Journal of Animal Research: v.16 n.03 p. 133-138. June 2026

DOI: 10.30954/2277-940X.03.2026.4

Diagnosis and Therapeutic Management of Porcine Sarcoptic Mange: A Case Report

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Received: 07 April, 2026 **Revised:** 10 May, 2026 **Accepted:** 15 May, 2026

ABSTRACT

Porcine sarcoptic mange caused by *Sarcoptes scabiei* var. *suis* is a highly contagious and economically important ectoparasitic disease of pigs, characterized by intense pruritus, dermatitis, reduced feed efficiency and impaired productivity. Early diagnosis and prompt treatment are essential to minimize production losses and prevent transmission within herds. A one-year-old Large White Yorkshire pig presented with severe pruritus, generalized alopecia, hyperkeratosis and crusted skin lesions. Deep skin scrapings collected from affected areas were processed using 10% potassium hydroxide (KOH) and examined microscopically for the detection and identification of mite developmental stages. Following confirmation of the infestation, therapeutic management was undertaken using ivermectin along with supportive care and appropriate hygienic measures. Microscopic examination revealed the presence of eggs, larvae, nymphs, and adult stages of *Sarcoptes scabiei* var. *suis*, confirming the diagnosis of sarcoptic mange. The animal showed progressive clinical improvement following treatment, with marked reduction in pruritus, resolution of crusted lesions, and gradual hair regrowth. Follow-up skin scrapings were negative for mites, indicating successful clinical and parasitological recovery.

HIGHLIGHTS

- Sarcoptic dermatitis is an economically important ectoparasitic disease of pigs.
- Ivermectin significantly effective against sarcoptic mange in pigs.

Keywords: Pig, sarcoptic mange, *Sarcoptes scabiei* var. *suis*, ivermectin

Sarcoptic mange, caused by *Sarcoptes scabiei* var. *suis*, is a contagious ectoparasitic disease of pigs with a worldwide distribution and considerable economic significance. The disease adversely affects animal health, welfare, and production performance, making it one of the most important parasitic skin conditions encountered in swine production systems (Taylor *et al.,* 2016; Bowman, 2021). The mites burrow into the epidermis, triggering inflammatory and hypersensitivity reactions that result in severe pruritus, erythema, papules, crusting, hyperkeratosis, alopecia, and chronic dermatitis (Pence and Ueckermann, 2002; Bowman, 2021). In prolonged infestations, reduced feed intake, poor growth performance, decreased feed conversion efficiency, and secondary bacterial infections

How to cite this article: Mallesh, P., Ayodhya, S., Suresh, R., Ramya, N. and Srinija, Ch. (2026). Diagnosis and Therapeutic Management of Porcine Sarcoptic Mange: A Case Report. *J. Anim. Res.,* **16**(03): 133-138.

Source of Support: None; **Conflict of Interest:** None

may contribute to substantial economic losses (Arends and Stanislaw, 1985).

Accurate diagnosis relies on recognition of characteristic clinical lesions together with microscopic identification of mites, eggs, or other developmental stages in deep skin scrapings obtained from affected areas (Bowman, 2021). However, the intermittent and often low mite burden in chronic cases may reduce diagnostic sensitivity, emphasizing the importance of careful sample collection and thorough parasitological examination (Zimmermann *et al.,* 2019).

Macrocyclic lactones, particularly ivermectin and doramectin, remain the cornerstone of therapeutic management because of their proven efficacy against burrowing mites (Curtis, 2003; Bowman, 2021). Nevertheless, successful control requires an integrated approach that combines effective acaricidal therapy with environmental sanitation, treatment of in-contact animals, and implementation of appropriate biosecurity measures to reduce the risk of reinfestation (Curtis, 2003; Aulakh *et al.,* 2003; Erasion *et al.,* 2010).

The present case report describes the clinical presentation, parasitological diagnosis, morphological characterization of developmental stages of *Sarcoptes scabiei* var. *suis*, and successful therapeutic management of sarcoptic mange in a pig. The report highlights the diagnostic value of microscopic examination of skin scrapings and the importance of integrated management strategies for effective disease control.

