CASE REPORT

Use of Fipronil Topical Spot-On for Treating *Notoedres* Mange in Cats

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Notoedric mange in cats is a highly contagious dermatological disease caused by the obligate sarcoptic mite *Notoedres cati* in felids, which can also infect more than 18 mammalian host species (Foley *et al*., 2016). It is transmitted primarily through direct contact and, more rarely, indirectly from a contaminated environment (Deplazes *et al*., 2016). Humans who come into close contact with an infected cat may also develop itching and papular lesions (Sivajothi *et al*., 2015; Sinha *et al*., 2023).

Therapeutic regimens usually include ivermectin administered in the field at a dose rate of 0.2 mg/kg body weight subcutaneously at weekly intervals, or the relatively costly and sometimes less available selamectin applied as a spot-on at a dose rate of 4 mg/kg body weight at weekly or fortnightly intervals for one month (Senthilkumar *et al*., 2008). Hence, this study was intended to assess the effectiveness of easily available, safe, and cost-effective Fipronil spot-on for underweight kittens suffering from feline scabies, for which injectable treatments were not feasible.

Case History and Observations

Six underweight kittens (2-3 months old) of a litter were presented with the history of intense pruritus and alopecia affecting the head, tail and limbs. Clinical examination of the cats revealed wrinkling and thickening of the skin over the head, ears, and tail, along with the presence of crusty lesions. Skin scrapings were collected from active lesions using a blunt number 22 scalpel blade onto the transparent slides. The samples were mixed with liquid paraffin and examined directly under 4× and 10× magnification, where rapidly moving mites were observed. The mite morphology, including both ventral and dorsal views, was as shown in Figure 1, 2. The characteristic "thumbprint" appearance of the *Notoedres* mites is clearly visible in Figure 3. The eggs of *Notoedres* were elongated and oval-shaped, observed in clusters under 40× (Fig. 4). The owner's complaint of developing pruritic papular lesions on his body from contact with affected kittens, suggestive of zoonotic transmission, was also recorded (Fig. 5).

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Treatment and Discussion

The cats were treated with 0.5 mL of Tickfree spot-on external liquid (Fipronil 9.8%, S-Methoprene 11.8%, SKY EC) fortnightly and monitored for response to treatment. The spot-on was applied topically by parting the hair along the midline of the neck, between the base of the skull and the shoulder blades. Supplementation with Gold Brio syrup (IRIDES Life Wellness Solution Private Limited), containing amino acids and multivitamins, was prescribed at 1 mL orally twice daily (BID) for a duration of three months. Owners were also advised on hygienic measures, including regular cleaning and replacement of bedding materials (Sadhu *et al*., 2024). The cats were fitted with Elizabethan collars to prevent scratching and self-mutilation.

After two weeks, most kittens showed marked improvement in lesions and hair regrowth observed. Notably, there was also improvement in weight gain and overall growth among the treated kittens. However, one kitten continued to exhibit itching and alopecia in the tail region, possibly due to an underlying immunosuppressive condition. The cats were reviewed biweekly to monitor their response to treatment till complete recovery, as illustrated in Figure 6, 7, and 8, which showed progressive improvement in hair coat and its shining.

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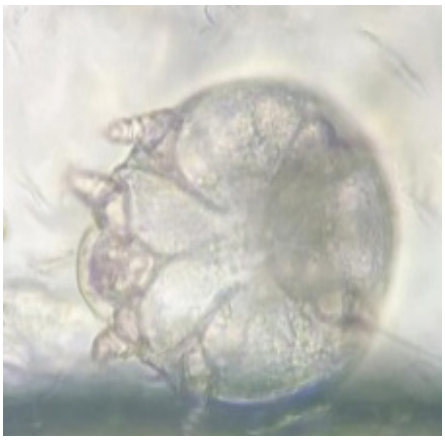


