International Journal of Advance and Applied Research
www.ijaar.co.in
ISSN – 2347-7075 Impact Factor – 8.141
Peer Reviewed Bi-Monthly
Vol. 6 No. 18 March - April - 2025

Antimicrobial Activity Of Fruit Extract Of Acacia Concinna (Willd) DC On Pathogenic Organisms.

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DOI - 10.5281/zenodo.15260936

Abstract:

Acacia concinna, commonly known as shikakai, has been traditionally used for hair care and various medicinal purposes. The antimicrobial activity of the ethanol extract of Acacia concinna (Willd. DC.) fruits was examined against bacterial isolates of Staphylococcus aureus, Streptococcus pyogenes, Pseudomonas aeruginosa, and Bacillus pumilus, as well as fungal isolates such as Candida albicans, Microsporumaudouinii, Trichophytonrubrum, and Trichophytonmentagrophytes by using the disc diffusion method (Zone of Inhibition in mm at 100 µg / disc). Staphylococcus aureus, Trichophytonrubrum. Microsporangium audouinii and Candida albicanswas found to be positively impacted by ethanol extract (zone of inhibition 9 mm).

Introduction:

Medicinal plants have served as a rich reservoir of therapeutic compounds for centuries, offering a promising avenue for discovering new antimicrobial drugs.Among these, *Acacia concinna* (Shikakai), a widely distributed leguminous tree, has a long history of traditional use in various systems of medicine, particularly in Ayurveda, for its purported health benefits. While *A. concinna* is well-known for its applications in hair care and as a natural surfactant, traditional medicine practitioners also employ it to treat a range of ailments, suggesting potential antimicrobial properties.*Acacia concinna* (Willd) DC. the big climbing shrub, which is a member of the Fabaceae family, is furnished with many tiny hooked prickles, *Acacia concinna* (Willd) DC pods, and leaves were used for the prevention of dandruff.

Several skin conditions were treated using pods. According to Natarajan & Natarajan (2009), it has anti-dermatophytic properties. Secondary metabolites such alkaloids, flavonoids, phytosterols, saponins, tannins, phenolic chemicals, and gums are found in the pods. The present investigation examined the antibacterial efficacy ofethanol extract of *Acacia concinna* (Willd) DC used to treat skin disease against eight clinically relevant pathogens.

Material and Methods:

Medicinal plants are the first home remedy that a person relies on for skin diseases. Lemon and Gram flour, Turmeric etc. are used from generations to beautify skin and also as quick home remedies against skin infections. The use of these plant based substances in treatment of skin infections are mainly because of its antimicrobial characteristics. Higher plants have shown to be potential source of new antimicrobial agent (Mitscer, 1987).

Preparation of Plant Extract:

The fruits of *Acacia concinna* (Willd) DC used in medicine was collected from different forest area. Cleaned and disinfected fruits was dried in shade and crushed to prepare a fine powder. The

powder was extracted in ethanol solvent with the help of Soxhlet's extractor.

Collection of fungal and bacterial isolates:

The test micro-organisms used for the antimicrobial activity were selected on their pathogenicity against different skin diseases in human beings. The micro-organisms selected were fungal isolates of *Candida albicans, Microsporumaudouinii, Trichophytonrubrum, Trichophytonmentagrophytes* and the bacterial isolates of *Staphylococcus aureus, Streptococcus pyogenes, Pseudomonas aeruginosa* and *Bacillus pumilus.*

Disc Diffusion Method:

Fungal isolates and the bacterial isolates were subculture overnight at 37^0C on potato dextrose agar and nutrient agar plates respectively. Six plates per organism. The suspension of each bacterial and parasitic isolates were prepare as described by John *et al* (1999) in isotonic sodium chloride solution. Solidified petridishes, for each microorganism for ethanol solvent on Muller- Hinton agar were flooded with the appropriate suspension of bacterial isolates respectively.

Sterile 10 mm diameter absorbent filter papers disc (punched out from Whattman filter paper No.1) were impregnated with ethanol solvent of plant extracts. It was placed on inoculated lawn. All the plates were kept for incubation period, i.e. for 24 hrs at room temperature. Results were noted down in terms of sensitivity zone around the disc which was measured in millimeter (mm) and results were sequentially recorded in the tabular form.

Result and Discussion:

Table 1.1: Antimicrobial activity of fruit extracts of *Acacia concinna* (Willd). DC.by disc diffusion method (Zone of Inhibition in mm at 100 µg / disc)

S. N.	Micro-organism	Ethanol
1	*Staphylococcus aureus*	**9 mm**
2	*Streptococcus pyogenes*	00
3	*Pseudomonas aeruginosa*	00
4	*Bacillus pumilus*	00
5	*Trichophytonrubrum*	**9 mm**
6	*Trichophytonmentagrophytes*	00
7	*Microsporangium audouinii*	**9 mm**
8	*Candida albicans*	**9 mm**

Ethanol extracts showed positive microbial zone of inhibition against *Staphylococcus aureus, Trichophytonrubrum. Microsporangium audouinii* and *Candida albicans*. The zone of inhibition of 9 mm against pathogens *Staphylococcus aureus, Trichophytonrubrum. Microsporangium audouinii* and *Candida albicans* was observed in ethanol extracts. Ethanol extracts was found non-reactive to other test organisms.

The ethno-medicinal use of *Acacia concinna* DC. pods in the treatment of Skin disease may be attributed due to the presence of Phyto-compounds and their activities shown in Ethanol extract.

Acacia concinna DC. is found in warm planes of central and South India. Traditional practitioners widely used the pods of this plant in treatment of Skin

disease. There is urgent need to conserve this plant.

Conclusion:

This study has demonstrated the significant antimicrobial potential of *Acacia concinna* extract against a range of bacterial and fungal pathogens. The varying degrees of efficacy across different extracts and target microorganisms highlight the complex nature of the plant's phytochemical composition and the specific mechanisms of action involved. While this research provides a valuable foundation for understanding the antimicrobial properties of *A. concinna*, further investigations are warranted to isolate and identify the specific active components responsible for this activity, elucidate their mechanisms of action at the molecular level, and explore the potential for developing novel antimicrobial agents from this promising natural resource.

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