

A Comprehensive Study of Predominantly used Traditional Sri Lankan naturopathic Remedies for *Tinea Versicolor* and their Underlying Scientific Effects

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ABSTRACT

Due to its characteristic hypo- or hyperpigmented macules, tinea versicolor—a common superficial fungal illness caused by the species *Malassezia*—presents substantial esthetic and psychological issues. It is most commonly found in tropical regions. Although non-contagious and not life-threatening, the condition can greatly impact an individual's quality of life. Traditional remedies, deeply rooted in Sri Lankan culture and linked to Ayurvedic practices, have been used for centuries to manage this skin condition. These remedies often involve natural ingredients such as medicinal plants and minerals, highlighting a cultural preference for naturopathic approaches. This study aims to investigate the prevalence and perception of these conventional remedies among the Sri Lankan public and to evaluate their scientific efficacy. A mixed-method approach was utilized, combining a quantitative descriptive study with a qualitative analysis of the antifungal properties of traditional ingredients. A structured questionnaire was distributed to 133 individuals, aged 15 to 60 years, who have experienced tinea versicolor, collecting data on their demographic background, medical history, and preferred treatment methods. The majority of respondents favored traditional remedies over allopathic treatments, with *Cassia alata* and *Psidium guajava* leaves being the most frequently cited ingredients. Additionally, *Alpinia niagra*, sulfur, and turmeric were also commonly used. The study further employed a comprehensive literature review spanning from 1980 to 2024, following PRISMA 2020 guidelines, to evaluate the antifungal efficacy of these remedies. The findings suggest that traditional remedies, particularly those involving *Cassia alata*, *Psidium guajava* leaves, and *Alpinia niagra*, exhibit notable antifungal activity against *Malassezia* species, the causative agents of tinea versicolor. *Cassia alata*, for instance, contains anthraquinones that have demonstrated significant antifungal effects. Similarly, *Psidium guajava* leaves and *Alpinia niagra* have shown promise in inhibiting fungal growth in various studies. Sulfur, often combined with coconut oil, and turmeric were also identified as having antifungal properties, although the scientific backing for their combined use is less robust. The study concludes that traditional remedies hold significant potential in recovery of *Tinea versicolor* skin condition, and further scientific researches on their efficacy are required. Further researches and validation could support the continued use of these remedies, provide more comprehensive treatment options for patients by bridging traditional knowledge with scientific research.

Keywords: *Tinea versicolor*, sri lankan traditional remedies, naturopathy, antifungal activity

INTRODUCTION

Background of the Tinea Versicolor and its Impact

Tinea versicolor is a common dermatomycosis caused by the genus *Malassezia*. Genus *Malassezia* is a group of commensal organisms in the normal skin microbiota. But several supportive factors including excessive sebum production in sebaceous glands in the skin (J,1993),[2] immune deprivation, hormonal changes and environmental factors such as warm moist weather can trigger its overgrowth which is characterized by hyperpigmented, hypopigmented or erythematous macules on the proximal upper extremities and upper trunk including the back and shoulder girdle, chest, upper arms and neck area (Beth G goldstein, 2024).[1] Even though adolescents get macules over the facial area, it is uncommon among adults. The infection can be mostly seen in adolescents and young adults. The infection appears as macules or patches which can be numerous and in various sizes and irregular in shape, dry itchy and scaly. These macules are clinically characterized hypo or hyperpigmented with a variety of colours including brown, yellowish or reddish (Nina Łabędź, 2023).[3] Even though it is not contagious, there might be reoccurrences if the individual is continuously exposed to the causative factors. While tinea versicolor is not typically associated with severe health complications, it can cause significant cosmetic concerns and psychological distress due to its appearance, potentially impacting the quality of life. The diagnosis of the tinea versicolor is based on clinical examination and in uncertain cases, KOH microscopic examination, dermatoscopy, ultraviolet-induced fluorescence dermatoscopy and wood lamps are used accordingly. (Nina Łabędź, 2023). In treatments, topical therapies including specific and non-specific antifungal medications are administered. Globally,

tinea versicolor can reach a prevalence of up to 50% in tropical countries (Karray & McKinney, 2024).[4] Several Indigenous formulae have been prevailing in the Sri Lankan society to overcome this condition since decades. This study aims to investigate the prevalence and perception of conventional naturopathic remedies for Tinea versicolor among the Sri Lankan general public via a survey study and to evaluate its scientific background.

