

Antimicrobial Activity of Sesbania Grandiflora Leaf Extract

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Abstract

Now a day's various diseases caused by growth of many pathogenic bacteria, fungi, viruses and other organisms. In the treatment of such diseases we commonly use many types of antibiotics. But there is an always threat of developing resistance to these antibiotics. In last two decades scientist are failing to find out new or potent antibiotics. Hence it is essential to find herbal medicines which possess antimicrobial activity. Also we have to research on them by using new scientific methods to prove there efficacy on modern ground.

Hence in this study we have a research on activity of Sesbania grandiflora against Staphylococcus aureus, Streptococcus pyogenes, Salmonella typhi and Candida albicans. In this research we found that extract of Sesbania grandiflora shows strong inhibitory activity against Staphylococcus aureus. Extract does not show activity against Streptococcus pyogenes. Among the observed result the chloroform extract of Sesbania grandiflora shows greater antimicrobial activity than methanolic extract. It indicates that chloroform is more useful to make extract of Sesbania grandiflora. As far antimicrobial activity of S. grandiflora against Salmonella typhi is observed that it shows moderate activity but when it used with other antibiotics it shows strong synergistic effect against Salmonella typhi. It is also observed that crude extract of Sesbania grandiflora alone does not shows any activity against Candida albicans but when used with other Antifungal agent it shows improved antifungal activity. It indicates that extract of Sesbania grandiflora shows synergistic effect while acting against salmonella typhi and Candida albicans.

Keywords: Agasthya patra, Bacteria, Staphylococcus Aureus, Streptococcus Pyogenes, Candida Albicans, mutualism, Candida albican

Introduction

Microorganisms are found in almost every environment present in nature. Even in critical environments such as the poles, deserts, rocks, and the deep sea. Many types of microorganisms have intimate symbiotic relationships with other larger organisms; some of which are mutually beneficial (mutualism), while others can be damaging to the host organism

(parasitism). If microorganisms can cause disease in a host they are known as pathogens and then they are sometimes referred to as microbes. Bacteria, fungus and Viruses are some microorganism which can affect human health and can cause disease.

Infectious diseases are the main cause of human death worldwide. The clinical efficacy of many existing antibiotics is threatened by emergence of multi-drug resistant pathogens and antibiotic resistance is a global concern. Indigenous medicinal plants have great medicinal potential, as they have been used and are still in use for the management of several diseases and as nutritional supplements. In so many countries research on these herbs are going on and they are separating their extract to see the effect on various disease. In these plants Agasthya plant is easily available and very well known plant and in Ayurvedic Samhitas Agasthya is described as Vishaghna, Raktpitthar, Kandughna and Krumighna. Kandu [Itching] is the main symptom in various skin diseases and it occurs due to some bacteria, fungus or viruses which are responsible for that skin disease. Hence Kandughna dravya like Agasthya may act against any of these. As well as Agasthya is also has Krimighna property. Wherein the word krimi has multi faceted meaning. Krimi may refer to both Macro and Micro organisms responsible for causing diseases and it includes all microbes irrespective of Bacteria, Fungi or virus and hence Krimighna dravya like Agasthya may also act against any of these microorganism.

अगस्त्यपत्रम कटूकम सतिक्तम गुरुक्रुमिघ्नम विशद कफघ्नम।

कडूघ्नहरम शोणित्पित्तहरि स्यात् सुसुक्ष्मष्ण मधुरम विषघ्नम॥ कै.नि.९३९

The present research work entitled for the same reason. Hence In this study an attempt will be made to evaluate Antimicrobial activity of Agasthya Patra extract on some Bacteria i.e. Staphylococcus Aureus, Streptococcus Pyogenes and Fungi i.e. Candida Albicans.

Staphylococcus aureus is a gram-positive and it can cause a range of illness such as Pimples, Impetigo, Boils, Cellulitis, Folliculitis, Carbuncles, Scalded skin syndrome, and Abscesses etc.

Streptococcs pyogenes is also Gram-Positive and cause of many skin infections. Examples of mild S. pyogenes infections include Pharyngitis (strep throat) and Impetigo and Cellulitis, Necrotizing Fasciitis..

Candida albicans is a diploid fungus that grows both as yeast and filamentous cells and a causal agent of opportunistic oral and genital infections in humans as well as it can also cause Candidal Onychomycosis, Systemic fungal infections (Fungemias). About 85-95 % of vaginal infections cases are responsible for physician office visits every year.

Previous work done

Ayurvedic Institute

1. An experimented Evaluation of Vedanasthapana (Analgesic) Effect of Agasthya. Dr. Prayalatha B.A., Koppa
2. Traditional & Ayurvedic medical imp. of Agasthya patra W.R.T. its pharmacognostic & physiochemical evaluation. By G. Venketeshwar (2012) IJRA & Pharmacy'
3. Agasthya: Its Properties and Medicinal Uses. Italian Institute Ayurvedic Research.

Other Institution

1. Phytopharmacology of Indian plant Sesbania Grandiflora, By Suresh Kashyap, Bareilly, college of pharmacy

2. Sesbania Gradiflora: New Nutraceutical Use as Ant diabetic, International Journal Of Pharmacy And Pharmaceutical Science.

