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Antimicrobial Efficiency of Leaves Extracts of *Milletia auriculata* Plant



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ABSTRACT

The present investigation was focused on the Antimicrobial Studies of extraction in distilled water, ethanol, petroleum ether, Acetone, ethyl acetate, benzene and chloroform solvents extracts of leaves of *Milletia auriculata*, site was selected in Nagthana, Tal-Warud, Dist-Amravati of Maharashtra State. The leaves of *Milletia auriculata* have antimicrobial activity against some gram-positive and gram-negative bacteria such as *B. subtilis*, *E. coli*, *S. typhi*, *S. aureus*. The extraction in distilled water, ethanol, Acetone, ethyl acetate against different pathogens but petroleum ether, chloroform and benzene extract dose did not show activity against given all pathogens. Hence, it is essential to explore the much more study of this herb in the botany, medicinal, pharmaceutical and biochemical sciences. The detailed study of phytopharmaceutical herbal drugs will make a direct impact on the overall economic development of the grower farmer and villagers.



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INTRODUCTION

Literature evidence reveals that medicinal plants have been used to prevent and cure human diseases. In India, medicinal plants have made a good contribution to the development of ancient Indian “medicinal medical”. During the past one century, there has been a rapid extension of the allopathic system of medical treatment in India. Efforts have been made to introduce many of these drug plants to farmers. Several research institutes have undertaken studies on the cultivation practices of medicinal plants, which were found suitable for commercial cultivation. Most of the plants have ethnomedical traditions known to possess various pharmaceutical and nutraceutical properties in their extract. Many human infectious diseases are known to be treated with herbal remedies throughout the history of humanity. Even today, plant materials continue to play a major role in primary health care as therapeutic remedies in many developing countries. The development of drug resistance as well as appearance of undesirable side effects of certain antibiotics has led to the search for new antibacterial agents in particular from medicinal plants[1].

In the recent years, antimicrobial resistance has become a major global problem[2]. The increased prevalence of antibiotic-resistant bacteria due to the extensive use of antibiotics has rendered the current antimicrobial agents inefficient to control several bacterial diseases [3-4]. Various extracts of this plant were examined using agar disk diffusion method against Gram positive, Gram negative and fungus microorganism. In future, this plant can be subjected to the isolation of major constituent's antimicrobials and to further pharmacological evaluation[5]. The antimicrobial activity of different extracts was evaluated using agar well diffusion assay[6]. A study of antimicrobial activity of few medicinal herbs[7].

Methanolic extract has effective antibacterial activity against Gram-positive bacteria and ineffective against Gram-negative bacteria. The study suggests that leaves of *Adenium obesum* (Desert rose) plant can be used as an antimicrobial agent and expected that leaves of *Adenium obesum* may be used as therapeutic agents for various diseases [8]. Antibacterial, antifungal and insecticidal activities of the bark of *Millettia ovalifolia*. The ethyl acetate fraction of the extracts of stem bark of *Millettia ovalifolia* was evaluated for their antibacterial, antifungal and insecticidal activities [9].

Proximate analysis of *Cissus quadrangularis* linn moisture, ash content and cold water, hot water, 1% NaOH and HCl solubility, root, stem and leaves samples have been investigated[10]. The proximate analysis such as moisture, ash content and cold water, hot water, 1% NaOH and HCl solubility of root, stem and leaves samples of *Milletia auriculata*[11]. Studies on the phytochemical, spectroscopic characterization and antibacterial efficiency of *Urginea indica* (roxb.) Kunth (liliaceae) and *Cyclea peltata* arn. Ex wight (menispermaceae) [12]. The most essential of these bioactive constituents of plants are alkaloids, tannins, flavonoids and phenolic compounds. Many of the indigenous medicinal plants are used as spices and food[13]. Five selected Indian medicinal plants such as *Andrograpis paniculata*, *Cassia alata*, *Cardiospermum halicacabum*, *Nyctanthes arbortritis* and *Solanum nigrum* were analyzed for phytochemical constituents and tested for antibacterial activity against human pathogens *Escherichia coli*, *Klebsiella pneumoniae*, *Micrococcus luteus* and *Pseudomonas aeruginosa*. All the plant extracts showed significant antibacterial activity against the tested organisms[14].

The present study deals with the study of *in vitro* growth inhibitory activity against different microbes *Staphylococcus aureus*, *Escherichia coli*, *Bacillus subtilis* and *Salmonella typhi* using paper disc method of *Milletia auriculata* plant.

