

Successful treatment of *Caparinia tripilis* infestation with ivermectin in an African pygmy hedgehog

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ABSTRACT: Acariasis is a prevalent disease in *Atelerix albiventris* or African pygmy hedgehogs, with *Caparinia tripilis* being the main aetiologic agent. This case report describes a single instance of *C. tripilis* mange in a 16-month-old African pygmy hedgehog detected through clinical and microscopic skin scraping investigations. The owner brought the hedgehog to the IPB University Veterinary Teaching Hospital, complaining about inappetence, intense pruritus, diarrhoea, and crusts in the patient. Faecal native and flotation showed no helminthic or protozoan parasites. The treatment comprised subcutaneous ivermectin application at a dose of 0.4 mg/kg body weight. The control was made 14 and 28 days after the first hospital visit, with ivermectin applications at the same dose (three doses in total and two weeks apart from each dose). Microscopic examination of the skin scrapings was performed on days 14 and 28, and *C. tripilis* was not observed in these examinations. Complete clinical improvement was observed during the two control examinations. This is the first report to describe the use of a three-dose (two weeks apart) of ivermectin to treat capariniasis in an African pygmy hedgehog in Indonesia.

Keywords:

acariasis, *Atelerix albiventris*, capariniasis, Indonesia, skin scrapings

■ INTRODUCTION

Hedgehogs are small nocturnal mammals with spines that cover their body. African pygmy hedgehogs (*Atelerix albiventris*) are popular pets. The African pygmy hedgehog belongs to the order Eulipotyphla and includes moles and shrews. However, it was formerly classified under the order Insectivora (d'Ovidio *et al.* 2021). Acariasis is a dermatological problem in pygmy hedgehogs. *Caparinia*, *No-toedres*, *Chorioptes*, *Otodectes*, and *Sarcoptes* are among the most common ectoparasites for hedgehog species (Antello *et al.* 2020). However, few studies have reported successful treatment of ectoparasitic infestations in hedgehogs (Romero *et al.* 2017). This study reports the presence of *Caparinia* acariasis in an African pygmy hedgehog and its successful treatment with ivermectin at the Veterinary Teaching Hospital, IPB University, Bogor, Indonesia.

■ CASE

Anamnesis: A 16-month-old female African pygmy hedgehog was submitted for consultation at the IPB University Veterinary Teaching Hospital with inappetence, scaling, crusts, and pruritus over the dorsal thorax and abdominal area. The hedgehog was being taken care of as a pet and kept perpetually in a cage that was cleaned daily. The hedgehog was fed open-access dog kibbles. The hedgehog had recovered from a subcutaneous abscess and overgrown nails the month before. **Physical Examinations:** Body

weight of 150 g, axial temperature of 36.5 °C, heartbeat of 180 bpm, and respiratory rate of 40x/min. The hedgehog presented with spinal or quill loss, pruritus, and crusts (Figure 1A). The mucosa of the oral cavity was pink, and no abnormal feature was observed. **Laboratory Examinations:** Superficial skin scrapings with 10% KOH were performed, and one *Caparinia tripilis* was observed under a microscope at 10×10 magnification (Figure 1B). Mange species were identified using morphometric methods by Eo *et al.* 2015. Faecal native and flotation showed no helminthic or protozoan parasites. **Differential Diagnoses:** Dermatophytosis and other mange infestations.

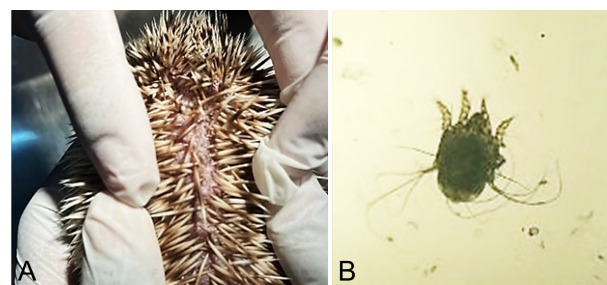


Figure 1. (A) Clinical symptoms of the African pygmy hedgehog (quill loss, pruritus, and crusts) during 1st physical examination; (B) Microscopy of *Caparinia tripilis* from skin scrapings

Received: 19-07-2023 | Revised: 04-08-2023 | Accepted: 10-08-2023

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Treatments: The treatment given was an initial subcutaneous injection of 0.4 mg/kg ivermectin (Ivomec, PT. Romindo Primavetcom, Indonesia). After the first injection, subcutaneous ivermectin injection (0.4 mg/kg) was repeated after 14 and 28 days (2nd and 3rd ivermectin injections). Ivermectin was diluted with normal saline (1:4). The treatment was successful, as during the 2nd and 3rd ivermectin injection, subsequent skin scrapings were also performed to monitor treatment response following three doses of ivermectin administration (days 0, 14, and 28), and no mange was observed in the skin scrapings.

