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Original Article

# ANTIFUNGAL SCREENING OF 61 TRADITIONAL MEDICINAL PLANTS OF 305 EXTRACTS AGAINST DERMATOPHYTIC FUNGI *TRICHOPHYTON TONSURANS*

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**ABSTRACT**

**Objective:** Antidermatophytic activity of 305 extracts from 61 traditional medicinal plants belonging to 33 different families from Hyderabad Karnataka region was subjected to screening against *Trichophyton tonsurans*.

**Methods:** The screening was performed using Pet ether, chloroform, ethyalacetate, methanol and aqueous successive extracts (Soxhlet extractor) of each plant was tested for their antifungal activity using the agar well diffusion method at a sample concentration of 5 & 2.5 mg/ml. The minimum inhibitory concentrations of 10 very effective plants were determined using the broth dilution technique.

**Results:** Out of 61 plants, 10 exhibited very effective antidermatophytic activity in three extracts like ethyalacetate (05), methanol (02), chloroform (02), Aqueous (01) extracts, effective activity observed in 14 plants in different extracts, whereas 34 plants showed moderate activity, 03 plants showed weak activity.

**Conclusion**: On the basis of the results obtained, we conclude that the crude extracts of *Allium sativam* L., *Corchorus oleterius* L., *Gymnosporia montana* (Roth) Benth, *Milletia pinnata* (L.) Panigrahi, *Lycopersicon esculentum* L., *Annona squamosa* L., *Plumbago zeylanica* L., *Calotropis gigantea* L., *Zingiber officinale* Rosce. exhibited significant antidermatophytic activity (*T. tonsurans*) and properties that support folkloric use in the treatment of skin diseases as broad-spectrum antimycotic agents. This probably explains the use of these plants by the indigenous people against dermatological infections.

**Keywords**: 61 medicinal plants, *Trichophyton tonsurans*, Antifungal screening.

## INTRODUCTION

Plants have a long history of antibiotic usage for the cure of disease caused by antimicrobial, including antiviral, antibacterial and antifungal, agents. Natural products are generally harmless or have minimum side effects as compared to synthetic drugs [1]. There are various types of fungal pathogens that infect humans, animals and plants, some causes severe type of acute inflammation and infection of hair, nails and skin. Such as *Trichophyton longifusis, Trichophyton tonsurans, Microsporum audouinii, Trichophyton schoenlenii* some organisms cause chronic infection of lungs, ear, and bones, etc., such as Candida albicans, some causes infection of joint, skin, and central nervous system, such as *Aspergillus flavus*, while *Microsporum Canis* causes ring worm infection of skin and hair in dogs and cats. Keeping in view, there is a need for investigation of new antifungal compounds [2]. Dermatophytes are the major cause of superficial mycosis of man and remain a public health problem, especially in tropical and subtropical countries. The humid weather, over population and poor hygienic conditions are conducive to the growth of dermatophytes. Even though it responds to treatment with conventional antifungal, the disease has a tendency to recur at the same or at different sites. In recent years, there has been growing interest in the use of medicinal plants. A medicinal plant is any plant used in order to relieve, prevent or cure a disease or to alter physiological and pathological process, or any plant employed as a source of drugs or their precursors [3-7]. Antifungal activities of medicinal plants have been reported by various researchers throughout the world [8-16]. In an effort to discover new lead compounds, scientists from different areas are investigating new plants aiming the detection of secondary metabolites with a relevant antimicrobial usefulness that can be further synthesized for improving their activity [17-20].

This is first and novel report from Hyderabad Karnataka region providing ethnopharmacological validation with special reference to *T. tonsurans.*

Therefore, in this report, the antimycotic activity of petroleum ether, chloroform, ethyalacetate, methanol and aqueous extracts of 61 medicinal plant parts against common dermatophytic fungi *T. tonsurans* was recorded.

## MATERIALS AND METHODS

### Plant materials

Plant materials were collected from various localities of Hyderabad Karnataka region and Identified with the help of Gulbarga district flora [21] the voucher specimens deposited in the herbarium centre, Department of Botany, Gulbarga University, Karnataka, India. The collected plant materials were initially rinsed with distilled water to remove soil and other contaminants and dried on paper towel in laboratory at 37 ± 2°C for week.

