

A Review on Anti Microbial Herbs in Siddha Medicine

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ABSTRACT

Microorganisms include bacteria, fungi, virus, protozoa are present everywhere in the soil, water, atmosphere and on the body surfaces are solely responsible for large number of infectious diseases in mankind. Commonly infectious organisms attacks, respiratory tract, Gastro intestinal tract, Urogenital tract, Skin etc. The use of antibiotics against these infections cause many adverse effects. This leads to the use of medicinal plants to treat the infections. Many of the herbs possess anti microbial activity against the dreadful microorganisms. Siddha medicine is one of the ancient systems of medicines, treats the infections with herbs (mooligai), Inorganic substances (thatthu) and animal products (Jeevam). Many of the Siddha formulations possess the herbs which has antimicrobial activity helps to treat acute and chronic infections. This article reviews on antimicrobial property possessing herbs in siddha medicine. This review has offered herbs in siddha medicines as an antimicrobial agent for further research to treat the acute and chronic infections.

Keywords: Infections, Siddha herbs, Microorganisms, Anti bacterial herbs, Minimum Inhibitory Concentration (MIC), Traditional Indian Medicine.

INTRODUCTION

Medicinal herbs are moving from periphery to mainstream use with greater number of people seeking remedies and health approaches free from side effects caused by synthetic chemicals¹. WHO has listed 21,000 plant species used around the world for medicinal purpose. In India about 2,500 plants species belonging to more than 1000 genera are being used in the indigenous system of medicine². The WHO estimated that about an 80% population of developing countries relies on traditional medicines, mostly plant drugs, for their primary health care needs³. Despite of tremendous progress in human medicines, infectious diseases caused by bacteria, fungi, viruses and parasites are still a major threat to public health. The characteristics of the plants that inhibit microorganisms and are important for human health have been researched in laboratories since 1926⁴.

The development of bacterial resistance to currently available antibiotics has made it necessary to search for new antibacterial agents. New sources, especially natural products from plants, are being investigated because medicinal plants have been widely used for treatment of many types of acute and chronic diseases in Asia and many plants with antimicrobial activity have been reported⁵. The toxicity to humans and other animals from antibiotics is generally considered low. However, prolonged use of certain antibiotics can decrease the number of gut flora, which may have a negative impact on health. To counteract these adverse effects siddha system is used nowadays.

Siddha medicine is one of the ancient most system of medical practice known to mankind. Siddha s fundamental

principles never differentiated man from the universe. According to them, Nature is man and man is nature and therefore both are essentially one. Man is said to the microcosm and the universe is macrocosm, because what exist in the universe exist in man. Agasthiyar was the first siddhar and his discliples and siddhars from other schools produced thousands of texts in siddha including medicine and form the propounders of the system to the world⁷.

Some Of Antimicrobial Siddha Herbs⁸

- Kuppaimeni- *Acalypha indica*
- Agathi - *Sesbania grandiflora*
- Nilavembu - *Andrographis paniculata*
- Adutheendapalai - *Aristolochia bracteolata*
- Azhavanam - *Lawsonia inermis*
- Vishnukiranti - *Evolvulus alsinoides*
- Palasu - *Butea monosperma*
- Vaivilangam - *Embelia ribes*
- Akashagarudan - *Corallocarpus epigaeus*
- Manjal - *Curcuma longa*

Microbiological studies

Acalypha indica : Annual erect herb. Family- Euphorbiaceae. Useful parts are leaves, roots, whole plant. It has anthelmintic, anodyne, cathartic, emetic, diuretic, emmenagogue actions. It cures dental carries, burns, gastritis, haemorrhoids, pruritis, rhinitis⁸. The plant is used as expectorant as a substitute for senega, it has also diuretic action. Useful remedy for bronchitis, asthma, pneumonia, and rheumatism. It was formerly employed as a purgative and anthelmintic⁹.

Analysing the anti microbial activity , the ethanol extract of *acalypha indica* showed maximum solubility against *B.cereus*, *B.subtilis*, *E.coli*, *S.typhi*, *V.Cholera* and *S.aureus*, *K.pneumoniae*, *V.cholerae* and *Bacillus cereus*. The ethyl acetate extract of *Acalypha indica* showed maximum inhibition against *S.aureus*, *K.pneumoniae* and *S.flexeri*.

