A Case Study on Medicinal Plants for Swine Dermatophytosis

R. Nithiaselvi¹*, K. Shibi Thomas², M. Dhanalakshmi³ and S. Maheshwari⁴
Veterinary College and Research Institute, Orathanadu-614 625, TANUVAS

(Received : January, 2024  6/24  Accepted : March, 2024)

Abstract
The present work is a case study that was conducted at the Livestock Farm Complex, Veterinary College and Research Institute; Orathanadu (Tamil Nadu) to assess the efficacy of topical herbal plant mixtures on swine dermatophytosis. Dermatophytosis is a contagious fungal disease affecting various animal species and is a high economic burden with limited antifungal agents. Skin disease in swine can significantly impact production, carcass value and reputation; diagnosing and treating these diseases can be challenging. Eight adult sows in the farm exhibiting moist, reddish brown colour irregular foci on different parts of the body with itching were selected for the study. A mixture of three medicinal plants were selected and combined with common salt in the ratio of 5:2:2:1, comprising Acalypha indica and Azadirachta indica leaves, Curcuma longa rhizome and salt, respectively. The herbal mixture was well grounded fresh every time to make a topical paste, which was applied over the affected area three times a day for five days. The response to the treatment was assessed based on the successful reduction of the severity of the cases. The current study’s findings suggest that the plants chosen for the study have the potential to...
alleviate pig’s skin disorders.

**Key words:** *Acalypha indica*, *Azadirachta indica*, *Curcuma longa*, *Dermatophytosis*, *Salt*, *Swine*

Dermatophytosis, a ringworm infection, is highly contagious and can be transmitted through direct contact with infected animals or contaminated objects. These fungi have the ability to invade and thrive in the keratinized structures of the skin, hair and nails, leading to various clinical manifestations. Dermatophytosis is one of the most common skin diseases worldwide (Fratti *et al*., 2023), with circular or irregular alopecic lesions and ring-shaped rashes, with scaling or crusting and itching. These lesions, can range in size from small patches to larger areas are characterized by inflammation with brown discoloration (Pittman and Roberts, 2005). Dermatophytosis in pigs is usually caused by *Microsporum nanum*, is a significant concern in the swine industry. Affected pigs may have a lower marketability and require more expensive treatments (Pena *et al*., 2020). Dermatophytosis is a self-curing disease and treatment is used to shorten the course of the disease. There are various treatment options available for dermatophytosis in pigs and one common approach is the use of topical and oral antifungal medications, such as miconazole or clotrimazole, with good hygienic to prevent the spread of dermatophytosis and reduce the risk of reinfection.

The use of antifungal agents is very costly; hence medicinal plants were tried in this study with the aim to investigate the potential benefits of ethnoveterinary medicine in managing skin diseases in swine. A mixture of medicinal plants comprising *Acalypha indica* and *Azadirachta indica* leaves, *Curcuma longa* rhizome with salt were selected and combined to study the efficacy in treating dermatophytosis in pigs.

**Materials and methods**

**Animal samples**

Dermatological samples were collected from affected animals by taking hair shafts and skin scrapings with a sterile scalpel and the collected material was covered and kept in a properly...

---

![Fig. 1](image_url) **Fig. 1** Effect of medicinal plants in swine dermatophytosis

The Indian Veterinary Journal (April, 2024) 49
labelled plastic bag. The samples were sent to the department of Veterinary Microbiology for further diagnosis.

**Sample processing**

The collected hair shaft and skin scrapings were stained with lactophenol cotton blue stain and the fungal hyphae were examined under a microscope. The examination under the microscope revealed the presence of intensely blue elements, suggestive of a fungal (Larone, 1995).