### Preparation of the plant extracts

The selected plant materials after shade drying were ground in a grinding machine in the laboratory. 25g of shade dried powder was weighed and extracted successively with petroleum ether, chloroform, ethyl acetate, methanol and aqueous in soxhlet extractor for 48h. The extracts were concentrated under reduced pressure and preserved in refrigerator in airtight bottles for further use.

### Microbial culture and growth conditions

Test microorganism *Microsporum gypseum* used in the present study was obtained from M. R. medical college, Gulbarga, Karnataka, India. The Culture of *T. tonsurans* grown on Sabouraud dextrose broth (HiMedia) at 28°C for 48 h and it was maintained on agar slants at 4°C.

### Inoculum preparation

Stock inoculums suspensions of *T. tonsurans* strain was prepared from 10-day culture in PDA at 28°C to induce sporulation. Fungal colonies were covered with 5 mL of sterile saline solution (NaCl 0.85 % w/v), the surface gently scraped with a sterile loop and this

resultant mixture of fungal units was transferred to a sterile tube. The turbidity of the final inoculum was standardized according to McFarland scale 0.5 tube and adjusted for presenting the fungal population of 106 colony former units (CFU). The confirmation of the inoculum quantification was made by plating 0.01 ml of inoculum suspension in Sabouraud dextrose agar (SDA). The plates were incubated at 28°C and were examined daily for the presence of fungal colonies which were counted as soon as growth became visible [22, 23].

**Agar-well diffusion method** [24]

The assay was conducted by agar well diffusion method. About 15 to 20 ml of potato dextrose agar medium was poured in the sterilized petri dishes and allowed to solidify. Fungal lawn was prepared using 5 days old culture strains. The fungal strains were suspended in a saline solution (0.85% NaCl) and adjusted to a turbidity of 0.5 Mac Farland standards (108 CFU/ml). 1 ml of fungal strain was spread over the medium using a sterilized glass spreader. Using flamed sterile borer, wells of 4 mm diameter were punctured in the culture medium and required concentrations of serially diluted extract (2.5, 5mg/ml) was added to the 20µl to each wells.

The plates thus prepared were left for diffusion of extracts into media for one hour in the refrigerator and then incubated at 30°C. After incubation for 48h, the plates were observed for the zone of inhibition. Diameter zone of inhibition was measured and expressed in millimeters. Dimethyl formamide (DMF) was used as a negative control. The experiments were conducted in triplicates.

**Minimum inhibitory concentration** [25]

One ml of sterile liquid Sabouraud medium was added to 08 sterile capped tubes, 1 ml of each solvent extracts suspension was added to tube 1. The contents were mixed and 1 ml was transferred to tube 2. This serial dilution was repeated through to tube six and 1 ml was discarded from tube 6. Fifty µl of inoculum was added to tubes 1-8 and the contents were mixed. Medium control (no inoculum and no drug) and inoculum control (no drug) tubes were prepared.

The final concentrations of each plant solvent extracts ranged from 05 mg/ml to 0.15 mg/ml. The tubes were incubated at 30°C for 96 h. The fungal growth in each tube was evaluated visually depending up on the turbidity in the tubes. MIC was defined as the drug concentration at which the turbidity of the medium was the same as the medium control.

**Statistical analysis**

All the experiments were conducted in triplicate unless stated otherwise and statistical analysis of the data was performed by analysis of variance (ANOVA), using STATISTICA 5.5 (Stat Soft Inc, Tulsa, Oklahoma, USA) software. A probability value of difference p ~ 0.05 was considered to denote a statistically significance All data were presented as mean values ± standard deviation (SD).

**RESULTS**

The plant extracts and their level of activity against the *Trichophyton tonsurans* was listed in table 1. A number of 305 extracts from 61 ethno medicinal plants belonging to 33 different families were used in treating skin diseases in Hyderabad Karnataka region were subjected to antidermatophytic screening against *Trichophyton tonsurans* in Pet ether, chloroform, ethyalacetate, methanol and aqueous extracts of each plant were tested for their antifungal activity using the agar well diffusion method at a sample concentration of 5 & 2.5 mg/ml.

