



Investigation of Anti-fungal activity of Flowers of *Leonotis nepetaefolia* (L) R.Br.

Deepak Shrivastava* and Sumeet Dwivedi

Faculty of Pharmacy, Oriental University, Indore (M.P.) – India

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Abstract

Fungal infections are one of the most prominent infection and causes a wide number of disease. It occurs in almost every person once in their life. *Leonotis nepetaefolia* (L) R.Br. belongs to the genus *Leonotis* and family Lamiaceae. It is native to tropical Africa and India. The flowers of the plant are used medicinally for the treatment of several skin infections. The present paper deals with the antifungal activity of flowers of the selected plant. PEE, CE, EE and AE of flowers of *Leonotis nepetaefolia* were evaluated for anti-fungal activity and zone of inhibition were recorded.

Key words: *Leonotis nepetaefolia*, Fungal infections, Flowers

Introduction

Fungal diseases are a global public health problem. Although fungal diseases can affect anyone, including travelers, they pose a serious threat to people who have weakened immune systems, such as those who have cancer or HIV/AIDS. Fungal infection, also called mycosis, is a skin disease caused by a fungus. There are millions of species of fungi. They live in the dirt, on plants, on household surfaces, and on your skin. Sometimes, they can lead to skin problems like rashes or bumps. [1]

Skin disease is a major problem throughout the world, and to cure bacterial and fungal skin infection is the most challenging task. To combat skin problems, various pharmaceutical companies produce different products and/or drugs. However, due to microbial drug resistance problems, this process requires searching for alternative sources of chemically synthesized ones. Many researchers have been working on medicinal plants based on traditional knowledge, and this research has been a

tremendous source of bioactive compounds. These compounds have different biological activity against skin disease—causing bacteria as well as fungi, and possess many health-protective effects. Attention to these aspects should lead in a new direction for commercialization and provide insight into the understanding of some promising plant species used for the treatment of skin diseases. [2]

Leonotis nepetaefolia (L) R.Br. commonly known barchibuti as is a less known medicinal plant, belongs to the family Lamiaceae. It is found almost along the hotter parts of India. Traditionally, the all parts of the plant especially roots, leaf and flowers are used for rheumatic problems and also serves as a tonic. Flower heads are used against scalds, burns, ringworm and some skin diseases. [3-5]

***Corresponding Author**

Email: herbal0914@rediffmail.com

During past few years plant derived extracts and their isolated phytochemicals are gaining importance and are also a new emerging area of research. In last two decades anti-fungal effects in the category of anti-microbial is of great interest. [5-6] The present study was designed to evaluate the flowers extracts of *Leonotis nepetaefolia* (L) R.Br. widely used to treat the fungal infection as mentioned in traditional system of medicine.

Material and Methods

Collection of herbs and their authentication

The flowers of *Leonotis nepetaefolia* (L) R.Br. (LNF) were collected in the months of July-September 2020 from the various local sites of Malwa region of Madhya Pradesh and identified & authenticated by Dr. S. N. Dwivedi, Prof. and Head, Department of Botany, Janata PG College, A.P.S. University, Rewa, (M.P.) and was deposited in our Laboratory. Voucher specimen No. J/Bot/2020-LNF392 was allotted.

Successive extraction of selected herb

Sample were shattered and screened with 40 mesh. The shade dried coarsely powdered plant material (250 gms) were loaded in Soxhlet apparatus and was extracted with petroleum ether (60-62°C), Chloroform, ethanol and water until the extraction was completed. After completion of extraction, the solvent was removed by distillation. The extracts were dried using rotator evaporator. The residue was then stored in dessicator and percentage yield were determined. [6]

Anti-fungal of extracts [7-10]

Fungal strain

Fungal strain i.e., *Candida albicans*, *Cryptococcus neoformans* and *Aspergillus flavus* were used for the present investigation. The inoculum of strains were transferred to the recultured before staring the lab work.

Screening of Anti-fungal activity (Disc diffusion method)

Preparation of Disc

Disc of whatsmann filter paper of one quarter inch in diameter was prepared and the same was sterilized using autoclave.

Preparation of samples entrapped disc

The accurately weighed flower extracts were dissolved in methanol of different stock solutions (10, 20, 30, 40, 50 µg/ml) solutions were prepared. All the dilution prepared was applied to

whatsmann filter paper disc using a micropipette. The disc were then dried and sterilized.

Preparation of culture plate

The sabouraud's agar and mueller Hinton agar media were prepared by dissolving media in 1000 ml of distilled water and sterilized by autoclave at 121°C for 1 hour. The media were cooled and poured in sterilized petri plate to solidified at room temperature.

