper has also been used in traditional medicine to treat dysmenorrhea. This study was set up to inves its role in uterine contraction in rat using isolated uterus as an experimental model. Female Wistar rats weighing between 200-250 gm were pretreated with 100 µg of estradiol benzoate intraperitoneal hours before experiment. On the day of experiment, approximately 1 cm of each uterine horn was removed, cleared of fat tissues and placed in organ bath filled with Jalon Ringersolution and aerated continuously. The uterus was set up in the organ bath so that the contraction of the uterus can be recorded by forcedisplacement transducer and Grass polygraph. The results has shown that methanolic extract of white pepper (10⁻⁴ – 10⁻³ mg/ml) dose-dependently reduced the contraction of rat uterus induced by oxytocin (1 mU/ml), CaCl₂ (10⁻³ – 10⁻² M), and KCl-depolarizing solution (56.3mM). In contrast, triethyl ammonium (10⁻⁵ M), glibenclamide (10⁻⁴ M) and propranolol (10⁻⁶ M) could not antagonized the relax effect of the extract on the uterus. These results suggested that the relaxing effect of the extract is, at least, due to the blockage of calcium movement across the plasma membrane. It is unlikely that the extract may act through an inhibition of Kᵢ₅₆, channel, Kᵢ₅₆, channel or the stimulation of β₃-adrenergic receptor on the uterine muscle. The precise mechanism of the extract is currently underway.

**Keywords:** Adrenergic receptor dysmenorrheal, extract, forcedisplacement, *Piper nigrum*, oxytocin.

### 1.70. Antidiarrheal, Analgesic and Anti-inflammatory Effects of *Commiphora molmol* Extract

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**Abstract:** The study was performed to assess some pharmacological effects of *Commiphora molmol* (Myrrh) ethanol extract (CME) and to clarify the possible mechanisms. Safety of CME was measured by determination of the acute oral LD_{50} in mice. Preliminary phytochemical screening of CME was performed. The antidiarrheal effect was studied using castor oil-induced diarrhea in rats and charcoal meal test in mice. The analgesic activity was examined using acetic acid (chemical) and thermal (heat) tail flick tests in mice. The anti-inflammatory activity was determined using formalin induced paw edema in rats. The acute oral LD_{50} of CME was 2750 mg/kg in mice, denoting high safety. The extract contains high concentrations of flavonoids, glycosides and /or carbohydrates, sapogenins, sterol, and terpenes and low concentrations of alkaloids. CME decreased the numt stool pellets discharged in castor oil-administered rats and delayed the propulsion of charcoal meal in denoting antidiarrheal effect. This effect was confirmed by marked inhibition of the in vitro isolated rat duodenal motility by CME. The plant extract significantly increased the reaction time to both chemical and thermal painful stimuli, in a dose-dependent manner, indicating potent analgesic effect via both perij and central mechanisms. CME reduced the volume of edema induced by formalin in paw's rats der anti-inflammatory activity. *Commiphora molmol* extract exhibits antidiarrheal, analgesic and anti-inflammatory effects. These results affirm the traditional use of *Commiphora molmol* resin for the treatment of diarrhea, intestinal colic, pain and inflammatory conditions.

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Keywords: Analgesic, anti-diarrheal, anti-inflammatory, Commiphora molmol, phytochemical.

1.71. Antioxidant and Antimicrobial Activities of Phenolic Extracts of Endemic Plants Marrubium Deserti and Ammodaucus Leucotrichus from Algeria

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Abstract: The Marrubium deserti and Ammodaucus leucotrichus L. an Algerian endemic species, has several applications in traditional medicine for example as a remedy for asthma and diabetes, and was found to have antibacterial properties. In this work, an antioxidant and antimicrobial activities performed on phenolic extracts of Marrubium deserti, Ammodaucus leucotrichus plants. The yield of methanol maceration of these plants is 12.4% and 20.4% respectively. The content of total polyphenols, flavonoids and anthocyanin in methanolic extracts, are varied between 19.52 ± 1.88 and 59.24 ± 3.45 mg/g gallic acid equivalent, and 2.08 ± 0.29 to 1.46 ± 0.39 mg / g quercetin equivalent, and 0.395 to 1.934 µmol/g respectively. The total chlorophylls and carotenoids were be ranged from 0.149 ± 0.20 to 1.537 ± 0.20 g / ml and 1.537 ± 0.20 to 0.149 ± 0.20 g/ml, respectively. According to DPPH and FRAP test, the values of EC50 was shows a higher activity of Marrubium deserti than Ammodaucus leucotrichus with EC50 values (DPPH) were 34.53 ± 0.71 μg/mL and 258,60 ± 15,67 mg / mL respectively. The TEAC values of FRAP test was a highly superior for Marrubium deserti 209.66 ± 0.26 mg Equivalent Trolox/g dry residue than Ammodaucus leucotrichus 45,88 ± 2,93 mg Trolox Equivalent/g dry residue. The antimicrobial activity against nine strains of bacteria (Staphylococcus aureus(+), Staphylococcus aureus (-), Bacillus cereus, Enterococcus faecalis, Esche coli, Pseudomonas aeruginosa, Klebsiella pneumoniae and Salmonella typhi), was showed that the extracts are a significant antibacterial activity with inhibition zones ranging from 10 to 50 mm. The value of CMI were ranging from 0.89 to 14.29 mg/ml.

Keywords: Ammodaucus leucotrichus, antimicrobial, antioxidant, marrubium deserti, phenolic.

1.72. In Vitro Evaluations of Anti-Hypoglycemic, Cytotoxicity and Chen Identification of Methanolic Sweet Basil Extract

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Abstract: Despite the enormous achievements in conventional medicine, diabetes reached epid proportions globally. Its highest prevalence is in the Arab world especially in the Gulf region. St medicinal plants can treat diabetes type II. Based on knowledge obtained from the Greco-Arab and Is herbal medicine as well as from our previous studies, the aim of this study was to evaluate the α glucose transporter-4 (GLUT4) in the anti-diabetic effects of the aerial parts of sweet basiland to id potential sources of bioactive derivatives in methanolextract. Chemical analysis of the methanolic extract using the silylationderivatization technique revealed new compounds and known compro Cytotoxic and anti-diabetic properties of the extract were evaluated using L6-GLUT4myc muscle stably expressing myc epitope at the exofacial loop (GLUT4). No cytotoxic effects were observed in tr cells up to 0.25 mg/ml extract as measured with MTT and LDH-leakage assays. GLUT4 translocation plasma membrane was elevated by 3.5 and 7 folds (+/− insulin) after treatment with sweet basil extract 20 h. Our findings suggest that the observed anti-diabetic properties of sweet basil extract are mediated in part through one or more of the identified compound.

Keywords: Anti-hypoglycemic, extract, evaluation, cytotoxicity, methanolic extract, Palestine.
1.73. Antimicrobial Activity and Chemical Composition of the Leaf Essential Oil of *Artemisia absinthium*

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Abstract: The essential oil of the leaves of *Artemisia absinthium* grown in Algeria was determined by distillation method and analysed by chromatography (GC) and gas chromatography coupled with mass spectrometry (GC-MS). The antimicrobial activities were tested in vitro by a bioassay on collect strains: *Escherichia coli*, *Staphylococcus aureus*, *Klebsiella pneumonia*, and were evaluated using methods; agar disc diffusion and minimum inhibitory concentration (MIC). The results of the revealed that the major component was Camphor (44.93%), other predominant constituents were Chamazulen (7%) and Terpinen-4-ol (9%). Essential oil extracted from *Artemisia herba alba* showed high activity against *Escherichia coli*, *Staphylococcus aureus*, and *Klebsiella pneumonia*, with inhibition zone 17, 36 and 17mm respectively.

Keywords: Antibacterial activity, *Artemisia absinthium*, camphor, essential oil composition, GC/MS.

1.74. Sub-Chronic Effects of *Centella asiatica* Extract on Blood Pressure of Rats

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Abstract: Hypertension is one of the most important modifiable risk factors for cardiovascular disease. *Centella asiatica* (C. asiatica), known as Asian pennywort, guta kola (Indian) and bua-bok (Thai), is one of the medicinal herbs that has been used extensively by Ayurvedic Pharmacoeia to alleviate hypertension. Thus, sub-chronic effects of *C. asiatica* extract on systolic blood pressure (SBP) of normotensive and L-NAME-induced hypertensive rats were investigated. SBP was recorded from caudal artery in 64 male Wistar rats by non-invasive tail cuff method. The rats were divided into 8 groups: the first to the fourth groups were freely accessed to water and daily orally administered with DDD water (10 ml/kg), *C. asiatica* extract (16 g/10 ml/kg), quercetin (5 mg/10 ml/kg), and propylene glycol (10 ml/kg), respectively, the fifth to the eighth groups were freely accessed to drinking water containing L-NAME (40 mg/kg/day) and orally administered with DDD water (10 ml/kg), *C. asiatica* extract (16 g/10 ml/kg), quercetin (5 ml/kg), and propylene glycol (10 ml/kg), respectively, for 28 days. SBP was recorded at day 0, 7, 14, 21, and 28. Baseline SBP of all groups was 126.27 ± 0.63 mmHg. The groups that consumed drinking water containing L-NAME significantly increased SBP to 173.87 ± 1.73 mmHg at day 7 and 185.57 ± 1.52 mmHg at day 28, compared to their respective control group. *C. asiatica* extract significantly dropped increased SBP to 146.65 ± 4.05, 146.60 ± 2.55, 141.78 ± 2.16 mmHg on day 14, 21, and 28, respect when compared to L-NAME with DDD water treated group (180.51 ± 3.68, 180.12 ± 2.38, and 184 4.40 mmHg). Quercetin significantly dropped the increased SBP after drinking water containing L-NAME to 156.91 ± 5.34, 147.77 ± 4.48, 140.89 ± 2.37 mmHg on day 14, 21, and 28, respectively, when compared to L-NAME with propylene glycol treated group (176.70 ± 2.55, 180.15 ± 3.05, and 186.64 ± 3.27 mmHg). In conclusion, this study demonstrated antihypertensive effects of *C. asiatica* extract. *C. asiatica* could ameliorate SBP in L-NAME-induced hypertensive rats. These data support the use of this plant in hypertension treatment in traditional medicine.

Keywords: Cardiovascular diseases, *Centella asiatica*, hypertension, systolic blood pressure, Thailand.
1.75. The Antimicrobial Activity of the Genus Galium L.

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Abstract: The common use of Galium L. family Rubiaceae Juss. plants in Ukrainian folk medicine treating infectious diseases has become the basis for the study of antimicrobial activity obtained from lipophilic complexes of the investigated materials. The samples of herbs Galium verum, G salicifolium Galium dasypodum, Galium aparine, Galium carpaticum and Galium pseudomono harvested at flowering stage of the plants have become the objects of the present research. Lipophilic complexes have been obtained by the exhaustive extraction of the raw material with chloroform i apparatus made by Soxhlet. The complexes have been used as a 2% alcohol solution in 96% of alcohol study has been conducted in vitro with the help of the agar diffusion method. To assess the activity we used the standard strains of microorganisms, regulated by WIO for studying antimicrobial action (drugs: Staphylococcus aureus ATCC 25923, Escherichia coli ATCC 25922, Pseudomonas aerug ATCC 27853, Proteus vulgaris ATCC 4636, Bacillus subtilis ATCC 6633 and Candida albicans 885). The results have shown that Staphylococcus aureus was most susceptible to antimicrobial ac lipophilic complexes. Escherichia coli and Proteus vulgaris showed least susceptibility. Pseudomonas aeruginosa and Bacillus subtilis showed average susceptibility. Candida albicans showed was susceptible to the complexes of Galium aparine, Galium dasypodum, Galium pseudomollugo. Noteworth we have noticed the decrease in antimicrobial activity while examining the combination with G verum. The minimum bactericidal and bacteriostatic doses have been defined. We have also found no correlation between the content of individual groups of biologically active substances and the level of activity of the complexes. The results obtained have given us the basis for an in-depth study antimicrobial and antifungal activity of the lipophilic complexes of the genus Galium L.

Keywords: Antimicrobial, Candida albicans, Galium aparine, Galium pseudomollugo.

1.76. Hepatotoxic Constituents and Toxicological Mechanism of Xanthium strumarium L. Fruits

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Abstract: In the recent years, the international community has attached increasing importance to po toxicity associated with Traditional Chinese Medicine (TCM). And hepatotoxicity is one of the concerns, a fundamental pathological process induced by toxicant. This paper is in an attempt to identify hepatotoxic components in Xanthium strumarium L. fruits (XSF) and interpret the toxicological mechanism induced by XSF. XSF extract was prepared and seven characteristic components were isolated identified in XSF water extracts. We evaluated their hepatotoxicity effect on cell proliferation and lactate dehydrogenase (LDH) activity in L-02 and BRL liver cell line. An integrated metabolomics study high-resolution 1H nuclear magnetic resonance (1H NMR) spectroscopy combined with multivariate statistical analysis was undertaken to elucidate the hepatotoxicity mechanism induced in rats by XSF urine and serum metabolites were measured after treatment of rats with XSF (7.5, 15.0 and 30.0 g/kg) for 5 days. The results showed that atracyloside, carboxyatractylloside, 40-desulphate-atractylosid-XSF induced significant cytotoxic effects in both L-02 and BRL liver cell lines, indicating atracyloside, carboxyatractylloside, and 40-desulphate-atractylosid were the toxic components of When rats were treated with XSF at 30.0 g/kg the hepatotoxicity was reflected in the changes observed serum biochemical profiles and by the histopathological examination of the liver. The level VLDL/LDL, 3-HB, lactate, acetate, acetone and glutamate in serum were increased in this group, while glucose, choline and valine were decreased. The elevation in the levels of succinate, citrate, 2 glutamate, glycine, 3-HB, acetate, lactate, hippurate, dimethylglycine, methylamine, dimethylphenylalanine and tryptophan was observed in urine, in contrast a reduction in the intensities of taurine glucose, N-acetyl-glucoprotein and trimethylamine-N-oxide (TMAO) was observed. The t
demonstrate that the major hepatotoxicity constituents are atractyloside, carboxyatractyloside and desulphate-attracyloside, and the hepatotoxicity of XSF involves mitochondrial inability, fatty metabolism, and some amino acids metabolism. This integrated \(^1\)H NMR -based metabolic pro approach has been able to capture and probe the metabolic alterations associated with the onset progression of hepatotoxicity induced by XSF, and permits a comprehensive understanding of toxicity for phytochemicals and other types of xenobiotic agents.

**Keywords:** hepatotoxicity mechanism, metabolic alterations, phytochemicals, *Xanthium strumarium*.

1.77. Bioassay-Guided Fractionation of Aqueous Plant Extracts with Anti-Para Activity

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**Abstract:** Since many smallholder farmers and pastoralists use indigenous knowledge for plant-parasite control strategies, anti-parasitic compound(s) may be isolated from extracts of the medicinal plant which they use. Because plant extracts are ‘cocktails’ of compounds, separation into discrete fractions containing compounds of similar properties (e.g. polarity or molecular size) followed by bioassay of claimed activity is needed to home in on target compound(s). Gel-permeation chromatography separation technique that exploits molecules’ ability to move through gels of defined pore sizes. Here separated *Cissus ruspolii* and *Adenia sp.* atractylosides from extracts into discrete fractions based on their molecular sizes and carried out anti-parasitic bioassays to reveal active constituents. Powdered plant root samples were macerated in 1 l of de-ionized water containing 0.05% chlorobutanol to inhibit micro growth. Macerated samples were stirred continuously at room temperature for 72 h, filtered through Miracloth and centrifuged. Clarified extracts (6.6 ml) were passed through glass columns containing 132 ml bed volume of Bio-Gel P-2, eluted with de-ionized water. Fifty 4-ml fractions were collected. Nematode egg hatch inhibition (EHI) was quantified by incubating *Teladorsagia circumcincta* eggs with the col fractions (undiluted and serially diluted to 0.2, 0.04 and 0.008 times initial concentration) at 25°C and RH using 24-well culture plates (three replicates per fraction tested). Incubation was stopped by Lugol's reagent after 48 h. Total numbers of unhatched eggs and hatched first-stage larvae were counted. In a small portion of each Bio-Gel fraction was analysed by thin-layer chromatography (TLC) and separated spots were examined under UV-light and after staining with molybdate reagent. Six *C. ruspolii* and seven *Adenia* sp. fractions showed remarkably strong, dependent EHI activities, with several undiluted fractions showing 100% EHI. TLC chromatograms sh a correlation between EHI activity of particular Bio-Gel fractions and the staining intensity and/or absorbance of TLC-resolved spots obtained from these fractions. Good correlations between plant fraction EHI assay results and TLC profiles indicated that anti-parasitic compounds would be isolated from relatively late-eluting, partially purified active fractions of both plants.

**Acknowledgements:** We gratefully acknowledge funding from BBSRC/DFID/SG and SRUC Interna. Engagement Strategy.

**Keywords:** *Adenia* sp., anti-parasitic, aqueous extracts, bioassay, *Cissus ruspolii*, nematode egg.

1.78. Changes in Intestinal Morphology of Rats Fed with Different Levels of Pollen

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**Abstract:** Bee pollen has been related to the therapeutic properties like antibiotic, antineoplastic, anti-inflammatory and antioxidant. A little is known about the effect of pollen feeding on the intestine structures and functions. The objective of this study was therefore to evaluate the small intestine morphology in rats fed with three different pollen levels. Forty rats were randomly separated into 4 g of 10 rats each. Control group (C) was fed with a basic diet, group L received diet supplemented with 1
group M with 0.5% and group H with 0.75% bee pollen for 90 days. Quantitative morphometry and histology methods revealed significant increase in the relative volume of epithelium (P < 0.0001) and group H with 0.75% bee pollen for 90 days. Quantitative morphometry and histology methods revealed significant increase in the relative volume of epithelium (P < 0.0001) decrease in the connective tissue volume (P < 0.0001) of jejunum in groups M and H as compared to control. The intestinal villi length significantly (P < 0.0001) increased in all experimental groups. On the other hand, the Lieberkühn crypts depth significantly (P < 0.001) increased only in groups L and significantly (P < 0.0001) increased only in groups L and H in the highest pollen-exposed group H. The results demonstrated that the bee pollen affects the small intestine development in a concentration-dependent manner and could be beneficial for the integrated management/prevention/reversal of diabetes.

Acknowledgements: This work was co-funded by European Community under project no 262202-2 Building Research Centre „AgroBioTech“.

Keywords: Bee pollen, intestinal, lieberkühn crypts, quantitative morphometry.

1.79. Emblica Officinalis Stimulates the Secretion and Action of Insulin Inhibits Starch Digestion and Protein Glycation In Vitro

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Abstract: Medicinal, edible and aromatic plants and natural products have been used worldwide for the management of diabetes mellitus. The aim of this study was to investigate the efficacy and mode of action of Emblica officinalis Gaertn. (Phyllanthaceae) used traditionally for treatment of diabetes. Using in vitro models, this study was designed to investigate the antidiabetes efficacy and mode of action officinalis. E. officinalis aqueous extracts (AEs) stimulated basal insulin output and potentiated glu stimulated insulin secretion concentration-dependently in the clonal pancreatic beta cell line, BRIN-BD11 (P<0.001). The insulin secretory activity of plant extract was abolished in the absence of extracellular calcium and by inhibitors of cellular Ca2+ uptake, diazoxide (P<0.001). Furthermore, the extract increased insulin secretion in depolarised cells and further augmented insulin secretion triggered by IBMX and tolbutamide stimulated E. officinalis AE (1 mg/mL) displayed insulin mimetic activity (230%, P<0.001). Furthermore, it enhanced insulin-stimulated glucose transport in 3T3 L1 adipocytes by 460% (P<0.001). E. officinalis augmented synergistically (P<0.001) insulin action, when co-incubated with insulin sensitizers; metformin (2.4-vanadate (4.9-fold), tungstate (4.8-fold) and molybdate (6-fold). At higher concentrations (0.5-5 mg/mL) the extract also produced 8-74% (P<0.001) decrease in enzymatic starch digestion In vitro. E. officinalis AEs (1-50 mg/mL) inhibited protein glycation 44-87% (P<0.001). This study has revealed that soluble bioactive principles in E. officinalis extract stimulate insulin secretion, enhance insulin action and inhibit both protein glycation and starch digestion. The former actions are dependent on the bioeffic component(s) in the plant being absorbed intact. Future work assessing the use of Emblica officinalis as an adjunctive therapeutic nutraceutical or as a source of bioactive anti diabetic principles may provide opportunities for the integrated management/prevention/reversal of diabetes.

Keywords: Emblica officinalis Gaertn, insulin, peptide glycation. starch digestion.

1.80. Vaginal Innate Immunity is Modulated by a Water Extract of Houttuynia cordata Thunb

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Abstract: Vaginal epithelial cells (VECs) produce antimicrobial peptides including human β-defensin (hBD2) and secretory leukocyte protease inhibitor (SLPI), as well as cytokines and chemokines that vital roles in mucosal innate immunity of the female reproductive tract. Houttuynia cordata Thunb (Houttuynia cordata), a herbal plant found in Asia, possesses various activities including antimicrobial infection.
anti-inflammation. As inflammation and infection are commonly found in female reproductive tract, we aimed to investigate the effects of *H. cordata* water extract in modulating innate immune factors pros by VECs. Primary human VECs were cultured and treated with *H. cordata* at a concentration ranging 25 - 200 µg/ml for 6 or 18 h. After treatment, the cells and culture supernatants were harvested expression of hBD2 and SLPI mRNA was evaluated by quantitative real-time reverse transcription Levels of secreted hBD2 and SLPI as well as cytokines and chemokines in the supernatants were mea by ELISA and Luminex assay, respectively. Cytotoxicity of the extract on VECs was assessed by Cell Blue Cell Viability Assay. *H. cordata* did not cause measurable toxicity on VECs after exposure for The expression of hBD2 and SLPI mRNA as well as the secreted hBD2 protein was increased in response to *H. cordata* exposure for 18 h when compared to the untreated controls. However, treatment with 15% extract for 6 h had only slight effects on the mRNA expression of hBD2 and SLPI. The secretion of IL-6 proteins by VECs was also increased, while the secretion of CCL5 was decreased after treatment with the extract for 18 h. Treatment with *H. cordata* extract had some effects on the secretion of IL-4, CCL2, and TNF-α, but not statistically significant. *H. cordata* water extract modulates the expres antimicrobial peptides and cytokines produced by VECs, which play an important role in the mu immune system and gene expression related to the digestive apparatus and to ease stomach and liver pain. The leaves are also used for complaints. In the Tassili region of Algeria, it is mainly used as powder or as an infusion to tree symptoms mentioned above. It is also used in the area to recover the appetite or avoid indigestio crushing the seeds with milk or millet. The leaves are used to aromatize tea. Powder is much appreciated spice food in the Djimet area. A number of studies on various plants reported that plant extracts and essential oils have antioxidant activity and benefits to the human health in play an important role in neutralizing free radicals, which can cause several disorders of immune system and expression. For this reason the aim of this work is to investigate the antioxidant activities of the essential oil acetone extract of seeds. The seeds of the studied plant (100 g) were submitted to hydrodistillation using a Clevenger type-apparatus. The essential oils thus obtained were stored in dark at 4 °C until tested. After the isolation of essential oil, the powdered spice materials were dried at 45 °C for 24 h. Then, 20 g of dried material were loaded on a Soxhlet apparatus and extraction was carried out acetone (400 ml) at 90 °C for 3 h. The remaining acetone was evaporated by placing the sample vacuum drier under reduced pressure. The viscous extracts were stored in a refrigerator at 4 °C until use. The antioxidant activity of essential compounds was measured in terms of hydrogen donating or scavenging ability, using the stable radical 2,2'-Diphenyl-1-picrylhydrazyl (DPPH). One millilitre of various concentrations of the oil (1 to 35 mg/ml), and extract (0.02 to 0.5 mg/ml) in ethanol was added 1 ml of a 0.004 % ethanol solution of DPPH. The mixture was strongly shaken and left to stand at 4 °C for 30 min in the dark. The absorbance was measured at 517 nm against a blank. The scavenging activity was expressed as percentage of inhibition (I %) according to the following form (% inhibition (I%) = 100 * (Acontrol – A sample)/Acontrol, where Acontrol is the absorbance of the control reaction and A is the absorbance of the test compound. All tests were run in triplicate and averaged. The concentration providing 50 % inhibition (IC50) was calculated from a graph representing the inh decrease in response to *H. cordata* treatment. The IC50 value of essential oil is 29.74 mg/ml which is higher than that of essential oil and synthetic antioxidant agents, BHT (1.52 mg/ml) and ascorbic acid (0.45 mg/ml), whereas value of acetone extract of seed is lower at 0.28 mg/ml. This is the first study showing that the antioxidant capacity of the acetone extract of seeds of *A. leucotrichus* is higher than that of essential oil and synthetic antioxidants. The results of this work indicate that the extract obtained from *A. leucotrichus* showed capacity to donate hydrogen; therefore they present scavenging activity of DPPH. This activity might be due to the presence of hydroxyl groups existing in the chemical compounds detected in the samples. It could react with free radicals to stabilize and terminate radical chain reactions. Moreover, several st
have been conducted to clarify the possible substances involved in antioxidant properties of the ess oil. Among the identified compounds in the essential oil from A. leucotrichus monoterpenes hydrocarbons and oxygenated monoterpenes may be considered the main contributors to the antioxidant activity. C basis of these results, A. leucotrichus seeds can be used as easily accessible source of natural antioxidants and as a possible food supplement or in pharmaceutical applications.

**Keywords:** Ammodaucus Leuocotrichus, antioxidant activity, essential oil, seed, traditional medicine.

### 1.82. Study on Inflammation Pathway and Nervous System of the Ethanolic Extract of *Jatropha curcas* L.

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**Abstract:** Preclinical studies have showed dose-dependent effects on inflammation and neurotoxic effects have demonstrated effects on nervous system of the *Jatropha curcas* L. The aim of this study was to analyze the effects of *Jatropha curcas* L seeds on inflammation pathway and nervous system. Experiments were performed with rats. A double-blind study. Eighty mice were divided into five control groups: Carrageenan 0.6% Diclofenac 8 mg/kg, Distilled water 0.1 ml/10 g, Diazepam 32 mg/kg and Caffeine 32 mg/kg experimental groups: J curcas 200, 400, 600, 800 and 1000 mg/kg. The temperature in left hind paw measured by a non-contact infrared digital thermometer; the effects on inflammation were assessed measured by local temperature increase in the left hind paw. The effects on inflammation were assessed as a difference between the temperatures before and after the injection. The Chi-square test was used to compare the results.

**Keywords:** Jatropha curcas, inflammation, nervous system, temperature.

### 1.83. Antipsychotic and Behavior Effect of *Maytenus macrocarpa* (Ruíz & Pav.) I in Mice

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**Affiliations:** Universidad de San Martin de Porres.

**Abstract:** Different studies indicate that Maytenus has many effects and that *M. obtusifolias* species of Central Nervous System depressant effect. Objective: To determine antipsychotic and behavior modi effect of the *Maytenus macrocarpa* (Ruíz & Pav.) Briq. ethanolic extract, using the Forced Swim Test. Method: 77 albino mice were used, with an average weight of 25 g. They were split into two groups and they were administered with *Maytenus macrocarpa* of 200 mg/kg, 400 mg/kg, 600 mg/kg, 800 mg/kg, 1000 mg/kg, caffeine 32 mg/kg, Diazepam 32 mg/kg, fluoxetine 30 mg/kg, haloperidol 5 mg distilled water (placebo) 0.1 ml/10 g, and a control group. Irwin test was used to evaluate presence of lethality, convulsions, Straub tail, sedation, excitement, abnormal gait, jumps, incoordination, abdominal writhes, piloerection, stereotypies, head twitches, scratching and breath. Forced Swim Test was used to evaluate the antidepressant effects of each substance. Results: immobility time was observed in *Maytenus macrocarpa*, compared with Haloperidol (p > 0.05) in the
of 400 mg/kg, which also had a Gaussian distribution. Irwin test for Maytenus macrocarpa of 200 mg/kg also had a Gaussian distribution. Irwin test for Maytenus macrocarpa of 200 mg/kg had sedation effect at minute 30; doses of 400 mg/kg at minutes 15 and 45, and doses of 600 mg/kg and 1000 mg/kg at 15 minutes. Conclusion: The antipsychotic effect and the behavior mod effect were demonstrated in Maytenus macrocarpa (Ruiz & Pav.) Briq. ethanolic extract.

**Keywords:** Antidepressive, antipsychotic, haloperidol, Maytenus.

1.84. Essential Oil of Bupleurum plantagineum: Chemical Composition, Antioxidant and Antibacterial Activities

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**Abstract:** The essential oils obtained by hydrodistillation from Bupleurum plantagineum harvested at different growth stages (vegetative and flowering) were analyzed by GC-MS. The yields were 0.10 and 0.12 respectively. Globally, 39 compounds were identified, involving cis-chrysanthenyl acetate (33.8%, 33.5%), α-pinene (25.4%, 18.4%), myrcene (23.1%, 16.5%), limonene (4.6, 3.3%) as main constituents. Monoterpene were the most represented chemicals in the oil of the plant followed by sesquiterpenes and phenylpropanoids. In vitro antioxidant activity of the Essential oil were assayed using DPPH (1,1-diphenyl-2 picrylhydrazyl) radical. The results indicated that Bupleurum plantagineum oils recorded a moderate capacity. The antimicrobial activity of essential oil were evaluated by disc diffusion method and tested against Gram-positive and Gram-negative bacteria and showed a good antibacterial activity against E.coli, and S.aureus for two samples at low concentration 5mg/mL.

**Keywords:** Antibacterial, antioxidant activity, Bupleurum plantagineum, chemical, essential oil.

1.85. Effect of Crude Extract of Cyperus Esculentusground Nuts in Experimenter Induced Hyperglycemia in Mice

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**Abstract:** The mice were divided into three groups, the first group were induced and treated with alcoholic extract of Cyperusesculentus extract 150mg kg⁻¹ body weight, the second group was induced and treated with distilled water. Treatment of mice in these groups continued for 14 days while the third group was used as a control group non induced non treated. The blood glucose were showed significant decrease P<0.05 of blood glucose for the group treated by Cyperusesculentus extract as compared with insulin hyperglycemia group. The results of serum cholesterol extract of the treated group after 7 days showed significant decrease P<0.05 as compared with hyperglycemic group and after 14 days showed significant difference P<0.05 as compared with mice in control groups. The measurement of food and water intake were showed significant increase P<0.05 of food and water for group treated Cyperusesculentus and group induction as compared with control. It was concluded that the extract Cyperusesculentus ground nuts showed inhibitory effect of hyperglycemia.

**Keywords:** Blood glucose, cholesterol, Cyperusesculentus, hyperglycemia, streptozotocin,
1.86. Antimicrobial Potential of Selected Excerpts from Two Medicinal Plants

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Abstract: Our work is part of the search for new natural antimicrobials from two plants in the region of Tlemcen. These flowers and leaves of Helichrysum stoechas subsp spices Rock-Honaine and stems leaves of Phagnalon saxatile subsp. saxatile of Felloucène. The successive extractions with solvents of increasing polarity (hexane, dichloromethane, methanol and aqueous), resulted in much greater yield aqueous methanolic extract compared to low polarity solvents. The results of the study of the antimicrobial activity, conducted by the disk method and the liquid medium on dilutions, show that some extracts, except water extracts, are endowed with a moderate antibacterial activity. The most sensitive strains are Bacillus cereus, Acinetobacter baumanii, Proteus mirabilis, Staphylococcus aureus, Enterococcus fae Escherichia coli, with diameters between 11 and 13 mm. The MIC values showed a wide range of values (up to 25 mg / ml) compared with the zones of inhibition (13mm). The extracts of the two plants show antifungal activity.

Keywords: Antimicrobial activity, extract, Helichrysum stoecha, Phagnalon saxatile, polarity.

1.87. Ethnopharmacological Evaluation of Geranium wallichianum from Western Himalaya, Pakistan

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Abstract: Geranium wallichianum in folk medicine used as tonic, and in the treatment of Hepa jaundice and against gastric ulcers among the various tribes in Western Himalaya, Pakistan. Methanolic extract of the Geranium wallichianum (GW) was tested to evaluate the ability to inhibit the growth of various human bacterial pathogens. Various antioxidant assays includes ABTS+ Radical Scavenging Activity, Hydroxyl radical scavenging capacity and Phosphomolybdinum assays were performed. Anticancer assays were performed against Human lung carcinoma (LU-1) and human prostate adenocarcinoma (LNCaP-1). Result of antibacterial assays revealed that GW showed promising results against the growth of Bacillus subtilis and Klebsiella pneumonia in comparison with all tested bacterial pathogens sharing MIC value of 2.5 mg/ml. Antioxidant activities include ABTS+ Radical scavenging Hydroxyl radical scavenging, and Phosphomolybdinum assay were recorded in term of their IC50 values of 97.85µg/ml, 51.78µg/ml and 139.23µg/ml respectively. Results of anticancer assays was also recorded term of IC50 (µg/ml) against human cancer cell LU-1 and LNCap-1<50 and 25.1 respectively. These results support the use of Geranium wallichianum in popular medicine and demonstrate that this plant can be a potential for the development of phytotherapies with anticancer, anti-ulcer properties.

Keywords: Antioxidant, cancer, Geranium wallichianum, methanolic extract, phytomedicines
Abstract: “Ecopharmacognosy” is a new term which is defined as the study of sustainable, biologically active, natural resources. Philosophically, it provides a conceptual framework for developing strategies and scientific perspectives which can improve future global health care product accessibility and assure beneficial outcomes utilizing both natural and synthetic drugs. In this presentation, some facets of how the sustainable precepts of ecopharmacognosy are applied in the development of improved traditional medicines for globalization, based on various integrated technologies, will be examined. Plants remain a primary source of health care for the majority of patients in many parts of the world. These are frequently used with minimal quality control. In addition, there are many tropical diseases which currently require drug discovery programs. To address these needs, ecopharmacognosy approaches network pharmacology must explore the many diverse effects of both individual and complex products at the gene level, and embrace computer-aided natural product design through molecular docking of target enzymes. Spectroscopic and chromatographic procedures are in development to quantitatively analyze single and multicomponent plant mixtures for bioactive markers. The effects of growing conditions and processing of traditional medicines is also under active examination through chromatographic and spectroscopic techniques. Field-based instruments are being deployed to assess natural materials non-invasively, and aerial sensing technologies will become an aspect of ecopharmacognosy. These strategies will be discussed in the context of enhancing the quality control of traditional medicines and improving natural product-based patient care.

Keywords: Ecopharmacognosy, global health, natural product, product, quality control, traditional medicine,
Quality of MAP – Influenced and Determined by Cultivation and Wild Collection

Invited Speaker Prof. Dr. Lorenz, Matthias
PhytoConsult Darmstadt.

Abstract: The production of standardized herbal medicinal products strictly requires raw materials that must meet the registered specification and should present as low variation as possible. The inclusion of GACP guidelines into the GMP conducted production process is intended to understand and possibly reduce causes of variation. Nature’s strategy requires on the contrary high variation to ensure the survival of species during phylogenesis. The following causes of variation during plant production can be identified: Genetic variability (intraspecific & interspecific), morphological variability (organs, tissues), ontogenetic variability, diurnal variability, and edapho-climatic variability (modification). Example for strain sourcing as referred to genetic, morphological & ontogenetic variability: *Valeriana edulis*, a native Mexican species commercially collected on the high plateau of Durango and Distrito Federal (Meseta Neovolcanica), show tremendous variations. Methods of strategic sourcing are discussed to meet the challenge of high variation by selective wild collection and field production. The Valepotriates have considered as valuable compounds of *Valeriana edulis*. Within this group we find Isovaltrate, Didrovaltrate and Valtrate in different concentrations. *Valeriana edulis* occurs in disjunct geographic areas in Mexico where different eco- and chemotypes may grow without genetic exchange. A quality targeted wild collection of this species must consider the selection of the right collection area (ecotype & chemotype). The highest total content of Valepotriates is being found in the area of Distrito Federal (Meseta Neovolcanica). Also the sequence of the Valepotriate composition differs. In Durango dominate Isovaltrate chemotype whereas in Meseta Neovolcanica also the Valtrate chemotype occurs. The Valepotriates are found to be located in different plant tissues of the valerian roots and rhizomes at different concentrations. In the bark of the roots/rhizomes Isovaltrate dominates followed by Valtrate. A quality targeted field production of this species must consider the right propagation technique on the one hand and different duration of cultivation on the other. Seedlings tend to form thick taproots which result in a dominance of Didrovaltrate whereas branched thin roots result in more bark with a dominance of Isovaltrate.

