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SHORT COMMUNICATION

Evaluation of Antimicrobial Potential of Sudarshan Churna: A Polyherbal Formulation

SUSHIL BHARGAVA, PARIDHI BHARGAVA, KARUNAKAR SHUKLA, RAVINDRA PANDEY, SHIVSHANKAR SHUKLA, SHAILESH JAIN

For author affiliations, see end of text.

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ABSTRACT

Sudarshan Churna (SC) is very potent Ayurvedic medicine; composed of 42 medicinal plants, which is used traditionally in treatment of malaria, viral fever, and bacterial infection. The Present study was designated to evaluate the antimicrobial activity of aqueous extract of Sudarshan Churna (ASC) using the paper disc diffusion method. The ASC was found active against the gram-negative bacteria *K. pneumoniae, E. coli*, and gram-positive bacteria *S. aureus, P. vulgris* and found less effective against gram-positive bacteria *S. epidermidis and B. subtilis.* The ASC shows significantly less effect against *C. Albicans*.

Keywords: *Sudarshan Churna, Antimicrobial, Ayurvedic medicine*

Sudarshan Churna is very potent Ayurvedic preparation, which is used traditionally as antimalarial, antipyretic, antiviral and antidiabetic agent. It has been given from ancient time by Vaidyas to cure all types of fever including bone fever, fever due to common cold, viral fever etc. In Sudarshan Churna, *Swertia Chirata* is present in 50% of total quantity, remaining other 42 ingredients is in equal proportion in remaining 50% of total churna (Table 1). All other ingredients have different therapeutic uses which support to treat the malaria and other fever in SC and very useful for rejuvenating the body. *Swertia Chirata* is specifically anti-malarial and antipyretic herb. Dose of SC is 3-6 gm bid as antipyretic and 1-2 gm bid as antidiabetic agent [1]. Literature survey revealed that SC is most useful as well as popular Ayurvadic medicine to cure malaria, fever, and microbial infection but no scientific evidence present for its antimicrobial potential. Thus, in present study antimicrobial activity of SC was evaluated.

MATERIALS AND METHODS

Collection of Materials and Preparation of Churna: All the ingredients were collected from Aushdhi Bhandar, Indore, Madhya Pradesh (MP), India. Authentication of all ingredients was done by Professor H S Chatree, Botanist, Agriculture College, Mandsaur. Sudarshan churna was prepared in the laboratory of B R Nahata College of Pharmacy (BRNCP) & Contact Research Centre (CRC), Mandsaur, India. These were cleaned properly to remove any type of contamination using distilled water. Washed ingredients were dried by different means. Churna were prepared according to ayurvedic literature.

Preparation of Extracts: Aqueous extracts of SC was prepared by infusion (1 L water for 24 hr) with occasional shaking, filtered and vaccum dried. 200 g of samples were taken.

Preparation of Seeded broth: The strains of microorganisms obtained inoculated in conical flask containing 100 ml of nutrient broth. These conical flasks were incubated at 37 ^{0}C for 24 hrs and were referred to as seeded broth.

Preparation of Culture media: The nutrient agar media (Hi- media, Mumbai) was prepared by dissolving 28 gm of nutrient agar in 100 ml of distilled water. The nutrient broth media (Hi- media, Mumbai) was prepared by dissolving 13 gm of nutrient broth in 100 ml of distilled water. The media was sterilized by autoclaving at 15lb/sq. inch pressure at 121 ^{0}C for 20 minutes.

Antimicrobial Assay: The paper disc diffusion method for antibiotic susceptibility testing was used [2]. Strain of gram-positive bacteria *Staphylococcus aureus* (NCIM 2079), *Staphylococcus epidermidis* (NICM 2493), *Bacillus subtilis* (NICM 2063), *P. vulgris* (NCIM2027) and the gram-negative bacteria *K. pneumoniae* (NICM 2597), and *E. coli* (NICM 2931) as