MATERIALS AND METHODS

Case History

A one-year-old male large white Yorkshire pig was presented to the Veterinary Clinical Complex, College of Veterinary Science, Korutla, Jagtial district, Telangana State, with a history of reduced feed intake, severe itching, frequent rubbing against hard surfaces and skin lesions.

Clinical Examination

Clinical examination revealed generalized pruritus, erythema, thick greyish-white crusts, extensive alopecia involving the ears, neck, shoulders, abdomen, and hindquarters, and marked hyperkeratosis with wrinkling of the skin (Fig. 1, 2). Deep skin scrapings were collected from active skin lesions, treated with 10% potassium hydroxide (KOH), and examined microscopically.

Fig. 1: Erythema and greyish white crust lesions on the ears

Fig. 2: Erythema, thick greyish-white crusts and extensive alopecia involving the ears, neck, shoulders, abdomen and hindquarters

Parasitological Examination

The microscopic examination revealed oval shaped eggs (Fig. 3). The developing larvae are found inside the egg (Fig. 4). Single leaf and double leaf egg shell fragments are seen after hatching of eggs (Fig. 5, 6). The larvae are round, tortoise-likein shape and have three pairs of legs (Fig. 7). Then the larvae are moult to become nymphs, and the fourth pair of legs is not well developed (Fig. 8). Adult mites are oval, ventrally flattened and dorsally convex tortoise-like bodies with prominent dorsal spines. The ventral view of the adult male mite has four pairs of