<table>
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<tr>
<th>Fraction</th>
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<tr>
<td>Didrovaltrate</td>
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<tr>
<td>Isovaltrate</td>
<td>Bark</td>
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<tr>
<td>Valtrate</td>
<td>Central cylinder</td>
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<tr>
<td>Total Valepotriates</td>
<td>Bark</td>
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Horizontal Transfer of Natural Products: A So Far Unrecognized Contaminations Source

Invited Speaker Prof. Dr. Selmar, Dirk
Institute for Plant Biology, TU Braunschweig, Mendelssohnstraße 4; 38106 Braunschweig, Germany.

Abstract: In a tremendous number (50 to 90 % of all samples tested, e.g. by the European Food Safety Authority - EFSA) of plant derived commodities (teas, spices, phytopharmaceuticals etc.) nicotine and pyrrolizidine alkaloids had been detected. Due to their negative impact on human health, there are large efforts to identify the sources of these contaminations. Apart from the co-harvesting of alkaloid containing weeds, a putative endogenous biosynthesis or the contamination by cigarette smoke, the uptake of alkaloids from the soil, which contain such compounds due to the rotting of plants originally revealing compounds, could not be excluded. In the case of nicotine, we unequivocally have demonstrated that alkaloids, which resulted from tobacco (e.g. from residues of cigarettes) indeed is taken up from the soil by various plants (e.g. peppermint, camomile, strawberries) and transported into the roots. From these findings, we are analyzing, whether also other alkaloids (e.g. pyrrolizidine alkaloids) are taken up by plants, too, in order to unveil the universality of horizontal transfer of natural products. These findings - in addition to the nutritional aspects - demonstrate that a certain alkaloid could be translocated from one plant after its death to another.
species, even though it has no direct functional relevance. In addition to the toxicological aspects, coherences will affect the way we define allelopathy. Up to now, only the transfer of “functional substances” i.e. those, which have a certain impact on other plants (e.g., by inhibiting their growth) had been considered and described by allelopathy.

**Keywords:** Alkaloids, allelopathy, contaminations, human health, nicotine, phytopharmaceuticals.

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**Total Phenolics and Antioxidant Activities of Fenugreek, Green Tea, Black Tea, Grape Seed, Ginger, Rosemary, Gotu Kola, and Ginkgo Extracts, Vitamin E, and Tert-Butylhydroquinone**

**Invited Speaker Prof. Dr. Taha Rababah**

*Jordan University of Science & Technology, Jordan*

**Abstract:** The total phenolics and antioxidant activities of fenugreek, green tea, black tea, grape seed, ginger, rosemary, gotu kola, and ginkgo extracts, vitamin E, and tert-butylhydroquinone, were determined. Grape seed and green tea were analyzed for their phenolic constituents using high-performance liquid chromatography. The total phenolics of the plant extracts, determined by the Folin-Ciocalteu method, ranged from 24.8 to 92.5 mg of chlorogenic acid equivalent/g dry material. The antioxidant activities of methanolic extracts determined by conjugated diene measurement of methyl linoleate were 3.4-86.3%. The antioxidant activity of the extracts using chicken fat by an oxidative stability instrument (4.6-10.2 induction time) followed a similar trend in antioxidant activity as determined by the Folin-Ciocalteu method. Seven phenolics in grape seed and green tea extracts were identified that ranged from 15.1158.49 and 18.3 to 1087.0 mg/100 g of extract, respectively. Plant extracts such as green tea and seed extracts can be used to retard lipid oxidation in a variety of food products.

**Keywords:** Antioxidant, extract, fenugreek, grape seed, green tea, phenolics, rosemary.
2.1. Assessing Nigella sativa (Black Seed) Variability Using NMR-Based Metabolomics

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3Biodiversity and Medicines Research Cluster, School of Pharmacy, University of London, London, United Kingdom.

**Abstract:** The medicinal plant Nigella sativa L. (NS) is used traditionally for different diseases, including diabetes, hypertension and allergy. Its metabolites may vary depending on the origin of NS, product type, and processing methods. NMR-based metabolomics offers a novel technology platform for plant chemical characterization and biological evaluation that has not been applied for NS. Using 1H-NMR spectroscopy combined with Principal Component Analysis (PCA) to establish a robust and reproducible method for the metabolomic analysis of NS products, investigate potential variations between same and different species of Nigella metabolites, and identify chemical quality markers. Twenty-three seed and six oil samples were collected from 13 different species and regions. Four different NMR solvents were evaluated to determine suitable extraction techniques. 1H-NMR combined PCA, using SIMCA statistical software, was utilized for exploring significant global locations. Four different NMR solvents were evaluated to determine suitable extraction techniques. The oil possesses a low antioxidant effect in comparison with other NS products.

**Keywords:** Assessing, medicinal plant, metabolomics, Nigella sativa, oil, quality evaluation, seed.

2.2. Chemical Composition And Biological Activity Balansea Glaberrima Esso Oil

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**Abstract:** The medicinal and nutritional properties of the Apiaceae plants are well-established for long time. Many of them are being used as spices and herbal medical preparations. Thus, they account as known source of essential oils and important products. They are included in various pharmacopoeias as antiseptic, expectorant, diuretic, carminative, vasodilator, or spasmyloytic agents. The chemical composition, the antibacterial and the antioxidant properties of Balansea glaberrima essential oils studied. Essentials oils were extracted by Clevenger type apparatus and their chemical composition was carried out by GC and GC/MS. γ-himachalene (36, 65%), apiol (34, 87%) and γ-murolene (9,83%) were the major components of the oil. Antimicrobial activity was determined using nine bacterial strains and fungi according to the disk diffusion assay. The antioxidant activity was evaluated using the free radical scavenging effects of the DPPH. The B. glaberrima oil is active only against E. coli ATCC 25922, A. j NNRRL 391 and C. albicans ATCC 1024. The oil possesses a low antioxidant effect in comparison with BHT.

**Keywords:** Balansea glaberrima, essential oils, antimicrobial and antioxidant activity.

2.3. Isolation, Characterization and Bioactivity Evaluation of the Chen Constituents of Two Medicinal Plants Growing Wild in Jordan

**Al-Jaber, Hala1, Al-Qudah, M.2, Abu-Zarga, M.3, Saleh, A.4, Aljada, A.4, Tashtoush, I.4, Lahham, J.3, Afifi, F.6 and Abu Orabi, S.2**

1Department of Applied Sciences, Faculty of Engineering Technology, Al-Balqa Applied University, Marka, Jordan. 2Department of....
Abstract: In a continuous effort conducted for investigating the chemical composition of the volatile nonvolatile constituents of Jordanian medicinal plants, we present here our latest findings concerning isolation, characterization of novel triterpenoids, flavones, rosmarinic acid derivatives and isoflavones isolated from two medicinal plants growing wild in Jordan, namely Salvia verbenaca (Lamiaceae Gynandris sisyrinchium) (Iridaceae). The isolated compounds were identified by NMR (1D and 2D) (HRESIMS and EIMS), UV and IR spectroscopic methods. The crude extracts and the pure compounds were screened for their antioxidant and antiperoxidative activities.

Keywords: Antioxidant activity, Gynandris sisyrinchium, Jordan, Salvia verbenaca.

2.4. Chemical Composition and Antibacterial Activity of Clinopodium vulgare Essential Oil

Azi Mouna and Laouer Hocine

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2Laboratory of biological resources valorization, Faculty of Biology, University of Ferhat Abbas, El Bez, Sétif, Algeria.

Abstract: Following the steep increase in bioresistance phenomenon of bacterial strains and the limited number of antibiotics in development, the discovery of new antibacterial agents has become more essential. Screening of essential oils to discover new antibacterial that could be an alternative to the conventional antibiotics. This work aims at upgrading the essential oil is a perennial aromatic plant species Clinopodium and family Lamiaceae by chemical characterization and the study of antibacterial activity. The aerial parts of Clinopodium vulgare were collected during the flowering period from the above sea level and were cut into small pieces and subjected to 3 hours hydrodistillation by a Clevenger apparatus. GC/MS analyses on HP1 column were carried out using an Agilent 7890A gas chromatograph apparatus equipped with a flame ionization detector (FID) and coupled to a quadrupole Agilent 5973 Network mass selective detector in electron impact (EI) mode at 70 eV. The constituents of the essential oil were identified by comparison of their mass spectral patterns and retention indices (RI) made database built up from authentic compounds. The antibacterial activity of the essential oil was tested against Gram-positive and negative bacteria.

Keywords: Antibacterial, essential oil, chemical composition, Clinopodium vulgare, gram-negative.

2.5. Impacts of Instant Controlled Pressure-Drop Treatment on Chemical Composition, Antioxidant Activity, and Microbial Activity of Myrtus communis L. Essential Oils

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Abstract: In this work the essential oils contained in the leaves of *Myrtus communis* L., were extract the standard steam distillation (SD) and by combining Instant Controlled Pressure Drop (DIC) t extraction (DIC-SD). The yields obtained using SD and DIC-SD have been found to be 0.43 and 0 EO/100g dry basis (db), respectively. The chemical composition of the extracted oils was analyzed GC/FID and GC/MS. The main components identified were α-pinene (36.94%), eucalyptol (19.3% eugenol (3.73%), methyl eugenol (3.71%), α-Terpineol (3.14%), and limonene (2.37%), for SD EO. were α-pinene (29.40% ), eucalyptol (24.19 %), methyleugenol (6.24 %), caryophyllene oxide (4.2 eugenol (5.14%) and limonene (3.05%), for DIC-SD EO. The functional behaviors were measured antioxidant and antimicrobial activities. EO IC50 was measured by DPPH radical. IC50 values were better for DIC-SD EO (642.39 µg/ml) than for SD (798.7 µg/ml). The minimum microbiologic inh concentration (MIC) values were higher for DIC-SD than SD EO; whatever the microorganisms.

Keywords: Antioxidant activity, extraction, *Myrtus communis*, steam distillation.

2.6. Inhibition of Carbon Steel (Api 5l Gr B) Corrosion By *Inula Viscosa* Extract

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Abstract: The inhibition of corrosion of carbon steel (API 5L Gr B) in hydrolic acid solution by extr: *Inula viscosa*, leaves has been studied using weight loss, electrochemical impedance spectroscopy: potentiodynamic polarization temperature. Inhibition was found to increase with increasing concentrati the extract but decreased with rise in temperature. Electrochemical impedance spectroscopy (EIS) e: one capacitive loop which indicates that the corrosion reaction is controlled by charge transfer process. results obtained show that the extract of *Inula viscosa* could serve as an effective inhibitor of the corr of carbon steel in acid solution.

Keywords: Corrosion inhibition, carbon steel, adsorption, *Inula viscosa*

2.7. Chemical Composition of *Limonium thouinii* (viv) . O. Kuntze (plumbaginaceae and the DPPH Free Radical Scavenging Activity

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Abstract: The investigations of the aerial parts of *Limonium thouinii* (Viv). O. Kuntze allowed the iso of four flavonoids: Quercetin, Vitexin, Isoorientin and Cannabiscitrin. Their structures were elucidat the basis of spectroscopic analysis including UV, MS and NMR techniques. The free DPPH radical scavenging activity was evaluated on crude extracts (EtOAc and n-BuOH extracts).

Keywords: Flavonoids, free DPPH radical scavenging activity, *Limonium thouinii*, plumbaginaceae.

2.8. Phytochemical Analysis and Anticholinesterasic Effect of Atlantic Pistachio

Benamar Houari12, Bennaceur Malik12, Marouf Abderrazak14

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Abstract: *Pistacia atlantica* Desf. (Anacardiaceae), an endemic plant from Algeria, is used in folk medicine to treat diabetes, eye infection and stomach disease. The aim of the present investigation is to evaluate *in vitro* anticholinesterasic activity of the leaves aqueous extract from *P. atlantica*, using a colorimetric procedure. The extract shows a considerable acetylcholinesterase inhibitory activity with the IC\textsubscript{50} value of 9.58 ± 0.60 µg/ml. Galantamine is used as a positive control (IC\textsubscript{50} = 0.29 ± 0.0036 µg/ml). Preliminary phytochemical investigation of the leaves extract using TLC shows the presence of flavonoids, lignans, phenolic acids and tannins. The HPLC-DAD analysis led to identify four phenolic compounds (gallic acid, para-coumaric acid, quercetin and rutin). Quercetin and gallic acid, have been previously described as acetylcholinesterase inhibitors. These results suggest that *P. atlantica* leaves possess acetylcholinesterase inhibitory activity, which could be attributed to the presence of phenolic compounds.

Keywords: Acetylcholinesterase, aqueous extract, phenolic compounds, *Pistacia atlantica*.


*Booker A.J.*, *Banaz J.*, *Debora F.*, *Eike R.*, *Lixiang Z.* and *M. Heinrich*

1. School of Pharmacy, Brunswick Square, London UK. 2. CAMAG AG, 4132 Muttenz, Switzerland. 3. Guangdong Pharmaceutical University, Guangdong, China.

Abstract: *Rhodiola rosea* (Golden Root, Arctic Root) is a high-value herbal medicinal product, registered in the UK for the treatment of stress-induced fatigue, exhaustion and anxiety. The aim of this project investigate the diverse value chains that lead to the production of *Rhodiola rosea* as a herbal medicinal product and assess any phytochemical variation between a products registered under the Traditional Herbal Medicine Products Directive (THMPD) and products obtained from the market without registration. There are different species of Rhodiola on the market and the principal aim is to establish these different species vary in their metabolite profile, how products are commercialized and whether it potential for adulteration at any stage. There are several Chinese species used in traditional Chinese medicine (TCM) and we investigate their phytochemistry and assess their potential as an adulterant in the *Rhodiola rosea* value chain. 40 commercial products and 40 crude dried plant specimens have been sourced from different suppliers. These samples were analyzed using high performance thin layer chromatography (HPTLC) and H-NMR spectroscopy coupled with multi-variate analysis software following a method previously developed by our group for the analysis of turmeric products. The consistency of the products varies significantly. Approximately one fifth of products that claimed to be *Rhodiola rosea* did not contain rosavin (the reference marker used to distinguish *R. rosea* from related species). Moreover some products appeared not to contain salidroside, another marker compound found in medicinal Rhodiola species. The variation in phytochemical constituents present in Rhodiola products available to European buyers via the internet and other sources is a cause for concern. Adulteration with different species, and other unknown adulterants, appears commonplace. Registration under the THMPD enables consumers to have confidence that products registered under the scheme are authentic and meet a high specification for quality and safety.

Keywords: *Rhodiola rosea*, market, medicinal product, phytochemical variation, rosavin, species.

2.10. Microscopic Control of Turmeric *Curcuma longae* l. Rhizomes U Multivariate Analysis

*Bouzabata Amel*

Laboratory of Pharmacognosy, Faculty of Pharmacy, Badj-Mokhtar University, Zuafrania City BP: Annaba. 23000, Algeria.

Abstract: *Curcuma longae* is widely used as spice and traditional medicine. This study was aimed to establish the microscopic identification of different commercial samples and finding parameter
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discriminating the identification of turmeric powder. We have analyzed 15 samples from different or each experience was performed in triplicate. Statistical techniques were used to analyze the partiti structure observation. Principal component analysis test was applied to the distribution of observation each sample. In total, 13 elements have been identified from 45 microscopic observation of turmeric powder. The most diagnostic features are starch granules, covering trichome, vessels, cork, fibre parenchymateous cells containing starch granules. The results showed that microscopic observation longae powder could be grouped according the presence of non glandular trichome, and two fori calcium oxalate crystals. In conclusion, the microscopic analysis coupled with statistical analysis, provide a platform of herb identification, particularly in authentication for diagnostic commercial san

Key words: Diagnostic, crystals, Curcuma longae, identification, microscopic, statistical.

2.11. Importance of Crude Drug Quality Control – Case of Hyperici herba from Balkan Penninsula

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Abstract: Raising interest for use of herbal remedies in the prevention and treatment of different disc led to the increased demand for cultivated, as well as for medicinal plants collected from natural hal Although for both, cultivated and plants collected from nature is assumed the adequate biological sour many cases different adulterations could be found. The problem is even greater if take into ac insufficient self-training of medicinal plants collectors. Thus, in the wide range of crude drugs dif adulterations could be found. In the peppermint plant often the leaves of Menthalongifolia are prese the cultivated Thymus folium leaves or herb of Thymus serpyllum. I. are found. Furthermore, in the hot herb instead of Equisetum arvense many other, sometimes toxic Equisetum species could be found. I or Hypericum perforatum, both subspecies of H.maculatum, as well as H. x desetangii or some representatives of the same genus could be found. This problem of the quality of crude drugs, mainly for production of commercial preparations is reflected also on the effectiveness of produced i remedies. The use of Hypericum perforatum is widely spread. For this plant, wide spectrum of activit confirmed, but most important is the clinically proved use in the treatment of mild to moderate depre Therefore, demand on Hyperichera is constantly growing, but the quality of crude drug or tea is not the subject of analysis. However, it is known that the content of secondary metabolites in plants deq from the plant source, ontogenetic stage of the plants and different ecological factors. Also, H. perfor for which is the official biological source of Hyperichera is rarely cultivated species and most oft collected from the nature. This can produce mismatches if collectors are not enough educated. In this 10 samples of Hyperichera, obtained from markethof Balkan Peninsula, were macroscopically microscopically checked for the presence of species different from H. perforatum. Water alcoholic ext used for the treatment of depression, were quantified for the amount of total phenolics and flavon HPLC analysis was used for quantification of amentoflavone, hypercin and hyperofrin, compounds r responsible for antidepressant activity. Furthermore, content of caffeic and chlorogenic acid, quercitrine and apigenin were evaluated. Considering the content of particular compounds, obtained i showed significant differences in the chemical composition, especially related to the compounds responsible for the health benefits of Hyperichera.

Keywords: Balkan, Control, drug Quality, Hyperici herba, leaf, Menthalongifolia, Thymus folium.

2.12. Analysis of Active Ingredients in Different Extracts of Fridericichica

Accorsi,W.M.¹, Souza, C.V.C.A.¹, Pacheco, S.G.², Gaspi, F.O.C.¹, Capellari Jr. L.², Ne M.B.¹, Minohara, A.C.M.¹, Tanaka, E.E.¹ and Parro, E.A.²
Abstract: In Brazil, economic index indicate an average increase of 15% per year in the market phyto medicines. In fact, alternative therapies are the main manner for health care in populations distant health centers or without fund to purchase medicines; and medicinal plants are the most used resource, generally as infusion. One of the plant species with ethnopharmacological value is Fridericiachica (Bonpl.) LG Lohmann (Bignoniaceae), which is also known as “grajirú”. It is a sea shrub, with two or three oblong-lanceolate leaflets which measure 8-13 cm. in length; campanulat rosy-lilacinflowers in terminal panicles, and capsule fruit. This species is distributed throughout Brazil with higher occurrence in the southeast region, mainly inCerrado and Atlantic Forest. However, in the southern region occurs the cuprea variety (with narrow and long leaflets), being perhaps the most grown for medicinal use. It has anti-inflammatory and antimicrobial action, being used in the treatment of skin diseases, gastrointestinal disorders, leukemia, jaundice, anemia, albuminuria, psoriasis enterocolitis. The healing action of the leaf hydroalcoholic extract on wounds was previously ana through in vitro and in vivoassessments; and this study showed an promotion the fibroblasts growth with positive effects on collagen synthesis. The objective of this research was to evi spectrophotometrically the flavonoid and tannin contents in different extracts, which are commonly us pharmacies. The sample collection (leaves) was performed in the Sud Mennucci city, northwest of the Paul. All extracts exhibited flavonoids and tannins, but hydroalcoholic extract (EH), extract obt by reflux (ER) and, extract obtained by infusion (EI) have higher concentrations than the other studies extracts. Therefore, it can be concluded that ER, EI and EH should be preferably used for dermatologic cases and other pharmaceutical formulations.

Keywords: Active ingredients, analysis, Brazil, Fridericiachica, medicinal extracts.

2.13. Extraction of Secondary Metabolites, Phytochemical Screening and Estimation of Total Phenolic content from Centaurea species (Asteraceae)

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Abstract: The genus Centaurea, which belongs to the Compositae family, contains more than 500 s which are distributed in the Mediterranean area and Western Asia. Many species of this genus are k for their biological activities such as anti diabetic, antidiarrhetic, antirheumatic, anti inflamm digestive, diuretic, menstrual, hypotensive and antibacterial effects by public medicals. The present concerned, at first time, a preliminary phytochemical screening of different parts of Centaurea sq using standard methods of analysis. This step allowed us to indicate the presence of several che groups such as alkaloids, flavonoids, tannins, coumarins, terpenes, steroids, triterpenes, saponins anthocyans with varying intensities in the tested organs. In another hand, Chloroform, ethyl acetate a butanol extracts were obtained by extraction of the aerial dried parts of the vegetal material with MeOH room temperature. The Obtained MeOH extract was suspended in distilled water then partitioned Chloroform, ethyl acetat and n-butanol respectively. The three obtained extracts were submitted estimation of total polyphenols and flavonoids content using Folin Ciocalteu and Aluminum chloride methods respectively. The results revealed that all extracts contain a various amounts of polyphenol flavonoids compounds. The ethyl acetate phase was carried out by chromatography on a silica gel cc with elution with CHCl₃/ MeOH by polarity gradient. As a result, we have separate and purify a com fan flavonoid type. The structure of this compound was established using the different physical and chemical analysis methods including: 1 H NMR and UV.

Keywords: Centaurea, Compositae, Flavonoids, Polyphenols, Phytochemical screening.

2.14. Chemical Composition and Antibacterial Activity of the Essential Oil Cedrusatlantica subsp. Libanotica(Pinaceae)

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Abstract: Cedrusatlantica (Pinaceae) is a renewable source of natural products. This species is distributed in Morocco and Algeria, it possesses a high quality wood and is used in construction handicraft industries. The essential oil from this plant has been shown to possess anti-inflammatory antifungal and antimicrobial activities among others. It is also proved to be useful in the treatment of loss in a combination of aromatherapy oils. The present work concerns the subspecies libanotica which is endemic to Algeria. The hydrodistilled essential oil of the cones of Cedrusatlanticasubsp. libanotic analyzed by GC and GC-MS and was investigated for its antibacterial activity. Cones of Cedrusatl. subsp. libanotica were collected in October 2013 at Aures-Belezma (Eastern Algerian). The essential oil extracted by hydrodistillation, for 3h, in a Clevenger-type apparatus and the components were identified and GC/MS analyses using a Shimadzu QP5050 mass selective detector using a cross-linked DB column (40 m × 0.18 mm, film thickness 0.18 μm), and by comparison of their mass spectral fragmentation patterns with those reported in the literature with authentic compounds. The antibacterial activity of essential oil was tested against 9 gram-positive and gram-negative bacteria by the use of the disc diffusion method. Thirty components representing 94.63% of the essential oil were detected with α-pinene (34.41), β-pinene (25.34%), β-myrcene (11.43), β-phellandrene (6.01) and D-limonene (6.21) as the main components. The essential oil inhibited strongly the tested bacterial strains with CMI values less than 40 μg/ml.

Keywords: Antibacterial, Cedrusatlantica essential oil, myrcene, phellandrene, pinene.

2.15. Antioxidant Activity and Caracterisation of Phenolic Compounds Extract of Teucrium polium Leaves of Two Regions, Ouenza and Tlemcen, Eastern Western of Algeria

Dridi A.1,2, Hadef Y.2,3, Kerkoub N.4, Lakhehal S.2,3 And Bouleguemeh A.2,3

Abstract: Teucrium polium L. is used by folk medicine for a long time for its rich in active ingredients and its therapeutic properties. The aim of our study is to compare some parameters this species harvested in the western region of Algeria in Tlemcen and Ouenza in Tbessa extreme east Algeria. In the first part, extraction of polyphenols sheets allowed us to calculate the following yields in a combination of aromatherapy oils. The essential oil from this plant has been shown to possess anti-inflammatory antifungal and antimicrobial activities among others. It is also proved to be useful in the treatment of loss in a combination of aromatherapy oils. The present work concerns the subspecies libanotica which is endemic to Algeria. The hydrodistilled essential oil of the cones of Cedrusatlanticasubsp. libanotic analyzed by GC and GC-MS and was investigated for its antibacterial activity. Cones of Cedrusatl. subsp. libanotica were collected in October 2013 at Aures-Belezma (Eastern Algerian). The essential oil extracted by hydrodistillation, for 3h, in a Clevenger-type apparatus and the components were identified and GC/MS analyses using a Shimadzu QP5050 mass selective detector using a cross-linked DB column (40 m × 0.18 mm, film thickness 0.18 μm), and by comparison of their mass spectral fragmentation patterns with those reported in the literature with authentic compounds. The antibacterial activity of essential oil was tested against 9 gram-positive and gram-negative bacteria by the use of the disc diffusion method. Thirty components representing 94.63% of the essential oil were detected with α-pinene (34.41), β-pinene (25.34%), β-myrcene (11.43), β-phellandrene (6.01) and D-limonene (6.21) as the main components. The essential oil inhibited strongly the tested bacterial strains with CMI values less than 40 μg/ml.

Keywords: Antioxidant, dosage, flavonoids, FRAP, phenolic compounds, Teucrium polium.

2.16. Larvicidal Activity and Phytochemical Composition of Extracts from Euphorbiaceae (Ricinus communis L. and Jatropha curcas L.)

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Abstract: We investigated the larvicidal activity of aqueous extracts of leaves and seeds of five regions populations of Castor (Ricinus. Communis L.) and eight introduced populations of jatropha (Jatcurcas L.) against Culex pipiens L. larvae. Further, levels of total phenolic contents, total flavonoid condensed tannins of extracts were determined by UV-spectrophotometer. Phenolic compounds identified and quantified by RP-HPLC (reverse phase HPLC). The IC50 values of R. communis a curcas L. seed extracts were lower than the IC50 founded in leaves extracts of both species. Gentisic catechin, rutin, vanillic acid, vitexin and gallic acid were detected in Castor and Epicatechin, nar
rutin, vitexin, and p-coumaric acid were detected in jatropha. This study permits to exhibit a positive correlation relationship between the total phenolic compounds, total flavonoid compounds and larvicidal activities of leaves and seeds extracts of *R. communis*, and *J. curcas*.

**Keywords**: Flavonoids, *Jatropha curcas*, larvicidal activity, phenolic compounds, *Ricinus communis*.

### 2.17. Arsenic Concentration in Wild Plants Growing on Two Mine Tailings \ Possible Traditional Medicine Interest

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**Abstract**: Arsenic exposition risk to wild plants in the contaminated area of Zimapán, Hidalgo, Mexico was studied. Total and EDTA-extractable As concentrations in the rhizosphere, in plants (shoots and roots) and deposition on leaves of wild plants naturally growing on two mine tailings (Santa María and San Francisco) were analyzed. Total soil As concentration ranged from 17,178 mg kg\(^{-1}\) while EDTA-extractable As concentration ranged from 234 to 499 mg kg\(^{-1}\) for San Francisco and Santa María sites, respectively. Eleven plant species with the prevalent vegetation, *Viguiera dentata*, *Brickellia veronicaefolia*, *Rutagraceae Dichondra argentea*, *Cuphea lanceolata* and *Aster gymnocephalus* are versatile plants in terms of potential uses in the traditional medicine as remedy of several illnesses. Because of this, the use of leaves collected from polluted sites could be a pathway of entrance to human body. The highest As accumulation was observed in *Aster gymnocephalus* (2,409 mg kg\(^{-1}\)) with the highest bioconcentration and translocation factors (9.6) and which were independent of the soil As concentrations. Similarly, highest deposition of As in aerial part was 7,521 mg kg\(^{-1}\) for *Aster gymnocephalus*, *Dalea bicolor* and *Rutagraceae Dichondra argentea* while EDTA-extractable As concentration was 52-88 mg kg\(^{-1}\) at San Francisco and Sta. Maria, respectively. Cases, As shoot concentration was higher than the maximum level tolerated by animals such as cattle, s chicken and swine (50 mg kg\(^{-1}\)). The high As concentrations in aerial parts of some of these plants may jeopardize the use of wild plants as forage. This study highlighted that plants are important organisms for retaining As not only on leaves surface but also inside of their structures. As a result, they strongly influence As dispersion and risk in mine tailings. Phytoremediation using some of these plants is suggested taking into account a control to As transfer to livestock or humans through their potential medicinal herb use. (This research is part of project PDCPN2013-1-215241).

**Keywords**: Arsenic, Mexico, phytoremediation, traditional medicine, wild plant.

### 2.18. Metal Ion Levels of Powder and Water Extracts of Gossampinus malabarica

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**Abstract**: Herbal medicines are normally ingested directly as a powder or as an extract in water. Hence, levels of metal ions in the Chinese herb, *Gossampinus malabarica*, were determined in both powder water extracts to determine the best way to use these herbs. These two samples were digested microwave oven before being subjected to ICP-OES Spectrometry in order to determine the levels of ions. The results showed that both the samples were rich in trace metal elements that are benefic health. The levels of Fe was highest in the powder extracts, followed by Zn > Cu > Mn > Cr. A similar trend was seen in water extracts made from the herbs, but metal ion levels in the powder extracts was fold to 9-fold higher than in the former. These results showed that, the most effective way to increase heavy metal contents in the body is to ingest the Chinese medicinal herb, *Gossampinus malabarica* powder and not as a water extract.

**Keywords**: Extract, *Gossampinus malabarica*, powder, trace metal.

### 2.19. Advances of Medicinal Plants in *Canscora* (Gentianaceae)

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Abstract: *Canscora* Lam. (Gentianaceae) plants were widely used as traditional medicine in many different countries. There are three species in China including, *Canscora diffusa* (Vahl) R. Br. ex R. Schult., *C. lucidissima* (H. Lév. & Vaniot) Hand.-Mazz., and *C. andrographioides* Griff. ex C. B. C. All of them were used as herbal medicine to treat hepatitis, bone fracture, snake bites and insect stings. Various chemical constituents, such as xanthones, triterpenoids, flavones, and steroids were isolated from these plants. Pharmacological researches proved that the extractions and compounds of *Canscora* species had bioactivities in antibacteria, anti-inflammation, liver protection and had beneficent medicinal effects. This paper summarized the research status of traditional knowl chemical compounds and pharmacological effects of *Canscora* plants, and aimed to provide data basis for further development and utilization of *Canscora* medicine. 

This study was supported by National Natural Science Foundation of China (31161140345 and 31071013) and the Ministry of Education of China (B08044, MUC985 and YLDX01013).

Keywords: Bioactivities, *Canscora*, chemical constituents, China, herbal medicine

2.20. Chemical Constituents of *Canscora lucidissima*, an Ethnomedicinal Plant fr SouthWest China

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Abstract: The plants in *Canscora* Lam. (Gentianaceae) have been used as traditional medicine in countries. Only three species in this genus occurring in China, and they are used by ethnic people, treating hepatitis, bone fracture, snake bites, and insect stings, and various injuries. In the present study, we investigated the xanthones from *C. lucidissima* (H. Lév. & Vaniot) Hand.-Ma traditional ethnomedicinal plant used by Zhuang, Mulao, Maonan, Shui, and Miao people in South China to treat hepatitis, bone fracture, snake bites, and insect stings, and various injuries. These substances were isolated from the whole plant of *C. lucidissima*. The structures of these compounds were deduced by spectroscopic techniques (MS, ¹H NMR, ¹³C NMR, 2D NMR(HMQC, HMB, COSY, NOESY)). Four naturally occurring xanthones, 1-hydroxy-3,5-dimethoxyxanthone (1), 1,6-dihydroxy-3,5-dimethoxyxanthone (2), 2-glucosyloxy-7-hydroxy-1,3,5-trimethoxyxanthone (3), 2-rutinobiose-6,7-hyd-1,3-dimethoxyxanthone (4) were isolated from *C. lucidissima*. 2-glucosyloxy-7-hydroxy-1,3,5-trimethoxyxanthone was firstly reported from the genus *Canscora*, while 1,6-Dihydroxy-3,5-dimethoxyxanthone (2), 2-glucosyloxy-7-hyd-1,3,5-trimethoxyxanthone (3), and 2-rutinobiose-6,7-hydroxy-1,3-dimethoxyxanthone were reported from this plant for the first time.

Keywords: *Canscora*, chemical constituents, China, spectroscopic, traditional medicine, xanthones.

2.21. Elicited Chickpea *Cicer arietinum* l. Callus Secondary Metabolites Producti

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Chickpea *Cicer arietinum* is an ethnobotanical interest grain legume, domesticated and cultivated worldwide. It is an important human dietary component regarding to its high nutritional value and benefits. This culture is mainly influenced by Ascochyta blight as a biotic stress. This interaction triggered the formation of callus in chickpea host plant with pathogenic agent spore suspension. Thereafter, substances resulted from this interaction are extracted and quantified. This can provide explanation about chickpea resistance or susceptibility and promote this plant Ascochyta blight resistance screening.

Keywords: *Cicer arietinum*, chickpea, ethnobotanical, secondary metabolites.
2.22. Chemical Composition and Antioxidant Activity of the Essential Oil
Ethanolic Extract of Algerian *Myrtus communis* L. Leaves

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**Abstract:** This investigation was designed to examine the chemical composition and antioxidant activity of the essential oil and ethanol extract of Algerian *Myrtus communis* L. leaf. GC-MS analysis has shown that the compounds in the essential oil. Algerian myrtle was characterized by a high proportion of α-pinene (39.10%) and eucalyptol (20.90). The total polyphenols and flavonoids contents was also investigated. Antioxidant activities of the essential oil and the ethanolic extract were evaluated using DPPH radical scavenging and reducing power of H$_2$O$_2$ assays. In all tests, ethanolic extract showed a concentration dependent antioxidant activity which is better than that of the essential oil.

**Keywords:** Antioxidant activity essential oil, *Myrtus communis* L., Polyphenols.

2.23. Metabolomics and Marker-Based Stability Studies of Extract of Seed
*Syzzygium cumini* L.


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2Lahore College for Women University, Lahore, Pakistan.

**Abstract:** Due to chemical complexity, herbal products deteriorate during storage, leading to a loss of activity, production of inactive/toxic metabolites. Therefore, the present study aimed to invest mehanol extract of seeds of *Syzzygium cumini* for accelerated stability to determine the chemical kinetics and predict shelf life. The extract was stored at three storage conditions (30°C/60% RH, 40°C/75%RH and 60°C/85%RH) for 6 months and the samples withdrawn at 0 month (before starting experiment) and 1, 2, 3, 4 and 6 months were analyzed to get uv-visible fingerprints and determine caffeic contents using HPLC. The comparison of metabolomics fingerprints indicated that the extract was stab 1 month at the three storage conditions. Caffeic acid within the extract followed the zero order degradation kinetics and was found to be decreasing with the increase in temperature. The results of the present study indicate that metabolomes of the extract change much faster. However, caffeic acid contents of the extract predicted to be stable for more than 3 years, if kept at 25°C.