Table 1. Ingredients of Sudarshan Churna

Swertia chirata Buch-Ham.	*Marsdemia Tenacissima* Wight and Arn.
Trichosanthes dioica Roxb.	*Embilica officinale* Gaerth.
Ureria picta, Desv.	*Tinospora cordifolia* Willd.
Jateorrhiza palmate Linn.	*Picrorrhiza kurrora* Benth.
Curcumma longa Linn.	*Plumbago zeylanica* Linn.
Cedrus deodar Roxb, Loud	*Moringa oleifecalam* Lam.
Acorus calamus Linn.	*Asparagus racemosus* Willd.
Desmodium trifiorum DC.	*Belbelis aristata* DC.
Terminalia chebula, Retz	*Didymocarpus pedicellata* Willd.
Alhagi pseudalhagi Bieb. Desv.	*Nelumbeum speciosum* Willd.
Rhus succedonia Linn.	*Pinus roxburghil* Sarj.
Solanum xanthocarpum Schrad & Wendl	*Andropugan muricatus* Retz.
Zingiber officinale Willd. Rosc.	*Cinnamon cassia* Blume.
Legenaria siceraria (Mol)Standl.	*Cinnamomum inners* Reinw.
Naregamala alata Linn.	*Desmodium gangaticum* DC.
Azadiracta indica A. Juss.	*Ptychotis coptica* DC.
Piper longum Linn.	*Aconytum hetrophullum* Wall. Ex Royle
Pavonia odorata Willd.	*Aegle marmelos* Corr.
Hedychim Spcatum Ham.	*Piper nigrum* Linn.
Inula racemosa Hook. F.	*Holarrhena antidysentrica* Wall.
Terminalia belerica Linn.	*Glycerrhyza glabra* Linn.

well as fungi *C. albicans* (NCIM347) were used in this study.

Paper disc of 6 mm diameter were prepared by ASC (100 µg/disc), and Ofloxacin (5µg/disc) as well as Miconazole (40µg/Disc) was used as standard, recommended by the National Committee for Clinical Laboratory Standards (NCCLS). Discs were dried at 37 ^{0}C before use. The bacterial broth suspension (seeded broth) was streaked evenly on the surface of a medium with a cotton swab. Subsequently the paper discs were placed on the surface of agar with flamed forceps and gently pressed down to ensure contact. Plates were incubated at 37 ^{0}C over night. After 24 hrs of incubation, the inhibition zone diameters (including the 6 mm disc) were measured with calipers. A reading of more than 6 mm indicated growth inhibition [3].

Determination of Zone of inhibition: The disc diffusion method of drug potency is based on the measurement of the diameter of zones of microbial growth inhibition surrounding discs containing various concentration of test compound, which are placed on the surface of a solid nutrient previously inoculated with culture of suitable microorganisms. Inhibition produced by the test drug was compared with that produced by known concentration of reference standard drug [4].

RESULTS AND DISCUSSIONS

ASC traditionally used in treatments of viral infection, viral fever and malaria. The results of the present study show that the aqueous extract of polyherbal formulation SC possesses significant antimicrobial activity (Table 2).

In the present study, disc diffusion method used for the evaluation of antimicrobial activity. The present study has revealed that ASC (100 µg/disc) possess significant antimicrobial activity. The effect is significantly active against gram+ve bacterial strain like S.aureus and gram-ve bacteria K.pneumoniae and E.coli, whereas less effective against gram+ve bacteria S.epidermidis and B.subtilis in comparison of standard Ofloxacin (5µg/disc). ASC was less effective on C. Albicans as compare to Miconazole (40µg/Disc). As mentioned earlier, SC contains 43 different constituents including 50% of Swertia chirata Buch Ham and the formulation is described in the ancient ayurvedic literature. A survey on the activities of the constituents revealed that Swertia chirata Ureria picta Curcumma longa Terminalia chebula Asparagus racemosus Acorus calamus Zingiber officinale, Azadiracta indica Glycerrhyza glabra are reported to be effective as antimicrobial herbs [5-9]. SC contains flavonoids and

Table 2. Effect of ASC on zone of inhibition of microorganism

S.N.	Microorganisms (Gram –ve & + ve)	ZONE OF INHIBITION (mm)		
		ASC	Ofloxacin 5µg/Disc	Miconazole 40µg/Disc
1	E.Coli (NCIM2931)	22	22	……
2	B.Subtilis (NCIM2063)	17	24	……
3	S. Epidermitis(NCIM2493)	16	23	.....
4	S.Aurus(NCIM2079)	26	27	…..
5	K.Pneumoniae(NCIM295)	27	23	….
6	P. Vulgris(NCIM2027)	26	26	…..
7	C. Albicans (NCIM347)	11	….	22

sterol, which may responsible for antimicrobial activity [10- 12].

CONCLUSION

To, conclude the Polyherbal formulation Sudarshan Churna possess significant antimicrobial potential. Further investigation and isolation of compound is necessary to establish the exact constituent responsible for antimicrobial activity as well as other activities of Sudarshan Churna.

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