



International Journal of Veterinary Sciences and Animal Husbandry



ISSN: 2456-2912

NAAS Rating (2025): 4.61

VET 2025; 10(12): 584-588

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www.veterinarypaper.com

Received: 15-11-2025

Accepted: 18-12-2025

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Sarolaner, a novel parasiticide in the treatment of generalized demodicosis in dogs-a case study

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DOI: <https://www.doi.org/10.22271/veterinary.2025.v10.i12i.2891>

Abstract

Demodicosis in dogs is a common inflammatory parasitic skin disease caused by overgrowth of *Demodex* spp. mites. Despite treatment with conventional therapeutic protocols, effective and complete recovery of generalised demodicosis remains challenging. The present case study reported the efficacy of sarolaner in the complete cure of six dogs with generalised demodicosis. Detailed clinical examination of the pets revealed areas of pale patchy alopecia all over the body, papules, pustules with exudation, erythema, scaling and crusting lesions prominently over face and ventral side of the neck. Vital parameters were found normal. Microscopic examination of deep skin scrapings and trichogram revealed the presence of *Demodex canis* mites. Therapeutic regimen included oral sarolaner, a novel isoxazoline with other topical and supportive medications. Significant resolution of clinical signs and complete parasitological cure was reported by four weeks of treatment without any adverse reactions.

Keywords: *Demodex canis*, isoxazoline, skin scrapings, trichogram

Introduction

Demodicosis in dogs is a serious, debilitating and often life-threatening parasitic skin disease caused by proliferation of *Demodex* spp. mites in the hair follicles and sebaceous glands of the skin (Pereira *et al.*, 2012) ^[11]. In dogs, three species of *Demodex* spp. mites have been identified of which *D. canis* being the most common demodectic mite (Mueller *et al.*, 2020) ^[10]. These mites are considered part of the microbiota of most mammals and under normal circumstances, they live as commensals, feeding on their host's sebum and are only opportunistically pathogenic. Clinical signs of juvenile demodicosis in dogs typically occur in the first 18 months of life (Miller *et al.*, 2013) ^[8] and reported to be associated with a temporary immune alteration or genetic disorders (Mueller *et al.*, 2020) ^[10]. While in older dogs, it has been attributed to immunosuppressive conditions or medications (Mueller *et al.*, 2020) ^[10]. Depending on the extent of skin lesions, demodicosis is categorized into localized or generalized forms (Mueller *et al.*, 2012) ^[9]. Localized form ranges from four lesions to 50% of the body surface and have spontaneous remission without treatment while generalised form is characterised by alopecia, papules, pustules, exudation, erythema, crusting, comedones involving entire body region or five or more separate affected areas with a diameter greater than approximately 2.5cm or pododemodicosis involving two or more feet (Miller *et al.*, 2013; Mueller *et al.*, 2012) ^[8, 9]. Deep skin scrapings are reported to be the diagnostic tool of choice in demodicosis suspected dogs. Trichograms have been considered as an alternative choice to deep skin scrapings particularly in the areas that are difficult to scrape, such as periocular and interdigital lesions Mueller *et al.*, 2012; Beco *et al.*, 2007) ^[9, 1]. From the past, several miticidal options are available which includes amitraz rinses, ivermectin, moxidectin, doramectin, milbemycin oximes etc., They requires repeated administration, appears to be cumbersome, have narrow safety margin and often associated with adverse reactions (Johnstone, 2002; Singh *et al.*, 2011) ^[6, 14]. In contrast to them, isoxazolines (fluralaner, sarolaner, afoxolaner and lotilaner) a new group of parasitocides have been proved to be potent, safe and easy to administer (Mueller *et al.*, 2020) ^[10].