**Keywords:** Extract, marker, metabolomics, seeds, stability, *Syzzygium cumini* L.

2.24. Standardization of Extracts Obtained from Yarrow Herb Collected in Ukraine

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**Abstract:** *Achillea millefolium* (yarrow) is widely used in medicine and pharmacy from ancient times nowadays. Extracts obtained from yarrow herb show different pharmacologic effects but anti-inflammatory and stop-bleeding are new areas of research for this plant and are of a particular interest. Such in makes the quality control of extracts obtained from plant raw material of big importance. Six alcoholic extracts of *Achillea millefolium* were obtained by percolation with 60% ethanol from the sample of plant raw material. The extracts were obtained successively. A high-performance liquid chromatography method with coupled diode array detection-mass spectrometry with electrospray ionization mode (HPLC-DAD-ESI-MS) was developed for identification and quantification of major phenolic compounds of *Achillea millefolium* obtained by percolation with 60% alcohol. Chromatographic separation was performed on a C18 SunFire column, phenolic acids and flavonoids separated in gradient elution mode with mobile phase of 0.1% (v/v) formic acid in water and 0.1% formic acid in acetonitrile with flow rate at 1 mL/min, column temperature at 38°C and detection wavelength at 330 nm and 360 nm. Quantitative analysis was carried out using an Agilent Technol
1200 LC/MSD HPLC system (USA) equipped with a single-quadrupole mass spectrometer with an interface in the positive and negative mode. MS data were collected in SIM mode at m/z -179 (caffeic m/z +465 (hyperoside), m/z +611 (rutin), m/z +287 (luteolin), m/z +449 (luteolin-7-glucoside), m/z (apigenin-7-glucoside) and m/z +355 (chlorogenic acid). The phenolic acids (chlorogenic and caffeic flavonoids and their glucosides were positively identified based on both absorption and mass spectra in hydro-alcoholic extracts of Achillea millefolium. Major compounds for all examined extracts chlorogenic acid, luteolin and apigenin-7-glucoside. ESI-MS was confirmed as a valuable tool obtaining potentially important information on major phenolic compounds in hydro-alcoholic extra-Achillea millefolium. The validation of quality control procedures for of extracts was carried out amount of flavonoids turned out to be different in six extracts. After the study of coagulant properties the above mentioned extracts there was an obvious dependence. The higher flavonoid content was in the extract, the better coagulant properties it showed.

**Keywords:** Achillea millefolium, Arrow Herb, extract, flavonoids, phenolic acids, quality control.

### 2.25. Extraction and Antibacterial Activity of the Extract Alkaloids of an Aromatic Medicinal Plant, Lavender « Lavandula Stoechas » in the National Park of El I Algeria

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**Abstract:** The present research has been conducted on an aromatic and medicinal plant, lavandula sto at National Park of El Kala, country of Ain Khair. This work was focused on a study of the Ain region, ethnomedical exploration and soil analysis, to end with histological study, qualitative and quantitative essential oils and antibacterial study as well. Tree harvest of Lavandula stoechas were re: during three months (March – April – May). Essential oils extractions of each harvest and che caracterisation and antibacterial activities study have allowed us to gather the follow results: Differer the yield between the three harvest was often conditioned by climatic changes, There was a differer chemical essential oils composition. Results of aromatogramme showed a real activity for the t samples. This was reported by literature. However, this activity differs in function of the harvest p concentration and type of bacteria targeted. Then, essential oil of Lavandula stoechas may be used eirl disinfectant of surfaces (subjects- hands), urinary disinfectant or epidermal disinfectant (injury causcoci Gram positive).

**Keywords:** Antibacterial activity, essential oil, lavandula stoechas, CCM, CPG.

### 2.26. Chemical Compositon and Antimicrobial Activity of Daucus aristidis Coss. Essential Oil in Pre-Flowering Stage from Algeria

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**Abstract:** Essential oils can have significant antimicrobial activities and can successfully replace antib that show their ineffectiveness against resistant germs. The chemical composition of the essenti obtained by hydrodistillation from the aerial part of Daucus aristidis (Apiaceae) at the pre-flowering was investigated for the first time, by GC and GC-MS and evaluated for in vitro antimicrobial activi the disk diffusion method. The Main components of D. aristidis oil were α-pinene (20.13%), ε (20.11%) and E- asarone (18.53%). The oil exhibited an antibacterial activity against almost all s tested except for Klebsiella pneumoniae ATCC 700603 K6 and Enterococcus faecalis ATCC 49452, t of D. aristidis had no activity against all fungi tested.

**Keywords:** Antimicrobial, aerial part, Daucus aristidis, essential oil, strains.
2.27. Chemical Composition and Biological Activity of Ferula vesceritensis Coss: DR. Essential Oil

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Abstract: The emergence of human pathogenic microorganisms that are resistant to major class antibiotics has increased in recent years. The screening of essential oils allows the discovery of antibacterial and antioxidant. Essentials oils were extracted by hydrodistillation from F. vesceritensis and their chemical composition was carry out by Gas-Chromatography coupled to Mass-spectro (CPG/SM). The antibacterial activity of the essential oil is evaluated by disk diffusion method against Escherichia coli ATCC 25922, Staphylococcus aureus ATCC 25923, Pseudomonas aeruginosa ² 27853, Staphylococcus aureus (methicillin resistant) ATCC 43300, Bacillus subtilis ATCC 6633, L. innocua CIP 74915 and three human pathogenic bacteria: Staphylococcus aureus (multiresistant), E. coli and P. aeruginosa. The antioxidant activity was evaluated using the free radical scavenging effects of DPPH. The results were compared with synthetic antioxidant, (BHT). α–pinene (28, 57%) and ariste (24, 63%) were the major compounds of the essential oil. S. aureus ATCC 25923 and B. subtilis ² 6633 were the most sensitive to the oil. An effect antiradical very low in comparison with BHT, The values for, F. vesceritensis oil and BHT were: 7440 µg/ml, 41,35ug/ml respectively. In conclusion, t possesses a god antibacterial activity against S. aureus which justifies its use in traditional medicin treating digestive diseases.

Keywords: Antioxidant, Biological, chemical, Ferula vesceritensis, essential oil.

2.28. Volatile Oils Composition of Bellis sylvestris L. Growing in Batna, Algeria

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Abstract: Essential oils were obtained by separate hydrodistillation from Leaves and Steams of l silvestris L. ( Asteraceae ) were analyzed by means of gas chromatography – mass spectrometry GC-MS ; the main constituents of the essential oil from the leaves were: camphene (5.847), Curcumene (10.85), β-Spathulenol (14.15), and α-Bisabolol (7.350), but those from the steams Pentacosane (1.041), Octadecanal (4.127), 2- - Naphthalene (4.754), and Pentacosan (4.399)

Keywords: Bellis sylvestris, essential oil, GC-MS, leaves, steams .

2.29. Phytochemical Study and ANTI-AGES Activities From Methanolic Extra Daucus aureus Desf. (Apiaceae)

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Abstract: Daucus is a genus belonging to the Apiaceae family and consists of about 200 species th widely distributed around the world. In Algeria, the Daucus genus is represented by more than 11 s living in dry and uncultivated areas. This work was interested from the phytochemical analysis of the parts and inhibitors of glycation and AGE-breakers activities in vitro of Daucus aureus specie (Apiaceae). Diverse separation and purification methods of the methanolic extract of the Daucus aureus have led isolation of two flavonoids O-glucosides (Luteolin-7-O-glucoside and Apigenin-7-O-glucoside). structures of compound were elucidated by spectroscopic methods, including (1D and 2D NMR, UV,
The AGE-breaking activities of butanolic and ethyl-acetate extracts from the aerial parts of *Daucus a* showed ‘AGE-breaking’ activities in vitro.

**Keywords**: Anti-ages, apiaceae, *Daucus aureus*, flavonoids, methanolic extract.

### 2.30. Chemical Composition, Macroscopic, Microscopic and DNA Fingerprinting to Adulteration of Lebanese Medicinal Plants and Spices

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**Abstract**: The use of medicinal plants and spices goes back to ancient times in Lebanon; however, Lebanon does not have yet its own pharmacopeia. Their use is well established and widely acknowledged to be safe and effective, and may be accepted by national authorities. In Lebanon there is a gap between the demand and supply of many medicinal plants and spices. This can lead to adulteration, substitution or imp storage of the genuine materials. On the other hand, a lot of controversy exists with regards to the identity of many drugs. In Lebanon, flowers of *Viola odorata* (Sweet violet), roots of *Rheum ribes* (Syrian rhubarb) and *Ferula hermonis* (Lebanese Viagra), essential oils of *Salvia fruticosa* (Sage) and stigmas of *C sativus* (Saffron) are considered to be very important medicinal plants and spices used in the traditional medicine. For all the above reasons, we were interested to inspect several genuinely claimed samples sold in the herbalist shops in Lebanon. Chemical composition, macroscopic, microscopic and DNA fingerprinting of samples were performed. We have compared the bought samples with the genuine origin to prove or not the adulteration. qPCR was used to confirm the findings of the macroscopic and microscopic studies. Our study revealed that the majority of the *Rheum ribes* samples bought in Lebanon were not adulterated. This was not the case of *Viola odorata*, since a sample was adulterated using *Cercis siliquastrum* flowers. In addition the majority of *Crocus sativus Ferula hermonis* were falsified. All essential oils of *Salvia fruticosa* showed falsification but this was not the case of *Crocus sativus* flowers. We can conclude that one method is sufficient to fight against falsification even though DNA fingerprinting if properly used can be considered a very useful tool to guarantee the genuineness of drugs and spices.

**Key-words**: Adulteration, falsification, *Ferula hermonis*, *Rheum ribes*, *Salvia fruticosa*, *Viola odorata*.

### 2.31. Drying Effect on the Water Content and the Essential Oil Content of *Eucalyptus Camendulensis* Plant

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**Abstract**: Medicinal and aromatic plants are promising and are characterized by the biosynthetic odorous molecules that make up the so-called essential oils (EO), which have long been known for antiseptic and therapeutic activity in folk medicine. The objective of this study was to evaluate the influence of drying in the shade on the water content and on the content of essential oils extracted from leaves of *Eucalyptus camendulensis* for better quality control of medicinal and aromatic plants. The water content of the *Eucalyptus camendulensis* plant material decreases during the drying process. It increased from 1 to 0.006 % for the drying in the shade after ten days. The moisture content is practically constant at the end of the drying period. The drying in the shade increases the concentration of essential oils of *Eucalyptus camendulensis*. When the leaves of *Eucalyptus camendulensis* plant are in the shade, the maximum essential oil content was obtained on the eighth day, the recorded value was 1.43 ± 0.01%. Beyond the 6th day, the content continuously drop in before stabilizing. The optimum drying time is between 6 and 10 days.

**Key words**: Drying, Essential oils, *Eucalyptus camendulensis*, extract, water content.
2.32. Phytochemical Screening of “Methane” a Varité of Thymelaceae 1 Northwestern Algerian Arid Areas: Pharmaceutical Properties

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Abstract: Thymelaea hirsuta: perennial plant family commonly known as “Methane” in Algerian with therapeutic properties. It’s use in traditional medicine, including treatments for skin diseases study aimed to use of natural active ingredients, after their leaves/flowers extraction, phytocher microbiological tests has been made: the first concerning metabolites available, the second deals with biological tests has been made: the first concerning metabolites available, the second deals with direct extract application on Gram positive and negative bacteria Staphylococcus aureus, Pseudomonas aeruginosa, fungi: Microsporum gypseum et Microsporum audouinii et Microsporum gypseum. Results of phytochemical tests revealed rich phenolic compounds (flavonoids, tannins), terpenes, sterols, quinones and anthraquinones. Inhibition areas in mm, Staphylococcus aureus-interactions at 10mg/ml extracts were: 24 ± 1.41mm, 1 0.71mm, 22.5 ± 3.54mm, 27.5 ± 3.54mm, and 12.5 ± 3.54 mm 31 ± 1.41 at 5mg / ml of dichloromethane extract were: 5 ± 7.1mm, 20 ± 14.1mm; methanol: aqueous 15 ± 7.1 and 220 ± 28.3; 105 ± 7.1. Bactericidal effect was obtained by direct contact with petroleum ether, ethanol and the decoction minimum inhibitory concentration was 500 µg/ml for Staphylococcus. aureus and 1000 µg/ml Pseudomonas. aeruginosa. The antifungal activity was dependent on concentrations of extract applied, and meant a reduction in speed of mycelial growth, absence of spores, delayed, initiation of mitosis with sl duration of fungal activity. For species M. audouinii, M. gypseum, inhibitory concentrations 50 (IC50) respectively: 488 ± 48.92 µg/ml and 512.62 ± 47.40 mg / ml (petroleum ether), 510 ± 63.13 µg/ml - 4 ± 48.12 µg/ml (dichloromethane), 674.06 ± 20.14 µg/ml, 461.56 ± 11.94 µg/ml (methanol), 524.79 ± µg/ml, 487.48 ± 46.15 µg/ml (ethanol), 510.94 ± 44.41 and 454.37 ± 3.45 g/ml (aqueous) and 477.81 ± 40.22, 450.58 ± 3.12 µg/ml (decoction) for IC90 were respectively 795.31 ± 27.48 and 792.51 ± 9.34 µg/ml (petroleum ether), 808.02 ± 4.32; for IC90 was 795.31 ± 27.48 µg/ml respectively and 792.51 ± 9.34 µg/ml (petroleum ether), 808.02 ± 4.32, 803.04 ± 13.31 µg/ml (dichloromethane), 818.64 ± 15.19, 783.610µg/ml (methanol), 809.15 ± 4.92, 789.83 ± 7.20 µg/ml (ethanol), 782.50 ± 11.44, 794.95 ± 11.2.5 µg/ml (aqueous) and 767.92 ± 08.25, 760.25 ± 7.76 µg/ml (decoction). The overall findings of the study indicate that extracts Thymelaea hirsuta possesses the inhibitory properties for gastrointestinal microorganisms involved in human pathologies.

Keywords: Extracts, Interaction, Micro-organisms, Phytochemistry, Thymelaea hirsuta.

2.33. Analysis of Volatile Oil Content and Total Polyphenols in Lippia alba

Minohara, A.C.M1, Capellari Jr.1,2, Gaspi, F.O.G2, Teramoto, J.R.S.3 and Tanaka, E

Abstract: Lippia alba (Mill.) N.E. Br. ex Britton & P. Wilson (Verbenaceae) is a sub shrub species long and fragile branches, which reach up to a height of 1.5 m. The leaves are opposite, simple, set with 3 to 6 cm in length; and the flowers are white or rose. In Brazil, this species is located in Am Cerrado, Atlantic Forest, and in disturbed areas. Its leaves and roots are used in folk medicine to diseases in the digestive system, also acting in the nervous and respiratory systems. The objective of the study was to analyze the content of volatile oil and total polyphenol in leaves obtained from Atlantic Forest in the northeastern of São Paulo state. Samples were collected from several individuals; then, they packed, transported and processed to extract volatile oil by hydrodistillation in a Clevergen apparatus. The obtained hydroalcoholic (70%) extract was used for assessment of total polyphenol content. The yield of volatile oil was 0.21% (w / v) and the average content of total polyphenol was 44.12 mg/g. Similar result was found in the study carried out by Oliveira et al. (2006), in which volatile oil yield was 0.20% (w / v). However, Barros et al. (2009) extracted the twice concentration of volatile oil, presenting a yield of 0.40%. In both studies, the volatile oil was extracted through the same method and in equivalent conditions. Possibly, the differences were due to the distinct origins of the leaf samples. Although, most studies on chemical composition of Lippia alba are related to its volatile oils, some researches have reported...
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presence of other phytochemical constituents such as polyphenols. Therefore, we evaluated the polyphenol content, and these compounds were found in the samples. However, due to the lack of similar studies in the literature, we cannot perform comparisons. It is concluded that these analyses allow the obtaining of parameters useful for pharmacognostic characterization of this important medicinal plant.

Acknowledgements: to Prof. Emeritus Dr. Walter R. Accorsi, for their invaluable scientific legacy; the farm São Paulo (collection area) Ricardo Mickenhagen; the Agronomic Institute of Campinas (IAC); the researcher José Siqueira (IAC); the Federal College of Juiz de Fora; Dr. Fátima Regina Gonçalves-Salimena (UFJF); to Marcia Eugenia Amaru de Carvalho for the abstract translation; to Group of Walter Accorsi studies (ESALQ/USP).

Keywords: Analysis, hydrodistillation, leaves, Lippia alba, polyphenol content, volatile oil extract.

2.34. A Need for Having a Re-Look at the Terms of Quality Assessment of Ayurvedic Medicines

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Abstract: One of the major issues that is preventing Ayurveda, a medical system with tremendous potentials, to contribute to the healthcare needs of the world is the expectation that Ayurvedic medicinal preparations must adhere to the western standards of pharmaceutical parameters. The aim of this communication is to make the policy makers understand the problems that could be solved by a better understanding of the differences in epistemology. This specifically points at the need for the acceptor Ayurvedic epistemology by the western governments. It also emphasizes the need for tackling the issue of raw material quality control at the pristine stages of product generation. Ayurveda and Western medical system have dissimilar ideas of institutionalization: the definition of standardization is restricted to the chemical composition of the drug. It is a well-known fact that a medicine with a definite chemical composition does not show the same therapeutic effect in all individuals. Therefore, Ayurveda considers every individual to be unique. It is to be noted that the disease identification in Ayurveda occurs through the study of patient’s bodily constitution (Prakriti), status of digestive function (Agni) and the integrity of tissues (Dhatu) and the specific and non-specific symptoms expressed by the patient (Lakshana). Hence, Ayurveda has a patient-specific strategy of healing and treatment that is quite different from the conventional medicine being practiced nowadays. Ayurvedic preparations contain materials of herbal- and mineral- and animal-origin which undergo a spectrum of pharmaceutical procedures so that show the desired healing effects on the patients. The credit for this goes to potentiation, impregnation and many such processes that these minerals undergo as described in Bhais Kalpana and Rasa Shastra (pharmaceutical science of Ayurveda). These procedures convert the harmful materials into certain valuable medicines through these well-researched and well-documented pharmaceutical procedures. Therefore, the fact that these medicines are being used for centuries continuously by people itself is a proof for their safety. Normally, the adverse effects by Ayurvedic products are rare, but if the patients work under the belief that these are ‘natural’ and hence cannot harm them at all, they tend to ignore the fact that these herbs are also drugs. What is required today is the need to bridge the gap between Ayurveda and the current sciences and bring up adequate appreciation of the epistemological principles and construct an environment that takes us more close to the common and wisdom of Ayurveda. This would enable Ayurveda to be of much help to the ailing humanity.

Keywords: Ayurvedic medicines, pharmaceutical parameters, quality assessment.

2.35. Free Flavonoid Aglycones Isolated from Leaves of Three Species Pistacia

N. Hamlat and A. Hassani


Abstract: Flavonoids are a family of many polyphenol compounds; some flavonoids aglycones extracted from the aerial parts of three species of Pistacia (Pistacia lentiscus L. Pistacia atlantica...
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Pistacia therebenthus, growing in Algeria. All the main aglycones isolated from leaves and fruits of Pistacia were identified using the high performance liquid chromatography (HPLC). The results allow to identify several compounds such as: Quercetin, myricetin and kaempferol.

**Key words:** Aglycones, flavonoids, Pistacia atlantica, Pistacia lentiscus, polyphenol.

2.36. Pharmacological Potential of Passiflora cincinnata Mast. (Passifloraceae)

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**Abstract:** Passiflora genus assembles 120 Brazilian climbing species with tendrils, alternate leaves, s flowers, and berry or capsule fruits, which are usually edible. They are used as sedatives due to growth natural substances, such as polyphenol stacten in the leaves; but many species require further study alata Curtis and P. edulis Sims are part of the Brazilian Pharmacopoeia and were very studied; therefore they are used as references for comparison in research of other species. This work presents a comparative analysis of polyphenol content from P. cincinnata Mast. ("maracujá-mochila") plants, growing in wild and controlled conditions. Its leaves and fruits are used to combat insomnia, as a sec and to control blood pressure. P. cincinnata is distributed throughout all country, but this species is mainly in the southeast region, in the Cerrado and Atlantic Forest. We collected 1 kg of leaves in the of São Paulo, at SudMennucci (wild conditions - WC) and Campinas (controlled conditions municipalities. In order to avoid interferferences in the results, care has been taken to preserve the sample with respect to the photosynthetic period at moment of collection and storage conditions. The extract of fresh leaves was carried out by soaking in alcohol 70%. The spectrophotometric measurements of polyphenols were performed using the Folin-Ciocalteu reagent, with catechin as standard. The value of total polyphenol content were 18.41 mg g⁻¹ in the extract obtained from WC and 17.04 mg g⁻¹ in one CC. Thus, there were similar values in polyphenol content between WC and CC specimens. In the study of Ramaiya (2014), P. edulis and P. alata showed 23.7 mg g⁻¹ and 16.8 mg g⁻¹ of total polyphenol co respectively. Polyphenols have various medicinal properties, acting as antioxidant, antimicrobial and antitumor compounds. When compared with other medicinal Passiflora, such as P. edulis and P. ala cincinnata species presented similar polyphenols content, showing that it is a potential source of substances, and possibly other phytochemicals compounds, suggesting research of this species to evaluate your medicinal properties.

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**Keywords:** Antimicrobial, antioxidant, Passiflora cincinnata, pharmacological, polyphenol content.

2.37. Analysis of Polyphenol and Volatile Oil Contents in Xylopiaaromatica (Annonaceae)


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**Abstract:** Xylopiaaromatica (Lam.) Mart. (Annonaceae) is a plant species represented by medium-sized tree with tomentose and lanceolate leaves that measure 6 to 14 cm in length; white and fragrant flowers; follicular apocarps and aromatic fruits. The objective of this study was to evaluate the volatile oil total polyphenol contents in leaves and fruits of X. aromatica. This species occurs in all regions of Brazil with the highest concentration in the Southeast. The sample collection was made in the city of Mennucci, northwest of São Paulo state (20°48'S and 50°55'W), in Atlantic Forest area with influence of the Cerrado. Leaves and flowers were separately collected; then, they were packed, transported and processed to extract volatile oil by hydrodistillation in a Clevenger apparatus for 2 h. The obtained hydroalcoholic (70%) extract was used for assessment of total polyphenols by spectrophotometry, using 725 nm reading. The results were expressed in mg g⁻¹ of catechin equivalents. The yield of volatile oil in flower

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leaves was 0.23% and 0.38% (w/v), respectively. The average content of total polyphenol was 14.50 mg g⁻¹ and 22.4 mg g⁻¹ in flowers and leaves. However, we did not find information about the volatile oil polyphenol contents in flowers of Xylopia aromaticae and other species of this genus. Many Annonaceae’s species are widely used in folk medicine due to their different pharmacological properties attributed mainly flavonoids, volatile oils, alkaloids and acetogenins, the major bioactive constituents found in specific species of this plant family, making important the analyzes of its phytochemical constituents. Branches and 1 of Xylopia are traditionally used to treat malaria. As previous data about this species were not found, be concluded that this research is unprecedented, making it very important for botanical pharmacological literature.

Acknowledgement: Prof. Emeritus Dr. Walter R. Accorsi, for their invaluable scientific legacy; the owner São Paulo (collection area) Ricardo Mickenhagen; the Group of Walter Accorsi ss (ESALQ/USP), Msc. Marcia Eugenia Amaral de Carvalho, for the abstract translation.

Keywords: Analysis, clevenger apparatus, extract, flower, Leave, oil content, Xylopia aromaticae.

2.38. Anatomical, Chemical Analysis, Thin Layer Chromatography and UV Spectroscopic Study of Marrubium Vulgar

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Abstract: Marrubium vulgar is a plant which is common throughout Algeria and it is widely used as traditional medicine to treat several diseases such as cough and fever. Firstly, anatomical and morphological observations were carried out on a freshly harvested plant using light microscope. The images obtained show different types of trichomes: glandular, multicellular and stellate as well as several types of trichome. Second, the plant chemical components were tested by different methods: 1) phytochemical analysis using extraction with solvents of increasing polarity and qualitative determination of chemical groups; 2) chemical and physicochemical analysis used to determine humidity, rate of ash and metals contents a qualitative estimation of chemical compounds using thin layer chromatography (TLC) and UV spectroscopy. Solvent extraction shows a high yield of apolar compounds (5.9%) compared to compounds (1.96%) while the chemical tests reveal the presence of alkaloids, tannins, sterols, triterpene saponins, mucilage, flavonoids, and other species of this genus. Many Annonaceae’s species are widely used in folk medicine due to their different pharmacological properties attributed mainly flavonoids, volatile oils, alkaloids and acetogenins, the major bioactive constituents found in specific species of this plant family, making important the analyzes of its phytochemical constituents. Branches and 1 of Xylopia are traditionally used to treat malaria. As previous data about this species were not found, this conclusion is unprecedented, making it very important for botanical pharmacological literature.

Keywords: Heavy metals, Marrubium vulgar, phytochemistry, extraction, thin layer chromatography

2.39. Phytochemical Investigation and Antimicrobial Activities of Jordanian Premature Psidium guajava l. Fruit Peel Extract Using Soxhlet and Microv Extraction Methods

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Abstract: This study was undertaken to evaluate the phytochemical composition of aqueous extract obtained from Jordanian premature Psidium guajava fruit peel (PGFP). Two different method extraction were used; microwave-integrated soxhlet (MIS) extraction and conventional soxhlet extraction methods. HPLC-MS/MS analysis allowed the identification and the quantification of phenolic compounds in the plant; significant differences between the two extracts were reported. Phenolic compounds were identified in the MIS extract, of which ascorbic acid shows the major constituent while sex phenolic compounds were identified in the CS extract, of which ellagic acid is the major constituent. Moreover, the MIS extract showed to contain higher level of total phenolic compounds compared to the CS extract. The minimum inhibitory concentration (MIC) of MIS extract was 10 μg/mL.

Keywords: Psidium guajava, Premature, Phenolic compounds, Antimicrobial Activity.
Escherichia coli, Staphylococcus aureus, Propionibacterium acnes and Bacillus cereus, was twice less than the values obtained from the CS extract, except for S. aureus, the two extracts were equally active.

**Keywords:** Antimicrobial, extraction, fruit peel, microwave, phenolic, *Psidium guajava.*

### 2.40. Composition and Antioxidant Activity of the Essential Oil of *Mentha Spicata* from Algeria

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**Abstract:** *Mentha* genus (*Lamiaceae*) has been found to possess significant biological activities, incl antimicrobial, antitumachache, anti-vomitive, antiseptic, anti-infective, vermicifuge, antitussive, to digestive tract disorders and as diuretic. 15 species are distributed in Algeria. In continuation of our investigation on *Lamiaceae* essential oils, we report here the GC and GC/MS analyses and the antioxidant activity of the species *Mentha spicata*. The hydrodistillation in a Clevenger-type apparatus of the aerial parts of *M. spicata* yielded 2.1% of a pale yellowish oil. The chemical composition of the hydrodistilled essential oil of *Mentha spicata*, collected from Ghardia (Saharienne Algerian), was analyzed by GC and GC/MS. The two extracts were equally active.

**Keywords:** Biological activities, components, essential oils, *Mentha spicata.*

### 2.41. Polysaccharide Compositions of Endocarp of Argan Fruits (*Argania spinosa*) from Algeria

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**Abstract:** Xylitol is a pentahydric sugar alcohol with high sweetening power and unique pharmacological properties. It occurs naturally in low concentrations in fruits, berries, and vegetables. Xylitol prevents decay and it can be used clinically as sugar substitute for diabetic patients and as parenteral nutrition sources. Clinical studies have also shown that xylitol can prevent ear infection in children and also prevents skin roughing when used in cosmetic products, and it limits the tendency to obesity continuously supplied in diet. Xylitol is found in many fruits and berries, but its commercial extraction is not considered. It is extracted from wood, corn, sugar cane pulp, seed pods, straw, and of coconuts. These sources contain 20-35% xylan, which is converted by acid hydrolysis into xylose then hydrogenated to obtain xylitol. Kernels fruit of the argan tree is rich in xylan and can be used as source of xyllose. The argan tree "*Argania spinosa* L.Skeels" is a tree of the Sapotaceae family, endemic to Morocco and Algeria. In Algeria, its geographic range covers a relatively large area in the northwest of Tindouf where this species is the second forest essence after Acacia. The harmo development of the Algerian population and the success of sustainable development program are interdependent on the knowledge of natural resources of the country. The present study was to examine polysaccharide compositions of the endocarp of argan fruits for their use in local pharmaceutical industry. The polysaccharide compositions of cell walls isolated from the endocarp of *Argania spinosa* investigated. The walls were fractionated progressively with hot water H2O, EDTA, 0.5N NaOH, 2N NaOH, 2N NaOH Monosaccharide and linkage analyses (Chromatography CPG) of the polysaccharides and the wall fractions indicated that the proportions of pectic polysaccharides were particular low, included pectic arabinans and or type I arabinogalactans. Evidence for rhamnogalacturonan I. In cor the proportions of cellulose, and xylans, probably homoxylans were particularly high. The cell preparations contained smaller amounts of xylolucans.

**Keywords:** *Argania spinosa*, berries, extraction, pectic arabinans, polysaccharide, xylitol.
2.42. Polyphenols Contents and Antioxidant Proprieties of Ethyl Acetate Extra-
Ruta chalepensis from Algeria

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Abstract: Ruta chalepensis (Rutaceae) is one of a large medicinals plants used traditionally in Alger
treatment of several diseases. In our study, total polyphenols and flavonoids were evaluated from
acetate extracts of aerial parts of Ruta chalepensis collected during different periods. The total ph contents were determined using the Folin–Ciocalteu reagent. They varied from 32±0,002 to57±0,00
gallic acid equivalent (GAE)/g dry weight from different samples. Total flavonoids concentrations quantified using aluminum chloride, they varied from 25,39 ± 0,004 to70,26±0,03 ug quercetin equi
(QE)/g dry weight. The results of the Antioxidant activities obtained from different samples using (I
scavenging test showed a variation depending on the period of collection with a high capacity observ
the December samples when compared to BHA.

Key words: Antioxidant activity, DPPH scavenging activity, polyphenols flavonoids, Ruta chalepensis.

2.43. How Useful is the Pollen of Anemophilous Plants?

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Abstract: It is considered that chemical composition of pollen is richer in entomophilous plant
comparison with the pollen of anemophilous plants and pollen, collected and processed by bees, is
useful than natural pollen, collected manually. Therefore to determinate the nutritional value
therapeutic potential of natural anemophilous pollen of Betula verrucosa Ehrh. is the aim of this study
results were compared with the bee pollen standards and the Recommended Dietary Allowance (RDA)
WHO. Quantitative content of protein, ascorbic and oxalic acids, β-carotene and minerals have
investigated. Sample of silver birch pollen has been prepared in the park zone relatively not far fro
highway and housing estate in Kyiv, Ukraine. Protein content was determined by Kjeldahl method, asc
and oxalic acids by HPLC, β-carotene by UV-Vis spectrometry, minerals by AES. The protein content of
silver birch pollen is 23,8 ± 1,0 %, that corresponds requirements for bee pollen (10–40 %). Ascorbic
content is 1513,0 ± 0,5 mg/kg, that exceeds the requirements for bee pollen almost in 3 times (71
mg/kg), and for providing 15% of the daily requirement for vitamin C is enough 9/8 g of pollen for me
women respectively. The content of oxalic acid is 680,0 ± 0,5 mg/kg, the content of β-carotene is 22,9
mg/kg at the requirement for bee pollen 10-200 mg/kg. Mineral composition in mg/kg is presented l
(2216 ± 10), Mg (669 ± 10), K (7858 ± 20), P (4685 ± 50), Na (92 ± 20), Mn (26,6 ± 0,2), Al (9,8 ± 1
(1919 ± 50), Fe (32,6 ± 0,5), Zn (79 ± 2,0), Cu (9,6 ± 1,0). The content of potassium, phosphorus, ca
and sulfur dominates in pollen of silver birch. All values of mineral elements are within the k
standards for bee pollen. The results show that Betula verrucosa Ehrh. pollen has sufficient nutritional
and can be recommended as a natural source of vitamins, in particular C, provitamin A, macro
microelements. The product can be successfully used as an additive to the basic food, of course on
those persons, who have no sensitivity to pollen of the Betulaceae family. Also it is necessary to tak
account regional peculiarities of sites of pollen collection – mineral features of soil and water, geogr
conditions and environmental factors.

Key words: Anemophilous pollen, biochemical composition, nutritional value silver birch.

2.44. Rosa Roots Numerical Values and Elemental Contents Determination

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Abstract: Rose hips Roots - a perspective herbal drug. Raw materials used in traditional medicine for
treatment of cholelithiasis and nephrolithiasis, has anti-inflammatory and reparative action for joint t
Pharmacopoeia materials are Rosae fructus, other parts of plant used in folk medicine are leaves, flo stems and roots. The roots of wild rose - a promising type of raw medicinal plants. Previous studies shown the existence and content of phenolic compounds, terpene natural compounds and organic -

registered in Ukraine dietary supplements containing powder roots hips capsules for the treatme articular tissues, cholethiathias options require further research and standardization. The purpo investigation: determining the numerical values of roots of dog rose and cinnamon rose includin elemental composition study. Decoction and infusion of the roots of wild rose enhance gastric motility, inflammatory effect. Broth decreases and increases bile infusion. The purpose of research - the stu macro- and microscopic signs of numerical indicators, including biological active substances c (amount of phenolic compounds and flavonoids amount) in the roots of wild rose cinnamon. 7 batch raw materials harvested in the early phase of sap flow during 2011-2014. The research found characteristic features of morphological and anatomical structure of raw materials and selected diag features, set a number of numerical indicators. Thus, for the roots Rosa majalis defined loss in weig drying (up 10.0%), total ash (up 6.5%), ash insoluble in hydrochloric acid (up 1.5%). The herbal d harvested in Kharkiv in 2013 is used, the numerical parameters set pharmacopoeial methods, elen analysis was performed by atomic absorption spectroscopy. For the roots of two species of wild rose b in weight on drying (9, 63%-9,45%), total ash content of about (2,86-2,81%), the ash retained curre solution of hydrochloric acid(1.022-1.078%), extracted matter (ethanol 50%) is 27,62-28,34%, the ar of phenolic compounds content spectrophotometric method per gallic acid (not less than 7.5%), the cc amounts of flavonoids per hyperoside (of 1.5%). The contents 19 elements in both types of mate established. Potassium (1200-1250mg/100g), calcium, magnesium, sodium and phosphorus are domi Content amounts of heavy metals are within permissible concentrations for medicinal plants and products.

Keywords: Content, Pharmacopeia, rosa root, traditional medicine, value.

2.45. Antioxidant Capacity for *Urtica Dioica* of Several Sites of Algeria Selective Extraction of Secondary Metabolites

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**Abstract**: Within the framework of this work we were interested in the study of a spontaneous med plant largely present in the world but little used by the local population called *Urtica dioïca* of the fam Urticaceae. This study on the two parts of the plant root, leaf aims to characterize and identify the v families of chemicals compounds contained in this medicinal plant. Indeed, the determination of the cc of secondary metabolites showed that, the flavonoids and the tannins in the leaves in large qua estimated respectively to 1%, 0.6% dry material. The qualitative analysis of tannins made it possi detect Phloroglucinol and Hydroquinone in the leaves, Phloroglucinol and the Vanillic acid in the Thin layer chromatography of the flavonoids also made it possible to identify: Kaempferol, Quer Chrysin, 7 - hydroxyflavone and Naringénine in the leaves. Chrysins, 7 - hydroxyflavone an Dihydroxyflavone, acid - O Comarique in the roots. The tannins and flavonoids have an antioxidant than ascorbic acid and trolox.

**Keywords**: Antioxidant, flavonoids, thin layer chromatography, tannins, *Urtica dioïca* L.

2.46. Fast Quality Evaluation of Goji Berry (*Lycurum barbarum* L. Solanaceae) 1 Different Areas of China by Hptlc and Sensory Properties Analysis

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**Abstract**: Goji berry has been used as a healthy food and medicine for millennia in China. Recently, been widely advertised in Europe and the US as health food supplement. However, substitutes contaminants threaten the quality of goji berry, therefore, a fast authentication is necessary for the q control in its transaction. Thirty-five goji berry samples were collected from the main production are China. Physical attributes such as size, color, and weight were determined. Color was measured percentage reflectance using an AvaSpec-2048 fibre optic spectrometer and an AvaLight-XE xenon f light source. HPTLC was employed for the identification of smaller molecular compounds
fingerprinting of extracts. Goji berries from different areas vary in their sensory properties, as well as HPTLC profile. PCA of this data was used to develop an effective method for the fast quality evaluation of goji berry.

