ANTIMICROBIAL ACTIVITY OF *LEUCAS ASPERA* AGAINST WOUND PATHOGENS

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Abstract: Medicinal plants are the treasure house of potential drugs. They possess anti inflammatory, anti helminthic, anti pyretic, analgesic and anti cancer properties. *Leucas aspera* is one among them. It is commonly used as anti pyretic and insecticide since ancient times. The leaves of *Leucas aspera* is used for healing of wounds since ancient times. The present study aims to isolate wound pathogens from clinical samples and to prepare herbal lotion using the leaves of *Leucas aspera*. This study also determines the effect of herbal lotion on wound pathogens by Agar well diffusion method. The pathogens such as *Staphylococcus aureus, Pseudomonas aeruginosa,* and *Escherchia coli* were successfully isolated. The herbal lotion inhibited *Pseudomonas aeruginosa,* followed by *Staphylococcus aureus,* and *Escherchia coli*. The results suggested that has potential effect over wound pathogens and can be used as ointment for wound infections.

Key words- *Leucas aspera*, herbal lotion, agar well diffusion method, wound pathogens

I. INTRODUCTION

Plants are used as a source of medicinal agents since ancient times. They can be used as antibacterial, anti helminthic, astringent, emetic, febrifuge, sedative and stimulant (Ishibangu, et. al., 2002). 70 percentof the medicines used in homeopathy system are prepared from plants (Khan and Chagtai, 1989). Plants can acts as the blue prints for the modern medicine (Reynolds, 2009). They are rich in phytoconstituents and many of them are effectively used to cure a wide range of ailments.

Due to increasing of resistance against several antimicrobial drugs, there is a need for new therapeutic alternatives (Lakshmanan and Sankaranarayanan, 1990; Goyal, *et. al.*, 2008). Medicinal plants play an important role for obtaining new drugs as they are rich in a wide variety of secondary metabolites such as tannins, alkaloids, terpenoids and flavonoids (Anuradha, *et. al.*, 2010). They have antimicrobial properties and can serve as an alternative, effective, cheap and safe antimicrobial for the treatment of microbial infections (Cragg, *et. al.*, 1997; Cowan, 1999).

Leucas aspera is an herbaceous aromatic weed found commonly in tropical regions (Ai Lan Chew, *et. al.*, 2012). It is a perennial herb belonging to the family Lamiaceae and is known as "Thumbai" in Tamil and "Dronapushpi" in Sanskrit (Rai, *et. al.*, 2005). It is used as medicinal plant since ancient times. The whole plant is used to cure many human ailments. The leaves are used to treat chronic rheumatism, psoriasis and other chronic skin eruptions (Rai, *et. al.*, 2005). Bruised leaves are used to treat snake bites. (Shirazi, 1947). The leaves are also used as insecticides and mosquito repellent in rural areas (Reddy et al., 1993). They are used to treat coughs, cold, and painful swelling (Kripa *et al.*, 2011). They possess wound healing property and can be used in the preparation of herbal ointments.

The objective of the present study is to determine the antibacterial activity of herbal lotion prepared from *Leucas aspera* against wound pathogens isolated from pus samples.

II. MATERIALS AND METHODS

2.1 Collection of Plant:

The plant sample was collected from Thiruverumbur, Tiruchirapalli district, Tamilnadu. The leaves of *Leucas aspera* were collected. The leaves were washed thoroughly with distilled water to remove dust particles. Then the leaves were shade dried and coarsely powdered using mechanical grinder.

2.2 Preparation of herbal lotion:

5g of white soft paraffin and 3 g of petroleum jelly was heated and melted at 76°C. To the melted solution, 10 g of powdered sample was added and stirred continuously. After 30 minutes, the solution was filtered using muslin cloth and cooled.

2.3 Collection of clinical samples:

Pus samples were collected from wound infected persons by using sterile cotton swabs. Then the swabs were immediately immersed into saline.

2.4 Isolation and Identification of pathogenic bacteria:

Pus samples were used to isolate the bacteria. The pus samples were collected aseptically and then streaked on Nutrient agar, Mannitol salt agar, Cetrimide agar medium, EMB agar medium. The isolated organisms were identified by Gram staining.

2.5 Antimicrobial activity:

The antimicrobial activity was carried out by agar well diffusion method against wound pathogens (Murray, *et.al.,* 1995). The organisms were spread over the Muller hinton agar and wells were made using cork borer. The herbal lotion was introduced into the plates in different concentrations (10 µl, 20 µl, 30 µl). Then the plates were incubated at 37°C for 24 hours. After 24 hours, the plates were examined for the zone of inhibition.

III. RESULTS AND DISCUSSION

Pathogens such as *Staphylocoocus aureus, Escherichia coli,* and *Pseudomonas aeruginosa* were isolated from pus samples. *Staphylococcus aureus* is the common wound pathogen which can cause severe infections. The herbal lotion preapared from the leaves of *Leucas aspera* is light green in colour and semi solid in consistency. This herbal lotion possesses antibacterial activity and shows effective result against wound pathogens and the results are summarized in table 1. The zone size increases as the concentration increases. The antimicrobial activity is mainly due to the presence of terpenes and their complex which can cause disruption of cell membranes (Urzua, *et. al.,* 1998). The antimicrobials prepared from plants are more effective than synthetic antimicrobials (Iwu, *et. al.,* 1999). The maximum zone of inhibition is seen in *Pseudomonas aeruginosa* (18mm). The lotion shows minimum inhibitory effect over *Escheriachia coli* (8mm) as it is a normal flora and it can cause only opportunistic infections. Thus, it is evident that the formulated herbal lotion is effective against wound pathogens.

Table 1. Results of zone of inhibition using herbal lotion.

PATHOGENS	10µl	20µl	30µl
Staphylococcus aureus	9mm	11mm	14mm
Pseudomonas aeruginosa	12mm	15mm	18mm
Escherichia coli	3mm	5mm	8mm

IV. CONCLUSION

In this study, the antibacterial activity of *Leucas aspera* has been investigated. The formulated herbal lotion shows more effect on *Pseudomonas aeruginosa* and it can be used as ointment for wound infections. This study provides evidences for the antibacterial activity of leaves of *Leucas aspera* which are capable of curing medical ailments. Further pharmacological investigations are being carried out to identify its medicinal profile in the field of medicine.

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