EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 3
Issue: 4
187-189
Year: 2016

PHYTOCHEMICAL SCREENING AND ANTIBACTERIAL ACTIVITY OF RASAYANAM PRESCRIBED BY THE SIDDHA MEDICINAL PRACTITIONER OF KANYAKUMARI DISTRICT, INDIA

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Article Received on 15/02/2016 **Article Revised on 06/03/2016** **Article Accepted on 26/03/2016**

ABSTRACT
The main objective of the present investigation is to evaluate the phytochemical constituents and antibacterial activity of Siddha Cough medicine prescribed by the Traditional Siddha Practitioner of Kanyakumari District, India. Rasayanam is an internal form of cough medicine prescribed for infants to 3 year old patient. Phytochemical analysis of the Rasayanam revealed the presence of phenols, flavonoids and saponins. The highest antibacterial activity of Rasayanam showed the zone of inhibition 16mm against *Pseudomonas* and least activity was recorded in the hexane extract of Rasayanam (1mm) against *Salmonella typhi* act as a great potential source to rid cough.

KEYWORDS: Rasayanam, Siddha Medicine, chemotherapeutics, antibiotic resistance.

INTRODUCTION

India has an eminent wealth of therapeutic agents for various ailments and diseases in our traditional system of medicine. More and more researchers found that food and their individual constituents perform similar fashion to modern drugs, sometimes better without the dreaded side effects. Siddha Medicine is one of the oldest medical systems known to mankind. According to Siddha medicine system, diet and lifestyle play a major role not only in health but also in curing diseases. The formulations and treatment of Siddha medicine emphasizes that medical treatment must be oriented not merely to disease but also in view of the patient, his environment, sex, age, habits, mental frame, diet, physical conditions etc. Antibiotics are the products of microbes that are powerful medicines fight against bacterial infections in dilute solution, inhibit or kill other organisms. Antimicrobial agents include antibiotics and synthetic compounds that have the same effect. Naturally occurring antibiotics may be modified to give semi-synthetic derivatives differ from their ferment compound as pharmacological properties. Those agents that kill bacteria are said to be bactericidal and the reversible upon removal of the drug are bacterostatic (Levy, 1992). Biologically active compounds present in the medicinal plants have always been of great interest to scientists working in this field. In recent years this interest to evaluate plants possessing antibacterial activity for various diseases is growing (Krishnaraju *et al.*, 2005). Many infectious diseases have been known to be treated with herbal remedies throughout the history of mankind. It has been well known since ancient times that plants and spices have antimicrobial activity (Ayres *et al.*, 1980; Zaika, 1988). The increasing failure of chemotherapeutics and antibiotic resistance exhibited by pathogenic microbial infectious agents has led to the screening of several medicinal plants for their potential antimicrobial activity (Iwu, *et al.*, 1999; Colombo & Bosisio, 1996). This scientific analysis was performed to verify the traditional uses of the Rasayanam against the control of a particular pathogen.

MATERIALS AND METHODS

The present study was aimed to assess the phytochemical constituents and antibacterial activity of the Siddha medicine (Rasayanam) used to cure infant cough by the Siddha Medicinal Practitioner at Chenamparavillai. Antibacterial activity was carried out for the Siddha medicine (Rasayanam) used to cure infant cough was tested against 4 bacterial pathogens. 500gm of Rasayanam was bought from the Siddha Practitioner for the preparation of different solvent extracts was selected for the antibacterial activity test by using four separate solvents via Hexane, ethanol, aqueous and acetone**.** The Rasayanam is prepared by the combination of medicinal plants in the form of Kalanchi One Kalanchi = 5gm of

each plant material, Two Kalanchi = 10gm of each plant material.

Phytochemical analysis: The crude medicinal extracts were subjected to preliminary phytochemical analysis for the presence steroids, sugars, phenolic compounds, flavonoids, saponins, tannins, anthroquinone and aminoacids. Preliminary phytochemical screening of the crude extracts was determined by following the standard procedure (Brindha *et al*., 1981).

Preparation of solvent extracts: The solvent extract of hexane, ethanol, aqueous and acetone of 5gm Rasayanam were completely dissolved in 5 ml of 0.5% Tween 80 and preserved at 5°C in airtight bottles until further use (Lin *et al.*, 1999). All the extracts were subjected to antibacterial activity assay. Muller - Hinton agar is used as the nutrient medium for all the other selected bacterial strains. General methodology was followed for the preparation and sterilization of agar medium. Discs of 4 mm diameter were cut from Whatman No.4 filter paper for inhibitory study. The discs were taken in culture tubes and sterilized using autoclave at 121°C under 15 lbs pressure for 15 minutes.

Antimicrobial susceptibility test: The disc diffusion method (Lennette *et al.*, 1985) was used to screen the antimicrobial activity. The empty sterile disc was dipped in the respective extracts and dried in room temperature placed on the inoculated agar medium in petriplates with the sterilized forceps. Then the plates were incubated at 37°C for 24 hours. The antibacterial activity of Rasayanam was observed through zone of inhibition around the disc. Then this zone of inhibition was measured in millimeter and tabulated.