Out of 61 plants, 10 exhibited very effective antidermatophytic activity in three solvent extracts *Allium sativam* L., *Corchorus oleterius* L., *Gymnosporia montana* (Roth) Benth, *Milletia pinnata* (L.) Panigrahi, *Lycopersicon esculentum* L., (Ethyl acetate), *Annona squamosa* L., *Plumbago zeylanica* L. (Methanolic), *Calotropis gigantea* L., *Zingiber officinale* Rosce. (Chloroform), *Bergera koenigii* L. (Aqueous) followed by effective activity was observed in 14 plants of different three solvent extracts, i. e., *Achyranthes aspera* L., *Aegle marmelos* (L.), *Allium sativam* L., *Citrus medica* L., *Lawsonia inermis* Linn., *Senna auriculata* (L.) Roxb., *Tectona grandis* L., *Tinospora cordifolia* (Willd.) J. Hook&Thoms, *Thevetia nerrifolia* Juss., *Emblica officinalis* Gaertn. (Ethyl acetate) *Aloe vera* L. *Curcuma longa* Linn. (Petroleum ether), *Tridax procumbens* Linn. *Tephrosia purpurea* (L.) Pers. (Chloroform). Whereas the moderate activity observed in 34 plants. While the weak activity observed in 03 plants, i. e., *Carica papaya* L., *Coriandrum sativam* L., *Tamarindus indica* Linn. There was no inhibition recorded from the negative control (DMSO), while the standard drug, Ketoconazole significantly inhibited (28. 66±1.15 to 12. 33±1.52 mm) the growth of the test dermatophyte.

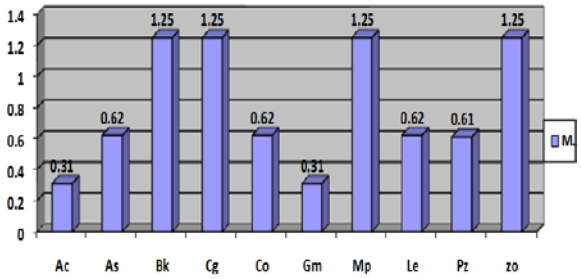


**Fig. 1: Minimum Inhibitory Concentration (mg/ml) of 10 effective medicinal plants of methanolic extracts against *T. tonsurans***

**DISCUSSION**

In the present report the effective activity observed in 10 plants in four solvent extracts at concentrations of between 05 and 2.5 mg/ml, present result is in line with the work of Shinkafi and Manga [26], who reported that the aqueous and solvent leaf extracts of *Mitracarpus scaber* and *Pergularia tomentosa* exhibited significant anti-fungal activities against dermatophytes at concentrations of between 80 and 160 mg/ml.

In the present report, the ethyl acetate extracts were shown effective activity when comparing with aqueous extract. Whereas in previous report showed effective activity in methanolic extracts, though not significant (P>0.05) when compared with the aqueous extract. The reason for this slight difference may be attributed to the solubility level of the phytoconstituents in the extracting solvents. It means that the organic solvent dissolved more of more of the active ingredients than aqueous. This reason is supported by Cowan [17], who reported that organic solvent were better extraction solvent over water.

Among 12 very effective plants, 5 from ethyl acetate extracts were detected. In the past similar report concentrated on solvents – compound relationship. the presence of bioactive metabolites presents in *Azadirachta indica* which are not soluble in hexane but are soluble in ethyalacetate so that the significantly suppressed the growth of the dermatophytes fungi, and two plants (*Calotropis gigantean, Zingiber officinale)* from chloroform extracts were reported. The similar type of report was given by Bharti and Vidyasagar [27], in *Calotropis spp.*

The methanolic and ethyalacetate solvent extracts were very effective and effective in respectively in the present study. The similar type of results reported by Mehmood Z *et al.,* [28] methanolic extracts showed an inhibitory effect against the three *Trichophyton* spp. In the present study *Bergera koenigii* L. leaves showed very effective activity observed in aqueous extract. The leaves are extensively used as a flavouring agent in curries and chutneys. The past report of Dhar ML et al. on antifungals was not correlating [29].

In the present report the weak activity was observed in 03 plants i. e., *Carica papaya* L., *Coriandrum sativam* L. and *Tamarindus indica* Linn. Whereas in previous report the similar type of results of *Carica papaya* extracts against dermatophytes were observed[30].