Sarolaner is currently authorized as chewable tablet with indications for the treatment of fleas, ticks, demodicosis, sarcoptic mange and ear mites in dogs (Becskei *et al.*, 2016; Mueller *et al.*, 2020) ^[15, 10]. It acts by blocking arthropod GABA and glutamate-gated chloride channels, producing fast mite elimination and can be used safely for puppies from eight weeks of age (Mctier *et al.*, 2016) ^[7]. This case study documents the therapeutic outcome of sarolaner in generalised demodicosis affected dogs.

Materials and Methods

In the present study, dogs presented to the small animal medicine ward, Department of Veterinary Clinical Complex, College of Veterinary Science, Proddatur with skin lesions suggestive of generalised demodicosis were selected. Detailed clinical examination was carried out. Deep skin scrapings were collected in the direction of hair growth and by squeezing the skin especially from the follicular papules and pustules (Becskei *et al.*, 2018) ^[3]. The skin was scraped until capillary bleeding oozes so that sufficient depth of the scraping was obtained. Trichogram was performed by plucking hairs with forceps in the direction of hair growth and placed on a slide in a drop of mineral oil or paraffin oil and covered with a cover slip. For a positive trichogram, plucking a large number of hairs (50-100) is recommended (Mueller *et al.*, 2020) ^[10]. Treatment regimen included a single dose of Sarolaner (Simparica) @ 2 mg/kg orally monthly once, tab cephalixin @ 15 mg/kg bwt orally BID for two weeks, benzoyl peroxide shampoo for bathing and omega-3 and omega-6 fatty acids supplements @5ml orally BID. Response to the treatment was recorded based on resolution of skin lesions and skin scraping for mite reduction on Day 0, Day 30 and Day 60.

Results and Discussion

In the present study, demodicosis was confirmed in six dogs by identification of live *Demodex canis* mites, a minimum of four live mites (Mueller *et al.*, 2012; Six *et al.*, 2016) ^[9, 15] on deep skin scrapings (Figure 1a, 1b) and trichogram (Figure 2). Since *Demodex spp.* mites are part of the normal microfauna, identification of one mite on several deep skin scrapings could be a normal finding and more than one mite with compatible clinical signs is strongly suggestive of clinical demodicosis (Mueller *et al.*, 2020) ^[10]. Age of the dogs varied from six months to two years indicating an early age of onset (Carvalho *et al.*, 2019) ^[5] and breeds presented were Non-descript, German shepherd and Bull Mastiff. Prominent

lesions noticed were patchy alopecia all over the body, papules, pustules with exudation, epidermal collarette, excoriation, seborrhoea, hypotrichosis, erythema, ulcers, scaling and crusting lesions prominently over face and ventral side of the neck (Figure 3a, Figure 4a, Figure 5a, Figure 6a, Figure 7a and Figure 8a) similar with the findings of Six *et al.*, 2016 ^[15]; Carvalho *et al.*, 2019 ^[5]; Becskei *et al.*, 2025 ^[4]. All the clinical parameters were within the normal range as described earlier by Prins *et al.*, 2022 ^[13]. All the six dogs in the present study showed marked reduction in skin lesions and skin scrapings were negative for mites by Day 30 and also negative on Day 60 which were consistent with the findings of Six *et al.*, 2016; Carvalho *et al.*, 2019 ^[15, 5]; Prins *et al.*, 2022 ^[13]. Treatment for generalized demodicosis should be monitored clinically and microscopically every month until the second negative skin scraping. Miticidal therapy should be continued four weeks beyond the second set of negative monthly scrapings to decrease the risk of a disease recurrence (Mueller *et al.*, 2020) ^[10]. No adverse reactions were reported by the pet parents which was in accordance to the findings of Mctier *et al.*, 2016 ^[7]; Six *et al.*, 2016 ^[15]; Carvalho *et al.*, 2019 ^[5]; Becskei *et al.*, 2018 ^[3]; Becskei *et al.*, 2025 ^[15]. This rapid and effective mite clearance with complete resolution of skin lesions (Figure 3b, Figure 4b, Figure 5b, Figure 6b, Figure 7b and Figure 8b) align with previously published research demonstrating high sarolaner efficacy. Sarolaner has high palatability and is fully and voluntarily consumed within one minute in 90.5% of cases (Becskei *et al.*, 2016) ^[15]. The development of resistance to the isoxazoline derivatives is less likely to occur due to its selective inhibition of insect and acarid GABACls and GluClIs (Mueller *et al.*, 2020) ^[10]. Besides their ease of administration, these have a further advantage of reaching all body areas, which has particular importance in long-haired animals (Miller *et al.*, 2013) ^[8]. In juvenile dogs, treatment of the demodicosis and possibly the secondary bacterial infection, if present, is typically sufficient without the need for further diagnostic investigation (Mueller *et al.*, 2020) ^[10]. In contrast to this, adult-onset demodicosis was reported to be associated with diseases or drugs leading to a compromised immune system such as leishmaniosis, hyperadrenocorticism, hypothyroidism, neoplasia, babesiosis, ehrlichiosis and glucocorticoid treatment or chemotherapy for which detailed investigation is needed to rule out the possible predisposing factors (Pinsenschaum *et al.*, 2019) ^[12]. In the present study, cephalixin was used to treat concurrent pyoderma as reported earlier by Prins *et al.*, 2022 and Carvalho *et al.*, 2019 ^[13, 5].