Ethyl acetate was resistant to *vibrio cholera* and *B. cereus*. *Pseudomonas aeruginosa* was resistant to ethyl acetate extract of *Acalypha indica*. The ethanol and water extract of leaves, stems, seeds and roots from *Acalypha indica* were effective against two bacterial *Escherichia coli*, *Aspergillus fumigates* and *Candida albicans* were resistant to both ethanol and water extract of all *Acalypha indica*.¹ *Sesbania grandiflora*: Tall slender tree .Family-papilionaceae. Useful parts are leaves , flowers , bark, root . It has antidote, refrigerant, laxative, vermifuge actions. It helps in digestion, lowers the pitha , removes toxins ⁸ bark is astringent , leaves have a sharp bitter, sweet taste, anthelmintic , alexeteric, cures kapha, itching , leprosy , night blindness, epilepsy, gout. Useful in ophthalmia.leaf has tonic , anti pyretic action , cures night blindness and biliousness . fruit is bitter, acrid , alexeteric, laxative, cures tridosha, fever, pain, bronchitis, anaemia, tumours⁹

According to the study ,Polyphenolic extracts (PE) of edible flower of *Sesbania grandiflora* were tested to evaluate its anti-microbial effect against some common pathogenic bacteria and growth promoting property against probiotic organism *Lactobacillus acidophilus*. The antimicrobial activity of *S. grandiflora* flower PE against selected pathogens was evaluated using in vitro. In vitro studies suggested that PE has inhibitory effect against *Staphylococcus aureus*, *Shigella flexneri* , *Salmonella Typhi*, *Escherichia coli* and *Vibrio cholerae*. The gram-positive organism *S. aureus* was the most sensitive organism to PE and minimum inhibitory concentration (MIC) was found to be 0.08 mg/mL where as the MIC of PE against *V. cholerae* was the highest (0.25 mg/mL).¹⁰

Andrographis paniculata: An erect branched annual shrub . Family -Acanthaceae. Useful parts are stem, leaves. It has stomachic, tonic, alterative, stimulant action. It cures all types of fever , sinusitis, giddiness⁸

On studying the activity , the methanol extracts of whole plant showed significant and highest antibacterial activity against *Bacillus subtilis* and *Staphylococcus aureus*. Moderate degree of activity against *E.coli*, *K.pneumoniae* and *P.vulgaris*. The water extract of the same showed moderate activity against *S.aureus*, *B.subtilis* and *P.vulgaris*. The methanol extract of leaf showed a positive significant anti bacterial activity against *S.aureus* and *B.subtilis*.

Moderate activity against *E.coli*, *K.pneumoniae* and *P.vulgaris*The water extract of the same exhibited moderate degree of activity against *Staphylococcus* and *Bacillus subtilis* but low activity against *E.coli*¹¹

Aristolochia bracteolata: A slender perennial .family-Aristolochiaceae. Useful parts are leaves , seeds , root , whole plant. It has anthelmintic. Stimulant, tonic, purgative, alterative, anti periodic, emmenagogue actions . It cures poisons due to insect and spider bites, worm

infestations, eczema⁸. The plant is bitter and useful in vata , kapha fevers , painful joints⁹.

According to study the different extracts (Aqueous, methanol and chloroform) of this plant were effective against the bacterial strains *Escherichia coli*, *Bacillus subtilis*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Pseudomonas fluorescens*, *Shigella flexneri*, *Proteus vulgaris* and the fungal strains like *Aspergillus Niger*, *Aspergillus terreus*, *Penicillium notatum* and *Rhizopus stolonifer*. Among the three extracts, methanol extract was found to have the significant activity followed by the chloroform extract against certain bacteria. Water extract did not have any activity against bacteria¹².

Lawsonia inermis : Shrub or small tree . Family-Lythraceae . Useful parts are leaves, flowers , seeds , bark. It has astringent, detergent, deodorant actions . It helps to cure arthritis, cephalgia, leucoderma, peripheral neuritis. ⁸ On analysing ,the ethanol and water extract of the bark of *Lawsonia inermis* showed antimicrobial activity against Diacyltheptenoid and its Fyroseliacrosyenia were identified at the constituent responsible for this activity. The aqueous extracts of *L.inermis* inhibits the *S.aureus*, *S.mutans* and *P.aeruginosa* potentially at 100%.¹³

Evolvulus alsinoides : A Perennial herb.Family-convolvulaceae. Whole plant is useful.It has diaphoretic , tonic ,alterative, febrifuge, anthelmintic, expectorant actions.It cures fevers, cough, diarrhoeal fever, nervousness. ⁸The plant is useful in bronchitis, biliousness, epilepsy, leucoderma,teething of infants, brightens the intellect, improves complexion, appetite⁹

According to the study, Aqueous extract (AE) has highest activity against *S.aureus*, *S.epidermidis*, *K.pneumoniae* and *Vibrio cholera* as compared to ciprofloxacin moderate activity was observed against *E.coli*, *Pseudomonas aeruginosa*, *S.paratyphi*, *S.typhi*. the isolate *S.paratyphi A* did not respond to both extracts¹⁴