**Table 1: Antidermatophytic screening (*T. tonsurans*) of traditional plants drugs of Hyderabad Karnataka region.**

| S. No. | Name of the Plant | Part used | Zone of Inhibition in different solvent extracts (mm) | | | | | | | | | | C | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | P | | C | | E | | M | | A | | | |
| | | | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | DMSO | Ketoconazole |
| 01 | *Achyranthes aspera* L. | L | 07.33±1.52 | 05.00±0.00 | 07. 33±1.52 | 07.66±0.57 | 11.66±1.15 | 05.00±1.00 | 05.00±1.00 | 04.33±1.52 | 04.00±0.00 | NA | NA | 30. 33±1.52 |
| 02 | *Aegle marmelos* (L.) | L | 07.00±0.00 | 04.00±1.00 | 06. 33±1.52 | 04.33±1.52 | 10.33±1.52 | 05.33±1.52 | 05.33±1.52 | NA | 06.33±1.52 | NA | NA | 18. 33±1.52 |
| 03 | *Allium cepa* Linn. | B | 0533±1.52 | 06.00±0.00 | 07.00±1.00 | 05.00±0.00 | 29.00±0.00 | 06.33±1.52 | 08.00±0.00 | 05.00±0.00 | 09.00±0.00 | 07.00±0.00 | NA | 15. 66±1.15 |
| 04 | *Allium sativam* L. | B | 07.66±1.15 | 05.00±0.00 | 07.66±1.15 | 07.66±0.57 | 11.66±1.15 | 05.00±0.00 | 05.33±0.57 | 04.66±0.57 | NA | NA | NA | 30. 33±1.52 |
| 05 | *Aloe vera* L. | L | 15.00±0.00 | 06.00±1.00 | 07.33±1.52 | 06.00±0.00 | 09.33±0.57 | 06.00±0.00 | 07.33±0.57 | 07.00±0.00 | 06.33±1.52 | 05.00±0.00 | NA | 24.00±0.00 |
| 06 | *Amaranthus spinosus* L. | L | 05.66±1.57 | 04.66±0.57 | 06.33±0.57 | 05.00±0.00 | 07.33±0.57 | 05.33±1.52 | 08.66±1.52 | 05.00±0.00 | 05.33±1.15 | NA | NA | 24. 33±1.52 |
| 07 | *Annona reticulata* L. | L | 05.00±000 | 04.33±1.52 | 06.00±0.00 | 04.33±1.15 | 07.66±0.57 | 05.00±0.00 | 07.00±0.00 | 04.66±1.57 | 06.33±1.52 | 05.00±1.00 | NA | 26. 66±0.57 |
| 08 | *Annona squamosa* L. | L | 09.33±0.57 | 05.33±1.52 | 07.00±0.00 | 05.00±1.00 | 07.66±0.57 | 05. 66±1.57 | 15. 33±0.57 | 08.00±0.00 | 07.66±1.52 | NA | NA | 27.00±0.00 |
| 09 | *Argemone mexicana* L. | L | 05.00±0.00 | NA | 04.00±0.00 | NA | 06.00±0.00 | NA | 05.66±0.57 | NA | 05.33±0.57 | NA | NA | 28. 33±1.52 |
| 10 | *Azadirachta indica* A. Juss. | L | 04.33±0.57 | 04.33±0.57 | 05.33±0.57 | 04.00±1.00 | 06.66±1.57 | 06.33±1.52 | 05.66±1.57 | 08.00±1.00 | 06.66±1.57 | 05.00±0.00 | NA | 35. 66±1.15 |
| 11 | *Bergera koenigii* L. | L | 05.33±1.52 | 04.66±1.52 | 06.33±0.57 | 05.00±0.00 | 07.66±1.52 | 05.33±0.57 | 06.33±1.52 | 04.00±0.00 | 13.00±0.00 | 07.00±0.00 | NA | 34. 33±1.52 |
| 12 | *Butea monosperma* (Lam.) Taub. | L | 07.66±1.52 | NA | 08.33±1.52 | 05.66±1.52 | 08.33±0.57 | 05.66±1.52 | 09.66±1.52 | 09.33±0.57 | 05.66±1.52 | NA | NA | 34.00±0.00 |