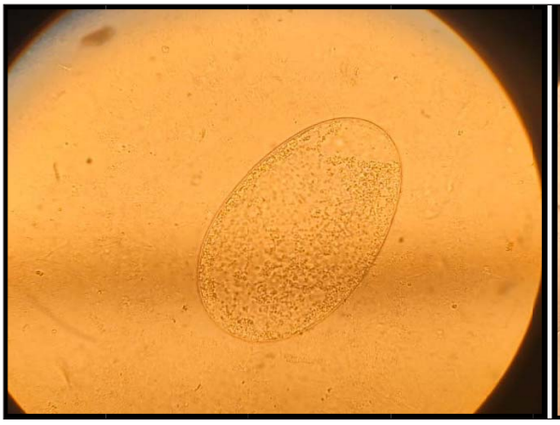

Fig. 3: Eggs of *Sarcoptes scabiei* var. *suis*

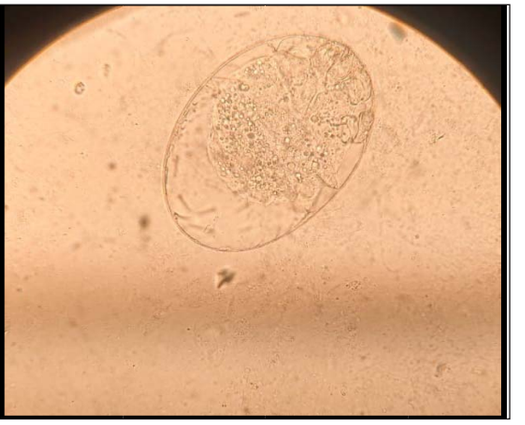

Fig. 4: Developing larvae inside the egg

Fig. 5: Single leaf egg shell fragment after hatching of eggs

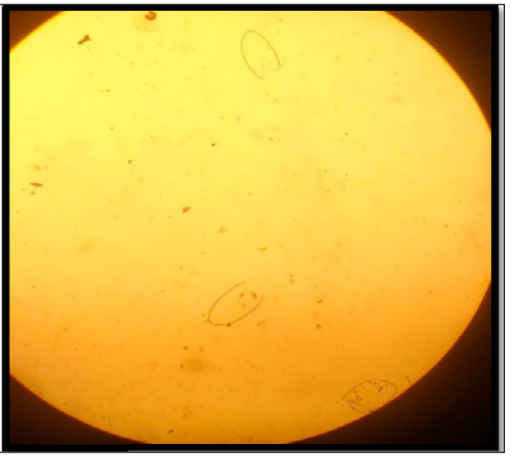

Fig. 6: Double leaf egg shell fragments after hatching of eggs

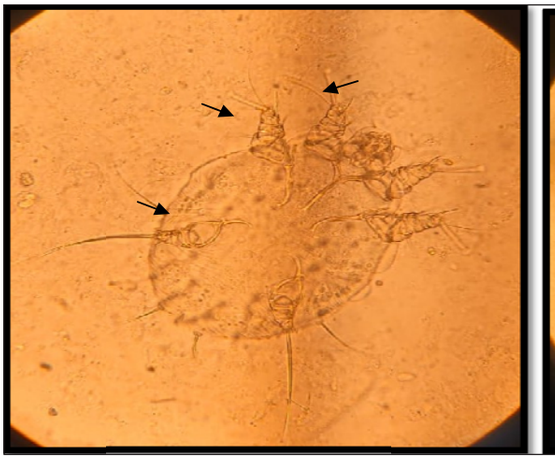

Fig. 7: Larvae of *Sarcoptes scabiei* var. *suis* (Arrows showing the three pairs of legs)

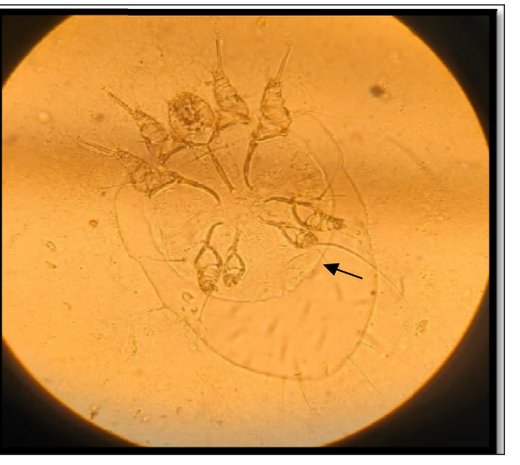

Fig. 8: Nymph of *Sarcoptes scabiei* var. *suis* (Arrow showing the fourth pair of leg which is smaller in size)

legs, epimeres and the presence of bell-shaped suckers on the first, second and fourth pairs of legs and the third pair of legs ends with a long bristle (Fig. 9). The ventral view of an adult female mite has four pairs of legs, epimeres and the presence of bell-shaped suckers on the first and second pairs of legs, while the third and fourth pair of legs ends with long bristles (Fig 10). Fig. 11 photomicrograph showing all developmental stages of *mites,* including eggs, larvae, nymphs, and adults, recovered from skin scrapings. Based on the characteristic clinical findings and the morphological identification of all developmental stages observed during microscopic examination, the infestation was confirmed as *Sarcoptes scabiei* var. *suis*, establishing the diagnosis of sarcoptic mange.

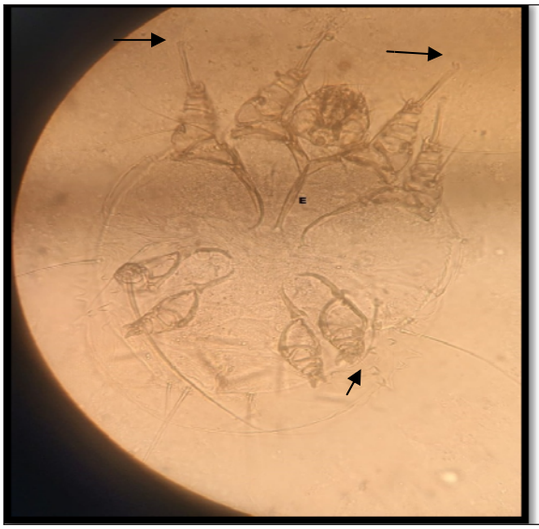

Fig. 9: Ventral view of adult male *scabiei* var. *suis* (Black arrows showing bell-shaped suckers)

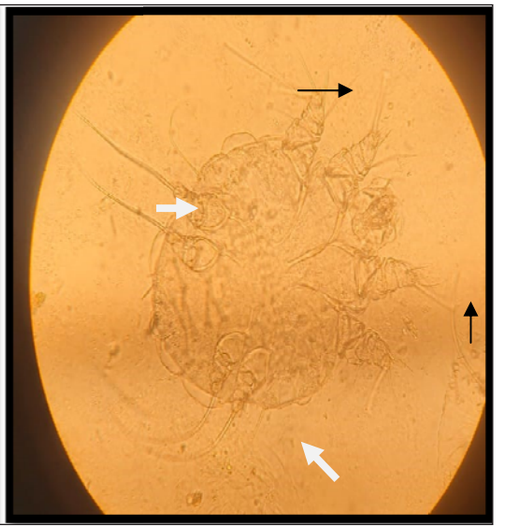

Fig. 10: Ventral view of adult female *Sarcoptes scabiei* var. *suis* (Black arrows showing bell shaped suckers; White arrows showing long bristles / Setae)

