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## Mixed ectoparasitic dermatitis associated with *Psoroptes* spp. in a goat and its successful management

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### Abstract

A 3-month-old female non-descript goat was presented with a history of progressive alopecia, severe pruritus, inappetence and marked emaciation. Clinical examination revealed generalized hair loss, hyperkeratosis and thick crusty lesions over the ears, dorsum and thigh regions. Deep skin scrapings examined microscopically revealed mites consistent with *Psoroptes* spp., characterized by long legs projecting beyond the body margin and segmented pedicels with terminal caruncles. Concurrent ectoparasitic infestation with *Linognathus vituli*, *Haemaphysalis* spp. and *Ctenocephalides canis* was also identified based on characteristic morphological features. Hematological evaluation indicated anemia, leukocytosis with eosinophilia, hypoproteinemia and hypoalbuminemia, while serum biochemistry revealed elevated aspartate aminotransferase levels. The animal was treated with ivermectin-based therapy along with antihistamines, vitamin supplementation and supportive care. Marked clinical improvement was observed and complete resolution of lesions with hair regrowth was evident after one month. The case highlights the clinical significance of psoroptic mange complicated by mixed ectoparasitic infestation in goats and emphasizes the importance of early diagnosis, comprehensive parasitological examination and integrated therapeutic management for successful recovery.

**Keywords:** Psoroptic mange, *Psoroptes* spp., caprine, *Linognathus*, *Haemaphysalis*, *Ctenocephalides*

### Introduction

Ectoparasitic infestations are one of the most common dermatological problems affecting small ruminants, particularly goats, and they significantly impair animal health, productivity and welfare. External parasites such as mites, lice, ticks and fleas cause irritation, pruritus, dermatitis, anemia and poor growth resulting in economic losses to farmers. These parasites feed on blood, lymph or skin debris and may also predispose animals to secondary bacterial infections and other systemic complications. In many regions, ectoparasitism is considered an important constraint in small ruminant production systems due to its high prevalence and the difficulty in effective control under field conditions (Ajith *et al.*, 2017) <sup>[1]</sup>. Among the ectoparasites affecting goats, mites, lice, ticks and fleas are commonly encountered either as single or mixed infestations. Mange mites such as *Psoroptes* spp. cause psoroptic mange characterized by intense pruritus, erythema, crust formation, alopecia and thickening of the skin due to chronic irritation (Soulsby, 1982) <sup>[8]</sup>. These mites inhabit the skin surface and feed on tissue fluids producing inflammatory dermatological lesions. Lice infestation caused by *Linognathus* spp. is another common problem in goats, where sucking lice feed on blood and may lead to severe itching, rough hair coat, alopecia and anemia on heavy infestations (Anumol *et al.*, 2011) <sup>[2]</sup>. Fleas such as *Ctenocephalides* spp. and ticks like *Haemaphysalis* spp. also contribute to irritation, hypersensitivity reactions and blood loss, further aggravating anemia and debility, particularly in young animals (Naseema *et al.*, 2022) <sup>[7]</sup>. The prevalence of ectoparasites in goats varies widely depending on climatic conditions, management practices, host immunity and hygiene (Ajith *et al.*, 2017) <sup>[1]</sup>. Studies have reported high occurrence of fleas, ticks, lice and mites in goats, with many animals harboring multiple species simultaneously (Hassan *et al.*, 2011) <sup>[4]</sup>. Mixed infestations are particularly important clinically because the combined parasitic burden intensifies dermatological

lesions, pruritus, and systemic effects such as anemia and hypoproteinemia. The present report describes a case of severe generalized ectoparasitic infestation involving *Psoroptes* spp., *Linognathus vituli*, *Haemaphysalis* spp. and *Ctenocephalides canis* in a three-month-old goat kid and its successful therapeutic management.

### Case History and Diagnosis

A 3-month-old female non-descript black goat was presented to the small ruminant medicine referral clinic of Veterinary College and Research Institute, Orathanadu, TANUVAS with a history of progressive alopecia, severe pruritus, inappetence and marked emaciation of several weeks duration. Clinical examination revealed generalized hair loss, intense pruritus, hyperkeratosis and thick crusty lesions predominantly over the ears, dorsum and thigh regions, with poor body condition (Fig. 1). Skin scrapings collected from representative lesions and examined microscopically revealed numerous mites consistent with *Psoroptes* spp. characterized by long legs projecting beyond the body margin and the presence of bell-shaped suckers (caruncles) borne on long, three-segmented pedicels (Fig. 2). Concurrently, ectoparasites recovered from the skin and coat included a sucking louse identified as *Linognathus vituli* exhibiting a long, narrow, pointed head (long-nosed type), relatively slender forelegs, absence of sclerotized plates with a more transparent body and a comparatively narrow abdomen (Fig. 3); fleas identified as *Ctenocephalides canis* characterized by a bilaterally flattened body, non-host specificity, short rounded head with a sloping frons and genal comb in which the first spine is shorter than the second (Fig. 4) and ticks belonging to *Haemaphysalis* spp., identified by a brevipalpal condition, rectangular basis capitulum, lateral prolongation of the second segment of the pedipalp, pointed spine on the first coxa and presence of festoons (Fig. 5). Hematological examination revealed marked anemia with hemoglobin of 5.2 g/dl and packed cell volume of 19%, leukocytosis ( $20 \times 10^3$  cells/ $\mu$ l) with eosinophilia (11%), along with hypoproteinemia (total protein 4.95 g/dl) and hypoalbuminemia (2.10 g/dl). Serum biochemical analysis indicated elevated aspartate aminotransferase activity, while alanine aminotransferase remained within normal limits. Blood smear examination was negative for hemoparasites. Based on the clinical presentation and parasitological findings, the case was diagnosed as psoroptic mange complicated by concurrent mixed ectoparasitic infestation, resulting in severe parasitic dermatitis and secondary emaciation.