| 13 | *Cajanus cajan* (L.)Mill. | L | 07.66±0.57 | 06.66±1.57 | 08.66±0.57 | 06.66±0.57 | 07.66±1.57 | 06.66±0.57 | 06.66±0.57 | 05.66±1.57 | 05.66±0.57 | NA | NA | 27. 33±1.52 |
| 14 | *Calotropis gigantea* L. | L | 05.33±0.57 | 08.66±1.57 | 12.66±1.57 | 09.33±0.57 | 10.33±0.57 | 06.66±0.57 | 07.66±1.57 | 05.00±1.00 | 05.00±1.00 | NA | NA | 32.00±0.00 |
| 15 | *Carica papaya* L. | L | 05.33±0.57 | 05.66±1.52 | 04.33±1.15 | 04.66±1.52 | 07.33±1.15 | 05.66±1.52 | 06.66±1.52 | 05.33±0.57 | 05.33±0.57 | NA | NA | 24. 33±1.52 |
| 16 | *Ceasalpinia bonducella* (L.) Flem. | S | 09.00±0.00 | 07.66±1.57 | 08.33±0.57 | 08.00±0.00 | 08.66±1.57 | 07.00±0.00 | 07.33±1.15 | 05.66±1.57 | 05.33±0.57 | NA | NA | 31.50±0.00 |
| 17 | *Celosia argentea* L. | S | 05.33±0.57 | NA | 06. 00±0.00 | 05.33±1.15 | 06.00±0.00 | 05.66±0.57 | 06.33±1.52 | 05.33±1.15 | 05.66±0.57 | NA | NA | 24. 66±0.57 |
| 18 | *Citrus medica* L. | L | 08. 00±0.00 | 05. 33±0.57 | 10.00±0.00 | 08. 66±1.52 | 11.66±0.57 | 06.00±0.00 | 10. 33±0.57 | 07. 66±1.52 | 04.33±1.15 | NA | NA | 15.00±0.00 |
| 19 | *Coccinia indica* Wt. & Arn. | L | NA | NA | 08.00±0.00 | 06.33±1.15 | 08.00±0.00 | 05.00±0.00 | 08.33±0.57 | 06.33±0.57 | 17.33±1.15 | NA | NA | 26. 66±1.15 |
| 20 | *Corchorus oleterius* L. | S | 06. 01±0.00 | 05. 33±1.15 | 08. 00±0.00 | 05. 66±1.52 | 12.66±0.57 | 05. 66±1.52 | 07. 33±1.15 | 05. 33±0.57 | 10.66±0.57 | NA | NA | 23. 33±1.52 |
| 21 | *Coriandrum sativam* L. | A | 05. 00±0.00 | 04. 33±1.15 | 06±33±1.15 | 04. 66±1.52 | 07. 33±1.15 | 05. 66±1.52 | 05. 33±1.15 | 05. 00±0.00 | 05. 01±0.00 | NA | NA | 28.00±1.00 |
| 22 | *Cryptolepis buchananii* Roem&Schult. | A | 05. 33±1.15 | 05. 33±0.57 | 08. 00±0.00 | 06. 33±1.15 | 07. 33±1.15 | 06. 33±1.15 | 07. 33±1.15 | 07. 66±1.52 | 05. 33±1.15 | NA | NA | 31.00±0.00 |
| 23 | *Curcuma longa* Linn. | R | 11. 00±0.00 | 08. 33±1.15 | 06. 66±1.52 | 06. 00±0.00 | 06. 66±1.52 | 06. 33±0.57 | 08. 00±0.00 | 04. 33±1.15 | 05. 66±1.52 | NA | NA | 30. 33±1.52 |
| 24 | *Dalbergia sisso* Roxb. | L | 06. 33±1.52 | 06. 66±1.57 | 08. 66±0.57 | 06. 33±1.52 | 08. 66±1.57 | 05. 66±1.52 | 07. 33±1.52 | 06. 33±1.52 | 05. 66±0.57 | NA | NA | 28.00±0.00 |
| 25 | *Datura metel* L. | L | 06. 00±0.00 | 05. 33±1.52 | 07. 00±0.00 | 04. 66±1.57 | 08. 66±0.57 | 05. 66±1.52 | 08. 66±0.57 | 05. 33±1.52 | NA | NA | NA | 26.00±0.00 |
| 26 | *Emblica officinalis* Gaertn. | L | 04. 33±1.52 | 06. 66±0.57 | 08. 66±1.57 | 06. 33±1.52 | 11. 00±0.00 | 06. 66±1.52 | 09. 66±0.57 | 07. 00±1.00 | NA | NA | NA | 28. 66±1.15 |