Fig 1a: Deep skin scraping positive for *Demodex canis* mites under 10X



Fig 1b: Deep skin scraping positive for *Demodex canis* mites under 10X



Fig 2: Trichogram positive for *Demodex canis* mites under 10X



Fig 3a: Skin lesions before treatment



Fig 3b: Complete resolution of lesions



Fig 4a: Skin lesions before treatment



Fig 4b: Complete resolution of lesions



Fig 5a: Skin lesions before treatment

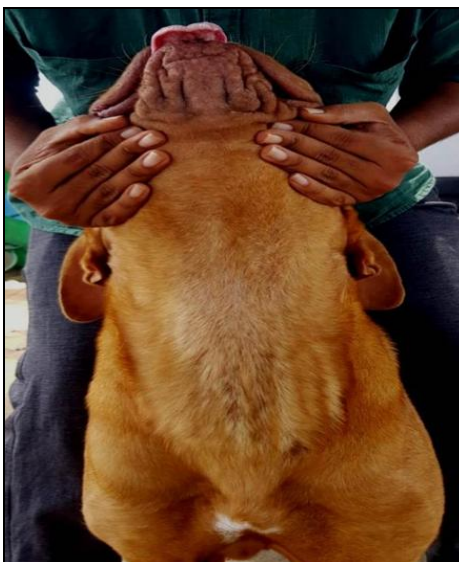


Fig 5b: Complete resolution of lesions



Fig 6a: Skin lesions before treatment



Fig 6b: Complete resolution of lesions



Fig 7a: Skin lesions before treatment



Fig 7b: Complete resolution of lesions



Fig 8a: Skin lesions before treatment



Fig 8b: Complete resolution of lesions

Conclusion

Despite the availability of multiple treatment options, generalized demodectic mange in dogs continues to be a severe, often a fatal dermatological condition and may be challenging to treat. From this study, sarolaner is found to be a rapid, effective, safer treatment and its palatability with convenient monthly dosing enhance pet parents compliance.

Acknowledgement

We thank the authorities of Sri Venkateswara Veterinary University, Tirupati, Andhra Pradesh and the College of Veterinary Science, Proddatur for the facilities provided in conducting this study.

Conflict of Interest: Not available

Financial Support: Not available

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How to Cite This Article

Matli B, Surendra B, Saikrishna KS. Sarolaner, a novel parasiticide in the treatment of generalized demodicosis in dogs-a case study. *International Journal of Veterinary Sciences and Animal Husbandry.* 2025;10(12):584-588.

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