Commentary
Volume 11:3, 2022

Alternative and Integrative Medicine

ISSN: 2327-5162 **Open Access**

Plant Extracts Contains Endogenous Bacterial Flora: Medicinal Plant

Wagner Diniz*

Department of Orthodontics, Faculty of Dentistry, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil

Description

Since ancient times, medicinal plants (MPs) have been utilised in traditional and folk medicine. MPs are a significant source of bioactive compounds, such as antibiotic, antiviral, and antifungal chemicals. Traditional medicine is the culmination of all procedures based on the theories, convictions, and encounters of various societies and eras. It is frequently mysterious and used for sickness prevention, early detection, and treatment, as well as to maintain and promote health. The World Health Organization developed clear rules for conducting clinical research and evaluating the efficacy of conventional medicine. Preparations based on MPs have evolved over time, particularly in relation to ethnobotanical and ethnopharmacological investigations, and are today employed as a source of chemicals, either directly (e.g., atropine, morphine, etc.) or for chemo-pharmaceutical hemi synthesis (e.g., acetylsalicylic acid, paclitaxel, etc.). When it is proven that a specific group of components has a different and superior pharmacological impact than the individual elements, MP extracts are utilised due of their phytocomplex. It is generally established that St. John's wort (Hypericum perforatum) only has an antidepressant effect when the phytocomplex that is rich in flavonoids, hypericins, and hyperforins is present. Even for severe diseases, single active compounds are frequently utilised in medicine. Examples include the use of taxol for neoplastic pathologies, artemisinin as an antimalarial, and morphine as an analgesic. The MP phytocomplex-containing extracts, on the other hand, are more frequently employed in the prevention and treatment of many disorders with mild to moderate severity: inflammation-prone rheumatic illnesses (*Boswellia serrata*, *Harpagophytum procumbens*), cardiovascular diseases (*Crataegus monogyna*), metabolic diseases (red fermented rice), neuro-psychic disorders (*Hypericum perforatum*, *Rhodiola rosea*), urinary genital disorders (*Serenoa repens*), digestive system disorders, such as irritable colon (essential oil of *Mentha piperita*), and recurrent infections of the ENT (ear, nose, and throat) and the bronchopulmonary system (*Eucalyptus globulus*, *Echinacea purpurea*) [1].

It is crucial to keep in mind that MPs are complicated, dynamic systems when they are utilised in medical therapy. As a result, their chemical makeup varies depending on a number of variables, including botanical species, genetically determined chemotypes, anatomical parts of the plant used (such as seeds, flowers, roots, and leaves), storage, sun exposure, humidity, type of ground, time of harvesting, and geographic area. Additionally, biogenic elements can alter the chemical composition of a plant, such as the bacterial and fungal endophytes attached to various plant sections. Recent years have seen a revolution in our understanding of plant biology as a result of the study and research of the numerous interactions between MPs and endophytes. These interactions have the potential to modulate, amp up, or interfere with the biosynthesis of phytoconstituents (such as terpenes, polyphenols, alkamides, etc.), as well as directly engineer the synthesis of new molecules, such as those with antibiotic activity [2,3].

Many MPs, including those from Traditional Chinese or Ayurvedic Medicine, have been shown to have antibacterial action *in vitro* and *in vivo*. The availability of clinical tests through rigorously conducted clinical trials is related to the uniqueness of the most recent research. Even though they are effective *in vitro*, many drugs have limited bioavailability or have direct harmful effects on humans, making them unsuitable for clinical use. Therefore, every preclinical research must utilise innovative pharmaceutical technologies, such as nano-formulations of active ingredients, and be backed by clinical pharmacological investigations.

The on-going spread of multi-drug resistance (MDR) microorganisms and the closing of the pipelines for novel antibiotic discoveries pose major threats to human health. Bacterial endophytes of MPs have been shown in numerous studies to be potential sources of antibacterial compounds. Contrarily, only a small number of novel antibiotic families have been identified since 1985, underlining the need for a different approach to extract potent antibiotics from endophytes. The traditional use of MPs may point to significant biological considerations and applications in the production processes. For instance, many conventional treatments frequently contain two or more antibiotic manufacturers, which may slow the evolution of resistance. Additionally, the metabolomic investigation of an *Aspergillus/Streptomyces* co-culture revealed the creation of additional natural compounds compared to a single culture. Additionally, the inclusion of additional strains that generate enhancing substances, such as cyslabadan, rather than antibiotics improves the antibacterial potential of certain Streptomyces. The action of -lactams against methicillin-resistant *S. aureus* has been enhanced by this molecule (MRSA). Additionally, the in situ incubation of bacteria in diffusion chambers and the addition of original micronutrients to the growth media are potential revertant tactics when antimicrobial production declines in *in vitro* bacteria cultivation [3-5].

Focusing on biotechnological and medicinal applications, the research discusses the function of MP bacterial microbiota in the synthesis of plant antibacterial chemicals. An effective possibility to create long-lasting defences against human and plant infections is the study of the MP-endophyte.

Conflicts of Interest

The authors declare no conflict of interest.

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***Address for Correspondence:** Wagner Diniz, Department of Orthodontics, Faculty of Dentistry, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil; E-mail: diniz.wagner@yahoo.com*

Received: 03-Mar-2022, Manuscript No. aim-22-67790; **Editor assigned:** 05-Mar-2022, Pre QC No. P-67790; **Reviewed:** 19-Mar-2022, QC No. Q-67790; **Revised:** 24-Mar-2022, Manuscript No. R-67790; **Published:** 31-Mar-2022, DOI: 10.37421/2327-5162.2022.11.386

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How to cite this article: Diniz, Wagner. "Plant Extracts Contains Endogenous Bacterial Flora: Medicinal Plant." Alt Integr Med 11 (2022): 386.