**Preparation of ethnoveterinary medicine**

Neem decoction was prepared by boiling 100gms of fresh neem leaves in one litre of water. The prepared decoction was used for washing the infected area and wiped out excess water with clean cotton towel. The plants were collected freshly in the morning and washed thoroughly. To make an herbal mixture *Acalypha indica* leaves 250gms, *Azadirachta indica* leaves 100gms, *Curcuma longa* rhizome 100gms and salt 50 gms were collected and ground to make a paste (Vijayakaran et al., 2020). This topical application was repeated three times a day for a period of 5 days, ensuring thorough treatment of the infection.

**Results and Discussion**

A total of eight adult sows in the farm presented with non-pruritic alopecia with reddish brown colored, irregular shaped crusts and erythema in the dorsal region of the neck and chest, sternum and pelvic limb (Fig.1a). These lesions appeared to be spreading rapidly, affecting a larger area of the pig’s body each day. Upon closer examination, it was observed that the affected skin was also thickened and inflamed, causing discomfort to the animals. The pigs were observed scratching and rubbing their bodies against surfaces in an attempt to alleviate the itchiness and discomfort. The intensity of these behaviours increased as the lesions worsened, indicating the significant distress to the animals. This study backs up the findings of Nweze, 2011 in swine. Dermatophytes are a group of fungi that could use keratin as a substrate. The infection of the keratinized tissue is termed “tinea” or ringworm (Valandro et al., 2017). In this study, keratinolytic fungal, which degrade the keratin in the hair shaft (Fig. 2) were detected in lactophenol cotton blue staining, which confirmed the fungal infection in swine.

*Acalypha indica* is known as a rich source of glycosides, flavanoids and tannins (Chekuri et al., 2020) and is used as anti-cancer, anti-diabetic, anti-oxidant, anti-bacterial, antifungal, hepatoprotective, anti-inflammatory and treatment for ulcers and wound healing.

Pankaj et al. (2011) stated that *Azadirachta indica* or (neem) have anti allergic, antidermatic, antifeedent, antifungal, anti-inflammatory, antipyorrhoic, antiscabic, cardiac, diuretic, insecticidal, larvicidal, nematocidal, spermicidal and other biological activities. Cyclic trisulphide and cyclic tetrasulphide are major chemical components present in the neem leaves and possesses antifungal activity. The application of the neem decoction and the homemade paste provided immediate relief to the infected area Fig.1(b & c). The neem decoction, with its antibacterial properties, helped to cleanse the wound and prevent further infection.

Curcumin, demethoxy curcumin and bis-demethohydroxycurcumin, are three pharmacologically important Curcuminoids that have been isolated from *Curcuma longa* (Gupta et al., 1999). They have been shown to possess anti-inflammatory, anti-carcinogenic, anti-mutagenic and anti-cancer properties. The therapeutic properties of *Curcuma longa* include insecticidal, antimicrobial, antifungal, antimalarial, antiviral and antioxidant properties (Vijayakaran et al., 2020).
Sodium chloride is also a known antifungal agent (Blomberg and Adler, 1993). Vijayakaran et al. 2020 were studied to determine the most effective combination of crude plant extracts and saturated salt solution against canine dermatophytes and suggests that a 7:2:1 polyherbal combination containing Acalypha indica, Curcuma longa and sodium chloride can effectively reduce fungal infections in pet animals for 10 days.

This herbal paste not only acted as a natural antiseptic but also helped to soothe the wound and alleviate any discomfort. As the days progressed, the healing process accelerated, and by the fifth day Fig.1 (d), the lesions were completely dried and the wound healed without leaving behind any noticeable scars. By the third day, there had been a significant decrease in itching, further proving the effectiveness of this homemade remedy.

**Summary**

A mixture of medicinal plants comprising Acalypha indica and Azadirachta indica leaves, Curcuma longa rhizome and salt in the following ratio 5:2:2:1 has been effective in treating dermatophytosis in pigs. This finding suggests that exploring the antifungal properties of different herbs in combination could lead to the development of more effective treatments for fungal infections. Additionally, investigating the specific mechanisms by which these herbs inhibit fungal growth could provide valuable insights for the development of novel antifungal drugs.

**References**


