

# Multiple herbal therapy - Antimicrobial activity of wound healing paste(Pasuru) used by Sugali tribes of Yerramalais of Kurnool district.,Andhra Pradesh,India

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**Abstract:** Antimicrobial activity was also studied against Bacillus subtilis,Escherichia coli (enteropathogen),Klebsiella pneumonia and Staphylococcus Streptococcus aureus and Staphylococcus by using cup-plate method. Erythromycin was used as standard antibacterial agent.The methanol extract was diluted into different concentration (1,2, 4, 6, 8, 10 mg/100 µl) with DMSO. The results of the study revealed that, the Pasuru exhibited significant antibacterial activity. The presence of these bioactive constituents have been linked to the antimicrobial activity of the plant material.

**Key words:** Antibacterial activity,Methonolic extract,Yerramalais forest.Sugali Tribes.Multiple drug therapy,Pasuru.

## Introduction

Nature has gifted us with many herbs having mystical haling properties that are used widely in number of ailments. The use of herbs and medicinal plants as the first medicines is a universal phenomenon. Today, as much as 80% of the world's population depends on traditional medicine as primary health care needs. Ayurveda is an intricate system of healing that originated in India thousands of years ago. We can find historical evidence of Ayurveda in the ancient books of wisdom known as the Vedas. In the Rig Veda, over 60 preparations were mentioned that could be used to assist an individual in overcoming various ailments. Ayurvedic yogas (medicinal preparations) rolled on from Vedic period to the modern times, have

passed on from the hands of Charak, Sushruta, Bhagbhatta, Chakradduta, Bhavaprakash, Sarangdhar, Yadaviji, Bangasen and many others, but still persisting to remain untarnished. Surely this is the result of masterly formulations of the plant drugs. Several Ayurved medicinal preparation are made by combining 2 or 3 herbal plants extracts. Ayurveda is attracting people around the world with its essence. It is a well-researched & organized science with vast span of knowledge for all needs of our society. Use of herbal medicine has grown extensively in developed countries over the past decade.

Multiple herbal therapies are of potential interest. Herbal blends and formulations combine the benefits of multiple herbs, which typically produces a

synergistic action while minimizing the potential toxic effects of a single herb. Herbs provide many unique qualities that are very limited in conventional medicine, such as anti-cancer, anti-viral and immunoregulation properties. Herbs are an excellent alternative to antibiotics in the treatment of infectious diseases, with wider antibacterial effects as well as various antifungal and antiviral actions. Some herbal formulations serve as detoxification agents, antioxidants, and anti-cancer therapies.

Antibacterial resistance especially among gram-negative bacteria is an important issue that has created a number of problems in treatment of infectious diseases and necessitates the search for alternative drugs of natural anti-bacterials<sup>1</sup>. It is necessary to evaluate, in a scientific base, the potential use of folk medicine for the treatment of infectious diseases produced by common pathogens. They can also be a possible source for new potent antibiotics to which pathogen strains are not resistant<sup>2</sup>. This has forced scientists to search for new antimicrobial substances from various medicinal plants.

Local Sugali tribes use Twenty three herbs with different combinations to treat wounds are reviewed. The use and efficacy of the herbs in healing wound, and the the chemical constituents of the plants are discussed. In regard to the wound condition, the preparations were applied more than one times daily until healing was evident. Multiple drug therapy<sup>3</sup> plays a vital role in treating various ailment of human beings. Pasuru traditionalay used for the treatment of wounds, it consists of *Acalypha indica*, *Ficus bengalensis*, *Morus alba* and *Tridax procumbence*. The ethnomedical claims that *Acalypha indica*, *Ficus bengalensis*, *Morus alba* and *Tridax procumbence*. are wound healing herbs of Yerramalais forest

#### Study area:

Kurnool district is present in Andhra Pradesh (Fig.1), situated between eastern longitudes of 76 58'-78 56' and northern latitudes of 14 54;-16 14'. Yerramalais forest covers over 1 lakh of the 4 laks hectares of forest in Kurnool district. Yerramalais receives very low rainfall and they come under the Sothern thorn forest.

Fig.1 Map Of Andhra Pradesh showing Kurnool district



**Materials methods:****Collection of plant material**

Acalypha indica, Ficus bengalensis, Morus alba and Tridax procumbence are collected from Yerramalais forest of Kurnool district, Andhra Pradesh, India. The collected plant materials were thoroughly washed with running tap water, rinsed with distilled water and air dried under shade for 30 days. The collected plants are dried and reduced to fine powder and passed through the Sieve no.100 and mixed in geometric proportion and packed in well-closed container.

