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Research Article

ANTIMICROBIAL ACTIVITY OF SOME TRADITIONALLY USED MEDICINAL PLANTS

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ABSTRACT

Microbial disease are Infectious and one of the major problems in developing as well as developed countries. Traditional medicinal plants are widely used to treat the microbial diseases due to their rich source of antimicrobial activity and less cost. The different plant parts such as seed, fruit, root, bark, stem, leaf and even the whole plant were used to treat various microbial disease. There are considerable alternative sources of natural antimicrobials from plants with different mode of actions. Some of them are employed in traditional medicine for centuries and effective one. This review provides the potency of plants as alternative source for antimicrobials and a lucid data of nearly 18 traditional medicinal plants with antimicrobial activity and this would open up the scope for further analysis of medicinal plant extracts to develop effective antimicrobial drugs.

INTRODUCTION

Infectious diseases are the world's leading cause of premature deaths, killing almost 60000 people per day despite remarkable advances in Medical research and treatment during the 20th century, infectious diseases remain among the leading cause of death worldwide (Culver *et al*., 1985).

A wide range of medicinal plants extracts are used to treat several infections as they have potential antimicrobial activity. Some of these bioactive molecules are screened and traded in market as raw material for many herbal industries (Renisheya *et al*., 2011). It is estimated that about 35,000 to 70,000 plants species are used as medicinal plants out of 422127 reported worldwide plant species (Bibi *et al*., 2011). In India 80% of the population belonging to the rural areas depends on the traditional medicines (Munir *et al*., 2013). Experts turned their concentration back towards obtaining advantages from medicinal plants after observing more side effects of synthetic drugs compared to their benefits (Bushra *et al*., 2012).
The screening of plant products for antimicrobial activity have shown that the higher plants represent a potential source of novel antibiotic prototypes (Afolayan, 2003). There has been an increasing incidence of multiple resistances in human pathogenic microorganisms in recent years, largely due to indiscriminate use of commercial antimicrobial drugs commonly employed in the treatment of infectious diseases. This has forced scientist to search for new antimicrobial substances from various sources like the medicinal plants (Wu *et al*., 1999).

Traditional System

In the traditional medicinal system of India, Rigveda mentions 67 plants having therapeutic effects, Yajurveda lists 81 plants and Atharveda have 290 plants (Singh and Bisht, 1992) besides this the different systems of medicine practiced in India, Ayurveda, Siddha, Unani, Amchi and local health traditions, utilize a large number of plants for the treatment of human diseases. Plant produces a wide variety of secondary metabolites which are used either directly as precursors or as lead compounds in the pharmaceutical industry. It is expected that plant extracts showing target sites other than those used by antibiotics will be active against drug resistant microbial pathogens. However, very little information is available on such activity of medicinal plants and out of the 4,00,000 plant species on earth, only a small number has been systematically

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investigated for their antimicrobial activities (Anjana *et al*.,2009).

The drugs already in use to treat infectious disease are of concern because drug safety remains an enormous global issue. Most of the synthetic drugs cause side effects and also most of the microbes developed resistant against the synthetic drugs. To alleviate this problem, antimicrobial compounds from potential plants should be explored. These drugs from plants are less toxic, side effects are scanty and also cost effective. They are effective in the treatment of infectious diseases while simultaneously mitigating many of the side effects that are often associated with synthetic antimicrobials.

Disease Cured

According to World Health Organization (WHO) medicinal plants would be the best source to obtain a variety of drugs (Nascimento *et al*., 2002). Several plant species are used by many ethnic groups for the treatment of various ailments ranging from minor infections to dysentery, skin diseases, asthma, malaria and a horde of other indications (Dahanukar *et al*., 2000). Plant based antimicrobials represent a vast untapped source of medicines and further exploration of plant antimicrobials is the need of the hour. Antimicrobials of plant origin have enormous therapeutic potential. Plant-derived antimicrobials have a long history of providing the much needed novel therapeutics (Silva *et al*., 2012). Plants constantly interact with the rapidly changing and potentially damaging external environmental factors. Being organisms devoid of mobility, plants have evolved elaborate alternative defense strategies, which involve an enormous variety of chemical metabolites as tools to overcome stress conditions.