Significance of Traditional Naturopathic Remedies in Sri Lankan Culture

Traditional remedies hold a significant place in Sri Lankan culture, deeply rooted in the island's history and heritage. These remedies are an integral part of Ayurveda, the ancient system of medicine that has been practiced in Sri Lanka for over 3,000 years. Utilizing a rich diversity of medicinal plants native to the region, Sri Lankan traditional medicine focuses on holistic healing, balancing the body, mind, and spirit. Remedies often include herbal preparations, dietary adjustments, and lifestyle practices tailored to individual constitutions. The traditional knowledge is passed down through generations, often within families of Ayurvedic practitioners known as "Vaidyas". This cultural heritage is not only a testament to the island's rich biodiversity but also underscores a deep connection to nature and an understanding of its healing properties. In contemporary times, there has been a resurgence of interest in these traditional practices as complementary and alternative medicine, highlighting their relevance in promoting health and wellness alongside modern medical practices.

Evaluation of traditional remedies scientifically is important since scientific studies can confirm the effectiveness of these traditional remedies in specific conditions while distinguishing their effectivity over other treatment modalities

in the present-day context. Moreover, potential side effects and toxicity evaluation ensure the safety of its consumption in public use. Scientifically validated remedies can be integrated to modern medical practices to enhance the quality of health care and give the best option for patients while gaining global acceptance and international recognition of traditional remedies. This can allow individuals to make informed choices on their treatment options with the scientifically validated profiles of traditional remedies including their benefits and risk factors. Furthermore, this can stimulate research and development in the field of novel drug innovations led by traditional remedies. Specifically encouraging scientific validation of Sri Lankan traditional remedies enhances the cultural pride and significance of the heritage while reinforcing the value of the traditional practices in the modern context.

METHODOLOGY

Quantitative descriptive study

Initially, a comprehensive literature review was carried out to review the published research and information available in texts regarding *Tinea versicolor* and natural treatments. The research methodology was designed to utilize a mixed-method approach to collect quantitative data to get a comprehensive experience and understanding of the individuals. A structured questionnaire was designed to collect the data including demographic information like age, gender, and profession, and medical history including previous and current treatments, remedies they have used, and their outcomes. It was distributed through multiple channels including online platforms, and skin clinics to reach the individuals who had suffered from versicolor. Inclusion criteria included individuals aged between 15 to 60 years, those with a history of tinea versicolor or currently experiencing symptoms, and those willing to provide

information. The collected data was analyzed using statistical methods to identify the correlation factors and conventional remedies used among people and their effectiveness.

Qualitative study

To identify the most widely used ingredients from traditional remedies for the treatment of tinea versicolor, a survey-based study was conducted followed by a comprehensive literature review. The review was conducted according to the PRISMA 2020 guidelines to ensure a systematic approach.

We performed an extensive literature search spanning the years 1980 to 2024, utilizing databases and search engines such as PubMed, Google Scholar, and ResearchGate. The search was focused on the keywords "*Tinea versicolor*," "Sri Lankan traditional remedies," and "Antifungal activity." The inclusion criteria were confined to peer-reviewed clinical trials, review articles, and other scholarly works published in English. Studies such as concept papers, letters to the editor, and publications in languages other than English were excluded from the analysis.

Out of the 85 studies initially screened, 21 met the inclusion criteria. These included eight in vitro studies, one data analytical study, one animal study, seven review articles, three books, and one safety assessment. This selection provided a robust foundation for evaluating the antifungal properties of the five most commonly used traditional ingredients against tinea versicolor.

RESULTS

Questionnaire Findings

When the questionnaire was distributed, 150 participants responded to the questionnaire and 05 answered questionnaires were rejected due to

incompleteness, 05 were rejected as the respondents are above 60 years and 07 were rejected due to irrelevancy in answers. Finally, 133 questionnaires were selected for the final evaluation among

them 78 were males and 55 were females. In this study, 90 respondents have suggested traditional home remedies, 11 have suggested herbal products and 32 have suggested allopathic treatments