### Treatment and Discussion

The animal was treated with topical application of 1% ivermectin solution, along with parenteral therapy

comprising chlorpheniramine maleate @ 0.5 mg/kg I/M, vitamin AD<sub>3</sub>E @ 0.5 ml I/M, and vitamin B<sub>1</sub>, B<sub>6</sub>, B<sub>12</sub> @ 1 ml I/M. The injectable therapy was repeated at weekly intervals for two weeks. Supportive therapy included topical application of benzyl benzoate twice daily, along with oral liver supplementation @ 2 ml BID P/O and biotin syrup (Lavitone-H®) @ 2 ml BID P/O to improve hepatic function and general condition. Following treatment, the animal showed progressive clinical improvement with marked reduction in pruritus and healing of skin lesions. On follow-up after one month, no clinical signs were observed, and complete hair regrowth was evident indicating successful therapeutic management (Fig. 6).

Psoroptic mange caused by *Psoroptes* spp. is a non-burrowing ectoparasitic infestation of small ruminants characterized by intense pruritus, dermatitis, crust formation and alopecia. The clinical manifestations observed in the present case, including severe itching, hyperkeratosis, crusting and progressive emaciation are consistent with the known pathogenesis of psoroptic mange, wherein mites inhabit the skin surface and induce hypersensitivity reactions and inflammatory exudation (Munro and Munro, 1980). In goats, infestation commonly begins in the ear region and may extend to the head, neck and body, producing chronic dermatitis and irritation (Kumar *et al.*, 2016) [5]. The concurrent presence of multiple ectoparasites (*Linognathus*, *Haemaphysalis* and *Ctenocephalides*) in this case suggests a heavy parasitic burden and poor management conditions (Ajith *et al.*, 2017; Dittrich *et al.*, 2024) [1, 3]. Ectoparasitism is widely prevalent in goats and is influenced by environmental and management factors, often leading to significant economic losses due to reduced productivity and health deterioration. Mixed infestations are particularly important as they exacerbate clinical severity through combined effects of irritation, blood feeding and stress. The favourable therapeutic response observed in this case, with complete resolution of lesions and hair regrowth within one month, is consistent with previous findings where effective treatment leads to rapid clinical and parasitological recovery in psoroptic mange-affected goats (Kumar *et al.*, 2016) [5]. Regular monitoring and early detection of ectoparasitic infestations in goats are essential to prevent severe dermatological conditions and systemic complications. Routine skin examination and timely skin scrapings should be carried out in animals showing pruritus or hair loss. Strategic use of effective acaricides, along with appropriate supportive therapy, is recommended for complete elimination of mites and associated parasites. Attention should also be given to improving management practices, including maintaining hygiene, avoiding overcrowding, and isolating affected animals to reduce transmission. Periodic deworming and ectoparasite control programs should be implemented at the herd level.



**Fig 1:** Progressive alopecia with severe pruritus, hyperkeratosis and thick crusty lesions over the body surface accompanied by poor body condition.