Active Compounds of Plant

The most important of these bioactive compounds are alkaloids, flavonoids, tannins and phenolic compounds (Purkayastha *et al*., 2012). These are the important raw materials for drug production (Tullanithi *et al*., 2010). Most plants contain several compounds with antimicrobial properties for protection against aggressor agents, especially microorganisms (Silva and Junior, 2010)

Table 1 Review on the Antimicrobial plants species and their uses.

Botanical Name	Common Name	Plant Part	Disease Cured
Buchanania lanzan	Chirongee	Seeds	Blood purification, scabies, leprosy, abdominal discomfort and acne vulgaris. It is also used as general health tonic.
Embelia ribes	Vayvidang	Whole plant	Worm infestation, wound healing and lymphodinopathy.
Gardenia gummifera	Dikamali	Leaves	wound healing, spleenomegaly, encephalitis, anorexia, flatulence and abdominal pain
Jatropha gossypifolia	Ratanjot	Root, Latex and leaf	Diarrhea, dysentery and colic, juice are used to treat ulcer, leprosy and gum infections. It's oil used as purgative and locally applies in skin disease.
Leptadenia reticulate	Jiwanti	Root	lactogenic and used in various gynecological disorders and urinary tract infection.
Phyllanthus urinaria	Bhui amla	Whole plant	cough, bronchitis, skin disease, enlarged spleen, liver jaundice and malaria
Lantana camara	Raimunia	Leaf	Leaf juice is used as antimicrobial in skin disease. It is used as mosquito repellant.
Mongifera indica	Aam	Roots, Bark	Roots are used in menorrhoea, leucorrhoea and scabies. Decoction of bark used for diarrhea
Acacia nilotica	Babool	Stem	Young stem is used as toothbrush. Toothache
Curcuma longa	Haldi	Rhizome	Rhizome extract is used for itches, skin eruption
Azadirachta indica	Neem	Leaf	Leaf paste applied externally with some other medicinal plants for skin diseases
Artemisia indica	Nagdona	Leaves, stem, flower, seeds	Plant extract is used against intestinal worms, Whole plant decoction is used as a tonic, Leaves powder is used for gastric problems, Seed powder is taken orally to treat rheumatism, teeth pain, ear pain, The smoke of twigs is considered good for burns,
Euphorbia hirta	Bada dudhi	Latex and leaf	Latex is applied externally for pimples; Leaves mixed with common salt and cow's milk is used to dysentery and treat diarrhea. Also asthma
Zingeber offcinalsis	Adarak	Rhizome	Juice of rhizome with honey is taken internally to improve digestion and relieve giddiness
Psidium guajava	Amrood, Bihi	Leaf	Leaves are used to treat dysentery
Medicago falcata	Lusan ghas	Seeds, leaves, sprouted seeds, root, flowers	Above ground parts are grind to prepare paste with water and applied on wounds, Plant is taken orally for treating anaemia, diabetes, asthma, ulcers, rheumatism, colitis, hemorrhage, menopausal complaints, pre-menstrual tension, fibroids etc, leaves treat earache
Solanum surattense	Kateli	Fruit	Fruit paste given orally twice a day for one week for tooth ache
Tecoma stans	Pila kaner/ Piliya	Entire plant, leaves, bark, and roots	Bark used as muscle relaxant, mild cardio tonic and lowering chloretic activity, Root is reported to be a powerful diuretic, vermifuge and tonic, Decoction of roots with lemon juice is used in small quantities as remedy for snake and rat bites and also externally applied on wounds, Leaves in diabetes

CONCLUSION

It can be concluded that various plants showed potential antimicrobial activities against microbial disease. The antimicrobial activities may be due to strong occurrence of active compounds i.e. saponins, tannins, alkaloids, steroids, phenols and flavonoids. Currently, after the fall of antibiotics, considerable number of studies has been conducted on antimicrobial activities of selected medicinal plants against various microorganisms. However, little of them are attracting of pharmaceutical companies. Serious interests should be focusing on extracting drugs from medicinal plants, particularly those mentioned in the traditional and folk medicine. However, these medicinal plant species may be subjected to detailed phytochemical and pharmacological studies in order to find out new drugs against pathogenic bacterial and fungal strains.

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