

In Vitro Antimicrobial Properties Of Plant Essential Oils

Fluidics, an increasingly examined topic in nanoscience and nanotechnology is often discussed with regard to the handling of fluid flow, material processing, and material synthesis in innovative devices ranging from the macroscale to the nanoscale. Nanoemulsions - Properties, Fabrications and Applications reviews key concepts in nanoscale fluid mechanics, its corresponding properties, as well as the latest trends in nanofluidics applications. With attention to the fundamentals as well as advanced applications of fluidics, this book imparts a solid knowledge base and develops skill for future problem-solving and system analysis. This is a vital resource for upper-level engineering students who want to expand their potential career opportunities and familiarize themselves with an increasingly important field.

Research Paper from the year 2013 in the subject Chemistry - Bio-chemistry, grade: none, Madonna University Elele, Nigeria, course: Pharmaceutical and Medicinal Chemistry, language: English, abstract: The in vitro antimicrobial activity of crude methanol and aqueous extracts of the seeds of *Bucholzia coriacea* were investigated. The extracts exhibited antimicrobial activities against *Escherichia coli*, *Klebsiella pneumoniae*, *Bacillus subtilis*, *Staphylococcus aureus*, *Salmonella typhi*, *Bacillus cereus* and *Pseudomonas aeruginosa*. The minimum inhibitory concentration (MIC) of the ethanol extract was between 0.50 – 6.00 mg/ml while the minimum bactericidal concentration ranged from 2.0 – 10.0. The methanol and water extracts exhibited antifungal activity against *Candida albicans* and *Aspergillus niger* with zones of inhibition of 7.50 and 2.80mm for *Candida albicans*; and 6.0 and 2.0 for *Aspergillus niger*. Phytochemical screening revealed the presence of tannins, saponins, terpenoids, cardiac glycosides and alkaloids in the ethanolic and water extracts. The ability of the ethanol extract of *Bucholzia coriacea* seeds to inhibit the growth of bacteria and fungi is an indication of its broad spectrum antimicrobial potential which justifies its utilization in traditional medicine in treatment of infections.

The fast growing problem of drug resistant pathogens and emergence of undesirable side effects of certain drugs has necessitated the need to search for new antibiotic sources. There are lots of drugs today that originally came from herbs or plants. This study focused on one of the Philippines' endemic plant which is *Glochidion cagayanense* C.B. Rob. This present work dealt with the preliminary antimicrobial activity of the leaves of *G. cagayanense* C.B. Rob through the disc diffusion method and the minimum inhibitory concentration (MIC). The concentrated methanolic extract was subjected to vacuum liquid chromatography (VLC), obtained fractions with similar TLC profile were pooled. Most of the VLC sub-extracts showed antibacterial activities against Gram-negative bacteria and Gram-positive bacteria. Among the VLC sub-extracts GCM2 and GCM3 showed the highest activity (ZI of 15.7 & 14.6 mm) against *Klebsiella oxytoca* while GCM1 showed the highest activity (ZI of 14.0 mm) against *Bacillus subtilis*. The MIC values observed for all microorganisms tested have the same mean level of 25 mg/mL and Minimal Bactericidal Concentration of 50 mg/mL except for *Staphylococcus epidermidis*, *Staphylococcus aureus* and *Candida albicans* whose MIC values were 6.5 and 12.5 mg/mL respectively. Screening of phytochemicals revealed the presence of flavonoids, steroid, phenols, tannins, sugars, and triterpenes. It is probable that some of these compounds, alone or in combination are responsible for the observed antimicrobial properties. Therefore, *Glochidion cagayanense* extract could be a potential source of effective and affordable antimicrobial compounds.

Antibiotics are antimicrobial agents that are used to treat infectious diseases. The outbreak of pathogenic antibiotic-resistant strains illustrates our urgent need to search for new alternative sources of treatment. Hence, an attempt has been made in this review to list some plant extracts, essential/volatile oils, and their antimicrobial activity against different microorganisms using different methods, as well as synergistic effects (plant extract-plant extract, plant extract-essential oils, plant extract-conventional antibiotics, phytochemical-antibiotics, and essential oil-essential oil). Plant products and their active constituents are useful in the treatment of infectious diseases caused by multidrug-resistant microbes, food borne diseases caused by food spoiling microbes, and oral pathogens. Products derived from plants have the potential to control microbial growth in diverse situations, and specifically in the treatment of disease. The various aspects of this review may be helpful for the food, cosmetic, and pharmaceutical industries.