3. A Review on Anti Inflammatory Plant Barks, Arya Vikrant, Arya M.L., Department of Pharmacognocny, A.S.B.A.S.J.S.M.P.G.C. of Phar. Bela.

Difference from previous studies

Agasthya plant is very well known plant for us. Properties and uses of Agasthya are described in many Samhithas i.e. Agasthya is Vishaghna, Vedanasthapan, Prathishayhar, Kapha - Pittaghna, Pandughna, Krumighna, Kandughna etc. There is no research work done on Antimicrobial property of Agasthya. Hence making an effort to assess single drug effect of Agasthya patra extract w.s.r. to Antimicrobial Activity.

Hypothesis:

Research question: Does Agashtya patra shows Antimicrobial activity?

Independent variables: Agasthya patra extract.

Dependent variables: Bacteria-Streptococcus Aureus, Staphylococcus Pyogenes. Fungus- Candida Albicans.

Null Hypothesis: Agasthya patra extract does not show significant Antimicrobial activity

Alternative Hypothesis: Agasthya patra extract shows significant Antimicrobial activity.

Aims and Objective

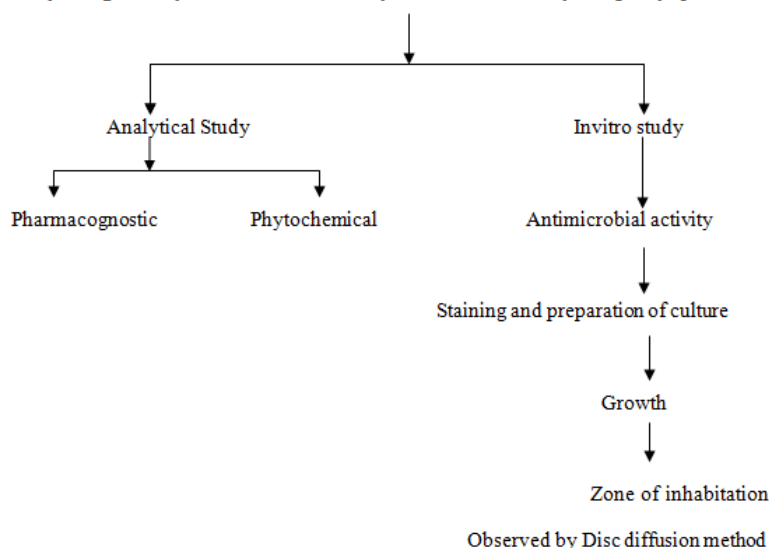
Aim: To study the Pharmacognostic and Phytochemical properties of Agasthya patra and its Antimicrobial activity [Krumighna karma].

Objective

1. To review the relevant Ayurvedic and Modern literature concerned with Agasthya patra.
2. To study the Pharmacognostic and Phytochemical properties of Agasthya patra.
3. To evaluate Antimicrobial activity of Agasthya patra against Bacteria-Streptococcus Aureus, Staphylococcus Pyogenes and Fungus-Candida Albicans.

Study Design and Samples Size

Study Design: Study will be carried out analytical and Invitro study of Agasthya patra.



Materials and Methods

Material

Conceptual study

1. Classical Ayurvedic literature (Samhita), Nighantu & other books etc.
2. Modern literature related to Pharmacology, Phytochemistry, Pharmacognocny will be studied.

Method

Collection and Processing of Plant Material: Agastya [Sesbania Grandiflora linn.] will be identified and authenticated by a botanist. There after fresh leaves will be taken and washed with distilled water and allowed to dry under shed. The dried leaves will be blended in fine powder by using electric blender and will be stored in air-tight containers.

Preparation of Extract: The dried powder will be macerated with 95% Ethanol for 48 h in room temperature. The filtrates from it will be subjected to the rotary evaporator at 45 °C and under vacuum for solvent removal. The crude extract obtained will be investigated further for Antimicrobial Activity.

Invitro study: An Invitro study to evaluate the Antimicrobial activity of Agasthya patra extract on some bacteria i.e. Staphylococcus Aureus, Streptococcus Pyogenes and fungi i.e. Candida Albicans will be done in the lab of Saptshrungi Ayurved Mahavidyalaya, Nashik.

Analytical Study

- Moisture content.
- Total ash value.
- Foreign matter.
- Extractive value [Water soluble and Alcohol soluble].
- T L C (Thin layer chromatography)

In vitro study

Material

- Nutrient Agar Slant..
- Sterilized disc of Whatsman no. 1 filter paper.
- Culture- Bacteria-Staphylococcus Aureus, Streptococcus Pyogenes and Fungi i.e. Candida Albicans
- Gram stain.

Inclusion criteria: Bacteria i.e. Staphylococcus Aureus, Streptococcus Pyogenes and Fungi i.e.Candida Albicans.

Exclusion criteria: Other Bacteria and Fungi will be excluded.

Study area: Lab of Shree Saptshrungi Ayurvedic Mahavidyalaya and Hospital, Nashik.

Observations and Results: Observations will be noted and presented in the form of Tables, charts and graphs and Results will be drawn on the basis of analysis.

Discussions :On the background of published results and collected data the observed data will be discussed.

Conclusion :On the basis of outcome of this particular work and discussion the conclusion will be made.

Summary : As mentioned in study design the work will be summarized.

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