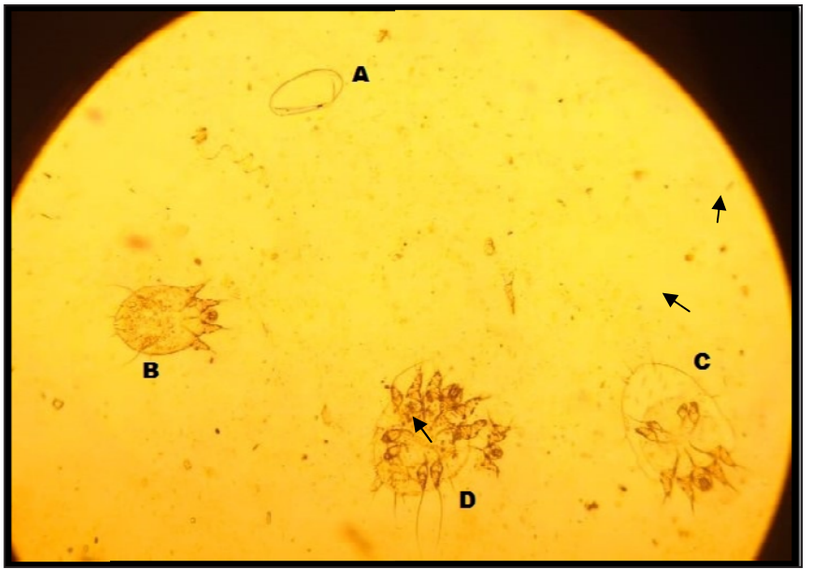

Fig. 11: Photomicrograph showing all stages of *Sarcoptes scabiei* var. *suis* (A: Egg; B: Larvae; C; Nymph and D: Adult mite) recovered from skin scrapings

RESULTS AND DISCUSSION

The affected pig was treated with ivermectin administered subcutaneously at a dose rate of 300 µg/kg body weight, with a repeat injection after 7 days to eliminate mites emerging from eggs that survived the initial treatment. Supportive therapy included administration of a multivitamin preparation containing vitamins A, D3 and E to improve skin health and facilitate tissue repair. Chlorpheniramine maleate was administered at a total dose of 20 mg. The affected skin lesions were gently cleaned with a mild antiseptic solution to remove crusts and reduce secondary bacterial contamination. Benzyl benzoate lotion was applied topically to the affected areas. The owner was advised to improve housing hygiene by removing contaminated bedding, cleaning and disinfecting the pen, and maintaining proper sanitation to minimize environmental contamination. Isolation of the affected pig and treatment of all in-contact animals were also recommended to prevent reinfestation and interrupt transmission of the mites.

Clinical improvement became evident within one week of therapy, as indicated by a marked reduction in pruritus and rubbing behaviour. By two weeks after treatment, the crusts had largely disappeared, erythema had subsided, and healing of the skin lesions with gradual regrowth of hair was observed. Repeat microscopic examination of deep skin scrapings collected after completion of therapy failed to demonstrate any developmental stages of *Sarcoptes scabiei* var. *suis*, confirming successful therapeutic management of the infestation.

Porcine sarcoptic mange is caused by *Sarcoptes scabiei* var. *suis*, and continues to be one of the most economically important ectoparasitic diseases affecting swine production worldwide because of its adverse effects on animal welfare, growth performance, and feed conversion efficiency (Taylor *et al.,* 2016; Bowman, 2021). The present case exhibited characteristic clinical manifestations, including severe pruritus, generalized alopecia, erythema, thick greyish-white crusts, hyperkeratosis, wrinkling of the skin, and persistent rubbing against hard surfaces. Similar clinical findings have been described in naturally occurring infestations by Arends and Stanislaw (1985), Curtis (2003), and Zimmermann *et al.* (2019), who reported that chronic infestation results from hypersensitivity reactions induced by mite burrowing and feeding activity within the epidermis.