**Key words:** Goji berry, fast quality evaluation, HPTLC, quality control, sensory property.

### 2.47. Analysis of the Used Extemporaneous Dosage forms in Ukraine

**Zalis'ka Olha and Maximovych Natalia**

**Revyatsky Iwan, Barchuk Olha, Lviv National Medical University named Danilo Halytsky, Lviv, Ukr**

**Abstract:** In Ukraine it’s the old tradition of extemporal production of authentic dosage form to personalize treatment of patients. These extemporaneous medicines contain herbal extractions Ukrainian plants. Most commonly used in extemporaneous forms the infusions and decoctions of plants: Urtica dioica, Althaea officinalis, Matricaria recutita, Acorus calamus, Leonurus villosus Des: others. Also these extemporaneous forms have many advantages: they don’t contain the preserva stabilizers, colorants, flavors taste fillers that may exhibit toxic properties; that don’t cause an allergic reactions in infants, children and chronic patients. The legislative requirements for the product-extemporaneous forms in pharmacies are quite complex, this factor is significant for reducing pharmacies in Ukraine. Nowadays the next substances are periodically absent: acetylsalicylic acid, glutamic acid, gelatin, caffeine sodium benzoate, sodium salicylate, norsulfazol salicylic acid. The medicinal plants are absent too. There is available a small number of who suppliers, making it difficult to provide the substances. We analyzed data of dosage forms, which produced in some pharmacies in Ukraine during 2014 year. We established that pharmacies produce recipes in 5 dosage forms per month. For these drugs used 53 names of substances and excipients. No produced such dosage forms: solutions - 40%, ointments - 25% and potions - 21% less suspensions and powder - 5%. These medicines are effective and popular among the patients in Ukraine. We determined the rate of economic accessibility of extemporaneous medicines by calculating average cost for treatment course per dosage form. In Ukraine extemporaneous medicines were considerable ran medicines for infants and children. We established that many doctors prefer these dosage forms: syrup (42%), mixture (16%), drop (14%), suppositorium (12%), parenteral solution (ointments (4%) . We established that many extemporaneous medicines for children don’t have indd analogues. We can approve that the list of extemporaneous forms in Ukraine is significant complemented by modern specifications physicians for the treatment of asthma, prostatitis, hemorrhoids thyroid and others. An important factor for success is to provide information for doctors prescribin availability production of extemporaneous medicines for supply of chronic patients, pregnant w infants and children.

**Keywords:** Analysis, asthma, children, dosage, extemporaneous medicines, syrup.
The 15th International Congress of the International Society for Ethno-Pharmacology

**Topic (3): Biodiversity & Ecological Aspects of Ethnobotanical Sources**

### 3.1. Taxonomic Authentication of Ethnopharmacology of Important Specie Family Euphorbiaceae on the Basis of Leaf Epidermal Characters

**Afifa Younas, Zubaida Yousaf and Nadia Raiz Qamar**

Molecular taxonomy Lab, Lahore College for Women University.

**Abstract:** Present piece of work conducted to investigate leaf epidermal anatomy ethnopharmacologically important species of family Euphorbiaceae from district Lahore. The study was accompanied in Molecular taxonomy Lab, Lahore College for Women University, Jail road Lahore. Morphology based taxonomic tools were investigated during this document. Leaf epidermal anatomy is considered as one of the effective techniques used for the generation of more authentic taxonomic inform. Important characters identified for the ethnopharmacologically important species of family Euphorbiaceae were, types and shape of cells, cell margins variation, shapes and types of trichomes, silica bodies and stomatal cell shapes and type variation. Pentagonal cells with elongated and smooth margins were prominent in *Euphorbia splendens* Bojer ex Hook and *Jatropha integra* Jacq. The maximum length of long cell ranged from 196.6µm-245.2µm and was found in *Euphorbia helioscopia* L. on adaxial side of leaf epidermis. Presence of silica bodies and trichomes can be taken as more taxonomically important characters of Family Euphorbiaceae. Silica bodies were found on abaxial and adaxial leaf surfaces of *Euphorbia splendens* Bojer ex Hook. And silica bodies were found on leaf surfaces of *Phyllanthus emblica* L. Further data suggested that these epidermal features (stomata, trichome and silica bodies features) are used to delimit the species of family Euphorbiaceae.

**Keywords:** Ethnopharmacology, *Euphorbia helioscopia*, *Euphorbia splendens*, leaf, taxonomic.

### 3.2. Cytotaxonomic Diversity of Some Medicinal Species of Hyacinthaceae from Algeria

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**Abstract:** The Hyacinthaceae family is a large group of attractive petaloid monocots. Within this family some species synthesize specialized metabolites known for their pharmacological usefulness as homoisoflavones, bufadienolides, cardenolides and steroidal glycosides. In Algeria, bulbous plants long been one of the most trusted sources of traditional medicines. For example within the genus *Drimia* (=*Urginea* Steinh.), *D. maritima* (L.) Stearns traditionally used to treat asthma, *D. noctiflora* Batt. and *D. undata* Stearns heal wounds and earaches. *Battandiera amoena* (Batt.) Maire, is recommended for leishmaniasis. In this study, taxonomic and karyological investigations were conducted on four taxa *D. undata*, *D. fugax* and *Battandiera amoena*, the two latter are endemic to North Africa. Analysis were performed on natural populations sampled in contrasted biogeographical areas of Algeria, in coastal hills for *D. fugax* and *D. undata*, and on sand dunes in the Saharan border for *D. noctiflora amoena*. Chromosomes number, karyotype formulas and symmetry index were established for all taxa. Results show that the three species of the genus *Drimia* were diploid with 2n = 20 chromosomes. In *Battandiera amoena* chromosome number is 2n = 2x = 18. Karyotype analyses marked variation in length chromosomes morphology and in the occurrence of sate. Cytotaxonomical data are discussed in relation to the endemism and the biogeographical distribution of species and in the context of the conservation of the biodiversity in Algeria.

**Keywords:** *Drimia*, *Battandiera*, endemism, cytotaxonomy, Algeria.
3.3. Biological and Molecular Effects of Thymol on the Sweet Potato Whitefly Bemisia tabaci

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Abstract: The sweetpotato whitefly Bemisia tabaci is an extremely polyphagous insect pest that inflicts damage on many agricultural crops. This pest is known for its ability to develop high levels of resistance to pesticides and to transmit more than 100 plant viruses. Therefore, the development of environment-friendly control methods is urgently needed. Promising sources for pest control are plant extracts and secondary metabolites that impact insect development. In this study, we tested the effect of thymol, a natural monoterpene derivative found in oil of thyme (Thymus vulgaris), on B. tabaci mortality, development, and its influence on the insect bacterial symbionts and expression of detoxification genes. Mortality and development experiments on the B and Q biotypes of B. tabaci showed that in the range of 1 mg a.i. L−1 and less, applying thymol to filter paper in ventilated chambers caused arrestment of the insect development and mortality rates that reached up to 100% within 24 h. Exposing B. tabaci nymphs and adults to thymol caused fatal effects on its primary bacterial symbiont Portiera and the secondary symbionts Hamiltonella and Rickettsia, and significant disintegration of bacteriosome cells was also observed. The expression of at least 13 P450 monoxygenase genes following exposure to thymol in the B and Q biotypes of B. tabaci is being monitored, and in further will be reported. Altogether, results demonstrate that thymol have significant effects on many aspects of B. tabaci biology and biochemistry, and may be further developed as a compound for controlling B. tabaci and other insect pests.

Keywords: Bemisia tabaci, biological, insect, nymph, thymol, whitefly.

3.4. Indigenous Knowledge of Medicinal Plants Used by the Communities of Mount Hermon, Lebanon

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Abstract: Therapeutic effects and medicinal efficacy of wild herbs are considered important in primary health care of the Lebanese people. Nevertheless, the practice of herbal medicine has been diminishing in Lebanon which may lead to the loss of a wealth of information about valuable healing herbs. Recognised as a key biodiversity area of the Mediterranean Basin and one of the Important Plant Area of Lebanon, Mount Hermon hosts important richness of medicinal plants that has been traditionally used in treatment of ailments throughout the rich successive cultures of the region. Novel knowledge gathered by the present investigation is important in preserving indigenous knowledge of Mount Hermon community revitalizing traditional herbal medicines. Ethnobotanical information was collected by desk review semi-structured interviews with the native communities of surrounding villages of Mount Hermon. The interviews were conducted with informants who have a strong connection with folk medicine activities including traditional practitioners, herbalists and knowledgeable elderly villagers. Collected information covered 150 plant species previously identified as native to the mountain. The plants were recognized by the informants during the in situ field walks or by looking on plant herbarium specimens. In the present study, a total of 119 medicinal plants species belonging to 48 families were reported to be used in treatment of a wide range of different ailments mainly covering fever, coughs, skin diseases, rheumatisms, insects and snake bites, cancer and diabetes. Consensus analysis revealed that gastrointestinal disorders respiratory diseases and diabetes had the highest informant consensus. The traditional knowledge of Mount Hermon surrounding communities incorporates a myriad of diverse flora available locally. The perpetuity of this knowledge through successive generations can be used as an important tool for the conservatio management of the medicinal plants as part of the local cultural heritage. In addition, the findings of this study can be used as the ethnopharmacological basis for future phytochemical and pharmaceutical studies.

Keywords: Cancer, cultural heritage, herbal medicines, mount hermon.
3.5. Synthesis of Ag Nanoparticles from *Foeniculum Vulgare* and *Tecoma Stans* Affected by Extraction Procedure and Chemical Composition

**Carrillo-González, Rogelio, Martínez-Gómez, Miriam, González-Chávez, Carmen**


**Abstract:** Aqueous extracts from *Foeniculum vulgare* and *Tecoma stans* were used for synthesis of nanoparticles (NP) by chemical reduction. Plants species were washed up with distilled water and dr 60 °C in an air-forced oven. The extracts were obtained by water infusing the dried leaves at b temperature and by vapour extraction process in a distillation system. Nanoparticles were synthesized mixing plant extracts with 2, 3 and 5 mM of AgNO₃ solution at 40 and 80 °C. Nanoparticles characterized for size, form, protein content, UV visible and IR spectroscopy. The best temperature infusing the plants was at 80 °C. Several authors have tested long reaction time for synthesis of AgNP hours to days, but increasing temperature it was possible to obtain NP in 20 minutes at 80 °C. ! reduction peak was observed due to the plasmon resonance variation, which was associated with char the solution colour. Variation in the absorbance was observed at 495 and 490 nm for *Foeniculum vs* and *Tecoma stans*, respectively. Protein concentration was higher in the insuling solution of *F. vs* (7.41 mg mL⁻¹) than in the vapour extract (2.96 mg mL⁻¹). Spheres of 72 to 104 nm were synthesized *F. vulgare* infusion and of 39 to 56 nm with vapour extraction method. Protein content was also high the infusion of *T. stans* (4.04 mg mL⁻¹) than in the vapour extraction (2.72 mg mL⁻¹). And the sp diameter ranged 44 to 46 nm and 91 to 367 nm for infusion and vapour extraction, respectively. A s functional groups were involved in the synthesis of nanoparticles: aromatic alcohols (ArOH 3800 cm⁻¹); prim amine (3500-3530 cm⁻¹); carboxylic acids RCO-OH (3400-2800 cm⁻¹); phosphate functional groups (2440-2280 cm⁻¹); alkyl isothiocyanate R-N=C=S (2140-1990 cm⁻¹); oxime group R=C=NOH (1680 cm⁻¹); nitro-saturated compounds N-O (1550-1475 cm⁻¹); alkane C-C (1400 cm⁻¹); amine Ar₂NH (1250 cm⁻¹); ester R-COOR (1050-900 cm⁻¹) and nitro-aromatic compounds 1,3,5 trisubstituted (86. cm⁻¹). Silver nanoparticles synthesized from *Foeniculum vulgare* were smaller than those obtained *Tecoma stans* using infusion at 80 °C and with 2 mM of AgNO₃ at high speed shaking. The procedure plant infusion does not affect the geometrical form of the nanoparticle, but the size does.

**Keywords:** *Foeniculum vulgare*, Nanoparticles, plant infusion, *Tecoma stans*.

3.6. Kew’s Medicinal Plant Names Services

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**Abstract:** There is increasing awareness of the need for Ethnopharmacologists to use accurate plant n and current taxonomies when publishing their research. Rivera et al. reviewed the classes of commonly found in ethnopharmacology literature in 2014. Heinrich and Verpoorte recommend that “essential step, authors [in the Journal of Ethnopharmacology] will have to check the taxonomic valid the plant names using one of the international databases, and preferably www.theplantlist.org.” The 1 Botanic Gardens, Kew, hosts and manages the most important international plant name and taxa databases, including The Plant List (TPL), International Plant Names Index (IPNI) and World Checklist. These essential references for taxonomists are often misinterpreted by others. Aware of this, established the Medicinal Plant Names Services (MPNS) with support from the Wellcome Trust. Med plants were our priority since use of the wrong plant as a medicine has serious consequences ranging ineffective treatments, to morbidity or even death. MPNS (www.kew.org/mpns) has built a new res which, whilst integrated with Kew’s taxonomic references, links those scientific names to the so named employed by other disciplines including common, pharmaceutical and trade names. The N resource currently covers 13,000 plants for which it contains 58,000 non-scientific names linked to 12 scientific names. These include names employed in key medical references such as pharmacopoeia ethnobotanical papers. We are using this resource to offer a variety of novel information services, incl a name validation service, consultancies, training, and also supply controlled vocabularies such as recently adopted by ISO for use by health regulators. Our project website includes a search portal ena users to find names, to resolve nomenclatural confusions and to locate published research or dic resources in which older synonyms may have been used. MPNS looks to extend coverage to include plants relevant to our users, to improve the reliability of the taxonomies presented for those plants a elicit feedback from people working in the field as to how our portal might become more useful. A
Effect of Climate Change on Threatened Medicinal Species In Spain

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Abstract: Climate change will affect in many ways the future behave of wild plants populations. If changes will impact in all kinds of ecosystems and the resilience weakest links of the ecological chains be decisive in maintaining the ecological structure. Many species can be considered such a weakest specially endangered species which are more susceptible to face dramatic effects: local or global change of medicinal species can be an excellent tool to try to minimize the negative effect climate change. Spain is one of the countries from the Mediterranean basin with highest plant diversity effect of the last glaciations in combination with a rugged relief and Euro-Siberian, Mediterranean Macaronesian influences have shaped an extremely rich and diverse flora on a scenario of vegetation heterogeneity. This wealth of plants has played a key role in development of all cultures that have inhabited the territory and set up a long list of useful species to man. Many of them have known medicinal attributes while others remain in poor knowledge even being supposed to be possible sources of active principles. In this communication we analyze the evolution of the Extent of Occurrence of all medicinal plants in Spain in the recent assessment of threatened species in Spain (2013). We generate environmental niche model for each medicinal species and project these results for each decade: 2020 and so on until 2080 considering several climatic scenarios. The analysis of evolution through time of the distribution patterns an identification of areas where more species are expected to disappear should help to point out management guidelines. In a conservation perspective, we should watch over areas where the species converge but in those places where extinction are expected.

Keywords: Climate change, conservation, medicinal species, Spain.

Conservation and Use of Wild Food, Medicinal and Forage Plants of Tajikistan to Address Issues of Sustainable Development

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Abstracts: Currently, the most pressing problem was the provision of the poor mountain areas of vitamins, and medicines. Tajikistan is a mountainous country (93.1% of the territory) and therefore a part of the population is concentrated in the mountainous country. Insufficient power resources, an lack of adequate state control over the collection and sale of food, medicinal plants, and non-systemat of pastures, have now led not only to the mass of forest tree felling of trees and shrubs, but also chaos of a massive collection of wild food, medicinal and flowering plants. Consequently, the forest belt i mountains greatly narrowed, thinned stands of natural landscapes and, if no urgent conservation measures in the near future we will have permanent damage - loss of a very valuable genetic material, especially wild food, medicinal and food plants, including which will narrow endemic many unique, rare, endemic and red-listed species (Hisoriev, 1998, 2007; Hisoriev, Ashurov, 2002; Rahimov, 2007). Rapidly decreasing at present, as the area of medicine species, valuable fruit trees (pistachio, almond, walnut plantations, mulberry, etc.) and grazing land in Tajikistan, especially in mountain areas. Although the history of the study of plant biodiversity of Tajikistan or Pamir-Alai mountains is dated from the late XIX and early centuries, but the status of real resources and food and medicinal plants of the region still remain undetected. Serial studies in recent years botanists and they received a lot of facts indicate that Pamir
mountain of wealth not only food and medicinal plants, but also the number of endemic species is also only in Tajikistan but also in the whole Central Asian region. According to preliminary data, in the P Alai different researchers were about 4,000 species of wild vascular plants, the vast majority of which are edible, medicinal and food plants, and the number of endemic, rare and endangered species are more than 800 species. Among the endangered plant species included in the "Red Book" of the Republic of Tajik (226 species) in the mountainous territory of Pamir-Alai grows 194 species, or 85% of the red species, dozens of which are now on the verge of extinction or critically endangered (CR). In this regard, there is an urgent need to conduct a complete inventory, accurate mapping of endemic, rare and endangered species of edible and medicinal plants of the mountain areas of Tajikistan, and the development of activities and specific scientific actions on their growth, renewal, management and sustainable use. Early studies by the scientists of the Institute of Botany of the RT in Tajikistan found 2200 species of algae, 2,000 species of micro- and macrofungi (mushrooms- Fungi), about 600 species of Lichens, 400 species of deciduous and hepatic plants (Bryophytes) and more than 4,500 species of vascular plants. Among the vascular plants, 675 species (are endemic plants and 226 species (or 5% of the flora) in the Red Book of the Republic of Tajikistan. preliminary studies show that about 4,000 species or nearly 90% of all vascular plants found in the mountainous territory of Tajikistan. The vast majority of which are edible, medicinal and food plants the number of endemic, rare and endangered species are more than 800 species.

Keywords: Conservation, food, forage, medicinal plants, mountain, species, Tajikistan.

3.9. Traditional Medicinal Knowledge in India and Malaysia

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Abstract: Chronic diseases like diabetes, arthritis, rheumatism, asthma can be treated using ointments, infusions and concoctions. In Asia many endemic, native and exotic plant species have been consumed applied for centuries, constituting a repository of knowledge reported in old manuscripts or transmitted to the place of their natural habitat. In this regard, there is an urgent need to conduct complete inventory, accurate mapping of endemic, rare and endangered species of edible and medicinal plants of the mountain areas of Tajikistan, and the development of activities and specific scientific actions on their growth, renewal, management and sustainable use. Early studies by the scientists of the Institute of Botany of the RT in Tajikistan found 2200 species of algae, 2,000 species of micro- and macrofungi (mushrooms- Fungi), about 600 species of Lichens, 400 species of deciduous and hepatic plants (Bryophytes) and more than 4,500 species of vascular plants. Among the vascular plants, 675 species (are endemic plants and 226 species (or 5% of the flora) in the Red Book of the Republic of Tajikistan. preliminary studies show that about 4,000 species or nearly 90% of all vascular plants found in the cou mountainous territory of Tajikistan. The vast majority of which are edible, medicinal and food plants the number of endemic, rare and endangered species are more than 800 species.

Keywords: Conservation, food, forage, medicinal plants, mountain, species, Tajikistan.

3.10. Ecological and Chemical Screening Studies of Zizyphus Lotus Roots in Djan Region

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Abstract: The aim of our work was to study the ecological and chemical screening of root of Zizyphus L.. It is a deciduous shrub in the buckthorn family Rhamnaceae, Commonly known in North Africa as its is. First one, we investigating the climatic and edaphic factors data of stations in Djamaa wilaya of El-

In a second step we made qualitative phytochemical screening study secondary metabolites: ste saponins, glycosides, cardiac glycosides, essential oils, flavonoids, alkaloids and tannins. This qual analysis based on the color reaction. The results show that the roots of Zizyphus lotus. Request Clay soils, profound, substantial fresh, but not wet, Zizyphus lotus is very resilient to drought, since i survive temperatures of -15 ° C to -40 ° C. The phytochemical screening of roots of Zizyphus lotus rev the presence of the group of chemical compounds: glycosides, steroids, cardiac glycosides, sap alkaloids, and tannins.

Keywords: Djamaa, ecological, phytochemical screening, root, Zizyphus lotus L.
3.11. Propagation, Improvement, Preservation and Enhancement of Forest Species in Tunisia

Lamia Hamrouni, Ismail A., Rekya A., Abdelhamid K., Mohamed L., Mohsen H., Abderrahmane R.

Abstract: The forest-pastoral resources in Tunisia spread over an area of 830,737 ha which we add 140,080 ha of rocky land and sand dunes in the domain forest, or approximately one million hectares. How these genetic resources are endangered and the risk of degradation due to various socio-economic and industrial (deforestation, wood industries and paper, ...) as well as environmental and climatic stresses (drought, salinity, erosion, ...) and it is therefore essential, to preserve in order to exploit them efficaciously and sustainably. The conservation and exploitation of these resources must be done in a rational and long term. The objective of this work was to achieve: the conservation of forest species and medicinal plants in vitro and ex vitro techniques. This is to prevent them of degradation and erosion of forest genetic resources but also to maintain the adaptive potential of species or populations in long term. Also, the recovery of forest species and medicinal use and exploitation by their essential oil to identify the bioactive substances of agronomic interest (ie biological herbicides and pesticides) and pharmaceutical (phytotherapy, synthesis of new antibiotics and anticancer drugs ...). The results show that the techniques of in vitro culture improve the rate of propagation of threatened forest species and also allow conservation and solve the problem of genetic conformity. Similarly the use of essential oils and natural resources could contribute economically to solve several problems. The results show that the techniques of in vitro culture significantly improve the rate of propagation of the forest species (Arbustus, argania spinosa, cupresus) and also allow their conservation and solve the problem of genetic conformity. Similarly the use of essential oils and fixed natural resources could contribute economically to solve several problems.

Keywords: Antibacterial activity, Argania spinosa, Cupresus pinus, essential oil, forest species, in vitro.

3.12. Botany as a Linchpin of Ethnobotanical Surveys in Cambodia

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Abstract: The Joint Laboratory of Phytochemistry USS-IRPF of Phnom Penh is a scientific training and research structure dedicated to plant studies and governed by a public-private partnership. It is located in Cambodia, which shows various vegetation types, from lowland evergreen rain forests to mangrove swamps. This large plants reservoir constitutes a source of food, medicines, and income for a population still mainly rural. But still today, available scientific data regarding Cambodian flora remains unavailable. Nevertheless, in-depth knowledge of local plants is a key point for phytochemical studies: incorrect determination is often the source of misunderstandings. Thus, a large ethnobotanical inventory of traditionally used plants has been conducted from 2005 to 2011 in selected Cambodian provinces known for species richness. Today, more than 1250 medicinal or useful plants specimens have been collected and pictured. Thanks to the assistance of botanists from numerous renowned Herbariums (Leiden, Singapore, Edinburgh, Kew...) the collected species have been formally identified and some new species described (Solanum sakhanii Hul, Curculigo fabrei Hul). The research studies performed in the laboratory now rely on trustful data. To make this inventory available to a large audience, the Cambodian Photographic Flora was published in 2013 in which 523 Cambodian medicinal and useful plants are described and illustrated by more than 2000 pictures.

Keywords: Cambodia, flora, medicinal, Solanum sakhanii, survey.
3.13. Medicinal Plants Diversity and Conservation in Northern Pakistan

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Abstract: The research project is confined to resource based areas of Northern Pakistan with emphasis on floristic diversity particularly halophytes, microbes, medicinal plants and their current threats and conservation measures. The prominent regions include lesser and upper Himalayan Range, Northern Areas and Kashmir. The area was selected because it has rich floral diversity and the local communities of the area have empirical observations of nature and by communicating with other people of their culture the indigenous knowledge about local plants. The area was also chosen due to, the variation in ecological zones (Mainly Soil and water conditions), rich diversity of medicinal plants and variation among local communities of folk medicinal uses of Plants. It was reviewed that some endangered species like Taxus wallichiana, Valeriana wallichii, Viola canescense, Pinus gerardiana, Ephedra gerardiana, Fragaria excelsa, Withania coagulena, Salvia aegyptica and Caralluma edulis demand extensive protection care regarding in situ and ex situ conservation. Currently the area faced the threats to floral biodiversity due to habitat destruction, deforestation, loss of indigenous knowledge and modernization in lifestyle. This study provides some practical measures to protect the floral wealth as well as indigenous knowledge for future generations by enriching the herbarium and cultivation of plants through in situ and ex situ strategies in botanical garden.

Keywords: Floral biodiversity, halophyte, medicinal plant, microbe, Pakistan, threat.

3.14. Collection, Cultivation and Used of Wild Species of Onions (Allium) in Medicine in Tajikistan

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Abstracts: The very diverse genus Allium L. shows a nearly exclusive distribution across the northern hemisphere with a main centre of diversity in Southwest and Middle Asia. Since 8000 years, common onion has been probably used by men kind as medicinal drug, spice and vegetable. Currently, rhizomes or t bulbs, extracts of those or green parts of several species like A. stipitatum Regel, A. macrolepii Bak. rosenorum R.M. Fritsch, A. oschaninii O. Fedtsch. are intensively used by the native Asian populations. This tradition has apparently deep historical roots. About 200 different Allium species were reported from mountainous regions of Middle and South-West Asia, and there are more than 100 wild species of Alliaceae family in Tajikistan. In the mountainous regions of Southwest and Central Asia, not only Allium species (A. sativum, A. cepa, A. stipitatum, A. rosenorum, A. giganteum etc.), but also other conspicuously tasting and curative plants are traditionally used by the local population. Also today, wild collected vegetables, spices and medicinal plants play an important role in the daily diet. However, only a few wild growing Alliums were chemically analyzed until now. Reports about aroma precursors, scavenger activity, and uses of Allium species by the native population in Tajikistan were already published. Onion crop species world-wide importance as spice, medicinal, and food plants. They Play an important role in the daily diet all over the world. These plants, the direct ancestors (the primary gene-pool) of both, onion and garlic, remained unknown yet, and breeder programs were only able to use more or less distantly related species (the secondary and tertiary gene pool) as donors of economically important characters like resistance factors. About 115 different onion species are reported for Tajikistan. The use especially tasteful and curative members of this family has a long tradition in several Asian populations with apparently deep historical roots. Traditionally, they play a very important role in the daily diet also in Tajikistan. Here they can be seen in cultivation in every home garden. This holds also true for the territory of Tajikistan where young plants and dry bulbs are offered at every local market-bazars, and are generally also extensively used traditional dishes (as an ingredient of different soups) and as medicinal plants. Besides these two cultivars...
species (common onion- Allium cepa and garlic- A. sativum), also a number of wild species are coll and eaten by the local population but separate references to medical application are rarely given. literature sources mention only that particular species were eaten, emit a characteristic smell like onion garlic, or are used as spice or medicinal plants without presenting further details. This description is diffuse and means that some parts of the plant can be used as vegetable, spice, or herbal drug. A differentiation between true vegetable plants and spicy vegetables is rarely given. However, only wild growing in Tajikistan Alliums were chemically analyzed until now. It is quite reasonable for wide using of the onions we should: to preserve their natural resources; to learn more deeply about resources of wild onions ( Allium species) in another Asian climatic zones and countries; to enrich dat of documentation, information and plant herbarium by collecting expeditions (in situ); to learn how to conserve the germplasm (ex situ) for uses of some medicine plants; to learn the methods for bioche analysis and making plant cellular culture (ex situ).

Keywords: Allium species, collection, cultivation, diet, onion, Tajikistan.

3.15. Cryopreservation of the Endangered Wild Arum (Arum Palaestinum) Call Encapsulation-Vitrification and Encapsulation-Dehydration

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Abstract: Arum palaestinum is a wild medicinal tuberous plant possesses a wide range of med components. Its populations are subjected to over exploitation and extinction totally from the Cryopreservation by encapsulation- dehydration and encapsulation- vitrification techniques were used study long-term conservation of the in vitro grown arum calli. Callus fragments were encapsulated in calcium alginate beads containing hormone-free MS (Murashige & Skoog) medium. In encapsulation, the highest survival 90% and regrowth 78% were obtained for 10 minutes dehydration PV82 after cryopreservation with liquid nitrogen for Arum palaestinum calli. While for encapsulation dehydration, the highest survival (70%) and regrowth (65%) rates were achieved when calluses of palaestinum were pretreated with 0.1 M sucrose for 1 day after 1 hour of dehydration. The viable Arum calli decreased with increased dehydration period. This results indicate that we can used cryopreservation methods to conserve Arum valuable genetic resources.

Keywords: Arum palaestinum, calli, cryopreservation, encapsulation, Jordan, vitrification.

3.16. The Middle Eastern Medicinal Plant Project (Memp): Preserving Knowned Conserving Species, Re-Introducing Extinct Flora & Developing New Medicines

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Abstract: The present study was conducted to construct an ethno-botanical data-base of Israeli domesticating medicinal and other important economic Middle-Eastern flora, evaluating selected plan activity using focused screening and reintroducing extinct species through germination experiment ethno-botanical database constructed from an archival collection of local medicinal plant us conjunction with other historical source material was used to select species for focused screening. I were derived from a domestication program at Kibbutz Ketura and from wild sources. Ancient obtained from archaeological sites were used in germination experiments with radiocarbon dating of fragments. Results From 1995, 500 local species were added to the database and over 200 plants, s and trees domesticated at the experimental cultivation site including rare/ endangered species. Bas
historical use screening of some 200 plants demonstrated significant activity in selected species against cancer, Alzheimer’s and viral, bacterial and fungal infections (human and veterinary). Growth of a year old date seed enabled re-introduction of the ancient Judean date palm extinct for a 1000 year preserving traditional knowledge, domesticating selected species and focused screening. MEMP provi valuable tool for conservation and the development of potentially important economic species, medicine, veterinary and agricultural purposes.

Keywords: Ancient seeds, ethnobotanical data-base, infection, medicinal, plant flora, species, wild.

3.17. Molecular Characterization of Pomegranate (Punica granatum L.) Genot Using Rapid Markers in Al shoubak Region

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Abstract: Al Shoubak region, located in Southern Jordan, is one of the most important centers of div in pomegranate in Jordan. In this study, we attempted to characterize 32 promising pomegranate geno originating from Al Shoubak region using RAPD markers. Fourteen RAPD primers were used, genera total of 57 fragments, 39 of which were polymorphic (68.4%). While polymorphism information con ranged from 0.37 to 0.837 with an average of 0.764. UPGMA clustering of the genotypes showed major groups. Most of the fruit characteristics of the genotypes within the same group were var Therefore, the results showed that molecular characterization is necessary to get reliable relation among pomegranate genotypes and RAPD markers can be used effectively in pomegranate.

Keywords: Genetic diversity, pomegranate, RAPD.

3.18. Cryopreservation by Vitrification of Arum (Arum palaestinum) Calli

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Abstract: In this study Arum palaestinum (Al- Loof) as commonly named in Jordan was conserved vitrification method. Arum is a very important medicinal plant that found in Jordan and subjected endangered. Vitrification is an effective freeze-avoidance mechanism used in long term storage. Arum were loaded in 0.4 M sucrose and 2 M glycerol for 20 min followed by desiccation with diff combinations and concentrations of plant vitrification solution (PVS2), before immersion in L Nitrogen (LN). A total of 100% of the cryopreserved vitrified calli survived when desiccat concentrated PVS2 solution for 20 min. Furthermore, about 75% of the cryopreserved vitrified calli regrown after 20 min of desiccation by one step in Plant Vitrification Solution (PVS2). This method easy to handle and produced a high levels of calli regrowth.

Keywords: Arum palaestinum, calli, cryopreservation, Jordan, vitrification.

3.19. Self-Renewal Capacity of Several Species of the Genus Sternbergia Posses Medicinal Properties

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Abstract: The present work deals with three relic species of the genus Sternbergia, distributed i Caucasus - Sternbergia lutea (L.) Ker Gawl. ex Spreng, Sternbergia fischeriana (Herb) Roem Sternbergia colchiciflora Waldst. & Kit.. All listed species possess valuable medicinal properties and protection status. Their bulbs (especially those of S. fischeriana) contain high amounts of the alkal lycorine, used for the treatment of opthalmic diseases (Proskurina and Ismailov, 1953; Pretkov, 1 Seed forming capacity of three Sternbergia species was studied. For S. lutea and S. fischeriana the
material, transplanted to the collection plot of the Department of Plant Conservation of the Natbotanical Garden of Georgia (NBGG) from Azerbaijan (Talysh) was used. Studies of S. colchiciflora carried out on plants, both growing on the collection plot of the NBGG and those growing in the wild (at 12.6°C; mean minimum temperature in January –0.5°C, absolute minimum –18°C; mean annual precipitation 518 mm. Summer and winter moderately dry. Blooming in studied species S. lutea and S. fischeriana in spring proceeds but do not produce seeds neither in conditions of open pollination, nor as a result of intraspecific artificial pollination. Both species are infertile in Azerbaijan as well (Kapinos, 1968). During 5 years more than flowers were artificially pollinated and no fruit-set was registered. Only single facts of bicollic embryonic embryo from the zygote were described in the process of these experiments. Only once a fruit, with two well developed seeds has been found in S. lutea as a result of open pollination, but we to germinate it. In S. lutea 14-32 ovules are set and 42-50 - in S. fischeriana. The processes of microsporogenesis (formation of microspore and megaspore mother cell) proceed simultaneously in species (in September). Meiosis - formation of microspore takes place under the ground, in the bulb. The grain in the flower emerging on the ground surface is in mononuclear stage. At this moment embryos are not formed yet in either of these two species. Some disturbances are observed in the procc microsporogenesis. Mature pollen is bicollic, elliptical, monoporous. It looks as fertile when stained acetocarmine. Fertility rate is 76-78% for S. lutea and 44-46% for S. fischeriana. On artificial medium 15 % saccharose germination rate of mature pollen is quite low – 14-20% for S. lutea and 10-15% fischeriana. Germination rate of pollen grains, occurring on stigma as a result of artificial pollination is 2-3%. Protrandry is strictly manifested in the studied species, which along with other reasons, unkn far, favours the infertility of the species. The picture is different in case of S. colchiciflora, y resembles S. lutea, though its plants are smaller, than those of S. lutea, and flowering also takes place in autumn. Great part of flowers do not emerge on the ground surface. Formation of generative structure pollination, produces only sporophylls and stomata are situated on the surface. Our research has shown that the species distributed in the Caucasus region S. lutea and S. fischeriana completely infertile species and propagate vegetatively by bulblets, while S. colchiciflora propagat seeds.

**Keywords:** Capacity, germination, medicinal, ovule, pollination, sporogenesis, Sternbergia.

### 3.20. Evaluation of Metal and Mineral Contents in Soils Amended By Sewage Sludge

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*Development Laboratory and exploiting resources Phytogénéques- Faculty of Biology, University Constantine 1.*

**Abstract:** The cork oak is a remarkable tree species that has a high economic value, thanks physiological peculiarity that distinguishes it from other wood. The present work aims to ex opportunities to improve the choice of growing media based sludge to make it better nutrition of mini and trace elements plants to assess the level of contamination by heavy metals (lead, copper, ...) biometric parameters of the meristem growth, aerial and underground biomass are the main criterion for standardization of plants. Seven types of growing media are tested for raising seedlings. The determiner of heavy metals was carried out on the various substrates before sowing and after 18 months. The n show morphogenetic differences for the seven substrates, particularly for sludge with pine bark mixtur olive pomace and high levels of NPK and heavy metals especially for substrates amended by sludge high levels of heavy metals induce large soil pollution that may be used as bio-indicator of too demonstrating the sensitivity of the case. The results obtained show contents NPK further lower the le four substrates, but that do not exhibit adverse effects on the development of standards. The high’s plants based substrates ie substrates S1 and S2 (<25% sludge) have levels of heavy metals in compl with the standard Osol, so we can recommend these substrates, substrates against S3 (45% sludge) at (65% sludge) have especially high levels of lead and copper thereby affecting the growth parameters. 5 can say that these are unfavorable substrates for growth and that the species is sensitive vis-à-vis concentrations of sludge. Finally sewage sludge have qualities and ideal characteristics for a recovery forest areas but requires a good study for the future of these heavy metals in plant tissues and i ecosystem.