There are 500 *Helichrysum* (Asteraceae) species world wide of which 245 occur in South Africa. The South African species display great morphological diversity and are, therefore classified into 30 groups (Hilliard, 1983). *Helichrysum* species have been reported for their antimicrobial activities (Rios et al., 1988; Tomas-Barberan et al., 1990; Tomas-Lorente et al., 1989; Mathekga, 1998; Mathekga et al., 2000). Not much information on the bioactivity of compounds isolated from these species is available. In vitro antimicrobial screening methods provide the required preliminary observations to select among crude plant extracts those with potentially useful properties for further chemical and pharmaceutical investigations. In this study we investigated the antimicrobial activities of crude acetone extracts (shaken and homogenized) of twenty-eight *Helichrysum* species on ten bacteria species and six fungal species. A new phloroglucinol with significant antimicrobial properties was isolated by bioactivity guided fractionation from *Helichrysum caespitium*. The structure elucidation, conformation and stereochemistry of the new phloroglucinol, 2-methyl-4-[2',4',6'-trihydroxy-3'-(2-methylpropanoyl) phenyl] but-2-enyl acetate (caespitate), was established by high field NMR spectroscopic, crystallographic and MS data. The compound inhibited growth of *Bacillus cereus*, *B. pumilus* and *Micrococcus kristinae* at the very low concentration of 0.5 ; g /ml and *Staphylococcus aureus* at 5.0 ; g/ml. Six fungi tested were similarly inhibited at low MICs: *Aspergillus flavus* and *A. niger* (1.0 ; g /ml), *Cladosporium cladosporioides* (5 ; g/ml), *C. cucumerium* and *C. sphaerospermum* (0.5 ; g /ml) and *Phytophthora capsici* at 1.0 ; g/ml. The cytotoxicity of most currently used drugs has become a serious problem and efforts are being directed to obtaining new drugs with different structural features. One option favoured is the search for new plant derived non-toxic drugs, as was investigated in this study. Caespitate proved to be non-toxic at biologically active concentrations. Development of resistance to

synthetic chemotherapeutic agents is known to occur in modern medicine: for example, resistance to some antibiotics of certain strains of microorganisms. A synergistic antibacterial bioassay demonstrated that the combination of caespitate and caespitin enhanced activity from a concentration range of 5 ; g /ml to 0.5 ; g /ml down to 0.1 ; g /ml to 0.05 ; g /ml on Gram-positive bacteria. The synergistic effect was in addition displayed against Gram-negative bacteria. The study of the morphology and ultrastructure of the epicuticular trichomes revealed that trichomes in *H. caespitium* originate from papillate cell outgrowths which elongate, develop and later polarise into apical, stem and basal parts and that repeated secretions of compounds probably occur from the young three-celled stage, enable us to characterise and relate our observations to their possible functional role in the production of the antimicrobial and other compounds on the leaf surface. South African *Helichrysum* species are a potentially good source of antimicrobial agents worthy of further investigation as efficient therapeutic compounds and in assisting the primary health care in this part of the world.

Fagonia Cretica is well known herbal plant used in traditional medicine of Pakistan, India and Far East, it is reputed to obtain a profitable therapeutical properties and it has been used in treatment of fever, thirst, vomiting, dysentery, asthma, urinary discharges, and liver troubles. Externally applied as a paste on tumors and other swellings of the neck. Reported to possess potent antibacterial properties against pathogenic organisms, also the scientific studies of the plant proved the presence of hematological, neurological, anticancer, and hepato- activity. The present study targeted the extraction and, study of antimicrobial properties of the extract. The most recent study proved that the plant has a high effect for the treatment of the breast cancer, the plant has the property to kill cancerous cells selectively without any harm to the normal cells and without any side effect

In Vitro Antimicrobial Properties of a Mouthrinse Containing Glycerine, Potassium Nitrate and Sodium Fluoride
In-vitro antimicrobial activity of the methanolic extract and sub-extracts of *Glochidion Cagayanense* (Euphorbiaceae) leaves
An initial study was designed validate an in vitro antimicrobial assay and evaluate the activity of natural antimicrobial animal proteins/peptides. A radial diffusion assay was utilized. By regressing known concentrations of tested compound against their respective clearance zones, an equation was developed to determine the minimum inhibitory concentrations (MIC) for polymyxin B (control antibiotic) which were 0.76, 0.76, and 0.90 [Mu]/g/mL for *Escherichia coli*, *Escherichia coli* (nalidixic acid-resistant), and *Staphylococcus aureus*, respectively. The intra- and inter-assay variations were 0.18 and 0.2%, respectively. Lactoferrin, lactoferricin B, hen egg lysozyme, and alpha-lactalbumin LDT2 were determined in vitro to kill bacteria. Each of the tested proteins/peptides was active against a nalidixic acid-resistant strain of *E. coli*. The antimicrobial activity of each protein/peptide in animal digesta fluid was 130 to 300% greater than that in the acetic acid media. Lactoferrin activity was decreased (P

