

Antibacterial Activity Of *Azadirachta indica* A. Juss. Leaves Extracts Against Skin Pathogens

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Research Article

Abstract: *Azadirachta indica* A. Juss. is an indigenous medicinal plant used to cure skin diseases in traditional healthcare system. The present study was carried out to evaluate antibacterial activity of *Azadirachta indica* A. Juss leaves extracts against certain skin pathogens. Disc diffusion method was used to assess the antibacterial activity of these extracts against skin pathogens. *Streptococcus pyogenes* and *Staphylococcus aureus* shows zone of inhibition. The growth of *Streptococcus pyogenes* was remarkably inhibited by chloroform extract of the *Azadirachta indica* A. Juss leaves than the other solvents used.

Key Words: *Streptococcus pyogenes* and *Staphylococcus aureus* *Azadirachta indica* A. Juss.

Introduction

Medicinal plants are a source of great economic value all over the world. Nature has bestowed on us a very rich botanical wealth and a large number of diverse types of plants grow in different parts of the country. Herbal medicine is still the main stay of about 75-80% of the whole population, and the major part of traditional therapy involves the use of plant extract and their active constituents. Following the advent of modern medicine, herbal medicine suffered a setback, but during last two or three decades advances in phytochemistry and in identification of plant compounds effective against certain diseases have renewed the interest in herbal medicines (FAO 19903). Medicinal plants are a source of great economic value in the Indian subcontinent. Nature has bestowed on us a very rich botanical wealth and a large number of diverse types of plants grow in different parts of the country.

India is rich in all the 3 levels of biodiversity, namely species diversity, genetic diversity and habitat diversity. In India thousands of species are known to have medicinal value and the use of different parts of several medicinal plants to cure specific ailments has been in vogue since ancient times. Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been

isolated from natural sources, many based on their use in traditional medicine. Various medicinal plants have been used for years in daily life to treat disease all over the world. They have been used as a source of medicine. The widespread use of herbal remedies and healthcare preparations, such as those described in ancient texts like the Vedas and the Bible, has been traced to the occurrence of natural products with medicinal properties. In fact, plants produce a diverse range of bioactive molecules, making them a rich source of different types of medicines even today, the World Health Organization estimates that up to 80 percent of people still rely mainly on traditional remedies such as herbs for their medicines. Its civilization is very ancient and the country as a whole has long been known for its rich resources of medical plants.

Today, Ayurvedic, Hoemoeo and Unani physicians utilize numerous species of medicinal plants that found their way a long time ago into the Hindu Material Media. *Azadirachta indica* A. Juss has been used to treat various skin conditions such as cuts, burns. It is alleged that sap from *Azadirachta indica* A. Juss eases pain and reduces inflammation. Evidence on the effects of *Azadirachta indica* A. Juss sap on wound healing, however, is contradictory. Screening techniques of biologically active medicinal compounds have been conducted on well-known species of plants used in traditional medicines and most plants have shown antibacterial activity like *Azadirachta indica* A. Juss.

Material and Method

Fresh plant leaves of *Azadirachta indica* A. Juss were washed under running tap water, shade dried and then homogenized to fine powder and stored in airtight bottles.

Preparation of Crude extract:

Different solvents like Petroleum ether, acetone, ethanol, benzene, Chloroform solvents and water were chosen for successive solvent extraction based on polarity using soxhlet extraction apparatus and the extracts of *Azadirachta indica* A. Juss leaves were concentrated under reduced pressure using rotary evaporator (Gunasekaran Balamurugan and Shinnaraj Selvarajan, 2009).

Test microorganisms:

The microbial strains are identified strains and were obtained from the National Chemical Laboratory (NCL), Pune, India. The bacterial strains studied, *Streptococcus pyogenes* NCIB8884 and *Staphylococcus aureus* ATCC 25923

Disc diffusion method:

Antibacterial activity is studied by using the disc diffusion method (Kirby et al., 1966). The discs were put in a clean glass bottle and sterilized at 121°C for 15 min in an autoclave. Broth dilution assay was used to screen the extracts for antibacterial activity.