In the present case, all developmental stages of the mite, including eggs, larvae, nymphs, and adult males and females, were demonstrated. Morphological identification was based on the rounded tortoise-shaped body, short legs, dorsal spines, bell-shaped suckers, and characteristic arrangement of ambulacra and terminal bristles, which are consistent with the standard descriptions of *Sarcoptes scabiei* var. *suis* (Bowman, 2021). Recovery of all developmental stages from skin scrapings provided unequivocal confirmation of the diagnosis. Although skin scraping remains the gold standard for diagnosis, its sensitivity may be reduced in chronic infestations because relatively few mites are present in the lesions; therefore, repeated sampling from active lesions is often recommended when clinical suspicion is high (Zimmermann *et al.,* 2019).

Ivermectin is one of the most widely used macrocyclic lactones for the treatment of porcine sarcoptic mange because of its excellent efficacy against burrowing mites. It binds selectively to glutamate-gated chloride channels in the parasite's nerve and muscle cells, resulting in paralysis and death of the mites while exhibiting a wide margin of safety in mammals (Campbell, 1989; Bowman, 2021). Administration of ivermectin at 300 µg/kg body weight, repeated after 7 days, resulted in complete clinical recovery in the present case. The second dose is essential because ivermectin has limited ovicidal activity and does not eliminate eggs already deposited within the epidermis; consequently, newly hatched larvae must be targeted before they reach reproductive maturity (Curtis, 2003). Similar therapeutic success using repeated ivermectin administration has been reported by Aulakh *et al.* (2003) and Eraslan *et al.* (2010).

Supportive management and environmental sanitation contributed significantly to successful treatment. Sarcoptic mites can survive for several days in the environment under favourable conditions, allowing indirect transmission between susceptible animals (Arends and Stanislaw, 1985). Therefore, cleaning and disinfection of pens, removal of contaminated bedding, treatment of in-contact pigs, and implementation of biosecurity measures are essential components of integrated control programmes.

The marked reduction in pruritus within one week and complete healing of skin lesions, accompanied by negative post-treatment skin scrapings observed after two weeks

in the present case, demonstrate the high therapeutic efficacy of ivermectin when combined with appropriate management practices. Early diagnosis through microscopic examination of skin scrapings and prompt institution of acaricidal therapy remain essential for minimizing production losses and preventing transmission within pig herds.

Overall, this case highlights the diagnostic importance of demonstrating the complete developmental stages of *Sarcoptes scabiei* var. *suis* in skin scrapings and reinforces that ivermectin, together with proper hygiene, environmental sanitation, and treatment of in-contact animals, remains an effective strategy for the therapeutic management and control of porcine sarcoptic mange.

CONCLUSION

Porcine sarcoptic mange can be accurately diagnosed through careful clinical examination supported by microscopic identification of all developmental stages of *Sarcoptes scabiei* var *suis* in deep skin scrapings. Administration of ivermectin together with supportive therapy, topical management of skin lesions and improved environmental hygiene resulted in rapid clinical recovery, complete parasitological cure, as confirmed by negative post treatment skin scrapings. The case further emphasizes that successful management of sarcoptic mange depends not only on effective acaricidal therapy but also on maintenance of strict hygiene and implementation of appropriate biosecurity measures to prevent reinfestation.

GENERATIVE AI DECLARATION

The author(s) confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript, and no images were manipulated using AI. The authors developed and verified all scientific content, data analysis, interpretation of results, and conclusions. The authors take full responsibility for the accuracy, integrity, and originality of the work presented, and no AI tool was listed as an author.

ACKNOWLEDGEMENTS

The authors are grateful to the Head, Department of Veterinary Clinical Complex and Associate Dean,College of Veterinary Science, Korutla, for providing all facilities to complete this work.

Animal Ethics Statement

The animal described in this report was presented to the Veterinary Clinical Complex for routine diagnosis and treatment. All procedures were performed as part of standard veterinary clinical practice with the informed consent of the owner. No experimental procedures were conducted on the animal.

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