**Fig 2:** Skin scrapings from ear, dorsum and thigh regions revealing *Psoroptes* spp. mites (x400)



**Fig. 3.** *Linognathus vituli* showing long narrow pointed head, slender forelegs, transparent body (plates absent)

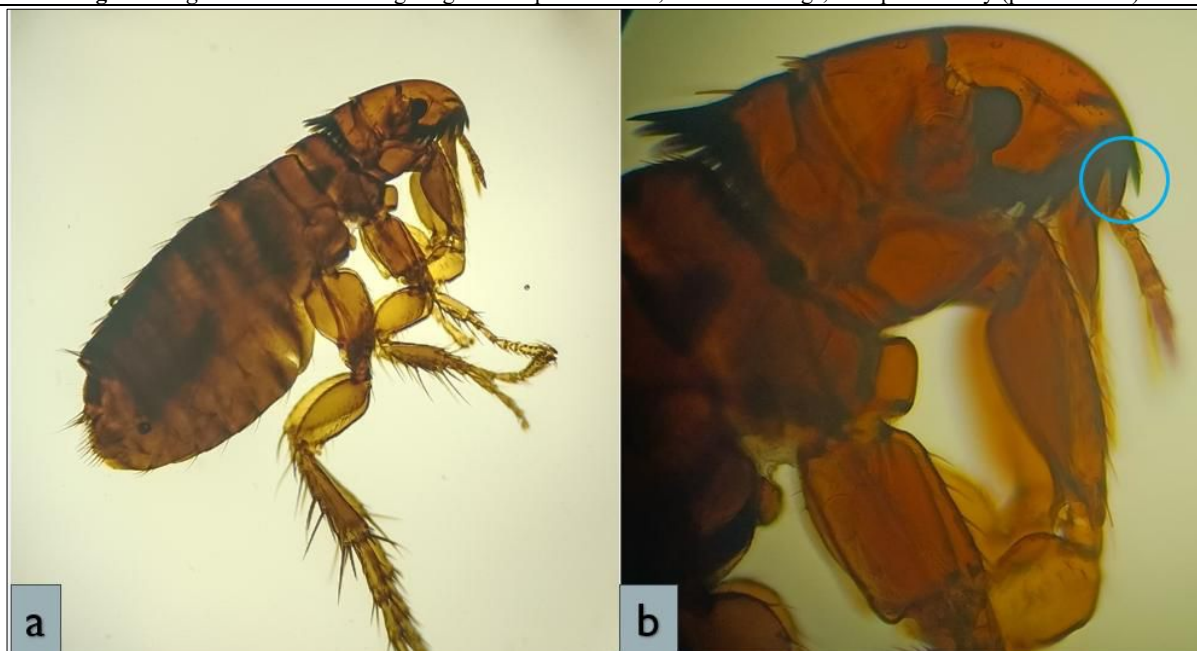


**Fig 4:** *Ctenocephalides canis* showing bilaterally flattened body, short rounded head with sloping frons and genal comb (a) with first spine shorter than the second (b).

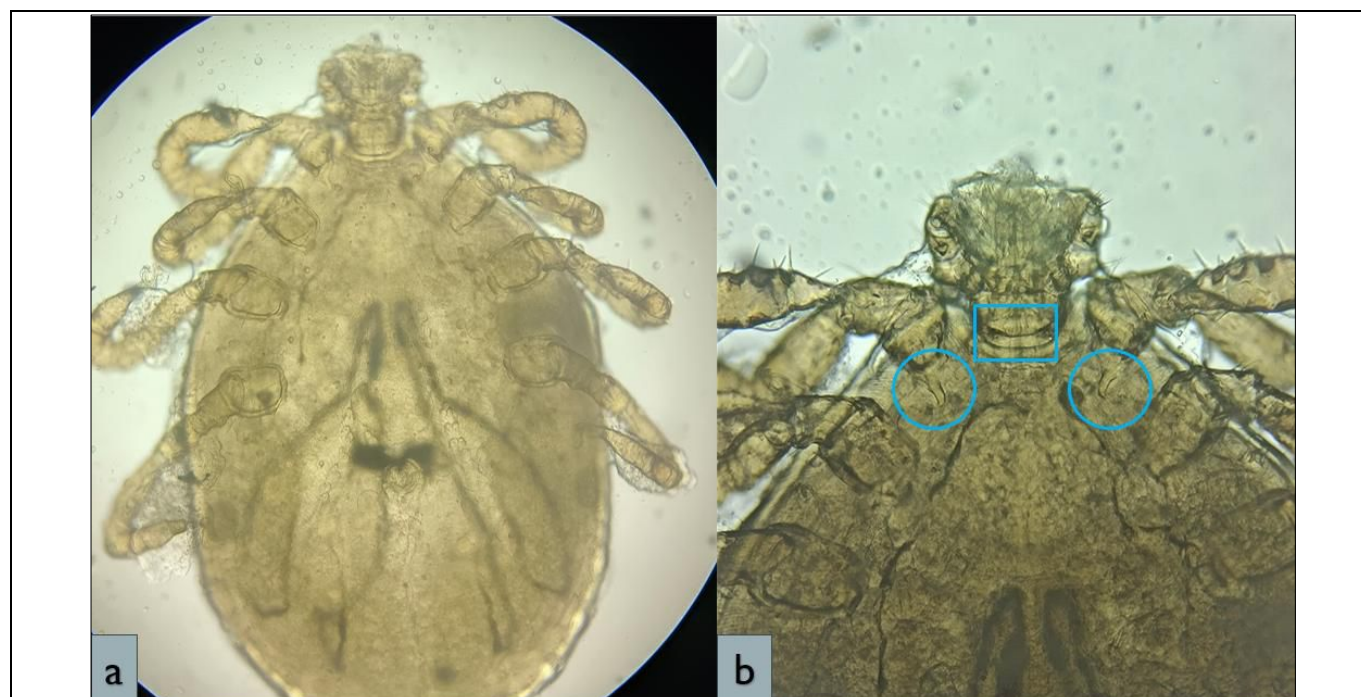


**Fig 5:** *Haemaphysalis* spp. showing brevisrostrate capitulum, lateral prolongation of second pedipalp segment (a) and presence of festoons, rectangular basis capitula and pointed spine on first coxa (b)



**Fig 6:** One-month follow-up showing complete resolution of lesions with full hair regrowth and absence of clinical signs.

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