

Anti-fungal activity of *Nardostachys jatamansi* essential oil beneficial for treating (dermatophytosis) ringworm

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ABSTRACT

Nardostachys jatamansi, a critically endangered rhizome-bearing medicinal plant, is restricted to specialized habitats in high altitudes of the Himalaya. The present study describes the anti-fungal activity of essential oil against an infectious fungi. Jatamansi oil contains (+)-essential oil, resin, sugar, starch, bitter extractive matter, gum, ketone, jatamansone, jatamansic acid, jatamansone semicarbazone, lupeol, malliene, calarene, terpenic coumarin - jatamansin, oroselol, dietheniod bicyclic ketone-nardostachone, sesquiterpene ketone-jatamansone. Author's forearm was infected with ringworm; a fungal disease caused by dermatophytes a parasitic infection. Half a drop of oil applied daily and the infection was found to cure within one week of regular application.

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INTRODUCTION

The rhizome of the herb is considered as the official plant part, found to have excellent therapeutic potential. As mentioned in Ayurvedic, the roots and the rhizomes of *Nardostachys Jatamansi*, are used to treat epilepsy, hysteria, syncope and mental weakness. In India, the rhizomes and roots are being marketed as an anticonvulsant Ayurvedic drug known as Ayush 56 and also used as an anti stress agent. The rhizome of *Jatamansi* is used as an aromatic adjunct in the preparation of medicinal oils, to promote hair growth and blackness. The roots of the herb is used in the preparation of an essential oil found to have fungi toxic activity, antimicrobial, antifungal, hypotensive, anti arrhythmic and anticonvulsant activity. As the species is reported to have become critically endangered, effective conservation, management and recovery of the species is highly important.

The author discloses *Nardostachysjatamansi* essential oil potency as an anti-fungal on his own infection

of dermatophytes (ringworm) on his forearm. Accidentally the author applied the half a drop of an oil on the infected part over eight days. Subsequently the infection was found to be cured within the described period of application. The finding of clinical potency of the oil is well supported by the literatures.

Sarbhoy *et al.* investigated the oil for its efficiency against *Aspergillus flavus*, *A.fumigatus*, *A.sulphureus*, *Mucorfragilis*, and *Rhizopus stolonifer*. Depending upon the concentrations, the *Jatamansi* oil was reported to be fungi static or fungicidal to one or the other molds.

Dermatophytosis or ringworm

Dermatophytosis or ringworm is a clinical condition caused by fungal infection of the skin in humans, pets such as cats, and domesticated animals such as sheep and cattle. The term "ringworm" is a misnomer, since the condition is caused by fungi of several different species and not by parasitic worms. The fungi that cause parasitic infection (dermatophytes) feed on kera-

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tin, the material found in the outer layer of skin, hair, and nails. These fungi thrive on skin that is warm and moist, but may also survive directly on the outsides of hair shafts or in their interiors. In pets, the fungus responsible for the disease survives in skin and on the outer surface of hairs. It has been estimated that currently up to twenty percent of the population may be infected by ringworm or one of the other dermatophytosis. It is especially common among people who play sports, wrestling in particular. Wrestlers with ringworm may be withheld from competition until their skin condition is deemed non-infectious by the proper authorities. Misdiagnosis and treatment of ringworm (figure 1, 2 and 3) with a topical steroid, a standard treatment of the superficially similar pityriasis rosea, can result tinea