■ Accepted responses ■ Rejected responses

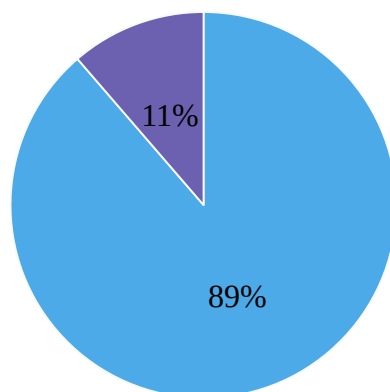


Chart 1. Percentage of suitable responses for the evaluation

■ Male ■ Female

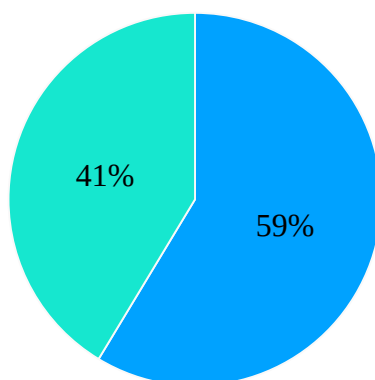


Chart 2. Percentage of respondents based on their gender

- Traditional home remedies
- Herbal products
- Allopathic treatments

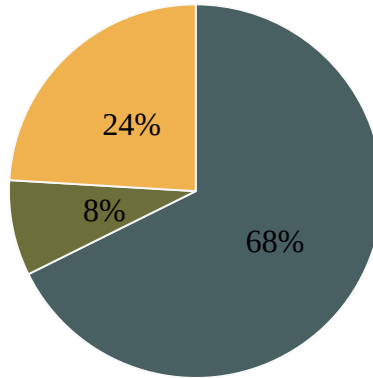


Chart 3. Distribution based on the choice of the treatment for tinea versicolor

Based on the survey respondents provided the below traditional home remedies are effective against tinea versicolor based on their prior experience.

Table 1: Most effective traditional home remedies.

Main ingredient	Method
<i>Kaluwala (Alpinia niagra)</i>	As a single drug
	with lime juice
	with turmeric
<i>Aththora (Cassia alata)</i>	As a single drug
	with lime juice
	with lime juice and turmeric
	with Guvava (<i>Psidium guajava</i>) Leaves , Castor leaves, <i>Azadiracta indica</i> leaves, and turmeric
	with bee honey
	with vinegar
Gendagam (Sulphur)	As a single drug
	with coconut oil
	with Bael leaves
Guvava (<i>Psidium guajava</i>) Leaves	As a single drug
	with turmeric
	with <i>Wada kaha (Calamus aromaticus)</i>
<i>Nika (Vitex Negundo)</i> leaves	with Sulphur and Sesame oil
<i>Kokum (Garcinia indica)</i> barks	As a single drug
Bittergourd Leaves	As a single drug
<i>Alu Kesel (Musa paradisiaca)</i>	branches are made into ash and mix it with ghee

Among the respondents recommending traditional home remedies for the treatment of tinea versicolor, 10 individuals identified *Alpinia niagra* as the primary ingredient, 41 participants had suggested *Cassia alata*, 03 participants had recommended the use of sulfur, 31 highlighted the use of *Psidium guajava* leaves, 02 participants had recommended the bark of *Garcinia indica*, 01 participant

has suggested the use of bitter gourd leaves, and 02 respondents had recommended the branches of *Musa paradisiaca* (Alukesel). These responses indicate a diverse range of traditional treatments employed in managing tinea versicolor, with *Cassia alata* and *Psidium guajava* leaves being the most frequently cited.