**Keywords:** Cork oak, growing media, metal toxicity, sludge, soil.
Abstract: Since prehistoric times, plants have been the basis for prevention and therapy by almost known culture and remain an untapped health resource for millions of world population still in the century. In many Arabic countries, including Jordan, the use of plant based preparations is a cor practice by patients suffering from chronic diseases as well as by patients in the management of chronic diseases, cancer is the second most frequent cause of death in Jordan. hydrodistilled volatile oils of the tested Salvia and Origanum species were analyzed by GC-MS. In enzymatic starch digestion was evaluated with Acarbose as the reference drug. Pancreatic lipase cat activity was determined colorimetrically and compared to Orlistat. Antiproliferative activities investigated using SRB assay against breast cancer (MCF7, T47D, ZR-75-1 and BT474 colorectal cell lines. As positive control Doxorubicin and Cisplatin were used. The antiangiogenic ac was evaluated using rat aortic ring assay. Results of the phytochemical and biological investigations the selected Salvia and Origanum species indicated that several Salvia species are dual inhibitors of amylase and alpha glucosidase and possess pancreatic lipase inhibitory potential. S. triloba found highly active antiangiogenic plant, while other Salvia species (S. dominica, S. fruticosa and S. syriaca) exhibited antiproliferative activities. The screening of the widely used indigenous plants different biological activities is essential for the justification of their traditional uses and for inspiration new drug discovery and development. Additionally they might present a new alternative source for poisonous bioactive substances.

Keywords: Aromatic plant, chronic diseases, diabetes, Jordan flora, lamiaceae, traditional medicine.

Arab-European Intercultural Ethno Pharmacology

Invited Speaker Prof. Dr. M. Hmamouchi
President of the Arab Federation of Medicinal and Aromatic Plants, Prof. faculty of Medicine and Pharmacy, Rabat, Morocco.

Abstract: In Arab and European countries, 50% - 80% of population relies on medicinal plants to their health care and food requirements. Apart from empirically learned medicinal and pharmacological properties, the selection of medicinal plants is dependent on cognitive features, ecological factor cultural history. So, it important to visualize how field based studies in ethno botany and pharmacology run the risk of repeating information and knowledge and illustrate the important differentiating and acknowledging the origin, transmission and rationale of plant use made by human all kind of useful products and enjoyed the food, medicaments, flavors, fragrances, colors, insecticides. There is also a crucial need to understand how these plants are used and when and how consumption phenomena change over time and place around the Arab and European countries. The sce our on-going presentation is to contribute to a scientifically based picture of ethno pharmacology focusing on a few case studies by our laboratory, using an interdisciplinary approach, to study knowledge systems and find innovative ways of infusing them to the Arab region. Following a historical overview, the presentation analyses sources, pointed out the importance of gathered different for Arab and European people, and inventoried the flora of this space with mention of the heath, foo other traditional use of wild plants as part of adopted use categories. The work integrates elements ra.
from ecological examinations of the methods applied in the collections and study of plants, their
sociological studies of local benefits and the production of discourses, to studies of the legal frame
For example the ethno botanical and ethno pharmacological surveys conducting different areas con
with gathering information on all the native plants of the Mediterranean region that are useful
identified of uses, native and naturalized plants of the Mediterranean Region, according to their
noting the parts used, preparation ways, relevant aspects plant nomenclature, chemistry, habitat descrip
tion, conservation, including references to literature sources and potential utilizations. Other example
Circum- Arab and European cultural heritage and medicinal plant uses in traditional health care rea
and the identification of native and naturalized plants of the Mediterranean Region, used as Food,
additives, Animal food, Bee plants, Invertebrate foods, Materials, Fuels, Social Uses, Vertebrate Po
Non-Vertebrate Poisons, Medicines, Environmental Uses, Gene sources are presented. A compa
the field survey was conducted on remedies used in traditional healthcare in Mediterranean areas. The countries involved in these studies are Algeria; Tunisia; Egypt; Lebanon; Syria; Pale
Albania; Romagna, Italy; French; Portugal Spain; Malta; Greece; Cyprus; England; Nederland; Ts
Israel; and Morocco.

Keywords: Ethno- botanical, knowledge, medical pluralism, medicinal plants, pharmacological, veter

Arab-European Intercultural Ethnopharmacology

**Invited Speaker Prof. Dr. Bauer Rudolf**

Bauer Rudolf1, Abdel Motaal A.2, Albulescu R.3, Tanase C.4 and Vassapollo G.5

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**Abstract:** European medicine and culture has been influenced from the Middle East since early tim
particular Ibn Sina (Avicenna, 980–1037) contributed a lot to the development of medicine in Europe
now even, there are a lot of Arabian plants from which Western healthcare could benefit. Currently,
250 plant species are still in use in Arab traditional medicine for the treatment of various diseases.
From the early past, it is important to bring European and Arab scientists together for doing joint re
The European FP7 Marie Curie Action “Natural anti-diabetic & anti-hypertensive drugs” (NA
conducted research on anti-diabetic and antihypertensive plants: The fruits of Solanum distichum
SCHUMACH. (Fig. 1) and Balanites aegyptiaca (L.) DELILE (“Egyptian dates”) have been used ancient times as antihypertensive and anti-diabetic agents, respectively, in folk medicine. The project
involved partners from University of Graz (UnGraz), Austria, The National Institute for Chemical-
Research and Development (ICCF), Romania, University of Salento (UnSalento), Victor Babes National Institute of Pathology (IVB), Romania, and SEKEM Development Foundation (SDF), Egypt. The goal was to develop safe and effective anti-hypertensive and anti-diabetic prepara
The NAAN project succeeded to define the most active fractions of the two plant extracts, to isolate
bioactive compounds from these active fractions, as well as to determine their mechanisms of action as
hypertensive and anti-diabetic agents. Five triterpenoidal saponins were isolated for the first time
Balanites aegyptiaca fruit. The isolated compounds were identified as: compound 1, 26-O glucopyranosyl-(25R)-furost-5-ene-3,22,26-triol 3-O-[α-L-rhamnopyranosyl(1→3)-β-D-glucopyranar
(1→2)-α-L-rhamnopyranosyl(1→4)]-β-D-glucopyranoside; compound 2, 26-O-β-D-glucopyranar
(25R)-furost-5-ene-3,22,26-triol 3-O-[β-D-glucopyranosyl(1→2)-α-L-rhamnopyranosyl(1→4)]
glucopyranoside; compound 3, 26-O-β-D-glucopyranosyl-(25R)-furost-5,20-diene-3,22,26-triol 3-O-
-rhamnopyranosyl(1→3)-β-D-glucopyranosyl-(1→2)-α-L-rhamnopyranosyl-(1→4)]
glucopyranoside; compound 4, 26-O-β-D-glucopyranosyl-(25S)-furost-5,20-diene-3,22,26-triol 3-O-
-glucopyranosyl(1→2)-α-L-rhamnopyranosyl(1→4)]β-D-glucopyranoside; compound 5, 26-O
glucopyranosyl-(25R)-furost-5,20-diene-3,22,26-triol 3-O-[β-D-glucopyranosyl(1→2)-
rhamnopyranosyl-(1→4)]β-D-glucopyranoside, by spectroscopical analysis [MS, 1D and 2D NMR (H
HMBC, D2Q-COSY, HSQC-TOCSY)]. Extracts and fractions from S. distichum were subject to in
studies in order to identify the anti-hypertensive fractions. The assessment evaluated the modulatory
secretory cytokines, and the inhibition of serum angiotensin converting enzyme. Cytotoxicity was ass
in vitro on Huvec cells and in total blood, with MTS assay as end-point. One isolated compounds disp
50% of the activity of ramipril, while some of the fractions displayed 12-15% of ramipril act
Considering the perspective of long-term administration, the natural extract may prove a viable alterna
to synthetic drugs, due to the lack of adverse effects .

Acknowledgement: This work was carried out in frame of the FP7 Marie Curie Action, PIRSES-GA-230816, which is gratefully acknowledged.

Keywords: Antidiabetic, anti-hypertensive, Arab, European medicine, triterpenoidal saponins.
4.1. Traditional medicine in Algeria: Benefits and Safety Case of Ecballium elaterium

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Abstract: Herbal medicine plays an important role among the disciplines of mediations used in society, however; the danger of its use; often underestimated represent real health problems. This aimed to assess the extent of use and the general knowledge of the benefits and safety of (Ecballium elaterium). An ethnobotanical survey was conducted in five wilaya of Algeria (Tébessa, Khencela, El Bouaghi, Constantine and Algiers; during year of 2014 with 50 herbalists through the question were established to collect information on the use; benefits and adverse effects of this herbal herbalists questioned have different sex: 43 men and 07 women; 48% of them have experience over 20 years. The fruit of this plant is recommended to treat hepatitis, diabetes. The toxicity of the plant is declared important by 62% of herbalists (hepatotoxicity, digestive disorders, internal bleeding. There is need to more strict measures to control the use of herbal medicinal in Algeria otherwise the patients prefer herbal medicinal are not safe. It may be necessary to evaluate the safety, efficacy and quality of t medicines through randomised clinical trial studies. Public enlightenment programme about safe u herbal medicines may be necessary as a means of minimizing the potential adverse effects.

Keywords: Ecballium elaterium, ethnobotanical survey, herbal medicine, hepatotoxicity, traditional.

4.2. Cytotoxic and Cytostatic Activity of Asparagus aphyllus, Crataegus aronia Ephedra alata in Hepatocytes and Thp-1-Derived Macrophages in Mono-Co-Cultures In Vitro

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Abstract: Based on knowledge from traditional Greco-Arab herbal medicine, this in vitro study aimed to evaluate cytotoxic and cytostatic effects of three traditionally used anti-diabetic and anti-cancer medic plants in human THP-1-derived macrophages, HepG2 cells and their co-cultures using MTT assay; LDH assay. Cells were treated for 24h (cytotoxic effects) and 72h (cytostatic effects) with increasing concentrations (0-1000 µg/ml) of water extracts from Asparagus aphyllus (AA-extract), Crataegus a (CA-extract), and Ephedra alata (EA-extract). No significant cytotoxic effects were seen with the extract three extracts up to concentration of 500 µg/ml. A slight cytotoxic effect was observed with extract in HepG2 monocultures at concentrations higher than 500 µg/ml. Significant cytostatic effects measured with CA-extract and EA-extract in monocultures and co-cultures. The cytostatic activity of extracts was more potent in co-cultures reaching IC50 of 178 µg/ml and 380 µg/ml for CA-extrac EA-extract, respectively. These results indicate that the traditionally known anti-cancer effects of extract and EA-extract might be mediated in part through cytostatic effects.

Keywords: Asparagus aphyllus, Crataegus aronia, cytotoxic, cytostatic, Ephedra alata.

4.3. Ethnopharmacological Study of Some Saharan Plants in the Region of the South of Algeria

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Abstract: Medicinal plants are important elements of worldwide indigenous medicinal systems. traditional medicine is a significant element in the cultural heritage remains the primary remedy for a majority of people in the South West Algeria. Ethnopharmacology took place in the frame of a general medical study and was performs in different regions of the South West of Algeria. Pharmacologists
and clinical studies of some Saharan medicinal plants and their natural products are the aim of this work. Different parts (leaves, stems, fruits, bark, aerial part and latex), and different preparations were identified. Some parts are frequently used in the treatment of several diseases. These plants are used alone or in combination. Some recipes are specific to one disease, for against, others can treat many diseases.

Keywords: Ethnopharmacology, medicinal plants, south west of Algeria, traditional medicine.

4.4. Ethnopharmacological Study and Evaluation of the Antioxidant Activity of Artemisia herba alba Asso.

Benabdallah Hassiba and Mokhtari Hakima

Department of Microbiology and Biochemistry, Faculty of Sciences, University Mohamed Boudiaf M'sila, Algeria.

Abstract: Artemisia herba alba Asso, commonly known as «Chih» is a plant used since antiquity in Algerian and African traditional medicine. In this study, a survey based on direct questions on the use of Artemisia herba alba Asso in traditional medicine is carried out in the region of M'sila. In this survey, 37 properties of Artemisia herba alba Asso have been identified. These properties vary from one herbalist to another; the most dominant are stomachic (70.45%) and antidiabetic activity (63.63%). The decoction is the most responded manual of Artemisia herba alba Asso followed by infusion. The phytochemical screening revealed that this plant contains polyphenols, flavonoids, polyphenolic derivatives, saponins, anthocyanins, organic acids, tannins and essential oils. The quantitative estimation of polyphenols and flavonoids showed that the extract of maceration with methanol is the richest in polyphenols (1681.43 ± 35.71 mg gallic acid equivalent/ml) followed by the extract of decoction (polyphenols: 1042.86 ± 37.14 mg/ml; flavonoids: 333.32 ± 25.17 mg/ml). The antioxidant activity is evaluated with DPPH assay using quercetin and ascorbic acid as standards. The extract of maceration with methanol possesses an antioxidant activity with an IC_{50} of 20.83 μg/ml. In contrast, quercetin and ascorbic acid are characterized by an IC_{50} that are higher than the extract of Artemisia herba alba Asso (quercetin: 42.47 ± 1.26 μg/ml; ascorbic acid: 56.95 ± 2.91 μg/ml).

Keywords: Antioxidant activity, Artemisia herba alba, ascorbic acid, flavonoids, quercetin.

4.5. Traditional Medicinal Uses of Urtica Dioica in the Hodna Region of the South East of Algeria

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2Laboratory of Applied Biochemistry, Faculty of Natural and Life Sciences, University of Setif 1, Setif 19000, Algeria.

Abstract: An ethnobotanical survey was carried out on the territory of Hodna region province of M'sila (South East of Algeria) to collect information on the medicinal uses of Urtica dioica L. Information presented in this paper was gathered from the informant using an integrated approach of group discussion and direct interviews with questionnaires in the year of 2013. Information was collected besides herbalist, healers and the people using the medicinal plants. The parts used, modes of preparation and routes of administration are reported and discussed in this paper. This study showed that leaves (33%) and roots (25%) were the most frequently parts of the plant used in traditional medicine. The most remedies prepared by decoction (28%) and infusion (22%). As a result, we observed that Urtica dioica L. was recommended by the majority of informants as being "beneficial for all ailments". The most frequently reported medicinal uses were for treating inflammatory diseases, allergy and blood circulatory disorders.

Keywords: Algeria, infusion, leaves, roots, tradition medicine, Urtica dioica.
4.6. Pomegranate and Brain Health

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Abstract: Increasing number of evidences clearly demonstrated the efficacy of polyphenolic antioxidants from natural products, vegetables and fruits might be able to reduce or to block neuronal death during various neuro-pathological conditions such as Alzheimer’s disease, hypoxia, Parkinson’s disease etc. Recently, consumption of pomegranate fruits has been well demonstrated to attenuate neuro degenerative processes of brain due to the presence of various active components. Pomegranate characteristically high content of antioxidant substances, which are present in all parts of the fruit; flower juice & pericarp. Free radicals such as a reactive oxygen species (ROS), reactive nitrogen species (NOS), super oxide (O2-), hydrogen peroxide (H2O2), hydroxyl radicals (OH) and nitric oxide (NO) can be scavenged effectively by pomegranate juice and leaves extracts. The antioxidant nature of the fruit is considered to be higher and more than any other fruits. Oxidized LDL production in vitro can be inhibited by pomegranate juice both in vitro and in vivo as well as effectively decreased the oxidized LDL (oxLDL) production. Pomegranate has a wide range of therapeutic benefits; most research has focused on its antioxidant anti-inflammatory properties. Pomegranate juice and seed extracts antioxidant capacity have 2-3 times higher than red wine or green tea as seen in vitro assays. Pomegranate extracts are able to scavenge free radicals and decrease macrophage oxidative stress and lipid peroxidation in animals, while plasma antioxidant capacity increased in elderly. In mouse peritoneal macrophages (MPM), about 19% reduction in oxidative stress, 42% decrease in cellular lipid peroxidation content, and 53% increase in reduced glutathione levels were confirmed by antioxidant properties of pomegranate byproducts (PPB) extract made from whole pomegranate juice (PJP) and cold pressed seed oil (CPSO) extracts are superior to red wine and similar to green tea extract. In human research, juice from pomegranate pulp (PPJ) has superior antioxidant capacity to apple juice. Guo et al found that pericarp antioxidant capacity increased from 1.33 mmol to 1.46 mmol in healthy elderly subjects who consumed 250 ml (PPJ) daily for four weeks, while no significant increase in antioxidant capacity was observed in subjects consuming apple juice. In addition, plasma carbonyl content (a biomarker for oxidant/antioxidant balance) in inflammatory diseases) was significantly decreased in subjects consuming pomegranate juice compared with subjects taking only apple juice. A synergistic positive relationship was found between pomegranate phenolic compounds and total antioxidant capacity, indicating that phenolics are dominant antioxidant components of pomegranate. Almost all parts of pomegranate contain tannins which consider an exceptional type of antioxidant that contains both galloyl groups and hexahydroxydiphenoyl-glu groups. Oxidative activity of tannins in pomegranate is due to availability of Ellagic acid and Punicalagin. Ellagic acid reacts with free radical due to its ability to chelate with metal ions, and is considered being a antioxidant versus lipid peroxidation in mitochondria & microsome. Flavonoids also have an eliciting effect of free radical which enhance pomegranate antioxidant activity. Anti-oxidative activity of pomegranate flavonoids is evidenced by enzyme activities such as Catalase, SOD, glutathione peroxidase, and glutathione reductase. Markable glutathione concentration in the tissues of rats, orally administered total pomegranate flavonoids.

Keywords: Brain, catalase, flavonoids, glutathione, health, pomegranate.
identified and their vernacular Tamahaq and Arabic names, their distribution, the parts used, the mode of preparation and routes of administration reported in our preceding papers. The present study was aimed to evaluate the biological activities of *Ammodaucus leucotrichus* C. et D., *Cymbopogon schoenanthus* Spreng., and *Matricaria pubescens* (Desf.) Schultz. *A. leucotrichus* is an endemic Saharan species, whose local names are “Akaman” (Tamahaq) and “Oum draiga” (Arabic). *C. schoenanthus* is a tropical Asiatic species called “Tiberimt” (Tamahaq) and “Lemmad” (Arabic). *M. pubescens* is a North-American endemic species, whose local names are “Aynasnis” (Tamahaq) and “Ouazouza or Guertoufa” (Arabic). Nine extracts (dichloromethane, methanol, water) of three plants: *Ammodaucus leucotrichus* C. (Apiaceae), *Cymbopogon schoenanthus* (L.) Spreng. (Poaceae), *Matricaria pubescens* (Desf.) Sc (Asteraceae) collected in the Algerian Sahara were screened for antibacterial, antifungal, cytotoxic activity as well as inhibitory activity towards two key enzymes PLA and elastase.

**Keywords:** *Ammodaucus leucotrichus*, *Cymbopogon schoenanthus*, *Matricaria*.

4.8. ETHNO-BOTANICAL INVESTIGATION OF MEDICINAL PLANTS USED IN THE WESTERN REGION OF ALGERIA

**Hammadi K., W.B. Kouadri and I.A. Boukhalfa**

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**Abstract:** Since ancient times plants have been indispensable sources of both preventive and curative treatments. In Algeria, plant remedies are still the most important and sometimes the only sources of therapeutics for nearly 50% of human and more than 70% in rural population. Therapeutic uses of the same plant species for humans and animals have also been compared. The identification of plant species traditionally from the local flora could be potentially useful for the isolation of natural extracts of phytotherapeutic interest to increase a resistance to the antibiotics. An ethnobotanical study of medicinal plants was carried out in the region of Algeria. It was made in order to establish a catalog of medicinal plants and gather information about the therapeutic uses practiced by the local population in the study area. Using survey techniques, ethnobotanical field were introduced at this study. The results have identified 39 medicinal plants used in the west region of Algeria. This work showed that the leaves and seeds are the most used parts and the remedies is prepared as is brewing. In terms of the treated diseases, digestive disorders rank first with a rate of 42.5%, followed by skin diseases (17.5%), rheumatism (10.0%) and face care (5.0%). Our results are the first results of a very valuable source of information in our study area as well as their pharmaceutical products used at this region of Algeria. They could be a database for future research in a phytochemical pharmacognosy studies.

**Keywords:** Ethnobotanic, Medicinal plants, Pharmacology products, Survey.

4.9. A COMPARATIVE SCREENING OF CHEMICAL COMPOSITION AND BIOLOGICAL ACTIVITY OF *ACHILLEA* SPECIES GROWN IN JORDAN

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**Abstract:** The use of herbal medicine in Jordan is very common. In Jordanian folk medicine, *Achillea* species are used as herbal remedies against fever, common cold, for digestive complaints, as haemostatic agents, and topically for slow-healing wounds and skin inflammations. Four *Achillea* species are commonly used in Jordan and are among the most commonly reported plants to be used in traditional medicine with a common name of “Quaysoom” or “Qisum”. In our study, the tested *Achillea* species showed different chemical composition and antioxidant activities for their aqueous and alcoholic extracts and fractions. They also exhibited variation in biological activities when tested for antiplatelet, antimicrobial, and antiproliferative activities. Our findings reveal the fact that plant species used in the traditional medicine should be identified and screened scientifically before recommending them for therapeutic uses.

**Keywords:** *Achillea* species, Biological Activities, Chemical Composition, Screening.
4.10. Traditional Use and Antimicrobial Effect of *Thymus ciliatus* (Desf) Benth. Growing Wild in Bou Saâda (Algeria)

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Abstract: This work aims to study the therapeutic use of medicinal plants in the region of the Hodna and in particular the species *Thymus ciliatus* (Desf.) Benth. Most of these plants are used against diseases of digestive system, respiratory, bone, circulatory, urinary, skin disorders and cancer. The infusion is the common mode of preparation, followed by decoction. Local use of *Thymus ciliatus* concerns digestive, respiratory and circulatory systems. Thyme essential oil was obtained by steam distillation carried out on a sample collected from Bou Saâda region (M’sila). Its effect on fungal and bacterial strains was tested. The evaluation of the antimicrobial activity showed the growth inhibition of bacteria and to most of the tested strains. They do not have a similar sensitivity towards the essential oil. The antifungal and antibacterial activity can be attributed to some chemical components of the essential oil.

Keywords: Antimicrobial activity, ethnobotany, essential oil, medicinal plants, *Thymus ciliatus*.

4.11. Desert Truffles of The Algerian Sahara Desert: Their Economic Importance and Their Valorization in Traditional Pharmacopoeia

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Abstract: This study aims to study the therapeutic use of medicinal plants in the region of the Hodna and in particular the species *Thymus ciliatus* (Desf.) Benth. Thyme essential oil was obtained by steam distillation carried out on a sample collected from Bou Saâda region (M’sila). Its effect on fungal and bacterial strains was tested. The evaluation of the antimicrobial activity showed the growth inhibition of bacteria and to most of the tested strains. They do not have a similar sensitivity towards the essential oil. The antifungal and antibacterial activity can be attributed to some chemical components of the essential oil.

Keywords: Antimicrobial activity, ethnobotany, essential oil, medicinal plants, *Thymus ciliatus*.

4.12. Ethnopharmacological Study of Some Saharan Plants in the Region of the South West of Algeria

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Abstract: Medicinal plants are important element of worldwide indigenous medicinal systems. Traditional medicine is a significant element in the cultural heritage remains the primary remedy for a majority of people in the South West of Algeria. Ethnopharmacological took place in the frame of a general medical interview and was performed in different regions of the South West of Algeria. Pharmacolog...
and clinical studies of some Saharan medicinal plants and their natural products are the aim of this study. Different parts (leaves, stems, fruits, bark, areal part and latex), and different preparations were identified. In this study we found that some parts are frequently used in the treatment of several diseases. However, these plants are used alone or in combination, and some recipes are specific to one disease, while others can treat many diseases.

Keywords: Algeria, ethnopharmacological, medicinal plants, traditional medicine.

4.13. Ethnopharmacological, Ethnobotanical Studies and Traditional Uses of *Fraxinus Dimorpha* at the High Atlas of Morocco

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**Abstract:** The aim of this work articulates around two axes. The first one deals with the various uses of *Fraxinus dimorpha* Coss&Dur at the high Atlas, and the second one studies the place of these species in the Moroccan traditional pharmacopoeia. First of all, we realized a survey on the practices of the various parts of the tree in the zone of Ait Mhamed (central High Atlas), the city of Azilal. Another investigation was realized with the herbalists of Marrakesh concerning the traditional Moroccan pharmacopoeia abou this species and its therapeutic use, the used piece, their mode of preparation, the posology, the mom administration of remedies as well as the origin and the price of the drug of vegetables. Our results show that the *Fraxinus dimorpha*, in its zone of extension, plays a very important ecological and socioeconomic role and that it is very required for these diverse uses. Fruits of the tree are widely used in the Moroccan traditional medicine. They constitute an inescapable ingredient of remedies, preparations and spices against the cold and for the increase of the sexual appetite, the most popular ingredients are *Ras el ha Mskhben and Maujou*. Therefore, the marketing of girdles constitutes an important source of revenue for local populations.

Keywords: Herbalists, high Atlas, *Fraxinus dimorpha*, Morocco, traditional pharmacopoeia.

4.14. Ethnobotanical Survey of Medicinal Plants from Bechar region, Southwest Algeria

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**Abstract:** The presented work reports on 107 medicinal plants, traditionally used in Bechar region, southwest Algeria. The information has been documented by interviewing traditional herbalists and various elderly men and women following different ethnobotanical methods. Ethnobotanical data was arranged alphabetically by botanical name, followed by family name, vernacular name, and part used. This study represents significant ethnobotanical information on medical plants used extensively in Bechar for treating various diseases and provides baseline data for future pharmacological and phytochemical studies.

Keywords: Bechar region, ethnobotanical survey, medicinal plants, southwest Algeria.

4.15. *Ruta* and *Peganum* - Classification Issues in Ancient Medicine

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**Abstract:** Both rue (*Ruta* L.) and harmel (*Peganum* L.) have been known for their medicinal qualities since ancient times. Their study in the medieval Arabic and Latin sources is complicated by the fact that they are classified together and treated as two types of one genus. This paper endeavors to explain the possible reasons for the connection between these two plant genera and to follow their interplay from Dioscorides up to the early modern period, at the same time identifying and highlighting potential differences in their usage and classification.
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pharmacotherapeutic applications for them. The study is based on historical material from Mediterranean and European sources, starting from Dioscorides and Galen through the medieval A medical texts to medieval and early modern Latin and vernacular European lore. 1) The most relevant herbal sources from Dioscorides to modern times are examined to see how the uses of *Ruta* and *Peganum* a of the *materia medica* developed. 2) The material is re-analyzed, using a method based on the Infos Consensus Model (Trotter and Logan [1986], Heinrich [2000]), and the method for biopr ospes typical historical texts developed by Buenz et al. (2004, 2005). 3) Using the results of stages 1 and 2 pharmacological data of *Ruta* and *Peganum* are compared in order to identify the possible connections between the two genuses' recommended uses in the ancient and medieval herbal and/or between their respective Territories) showed more bioactivity compared to those in less harsh climatic zones. Samples were assessed for thirteen types of anti-infectious/health protection activities. By using several plant samples were identified as plants of the extracts showed at least one high-potency bioactivity (3/3); 78 (5.3%) extracts exhibited 3-5 antiinfectious activities. Plants growing in areas with more extreme conditions (Irano-Turanian, Sudanian Penetration Territories) showed more bioactivity compared to those in less harsh cli-1 (Mediterranean Territory) Antiradical activity, glucosidase inhibition, amylase inhibition, planaria lethality, protease inhibition, planaria regeneration, anthocyanin, round worm lethality, and protease activity were also seen. The STN technique enables rapid, accurate field-deployable screening of diverse plant species for multiple anti-infectious/health protection activities. By using several plant samples were identified as having potential to serve as a source of biological material for medicinal purposes.

Keywords: Ancient, *Peganum* L., medicinal, *Ruta* L.

4.16. Medicinal Plants of Palestine: A Comprehensive Science-Based 1 Assessment of Bioactive Properties of the Endemic Plants of Palestine

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Abstract: Due to its unique geography, and diverse climate zones, Palestine has a large variety of indigenous plants. However, local species have not been systematically screened for their bioactivity. Plant samples were collected from 76 natural sites distributed in different geographical climate zones. Samples were assessed for thirteen types of anti-disease/health protection activity field-deployable bioassays based on the Screen to Nature (STN) technique developed by the Global Institute of BioExploration (GIBEX). Plant extracts were assessed for medicinal activity on a scale of 0 (no activity) to 3 (most potent). More than 1470 plant samples derived from 588 plant species belonging to different families were screened. Approximately 329 species (56%) belonged to 12 families, notably Papilionaceae, Asteraceae, Liliaceae, Lamiaceae, Brassicaceae, and Apiaceae families. About 1369/1471 of the extracts showed at least one high-potency bioactivity (3/3); 78 (5.3%) extracts exhibited 3-5 antiinfectious activities. Plants growing in areas with more extreme conditions (Irano-Turanian, Sudanian Penetration Territories) showed more bioactivity compared to those in less harsh climatic zones. Antiradical activity, glucosidase inhibition, amylase inhibition, planaria lethality, protease inhibition, planaria regeneration, anthocyanin, round worm lethality, and protease activity were also seen. The STN technique enables rapid, accurate field-deployable screening of diverse plant species for multiple anti-infectious/health protection activities. By using several plant samples were identified as having potential to serve as a source of biological material for medicinal purposes.

Keywords: Anti-infectious disease, bioactivity, bioexploration, plant field survey, screens-to-nature.

4.17. Ethnobotanical Study of The Lamiaceae Family in Atlas Mountains, Morocco

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Abstract: Moroccan people have a rich and ancient tradition in the field of phytotherapy. Ther numerous medicinal plants described for treatment of many diseases and herbal medicine is an integral part of Moroccan culture. In modern society, herbal medicine based on this heritage continues to flourish as a pivotal and indispensable role in the current public healthcare. This document presents the uses of medicinal plants in traditional herbal medicines in mountainous regions Middle and High Atlas Morocco. It
determines the homogeneity of informant knowledge in medicinal plants suitable for different ailment categories and the most preferred plant species used to treat each illness category in the study area. Results of the study showed that users of the plant are mostly male (73%) and 67% of them are illiterate. The virtues of this species are diverse, including digestive, respiratory, and nervous system diseases according to 54.5%, 41% and 4.5% of respondents. Most remedies are made as an infusion (66%) and leaves are the most organs used by 55% of the respondents. This study proves that medicine is still widely practiced by the population in Morocco. This region, which is rich in medicinal plants, still needs more investigation and study. Thus, it is important to document and reconstitute the remains of the ancient medical practices which exist in Morocco and other areas of the world. Preserve this knowledge for future generations. The traditional medicine used in the region lacks therapeutic evidence. It is necessary to perform phytochemical or pharmacological studies to explore potential plants used for medicinal purposes. The unsustainable harvesting of such medicinal plants are obtained from the wild may cause a serious decline in plant population. It is thus recommended that cultivation techniques be formulated, especially for the most important plant species that are used and traded outside the region.

Keywords: Ethnobotanical survey, folk medicine, middle atlas, high atlas, lamiaceae, phytotherapy.

4.18. Tamrekh, A Traditional Method for Treatment of Women Infertility in S Arabia

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Abstract: Plants have been used for treatment of fertility problems, miscarriages, postpartum abdominal pain and hemorrhages, retained placenta, and for speeding up contractions during labor. These have documented for various ethnic groups. The traditional knowledge about the use of these plants is ofter by midwives, elderly women, and traditional healers. Tamrekh is a traditional method used by tradi healers in Al-Madinah, KSA to provide healthcare to women (using a wide array of plants). Document of the Tamrekh in Al-Madinah region are lacking. The study aimed to document information on remedies traditionally used for the treatment of women infertility in order to conserve this valuable knowledge from loss. This study is a part of large study which intends to explore Al-Madinah people's perceptions, attitudes, and treatment choices related to women’s health. Ethno-botanical surveys conducted using semi-structured interviews with four key informants (herbalists and healers) to medicinal plants they use and describe the preparation of medical remedies. Data has been collected from 30 participants (non-specialist informants) who were interviewed face to face of whom 85% were women. Data collected revealed that a total of 19 plant species of 13 families are commonly used by local people for medicinal purposes to treat conditions related to fertility problems. Such as: Cymbopogon schoenanthus, Commiphora gileadensis and Foeniculum vulgare. Most frequently cited plants were essential oil plants. Preparation mainly involved as a fume infusion where the leaves are burned by a woman in such a manner that the fumes reach her vaginal area) decoction for consumption and herbal steam bath (The preparation consists of a handful from each plant being added to boiling water in an open bucket, which the woman places opposite herself so that the steam can reach buttocks and vulva areas, then woman wraps herself in a blanket). Tamrekh included both thermotherapy and aromatherapy which is believed that this contributes to recuperation and restoration, as well as in the prevention of any infection. This study provides data on the medical properties of locally available medicinal plants for treatment of female conditions. The pharmacological phytochemical evaluation of the therapeutic potential of some of these plants is important for pharmaceuticals. Scientific evidence for their usage and improvement of women reproductive health, but could also preserve sustainable resources through conservation of the biodiversity in this area of Saudi Arabia.

Keywords: Commiphora gileadensis, Cymbopogon schoenanthus, Foeniculum vulgare, Tamrekh.
4.19. Shaping of Medicinal Plant Use: A Phylogenetic and Organoleptic Approach

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Abstract: Ethnopharmacopoeias result from complex interactions between peoples and their environments. Apart from empirically learned therapeutic effects, medicinal plant selection is also influenced by perceived sensory information. Morphochemical features of plants were suggested to culturally encode medicinal qualities to both ensure purpose specific plant use and successful knowledge transmission. However, despite studies finding vague links between a plants' therapeutic use and its sensory features, it is not well understood how varying organoleptic properties influence ethnomedicinal applications. We use Dioscorides’ De Materia Medica as a model to study the development of ethnopharmacopoeias. By analysing organoleptic properties and historical use of medicinal plants in a phylogenetic framework, we test for associative patterns and elucidate to what degree medicinal plant use is determined by phylogenetic affiliation or sensory features. Taste and smell profiles of plant samples will be assessed experimentally combined with historical use data. A reconstructed molecular phylogeny of medicinal plant taxa will allow a statistical exploration. Preliminary results corroborate the view that medicinal plant selection is non-random.

Keywords: Approach, ethnopharmacopoeias, phylogenetic, organoleptic properties.

4.20. Study on the Composition of Algerian Argan Oil

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Abstract: The argan tree (Argan) is an endemic tree of Algeria (Tindouf) and Morocco. The Algerian geographical range covers a relatively large area in the north-western province of Tindouf where this tree is the second most common one after Acacia radiansa. The argan tree is extremely important to the local economy. Every part of the tree is used and is a source of income or food: wood is used as fuel, leaves and pulp are used as a very valuable food for goats and camels, the extracted oil from the grains by women is used in cooking and in traditional medicine. The argan oil is the main product of the argan tree extract it from its grain which contains 50% of the oil. The argan oil has been the subject of intense research and development and research of the natural substance. It is in this context that the study of vegetable oil extracted from the argan almonds, from the province of Tindouf, was made in order to develop and consider their use as bio-natural product has therapeutic effect.

Keywords: Antioxidant, argan oil, *Argania spinosa*, ethnopharmacology, natural therapeutic.
Topic (5): Traditional and Modern Herbal Medicinal Products in Treatment of Cancer

HDAC Inhibitors from Nature for Cancer Chemoprevention

Invited Speaker Prof. Dr. Cucnet Muriel
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Abstract: The treatment of several diseases is highly dependent on natural products and this is especially true in the case of cancer. Most of human cancers seem to be potentially avoidable by controlling exogenous factors (primary prevention), but also by using agents interfering with carcinogenesis. Compounds can be divided into three categories: blocking agents (anti-initiation), agents against promotion or the progression stages. Epigenetic changes, induced by compounds acting on the methylation or acetylation status of the histones, mostly act in the last stage. Histone deacetylases (HDACs) are enzymes that deacetylate lysine residues from histones, as well as several other nuclear, cytoplasmic or mitochondrial proteins. In mammals, there are 11 zinc-dependent HDACs classified in three classes: class I (HDACs 1-3 and HDAC8), class II which is subdivided into classes IIa (HDAC4, 5, 7, and 9) and IIb (HDAC6 and 10), and class IV (HDAC11). During the past years, the number of enzyme subtype increased and offers the possibility to develop HDAC inhibitors with increased specificity. In the case of cancer, these inhibitors should have a better efficacy and decreased side effects. Various diterpenes and aurones showed promising results and will be discussed. The use of epigenetic modulators could be an optimal intervention to prevent early epigenetic changes and decrease the prevalence of age-related diseases such as cancer.

