ANTIMICROBIAL ACTIVITIES OF *NYCTANTHES ARBOR-TRISTIS* L.

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Summary

Antimicrobial activity of ethanolic extract of leaves of *Nyctanthes arbor-tristis L.* was examined against selective bacteria and moulds by using disc diffusion method. It showed significant antibacterial activity at 100 µg / ml against *Candida albicans* (MTCC 227) and *E. coli* (MTCC 443) however it showed antibacterial activity significantly low against the selected strains of *Micrococcus luteus (*MTCC106), *Staphylococcus aureus* (MTCC96), *Bacilus subtilis* (MTCC441) and *Aspergillus niger* (MTCC282). Ofloxacin (5 µg / ml) and Miconazole (40µg / ml) were taken as control or standard drug.

Key words: *Nyctanthes arbor-tristis L.*, antibacterial, Harsingar, Night Jasmine

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Introduction

Nyctanthes arbor-tristis L. belongs to the family Oleaceae of the order Jasmlnaceae. Its synonyms are Sephalika, Parijatham in Sanskrit, Harsingar in Hindi and Coral / Night Jasmine in English. It is having brilliant, highly fragrant flowers which are white and yellow, and do not expand till evening and which fall off about sunrise. Thus during the day the plant lose all its brightness, and hence is called '*the sad tree'*. Nyctanthes means 'Night-flowering'. It is occurring wild in the Sub-Himalayan region, Madhya Pradesh and Southwards to Godavari. It is cultivated in gardens as ornamental plants It has traditionally been used as antibacterial, analgesic, antirheumatic and a remedy in obstinate sciatica. Its leaves and corolla are used for the medicinal purpose & are collected during autumn season.[1-8]
In present work the antibacterial studies were performed using some of the common gram negative bacteria, gram positive bacteria and moulds.

Materials And Methods

Plant materials: Fresh leaves of the plant were procured from Shastri Nagar area of Jodhpur district, Rajasthan, India. It has been authenticated by botanical survey of India, Jodhpur on 05.10.2005 through voucher number BSI/AZC/A- 19014/SG- I/Tech 2005. The material was powdered and stored in descicator until extraction.

Preparation of Extract: ENT was prepared by soxhelation method and filtered twice through filter paper. The obtained extract was dried by evaporation (yield = 5.6%) and kept in an airtight bottle until use.

Preparation of Seeded broth: The strains of microorganisms obtained inoculated in conical flask containing 100 ml of nutrient broth. These conical flask were incubated at 37 0 C for 24 hrs and was referred to as seeded broth.
Preparation of Culture media: The nutrient agar media (Hi- media, Mumbai) was prepared by dissolving 28 gms of nutrient agar in 100 ml of distilled water. The nutrient broth media (Hi- media, Mumbai) was prepared by dissolving 13 gms of nutrient broth in 100 ml of distilled water. The media was sterilized by autoclaving at 15lb/sq.inch pressure at 121 ^{0}C for 20 minutes.

Antimicrobial assay: The paper disc diffusion method for antibiotic susceptibility testing (Malcolm et al., 1969) was used. Following Bacterial and fungal strains were purchased from Dr. Tapan Chakrabarti, IMTECH, Sector 39- A, Chandigarh, 160036, India. *E. coli* (MTCC Number 443), *Micrococcus luteus (*MTCC Number 106), *B. subtilis* (MTCC Number 441), *Staphylococcus aureus* (MTCC Number 96), *Candida albicans* (MTCC Number 227), and *Aspergillus niger* (MTCC Number 282) were used in the study.
Paper disc of 6 mm diameter were prepared using ENT (100 µg/disc) of, and ofloxacin (5µg/ disc) and Miconazole (40 µg/disc) as standard were used and discs were dried at 37^{0}C before use. The bacterial broth suspension (seeded broth) was streaked evenly on the surface of a medium with a cotton swab. Subsequently the paper discs were placed on the surface of agar with flamed forceps and gently pressed down to ensure contact. Plates were incubated at 370C overnight. After 24 hrs. of incubation, the inhibition zone diameters (including the 6 mm disc) were measured with calipers.

Determination of Zone of Inhibition: The disc diffusion method of drug potency is based on the measurement of the diameter of zones of microbial growth inhibition surrounding discs containing various concentration of test compound, which are placed on the surface of a solid nutrient previously inoculated with culture of suitable microorganisms. Inhibition produced by the test drug was compared with that produced by known concentration of reference standard drug. [9]

Results and Discussion

Antimicrobial activity: The results of the antimicrobial activity of the ENT (100µg/Dis**c**), assayed *in*-vitro by disc diffusion method, are shown in Table 1. The ENT (100µg/Dis**c**) displayed the highest level of activity against *Candida albicans* (MTCC 227) and *E. coli* (MTCC 443) however it showed antibacterial activity at low level

against the selected strains of *Micrococcus luteus (*MTCC106), *Staphylococcus aureus* (MTCC96), *Bacilus subtilis* (MTCC441) and *Aspergillus niger* (MTCC282). Ofloxacin (5 µg / ml) and Miconazole (40µg/Disc) were taken as control or standard drug.
The antimicrobial activity of the Ethanolic extract of *Nyctanthes arbor-tristis* L leaves may be due to tannins and other phenolic constituents. The results obtained in this study suggest a potential application of *Nyctanthes arbor-tristis* L for treatment of skin wounds and further investigations should be conducted in order to explore this application.

Table 1: Effect of AESC on zone of inhibition of microorganism

S.No	Microorganism	ZONE OF INHIBITION (mm)		
		ENT (100µg/Dis**c**)	**Ofloxacin** (5µg/Dis**c)**	**Miconazole** (40µg/Disc)
1	*E. coli* (MTCC443)	**23**	**21**	**….**
2	*Micrococcus luteus (*MTCC106)	**13**	**23**	**…….**
3	*B. subtilis* (MTCC441)	**16**	**26**	**……..**
4	*Staphylococcus aureus* (MTCC 96)	**13**	**22**	**…….**
5	*Candida albicans* (MTCC 227)	**24**	**……**	**26**
6	*Asperagillus niger* (MTCC282)	**12**	**…….**	**24**

Conclusion

Present study reveals that leaves of *Nyctanthes arbor-tristis* L has significant antimicrobial activity on selected strain. This study supports to identify exact mechanism and key phytochemical responsible to antimicrobial activity of *Nyctanthes arbor-tristis* L. it also helps to provide a way to identification potency of various parts of *Nyctanthes arbor-tristis* L It also justifies the traditional usage of this plant as health remedy. The future prospect for effective utilization of this plant for the development of novel antibiotics will however depend on identification of the various chemical components of the phytoconstituents, purification of the components and the determination of their toxicity level with a view to establishing the biosafety of the plant as source of drug for human consumption.

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