Objectives This study was undertaken to screen the in vitro antimicrobial properties of four Australian native *Eucalyptus* species, i.e., *E. dives*, *E. gunnii*, *E. olida* and *E. staigeriana* against five food-related micro-organisms, i.e., *E. faecalis*, *S. aureus*, *E. coli*, *P. aeruginosa* and *C. albicans*. The influences of two different extraction methods as well as the influence of a surfactant as plant extract dissolver in the water-based culture media used in agar disc diffusion tests and the role of growth location of two different *E. olida* specimens were investigated on the antimicrobial activity. Plant extracts profile and major compounds were analysed by GC/MS. Results Essential oils of the four *Eucalyptus* species displayed a variable degree of antimicrobial activity against the panel of micro-organisms tested, *E. staigeriana* oil showing a greater potential. Hexane extracts displayed no or low antimicrobial properties against the microbial strains tested with the exception of *S. aureus*. *P. aeruginosa* proved to be the most resistant micro-organism tested while *S. aureus* was the most sensitive one. The effect of a surfactant showed to decrease the antimicrobial activity of plant extracts or to not have any influence at all. GC/MS analyses showed that *E. staigeriana* and *E. dives* essential oils contain mostly volatile compounds while essential oils of both *E. olida* specimens contain heavier compounds.

Probiotic microorganisms are recognised as being beneficial for human health. Prebiotics are substrates that are used preferentially by the probiotic bacteria for their growth. A great deal of interest has been generated in recent years in identifying probiotic bacteria and prebiotics, their characterization, mechanisms of action and their role in the prevention and management of human health disorders. Together they are referred to as synbiotic. This book is in response to the need for more current and global scope of probiotics and prebiotics. It contains chapters written by internationally recognized authors. The book has been planned to meet the needs of the researchers, health professionals, government regulatory agencies and industries. This book will serve as a standard reference book in this important and fast-growing area of probiotics and prebiotics in human nutrition and health.

A novel series of 1,3,4-oxadiazole analogues were synthesized for their antimicrobial activities using disk diffusion and agar streak dilution method. The synthesized compounds were tested for their in vitro antimicrobial activity against the Gram-positive bacteria *Staphylococcus aureus* and *Bacillus subtilis*, the Gram negative bacteria *Proteus mirabilis* and *Pseudomonas aeruginosa*, the fungal strain *Aspergillus niger* and the yeast like pathogenic fungus *Candida albicans*. All the compounds were found to possess a broad spectrum of antimicrobial activities. Synthesized oxadiazole analogues exhibited more pronounced inhibitory activity against Gram-positive bacteria than Gram-negative bacteria. Antifungal properties of the oxadiazole analogues were found to be weaker when compared to their antibacterial activity. The efforts were also made to establish structure activity relationships among synthesized compounds.

All Enterobacteriaceae isolates tested were susceptible at M.I.C.

Honey is a natural medicinal substance, has been applied since ancient times as a natural remedy of various ailments and diseases. It is valued to possess antimicrobial and anti-inflammatory activity. The present study was to determine the in-vitro antimicrobial activity of different honeys samples belonging to Pakistani floral sources against certain clinical pathogens and too compared with commercial antibiotics. This book useful for the researcher, student and teachers of the Microbiology.

This timely and original handbook paves the way to success in plant-based drug development, systematically addressing the issues facing a pharmaceutical scientist who wants to turn a plant compound into a safe and effective drug. Plant pharmacologists from around the world demonstrate the potentials and pitfalls involved, with many of the studies and experiments reported here published for the first time. The result is a valuable source of information unavailable elsewhere.

Lipids and essential oils have strong antimicrobial properties — they kill or inhibit the growth of microbes such as bacteria, fungi, or viruses.