MATERIALS AND METHODS

Collection of plant Material

First, the site was selected in Nagthana, Tal-Warud, Dist-Amravati of Maharashtra State. Before picking the whole plant, the soil was moistened. The plant was collected in January-2015. That was washed smoothly by distilled water, leaves were separated from plants by scissor and all were shed dried at room temperature. Leaves sample was crushed separately in pestle-mortar to isolate fine powder.

Solvent extraction

5 g. portion of powdered plant materials were each separately dispersed in 100 ml of each water, ethanol, acetone, petroleum ether, ethyl acetate, chloroform and benzene. The solution was left to stand at room temperature for 24 hrs and was filtered with Whatman No. 1 filter paper. The filtrate was used for the antimicrobial screening.

All solvent extracts were screened for *in vitro* growth inhibitory activity against different microbes *Staphylococcus aureus*, *Escherichia coli*, *Bacillus subtilis* and *Salmonella typhi*. Using paper disc method [15] at a concentration of 50µg/ml using DMF as solvent. The culture medium used was a nutrient agar medium. After 24± 2 hours of incubation at 37 ± 2 0C; zones of inhibition were measured in mm and recorded in a table.

Table 1:- Antimicrobial activity against *Staphylococcus aureus*, *Escherichia coli*, *Bacillus subtilis*, and *Salmonella typhi* of leaves extract of *Milletia auriculata*.

Sample	<i>B.subtilis</i>	<i>E.coli</i>	<i>S.typhi</i>	<i>S.aureus</i>
H ₂ O	+	-	-	-
Ethanol	+	+	+	-
P.ether	-	-	-	-
Acetone	+	-	-	+
Ethyl acetate	+	-	+	+
Chloroform	-	-	-	-
Benzene	-	-	-	-

N.B. – Inactive (Resistance) ,+Active (Zone of Inhibition)

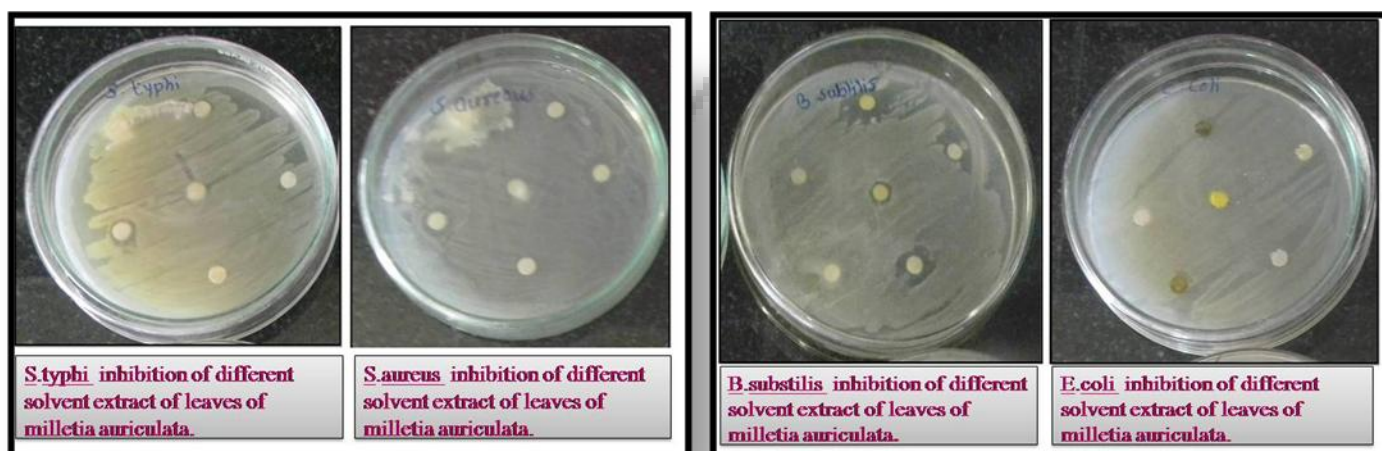


Fig. 1: Antimicrobial activity of leaves extracts of *Milletia auriculata*.

RESULTS AND DISCUSSION

The dried leaves sample of *Milletia auriculata* shown to possess antibacterial activity, the antimicrobial activity of leaves extract of distilled water, ethanol, petroleum ether, acetone, ethyl acetate, benzene and chloroform were inspected against the selected experimental pathogens such as *B. subtilis*, *E. coli*, *S. typhi*, *S. aureus*. The distilled water extract showed activity against *B. Subtilis* and inactive against *E. coli*, *S. typhi*, *S. aureus*. The ethanol extract showed activity against *B. subtilis*, *E. coli* and *S. typhi* and inactive against *S. aureus*. The petroleum ether extract inactive against given pathogens. The acetone extract was exhibited activity against *B. subtilis*, *S. aureus* and inactive against *E. coli* and *S. typhi*. The ethyl acetate extract showed activity against *B. subtilis*, *S. typhi* and *S. aureus* and inactive against *E. coli*. The chloroform and benzene extract did not show activity against given all pathogens.

