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Phytochemical screening & antimicrobial property of solvent extract of *Ceropegia juncea* Roxb

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Abstract
Background: *Ceropegia juncea* Roxb is a fleshy twining herb with tuberous roots. The present study was conducted to assess the phytochemical screening & antimicrobial property of solvent extract of *Ceropegia juncea* Roxb.
Materials & Methods: The present study was conducted in the department of Botany. Plant *Ceropegia juncea* was collected from different localities. The entire plant of *Ceropegia juncea* was used for preparation of extracts. The phytochemical screening & antimicrobial property of solvent extract of *Ceropegia juncea* Roxb was tested.
Results: The phytochemical analysis of extracts exhibited that alkaloids and carbohydrates were found in all the solvent extracts used while saponin were detected in methanol only and tri- terpenoids in ethyl acetate and methanol only.
Conclusion: This study provides the use of the solvent extracts of *Ceropegia juncea* to treat various oral infections caused by bacterial pathogens.

Keywords: *Ceropegia juncea*, Herbal, solvent

Introduction
Ceropegia juncea Roxb is a fleshy twining herb with tuberous roots. The genus Ceropegia belongs to the Asclepiadoideae (Milkweed) sub-family within the family Apocynaceae, is an important medicinal herb, which is used as a source of "Soma", a plant drug of the ayurvedic medicine with a wide variety of uses. The plant looks almost leafless as the leaves are minute, in opposite pairs and very sparsely distributed in the bare stem. [2]
There has been increased use of herbal drugs in recent years. Heavy metals are ubiquitous in trace concentrations in nature. Plants grown on heavy metal rich soils and waters undergo stress and show changes in production of secondary metabolites. [2] High levels of heavy metal contamination in medicinal or other plants may suppress secondary metabolite production. WHO (1998) recommended that medicinal plants which form the raw material for the finished product must be checked for the presence of heavy metal and pesticide residues etc. [3] The traditional medicines cater about 85% of the world population for their health needs. It is essential to maintain safety, quality and efficacy of the plant and their products to avoid serious health problems. Pharmacological evaluation of the medicinal plant and products has been recommended for the purity and quality of the drugs coming from the botanicals. [4] The present study was conducted to assess the phytochemical screening & antimicrobial property of solvent extract of *Ceropegia juncea* Roxb.

Materials & Methods
The present study was conducted in the department of Botany. Plant *Ceropegia juncea* was collected from different localities. The entire plant of *Ceropegia juncea* was used for preparation of extracts. The plant material was collected, cut into small pices, washed in water and dried at 40 ºC. The dried plant pieces were then grind in mechanical grinder. The powder was sieved using a mesh sieve and stored in air tight bottles. 50 g of the plant was taken in a Soxhlet's apparatus.
The Gram positive stains of Staphylococcus aureus and Streptococcus faecalis and Gram negative strains of Escherichia coli, Pseudomonas aeruginosa, Klebsiella pneumonia, Proteus vulgaris, Salmonella typhi, Chromobacterium violaceus and Burkolderia mallei were maintained at 37OC in Nutrient Broth and the fungus Candida albicans was maintained in

Potato dextrose agar medium until the preparation of inoculum.

All the test bacterial species were maintained in nutrient agar media. Fungal colonies were harvested from 9-10 day old cultures, which were maintained on potato dextrose agar (PDA) medium.

The qualitative phytochemical analyses were carried out following the Indian pharmacopoeia and the methods described by Harborne (1973). The three different solvent extracts obtained by successive solvent extraction were tested separately for the presence of various phytoconstituents namely alkaloids, amino acids, carbohydrates, fats and fixed oils. The MIC values of the plant extracts were determined against the selected test organisms using the methods as described by National Committee for Chemical Laboratory Standard (1993). The antimicrobial activity was determined by using the agar disc diffusion method. Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I: Phytochemical screening of crude solvent extracts of *Ceropegia juncea*

Solvents used	Alkaloids	Carbohydrate	Saponins	Tri-terpenoids
Petroleum ether	+	+	-	-
Chloroform	+	+	-	-
Ethyl acetate	++	+	-	++
Methanol	++	+	+	+

Table I shows that the phytochemical analysis of extracts exhibited that alkaloids and carbohydrates were found in all the solvent extracts used while saponin were detected in methanol only and tri- terpenoids in ethyl acetate and methanol only.

Table 2: Antimicrobial activity of crude solvent extracts of *Ceropegia juncea*

Microorganisms	Petroleum ether	Chloroform	Ethyl acetate	Methanol	P value
Staphylococcus aureus	0.32	0.45	0.61	0.95	0.01
Streptococcus faecalis	0.0	0.31	0.91	0.0	0.02
Escherichia coli	0.43	0.56	0.81	16.2	0.05
Pseudomonas aeruginosa	3.12	2.45	16.2	17.1	0.01
Klebsiella pneumonia	1.12	4.01	5.14	16.8	0.03
Candida albicans	2.14	1.18	3.23	6.47	0.04

Table II, graph I shows that maximum zone of inhibition was found in methanol against Staphylococcus aureus, Ethyl acetate against Streptococcus faecalis, methanol against E. coli, methanol against Pseudomonas aeruginosa, methanol against Klebsiella pneumonia and methanol against Candida Albicans. The difference was significant ($P < 0.05$).

