

3. Brogden, R.N and Faulds, D., *Drug*, 1991, 42, 895.
4. Twentyman, O.P., *Lancet*, 1990, 336, 1138.
5. Shah, V.P and Midha, K.K., *Eur. J. Drug. Metab. Pharm.*, 1991, 6, 249.
6. Nagesh, B., Naresh, S and Pathak, M.L., *The Eastern Pharmacist*, 1997, 40, 141.
7. Chowdary, K.P.R and Devala Rao, G., *Indian Drugs*, 1997, 34, 605.
8. Chowdary, K.P.R and Devala Rao, G., *J. Inst. Chemists (India)*, 1997, 69k, 170.

Antifungal Activity of *Luvunga scandens* Against Some Keratinophilic Fungi

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The essential oil from the fruits of *Luvunga scandens* Roxb. (Family Rutaceae) has been studied for *in vitro* antifungal activity against four keratinophilic fungi, *Arthroderma benhamiae*, *Microsporium gypseum*, *Trichophyton mentagrophytes* and *Ctenomyces serratus* using filter paper disc agar diffusion technique. The oil exhibited very good to moderate inhibitory effect against the fungi. The susceptibility of the oil towards dermatophytes is interesting and can be exploited against dermal infections.

Luvunga scandens Roxb. (Family Rutaceae) is a shrub widely distributed in tropical and subtropical Asia including India and Burma. Dried fruits are available in Indian Bazar (Particularly Bengal) under the name of Kakala or Sugandh-kokila and used for preparing perfumed medicinal oil¹ to cure baldness. The root and berries are cure for exhaustion, biliousness, troubles due to vata, kapha and fever². The essential oil from the fruit pulp has 1:8 cineole (32.3%), methyl cinnamate (14.5%), camphor (9.7%), carene (9.1%) and α -terpineol (5.6%) as the main constituents³. The oil has CNS depressant and hypotensive action⁴. The present paper reports the preliminary *in vitro* investigations on the efficacy of the essential oil of *Luvunga scandens* against four keratinophilic fungi.

The dried fruits of *Luvunga scandens* were procured from the local market and identified on the basis of morphological characteristics. The essential oil from the coarsely crushed dried fruit pulp was obtained by hydrodistillation using a Perkin apparatus in a yield of

3.1% (v/w). The test keratinophilic fungi, *Arthroderma benhamiae*, *Microsporium gypseum*, *Trichophyton mentagrophytes* and *Ctenomyces serratus* were procured from the Department of Botany, Dr. Harisingh Gour University, Sagar. Filter paper disc agar diffusion technique of Maruzzella and Henry⁵ was followed for the evaluation of *in vitro* antifungal activity.

The pathogenic fungal species were subcultured on sterile Sabouraud's nutrient broth. Suspension of subcultured organisms were made following the procedure adopted by Bray⁶. Twenty millilitres of sterilized Sabouraud's dextrose agar medium was taken in each petriplate (15 cm). After the agar had hardened, 4 ml of suspension of subcultured organism was distributed evenly over the surface of the plated medium. Sterilized Whatman filter paper No. 1 discs (6 mm) were thoroughly impregnated with 5 μ l neat oil as such and in the dilutions of 1:50, 1:100, 1:200 and 1:1000 using Tween-80. Five test discs along with control disc of griseofulvin dissolved in dimethyl formamide (1000 ppm) were placed on each seeded agar plate and incubated at 28° in cool room for 72 h. The experiments were performed

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Table I - *In vitro* Antifungal Activity of Essential Oil of *Luvunga scandens*

Organism	Zone of Inhibition (mm)*					Control Griseofulvin (1000 ppm)
	Neat oil	1:50	1:100	1:200	1:1000	
1. <i>Arthroderma benhamiae</i>	15.5 ±0.3	12.0 ±0.5	10.5 ±0.3	9.5 ±0.3	7.0 ±0.0	10.5 ±0.3
2. <i>Microsporum gypseum</i>	30.5 ±0.3	25.5 ±0.3	25.5 ±0.3	23.5 ±0.3	20.5 ±0.3	35.0 ±0.5
3. <i>Trichophyton mentagrophytes</i>	40.0 ±0.5	35.0 ±0.5	32.0 ±0.5	31.5 ±0.3	25.5 ±0.3	23.5 ±0.3
4. <i>Ctenomyces serratus</i>	36.0 ±0.5	30.5 ±0.3	30.5 ±0.3	28.5 ±0.3	21.5 ±0.3	14.5 ±0.3

* All values are mean ± standard deviation of 3 determination.

in triplicate and average zones of inhibition were recorded. Table-1 gives comparative record of the antifungal activity of the neat oil and its dilutions and the standard.

The data from Table-1 reveal that the oil from *Luvunga scandens* has inhibitory action on the growth of all the 4 test organisms. The oil is most active against *Trichophyton mentagrophytes* and *Ctenomyces serratus*. Even at a dilution of 1:1000, it exhibited better inhibitory activity than the standard antifungal drug griseofulvin. The inhibitory effect of the oil in various dilutions against *Microsporum gypseum* is also very good. The activity against *Arthroderma benhamiae* is also notable at higher concentrations but diminishes as the dilution of the oil increases. The oil has earlier been found to exhibit inhibitory effect on fifteen bacteria and eight fungi including *Aspergillus* species and *Microsporum cookei*. All four test organisms are well known keratinophilic fungi causing skin infections like ring worm of the scalp, body, feet and nail. *T. mentagrophytes* and *T. rubrum* cause Athlete's foot. The results suggest that the oil, can be utilized apart from perfumery, as a local applicant for

dermal infections caused by the test keratinophilic fungi. However, this needs to be confirmed through further studies.

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REFERENCES

1. Anonymous, "Wealth of India-Raw Materials", Vol. VI, CSIR, New Delhi, 1962, 185.
2. Kirtikar, K.R. and Basu, B.D., In; Indian Medicinal Plants, Vol. I, Lalit Mohan Basu Publications, Allahabad, 1933, 479.
3. Mishra, P., Agrawal, R.K and Gandhe, B.R., *Seifen Ole Fette Wachse*, 1988, 114, 124.
4. Mishra, P. and Agrawal, R.K., *Fitoterapia*, 1988, LIX, 441.
5. Maruzzella, J.C. and Henry, P.A., *J. Am. Pharm. Assoc.*, 1958, 47, 471.
6. Bray, W.B., In; Clinical Laboratory Methods, 5th Edn., The C.V. Mosbey and Co., Washington, 1957, 495.
7. Mishra, P. and Chauhan, C.S., *Indian Perfum.*, 1983, 27, 156.