Hence, it is essential to explore the much more study of this herb in the botany, medicinal, pharmaceutical and biochemical sciences. The detailed study of phytopharmaceutical herbal drugs will make a direct impact on the overall economic development of the grower farmer and villagers. The phytopharmaceutical as medication and their derived economic impact on the population.

CONCLUSION

The leaves of *Milletia auriculata* have antimicrobial activity against some gram-positive and gram-negative bacteria. *Staphylococcus aureus* and *Bacillus subtilis* gram positive bacteria which retain crystal violet staining while *E. coli* and *S. typhi* are gram negative which do not retain crystal violet staining. Gram positive bacteria are highly active against solvent of leaves extract.

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REFERENCES

- [1]LadjelS, Gherraf N, Zellagui A, BrahimL,Phytochemical And Antibacterial Screening Of Some Algerian Saharian Medicinal Plants.Plant Sciences Feed,1(10), 179-178, (2011).
- [2]RaghunathD,Emerging antibiotic resistance in bacteria with special reference to India. J.Biosci.; 33 (4): 593-603, (2008).
- [3]Nascimento GGF, Locatelli J, Freitas PC, Silva GL. Antimicrobial activity of plant extracts and phytochemicals on antibiotic resistant bacteria. BrazJ.Microbiol; 31: 247-256, (2000).
- [4]Hay A.D, Thomas M, Montgomery A, Wetherell M, Lovering A, McNulty C, et al.The relationship between primary care antibiotic prescribing and bacterial resistance in adults in the community: a controlled observational study using individual patient data. J AntimicrobChemother; 56: 146-53,(2005).
- [5]JogiP. S., AkkewarD.M.,Phytochemical screening and antimicrobial activity of medicinal plant Pergulariadaemia From Chandrapur Forest Region. International Journal Of Natural Products Research, 1(3), 61-63,(2012).
- [6]Kumar M, Nehra K, Duhan JS. Phytochemical analysis and antimicrobial efficacy of leaf extracts of Pithecellobiumdulce. Asian Journal of Pharmaceutical and Clinical Research; 6(1): 70-76, (2013).
- [7] AlavijehPK, AlavijehPK and SharmaD, A study of antimicrobial activity of few medicinal herbsAsian Journal of Plant Science and Research,2 (4) 496-502,(2012).
- [8]Sharma Y, Nagar A and ShuklaS,Antimicrobial Activity and Phytochemical Screening Of *AdeniumObesum*(Desert Rose) Leaf. ,IntJ.Pharm Bio Sci.6(3): 85 – 92, (2015).
- [9] RahmanTU, UddinG,LiaqatW, ZamanK, MohammadG, and ChoudharyM I,Antibacterial, Antifungal And Insecticidal Activities Of The Bark Of *MillettiaOvalifolia*. International Journal of Scientific Research and Essays,1(1) 4-9 , (2013).
- [10]Ganorkar R. P., Atloye A. H. ., Bansod J. S.,Deshmukh O. S. and Pund D. A., Proximate Analysis Of Root, Stem And Leaves Of *CissusQuadrangularis* Linn.Int. J.Chem. Sci.,10(2):855-860,(2012).
- [11]Rajesh P. G, DeoghareD. V., ShingarwadeK.A. And KholeY. S. Proximate Analysis Of Root, Stem And Leaves Of *MillettiaAuriculata*.International Journal of Pharma and Bio Sciences.7(1): 279 -283,(2016).
- [12]PatilU. S., DeshmukhO.S.and GanorkarR.P.,Studies On The Phytochemical, Spectroscopic Characterization and Antibacterial Efficiency Of *UrgineaIndica*(Roxb.) Kunth (Liliaceae) and*CycleaPeltata*Arn. Ex Wight (Menispermaceae).European Journal of Pharmaceutical and Medical Research,2(6),171-176,(2015).
- [13] Amin MM. Sawhney SS, JassalMMS.Qualitative and quantitative analysis of phyto -chemicalsof *Taraxacumofficinale*.Wudpecker Journal of Pharmacy and Pharmacology.;2:1-5,(2013).
- [14]Nath R.S, BaluP.M.andMurugesanK.,Phyto-chemical Screening and Antibacterial Activity of Five Indian Medicinal Plants against Human Pathogens. International Journal of Current Microbiology and Applied Sciences.,2(3):75-84(2013).
- [15] Collins C. H., Microbiological Methods Butterworth, London 1967.