

REVIEW ARTICLE

Phytoextracts as Antibacterials - A Review

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Abstract: Botanicals have been cultured to flavour food, to treat health disorders and to put a stop to diseases caused by various microorganisms. The awareness of curative features of different medicinal plants has been spread among human communities. The application of herbal products as antimicrobial agents may be a better choice for the extensive and imprudent use of synthetic antibiotics. World Health Organization recommended traditional medicines as the safest remedies for the treatment of diseases of microbial origin. The plant extracts are generally non-hazardous, available in plenty at reasonable prices, biodegradable, eco-friendly and sometimes show broad-spectrum activities against different microorganisms. The current knowledge on plant extracts, phytochemicals and their antibacterial activity, target specific mechanism of action, solvents deployed during extraction, properties of an active ingredient isolated may help in biological control of bacteria. Antimicrobial properties of different plant parts, which act in a low dose, have been organised separately for easy understanding.

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1. INTRODUCTION

Traditional medicine has a long history of serving people all over the world. Fossil records implicated the use of plants as medicines at least to the middle Paleolithic age some 60,000 years ago. From that point, the development of traditional medical systems incorporating plants as a means of therapy can be traced back only as far as recorded documents of their likeness. The goals of using plants as sources of therapeutic agents are:

- To isolate bioactive compounds for direct use as drugs, *e.g.*, digoxin, digitoxin, morphine, reserpine, taxol, vinblastine and vincristine,
- To isolate bioactive compounds of novel or known structures as lead compounds for semi-synthesis to produce patentable entities of higher activity and/ or lower toxicity *e.g.* metformin, nabilone, oxycodon (and other narcotic analgesics) taxotere, teniposide, verapamil and amiodarone, which are based respectively on galegine, morphine, taxol and podophyllotoxin,

- To use agents as pharmacological tools, *e.g.* lysergic acid diethylamide, mescaline, yohimbine and
- To use the whole plant or part of it as a herbal remedy *e.g.*, ginger, clove, garlic, *etc.*

The number of higher plant species (angiosperms and gymnosperms) on this planet is estimated to be 2,50,000 with a lower level at 2,15,000 [1] and an upper level as high as 5,00,000 [2]. Of these, only about 6% have been screened for biologic activities, and a reported 15% have been evaluated phytochemically [3]. Meanwhile, the need for basic scientific investigations on medicinal plants using indigenous medical systems becomes imminent. In the following, a detailed review of the development of traditional plants against bacteria will be given. When we reviewed a good number of antibacterial articles during the period 1948-2018 published on medicinal plants, we found that a portion of the scientific community was dedicated to the investigation of the antibacterial activity of plants. Many researchers focused on folk medicines [4, 5], essential oils [6, 7] and secondary metabolites like alkaloids flavonoids, diterpins, triterpins, phenols, steroids, *etc* [8]. The aim of writing this review is to garland important information, where plant parts have been used in a substantially low dose to fight with pathogenic bacteria, as a ready reference for future use by the researchers.

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