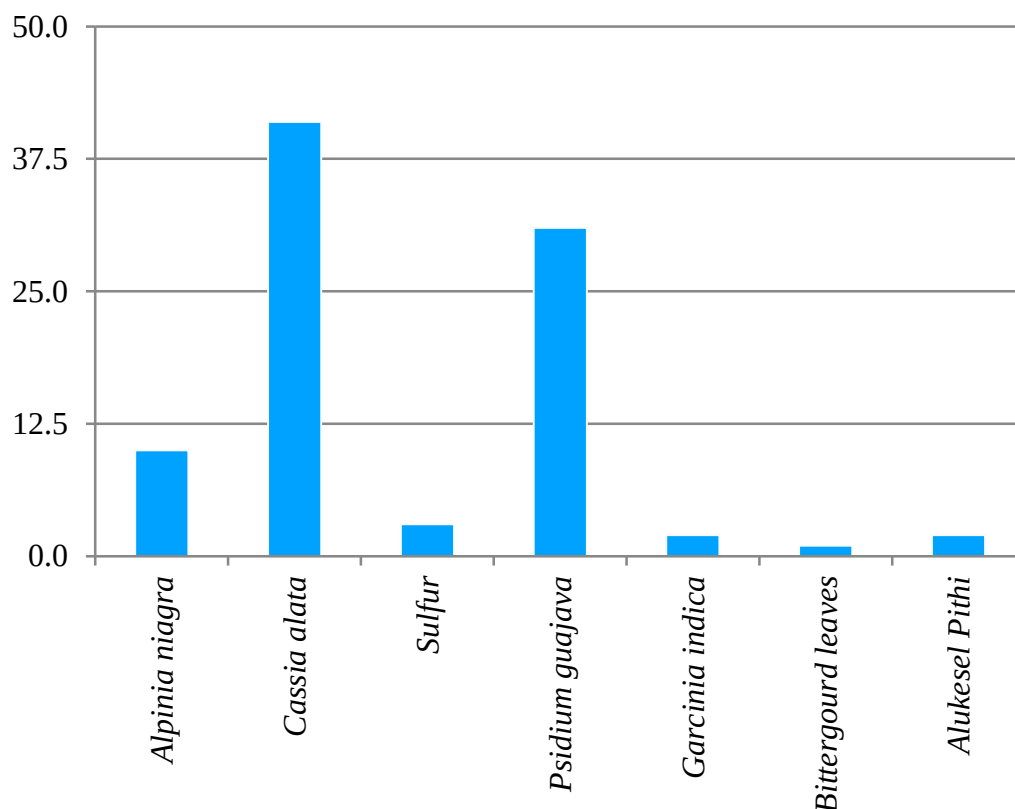


Chart 4. Mostly used herbal plants and ingredients against *Tinea versicolor* among the Sri Lankan general public

Phytochemical effects of the identified herbal plants and ingredients on *Tinea versicolor*

According to the results obtained from the survey *Alpinia niagra*, *Cassia alata*, Sulfur, and *Psidium guajava* Leaves were identified as mostly and widely used main ingredients. In contrast, Turmeric (*Curcuma longa*) is used as an accessory ingredient in formulae. Therefore, based on the existing scientific literature, these

five were selected to review and evaluate their antifungal activity.

Kaluwa Ala (Alpinia niagra)

Alpinia niagra belongs to the Zingiberaceae family and the fresh juice of this rhizome is used against tinea versicolor among the Sri Lankan general public. studies have evaluated the antifungal activity of an extract against *Malassezia furfur*, showing that the inhibition zone's

diameter increased with higher extract doses. The mean diameters of the inhibition zones at doses of 50 µg, 100 µg, 200 µg, and 300 µg were 0.8 cm, 0.9 cm, 1.4 cm, and 1.7 cm, respectively. The highest inhibition was observed at 400 µg, with a mean diameter of 2.1 cm. The Minimum Inhibitory Concentration (MIC) was 200 µg, and the Minimum Lethal Concentration (MLC) was 300 µg (Rajapaksha et al., 2017).[5,6]

Aththora (Cassia alata)

Cassia alata, commonly known as ringworm bush, is a member of the Leguminosae family and has been traditionally employed in various cultures to address skin disorders, including fungal infections such as tinea versicolor, ringworm, eczema, and scabies (Abille, 2015).[7] The plant's leaves have been documented for their significant antifungal activity, a property primarily attributed to the presence of anthraquinones and anthracene derivatives. (Fatmawati et al, 2020; Oladeji et al., 2020)[9,11] Several studies have highlighted the antifungal potential is due to the presence of bioactive compounds such as rhein, emodol, and various anthrones. Fuzellier et al. (1982)[12] identified these compounds in the leaves of *C. alata* and demonstrated their efficacy against dermatophytes and yeast, both of which are common fungal pathogens affecting human skin. The presence of these anthraquinones, specifically rhein and emodol, alongside their derivatives, underscores the plant's traditional use in treating dermatological conditions. Moreover, the anthracene derivatives found in *C. alata*—including aloe-emodin, sennosides A and B, 4,5-dihydroxy-1-hydroxymethylanthrone, and 4,5-dihydroxy-2-hydroxymethylanthrone—contribute further to its antifungal properties. (Meenupriya et al., 2014; Abdulwaliyu et al., 2013)[8,10] These compounds are known to disrupt fungal

cell membranes, thereby inhibiting the growth of pathogenic fungi. Abo et al. (1999)[13] also supported these findings, reinforcing the plant's potential as a natural antifungal agent. Given the increasing interest in plant-based alternatives for managing skin disorders, *C. alata* stands out for its broad spectrum of antifungal activities, primarily due to its rich composition of anthraquinones and related phytochemicals.