Another study indicates that the ethanolic extract exhibited activity against *Pseudomonas aeruginosa* and *E.coli* but inactive against *S.aureus* and *C.albicaro*. None of the test concentration exhibited comparable activity with the reference control ampicillinfrihydrate.¹⁵

Butea monosperma: An erect tree. Family-papilionaceae,useful parts are leaves, flowers, seeds, bark, gum.It has astringent, tonic, aphrodisiac , diuretic, laxative, anthelmintic actions. Helps to cure diarrhoea, body aches, tridosha ,taenia infections, eczema, snake venom, sinusitis, dysentery, haemoptysis ⁸.Bark is hot , acrid , bitter, oily. Useful in fractures of bones. The fruits and seeds are bitter and oily. Useful in piles, eye diseases, inflammations⁹

Analysing the study, The ethenolic bark extract had a good control on drug sensitive strains of *S.aureus*, *Bacillus cereus*,*P.aeruginosa* and *E.coli* with the highest sizes of zones of inhibition against the used bacteria at around 100 mg/ml with the aqueous extract of the plant. Ethanolic extract of *B.monosperma* bark inhibited the growth of drug sensitise strains of *S.aureus*, *P.aeruginosa* and the fungus, *Candida albicans* at 400 to 800 mg/ml. Antimicrobial activity of the bark extract with petroleum

ether and ethanol in controlling *S.aureus*, *B.subtilis*, *S.typhimurium* and *E.coli* were the minimum¹⁶.

Embelia ribes: Climber, family-Euphorbiaceae. Bitter in taste. It has anthelmintic, carminative, stomachic, stimulant actions. It cures anaemia, snake venom, gastric and peptic ulcers, worm infestations, scorpion sting. Prevents the diseases of head, nose and stomach.⁸

The ethanolic extract of *embelia ribes* fruits showed highest zone of inhibition against *Pseudomonas aeruginosa* while the lowest activity was demonstrated by the water extract showed lower activity against test organisms compared to the ethanolic extracts¹⁷.

Corallocarpus epigaeus: Climber. Family-cucurbitaceae. Root is useful part. Bitter, alterative, tonic. Cures pricking pain, anaemia, tridisha, herpes zoster, leprosy, poisons, pruritis, dysentery⁸

The chloroform and acetone extract of the plant showed significantly equal activity against *S.aureus* (9.33 and 9.67mm at 100% concentration) similar activity was also observed in *P.aeruginosa* by chloroform and methanol extract (7.03 and 7.06 mm at 100% concentration). When compared to methanol and acetone extracts the chloroform extract showed maximum zone of inhibition against *S.marcesense* (7.67mm at 100% concentration) whereas with *E.coli* methanol extract (11.33 mm at 100% concentration) shows maximum zone of inhibition. The organism *Klebsiella pneumonia* was extremely resistant to all extracts. The chloroform extract showed maximum zone of inhibition against *S.aureus* (11.33 mm at 100% concentration) while in *P.aeruginosa* the methanol extract (9.00 mm at 100% concentration) showed highest activity. The chloroform and acetone extract showed equal zone of inhibition against *P.aeruginosa* (5.90; 5.68 mm at 100% concentration) whereas in *E.coli* methanol, chloroform and acetone extract (6.00, 6.73 and 6.8 mm at 100% concentration) showed significantly equal activity¹⁸

Curcuma longa: A perennial herb. Family-Zingiberaceae. Rhizome is the useful part. It has carminative, stimulant, hepato tonic activity. It cures cephalalgia, leucorrhoea, swelling, insect bites, vomiting, wounds, scabies, boils, flatulence, intermittent fever, eye diseases, poisons, leech bites. Gives complexion to the skin⁸.

On analysing the study, Curcumin exhibited very good activity against *B.subtilis*, *E.coli*, *S.aureus* and *P.mirabilis*, whereas it showed moderate activity against *K.pneumonia*, *Enterobacter aerogenes* and *Pseudomonas aeruginosa*. Curcumin exhibited very good activity against both fungi, viz. *A.niger* and *C.albicans*. Demethoxy-curcumin exhibited some degree of activity against *B.subtilis*, *S.aureus*, *E.coli*, *P.mirabilis*, *K.pneumonia*, *Enterobacter aerogenes*, *C.albicans*, no activity against *Pseudomonas aeruginosa*, *A.niger*¹⁹

CONCLUSION

Siddha medicine employs a variety of herbs and minerals, many of which were developed in the ancient past under advanced scientific techniques, even by today's standard. Siddha medicine deals with several herbs for treating acute and chronic infections. In this review article, we have discussed elaborately about the antimicrobial activity of

some herbs in the Siddha system of medicine. This review article may be helpful for the other research scholars for further studies.

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