They are being studied for use in the prevention and treatment of infections, as potential disinfectants, and for their preservative and antimicrobial properties when formulated as pharmaceuticals, in food products, and in cosmetics. Lipids and Essential Oils as Antimicrobial Agents is a comprehensive review of the scientific knowledge in this field. International experts provide summaries on: the chemical and biological properties of lipids and essential oils use of lipids and essential oils in pharmaceuticals, cosmetics and health foods antimicrobial effects of lipids in vivo and in vitro antimicrobial lipids in milk antimicrobial lipids of the skin antibacterial lipids as sanitizers and disinfectants antibacterial, antifungal, and antiviral activities of essential oils antimicrobial lipids in milk antimicrobial lipids of the skin antibacterial lipids as sanitizers and disinfectants antibacterial, antifungal, and antiviral activities of essential oils Lipids and Essential Oils as Antimicrobial Agents is an essential guide to this important topic for researchers and advanced students in academia and research working in pharmaceutical, cosmetic and food sciences, biochemistry and natural products chemistry, microbiology; and for health care scientists and professionals working in the fields of public health and infectious diseases. It will also be of interest to anyone concerned about health issues and particularly to those who are conscious of the benefits of health food and natural products.

The Lichens covers the structure and development, physiology of the intact thallus, environmental response and effects, secondary metabolic products, and symbiotic interactions of lichens. This book is divided into five parts encompassing 19 chapters. It also includes appendices consist of a taxonomic scheme, methods for isolating and culturing lichen symbionts and thalli, and methods for isolating and identifying lichen substances. The first part of this book describes the original fungal cell and its development into specialized cells of which the various tissues and thalli are composed. This is followed by discussions on sexual reproduction of ascolichens and basidiolichens and on systematic criteria for the definition of taxa in different hierarchical steps. This book also explains the types of propagules produced by lichens and the submicroscopical investigations of lichens, including phycobiont and mycobionts' substructure and symbiotic relationship. The second part of this book examines the physiological aspects of lichens. It includes discussions on metal cation uptake and translocation in vascular plants and on lichens' role in rock weathering and soil formation. This part also studies photosynthetic rates and nitrogen absorption and metabolism by the intact thallus of lichens. Succeeding chapters discuss physiological and morphological responses of lichens to the most important environmental factors and the relationship of these factors to lichen distribution. Substrate preferences of lichens and their causes and implications with regard to the ecology, distribution, and taxonomy of lichens are also examined. This text also discusses lichen thalli growth, methods of measurement, and factors influencing growth. Finally, the concluding parts deal with the biosynthesis of lichen substances, secondary metabolic products, and symbiotic relations of lichens to fungi and algae. This multi-authored book is an ideal source of information for researchers, teachers, and students who wish to broaden their knowledge in the diversity of lichenology.

Antimicrobial susceptibility -- *Agapanthus africanus* -- Plant extract -- Pheroid?? -- Accelerated stability testing -- Human pathogens -- Formulation -- Antimikrobiële vatbaarheid -- Plant ekstrakt -- Versnelde stabiliteitstoetsing -- Menslike pathogene -- Formulering.

Increasing incidence of anticancer and antimicrobial resistance are the most common concerns in the medical field. Cancer is a serious disease that can affect almost every tissue lineage in the human body and poses great challenges to medicinal science. In addition, many antibiotics have a tendency to becoming resistant and are prone to severe adverse effects after long term use. Hence, there is an urgent need to discover and develop novel antitumor drug molecules which could effectively inhibit proliferative pathways with fewer side effects. Also, increasing demand to synthesize novel antimicrobial agents that are active against resistant strains. This research aimed to design, synthesis, physical studies and biochemical evaluated of some novel pyrazolones and their corresponding ribonucleoside, deoxyribonucleoside and benzoyl analogues for their in vitro antimicrobial and anticancer activities. Antimicrobial properties of the title compounds were investigated against Gram positive and Gram negative bacterial as well as fungal strains. Anticancer activity was performed against HL60 cell lines. Antimicrobial activity results revealed that the synthesized azo compound 113c, and the synthesized nucleosides compounds 116a and 118c were found to be the most effective agents with better MIC values, compared to some existing antimicrobial drugs, such as Ceftriaxone and Amphotericin B. On the other hand, the results of anticancer study indicated that the synthesized nucleosides 117a, 122a,b and 123 were found to be most potent anticancer agent against the cancerous HL60 cell line while the synthesized nucleosides 117e,f, 122a and the benzoylated compounds 124c,d,f, and 124g showed good affect against the A-549 cell line. Also, pyrazolones derivatives are more sensitive against the lung cancer. Binding affinity and selectivity of the synthesized compounds towards ct-DNA were studied at different conditions of pH and solvents; the results showed that compound 118c interact and stabilize the ct-DNA which can be anti-cancer agent. Therefore, these compounds, open new avenues for the development of antibacterial and anti-cancer therapeutic agents for the treatment of infectious and cancer diseases. Also, these results give an insight into the structure-activity relationships, which are tremendously important for the design of further new antimicrobial and anticancer agents.

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