**Preparation of Pasuru:**

About 100 g of the leaf powder (equal ratio of four plant powders) was taken in a soxhlet extractor and extracted with methanol for 72 hours. The solvent was recovered by distillation *in vacuo* and the residue stored in the dessicator was used for subsequent experiments. Before use, each crude extract was re-suspended in their respective solvent to yield 50 mg extract residue per ml solvent.

**Test Microorganisms**

The test organisms included the gram-positive bacteria Bacillus subtilis, Staphylococcus aureus and gram-negative bacteria Klebsiella pneumoniae, Escherichia coli and Streptococcus obtained from the Kurnool Medical College, Kurnool, Andhra Pradesh.

The bacteria were grown in the nutrient broth at 37°C and maintained on nutrient agar slants at 4°C.

**Preparation of Extract**

Pasuru was extracted with methanol by maceration process. The different concentrations (1mg, 2mg, 4mg, 6mg, 8mg, 10mg/100 µl) were prepared with DMSO for antimicrobial activity.

**Photochemical screening of the Pasuru**

Phytochemical investigations of the Pasuru was carried out using the methods described by<sup>4,5</sup> Kokate, Trease and Evans 1994 to check for the presence of phenolic compounds, flavonoids, tannins,

**Antimicrobial Activity:** The antimicrobial activity was evaluated by employing 24 hrs cultures of B. subtilis, E. coli, S. aureus and Staphylococcus, using nutrient agar medium. The bacterial strains were transferred to sterile plates aseptically. The plates were left at room temperature and allowed for solidification. In each plate one well of 6 mm diameter were made using a sterile borer. Accurately 100 µl different dilutions of methanol extract of Pasuru (1, 2, 4, 6, 8, 10 mg) and single concentration of erythromycin (5 mg/ml) solutions were transferred to wells aseptically and labeled accordingly. The plates were incubated at 37±1°C for 24 hrs. The diameter of zone of inhibition surrounding each of wells was recorded<sup>6,7</sup>.

**Table 1: Antibacterial activity of methanol extract of Pasuru**

Microorganisms	Zone of Inhibition of methanol extract in mm						
	1mg	2mg	4mg	6mg	8mg	10mg	Erythromycin 5 µg/100 µl
E.coli	15	18	22	22	20	23	18
Staphyococcus	4	10	16	21	21	22	24
B.subtilis	6	10	18	15	18	18	25
S.aureus	12	12	14	13	15	17	18
K.pneumoniae	8	7	12	10	13	16	17

**Table.2 Phytochemical screening of Medicinal Plants**

	Tanins	Saponins	Flavonoids	Steroids	C. glycosides	Alkaloids	Phenols
Acalypha indica	+	+	–	+	+	+	+
Ficus bengalensis	–	+	+	–	–	+	+
Morus alba	+	+	+	+	+	+	+
Tridax procumbence	+	+	+	+	+	+	+

## **Results and Discussion**

Antibacterial activity of different concentration of methanol extract of Pasuru was measured in terms of Zone of Inhibition. It revealed that significant antibacterial activity was showed against bacterial strains like *Escherichia coli*, *staphylococcus*, *Bacillus subtilis*, *Klebsiella pneumoniae* and *Streptococcus* in comparison with standard erythromycin. Pasuru showed maximum effect against *E.Coli* and *Streptococcus* at small concentrations (Table 1).The antibacterial activity of Pasuru showed significant activity against *E. coli* and *S. aureus* at 1 mg/ml concentration. This activity is due to the constituents like *Acalypha indica*, *Ficus bengalensis*, *Morus alba* and *Tridax procumbence*, are having wound healing and antiseptic properties

The use of specific herbs for medicinal purposes dates back thousands of years. Several herbs are mentioned in the Bible and archeologists have documented herbal usage back to prehistoric times. Wound healing or wound repair is the body's natural process of regenerating dermal and epidermal tissue.. Local communities use 28 indigenous phytotherapies to treat wounds. The method of preparation falls into four categories, paste, powder, juice and decoction. Fresh pulp, warm resin and leaves were also used. In regard to the wound condition, the preparations were applied

more than one times daily until healing was evident. The flavonoids and saponins present in this herb can speed up wound healing, by strengthening the connective tissues. Present study provides baseline data on wound healing properties of native plants that can be exploited by pharmaceutical industry for screening new active compounds. Indigenous remedies which are more effective, safe and inexpensive are gaining popularity among both rural and urban areas. Information from ethnic groups or indigenous traditional medicine has played a vital role in the discovery of novel products from plants as chemotherapeutic agents (Katewa *et al.*, 2004). Phytochemical screening of the Pasuru revealed the presence of tannins, saponins, phenolics, flavonoids, cardiac glycosides, anthroquinones and alkaloids. (Table.2)

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