| 27 | *Euphorbia tirucalli* L. | L | 04. 33±1.52 | 04. 00±1.00 | 08. 00±0.00 | 07. 33±1.52 | 05. 66±0.57 | 04. 33±1.52 | 09. 00±1.00 | 07. 00±0.00 | 05. 66±0.57 | NA | NA | 26.00±0.00 |
| 28 | *Ficus racemosa* L | L | 05. 33±1.52 | 05. 66±1.52 | 06. 66±1.52 | 06. 00±0.00 | 07. 00±1.00 | 05. 66±0.57 | 05. 33±1.15 | 05. 33±1.15 | 05. 66±0.57 | NA | NA | 40.00±0.00 |
| 29 | *Gymnosporia montana* (Roth)Benth | L | 05. 00±0.00 | 06. 66±1.52 | 08. 33±1.52 | 06. 66±1.52 | 12. 66±0.57 | 08. 66±1.57 | 08. 33±1.15 | 09. 66±0.57 | 05. 00±1.00 | NA | NA | 30. 33±1.52 |
| 30 | *Hibiscus rosa-sinensis* L. | F | 05. 00±1.00 | 07. 66±0.57 | 08. 00±1.00 | 06. 33±1.15 | 05. 33±1.52 | 04. 66±0.57 | 07. 33±1.15 | 04. 66±0.57 | 05. 33±1.15 | NA | NA | 30. 66±1.15 |
| 31 | *Hyptis suoveolens* (L.)Poit. | L | 06. 33±1.15 | 05. 33±0.57 | 10. 33±1.52 | 06. 66±0.57 | 10. 66±1.57 | 08. 33±1.52 | 09. 33±0.57 | 08. 00±0.00 | 05. 00±0.00 | NA | NA | 26. 33±1.52 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | *Ixora coccinea* L. | F | 06. 33±0.57 | 04. 66±1.57 | 06. 33±1.52 | 05. 66±1.52 | 08. 66±1.57 | 04. 33±1.15 | 07. 00±0.00 | 04. 33±0.57 | 05. 33±1.15 | NA | NA | 28. 33±1.52 |
| 33 | *Jatropha glandulifera* Roxb. | L | 06. 33±1.15 | 04. 00±0.00 | 06. 66±0.57 | 05. 33±1.15 | 11. 33±1.15 | 05. 33±0.57 | 09. 33±0.57 | 06. 33±1.15 | 06. 00±0.00 | NA | NA | 28.00±1.00 |
| 34 | *Lantana camara* L. | L | 05. 33±0.57 | 0433±1.15 | NA | 10. 66±1.52 | 05. 33±1.52 | 04. 66±1.52 | 04. 33±0.57 | 10. 33±0.57 | NA | NA | NA | 16. 33±1.52 |
| 35 | *Lawsonia inermis* Linn. | L | 05. 33±1.15 | 04. 33±0.57 | 06. 66±0.57 | 06. 66±1.52 | 11. 00±1.00 | 04. 00±0.00 | 09. 66±1.52 | 06. 66±1.57 | 06. 00±0.00 | NA | NA | 38.00±0.00 |
| 36 | *Lycopersicon esculentum* L. | L | 07. 33±1.15 | NA | 07.66±0.57 | 04. 66±1.52 | 12. 66±0.57 | 05. 00±0.00 | 07. 00±0.00 | 05. 66±0.57 | 09. 66±1.52 | 05.33±1.15 | NA | 23.00±0.00 |
| 37 | *Mangifera indica* Linn. | L | NA | 06. 00±0.00 | 06. 66±0.57 | 07. 66±1.52 | 06. 66±1.52 | 05. 33±1.15 | 09. 66±1.52 | 07. 33±1.52 | 05. 66±1.52 | NA | NA | 32. 66±1.15 |
| 38 | *Mentha viridis* L. | A | 06. 00±1.00 | NA | NA | NA | 04. 00±1.00 | NA | 05. 00±1.00 | NA | 06. 00±1.00 | NA | NA | 28. 33±1.52 |
| 39 | *Milletia pinnata* (L.) Panigrahi | L | 11. 33±1.52 | 08. 66±1.57 | 11. 66±1.57 | 11. 33±1.15 | 12. 33±1.52 | 06. 33±1.15 | 11. 33±0.57 | 06. 66±0.57 | NA | NA | NA | 16. 66±1.15 |
| 40 | *Momordica charantia* L. | L | 06. 00±1.00 | 05. 33±0.57 | 07. 66±1.52 | 05. 00±1.00 | 08. 66±0.57 | 07. 66±1.57 | 08. 00±1.00 | 07. 66±1.57 | 06. 00±1.00 | NA | NA | 28.00±0.00 |