Evaluation of Zone of inhibition

The re-cultured fungal strains were used for antifungal evaluation. The strains were streak on the Mueller Hinton media and the drug entrapped patches were placed. For negative control disc of distilled water and for positive control amphotericin B disc (10 µg) were used. The petri plates were kept in incubator for 24 hrs. After 24 hrs the petri-plates were checked for zone of inhibition. The zone of inhibition diameter was recorded with the help of zone reader scale. The zone of inhibition was calculated by subtracting diameter of sample or standard or control by diameter of disc. The more the zone of inhibition the more will be antifungal activity.

Results and Discussion

Anti-fungal activity of flowers of *Leonotis nepetaefolia* (L) R.Br. were evaluated. The zone of inhibition of PEELNF, CELNF, EELNF and AELNF extract on *Candida albicans*, *Cryptococcus neoformans* and *Aspergillus flavus* were presented in table 5.5. Results indicate (Graph 5.3) that EETSF and AETSF have significant anti-fungal activity when compared with standard drug amphotericin B.

Conclusion

Natural and herbal drugs have great potential to cure various kinds of skin diseases and disorders caused by fungal strains, which screened many indigenous people depending on medicinal plants all over the country. On the basis of traditional knowledge with its holistic and systemic approach, various scientists have worked on different parts of particular medicinal plants using different methods to cure skin-related problems. Several promising medicinal plants used in various countries, alone or in combination with synthetic drugs, might be of future relevance to modern medicine not only in treating skin diseases but also as potential sources for maintaining proper health. The potent plants

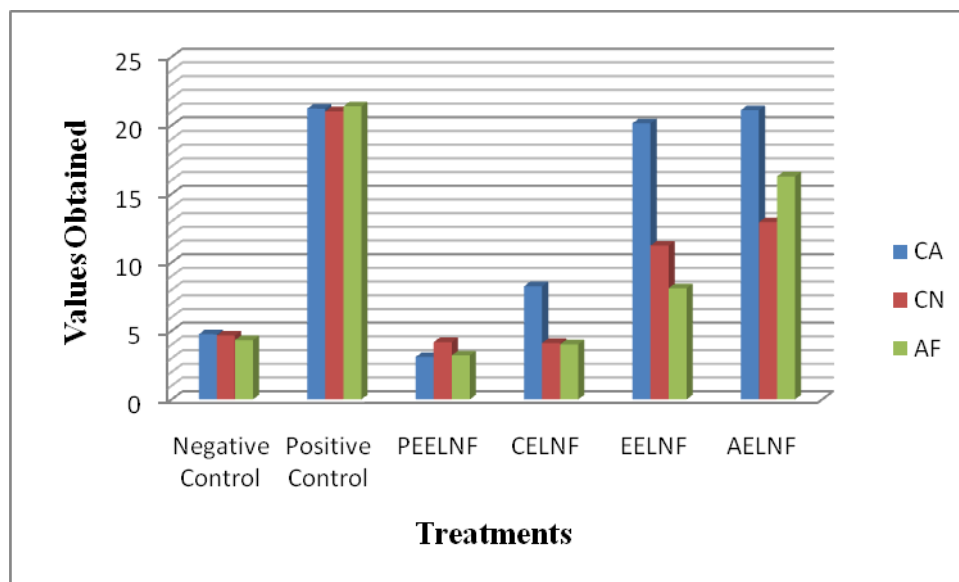
showed biological activity due to the phytoconstituents present in them. In the present investigation antifungal activity of PEE, CE, EE and AE of flowers of *Leonotis nepetaefolia* (L) R.Br. were carried out against three fungal strains i.e., *Candida albicans*, *Cryptococcus neoformans* and *Aspergillus flavus*. The result indicates that

EE and AE possess significant anti-fungal activity when compared to standard drug. Further research is warranted to isolate the compounds responsible for the observed biological activity will be of great interest to developed new phyto-formulations.

Table 1: Anti-fungal activity of various Flowers Extract of *Leonotis nepetaefolia* (L) R.Br.

S/No.	Test/Extract	Zone of Inhibition (mm)		
		CA	CN	AF
1.	Negative Control	4.75±0.18	4.66±0.08	4.32±0.13
2.	Positive Control	21.22±0.13**	21.02±0.11**	21.39±0.33**
3.	PEELNF	3.09±0.19*	4.18±0.09*	3.21±0.11*
4.	CELNF	8.26±0.14*	4.11±0.04*	4.02±0.33*
5.	EELNF	20.15±0.10**	11.22±0.11**	8.11±0.03**
6.	AELNF	21.11±0.11**	12.93±0.18**	16.27±0.01**

Note: All values are expressed as Mean (X) ±SEM, (n=3). One way ANOVA followed by student test, values are statistically significance *P<0.001, **P<0.01 when compared with control and standard.



Graph 1: Anti-fungal activity of various Flowers Extract of *Leonotis nepetaefolia* (L) R.Br.

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