Gendagam (Sulfur)

During the study mixture of Sulphur and coconut oil was suggested get rid of tinea versicolor. Scientific studies clarify that Extra Vergin Coconut oil contains caprylic, capric and lauric fatty acids and rutin, 3,4-dihydroxybenzoic acid, and salicylic acid as major phenolic compounds (De Vasconcelos et al., 2022). Gupta et al. (2015)[14,15] have reported that Non-specific antifungal topicals such as sulphur combined with salicylic acid can be used to eliminate dead corneocytes and thwart further infection in the stratum corneum. In contrast, there is no scientific data to validate the antifungal effectivity of the mixture of Bael leaves with Sulphur.

Guvava (Psidium guajava) Leaves

Guvava (*Psidium guajava*) leaves exhibit notable antifungal activity against *Malassezia furfur*, the fungus causing tinea versicolor. According to the ROC-MOORA decision support system analysis, guava leaves achieved a ranking score of 0.459, placing them among the top five medicinal plants effective for treating this skin condition. The bioactive compounds in guava leaves contribute to their efficacy, making them a valuable natural remedy for tinea versicolor (Widians et al., 2024).[16]

Turmeric (Curcuma longa)

Curcuma longa (turmeric) oil has shown potent antifungal activity against *Malassezia furfur*, the causative agent of

tinea versicolor. The essential oil, extracted via hydro distillation, demonstrated a significant inhibition zone of 55 mm using the disc diffusion method at 100% concentration. The minimum inhibitory concentration (MIC) was found to be 0.1 µl/ml, aligning with previous studies by Wuthi-udomlert et al. (2000),[18] who also reported the antifungal efficacy of turmeric oil against dermatophytes, albeit with varying MIC values (Sharma et al., 2012).[17]

DISCUSSION

The study's findings underscore the persistent reliance on traditional remedies for the treatment of tinea versicolor among the Sri Lankan population. The preference for these remedies reflects not only cultural heritage but also a trust in their efficacy, passed down through generations. The survey revealed that a significant portion of respondents favors traditional home remedies over allopathic treatments, with plants like *Cassia alata* and *Psidium guajava* leaves being prominently mentioned.

The scientific literature supports the antifungal properties of these traditional remedies, particularly *Cassia alata*, which contains bioactive compounds like anthraquinones known for their antifungal activity. The use of sulfur combined with coconut oil is another notable practice, although the scientific backing for this combination is less robust. The presence of caprylic, capric, and lauric acids in coconut oil, along with the antifungal potential of sulfur, suggests a synergistic effect that merits further investigation.

Despite the promising results, the study also highlights the need for more rigorous scientific validation of these traditional remedies. While some plants have well-documented antifungal properties, others require more extensive research to confirm their efficacy and safety. Integrating these

remedies into modern healthcare could provide a complementary approach to managing tinea versicolor, especially in regions where access to conventional treatments is limited.

CONCLUSION

This study highlights the significant reliance on traditional naturopathic remedies for the treatment of tinea versicolor among the Sri Lankan population. The survey results demonstrate a strong cultural preference for natural home remedies over allopathic treatments, particularly emphasizing the use of *Cassia alata*, *Psidium guajava* leaves, and *Alpinia niagra*. Scientific literature supports the antifungal efficacy of several of these remedies, especially *Cassia alata* and turmeric, which contain bioactive compounds with proven antifungal properties. However, the study also identifies a gap in scientific validation for some combinations, such as sulfur with coconut oil, which shows promise but lacks comprehensive research.

These findings advocate for more rigorous scientific investigations into traditional remedies to confirm their safety, efficacy, and potential integration into contemporary medical practices. By bridging traditional knowledge with modern science, healthcare providers can offer a more holistic approach to treating *Tinea versicolor*, ultimately enhancing patient care options and preserving cultural heritage. The integration of validated traditional remedies could provide a cost-effective and accessible alternative in resource-limited settings, offering a valuable complement to conventional therapies.

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