Keywords: Cancer, enzyme, epigenetic changes, HDACs, inhibitor, methylation, natural product.
5.1. Preliminary *In Vitro* Study of *Ardisia Crispa* Root in Angioprevention

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**Abstract:** Several natural compounds, especially plant products and dietary constituents, are all exhibit ‘angiopreventive’ (anti-angiogenic chemoprevention) activities both *in vitro* and *in vivo* in *Ardisia crispa*. The plant’s root has been shown to exhibit chemoprevention in skin tumorigenesis, as well as benzoquinonoid compound against tumor promoting effect *in vitro*. In the current study, we investigated benzoquinone (AC2) and its hexane fraction against tumor promoting effect *in vitro* in cells proliferation, *Fluorescence Activated Cell Sorting* (FACS) analysis for cell cycle distribution and cell migration assay on human umbilical vein endothelial (HUVE) cells. Results showed that all the concentrations of ACRH and AC2 retarded the growth of HUVE cells after 24 hours exposure with IC0.1 and IC2 of 1.21 µg/ml and 0.95 µg/ml respectively. The cell cycle distribution was then analyzed via flow cytometry to reveal that, G0/G1 arrest (64.14±1.30%) was appeared to be the main cell cycle arrested, followed by S phase (18.84±0.79%) then G2/M phase (6.12±0.51%) for all groups treated either ACRH or AC2. However, there was no significant difference across all the treatment groups compared with the negative control group. Detection for cell apoptosis was performed via Annexin V staining which exhibited majority of the cells were in early apoptosis after treated with 10 mcg/ml of ACRH or AC2. However, these differences were not significant. The effects of both ACRH and AC2 then tested on HUVE cells migration via wound healing assay at various concentrations (0.1–100 µg/ml). ACRH and AC2 were able to either significantly reduce or inhibit the HUVECs migration concentrations. However the effects were not concentration dependent. These findings reveal preclinical potential of both ACRH and AC2 as angiopreventive agents. Further studies are still underway to establish their effectiveness, *in vivo* and other *in vitro* assays, in elucidating their potential pathways.

**Keywords:** Angioprevention, *Ardisia Crispa*, cell apoptosis, root.

5.2. Proliferations of Normal Human Adult Dermal Fibroblast Cells (Atc Pcs 201-012®)

*In Vitro* Enzymatic Inhibitions of *Curcuma Xanthorrhiza* and *Curcuma Longa* Rhizomes Extracts

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**Abstract:** Plants are sources of precursors of many natural products and secondary metabolites pharmacological and therapeutic potentials. *Curcuma xanthorrhiza* and *Curcuma longa* are some medicinal plants used in folklore medicine to treat and manage skin wrinkles in Southeast Asia. Skin is characterized by loss of skin structural integrity and degradation of Extracellular Matrix (ECM) by matrix metalloproteinases (MMP). A critical therapeutic approach for the management of skin aging is to induce the proliferative dermal fibroblast cells for the production of Collagen and subsequent increase in the production of Collagen. In this study, Normal Human Adult Dermal Fibroblast Cells (ATCC PCS 201-012®) was cultured in humidified incubator. Using MTT assay, the percentage cells viability was determined and spectrophotometric techniques was used to determined extracts potentials to inhibit ECM degrading enzymes such as Elastase, *Hyaluronidase* and *Collagenase*. The results revealed increased in percentage cell viability of Mean (P<0.005) 149.5% and 117.6% at concentrations of 3.13 µg of *C. xanthorrhiza* and *C. longa* respectively compared with both untreated and positive controls. The enzymatic inhibitions potentials of the extracts were revealed as 94.6% and 98.4% (Elastase) 23.2% and 21.4% (Hyaluronidase) and 71.3% and 6 (Collagenase) for *C. xanthorrhiza* and *C. longa* respectively. This study provides evidence that support the folkloric usage of *C. xanthorrhiza* and *C. longa* for the treatment and management of skin in Southeast Asia.

**Keywords:** Collagenase, *curcuma longa*, *curcuma xanthorrhiza*, dermal fibroblast, elastase, hyaluronidase, *Ardisia Crispa*.
5.3. Antitumor Prospects for Utilization of *Phellodendron amurense* Rupr.

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Department of pharmacognosy and botany, The University of veterinary medicine and pharmacy in Košice, Slovakia.

Abstract: *Phellodendron amurense* cortex contains berberine alkaloids (berberine, oxyberberine, epiberberine, jatrorrhizine and palmatine), limonoids, fenolic compounds, which have effect on the whole range of microorganisms and inhibit the development of resistance to antibiotics. Extract of bark is interesting for its promising anticancerogenic activity. We tested inhibition effects of the extract *Phellodendron amurense* cortex to angiogenesis by *in ovo* experiments on chorioallantoic membrane. Antioxidant activity and content of active substances responsible for this activity (polyphenols, flavonoids, and ascorbic acid) were spectrophotometricaly measured. As berberine alkaloids are poorly permeable through the mucosa of the digestive tract, their absorption was enhanced by using inhibitors of P-gp. We found that, extract from *phellodendron amurense* cortex has promising use in the treatment of cancer thanks inhibition of angiogenesis and antioxidant effects.

Key words: alcaloids, angiogenesis, plant extract, resistance, tumor.

5.4. Potion from *Piper aduncum* Ash for Cancer Cure in Papua New Guinea: Myth, Mystery or Chemistry

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Abstract: Medicinal plants and hence traditional health practices are very abundantly found in Papua Guinea (PNG) due to richness in flora. Of the various *Piper* species available, *Piper aduncum* is found thickly populated in Morobe province, especially in Bulolo and Finschhafen district. While some authors published that this shrub variety has severely affected the rural livelihoods of the places in terms of loss of primary forests and indigenous vegetations, others have found uses, not only for farm and household also for medicinal purposes. One such use is as a potion for curing stomach and mouth cancers where patient is given the filtrate of *Piper aduncum* ash to drink in fixed dosages. Such indigenous traditional curing methods were considered as a “secret” and were revealed only to close family members, reli and associates. The mature and young stems of *Piper aduncum*, collected from Waramuli area situated Bulolo district of Morobe Province, were dried, burnt to ashes, lixiviated with water and the clear filtrate were analysed. Dirty white salts were obtained by evaporating the ash filtrates of *Piper aduncum* and analyzed. As expected, no organic part was found to be present and only common inorganic cations and anions were found. While the cationic content was determined using ICP-OES, anions were deterr using simple analytical techniques like titrimetry and gravimetry. The total essential mineral electrolyte (Na⁺, K⁺, Cl⁻ and HCO₃⁻) content for the two salts was calculated and it was this that probably assists suffering patients to get re-energized when they drink. Antimicrobial studies indicated that the salts possess any antimicrobial activity. Electrical conductivity and solubility studies reflected the soluble mineral constituents of the salts. Hence, it is really a myth and mystery, and not chemistry, that people get cured from such dreadful diseases; the rate of curing can possibly be related to a rich and careful change in the diets the patients adapt to during such circumstances.

Keywords: Antimicrobial studies, Guinea, cure, medicinal plants, *Piper aduncum*.

5.5. Cytotoxic Malaysian Ficus Spp. Extracts

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Abstract: Prostate cancer is one of the most common types of cancer worldwide, especially in western societies. In the United Kingdom, prostate cancer contributed to the 35,000 new cases and 10,000 d
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annually. According to the statistics provided by the Malaysian Oncological Society in 2012, prostate cancer is the sixth most frequent cancer in Malaysia and it accounts for 5.7% of cancer cases in males. The global resurgence of the interest for natural remedies as a commodity, Malaysia is looking to capitalize on its megabiodiversity, which includes the oldest rain forest in the world and an estimated 1,200 medicinal plants. One of them includes *Ficus spp.* where a number of phytochemicals have been identified from the plants including galloclatech, epigallocatech, catechin, luteolin-8-C-glucoside coumaroylquinic acid, orientin, vitesin, isovitesin, rutin, queretin and naringenin. These phytochemicals are known to exhibit antitumor properties. Therefore, this study aims to investigate the potential of *spp.* extracts in preventing prostate cancer and the mechanism involved in inhibiting prostate cancer proliferation leading to cancer cell death via apoptosis. Three different varieties of *Ficus deltoidea* extracts were used in this study. Three different fractions (aqueous, n-hexane and chloroform) were prepared from each plant extract. The cytotoxicity of each extract was determined by using the Sulforhodamine B (SRB) in PC3 cells after 72 hours of exposure. Paclitaxel was used as positive control. The apoptosis induced by plant extracts was determined by measuring the activity of caspases 3 and 7 using an apoptosis detection kit. This method was used for the detection and discrimination of apoptotic, necrotic, and cells. Results showed that *Ficus deltoidea* 1 (FD1) extracts have the lowest IC50 value at 27.5 μg/mL. Chloroform fraction of FD1 significantly induces caspase 3/7 apoptosis when compared to control. This is the first time with promising cytotoxic effect of *Ficus deltoidea* var. angustifolia (Miq.) Corner (FD1) is found in cancer cell lines. The results of this study clearly demonstrate the potential of some of the plant extracts in prostate cancer cells inhibition.

**Keywords:** Cancer cell line, cytotoxic effect, extracts, *Ficus angustifolia, Ficus deltoidea, Malaysia.*

5.6. Traditional Medicinal Knowledge on Cancer Prevention and Treatment

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Abstract: Research on the issue of therapeutic vegetable species creates opportunities to test new drugs that can cure cancer. Traditional medicinal knowledge gathered amid herb traders, wild plant collectors, herb doctors, as well as urban gardeners and peri-urban farmers, transmitted through generations is a source of data that can provide clues about new paths to be developed by pharmaceuticals. Because plant stems, leaves, fruits, barks, roots are used both externally or ingested along a considerable length of time, using identical prescriptions, the record of in-depth interviews that results from fieldwork conducted in Portugal Tropical Institute in Latin America (8 countries), in two Pacific Ocean Islands and in Asia (11 countries) permits advances on the study of the properties and virtues of several plant species.

**Keywords:** Cancer, herbal, medicinal, knowledge, traditional.

5.7. Herbal Medicines for Treating Cancers Used by Local Healers in Thailand

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Abstract: The number of cancer patients using herbal or alternative medicine is increasing worldwide. In Thailand, many of them seek help from local healers, traditional practitioners, and herbalists. Then with its rich biodiversity and traditional medicine knowledge, Thailand is a potential source of new cancer and chemopreventive agents. The aims of this project are to understand how local healers treat cancer and to document medicinal plants used in cancer treatment and prevention with the ultimate aim to have this as a basis to discover new cancer therapies. We interviewed thirty three Thai local healers, practitioners, and herbalists in order to understand the treatment concepts and medicinal plants used. Semi-structure interviews were conducted. The major forms of treatment include herbal medication, massage, spiritual approaches, and combinations of these strategies. These informants mention herbal remedies, composed of at least 341 crude drugs, used against cancer. The most utilized species are *Smilax* spp. (*Smilacaceae*), *Stemonatuberosa* Lour. (*Stemonaceae*), *Thunbergialauri folia*
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(Acanthaceae), Acanthus ebracteatus Vahl. (Acanthaceae), Suregadumultiflora (A. Juss.) (Euphorbiaceae), Zingiber officinale Roscoe (Zingiberaceae), and Piper retrofractum Vahl (Piperaceae) respectively. Most of the remedies are decoctions which are used for cancer treatment, to maintain health, cancer prevention, as a supplement to cancer treatment, for the prevention of development of cancer if specific disease, and for treatment of some symptoms which are similar to those of cancer. During treatment, the informants adjusted herbal remedies according to the patients' condition and disease progression at that time. Additionally, the informants also advise their patients to modify their eating since some food is seen to have a negative effect to the treatment. Medicinal plants used in the treatments of cancer are an important element for understanding Thai traditional healers' practices concepts. The study also forms a basis for selecting species to be further investigated for biotrick activities related to anti-cancer or chemopreventive properties.

Keywords: Cancer, herbal Medicine, Stemona tuberosa, Thunbergia laurifolia, Zingiber officinale.

5.8. Protective Effect of Citrus limonum Against DMBA Induced Papillomagenesis

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Abstract: Citrus fruits and their chemical constituents have anticarcinogenic effects and induce apoptosis in human gastric and colon cancer cells. The present study was conducted to evaluate the chemopreventive potential of Citrus limonum juice (C.L.J.) and its extract (C.L.P.E.) in 7,12-dimethylbenz(a)anthracene (DMBA)/ croton oil induced skin papilloma in male Swiss albino mice (7-8 week old) were received C.L.J. (100 mg/kg, p.o.; 200 mg/kg, topically C.L.P.E. (150 mg/kg, p.o.; 200 mg/kg, topically) before each application of croton oil. The control animals received dimethyl sulfoxide and number of animals which developed papillomas were monitored weekly and excised for biochemical assays for lipid peroxidation, catalase, glutathione during DMBA-induced skin carcinogenesis. Male Swiss albino mice (7-8 week old) were received C.L.J. (100 mg/kg, p.o.; 200 mg/kg, topically) before each application of croton oil. The control animals received dimethyl sulfoxide and number of animals which developed papillomas were monitored weekly and excised for biochemical assays for lipid peroxidation, catalase, glutathione, TNF-alpha, interleukin-6. The oral administration of C.L.P.E. (P<0.05) while topical application of C.L.J. (P<0.01) C.L.P.E. (P<0.001) showed significant reduction in tumor burden as compared to carcinogen treated control animals. Furthermore, significant increase in glutathione and catalase level was observed in treated C.L.J. and C.L.P.E. orally (P<0.001) and C.L.P.E. topically (P<0.01), whereas MDA form in lipid peroxidation was inhibited significantly by administration of C.L.J. topically (P<0.05) and C.L.P.E. (P<0.01). Also the expression of biomarkers like TNF-alpha and IL-6 were reduced in Citrus limonum treated groups. The results from the present study suggest significant chemopreventive effect of Citrus limonum against DMBA induced skin papillomagenesis.

Keywords: Cancer cell, chemopreventive, Citrus limonum, peel extract, skin papilloma, tumor burden

5.9. Berberis Libanotica Extract Targets NF-kB/Cox2, PI3k/Akt and Mitochondrial Caspase Signaling to Induce Human Erythroleukemia Cell Apoptosis

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Abstract: It has been demonstrated that different species of the plant “Berberis” possess anticancer activity on several cancer cell lines. This is exerted via multiple mechanisms, dependent of each cell line. In this study, we investigated the anticancer potential of the Lebanese endemic species: Berberis libanotica. Most of anticancer drugs exert their effect through the decreasing of cell proliferation and the induction of an apoptotic cell death. On the other hand, it is also well known that natural products usually increase expression of cyclooxygenase-2 (COX-2). COX-2 is generally up-regulated in cancers and can inhibit apoptosis susceptibility, generally implicated in resistance to apoptosis. We thus investigated the efficacy...
an ethanolic extract from BL on erythroleukemic cell lines. Therefore, we choose three erythroleukemia lines that differ from their level of COX-2 expression: HEL, K562 (COX-2 deficient) and transfected (COX-2 +). BL induced apoptosis through disruption of Δψm, caspase-9 and caspase-3 activation. Furthermore it induced PARP cleavage and DNA fragmentation, two well known hallmarks of apoptosis. Finally, we showed that BL treatment induced a down-regulation of COX-2 expression which is correlated with the inhibition of the two survival pathways: NF-κB and phospho-Akt. When we put together, data suggest that BL has a potential chemopreventive effect through the regulation of Akt/NF-κB/COP pathways in human erythroleukemia.

Keywords: Apoptosis, Berberis libanotica, COX-2, NF-κ B, erythroleukemia cell lines PI3K/Akt.

5.10. Phytochemical Leads from African Medicinal Plants

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Abstract: The use of plants in traditional medicine is widespread with an estimated 75 000 tonne material consumed annually in South Africa and 72% of the Black South African population subscribes to traditional health care systems [1,2]. Over the last 20 years the group has evaluated plants used medicinally in southern Africa, mainly by the Zulu population of KwaZulu-Natal. In each case, compounds activity have been isolated, supporting the traditional use of the material and the ethnomedicinal app to drug discovery. Key to the success of such projects is collaboration between ethnobotanists, chemists and pharmacologists. In this talk, challenges relating to the development of a product from an ethnomedicinal lead will be discussed. The use of synthetic chemicals, e.g. hydroquinone, as skin lighteners, is a widespread, dangerous practice that may lead to ulceration and permanent skin damage. Garcinialivingstonii, a plant used traditionally for skin lightening, has yielded a range of compounds with cytotoxicity and effects on melanin production are reported. The stem bark and fruit of Garcinialivingstonii T. Anderson were extracted with dichloromethane, ethyl acetate and methanol for 24 h each. Rep separation by normal phase (Merck 9385 Si gel) and size exclusion (Sephadex LH-20) chromatograph undertaken. The stem bark yielded common triterpenoids, morelloflavone and morelloflavone-7'-sulphate. Guttiferone A was isolated from the fruit peel extract. Sargaol, isojacareubin and 6-deoxyisojacareubin isolated from the kernels. Compounds were identified using NMR spectroscopy and HRMS. Compounds and extracts were screened in vitro against a malignant melanoma cell line (MeWo; ECACC 93082609) and melanin content was determined. The cytotoxicity of the compounds was evaluated in vitro. Fruit peel extract was cytotoxic, leading to complete cell death within 48 hours. Guttiferone A was shown to be cytotoxic, with 25 µM causing approximately 80% cell death. 25 µM exposures of morelloflavone, morelloflavone-7'-sulphate and sargaol caused between 10 – 20 % cell death. All compounds were able to decrease the melanin content of the cells, although to differing extents. Guttiferone A produced the largest decrease, but this was offset by the large cytotoxic effect observed at the same dose. Morelloflavone, morelloflavone-7'-sulphate and sargaol all caused significant decreases in melanin content, while the least than 20 % cell death at 25 µM. All three compounds elicited a concentration-dependent decrease in melanin content and cytotoxicity in MeWo cells, with morelloflavone-7'-sulphate having the promising profile. Morelloflavone, morelloflavone-7'-sulphate and sargaol are highly effective melanin production inhibitors validating the use of Garcinialivingstonii as a skin lightener.

Keywords: African, cytotoxicity, Garcinialivingstonii, phytochemical, traditional medicine.
5.11. Mechanisms Underlying The Growth Inhibition of Hepg2 Cells by C. Bergamia Juice

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Abstract: Among cancers, hepatocellular carcinoma is one of the common worldwide, and its incidence is increasing around the world. A lot of evidence underline that natural substances usually assumed by th can have an important role in the prevention of cancer. The aim of the study was to evaluate antiproliferative activity of Citrus bergamia (bergamot) juice (BJ) on the HepG2 human hepatocarcinoma cell line, focusing on its effect on cell cycle distribution and apoptosis. The characterization of BJ was performed by UHPLC analysis. Cell proliferation was determined by both cell count assays. Trypan blue exclusion test and Comet assay were carried out to assess the pot cytotoxic activity and genotoxicity of BJ, respectively. Cytofluorimetric analyses were conducted in to evaluate apoptosis and the progression of cells trough the cell cycle. Finally, real time PCR and Ws blot analyses were performed to study the profile of genes and proteins related to apoptosis. Our r demonstrate that BJ reduces the growth rate of human hepatocellular carcinoma HepG2 cells in a timeconcentration-dependent manner, by a mechanism involving the activation of apoptotic machinery via intrinsic and extrinsic pathways. Moreover, BJ increases the expression of P53 and P21 proteins that be responsible for the HepG2 cell cycle arrest in G2 phase. In addition, BJ suppresses NF-kB act. These data demonstrate the ability of BJ in reducing the growth of HepG2 cells, revealing its mecha action and suggesting a promising role as anticancer drugs.

Keywords: Cancer, Citrus bergamia, evaluation, growth, hepatocellular carcinoma, inhibition, mechar

5.12. Cytotoxicity of Two Medicinal Plants Using Chang Liver Cell Lines

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Abstract: Albuca bracteata and Albuca setosa are two of the commonly used medicinal plant traditional healers in Eastern Cape Province of South Africa. These plants have been reportedly used for management of diabetes, ulcer, wounds and inflammation. However, there are few reports on the toxic these plants. To investigate the cytotoxicity of aqueous, methanolic and acetonic extracts of A. bracteata and Albuca setosa in Chang liver cell lines. The aqueous, methanolic and acetonic extracts were evaluated in Chang liver cells for cytotoxicity using MTT and crystal violet assays. Dil concentrations (0, 12.5, 25, 50, 75, 100µg/ml) of the extracts were added into 24-hour cultured cell incubated for 72 hours at 37 °C and 5% CO2. The percentage cell viability was determined using the 5-dimethylthiazol-2-y)-2, 5-diphenyltetrazolium bromide (MTT) and crystal violet compared to control. The aqueous extract of Albuca setosa and Albuca bracteata enhanced cell proliferation and considered relatively not cytotoxic in both MTT and crystal violet. Albuca bracteata acetonic extract was the most toxic, while Albuca bracteata methanolic extract, Albuca setosa acetonic and methanolic ex all showed weak toxicity compared with the control in the MTT and crystal violet assays. These fin showed that the aqueous extracts of these plants are not cytotoxic supporting their folkloric usage. Hov the cell proliferation property of these plants raises serious concern suggesting that they be used caution.

Keywords: Acetonic extracts, Albuca bracteata, Albuca setose, chang liver, cytotoxicity.
5.13. Multiple Effects of *Hymenocrater Longiflorus* on Human Colon Cancer (I) By Using Different Techniques

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**Abstract:** *Hymenocrater longiflorus* is a perennial herb. Leaves ovate- belong or lanceolate. This plant growing above timberline or in subalpine zone between the rocks. The methanolic extract of this plant used to study the immunoflourescence assay for γ-H2AX for RKO (colon cancer) cell line and obtained induction of DNA double-strand breaks causes phosphorylation of histone H2AX at serine 139. Then effects on some proteins like P21, P53, P53, γ-H2AX and observe cleavage of PARP proteins by western blot analysis and this an indicator of DNA damage and apoptosis for RKO cell line. The results showed the presence of higher amount of Pb as (µg/g) 2.23±0.03, 1.82±0.02, 1.52±0.003, 0.88±0.0 0.82±0.02 respectively along with the presence of Cd and Hg. Similarly the residual level was found in the plant extract in compares with CPT, UV and NT cells. Also during treatment with plant extract at different times and concentrations observe increasing in proteins like P21, P53, P53-P, γ-H2AX and cleavage PARP protein and these are signs of DNA damage which lead to apoptosis.

**Key word:** γ-H2AX, *H. longiflorus*, immunoflourescence, RKO, western blot.


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**Abstract:** Conventional assays for toxicity profiling are carried out through animals, plants, planktonic algae usually found to be less sensitive, costly, time consuming and highly structured. Bioluminescent biological phenomenon exhibited by various bacterial strains & gradually decrease in it has taken indicator of toxicity in present investigation. Current studies have been focused on the toxicity monitor and evaluation of organically and non-organically cultivated plants using bioluminescent bacterial strains *Vibrio harveyi* has been selected as the test organism and toxicity levels of various plant (*Momordica charantia, Ocimum sanctum, Trigonella foenum graecum, Gymnema sylvestre* and *Cymbopogon citratus*) extracts grown by organic as well as conventional farming methods (randomized block design) utilized. The plant parts were examined for heavy metals were detected (ICP-AES), mycotoxines (H and inorganic pesticides (LC & GC/MS). Both the crops were found free from mycotoxines (aflatoxin B2a, aflatoxin G2 and aflatoxin B2) but the non-organic crop (NMC, NOS, NGS, NCC and showed the presence of higher amount of Pb as (µg/g) 2.23±0.03, 1.82±0.02, 1.52±0.003, 0.88±0.0 0.82±0.02 respectively along with the presence of Cd and Hg. Similarly the residual level was found in decreasing order of NTF>NMC>NCC>NGS>NOS. The very low intensity of bioluminescence and values were observed in extracts of conventional crop, indicate the high level of toxicity in the conven crop which, may attribute to the presence of high level of heavy metals and inorganic pesticides. This showed the excellent correlations with toxic components present in plants by conventional fertilizers and pesticdes as compared to organic and has reported to detect toxicity across a broad range of extracts containing toxic components.

**Keywords:** Bioluminescent bacteria, cultivation, cytotoxicity, non-organic, organic.
5.15. Controlled Release of Thymoquinone for Favourable Cancer Cells Elimina

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Abstract: Thymoquinone (TQ) (C10H9O2) is the bioactive compound of Nigella sativa seeds. From previous study, TQ exhibited strong cytotoxic activities against several cancer cell lines including human cervical adenocarcinoma (HeLa), human squamous carcinoma (SiHa), human oestrogen receptor negative breast adenocarcinoma (MDA-MB-231) and human oestrogen receptor negative breast adenocarcinoma (MCF-7). Intra-peritoneal route to administer TQ is restricted for pre-clinical and clinical use due to discomfort, costly and sterile issues. The oral delivery is limited by the solubility-related poor bioavailability. In order to overcome the low solubility and bioavailability of TQ, thymoquinone-hydrostructured lipid carrier (TQ-NLC) was formulated (Patent no.: PI20130601815). Cytotoxicity of NLC towards the cancer cells was insignificantly different compared to TQ. The invitro drug release was carried out, and the data showed that the concentration of TQ released from NLC was not equivil to the concentration of TQ alone even after 72 hours. Mathematical modelling and regression analysis revealed that the release kinetic of TQ from NLC was in a zero-order manner indicating the sustained release was time- and concentration-independent. Zero-order drug release kinetic is an ideal sustent delivery system, which is able to prolong the controlled release of drug from the delivery system to maintain the drug concentration within the therapeutic window, hence, minimizing the episode of toxicity. This release kinetic is essential and crucial for anticancer drug as it can constantly maintain tumour drug concentration at a steady and effective level for a long period of time which is favourable for tumour cells killing process. From the in vitro digestion analysis, TQ was found to be protected by NLC from pepsin degradation and solubilisation in mixed micelles which increase the bioavailability of the compound. This study revealed that NLC serves as a good delivery system for TQ that it provides many advantages including capabil to control drug release, providing protection and increasing the bioavailability of the compound.

Keywords: Cancer cell, cytotoxic activities, intestine, Nigella sativa, pepsin, thymoquinone.

5.16. Studies on the In Vitro Determination of the Antiproliferative Act Associated with Chrysanthemum Coronarium Essential Oil

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Abstract: Chrysanthemum coronarium L. (Garland, Compositae) is an annual herb. In oriental medicine, the aerial parts of C. coronarium have been widely utilized as remedy for numerous conditions. Although phytochemical and pharmacological evaluation of the plant constituents have been previ reported, no similar reports are found on the essential oil isolated from C. coronarium. In this study, invitro antiproliferative activity associated with the essential oil isolated from C. coronarium was eval against wide range of human tumor cell lines. The air-dried flowers of C. coronarium were subject hydrodistillation to yield the oil. The antiproliferative effects of the oil on several cell lines were ass using the MTT colorimetric assay. Demonstrated by cell line-dependent IC50 values, our results in that the oil exhibit tumor-reliant cytotoxicity ranging from weak to potent antiproliferative activities results obtained indicate a prospective for C. coronarium essential oil as bioactive oil for m applications.

Keywords: Antiproliferative, Chrysanthemum coronarium, herb, phytochemical, essential oil.
5.17. Anticancer Activity and Phytochemical Profiling of *Terminalia Ferdinand* (Kakadu Plum) Fruit Extracts

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Abstract: Kakadu Plum (*Terminalia ferdinandiana* Exell, Combretaceae) is endemic to the tropical northern regions of Australia. It has the highest natural ascorbic acid content of any plant worldwide, with levels approximately 900 times those of blue berries. Apart from its high ascorbate content, it possesses remarkably high levels of polyphenolic compounds that have the ability to affect the redox state of a cell. Cellular redox state has been implicated in carcinogenesis, and often requires rectification either at onset or through apoptosis. This study investigates the potential of Kakadu plum (KP) extracts as anticancer agents and their ability to quell free radicals, thereby inhibiting carcinogenesis. KP fruit were extracted with a variety of solvents and the antioxidative potential was determined by DPPH assays. The extracts were further evaluated in vitro for anti-proliferative activity using MTS cell viability assays. Cell imaging was used to examine morphological and mechanistic detail. Toxicity of the extracts was determined using Artemia nauplii bioassays. Metabolomic profiling of bioactive extracts was achieved using LC-MS, GC and Headspace GC-MS. Bioactivity driven RP-HPLC fractionation was used to separate and puta compounds present in active extracts. High and mid polarity KP extracts exhibited high levels of antioxidative activity. Indeed, levels as high as 660 mg ascorbic acid equivalence (per g of dried extracted plant material) were evident in the methanolic extract. In vitro trials of crude KP extracts against a panel of cancer cell lines (HeLa, CaCO2, JEG-3 JAR, MC3T3, MG63), showed promising anti-cancer potential. Positive results were noted against all cancer cell lines with IC50 values as low as 600 µg/ml. Artemia nauplii toxicity assays demonstrated that all extracts were either nontoxic (LC50 >1000 µg/ml) or of low toxicity. LC-MS, GC-MS, Headspace GC-MS, RP-HPLC in conjunction with MTS assay narrowed the field of active compounds to approximately 40 out of 1110 putative identifications. Kakadu plum raw and fractionated extracts showed promise in the treatment of a variety of different types of cancer.

Keywords: Ascorbic acid, Australia, carcinogenesis, fruit extract, *Terminalia ferdinandiana*.

5.18. Anticancer Activity of Bioactive Fractions from *Pithecellobium jiringa* Against Lung and Breast Cancer Cells *In Vitro*

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Abstract: Phytochemical compounds from plants have been used as promising therapeutics to prever treat various diseases including cancer. *Pithecellobium jiringa* seed, known as jengkol, has poss pharmacological effects, such as antioxidant, antimicrobial, and anti-inflammatory activities. In this , anticancer activity of bioactive fractions, i.e. polyphenol and essential oil, derived from *P. jiringa* (seed, seed coat, and peel) was measured by modulating the expression of matrix metalloproteinases (MMPs) in A549 lung and MCF7 breast cancer cells by employing gelatin zymography and Real PCR. Polyphenol fraction was extracted in 70% ethanol, whilst essential oil fraction was extract hexane. Both fractions were identified using pyrolysis GCMS. MTT profiles showed that both frac dose dependently increased cell mortality of A549 and MCF7 cancer cells. Gelatin zymographic pr revealed that the decrease of MMP-2 and MMP-9 enzymatic activity secreted by A549 cells was ach after treatment with both *P. jiringa* fractions up to 25 µg/mL. RT-PCR results demonstrated that fractions (5-25 25 µg/mL) significantly reduce only MMP-2 gene expression in A549 and MCF7 c cells. Therefore, polyphenol and essential oil fractions of *P. jiringa* plant may exert potential antic effect via modulating MMP-2 cancer biomarker in vitro.

Keywords: A549 cells, anticancer, jengkol, matrix metalloproteinases, MCF7 cell, *Pithecellobium jir
5.19. Preliminary Study for the Anticancer Activity of Flavonoids Extracted from Wild *Lycium Barbarum* Leaves

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**Abstract:** The discovery and identification of new drugs, which can act as anticancer agents, is an important goal of researches. This study demonstrates the favorable effects of Iraqi wild type *L. barbarum* active components as anticancer agents. Flavonoids from *Lycium barbarum* leaves were extracted and identified by the preparative thin layer chromatography (PTLC) technique which was the best to separate several flavonoids among them; Rutin, Quercetin, Kaempferol, luteolin and a quantity of unknown flavonoid that had been separated and purified to evaluate its biological activity. Results showed that Iraqi *L. barbarum* leaves contain total flavonoids (11.28 mg/g dried leaves) calculated as Quercetin, and the purified extracted flavonoid showed cytotoxic effect towards both: the primary culture of normal hepatic cells (WRL-68), and cancer hepatic cell lines (HepG-2) at 100 µg/ml concentration for 24 hours treatment. The High Content Screening (HCS) assay was held only for the purified flavonoid to investigate the mechanism by which the purified flavonoid affected living cells toward apoptosis. The most significant reduction (p≤0.05) in cell viable count was at the concentration 100 µg/ml which appear to cause the induction of cell death via mitochondrial pathway for HepG-2 cells after 24 hours exposure.

**Keywords:** Cytotoxic assay, flavonoids, *Lycium barbarum*, screening assay.
Evidence Based Validation of Indian Traditional Medicine – Way Forward

**Invited Speaker Prof. Dr. Pulok K. Mukherjee**

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**Abstract:** Evidence based validation of the ethnopharmacological claims on traditional medicine is need of the day for its globalization and promotion. Combining the unique features of identifying biomarkers that are highly conserved across species can offer a promising approach to biomarker-driven drug discovery and development. Globalization of traditional medicine (TM) is necessary for health with assessment of its safety, efficacy, therapeutic and clinical evidences. New technology and science developed many techniques and systems to raise the natural compounds for global existence. The Indian subcontinent, with the history of one of the oldest civilizations, harbours many traditional health systems. The development of traditional systems of medicines with the perspectives of safety, efficacious quality will help not only to preserve this traditional heritage but also to rationalize the use of TM in health care. TMs are an integral component of alternative medical care. There are huge potential to meet the global demand for them. Ayurveda, Yoga, Unani, Siddha Homeopathy (AYUSH) are the major components if the Indian traditional medicine being practice in Indian culture for together. The plant species mentioned in the ancient texts of these Indian systems of medicines (ISM) being explored with the modern scientific approaches for better leads for health care. Authentication scientific validation of these medicinal plants is a fundamental requirement of industry and organizations dealing with herbal drugs. Quality control of botanicals, validated processing manufacturing, consumer awareness and post marketing surveillance are the key points which could ensure the safety and efficacy of TM. Globalization of TM is the need of today for harmonization in respect biomarker fingerprinting and metabolite profiling, chemical characterization, standardization, quality control, metabolomics study, documentation, regulatory aspects and scientific validation in all contexts. Considering the widespread use and popularity of AYUSH, proper standardization and validation m are being developed for promoting Indian medicine including the Ayurvedic drugs. The existing knowledge of Ayurveda and other TM are being validated through newer guidelines of standardization, manufa quality control and newer techniques. In India, such efforts including administrative managements infrastructure facilities of AYUSH, standards for quality control and indigenous practices for integrating TM provides potential role in health care of the people.
Perspectives for Globalized Natural Medicines

Invited Speaker Prof. Dr. Thomas Efferth
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Abstract: Natural medicines provide valuable resources to meet the requirements for global health care at affordable prices. It has been discussed whether or not synthetic drug pipelines run out of candidates. During the past two decades, the costs for the development of a novel drug tremendously increased\cite{1}. In parallel, the number of novel drug candidates with acceptable toxicities was decreasing. This also illustrates that many health care systems, especially in developing and Third World countries cannot afford the costs of sophisticated therapies developed by high-tech medical and pharmaceutical research. Industrialized countries will be more and more restricted to rich elites. On the other hand, traditional medicines have been developed in almost all cultures worldwide. As a consequence, two thirds of the population with non-sufficient access to modern drugs still rely on natural medicines. Hence, natural medicines may provide valuable resources to meet the requirement for global health care at affordable prices. Therefore, safety and efficacy of medicinal plants and other traditional treatment options urgently need to be proven in a comparable manner to conventional western drugs. We need evidence-based medicine both for natural medicines and western medicine. Then, the best of both systems can be combined (“One-World-Medicine”) for the sake of all patients in industrialized as well as developing countries (\text{Fig. 1}).

Here, I will give an overview of our own research efforts on screening of medicinal plant extracts, mode of action analyses of isolated phytochemicals against multidrug-resistant tumor cells \textit{in vitro} and \textit{in vivo} using molecular biological and pharmacogenomics techniques as well as clinical phase I/II trials in human cancer patients using phytochemicals. The overall goal is to reach a stronger integration of phytomedicine into academic western medicine to improve health care conditions for all patients on this globe.
6.1. Neuroprotective Effect of Walnut Extract on MPP+-Induced Oxidative Stress in Human Neuroblastomas SH-SY5Y Cells

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Abstract: Oxidative stress and mitochondrial dysfunction mediated neuro apoptosis is reported to play a major role in the pathology of Parkinson’s disease. Walnuts (Juglans Regia) (WE) are rich in the n-3 acids alpha-linolenic acid and linoleic acid and a dietary source of polyphenols, folate, antioxidant lipids. Polyphenols isolated from walnuts, including ellagic acid monomers, polymeric tannins, and phenolic compounds are potent inhibitors of plasma and LDL oxidation in vitro. In the present study we investigated the protective effects of WE extract against 1-methyl-4-phenylpyridinium (MPP+) induced toxicity in SH-SY5Y cell lines. The effect of WE on MPP+ induced cell viability (MTT - 3 dimethylthiahazol-2-yl)-2,5-diphenyltetrazoliumbromide assay), membrane damage (lactate dehydrogenase (LDH), oxidative stress (levels of ROS, nitric oxide and GSH and activities of SOD and cata mitochondrial membrane potential and apoptosis (activity of caspase 3 and protein expressions of cyto c, Bax and Bcl-2) were measured. Our results showed that WE could be able to reduce the neurotoxic MPP+ and offer neuro-protecton in vitro which might be mediated by its potent antioxidant properties. However, further research is necessary to isolate active compounds and performing preclinical and clinical studies to confirm the neuro-protective effects of WE in PD.