| 41 | *Nerium odorum* Solander. | L | 04. 66±0.57 | 04. 00±1.00 | 05. 66±1.52 | 04. 66±1.57 | 07. 33±1.52 | 05. 33±1.15 | 06. 00±1.00 | 05. 66±0.57 | 04. 00±1.00 | NA | NA | 29. 33±1.5 |
| 42 | *Ocimum sanctum* L. | A | 08. 33±0.57 | 05. 66±1.52 | 10. 00±1.00 | NA | 06. 66±0.57 | 05. 00±1.00 | 06. 66±1.52 | 04. 66±1.57 | 05. 33±0.57 | NA | NA | 29. 66±1.15 |
| 43 | *Piper nigrum* L. | S | 06. 66±1.57 | 05. 66±1.57 | 08. 66±1.52 | 06. 66±0.57 | 07. 33±1.15 | 06. 66±1.52 | 07. 33±1.15 | 05. 00±1.00 | 05. 33±1.15 | NA | NA | 31.00±0.00 |
| 44 | *Plumbago zeylanica* L. | L | 10. 00±1.00 | 04. 33±1.15 | 08. 33±0.57 | 04. 00±1.00 | 07. 66±1.52 | 05. 66±1.57 | 13. 00±1.00 | 04. 00±1.00 | 06. 66±1.52 | NA | NA | 28.33±1.52 |
| 45 | *Ricinus communis* L. | S | 04. 33±1.52 | 04. 66±1.52 | 05. 33±1.52 | 04. 66±0.57 | 07. 33±1.52 | 05. 66±0.57 | 08. 66±1.52 | 05. 66±1.57 | 04. 33±1.15 | NA | NA | 29. 66±0.57 |
| 46 | *Santalum album* L. | L | 06. 66±0.57 | 05. 66±1.57 | 06. 66±1.57 | 05. 00±0.00 | 07. 66±1.57 | 04. 66±0.57 | 10. 66±1.57 | 11. 66±1.52 | 04. 33±1.15 | NA | NA | 38.20±1.00 |
| 47 | *Senna auriculata* (L.) Roxb. | F | 05. 33±1.15 | 05. 33±0.57 | 06. 00±0.00 | 05. 66±1.52 | 10. 66±0.57 | 05. 00±0.00 | 06. 33±1.52 | 04. 33±1.15 | 05. 66±1.57 | NA | NA | 35. 33±1.52 |
| 48 | *Senna tora* L. | L | 06. 33±1.52 | 05. 66±0.57 | 07. 33±0.57 | 05. 33±1.15 | 09. 33±1.52 | 06. 33±0.57 | 09. 33±0.57 | 06. 33±1.15 | 05. 66±1.57 | NA | NA | 27. 33±1.52 |
| 49 | *Solanum nigrum* L. | L | 06. 33±1.15 | 06. 33±0.57 | 09. 33±1.52 | 05. 66±0.57 | 06. 33±0.57 | 06. 66±1.52 | 06. 66±1.57 | 05. 33±1.52 | 08. 66±0.57 | 05.66±1.57 | NA | 29.00±0.00 |
| 50 | *Sterculia foetida* L. | S | 09. 66±0.57 | 05. 66±1.57 | 07. 66±0.57 | 07. 33±0.57 | 07. 66±1.52 | 06. 00±0.00 | 08. 66±1.52 | 07. 66±1.52 | 06. 33±1.52 | NA | NA | 27. 66±1.15 |
| 51 | *Semecarpus anacardium* L. | B | 08. 00±0.00 | 05. 33±1.15 | 09. 66±0.57 | 05. 33±1.52 | 06. 00±0.00 | 05. 66±0.57 | 08. 33±1.15 | 05. 66±1.52 | 05. 66±1.57 | NA | NA | 26. 33±1.52 |
| 52 | *Tamarindus indica* Linn. | L | NA | NA | NA | NA | 05. 66±0.57 | NA | 06. 66±0.57 | 04. 66±1.57 | NA | NA | NA | 18. 66±1.15 |
| 53 | *Tectona grandis* L. | L | 06. 33±1.52 | 04. 00±0.00 | 08. 33±0.57 | 05. 33±0.57 | 10. 66±0.57 | 05. 33±0.57 | 07. 33±1.52 | 05. 33±0.57 | 05. 00±0.00 | NA | NA | 28. 33±1.52 |
| 54 | *Tinospora cordifolia* (Willd.)J. Hook&Thoms. | L | 05. 66±0.57 | 05. 33±0.57 | 10. 66±0.57 | 06. 66±1.57 | 11. 66±0.57 | 06. 33±1.52 | 06. 33±1.15 | 07. 33±1.15 | 06. 66±0.57 | NA | NA | 24. 66±1.15 |
