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PRELIMINARY PHYTOCHEMISTRY AND BACTERICIDAL ACTIVITY OF LEUCAS ASPERA S.

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ABSTRACT

For the study, the whole plant of Leucas aspera was first defatted and remaining material was successively extracted with water, ethyl acetate and methanol. All the extract were concentrated under vacuum to yield corresponding aqueous (AQ), ethyl acetate extract (EAE) and methanolic extract (ME). Extractive value was found to be 4.36% w/w, 5.28% w/w and 8.50% w/w, respectively. Preliminary phytochemical screening reveals the presence of alkaloids, glycosides, terpenoids and sterols in both the extracts. All the tree extracts were screened for its Bactericidal activity against two gram positive and three gram negative bacteria at different concentrations of 50, 100, 200, 300 and 400 µg/disc by agar diffusion method. The activities of both the extracts were compared with standard antibiotics, by measuring the dimension of the zone of microbial growth (zone of inhibition) around the disc. EAE and ME extracts exhibited a significant antibacterial activity against all the screened microorganisms.

KEY WORDS

Leucas aspera, Bactericidal activity, Phytochemical screening.

INTRODUCTION

Leucas aspera S. (Lamiaceae) is one of the common plant found in the wild and open agriculture waste lands. It has been reported to possess antipyretic, antiinflamatory, antiseptic and insecticidal Properties [1]. The leaf juice is used as an external application for psoriasis, chronic skin eruption, and painful swelling [2, 3]. Due to its wide ethnic medicinal potential, this plant was investigated for its bactericidal activity.

MATERIAL AND METHODS

The whole plant of *Leucas aspera* S. (Lamiaceae) was collected from Dr. P. D. K. V. Agricultural campus, Akola (MS) in February 2011. The sample was authenticated by Dr. D. G. Bhadange, Head. Department of Botany, Shri Shivaji College, Akola and a voucher specimen has been preserved. Air dried and powdered, whole plant of *Leucas aspera* was defatted with hexane by maceration process. The defatted material was successively extracted with water, ethyl acetate and methanol. The extractive value was found to be 4.36%, 5.28% and 8.50% w/w, respectively. The preliminary phytochemical analysis was carried out using standard methods [4, 5].

Aqueous (AQ), Ethyl acetate extract (EAE) and methanolic extract (ME) was studied for its bactericidal activity using different clinically important strains at different concentrations of 50, 100, 200, 300 and 400 µg/disc by agar diffusion method [6] against two gram positive and three gram negative bacteria. The activities of extracts were compared with the standard antibiotics. The plates were incubated at 37°C for 48 hrs. The zone of inhibition was calculated by measuring the dimension of the zone of no

microbial growth around the disc. For each value, averages of three determinations were recorded.

RESULTS AND DISCUSSION

The preliminary phytochemical analysis of Leucas aspera showed the presence of alkaloids, phenolics, tannins, terpenes, steroids, glycosides and fatty acids. Ethyl acetate is found to be the best extraction medium for the isolation of phytochemical compounds (**Table 1**).

Except AQE other two EAE and ME of *Leucas aspera* exhibited moderate to significant and concentration dependent bactericidal activity against all the tested microorganisms at the concentrations of 50, 100, 200, 300 and 400 µg/disc and comparable to the various antibiotics used for individual microorganism. The aqueous extracts revealed poor bactericidal activity. Present study also reveals that EAE was found to be highly active against *Klebsiella pneumoniae*, where as ME was highly active against *Escherichia coli* **(Table 2)**. Our results indicate the potential usefulness of *Leucas aspera*, in the treatment of various bacterial infections. Further phytochemical studies are needed to identify the active principle responsible for the observed bactericidal activity.

Table 1: Preliminary phytochemistry of *Leucas aspera*

Phytochemicals	Aqueous extract (AQE)	Ethyl acetate extract (EAE)	Methanolic extract (ME)
Alkaloids	-	++	+
Phenolics	-	+	+
Tannins	+	+++	++
Terpenes	-	+++	++
Steroids	+	+++	++
Fatty acids	+	++	+
Glycosides	-	++	+
Anthroquinones	-	-	-

Table 2: Bactericidal activity of extracts of *Leucas aspera*

Microorganisms	AQE (Zone of inhibition at mg/disc)					EAE (Zone of inhibition at mg/disc)					ME(Zone of inhibition at mg/disc)				
	50	100	200	300	400	50	100	200	300	400	50	100	200	300	400
Bacillus subtilis (G+)	--	--	--	--	--	5.0	7.0	12.0	12.5	13.2	--	--	--	--	--
Staphylococcus aureus (G+)	--	--	2.5	3.2	3.5	3.0	5.0	8.0	9.2	9.5	5.0	6.8	10.5	11.5	13.0
Escherchia coli (G-)	3.5	3.8	5.2	6.5	7.0	8.0	9.8	12.0	13.2	15.0	12.5	14.0	16.2	17.5	19.5
Klebsiella pneumoniae (G-)	--	--	--	3.2	3.5	10.3	12.5	15.2	16.5	18.5	8.7	10.2	12.6	14.5	15.5
Proteus vulgaris (G-)	--	--	--	--	--	--	--	--	7.5	8.2	--	--	--	8.0	9.5

***Novobiocin* (std)** 30mg/disc, average zone of inhibition (31 mm)
***Chloramphenicol* (Std)** 30mg/disc, average zone of inhibition (26mm)
Values are mean of triplicate analysis, Zone of inhibition is measured in mm, -: no inhibition.

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