Keywords: Mitochondrial dysfunction, oxidative stress, Parkinson’s disease, SH-SY5Y cells, Walnuts

6.2. Natural Materials in Beauty Chapter of Traditional Iranian Medicine Pharmacy

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Abstract: In this work we searched the title 'zinat' which means beauty in 10 of the most famous Traditional Iranian medical and pharmaceutical books. We identified the compounds and categorized according to their mentioned cosmeceutical effects. The possibility of use of these as ingredier cosmetic formulations today was further investigated. In most traditional Iranian medical treatise the chapter is called 'Baab e zinat' which means the beauty chapter. The main concern of this chapter or 'Baab' is the health and beauty of the skin, hair and nails. In few books, the concepts such as obesity, underwe and their treatments are discussed in this 'Baab'. There are books in traditional Iranian pharmacy contain monographs on the ingredients used in the compound formulations. Each monograph contain name of the ingredient, the nature of the compound as well as its descriptions from which one can con the scientific name of the compound today. In the following part the temperament of the compou mentioned. The other sections are dedicated to the pharmacological effects of the compound, it's po harms as well as the amelioration and the replacement for the compound if for any reason it cannot be. At the end of each monograph, the formulations in which the compound is used in the *Darashad* book listed. We found 96 ingredients which were used for their positive effects on beauty. These materials divided to minerals, herbalas and animal-derived ingredients. Some of these materials could not be today as they might cause biologically transmitted diseases or toxicity. There were materials which used in these formulations but were omitted from pharmacopoeias as their components were not known. With our today's analytical techniques it is possible to analyse their component. Traditional Iranian medicine provides researchers with a source of formulations and compounds which had passed their evaluation throughout the history.

Keywords: Beauty, biological, pharmacy, natural material, traditional iranian medicine.
The 15th International Congress of the International Society for Ethno-Pharmacology

6.3. The History Slovakia’s Garden of Herbs

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Abstract: Slovak Republic is placed in the Central Europe. It lies in the climatically favourable mild zone of Northern hemisphere. Since time immemorial the Slovakian medicinal plants have played the most important part in the composition of therapeutic and various preparations used in popular doctoring. Experiences of simple people were being the basin for the use of these medicinal plants. In past centuries about 600 or 800 species were used for curative purposes. There exists evidence that as early as in the Slavonic period (about 900 AD) the following plants were used (poppy /Papaver somniferum L., Linum itatissimum L/., cannabis /Cannabis sativa L./, hops /Humulus lupulus L./, garlic /Allium sativum L./, onion /Allium cepa L./, mugwort /Artemisia manua L./, gentiana /Gentiana verna L./, asarabacca /Asarum europaeum L./, valerian /Valeriana offcinalis L./, celandine /Chelidonium majus L./, ping /Anagallis arvensis L./, mother of thyme /Thymus serpyllum L./, plantain /Plantago major L./, elecampane /Inula helenium L./, etc.). In this short survey of traditions in popular doctoring it is necessary to mention also the herbalists, i.e. people who dispensed medicinal herbs in order to cure specific diseases. In the region their activity these „popular doctors“ were highly respected. From the latter, brew-ups for drinking and compresses and baths were prepared. They were steeped in beverages, their fresh or scalded leaves applied to wounds, used for inhalation... . There is a long tradition in Slovakia of using aromatic travelling “oilmen” prepared the oils and peddled them – along with other pharmaceutical preparati between villages. Essential oils, obtained by distillation or pressing various parts of herbs (pine /Pinus silvestris L./, juniper /Juniperus communis L./, caraway /Carum carvi L./, rosemary /Rosmarinus offic L./, lavender /Lavandula officinalis L./, etc.), were used as the basis of many treatments with the practice becoming widespread during the 18th and 19th centuries. Modern phytotherapy is the direct successor of this rich tradition of folk medicine in Slovakia. Little is known of the earliest history of Slovak medicine but the monasteries were, as in other cultures, important healing centres. The oldest herbal in Slovakia dates from 1765 and was written by a monk called Cyprian. It has 97 pages and details 265 medicinal plants with a description, in German, of their medicinal properties. The first book describing use of oils printed in Slovakia was the Herbalist by Fandly written in 1793. Although written in Slovak, it contains many ex from foreign literature and was aimed at the common people who often lacked ready access to trained doctors and prepared remedies. One of the best known of the early Slovak herbalists was Mr. Frano Vojtek (1786-1852). He was well-known throughout Central Europe as a folk doctor, treating patients free of charge and teaching the common people elementary hygiene and healthy living. Towards the end of that century a priest, Fr. Angel, was the first to start formal cultivation of medicinal and aromatic plant sold peppermint (Mentha ×piperita L.), hyssop (Hyssopus officinalis L.) and thyme (Thymus vulgaris) all over country. By 1896, when the first international pharmaceutical exhibition was held in Prague, Slovakian medicinal plant cultivation was well established. Mrs. Ludmilla Thurzova (1881-1971) wa one of the greatest of Slovakia’s 20th century herbalists combining herbs into specific therapeutic mixtures stressed the psychological and spiritual components of treatment and her book Maly Atlas Liecivych Rastlin (The Small Atlas of Herbs) has been translated into several European languages.

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Keywords: cultivation, herb, essential oil, history, medicinal plant, Slovakia garden.
6.4. Antioxidant Activity and Biological Effects of Japan Quince (Chaenomeles Lindl.) Leaves Extracts

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Abstract: Plants are rich source of biologically active natural compounds that helps to reduce the risk of certain diseases and may provide a positive physiological effect on the human organism. The pow antioxidant activity of plant extracts makes them potentially useful as components of food additives. The aim of this study was to determine chemical composition, antioxidant activity and biological effects of extracts from leaves of Chaenomeles Lindl. grown in Ukraine. Leaves of different species and so Japan quince - Ch. superba (Frahm) Rehd. sort “Amphora”; Ch. japonica (Thunb.) Lindl. ex Spach sort “Yan”; “Vshukhanuy”; hybrid Ch. japonica (Thunb.) Lindl. ex Spach and Ch. spectosa (Sweet) Naka “Holiday” – were collected in June 2013 in M.M. Gryshko National Botanic Garden (Kiev, Ukr). Leaves were selected to extraction and determination their antioxidant properties, yield of phenolic compounds, ascorbic acid, hydroxycinnamic acids, procyanidins. The extraction process param optimized for the different solvents (water and 10, 30, 50, 70 % water-ethanolic solutions) solvent/plant ratio, temperature, time, number of extraction. The antioxidant capacity of extract investigated based on their ability to scavenge stable free radical DPPH. Phenolic content of the extract was determined using Folin-Ciocalteau reagent, amount of hydroxycinnamic acids, procyanidins accc State Ukrainian Pharmacopoeia. The extracts were administrated the rats with tetrachloromethane-induced hepatitis. The activity of enzymes (alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP)), the content of bilirubin and cholesterol were analyzed in blood samples. It was shown that extracts from leaves of Japan quince contain highest values of total phenolics and exhibited higher level of free radical scavenging. The extracts from leaves of sort “Yan” exhibit hepatoprotective properties, significantly reducing the activity of ALT, ALP, the content of bilirubin and cholesterol. The results indicate that extracts from leaves of Japan quince can be used as sources of valuable components of functional foodstuffs and food additives for preventi oxidation-associated diseases via dietary approach.

Keywords: Antioxidant activity, ethanolic extracts, hepatoprotective activity, japan quince leaves.

6.5. Composition and Biological Activities of Fruits, Jam, Seeds and Oil Seeds of Phoenix dactylifera L.


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Abstract: Phoenix dactylifera L. is a monocotyledoneous woody perennial belonging to the Arec family, which comprises about 200 genera and 3000 species. The beneficial health and nutrition value date palm, for human and animal consumption, have been claimed for centuries. Algeria is the 1 important country in date world production (780000 metric tons in 2009). We report here, the compa total polyphenolic contents and antioxidant activity of the fruits, Jam and seeds (grilled and not gr from Deglet-Nour (DN) and Gheres (Gh) varieties of dates, grown in Algerian Septentrional Sahara - N (Zelfana and Metfili, respectively). The composition of the respective oils seeds and the antioxidant antibacterial activities were also investigated. The fruits of varieties Deglet Nour and Gheres were col at Zelfana and Metfili, respectively (Algerian Septentrional Sahara - M’Zab), in October 2013. Fruit seeds (grilled and not grilled) were macerated with EtOH/H2O (80:20 v/v). The extracts were filter centrifuged and the hydro-alcoholic solutions were concentrated under reduced pressure to obtain ethanolic extracts. In another part, the seeds of each variety were powdered and extracted in a Sox apparatus, using petroleum ether. The fatty oils were obtained after evaporation of the solvent. The Ji each variety was prepared as traditionally used for syrup. The total polyphenolic content was determin Folin Ciocalteau method. The antioxidant activity was tested by the use of DPPH method. The antibac activity was achieved by the use of disc diffusion method. The variety Deglet Nour (fruits, jam, grille
not grilled seeds) was the higher polyphenol-content (27.44, 17.48, 39.84, 446.24mg/100g, respect:

than the variety Gheres (16.64, 8.5, 63.84, 228.24mg/100g, respectively). The variety DN (fruits, jam, g
seeds and not grilled seeds) exhibited a better antioxidant activity (IC\text{50}; 53.57, 10.40, 1.12, 0.04 m
respectively) than the variety Gh (IC\text{50}; 35.65, 19.05, 3.69, 0.14mg/ml respectively). The GC and G4
analyses showed that the oils of DN and Gh seeds were mainly characterized by palmitic acid (11
10.53% ), lauric acid (9.75%, 22.71%) and oleic acid (5.99%, 43.93%), respectively. Both of the van
DN and Gh extracts and oils exhibited a good antibacterial activity against all the tested microorganisms
with largest inhibition zones and lowest MIC against E. coli and Staphylococcus aureus.

Keywords: E. coli, Jam, oil seeds, Phoenix dactylifera, Staphylococcus aureus, seeds.

6.6. Study of Persica Vulgaris Leaves as Prospective Source of New Phytomedicin

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Abstract: Peach (Persica vulgaris, Rosaceae) refers to plants that have long and successfully
cultivated worldwide. In Ukraine, peach cultivation zone covers the South area up to and including
region. We have previously studied the chemical composition of the two early-, two middle- and two
cipening varieties provided by co-workers of the Nikitsky Botanical Garden, as well as a variety grown in the Kharkiv region, derived in the M.M. Gryshko National botanical garden. Peach is cultivated in Tajikistan. Special climatic conditions of Tajikistan promote here late- blossoming and w
hardy varieties. To continue our investigation we have analyzed peach leaves collected in August 20 Tajikistan after fruit harvesting. Qualitative and quantitative composition of biologically active subst of peach leaves varieties "Salvey", was determined by methods of paper and thin layer chromatogr qualitative reactions, titration, spectrophotometry, HPLC and gas chromatography analysis. The pre and quantity of oxyccinamic acids, flavonoid glycosides and aglycones, tannins, organic acids, vita steroid compounds, terpenoids, polysaccharides, minerals were determined. Extract from peach leaves varieties "Salvey" was obtained and its pharmacological screening was performed. By paper and chromatography of peach leaf extract in different solvent systems with reference compounds befor after hydrolysis not less than 5 flavonoids were determined: lutecolin and quercetin and their glycosides total amount of phenolic compounds was 12,80%, oxyccinamic acids ~ 9,61% and flavonoids ~ 5, Screening experimental research of anti-inflammatory activity of thick peach leaves extract was conducted. Study of anti-inflammatory activity was carried out on the model of carrageenan induced paw edema rats. The anti-inflammatory activity of extract caused by inhibition of the histamine and leukotri release and its conditional effective dose (50 mg/kg) was determined. The immunotrophic activity of peach extract was defined in the tests of in vitro. Peach extract showed a moderate, stimulating eff terms of factors as both of inborn (increased natural cytotoxicity) as with acquired immunity (iner antibody). The immunostimulatory activity of the extract was more expressed in the low concentrat 0.4 mg / ml, rather than in the high one - 2 mg / ml. Our phytochemical and pharmacological studies o further research on the creation of medicines and dietary supplements for correction of metabolic dis in patients with diabetes, obesity, atherosclerosis, and those who have long duration of treatment glucocorticosteroids.

Keywords: extract, Persica vulgaris, peach leaves, phytomedicine, plant, rat.

6.7. Nutritional Value of Stevia rebaudiana (Bert.): A natural Low-Calorie Sweetener Plant

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Abstract: Stevia rebaudiana (Bert.) is a perennial sweet herb belongs to Asteraceae family whic great potential as a crop for the production of a high-potency natural sweetener. Accordingly, the study was undertaken to determine the chemical composition and the nutritional value of this medic plant and making thereby a contribution in enhancing its importance as a promising newly introduces
caloric sweetener and antidiabetic medicinal plant in Tunisia. For this purpose, the chemical compo and the nutritional value of Stevia leaves collected from plants successfully grown under glasshouse Horticulture Science’s Laboratory at the National Agronomic Institute of Tunisia were determined. R showed that Stevia leaves (% on dry weight basis) are a good source of carbohydrates (56.39%), protein (10.41%), crude fiber (11%) and ash (16%). On the other hand, they contained a low fat props (6.2%). Analysis of the fatty acid composition showed that the oil is rich in polyunsaturated fatty which are the linolenic (C18: 3) (41.61%) and linoleic (C18: 2n-6) (21.6%) ones. Besides monounsaturated fatty acid proportion was represented by the oleic (C18:1n-9) (8.78%) and the palmi (C16: 1n-7) (3.75%) acids. However, the palmitic acid (C16:0) (24.25%) was the saturated fatty present in the Stevia leaves oil. Regarding the mineral composition of Stevia leaves, potassium was for the highest content (1133.33 mg/100 g DM) followed by calcium (88.77 mg/100 g), sodium (mg/100g), magnesium (13.94 mg/100g) and phosphorus (0.10 mg/100g). Additionally, substantial ar of micronutrients such as iron (32.55 mg/100g), manganese (26.04 mg/100 g), zinc (2.94 mg/100g) copper (0.11 mg/100g) were detected in Stevia leaves. In addition, Stevia leaves were a good sour polyphenols (63.31 mg GAE/g) and steviol glycosides (1.75%) which are low calorie sweetener overall results indicated the nutritional value and the medicinal potential of Stevia leaves as a natural caloric sweetener and hence, their use as dietary sugar substitutes in food and pharmaceutical products.

Keywords: Medicinal, nutritional, steviol, Stevia rebaudiana, glycosides sugar.

6.8. Herbal Medicinal Plants Traditionally Used for Oral Diseases in China

Zhou, Yilan1,2 and Long, Chunlin1,2


Abstract: Oral diseases had been recorded in ancient Chinese literatures since BC 50. Many tradi medicines have been used for treating oral ailments by different ethnic groups. Except for 160 speci animals and 10 kinds of minerals, the others are plants, including algae, bryophytes, pteridophyte spermatophytes. The herbal medicinal plants are still essential for the local people to treat oral dise rural China, especially in southwest China. However, there is not any special record about medicinal used to deal with oral diseases. Both ancient and modern literatures were studied by use of collections National Library of China and other libraries, and electronic resources such as Web of Science, G Scholar, PubMed, and Chinese database. We have conducted field investigations in 12 provinces co Beijing, Chongqing, Guangxi, Guizhou, Hainan, Hubei, Hunan, Inner Mongolia, Sichuan, Tibet, Xin and Yunnan since 1996. Methods of semi-structured interviews and participatory observation had adopted in the field studies. We recorded 1524 taxa of plants used for oral diseases from 36 ethnic gro China. They belong to 164 families and 599 genera. Among them, seed plants are the biggest g consisting of 143 families, 567 genera and 1449 species. An inventory had been finished with names name, Chinese name and scientific name), botanical description, habitat and distribution, taste or s functions, parts used, preparing method, other uses and ethnobotanical information. We provide integrated inventory covered all plant species traditionally used for oral ailments by 36 ethnic groups. biggest families, Asteraceae (with 87 species), Fabaceae (58), Lamiaceae (51), Ranunculaceae (44) Rosaceae (39) contributed 20% to the species numbers of seed plants. Southwest China is the richest r with most species of medicinal plants, and with plentiful traditional knowledge to use herbal medici treat oral disorders. More species can be discovered in southwest China, particularly in Yunnan’s e communities. This study was supported by National Natural Science Foundation of China (311611 and 31070288) and the Ministry of Education of China (B08044, MUC985 and YLDX01013).

Keywords: China, herbal medicine, plant, oral diseases, traditional.

6.9. New formulation for Dehydratation Produced by any Causes Based on Electrolytes and an Andean Cereal, Chenopodium quinoa

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Abstract: We developed a new formula for an Oral Solution to treat dehydration based on electrolyte Chenopodium quinoa, safe, available, non-expensive and culturally appropriate for the target populati
of infectious diarrhoea. The aim of the present study was to compare the efficacy and safety of a rehydration formula based on electrolytes and the powder of *Chenopodium quinoa*. A double randomized clinical trial comparative against the WHO oral rehydration formula. We used the new for as a control in 223 patients with diarrhoea caused by any microorganism bacterial, viruses, and parasite. The new formulation has safe results, no side effects were found. The OR was 2.99 in the new formula against OR =1.2 with conventional salt. The new formula showed 3 times more effectiveness than the conventional formula recommended by WHO. We tested 26% of children under 5 years old, 52% of patients, all have recovered from dehydration faster by using our new formula based on *Chenopodium quinoa* powder. Also we developed several innovations to make it safe and easy to drink as a “strusion” process and sterilization process. The reason for better results in the new formula is because of excl the glucose molecule on our new formula. We got a polymeric molecule of glucose from *Chenopodium quinoa*, in comparison with the monomeric glucose molecule of Glucose on the conventional recommended by WHO. That allows the patient a greater amount of sodium inside the gut cell and per: 5 times faster, creating a faster rehydration process. We strongly recommended the use of new formula based on Andean cereals. It is easier for our target population (lower socioeconomic status) to use “solid” supplements based on natural cereals familiar to them, instead of the conventional formula.

**Keywords:** *Chenopodium quinoa*, children, dehydration, formula, microorganism, oral Solution.

### 6.10. Native Plants In Serbia as a Source of New Antiinflammatory Ager Polygonaceae Family

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**Abstract:** Herbal medicine has a long tradition in Serbia. According to the last estimates the flora of Serbia contains 3662 taxa, which makes Serbia a country with very high floristic diversity compared to European countries. Although more than 700 species are considered as medicinal only 10% are officially registered. This is why exploration of new plant species possessing considerable biological and pharmaceutical activities attained considerable focus. The Polygonaceae family comprises 43 genera and nearly 1100 species. In Serbia plant species of Polygonum, Rumex, Persicaria and Bistorta are widely distributed and were popular in traditional medicine of the natives. These plants are found to possess laxative, diuretic, analgesic, anti-inflammatory, curative, antimicrobial properties. Some of the species are also used in preparing and cooking food, salads, and spices. However most of the species are still unexplored. In this study we report on anti-inflammatory potential of several Polygonaceae species: Polygonum sp. (P. aviculare and P. maritimum); Persicaria sp. (P. amphibia, P. hydropiper, P. lapathifolium, P. maculosa); Bistorta (Bistorta officinalis) and Rumex sp. (R. patientia, R. acetosella, R. crispus, R. obtusifolius, R. balcanicus). Plant material (rhizome and herb) was collected in different localities in Serbia in period of 2010-2012. The investigation of following plant species undertaken: Air-dried and smoothly ground herbal samples were extracted by maceration with MeOH during 72h. Extracts were concentrated to dryness and dissolved in DMSO. Chemical profile each sample was explores by the means of LC-MS/MS. Anti-inflammatory potential was determined using COX-1 and 12-LOX assay. Human platelet was used as a sources of cyclooxygenase-1 (COX-1 12-LOX) enzymes. Highly sensitive LC-MS/MS technique was used for determination of 12(S)-hydroxy-(5Z,8E,10E)-heptadecatrienoic acid (12-HHT) and 12(S)-hydroxy-(5Z,8Z,10E)-eicosatetraenoic acid (12-HETE), inflammation mediators derived from arachidonic acid metabolized by COX-1 and 12-LOX, enzymes of inflammatory response. Polygonaceae plants, especially *Persicaria lapathifolia* (COX-1 and 12-LOX) and rhizome *Rumex balcanicus* (COX-1), p* high anti-inflammatory activities considering their ability to inhibit COX-1 and 12-LOX. Their acetogenin was nearly to quercetin, well-known anti-inflammatory agent and might be an interesting candidate for developing new phytopharmaceuticals and dietary supplements.

**Keywords:** Anti-inflammatory, chemical profile, floristic diversity, herbal medicine, phytopharmaceutical
6.11. Effect of *Aframomum Melegueta* Ethyl Acetate Fraction from Fruit in Type 2 Diabetes Model of Rats

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**Abstract:** Various parts of *Aframomum melegueta* K. Schum. (Zingiberaceae) are used locally in the treatment of diabetes mellitus in different parts of Africa and Asia. Therefore this study is aimed to investigate the antidiabetic effect of *A. melegueta* fruit ethyl acetate fraction (AMEF) in a type 2 diabetes (T2D) model of rats. Six-week-old male Sprague-Dawley rats were randomly divided into six groups of five or seven animals each: Normal Control (NC), Diabetic Control (DBC), diabetic rats treated with 150 mg/kg bw (DAML) and 300 mg/kg bw (DAMH) of AMEF, diabetic rats treated with 300 mg/kg l metformin (DMF) and normal rats treated with 300 mg/kg bw of AMEF (NAMH). T2D was induced feeding a 10% fructose solution for 2 weeks *ad libitum* followed by an intraperitoneal injection of streptozotocin (40 mg/kg bw). After 4 weeks of intervention, non-fasting blood glucose concentrations were significantly decreased and oral glucose tolerance ability was significantly improved in the DAML and DAMH groups compared to the DBC group. Serum insulin and HDL-cholesterol concentrations, body weight and pancreatic β-cell function (HOMA-β) were significantly (*p* < 0.05) increased while polyphagia, polydipsia, serum alanine transaminase, alkaline phosphatase, lactate dehydrogenase, fructosamine, urea, lipid profile and peripheral insulin resistance (HOMA-IR) were significantly decreased in the AMEF treated diabetic rats compared to the DBC group. The pancreatic histopathological examination showed that DAML, DAMH and DMF groups had relatively larger islets with higher number of β-cells compared to the DBC group. Therefore, the orally administered AMEF possesses strong anti-T2D activity and could ameliorate most of the T2D-induced abnormalities. Furthermore, isolation and structural elucidation of the active principle from AMEF is currently underway to find the compound responsible for these activities.

**Keywords:** *A. melegueta* fruit, β-cells, diabetes mellitus, polyphagia, serum alanine transaminase.

6.12. *Carica Papaya* Alleviates the Associated Symptoms of Dengue Fever

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**Abstract:** Dengue fever is a viral infection and epidemic dengue is a major public health problem in and developing countries of tropical and equatorial zones. In folk medicine, it is believed that aqueous extract of leaves of *Carica papaya* can alleviate the symptoms of Dengue infec Clinical studies demonstrated the potential of aqueous extract of this plant against dengue fever. present investigation evaluated the reverse transcriptase inhibition by ELISA method, difluoromethyl ornithine induced thrombocytopenia and immunoglobulin production in rats by leaf extract and obtained from the trunk and unripe fruit of *Carica papaya*. In reverse transcriptase inhibition E method. The extract and latex of *Carica papaya* demonstrated significant inhibition of RTase activity IC₅₀ values of 47.78 µg/ml and 31.71 µg/ml respectively. The extract (100 – 400 mg/kg) and latex 200 mg/kg) significantly decreased the IgM production in a concentration dependent manner at the dose levels indicating the immunosuppressant activity. 12 day treatment of aqueous extract (100 - mg/kg) and latex (50 - 200 mg/kg) of *Carica papaya* given to difluoromethyl ornithine in thrombocytopenic rats increased decrease the platelet count while a decrease in the blood clotting time observed. The results of the study provide an evidence for the rational use of Carica papaya extract for treatment of dengue fever and associated symptoms.

**Keywords:** Carica papaya, dengue, reverse transcriptase, thrombocytopenia.
6.13. Icariin, Timosaponin B II and Ferulic Acid Synergistically Modulate Osteogenesis on Umr-106 Osteoblastic Cells and Osteoblast in Neonatal Calvaria Cultures Through Bmp and Wnt/B-Catenin Signaling Pathway

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Abstract: Icariin (I), ferulic acid (F) and timosaponin B II (T) are respectively derived from Epimedii Folium, Anemarrhenae Rhizoma and Angelicae Sinensis Radix, which are included in several traditional Chinese medicine formulas for the treatment of osteoporosis. Hence, we investigated the effects of I and their combination on ovariectomized osteoporotic mice and on bone formation activity in vitro osteoblast. The results clearly showed that I, F, T, and their combination exert enhanced therapeutic effects on osteoporotic mice, and did not exhibit an intensified adverse effect. IFT synergistically incr the osteoblast proliferation, alkaline phosphatase (ALP) activity and the formation of the mineralized nodules, and also enhanced the promoting effects on the expression of bone matrix. The IFT regu osteogenesis through BMP, Wnt/β-catenin and Notch signaling pathways in osteoblast, indicating that the T exert reinforced therapeutically effects on osteoporosis through modulating multi-signaling path and action targets.

Keywords: BMP signaling pathway, ferulic acid, icariin, osteoporosis, Wnt/β-catenin signaling pathwa

6.14. Ethnobotanical Study of Medicinal Plant Use by Williche People from CI Island

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Abstract: A study was carried out with an ethnobotanical survey from 2008 to 2010. It examine traditional use of medicinal plants in Southern Chile, with special emphasis on rural areas of Chiloé Island. Information was gathered from 40 informants: 39 females and 1 male were interviewed using botanica collections and semi structured questionnaires on the traditional use of medicinal plants; 7 were healers, all females. All the informants, except the healers, were selected randomly. A total of 164 plant species distributed in 70 families were collected in this study. They are listed with scientific name, family, local or indigenous name, mode of preparation, and their medicinal uses. The families best represented were Asteraceae with 17 species, Lamiaceae (12), Rosaceae (8), Apiaceae (8), Myrtaceae (6), Fabaceae (6), Poaceae (5), Solanaceae (5) and Proteaceae (4). The documented ethnomedicinal plants were mostly used to cure stomach, respiratory, ear, eyes and tooth problems, liver, kidney and heart disorders; an inflammations; rheumatism; female organs disorders, and diabetes. Magical and ritual ailments were included. The plants used were 66 native to Chile, 14 endemic and 83 introduced. They were u collected wild and used fresh or dry depending on the part of the plant used. The most common applied included the ingestion of herb infusions, decoctions, juices, and the application of plant materia poultices. This study indicates a high importance value for traditional medicinal use of plants by Wi people as well as their spiritual, cultural and medicinal beliefs. They still depend on plants present in local forest which still posses a high level of endemism.

Acknowledgements: Thanks to the Williche communities of Chiloé Island for their knowledge, sharing and support for this study.

Keywords: Chile, Ethnobotanical, female, survey, liver, kidney, rural, traditional medicine.
6.15. Ethnopharmacological Study of Antiulcerogenic Activity of *Sedumdendroides*

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Abstract: *Sedumdendroides* Moc. et Sesséex DC. (Crassulaceae), also called “bálsamo” (balsam) in Brazil, is a succulent plant with up to a height of 1 m., its leaves are alternate, simple, curved with 1 to 2 cm in length and 1 to 2 cm of width and yellow flowers. This species is originated from Mexican desert regions which are characterized by dry tropical climate. In Brazil, the fresh leaves are used as treatment of gastrointestinal ulcers, due to its emollient and healing properties. Some studies evidence an aqueous extract of leaves promoted a protection against gastric ulcers, and also anti-inflammatory; antinociceptive activities in mice. Therefore, the objective of this study was to evaluate the antiulcer activity through ulcer-induced method by ethanol, using hydroalcoholic extract (HE) of leaf juice. Animals were divided in 8 groups with 5 each. Were tested 5 treatments: saline solution 0.9% (10 mL as negative control); carbenoxolone (200 mg kg⁻¹) as positive control, and three doses of HE (100, 300, 1000 mg kg⁻¹), and all them were orally administered. After 60 minutes, absolute ethanol 1 ml was administered, and animals were sacrificed 60 minutes later. Immediately after, their stomachs removed for evaluation of ulcerative lesion index (ULI) for each animal. The obtained data were submitted analysis of variance (ANOVA, p<0.05), and the means were compared by Duncan test. HE at 100, 300, 1000 mg kg⁻¹ showed antiulcer activity of 15%, 55% and 88% of ULI inhibition, respectively; carbenoxolone decreased 90% of ULI. The formation of ulcerative lesions significantly decreased 1000 mg kg⁻¹, showing activity similar to the carbenoxolone. The results indicated that chemical compounds in the HE can be used in the treatment for peptic ulcers. Therefore, the ethnopharmacological use of this species was proven; but further studies should be carried out to detail the action mechanism of such substances.

Acknowledgements: to Prof. Emeritus Dr. Walter R. Accorsi for their invaluable scientific legacy; Universidade São Paulo (USP) and Centro Pluridisciplinar de Pesquisas Químicas, Biológicas e Agrícolas – CPQRA/UNICAMP. Msc. & Eugenia Amaral de Carvalho, for the abstract translation.

Keywords: Antiulcerogenic, Brazil, ethnopharmacology, lesions, peptic ulcers, *Sedumdendroides*.

6.16. Possibility of Keeping Health of the Population of Russia with Application of the Traditional Chinese Medicine

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Abstract: In recent years in Russia Federation as for patients and for physicians there is interventional traditional Chinese medicine, which has already 5 thousand years. The principles of traditional Chinese medicine are based on disease prevention. For successful prevention of diseases and health need to the laws of dialectics in nature and adapt this knowledge to humans, and with their help to maintain balance between man and the environment. Chinese doctors say that to treat the disease is the same as to start digging a well when you want to drink. For prevention and treatment of diseases in Traditional Chinese Medicine since ancient times successfully applied medicinal and food plants, also has been successfully acupuncture, moxibustion and massage. It is believed that the knowledge of Russian physicians about the application of the traditional Chinese medicine expands the possibilities of rehabilitation measures and keeping health of the population.

Keywords: Chinese, disease prevention, health of population, traditional medicine.
6.17. Ethnobotanical Survey and Topical Anti-Inflammatory Activity of *Croton adamantinus*

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**Abstract:** *Croton adamantinus* Müll. Arg. (Euphorbiaceae) is a shrub known as “carrasco” and used to treat skin inflammation, pain, wounds, and gastrointestinal disturbances in the semi-arid region of the Northeast Brazil. An ethnobotanical survey was performed in the State of Pernambuco to list the plants used to treat inflammatory diseases. One hundred people were interviewed and use values were calculated. Identification by the informants, the branches of *C. adamantinus* were extracted with ethanol. A brief, chloroquine, embelin, isobologram, and FIC analysis was performed through incubating the two drugs with *Plasmodium* such that their IC\(_{50}\)s and IC\(_{90}\)s of both embelin and chloroquinones were derived. Results show that *C. adamantinus* is effective in reducing the edema (p < 0.05). When administered by intraperitoneal route at dosage 30, 100, and 300 mg/kg 30 minutes before the induction of ear edema by croton oil, the extract was effective in reducing the edema (p < 0.05). In the present work, it was verified that *C. adamantinus* is known and is used as a medicinal plant in the semi-arid region of the Northeast of Brazil. The ethnomedical plant of *C. adamantinus* branches possesses topical anti-inflammatory activity, probably due to inhibition of arachidonic acid metabolism.

**Keywords:** Anti-Inflammatory, Brazil, ethnobotanical, *Croton adamantinus*, survey, tropical.

6.18. Antiplasmodial and Chloroquine Resistance Suppressive Effect of Embelin Against *Plasmodium Falciparum* K1

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**Abstract:** Embelin is a naturally occurring quinonoid alkaloid present as a main constituent of *Embeliaribes* (Myrsinaceae). It proved its efficiency in cancer chemoprevention, retardation of oxi stress and fighting of microbial infections. The study aimed to screen its anti-plasmodia and chloro resistance (CQR) reversing effect against K1 strain of *Plasmodium falciparum*. Briefly, chloro resistant strain of *Plasmodium falciparum* was cultivated according to method of (Trager et al 1976). IC\(_{50}\) and IC\(_{90}\) of both embelin and chloroquine (CQ) were measured using drug sensitivity test. Isobologram analysis was performed through incubating the two drugs with plasmodium such that thei fall in the fourth of 2 fold serial dilution. Then the isobologram was plotted and fractional inhibilation concentration (FIC\(_{50}\) and FIC\(_{90}\) of both embelin and chloroquinones were derived. Results show that embelin has a weak to moderate anti-plasmodium effect and can effectively reduce CQR in K1 strain of *Plasmodium falciparum*.

**Keywords:** Chloroquine, embelin, isobologram, *Plasmodium falciparum*, resistance.
**Topic (7): Ethnobotanical Approach to Drug Discovery Strengths and Limitations**

**Interrelations of Plants and People: Ethnobotanical Research and Education in 21st Century**

*Invited Speaker Dr. Caroline Weckerle*

Institute of Systematic Botany, University of Zurich, Switzerland.

**Abstract:** Ethnobotany connects various research fields with the aim to investigate interrelations of plants and people. Historically, the search for new useful plants, either as medicine or new crops, was one of the main drivers of the field. Today, the scope is much broader encompassing basic and applied research fields of primary health care and development, biodiversity conservation, and complementary alternative medicine. This presentation provides an overview of the role of ethnobotanical research and education in the 21st century including information from a number of case studies of different parts of the world.

**Keywords:** Alternative medicine, ethnobotany, plant, research, world.

**Selection of Australian Plants for Medicinal Testing: A Case Study Using Different Approaches**

*Invited Speaker Prof. Dr. Cock I.E.1,2*

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**Abstract:** A variety of selection methods may be used to identify plant species for medicinal testing. Arguably, the most useful way of selecting plant species is by examining the traditional healing practices of the area. However, an ethnobotanical approach to plant selection is not always possible. Often medicinal plant usage has not been adequately documented and much traditional knowledge has been irretrievably lost over time. Alternatively, the researcher may wish to screen for therapeutic properties against diseases which did not exist until recently (eg HIV, ebola) for which there was no traditional remedies. Traditionally, Australian Aboriginal medicinal plant usage, whilst extensive and well understood by the first Australian, was not recorded in a written format. Thus, much of this knowledge is not available to guide medicinal plant studies. With some notable exceptions, researchers examining Australian plants for medicinal properties often must use other selection criteria to narrow the focus of the myriad of species yet studied. A variety of methods for the selection of plant species for medicinal study are examined (including ethnobotanical considerations, field observations, taxonomic similarities and an understanding of species’ phytochemistry). A case study examining *Terminalia ferdinandiana* (Kakadu plum) is used to illustrate the how these alternative methods of species selection may also lead to the discovery of interesting therapeutic properties in species lacking documented ethnopharmacological use. The therapeutic prop of the Australian plant species Kakadu plum (Kakadu fruit) is examined. There is limited documented history of this plant for medicinal purposes by Australian Aborigines. The fruit was used as a highly nutritious food and general tonic, although little is known of its therapeutic potential. However, Kakadu plum was deemed to be a good target to screen for medicinal properties based on several selection criteria: Taxon similarities: *Terminalia* and Combretum species from other regions (eg: *T. arjuna*, *T. chebula*, *T. sericea*) have well documented, and often scientifically verified, therapeutic uses. Phytochemistry: Kakadu plum has extremely high antioxidant contents (high antioxidant contents have been linked with decreased incidences of chronic diseases). Ethnobotanical considerations: Whilst there is no documented history of medicinal use of the fruit, the bark of the tree was used to prepare an antiseptic. The therapeutic properties of Kakadu plum (including antibacterial, anti-Giardia, anti-inflammation and anti-cancer activities) are examined to illustrate how species selection by methods other than ethnobotanymay uncover plant species promising medicinal potential.