| 55 | *Tephrosia purpurea* (L.) Pers. | L | 06. 00±0.00 | 05. 00±0.00 | 11. 66±1.57 | 06. 33±1.15 | 10. 00±0.00 | 07. 33±0.57 | 09.33±0.57 | 06. 33±1.52 | 0500±0.00 | NA | NA | 29.00±0.00 |
| 56 | *Thevetia nerrifolia* Juss. | L | 05. 66±0.57 | 04. 33±0.57 | 06. 33±1.52 | 05. 33±0.57 | 10. 66±0.57 | 04. 66±1.57 | 08. 00±0.00 | 05. 33±0.57 | 05. 66±0.57 | NA | NA | 28.00±0.00 |
| 57 | *Tribulus terrestris* L. | A | 05. 33±1.52 | 04. 00±0.00 | 07. 66±0.57 | 04. 33±0.57 | 09. 33±1.52 | 04. 33±0.57 | 07. 33±1.52 | 04. 00±0.00 | 05. 33±0.57 | NA | NA | 23. 66±0.57 |
| 58 | *Tridax procumbens* Linn. | A | 06. 66±1.57 | 09. 66±0.57 | 10. 66±1.57 | 04. 33±1.52 | 05. 33±1.52 | 10. 33±1.52 | 04. 66±0.57 | 11. 33±1.52 | NA | NA | NA | 20. 66±1.15 |
| 59 | *Vitex negundo* L. | L | 05. 66±0.57 | 05. 66±1.52 | 06. 66±1.57 | 06. 66±0.57 | 07. 33±1.15 | 05. 66±0.57 | 05. 33±1.52 | 05. 33±1.15 | 05. 00±1.00 | NA | NA | 40. 66±1.15 |
| 60 | *Zingiber officinale* Rosce. | R | 07. 66±1.57 | 04. 66±0.57 | 15. 33±1.15 | 06. 66±1.57 | 12. 33±1.15 | 05. 00±0.00 | 06. 66±1.52 | 07. 33±0.57 | 05. 66±0.57 | NA | NA | 24. 66±1.15 |
| 61 | *Zizyphus jujuba* Lam. | B | 07.66±1.57 | 06.00±0.00 | 05. 33±1.52 | 05.66±1.57 | NA | 06. 33±1.15 | 10.33±1.52 | 05. 00±1.00 | NA | NA | NA | 20. 66±1.15 |

1=5mg/ml,2=2.5mg/ml, P= Pet ether extract, C= Chloroform extract, E= Ethyl acetate extract, M=Methanol extract, A=Aqueous extract, C=Control (DMSO), S=Standard (Ketoconazole), NA= No Activity, Parts used= L. Leaf, R. Rhizome, A. Ariel, F. Flower, B. Bark, S. Seed. The minimum inhibitory concentrations of very effective 10 plants were determined, among the 10 plants extracts 03 i. e., *Allium cepa* Linn., *Gymnosporia montana* (Roth) Benth, *Plumbago zeylanica* L. were showed effective MIC at 0.31 mg/ml conc. (fig. 1).

## CONCLUSION

The present report suggests that the effective extracts of 24 plants is a potential source of natural antidermatophytic agents against *Trichophyton tonsurans*. After this screening experiment, further work should be performed to describe the antifungal activities in more detail as well as their activity in-vivo. In addition, phytochemical studies will be necessary to isolate the active constituents and evaluate the antidermatophytic activities against a wide range of fungi population.

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interests regarding the publication of this paper.

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