■ RESULTS AND DISCUSSION

Four-toed African pygmy hedgehogs are currently common pets, with acariasis being the most common dermatological problem (Antelo *et al.* 2020). *Caparinia tripilis* is a mange species that is mainly detected in African hedgehogs (*Ateleix albiventris*) (Antelo *et al.* 2020; Bezerra-Santos *et al.* 2021; Eo *et al.* 2015; Romero *et al.* 2017). Hedgehogs afflicted by *C. tripilis* acariasis show dry and flaky skin, alopecia, erythema, alopecia, intense pruritus, crusting, and white or brown hyperkeratosis. The crusts comprise the residue produced by mange. Other commonly reported clinical symptoms include seborrhea, lichenification, spine loss, weight loss, dehydration, and anorexia, which may occur if the mange infestations are severe and debilitating. Scabies lesions caused by *C. tripilis* infestation occur in various anatomical areas (e.g. the ears, heads, dorsum, and abdominal area, and between the limbs), producing skin inflammation, irritation, and itching, which can lead to self-injury, secondary infections, and even death (Antelo *et al.* 2020; Bezerra-Santos *et al.* 2021; d'Ovidio *et al.* 2021; Eo *et al.* 2015; Romero *et al.* 2017). In the current case, the symptoms were inappetence, pruritus, crusts, and spine loss on the dorsal surface. The clinical appearance of the skin and the discovery of non-burrowing mites based on microscopic characteristics are used to diagnose (Eo *et al.* 2015).

The current case report describes a protonymph of *C. tripilis*, which has eight legs and is sexually differentiated. The female protonymph had a pair of posterodorsal tubules for mating (Figure 1B). Nevertheless, the life cycle of *C. tripilis* consists of eggs, larvae, protonymphs, deutonymphs, and adults and lasts approximately three weeks. Mange lives its whole life on its host, with all phases of development visible on the surface of the hedgehog's skin and "running up and down" on the hedgehog's quills. Disease contraction between hosts may occur via direct contact (d'Ovidio *et al.* 2021).

This study reported successful therapy of *C. tripilis* infestation in a pygmy hedgehog with three doses of ivermectin two weeks apart from each dose therapy. Successful treatment of capariniasis with three doses of ivermectin has been reported by Eo *et al.* (2015). They used subcutaneous injection

of ivermectin with 0.4 mg/kg for the first dose. The second and third doses of their report were administered orally. In addition to ivermectin, other studies have reported the maximum efficacy of a single oral fluralaner (15 mg/kg) (Romero *et al.* 2017) and a single dose of oral sarolaner (2 mg/kg) (Antelo *et al.* 2020) for the treatment of *C. tripilis* in hedgehogs. In the current case, the source of the *C. tripilis* infestation was indeterminate. Still, it might have been from the original pet shop where it was first bought, as the patient was a single hedgehog with no cage mate. African pygmy hedgehogs are solitary animals, except during courting and when females rear babies. In contrast to their natural behaviour, hedgehogs kept in pet stores are confined to dense groups and small cages, which may encourage stress and poor cleanliness, resulting in unusual multiplication and transmission (d'Ovidio *et al.* 2021). Finally, to the best of our knowledge, this study is the first description of mange infestation by *C. tripilis* in an African pygmy hedgehog in Indonesia and a report describing successful ivermectin treatment of the disease. Hence, further studies are crucial to assess capariniasis in hedgehogs in the country.

■ CONCLUSION

In conclusion, three subcutaneous injections of ivermectin at a dose of 0.4 mg/kg of each injection (and 2 weeks apart from each dose) were effective in treating *Caparinia tripilis* in an African hedgehog (*Ateleix albiventris*), removing mange, itchiness, and skin lesions. Side effects were not detected in the patient.

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