Fig. 1: Ventral view of *Notoedres cati* mite under 40x magnification

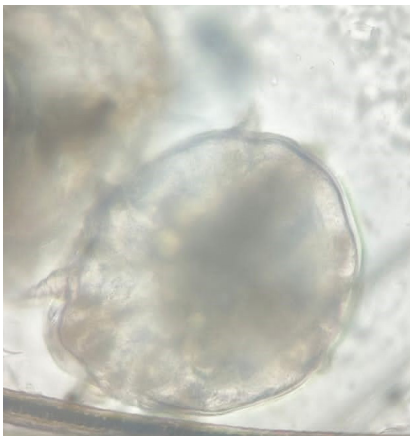


Fig. 2: Dorsal view of *Notoedres cati* under 40x magnification

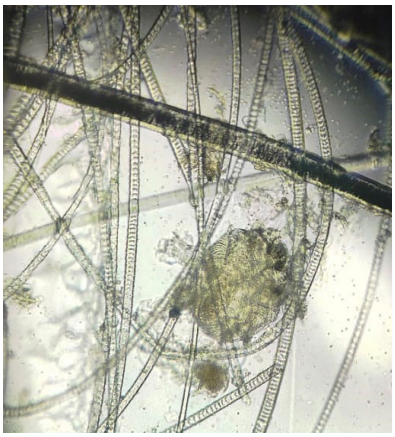


Fig. 3: Fingerprint appearance of mite under 10x magnification.

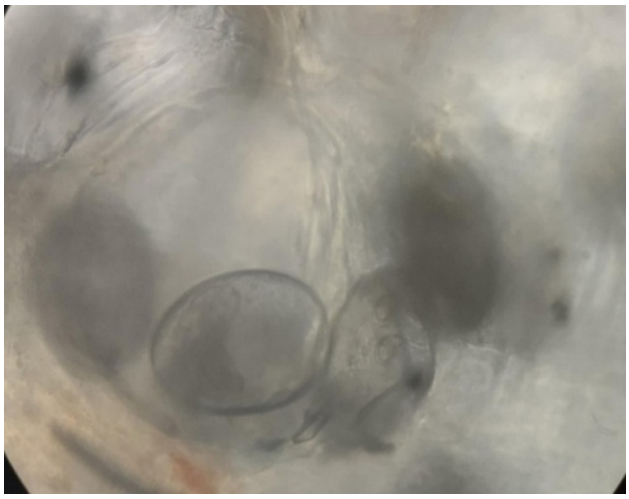


Fig. 4: Eggs of *Notoedres* mite under 40x



Fig. 5: Erythematic papules on hand of infected cat owner

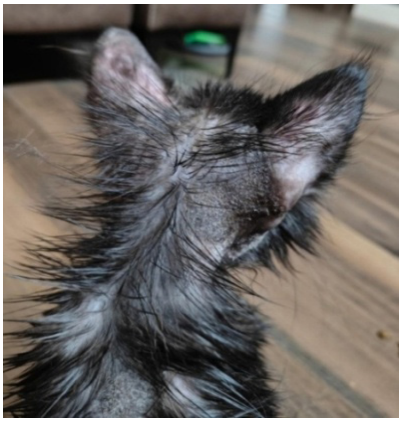


Fig. 6: Day 1 post-treatment



Fig. 7: Day 14 post-treatment



Fig. 8: Day 30 post-treatment

Fipronil belongs to the phenylpyrazole class of drugs and binds to skin fat to eliminate ectoparasites upon contact. It acts by disrupting the flow of chloride ions through GABA-regulated chloride channels, thereby interfering with central nervous system activity. Biochemical studies have shown that fipronil binds with higher affinity to insect GABA receptors than to vertebrate GABA receptors (Hermawan *et al*., 2024). S-methoprene is used in cats primarily as an insect growth regulator in flea-control products to interrupt the flea life cycle.

The clinical signs observed in this study such as severe pruritus, alopecia, and crusty, scabby lesions, particularly around the margins of the ears and subsequently spreading to the neck, face, and hind limbs, were consistent with previous reports of Sivajyothi *et al*. (2015), Dangi *et al*. (2023) and Ansari *et al*. (2024). The severe pruritus might be due to mite secretions and excretions, allergic reactions to extracellular products, and the release of proinflammatory cytokines such as IL-1.

Diagnosis was made through skin-scraping examination and by observing morphological features of *Notoedres mite*, including concentric rings on the dorsal idiosoma and a subterminal anus. The observed mite morphology was consistent with descriptions made by Deplazes *et al*. (2016). Skin scrapings were negative for mites after four weeks of therapy, supporting the findings by Sinha *et al*. (2023). Although fipronil has been reported to be effective with monthly application (Purnamaningsing and Ida, 2002), our study emphasizes on fortnightly application in accordance with Hermawan *et al*. (2024). Supplementation with amino acids and multivitamins to promote faster healing and recovery of dermatitis lesions was also supported by Sadhu *et al*. (2024), as keratin synthesis in the skin requires sulfur-containing amino acids.

The present findings highlight the effective use of fortnightly Fipronil topical spot-on applications for young kittens over a period of three months, in cases where parenteral ivermectin cannot be administered for the treatment of feline scabies. Amino acid supplementation is also important for cats, as they are strict carnivores, and it supports faster healing of skin lesions.

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