Observations and Results:

The antibacterial activity of various *Azadirachta indica* A. Juss extracts like petroleum ether extract, chloroform extract, ethanol extract are evaluated and compared using disc diffusion method .The

antibacterial activity of *Azadirachta indica* A. Juss leaves extracts of petroleum ether, acetone, ethanol, benzene, chloroform solvents studied against *Streptococcus pyogenes* and *Staphylococcus aureus*. The chloroform extract showed maximum activity than the other extracts (Table- 1). All the test extracts of *Azadirachta indica* A. Juss possess significant antibacterial activity against the skin pathogens.

Conclusion:

Azadirachta indica A. Juss leaves extract exhibit some degree of antibacterial activity towards *Streptococcus pyogenes* and *Staphylococcus aureus*. Thus, it shows that some of the medicinal plants used in traditional medicine are potentially effective antibacterial agents. It may be concluded from this study that *Azadirachta indica* A. Juss leaf extract has antibacterial activity against skin pathogens. It is expected that using natural products as therapeutic agents will probably not elicit resistance in microorganisms. This can explain the rationale for the use of the plant in treating infections in traditional medicine. The plant could be a veritable and cheaper substitute for conventional drugs since the plant is easily obtainable and the extract can easily be made via a simple process of maceration or infusion. It is essential that research should continue to isolate and purify the active components of this natural herb and use in experimental animals.

Table-1: The antibacterial activity of the *Azadirachta indica* A. Juss leaves extracts.

Organisms	Zone of inhibition (in mm)				
	Petroleum ether	Acetone	Ethanol	Benzene	Chloroform
<i>Streptococcus pyogenes</i>	8	12	10	5	16
<i>Staphylococcus aureus</i>	6	9	8	3	12

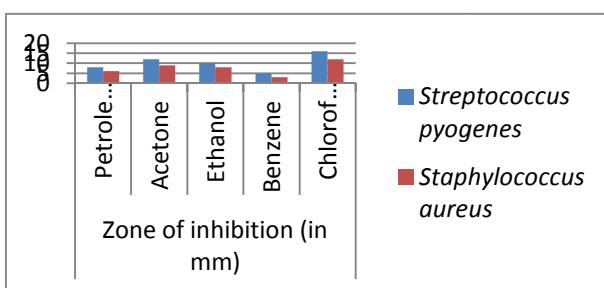


Fig.1. Graph showing antibacterial activity of the *Azadirachta indica* A. Juss leaves extracts.



Fig.2. Photoplate showing antibacterial activity of Chloroform extract of *Azadirachta indica* A. Juss.

References:

- [1] Anonymous. 1993. World Health Organisation Summary of WHO guidelines for the assessment of herbal medicines *Gram*, 28: 13- 14, 1993.
- [2] Ateş, A., Ö.T. Erdoğrul., Antimicrobial activities of various medicinal and commercial plant extracts. *Türk J Biol.*, 27: 157-162, 2003.
- [3] Erdoğrul OT. Antibacterial activities of some plant extracts used in folk medicine. *Pharmaceutical Biol* 40: 269-273, 2002.
- [4] FAO, Medicinal and Aromatic plant in Asia. Bangkok, Thailand RAPA,Publication, 1993.
- [5] Gunasekaran Balamurugan and Shinnaraj Selvarajan; Preliminary phytochemical screening and anthelmintic activity of indigofera tinctoria linn. *int.j.drug dev & res.*, sep-dec 20091(1):157-160.,2009.
- [6] Kirby M, Bauer A, Sherris C, Turck M. Antibiotic susceptibility testing by a standardized single disk method. *Amer J Clin Pathol* 45: 493-496, 1966.
- [7] Nostro A, Germano MP, D'Angelo V, Marino A, Cannatelli MA. Extraction methods and bioautography for evaluation of medicinal plant antimicrobial activity. *Lett. Appl. Microbiol.* 30(5): 379, 2000.
- [8] Reddy PS, Jamil K, Madhusudhan P et al. Antibacterial activity of isolates from *Piper longum* and *Taxus baccata*. *Pharmaceutical Biol* 39: 236-238, 2001.
- [9] Samy, R.P. and S. Ignacimuthu, Antibacterial activity of some folklore medicinal plants used by tribals in Western Ghats in India. *J. Ethnopharmacol.*,69: 63-71, 2000.
- [10] Uniyal, S.K., K.N. Singh, P. Jamwal and B. Lal, Traditional use of medicinal plants among the tribal communities of Chhota Bhangal, Western Himalayan. *J. Ethnobiol. Ethnomed.*, 2: 1-14, 2006.