**Keywords:** Australian plants, chronic diseases, medicinal, method, selection, *Terminalia ferdinandiana*.
Ethnobotanical Approach to Drug Discovery: Strengths and Limitations

Invited Speaker Prof. Dr. De Feo Vincenzo

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Abstract: Higher plants are still regarded as potential sources of new medicinal compounds; approaches are available for the selection of plants for drug discovery: the ethnobotanical approach significantly enhance the probability of identifying a potential drug molecule from medicinal plants. Ethnobotany can be considered as the interaction between man and plants and can offer phytochemical and therapeutic material for the development of new drugs. Humans since ancient times have utilised plants not only as food sources but also as part of their ritual and healing practices: the study of medicinal plants based on the knowledge of native species uses by the indigenous people; a central role is also played by “magical plants”, that may assume sacred and/or magical along with therapeutic roles, because of their potential in altering the state of mind: it was hypothesised that psychoactive plants have been responsible for the origin of the concept of the sacred; often it is secretly kept and conveyed by shamans and other religious figures, who are very knowledgeable about herbs and who combine their botanical, phytotherapeutical toxicological knowledge with religious elements and rituals based on magic and ancestral beliefs. The method involves the integration of many disciplines: anthropology, botany, ecology, pharmacy, linguistics, medicine and ethnography. A scheme for the rapid evaluation of plant samples used in traditional medicine and their investigation for the presence of bioactive compounds expects: 1) ethnobotanical survey conducted by a physician/botanist/sociologist team based on a record talk use of the plants and vouchers collected after interview; 2) ethnomedical analysis based on determination of disease being treated, efficacy equivalence in diagnosis by traditional/modern medicine; 3) clinical outcome evaluation based on leads replicated, safety determined in animals, appropriate dosage formulations and an end-point determined. On the hand, ethnobotanical, phytochemical and pharmacological studies have been carried out on plants used in the traditional practices in the shamanism of the Northern Peruvian Andes: the pharmacological assays showed a real pharmacological activity on CNS, suggesting that these plants act as psychotropic agents; on the other hand, in Western countries, however, medicinal plants can have a role today, in preventive medicine and in the treatment of human and environmental disorders. The ethnobotanical approach has obvious limits, due to the fact that some diseases may be unfamiliar to the indigenous population, and therefore, non effective intervention or therapy has been developed.

Keywords: Ethnobotanical approach, medicinal plant, phytochemical, therapeutical, toxicological effect.

Finding the World’s Best Plants for Type-2 Diabetes Targets

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Abstract: The number of people afflicted by type-2 diabetes is rapidly increasing. 382 million people in the world are estimated to have type-2 diabetes today. 75 % of the patients live in low- and middle-income countries. In an affluent country like Denmark, more than 20 % of the population is afflicted, meaning one in four adults are affected. Currently, there are very few herbal products on the market in Denmark treatment of type-2 diabetes. This prompted the aim of identifying the best plants in the world for various targets involved in type-2 diabetes. Our research takes it starting point in ethnopharmacological research already performed, mining results, selecting the most promising candidates, then evaluating in our lab, to find the truly promising plants. Preclinical data needs to be obtained to register 1 products with the health authorities.

Keywords: Denmark, diabetes targets, evaluation, herbal products, medicinal plant, population.
7.1. Isolation and Characterization of Secondary Metabolites from Arid Zone Plants of Rajasthan, India

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**Abstract:** Plants and plant products were used as the medicine from the earliest time. It is estimated by the World Health Organization that approximately 75-80% of the world's population uses plant medicines either partially or completely as medicine. In the present research work an attempt has been made to isolate the various bioactive compounds from *Prosopis cineraria* and *Amorphophallus konjac*. TLC profiling of plant extract gives an idea about the presence of various phytochemicals. The isolated compounds lupeol, \(\beta\)-Sitosterol and other terpenoids, which have potential source as Anti-HIV agents. Lupeol is first time isolated from *Prosopis cineraria*. Antimicrobial activity were performed against selected bacterial species *S. Aureus*, *K. Pneumoniae*, *Enterobacter clocae*, *Escherichia coli*, *S. Aureus*, *Proteus mirabilis*, *Eschaecalis* and *S. Pneumonae*. Therefore *Prosopis cineraria* and *Amorphophallus konjac* can be used as bioactivity guided fractionation to work as potential source of therapeutics and antibiotics in future curing of various ailments against multi drug resistant bacteria with (ATCC).

**Keywords:** *Amorphophallus konjac*, antimicrobial, arid zone, \(\beta\)-sitosterol, India, Lupeol, *Prosopis cineraria*.

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7.2. An Investigation of Potential Gene Level Interactions of Herbal Products

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**Abstract:** As medical use of herbal products has been growing substantially over last decades, the growing interest in the interactions of these health remedies. The interaction of conventional drugs with a variety of human genes is well studied however the number of the studies focusing on the gene-path level interactions of herbal products is still limited. The aim of this study is to examine the potential interactions of commonly used herbal products Ginkgo, St. John’s Wort, Kava and Ginseng with human genes through an approach including database searches based on molecular functions. The molecular functions of herbal products were explored using Gene Ontology database and literature searches carried out using NCBI PubMed Database covering its establishment to 2014. According to the analysis of databases and final modifications results in 171 molecular functions for target herbal products. Further searches and examinations for each herbal product revealed that 1447 genes involved in the mentioned pathways/biological reactions in which HP compounds play an important role while only 23 of them were studied from genomic perspective. The obtained genes are elaborated and grouped according to the current literature. The analysis of databases and final modifications resulted in 171 molecular functions for target herbal products. Further searches and examinations for herbal product revealed that 1447 genes involved in the mentioned pathways/biological reactions in which HP compounds play an important role while only 23 of them were studied from genomic perspective. Results of the study clearly shows that analyzed herbal products have stupendous potential of interacting with a variety of genes which brings the necessity of questioning effects of genomic variations on herbal product mechanisms and metabolisms. However, the number of genes studied for effects on herbal product efficacy forms a very small percentage. Thus, the further investigations on genes-herbal product interactions and the potential consequences of these interactions are essential to solve safety and efficacy problems.

**Keywords:** Gene level, herbal products, mechanism, metabolism, Turkey.
7.3. How Did Medicinal Plant Use Change? Adiachronic Study over Two Millennia in Switzerland

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Abstract: Medicinal plant knowledge in Switzerland can be traced back from present to antiquity (1). About 100 medicinal plant species and ethnotaxa are continuously documented over two millennia back through history. While some species underwent dramatic changes in use, application and preparation others show at present the same uses as in antiquity or monastic medicine. Drivers for these shifts and changes can be found in the evolution of medicinal concepts (e.g., humoralpathology vs. evidence-based medicine), changing environmental conditions, history of epidemiology, legal framework and economic reasons. Based on a broad selection of historical, popular and scientific herbals relevant for Switzerland we investigate how specific uses of medicinal plant changed over time. We elucidate use patterns (e.g., indica preparations, applications, plant part used) in relation to phylogeny. Our research documents several trends: a broad and continuous use of species from Lamiaceae, Apiaceae and Asteraceae. A decrease in importance for certain use categories (n=19) from antiquity to present, e.g., gynaecological (11.5% to 3% of total use reports) and antidots (9% to 0.5%), while the interest in medicinal plants for gastrointestinal disorders increased in recent popular herbals (23%) as well as in scientific literature (31%). Another general shift is detected in application form from topical use (43% antiquity, 22% contemporary) toward systemic use (50% antiquity, 75% contemporary) and plant part used with a recent focus on flowers instead of fruit and seeds in antiquity. Overall the general pattern is an increase in variety of use categories from antiquity to renaissance. The present folk medicinal herbals still reflect this variety whereas evidence based literature (e.g., ESCOP / EMA monographs) document only a small sector of present historical uses.

Keywords: Flowers, medicinal plant, millennia, renaissance, Switzerland.

7.4. Reverse Ethnopharmacology and Drug Discovery

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Abstract: Biological diversity is evidence for chemical diversity. Secondary metabolites are adaptive within members of a taxon and occasionally also between taxa exposed to similar ecological selection pressures. Chemodiversity is thus not distributed evenly across plant biodiversity. How widespread taxa contain a broader range of ecologically-relevant information encoded in their genes respect to locally occurring or locally evolved taxa. This information is expressed through the synthesis of metabolites having a wide ecological radius with broad-spectrum biota-specific interactions, including targeting of proteins in mammals and primates. How are biodiversity, drug discovery, traditional medicine and ethnopharmacology related? In this paper we propose the concept of “reverse ethnopharmacology” as a tool in the search for new drugs from ethnomedical floras. The question, if associative patterns between clinical and ethnomedical uses of the same taxa can be detected is focused on. Instead of starting from the ethnomedical point of view we look at the taxonomic origin and clinical indication of plant derived biomedical and clinical trial drugs and compare this data with the ethnomedical uses of the same taxa. The statistical association found between women’s medicine and anticancer drugs exemplifies the potential value of “reverse ethnopharmacology” in drug discovery.

Keywords: Biological diversity, ethnomedical flora, ethnopharmacology, plant biodiversity.
7.5. Ethnopharmacology and Global Health: Opportunities and Challenges

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Abstract: Herbal medicines and products derived from them have been labelled in any ways including natural health products and dietary supplements. The title tries to highlight the conflict between those see medicinal plants and traditional medicines as a key element of healthcare in many regions of the world. However, these are diverse products for which different (and very often limited) levels of evidence available. And as such, there has been not only a criticism of these products lacking an evidence-base also that there are tremendous health risks associated with poor quality and with a lack of quality assurance. In recent year an essentially private initiative has started to develop strategies for overcoming problems with adulteration in the US market – the ABC-AHP-NCNPR Botanical Adulterants Program (http://cms.herbalgram.org/BAP/index.html?ts=1422581352&signature=aeb7dcb4557556ae5:0b64b043). As we have argued such products are generally at the end of an often poorly understood value chain, which often links producers in biodiversity rich countries with the large markets in the North today more and more commonly in ‘emerging markets’ like China. However, simultaneously the cons in these emerging markets are also supplied such materials, and often the quality seems to be even poorer than in unregulated ‘northern markets’. The tools are available and – while they may not be accessible to all producers – regulatory frameworks can be implemented which foster good quality. Examples from our own metabolomic research and from our critical reviews of the pharmacological clinical evidence of commercially available herbal medicines, I discuss new opportunities to come evidence-based assessment of such products. In this presentation I want to highlight how I ethnopharmacology can contribute to a better and more sustainable use of such natural resources and is needed in terms of both setting standards and developing an outreach strategy in order to inform wider (Indian) public. So, yes medicinal plants can contribute to global health, but only if we base the of a more rigorous assessment embedded in an adequate regulatory framework.

Keywords: Challenges, dietary supplements, ethnopharmacology, herbal medicines, global health, natural products.

7.6. Ethno Botanical Assessment of District Lahore, Pakistan

Nadia Riaz Qamar, Zubaida Y., Afifa Y. and Rabia Hanif

Pakistan

Abstract: Present investigation limited to document medicinal uses of plants utilized by local comnu in Burj Attari, Pakistan. The purpose of this study was to collect information about the interactive- various communities of the area with plant wealth. The study represents data on 45 species belonging families. It was found that local communities of the area have rich tradition of using natural plant reso for their common diseases. Local inhabitants both men and women believe that these plants medicines are easily available, low-cost and with no side effects. It was found that common disorders as fever, cold, cough and diarrhea could be treated by simple herbal trees and herbal powders. And focus to study was on wild plant. For each species; botanical, local name, family and part used and ethno-botanical uses were mention. It is also suggested that plant based industries and markets shou promoted in the area to alleviate the poverty problems of local communities.

Keywords: Assessment, ethnobotanical, medicinal plants, natural plant resources, Pakistan.
7. Ethnopharmacology and Forgotten Medicines of the Transatlantic Slave Trade

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Abstract: By studies of books and manuscripts relating to the Danish overseas spheres of influence during the centuries of the transatlantic slave trade, as well as taxonomically reviewing the original herb specimens of the colonial European authors, the present project identifies historical West-African and Caribbean medicinal plant uses. We (re-)collect the plants species to further support the botanical identification of the modern distribution and availability, and to serve as voucher material in ethnobotanical interviews with the descendants of the Ga, Fante and Ashanti peoples, and of the Afro-Caribbean slave trade. This allows us to assess the scale of change and loss of knowledge within Ghanaians and other African island medicine systems, and to test our hypothesis that medicinal plants may be forgotten over time despite pharmacological potential. Plant material has been collected for bio-assays and chemical analysis of 134 historical medicinal plant uses in Ghana, 2-300 years ago, it was possible to trace 31 contemporary Ghanaians to traditional medicine. However, 69% appears to be discontinued or forgotten. Among the Ga, only two of the historical medicinal plant species have become locally extinct, and this significant loss of knowledge over time appears due to cultural change rather than biodiversity. Our lab results show that for a number of these “forgotten” medicinal plants, the historical use was pharmacologically supported, e.g. showing antibacterial, anti-inflammatory, antacid, abortifacient or wound healing properties in bioassays. We disseminate the results of the historical, botanical and pharmacological studies both scientifically and in publications dedicated to the descendants of the historical intellectual property holders, hoping to provide the foundation to re-introduce otherwise forgotten medicinal plant evidence-based ethnopharmacological contexts.

Keywords: Availability, distribution, medicinal plant, transatlantic slave trade.


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Abstract: Drug discovery from natural product research is at its peak of popularity now. Even though, there have been many scientific developments in proteomics and genomics pertaining to drug discovery natural products, but a huge hidden treasure of natural leads still remains unrevealed and we need to look for the hidden potential from the ethnic cultures and society. When it comes to drug discovery from traditional medicine histot always show the path and have provided vital information leads in shaping the future. Ethnic cultures and medicinal plants revealed the secret of synergism thus bringing out a new concept of polyherbal medication than look into single entities. The fact that traditional medicines has been in use for ages with positive effects ever since the drug discovery process a sure success affair. Collection of ethnobotanical leads is not a child’s play and it needs enormous patience. Ethnobotanists who conduct field work in areas where use of medicinal plants is a way of life are not trained to fully understand the disease state. The information gathered is generally inadequate for the laboratory scientist to evaluate in terms of selecting plants for ex vitro biological investigations. For example, the literature in ethnobotany and ethnopharmacology ush documents the following information: (a) the Latin binomial of the plant used, (b) common or local name of the plants used, (c) plant part and (d) geographical area where used. Data that are required ethnobotanical writing for assessment of the value of the plant medicine are (a) method of preparation of the medicine, (b) dosing, (c) source of information (which if not mentioned is difficult to trace), (d) route of administration and the symptomatology of the disease. If ethnobotanical information states that a plant used to allay thirst and since thirst is one of the many symptoms of diabetes, follow-up questions such as asked to see if the user urinates frequently, is susceptible to fungal infections or has any other characteristics of diabetes. Users of traditional medicines often perceive a relationship between the shape, size, and odor of plant materials and features of their diseases. This prompted the use of such plant afflications related to these factors. This is known as the doctrine of signatures. Some examples might be a plant which exudes a red sap or resin, or plants that are red in color, may be useful for hemorrhage bowel or blood related disorders. The point is that if ethnomedical information is to be of val
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drug discovery, it must be collected in more detail. Otherwise, this approach is no better than random selection followed by targeted biological screening. However, development of ethnobotanically trained personnel through inclusion of this subject in the pharmacy curriculum can solve the problem to a great extent.

Keywords: Culture, drug, ethnic society, holistic Approach, traditional medicine.

7.9. Ethnobotanical Investigation of *Acorus* in China

Zhang, Shuang1 Xin, T.1, Liu, Z.1, Zhou, Y.1, Ni, Y.1, Zhang, X.1, Ma, L.1 Chen, Z.1, Ho L.1, Li, F.1, Liu, B.1 and Long, C.1,2

1College of Life and Environmental Sciences, Minzu University of China. Beijing 100081. 2Kunming Institute of Botany, Chinese Academy of Sciences. Kunming 650201, China.

Abstract: China has a long history of using herbal medicinal plants. The genus *Acorus* was first mentioned by Shen Nong’s herbal classical in 200BC-200AD as traditional Chinese medicine. It was used for treating deaf ears, blind, cramps and digestive disorders. *Acorus* has been also used for multiple purposes, such as cultural and religion uses, spice, insecticide, and ornamental. Field studies were carried out to identify and highlight the traditional usage of *Acorus*. This genus is very important and valuable to every linguistic group in the whole country. Literature studies were tracked via PubMed, Scopus, Web of Science, and Google Scholar, and Chinese database. Field studies were carried out from August 2013 to September 2014. Ethnobotanical data were collected through key informant interviews, direct observation, semi-structured interviews, individual discussions and focus group discussions. The local names, uses, used, and preparation methods were involved. *Acorus* is used as traditional herbal medicine by 25 ethnic groups in China for the treatment of diseases including nerve system, respiratory system, digestive system, cardiovascular system, and with the activity of anti-inflammatory and wound-healing. It is an essential plant in Dragon-boat Festival for many centuries, with the good wish of praying healthy and dispelling the evil spirits. The phytochemical and pharmacological researches on *Acorus* have proved the rational medicinal treatments and other applications. Better understanding *Acorus* is vital important not only to protect its wild resources, but also to explore, inherit and promote traditional culture. This study supported by National Natural Science Foundation of China (31161140345 and 31070288) and the Ministry of Education of China (B08044, MUC985 and YLDX01013).

Keywords: *Acorus*, China, ethnobotanical, herbal medicine.

Brand, Eric¹, Zhao, Z.¹, and Guo, P.¹
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Abstract: Texts dedicated to the classification of medicinal substances, known as bencao, have imp
the clinical practice of Chinese herbal medicine for centuries. Bencao literature focuses on the or
properties, and effects of medicinal substances, and represents a valuable historical and cultural resou
well as an important reference point for new drug discovery and botanical authentication. In Chin
scientific discipline of pharmacognosy was influenced by exchange with Japan, where a number of tex
devoted to pharmacognosy emerged in the late 19th century. By the early 20th century, the discipl
pharmacognosy had reached China and materia medica knowledge began to be organized based on
taxonomy. While this era represents a milestone for the arrival of pharmacognosy as a modern scie
China, many aspects relevant to pharmacognosy had been previously explored in bencao literature
example, the Ming Dynasty illustrated text Origins of the Materia Medica was dedicated to morphologica
identification of medicinal materials, and previous works such as the Extension of Materia Medica focused
on the differentiation of genuine vs. inauthentic medicinals. In 1593 the Compendium of Materia Medica by Li Shizhen was published; featuring 1,892 medicinal substi
this monumental text utilized a novel, two-tiered classification system for organizing natural substi
This text was praised as a valuable medical encyclopaedia by Charles Darwin, and remains a rich res
with great relevance for pharmacognosy. Additional bencao texts focused on recording med
stances from specific geographic regions, such as the Materia Medica of Steep Mountainsides, catalogued local medicines from the region around modern-day Hangzhou. Bencao literature also inc
texts dedicated to medicinal processing, a practice that significantly impacts the chemistry and therapeut
nature of medicinal substances. Bencao literature contains valuable information on the authenticati
medicinal materials, the classification of natural substances, and the acquisition of new drug sources the exploration of locally used plants by indigenous groups. While these developments arose histor
prior to the arrival of the modern science of pharmacognosy, bencao literature illustrates a sophisticated
level of knowledge regarding the study of crude drugs, and has led to important medical advances su
the discovery of artemisinin and detailed methods of reducing the toxicity of traditional drugs su ac
onite and other agents.

Keywords: Aconite, artemisinin, Bencao, drug, literature, medicina, pharmacognosy, resource.

8.2. Canadian Aboriginal Traditional Medicinal Plants Used for the Treatment of Diabetes

Omri, Nadia, Parent, Michèle, Larocque, Sylvie, and Omri, Abdel
Laurentian University, Sudbury, Ontario, Canada.

Abstract: Diabetes mellitus type 2 is a significant health issue for the Canadian indigenous populatio
they are predisposed to this chronic disease. Furthermore, treatment compliance in this population has sub
optimal, leading to an increase in the prevalence and incidence of diabetes related complications. Th
of this research was to identify Canadian medicinal plants used by the indigenous population that may m
an impact on diabetes related complications. We used the updated method of Whitemore and Knafl and identified 14 natural products with antidiabetic properties. The pharmacokinetics and toxicolo
these plants were confirmed according to published retrospective studies. We found that the two prod
Populus balsamifera and Vaccinium vitis-idaea, are unlikely to counteract with commonly w
western medicine and their therapeutic properties. The bark of Populus balsamifera increased exp
expenditure, reduced appetite, and decreased glycemia and insulin resistance. This agent also exhibits obesity properties as it reduces body weight, the grade of steatosis, and the accumulation of retrop
fat and triglycerides levels. The fruit of Vaccinium vitis-idaea is also an excellent complementary trea
as it reduces disease-related complications and promotes weight loss. This fruit agent reduces LDL, in
advanced glycation end products, lowers the total cholesterol level, and decreases the grade of steatosis. Conclusion, this retrospective review will enable health professionals to better understand pharmacokinetics and pharmacodynamics of traditional indigenous medicine and their potential use with conventional drugs for better management of diabetes mellitus type 2.

Keywords: Canadian, Diabetes, Populus balsamifera, Vaccinium vitis-idaea.

8.3. Authentication is Fundamental for the Standardization and Globalization of Herbal Medicine

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Abstract: Traditional Chinese medicine (TCM) has earned worldwide recognition for its efficacy. As TCM undergoes rapid globalization, the safety of Chinese medicinals is drawing international concern. Medicinal authentication is a key first step for standardizing Chinese medicinals for global market research. Authentication methods include origin identification, macroscopic identification, microscopic identification, physical/chemical identification, and molecular biological identification. Many issues related to authentication have remained unresolved since ancient times. Determining the authenticity and quality of Chinese medicinals remains as much a frontier as it is an essential science in guaranteeing safety and efficacy of Chinese medicinals in clinical use. Authentication is directly connected to the clinical efficacy of TCM. This can be a matter of life and death in clinical practice and will almost certainly influence the fate of Chinese medicinals. The School of Chinese Medicine (SCM) of Hong Kong Baptist University (HKBU) is a HKSAR University Grants Committee-funded tertiary institution that provides full-time tertiary education degree program in TCM. SCM has been striving to promote the modernization and internationalization of Chinese medicine in its teaching, research, clinical services, consultancy services, and technology transfer. In the past 15 years, SCM has laid a solid foundation in the field of medicinal authentication and has made a major impact at home and abroad in this capacity. As an international trade center, Hong Kong is the source of many Chinese medicinal materials reaching international markets. The quality of Chinese medicinal in Hong Kong directly reflects the status of herbal markets overseas. SCM at HKBU will continue to make great efforts to promote Chinese medicinal authentication and the development of medicinal resources, which will in turn further strengthen the competitiveness and influence of Chinese medicinal in the international community.

Keywords: Authentication, Chinese medicinal, herbal medicine, globalization, standardization.
Abstract: Compounds originating from plants form an important part in human and animal medicine. A large proportion of currently used medicines are based on compounds originally isolated from plants. There has been a high success rate in developing medicines for diseases such as cancer, diabetes and malaria. There has been hardly any success in developing medicines against microorganisms or some parasites plants. Because microorganisms and parasites have developed a worrying resistance to many compounds, there is a great need to search for possible compounds from plants. Antimicrobial activities determined by a serial dilution technique using tetrazolium violet as growth indicator. Different methods were used to determine activity against parasites, ticks and blowflies. Traditional use of plants gave good results when we investigated the activity against internal and external parasites, ticks and blowflies. We found good results leading to some products and patents. Using traditional leads against microorganisms did not lead to good results. Plants may be selected after a random screening or on a taxonomical basis screening of leaf extracts of more than 700 trees have led to products with promising activity in handling diarrhoea and fungal infections. Factors useful in identifying promising leads include biological activity, cytotoxicity, selectivity index, mechanism of activity and activity in preclinical trials. Analysis of the data also led to identification of tree plant taxa with promising activities and selectivity against different pathogens. Promising products based on traditional use have been developed to treat infestations by helminths, ticks and blowflies. There are however many difficulties between discovering an effective extract and developing a commercially viable product. This aspect requires diverse expertise outside the sphere of academics. Protecting the intellectual property may also stifle collaboration advances in using plants to increase the quality of life of poor rural inhabitants. While it is relatively easy to isolate and characterize compounds that are active against bacteria and fungi, it is very demanding to isolate compounds active against parasites due to the complex assays used. It was very exciting when we found that in many cases there is a good correlation between antifungal and anthelmintic activity. This means isolating antifungal compounds and then testing it against helminths may be an easy strategy to facilitate identification of antiparasitic compounds.
9.1. Effect of Two Levels of Ginger (Zingiber Officinale) Powder Roots on Productive Performance of Awassi Ewe Lambs

Abdullah Isam Noaman
Department of Animal Science, college of agriculture, Tikrit university, Iraq.

Abstract: In this experiment used 12 individually feeding Awassi ewe lambs, (each group was 4 an average weight was 26.89kg, aged 4-5 months. Animals fed during the experiment on concentrate feed by 3.3% of body weight, the diets equal in total nutrients and in addition. Ginger powder roots was added diet and mix with the feed daily by 0, 5 and 10 g / kg dry matter, respectively. This Study Conducts effects of ginger on some productive performance. There was no significant difference on initial and final weight and average daily gain and total gain and feed conversion ratio by the levels of ginger powder and the control group.

Keywords: Ewe, ginger, lamb, performance, powder roots, Zingiber Officinale

9.2. Ethnoveterinary Knowledge and Practices in Tribal Communities of Thakht-Sulaiman

Ahmad, Khalid1, Ahmad, Mushtaq2, Weckerle, Caroline3
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2Department of Plant Sciences, Quaid-i-Azam University Islamabad-Pakistan
3Institute of Systematic Botany, University of Zurich-Switzerland.

Abstract: The pastoralist’s tribal communities of Thakht-e-Sulaiman hills were investigated for the ethnoveterinary knowledge and practices. The locals inhabit this remote and geographical isolated are rely on livestock raising from centuries, which strongly linked them with natural remedial entities. Therefore, the region was of special importance to be assessed and analyzed for ethnoveterinary knowledge, its applications and efficacy. A field work of two year duration was conducted and 86 informants consulted. A detailed semi-structured interviews and group discussions were made with key informa the first phase of the study while successive oral freelistings were performed during the second phase veterinary diseases were categorized as described by the informants according to the symptoms they and the organs they affect. Information on the cited plants, informant consensus factor (FIC), fidelity (FL) and cultural importance index (CI) were calculated using use report. A total of 22 ethnoveteran medicinal plant species, belonging to 21 genera and 20 families with 559 use reports from two different ecological zones, were recorded. Among them, more species were documented from foothills but the reports of mountain species were higher. Leaves, oral administration and decoction were the dom among the parts used, route of administrations and type of preparations respectively. All the reported ailments were classified into 8 medicinal categories where skeletal-muscular problems followed gastrointestinal ailments were the major groups but ritual and dermatological medicinal classes were the high ICF. The highly cited species with broader CI were Pinus gerardina, P. wallichiana Daphne papyracea while highest FL was obtained for Salix tetrasperma, Berberis calliobotrys and i monopetala respectively. Interestingly, 56% of the present species were having the same or partially modified use for humans as well. The research provide an insight that species with high medicinal pot would not have only higher use reports, but also wider acceptance, broader application, multiple wa preparation and administration. There is a need to conserve the medicinal plants uses and its assoc knowledge, as it could serve to lead in the development of modern herbal drugs.

Keywords: Ethnoveterinary practices, medicinal plants, Pakistan thakht-e-Sulaiman.
9.3. Effect of Aqueous Extract of Cumin Seeds on the Production and Physiological Performance and Some Blood Parameters of Broiler, Ross 308

Ahmed A. AL-Douri and Ahmed A. Dawood
College of Agriculture, Tikrit University, Iraq.

Abstract: The present study was conducted to find out the effect of aqueous extract of cumin seeds on productive and physiological performance of Ross308 broilers. A total of 270 broiler chick (Ross were randomly divided into three treatments with three replicates of 30 chicks each. The experin treatments were as follows: T1 / as Control treatment without the addition of Aqueous extract cumin drinking water. T2 / addition of Aqueous extract cumin by 1ml per Liter in drinking water. T3 / additi Aqueous extract cumin by 1.5ml per Liter in drinking water. The results showed that the supplement of 1.0 or 1.5 ml Aqueous extract cumin a significant increase (p<0.05) for live body weight, body w gain , and feed conversion ratio as compared to control treatment . but they had no significant effects on feed intake, mortality rate . dressing percentage and other blood constituents(glucose, cholesterol, triglycerides, total protein, globulin ,albumin , ALT and AST. and caused significant decrease (p<0.0 MDA.

Keywords: Aqueous extract, blood parameters, broiler, cumin.

9.4. Effect of Pomegranate Juice as a Diluent Supplementation on Sperm Quality During Liquid Storage of Chicken Semen

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Abstract: In an attempt to find a suitable in vitro storage method for roosters' semen, an experimen conducted to study the influence of inclusion pomegranate juice (PJ) into semen diluent on semen q during liquid storage for up to 72 h. A total of 60 White Leghorn roosters, 40 weeks of age, ranc divided into 6 treatment groups (10 males each) were used in this study. Treatment groups were as fol T1 = fresh semen, T2 = semen diluted 1:2 with Al – Daraji 2 diluent (AD2D) alone, T3 – T6 = s diluted 1:2 with AD2D supplemented with 1 ml, 3 ml, 5 ml or 7 ml of PJ / 100 ml of diluent, respect Semen samples were assessed after in vitro storage at 4 – 6 °C for 12 h, 24 h or 36 h as regards activity, individual motility and percentages of dead spermatozoa, abnormal spermatozoa and acrosomal abnormalities. Results revealed that supplementing the diluent of roosters semen with PJ (T3, T4, T; T6) and then store it for different storage periods (12 h, 24 h or 36 h) resulted in significant (p < improvement in spermatozoa motility, viability, morphology and acrosomal integrity in comparison control group (T1). Moreover, T5 and T6 surpasses other treatments with respect to these s characteristics, while there were no significant differences between T2, T3 and T4 concerning all s traits included in this study. In conclusion, the substitution of AD2D diluent composition wi significantly improves quality of roosters semen that in vitro stored for up to 36 h. Furthermore, the po effect of PJ observed in this study may be due to enhanced sperm resistance to lipid peroxidation naturally occurred during in vitro storage of avian semen.

Keywords: Chicken semen, liquid storage, pomegranate juice, semen quality.

9.5. Effect of Water Spray and Formaldehyde Treated and Untreated Anise Seed Supplementation on Some Blood Characteristic in Friesian Cow Under Heat Stress

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¹Department of Animal Resc. University of Baghdad. ²Department of Animal Prod. University of Dia Iraq.

Abstract: This study was carried out at the Animal Farm pertaining to the Department of A: Resources, College of Agriculture, University of Baghdad, using 18 multiparous Holstein Friesian following their beak milk production. The cows were randomly divided into two main groups (wit without spraying, the body with water). Each group was sub-divided into three sub groups including 3
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Each representing treatment of anise (0 and 30 gm of formaldehyde-treated anise as well as 30 formaldehyde untreated anise to the concentrate diet/cow/day). The field part of the experiment continued for the period from 1/7/2012 to 2/10/2012 to study the effect these treatments on the productivity and physiological performance under heat stress conditions in Summer. Results revealed the experimental cows were exist under severe heat stress during the experiment which negatively affect some studied traits. Significant (P<0.05) effect of anise was observed on some blood characters (cholesterol, cortisol and thyroxin hormones). Excluding data of cortisol hormone which was dec (P<0.05) in spraying group (1.01±0.22) at the end of the experiment, the influence of water spraying blood attributes lacked significant. The interaction between the anise treatment and water spraying positively significant (P<0.05) on most studied traits. The formaldehyde 30 gmcow/day anise treated was better than untreated group during the experiment. It seems clear that exposure of dairy cattle to stress in summer had a negative effect on productive and physiological performance. The formaldehyde treated and untreated anise supplementation (30 gmcow/day) to concentrate diet and water spraying d afternoon led to the mitigate the adverse effect of heat stress of these cows and enhanced their perform.

Keywords: Anise seed, blood characteristic, friesian cow, heat stress.

9.6. Thymus vulgaris and Propolis In Vitro Synergistic Effect Against Bovine E. coli Strains

Niculae Mihaela1, Spinu Marina1, Sandru C. Dana1, Niculae E. Catalina1, Mates C. Ioa Junkee Laeish1, Doczi I. Krizstina2, Stan Laura2

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Abstract: Both propolis and Thymus vulgaris L. derived products were previously demonstrated relevant therapeutical potential including antimicrobial, antifungal and antiseptic properties. The aim of study was to evaluate the possible synergistic antibacterial activity of the association between propolis Thymus vulgaris L. against E. coli strains isolated from bovine clinical mastitis. Materials and methods Five propolis samples and essential oil and ethanolic extract obtained from Thymus vulgaris L. were tested in vitro against multiresistant strains of E. coli of bovine origin (resistant towards amoxicilllin, kanan gentamicin, enrofloxacin, cefquinome). The minimum inhibitory concentrations (MIC) were determined based on a broth microdilution method, while the synergism was investigated by the time-kill curve method. Total phenolic acid the propolis samples were established by FolinCiacalteau method. Results and conclusions. All tested products displayed antimicrobial properties, with the highest efficacy in case of Thymus vulgaris L. essential oil and propolis combinations, for all propolis samples and against a tested strains, with MIC values ranging from 0.125 % to 1% (v/v). The propolis samples with the phenolics of 38,02% ±2.34% and the essential oil induced an enhanced in vitro susceptibility coli strains pointed out by the results of the bacterial survival rates. Further studies are intended to study possible synergism with antimicrobials, as proposed alternatives in case of multiresistant E. coli treatment.

Keywords: E. coli, essential oil, ethanolic extract, Romania, Thymus vulgaris.

9.7. Use of Bidens pilosa as a Novel Veterinary Remedy for Coccidiosis in Chicks

Wen-Chin Yang1,2 and Cicero L.T. Chang2

1Agricultural Biotechnology Research Center, Academia Sinica. 2Department of Veterinary Medicine, College of Veterinary Medicine, National Chung Hsing University, Taiwan.

Abstract: Coccidiosis is a bane to the poultry industry causing considerable economic loss. Extensive of current anti-occidial drugs together with drug resistance and residue has raised concerns about health and poultry development. Plants have long been an extraordinary source of medicines for mic infections in humans and animals. Here, we studied the anti-occidial properties of the edible, medic plant Bidens pilosa (Asteraceae). A phytochemical approach including high-performance liquid chromatography, ultraviolet spectroscopy and mass spectroscopy was developed for analysis of different preparations of B. pilosa utilized as a feed additive. Good batch consistency and quality control revealed in different batches of preparations. The protective effects of B. pilosa, supplemented i
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standard chicken diet were evaluated on 74 chickens infected with *Eimeria tenella*. ANOVA and chi-squared test were used for statistical analyses. Three doses of *B. pilosa* significantly protected against *E. tenella* as measured by reduction in mortality, weight loss, fecal oocyst excretion and gut pathology in chickens. Finally, drug resistance of *E. tenella* to *B. pilosa* and salinomycin, a commercial anti-coccidial drug assessed in 169 chickens using the anti-coccidial index. Unexpectedly, this index showed that *B. pilosa* induced little, if any, drug resistance to *Eimeria* in chickens. Collectively, this suggests that the edible plant, *B. pilosa* may serve as a novel, natural remedy for coccidiosis with low drug resistance in chickens.

**Keywords:** *Bidens Pilosa*, chickens, coccidiosis, edible plant, natural remedy, poultry, Ta
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