RESULTS AND DISCUSSION

Phytochemical constituents are responsible for the medicinal activity of the plant species used for the preparation of Rasayanam. The present study was done to analyse the phytochemical constituents of nine different metabolites via steroids, alkaloids, sugars, phenolic compounds, flavonoids, saponins, tannins, anthroquinone and aminoacids in Siddha medicine prescribed to cure infant to 3 year old Cough Medicine. The highest antibacterial activity of Rasayanam showed the zone of inhibition 16mm against *Pseudomonas* and least activity was recorded in the hexane extract of Rasayanam (1mm) against *Salmonella typhi*.

Phytochemical screening: Preliminary phytochemical analysis of the Rasayanam used to cure cough (infants to 3 years old) was determined by following the standard procedure. The observance of steroids, alkaloids, sugars, phenols, flavonoids, saponins, tannins, anthroquinone and aminoacids was done. In general, the phytochemical analysis of Rasayanam showed the presence of phenolic content, flavonoids and saponins. On the other hand, revealed the absence of phytochemicals such as steroids, alkaloids, sugars, tannins, anthroquinone and aminoacids (Table – 1 & Plate - 1).

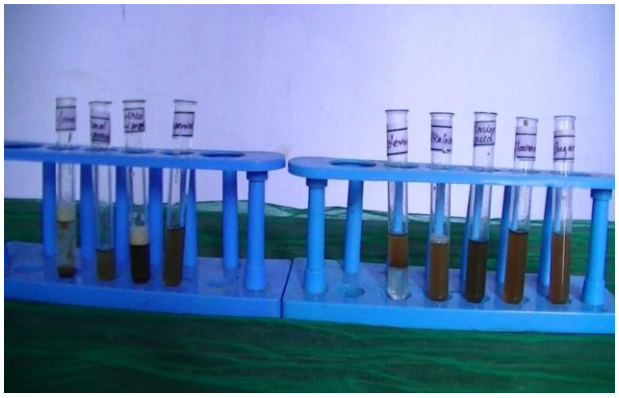

Plate: 1 Phytochemical Analysis of Siddha Cough Rasayanam

Table: 1 Phytochemical Analysis of Siddha Cough Rasayanam

S.No	Phytochemicals	Siddha Infant Cough Medicine Rasayanam (Kulambu)
1	Steroids	-
2	Alkaloids	-
3	Sugar	-
4	Phenol	+
5	Flavonoids	+
6	Saponins	+
7	Tannins	-
8	Anthroquinone	-
9	Aminoacid	-

+ Presence - Absence

Antibacterial activity of Rasayanam

The antibacterial activity of Siddha medicines prescribed to cure infant to 3 year old Cough (Rasayanam) showed both positive and negative activity. Rasayanam showed the maximum zone of inhibition (16mm) against *Pseudomonas aeruginosa*, whereas, *Staphylococcus aureus* and *E.coli* showed the zone of inhibition (5mm) and minimum zone of inhibition (2mm) against *Salmonella typhi*. Hexane extract of Rasayanam showed the maximum zone of inhibition (13mm) against *E.coli*, *Staphylococcus aureus* showed the zone of inhibition (2mm) and minimum zone of inhibition (1mm) against *Pseudomonas aeruginosa* and *Salmonella typhi*. Aqueous extract of Rasayanam showed the maximum zone of inhibition (3mm) against *Pseudomonas aeruginosa* and minimum zone of inhibition (2mm) against *Staphylococcus aureus* and *E.coli.* On the other hand, aqueous extract of Rasayanam fail to inhibit the growth of the bacteria *Salmonella typhi*.

Chloroform extract of the Rasayanam showed the maximum zone of inhibition (14mm) against *Pseudomonas aeruginosa* and *Staphylococcus aureus* whereas, *E.coli* showed the zone of inhibition (3mm) and minimum zone of inhibition (2mm) against

Salmonella typhi. The antibiotic disc Amikacin showed the maximum zone of inhibition against *Pseudomonas aeruginosa* (17mm) *E.coli* (9mm), *Staphylococcus aureus* (8mm) and minimum zone of inhibition (6mm) against *Salmonella typhi*. In general, the antibacterial activity of Rasayanam showed maximum inhibition zone (16mm) against *Pseudomonas aeruginosa* whereas, hexane extract of Rasayanam showed minimum inhibition zone (1mm) against *hexane extract of Salmonella typhi* and aqueous extract of Rasayanam fail to inhibit the growth of *Salmonella typhi* (Table – 2).

Table- 2 Antibacterial Activity of Rasayanam (Infant Cough Medicine).

Extract	Inhibition Zone in diameter (mm)			
	Pa	**Sa**	***E.coli***	**St**
Rasayanam	16mm	5mm	5mm	2mm
Hexane	1mm	2mm	13mm	1mm
Aqueous	3mm	2mm	2mm	-
Chloroform	14mm	4mm	3mm	2mm
Amikacin	17mm	8mm	9mm	6mm

Pseudomonas aeruginosa (Pa), *Staphylococcus aureus* (Sa), *E.coli* and *Salmonella typhi* (St).

CONCLUSION

The work carried was a basic approach to find out the antimicrobial activity in Siddha medicine. Further works on the types of phytoconstituents and purification of individual groups of bioactive components be able to reveal the exact potential of the Rasayanam to inhibit several pathogenic microbes.

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