Figure 1: Ringworm on human leg

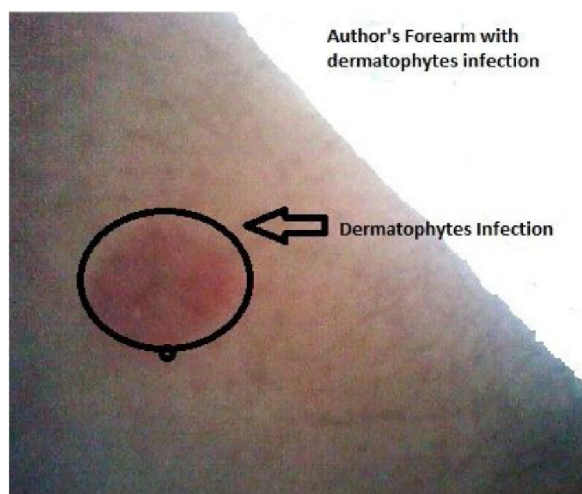


Figure 2 : Author's forearm

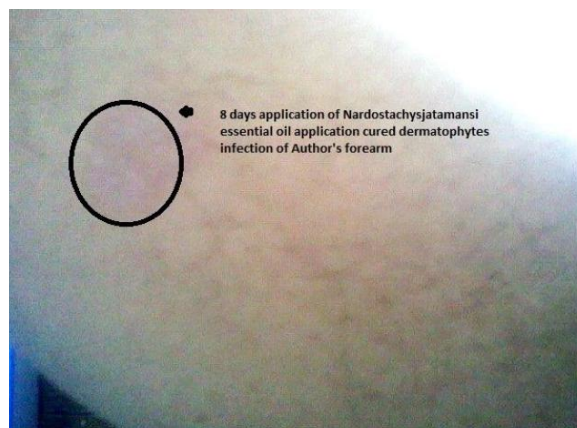
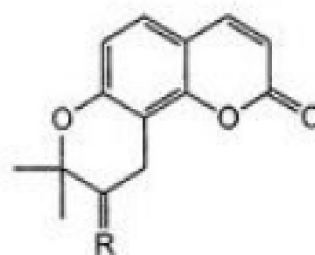


Figure 3 : Author's cured ringworm infection



R= O Jatamansone
 R=H, OH Jatamansinol
 R=H, OCOCMe=CHMe, Jatamansine

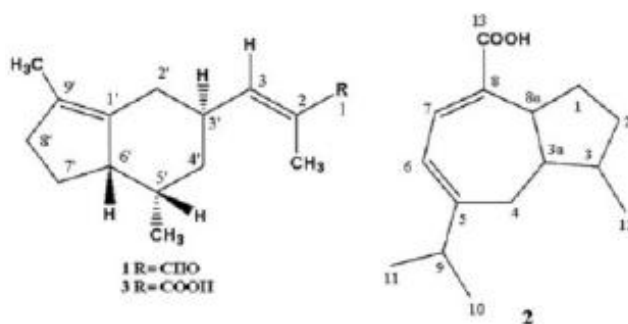
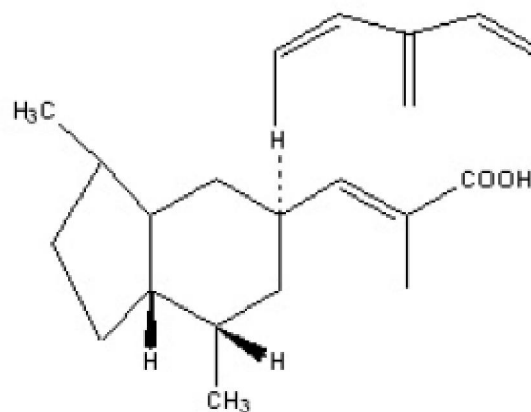


Figure 4 : Jatamansone, Nardin, Nardal and Jatamansic acid

incognito, a condition where ringworm fungus will grow without typical features like a distinctive raised border.

Antifungal treatments include topical agents such as miconazole, terbinafine, clotrimazole, ketoconazole, or tolnaftate applied twice daily until symptoms resolve, usually within one or two weeks. Topical treatments should then be continued for a further 8 days after resolution of visible symptoms to prevent recurrence. The total duration of treatment is therefore generally two weeks, but may be as long as three.

Dermatophytosis has been prevalent since before 1906, at which time ringworm was treated with compounds of mercury or sometimes sulphur or iodine. Hairy areas of skin were considered too difficult to treat, so the scalp was treated with x-rays and followed up with anti parasitic medication

In more severe cases or where there is scalp ringworm, systemic treatment with oral medications may be given.

To prevent spreading the infection, lesions should not be touched, and good hygiene maintained with washing of hands and the body.

A number of different species of fungi are involved. Dermatophytes of the genera *Trichophyton* and *Microsporium* are the most common causative agents. These fungi attack various parts of the body and lead to the conditions listed below. Note that the Latin names are for the conditions (disease patterns), not the agents that cause them. The disease patterns below identify the type of fungus that causes them only in the cases listed:

Dermatophytosis

- (a) Tinea pedis (athlete's foot) affects the feet
- (b) Tinea unguium affects the finger nails and toe nails
- (c) Tinea corporis affects the arms, legs, and trunk
- (d) Tinea cruris (jock itch) affects the groin area
- (e) Tinea manuum affects the hands and palm area
- (f) Tinea capitis affects the scalp
- (g) Tinea barbae affects facial hair
- (h) Tinea faciei (face fungus) affects the face

Other superficial mycoses (not classic ringworm, since not caused by dermatophytes)

- (1) Tinea versicolor caused by *Malassezia furfur*
- (2) Tinea nigra caused by *Hortaea werneckii*

Some important constituents of the *Nardostachys Jatamansi* (figure 4) are as follows believed to be exhibiting an important medicinal potency for its anti-fungal activity.

CONCLUSIONS

To the best of my knowledge and personal clinical attempts, on realizing the infection of dermatophytosis, when the oil of the *Nardostachys Jatamansi* was applied on the infected part of the forearm skin. It was observed that the oil has potent anti-fungal activity by inhibiting the growth of the dermatophytes.

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