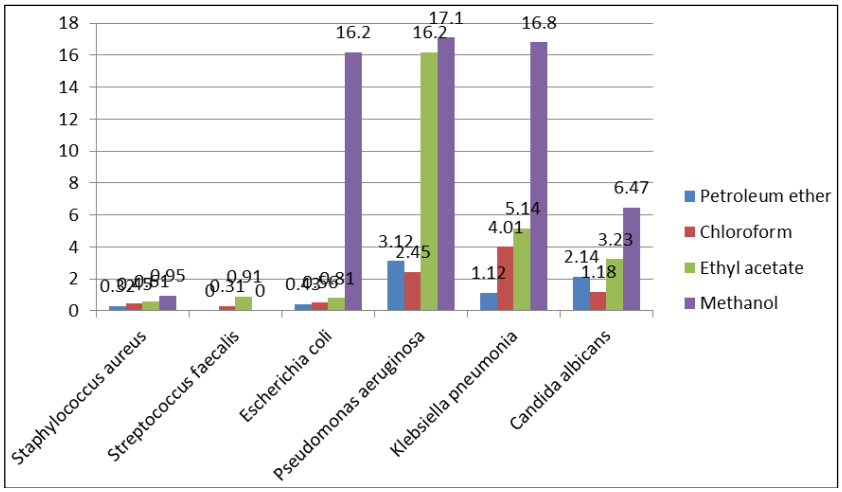

Fig 1: Antimicrobial activity

Discussion

Management and treatment of diseases has attracted many researchers to exploit plants as they are rich sources of primary and secondary metabolic products that show remarkable biological activities. [5] The potential bioactive compounds are source for drug discovery. Natural products had been indispensably used by many cultures and traditions for thousands of years. Plant and their derived products are always an exemplary source of drugs to treat various diseases. [6] According to world health organization (WHO), about three-quarters of the world population rely upon traditional remedies (manily herbs) for their health care. The secondary metabolites show variety of structural arrangements and properties4. Bioactive compounds are used for curing various human diseases and also play an important role in healing. Phytochemicals naturally occur in various plant parts and are involved in strengthening defense mechanism against various pathogens. [7] The present study was conducted to assess the antimicrobial property of solvent extract of *Ceropegia juncea* Roxb.

In this study, the phytochemical analysis of extracts exhibited that alkaloids and carbohydrates were found in all the solvent extracts used while saponin were detected in methanol only and tri- terpenoids in ethyl acetate and methanol only. The solvents used for preparation of crude extracts of *Ceropegia juncea* exhibited maximum extractive value in methanol**.** In earlier studies, the high extractive value of methanol for woody stem extract of Wrightia

tinctoria and ethanol for whole plant extract of Cardiospermum halicacabum was reported. The phytochemical analysis of crude extracts of *Ceropegia juncea* revealed the presence of alkaloids in all solvent extracts. There was also a resemblance in occurrence of saponin and steroids in methanol and aqueous extracts. Similarly, phenolic compounds and tannins were found common in the extracts prepared with ethyl acetate, chloroform and water. Among the solvent extracts, ethyl acetate had a majority of phytoconstituents.

We found that maximum zone of inhibition was found in methanol against Staphylococcus aureus, Ethyl acetate against Streptococcus faecalis, methanol against E. coli, methanol against Pseudomonas aeruginosa, methanol against Klebsiella pneumonia and methanol against Candida Albicans. Murugan *et al*. [8] found that copper and zinc were determined in the test plant and the concentration of the copper in the plant was 1.627 µg/g and is within the WHO limit (40 mg/kg). The concentration of Zinc was 0.247 µg/g and below the recommended limit by WHO (60mg/kg). Zinc is an essential trace element for plant growth and also plays an important role in various cell processes including normal growth, brain development, behavioural response, bone formation and wound healing. Zinc deficient diabetics fail to improve their power of perception and also cause loss of sense of touch and smell. The dietary limit of Zn is 100 ppm. Copper and Zinc acts as essential micronutrients up to certain concentration. Copper plays an important role in the oxidative defense system but the high levels of copper leads to toxic conditions.

Conclusion

Authors suggested that this study provide the use of the solvent extracts of *Ceropegia juncea* to treat various oral infections caused by bacterial pathogens.

References

1. David Berverly C, Sudarsanam G, Antimicrobial activity of Gymnema sylvestre (Asclepiadaceae). J. Acu. Dis, 2013, 222-225.
2. Dayang FB, Razinah S, Paden M. Antimicrobial activities of ethanol and ethyl acetate extracts from the fruits of Solanum torvum. Malays. Appl. Biol. 2005; 34(1):31-36.
3. Gamble JS, The Flora of the presidency of Madras, Vol I-III. Adlard & Son, Ltd.; London, 1935.
4. Harborne LB, Phytochemical methods, A guide to modern techniques of plant analysis, Chapman and Hall, London, 1973.
5. Jagtap AP, Singh NP, Asclepiadaceae, Periplocaceae. Fascicles of Flora of India, Botanical Survey of India, Kolkata. Fascicle. 1999; 24:211-241.
6. Jain SK, Defillips RA, Asclepiadaceae. In: Algonac M. I. (ed.). Medicinal plants of India. Vol.1. Reference Publications Inc. Michigan, USA, 1991, 144-152.
7. Karuppusamy S. Medicinal plants used by Palliyan tribes of Sirumalai hills of Sothern India. Nat. Prod. Rad. 2007; 6(5):436-442.
8. Murugan M, Mohan VR. Phytochemical screening and antibacterial activity of Gymnema sylvestre (retz) R. Br. Ex. Schultes and Morinda pubescens. J. Appl. Pharm. Sci. 2012; 02(02):73-76.