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# First report of acariasis by *Caparinia tripilis* in African hedgehogs, (*Atelerix albiventris*), in Costa Rica

Primeiro relato de acariasis por *Caparinia tripilis* em ouriços Africanos, (*Atelerix albiventris*), na Costa Rica

Andrés Moreira<sup>1\*</sup>; Adriana Troyo<sup>1</sup>; Olger Calderón-Arguedas<sup>1</sup>

<sup>1</sup>Departamento de Parasitología, Centro de Investigación en Enfermedades Tropicales, Facultad de Microbiología, Universidad de Costa Rica, San José, Costa Rica

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## Abstract

The African hedgehog is one of the newly imported exotic pets which have been observed with increasing regularity in veterinary clinics in Costa Rica. Despite their popularity, information about their diseases is scarce. Within skin diseases of hedgehogs, mange caused by *Caparinia* spp. is a common diagnosis in other countries. Two adult African hedgehogs, one male and one female, were brought to a private clinic in Heredia, Costa Rica, with chronic pruritic dermatitis, scabs, nearly complete loss of spines, lethargy, dehydration, and weight loss. During physical exam, deposits of dry seborrhea were taken and processed for diagnosis. Microscopic examination revealed psoroptid mites identified as *Caparinia tripilis*. This is the first report of the presence of *Caparinia tripilis* in Costa Rica and, to the authors' knowledge, the rest of Central America.

**Keywords:** Erinaceidae, ectoparasites, mange, Psoroptidae, Central America, African hedgehog.

## Resumo

O ouriço africano é um dos animais de estimação exótico, recém-importado que tem sido observado com maior regularidade nas clínicas veterinárias da Costa Rica. Apesar da sua popularidade, informações sobre suas doenças são escassas. Dentre as doenças de pele de ouriços, a sarna causada por *Caparinia* spp. é um diagnóstico comum nos outros países. Dois adultos ouriços africanos, um macho e uma fêmea, foram levados para uma clínica particular, em Heredia, Costa Rica, com a dermatite pruriginosa crônica, crostas, perda quase completa de espinhos, letargia, desidratação e perda de peso. Ao exame físico, os depósitos de seborreia seca foram retirados e processados para o diagnóstico. O exame microscópico revelou ácaros (psoroptidae) identificados como *Caparinia tripilis*. Esse é o primeiro relato da presença de *Caparinia tripilis* na Costa Rica e, para conhecimento dos autores, o resto da América Central.

**Palavras-chave:** Erinaceidae, ectoparasitos, sarna, Psoroptidae, América Central, Ouriço africano.

## Introduction

The African hedgehog or white-bellied hedgehog (*Atelerix albiventris* Wagner, 1841) is one of the exotic species newly imported into Costa Rica as pets, and consult for these animals has been increasing in veterinary clinics around the country. The introduction of exotic species as pets has forced veterinarians to acquire knowledge about these new species, which makes the study of their diseases of utmost importance.

Hedgehogs harbor a large number of ectoparasites, being the most common ticks, fleas, as well as mites. Also their lack of effective grooming makes this species an ideal host for ectoparasites (FÖLDVÁRI et al., 2011). Concerning skin diseases of hedgehogs, acariasis is relatively common, although less prevalent than other ectoparasites (GERSON; BOEVER, 1983). Generally the species

reported are mites that belong to the genera *Sarcoptes*, *Notoedres*, *Otodectes*, *Chorioptes* and *Caparinia* (FREDES; ROMAN, 2004). Within the genus *Caparinia* Canestrini, 1894, the most prevalent species are *C. tripilis* Michael, 1889, and *C. erinacei* Fain, 1962, but other species like *C. setifera* Megnin 1880, *C. algirus* Fain, 1979 and *C. lophiomys* Fain, 1975 have also been described (FAIN, 1962, 1975; SWEATMAN, 1962; FAIN; PÓRTUS, 1979).

Due to the relatively recent entry of this exotic species in the region of Central America, it is essential to report and study their parasitic species, in order to evaluate if any of these exotic parasites poses a risk for human health or infecting local fauna (FURLEY et al., 1999; PRAZERES et al., 2011).

## Case Description

One male and one female African hedgehogs, *Atelerix albiventris*, where referred to a private clinic in the city of Heredia, Costa Rica, with a history of loss of spines, itching, lethargy and weight loss. The animals had lived together for their whole lives

\*Corresponding author: Andres Moreira Soto  
 Departamento de Parasitología, Centro de Investigación en Enfermedades Tropicales, Facultad de Microbiología, Universidad de Costa Rica, Ciudad Universitaria Rodrigo Facio, CEP 11501, San José, Costa Rica  
 e-mail: anders2323@gmail.com



**Figure 1.** a) Adult Male of *Caparinia tripilis* (Scale bar: 100 µm). Diagnostic structures used for identification: bristles L4, L5, in b) male and bristles L5, ai in c) Female.

(2 years approximately), and within the same enclosure. They ate commercial cat food *ad libitum* and yellow mealworms. The owners had observed loss of spines and scratching for several months, but had not sought treatment previously. Observations during the physical exam included extensive bilateral alopecia of the periorbital region, lateral surfaces of the head, the flanks, hind and fore limbs, abdominal area, and rump. The skin was dark grey, dry, and extremely lichenified, there were also flaky white scales in the entire dorsal surface. Sparse spines remained on the flanks. The hedgehogs were in poor nutritional condition, weighing approximately 250 g.

Upon examination with a magnifier, moving ectoparasites were observed on most of the animals' body, with copious amounts below the crust. A skin scraping of each individual was taken for microscopic examination. The samples were obtained from several body parts: the dorsum, behind the ear, near scapular region and head. Collected material was observed first in KOH 10%, to assess the presence of other pathogenic agents.

Numerous ectoparasites were observed, collected, and preserved in 70% ethanol. Some specimens were mounted in Hoyer's medium, with subsequent evaluation in light microscopy (KRANTZ; KRANTZ, 2009).

Species identification was performed with the aid of taxonomic keys and descriptions that include psoroptid genera, and species of *Caparinia* (FAIN, 1962; 1975; FAIN; PÓRTUS, 1979; OCONNOR, 2009).

Scrapings from both hedgehogs contained eggs, immature stages, and adults, of a psoroptid mite identified as *Caparinia tripilis* (Figure 1a). Identification was based on diagnostic characters such as body length, hairs (*l4* and *l5* in males, and *ai* and *l5* in females), and appearance of adanal suckers and posterior lobes of males (Figure 1b, c).

Hedgehogs were treated with ivermectin at 200-500 µg/kg topically. Although repeated administrations were advised and are usually required (MEREDITH; REDROBE, 2002), owners did not return for further treatment. Therefore, complete resolution of the mange could not be confirmed.

## Discussion

In the case presented, the mite was identified as *C. tripilis*, which is usually the most prevalent species and regularly observed in pet hedgehogs (IVEY; CARPENTER, 2003; PATERSON, 2006). Up to 40% of hedgehogs held in captivity can be infested with *C. tripilis* (BEXTON; ROBINSON, 2003). *Caparinia erinacei* may also be frequent, although it is generally seen in wildlife populations (IVEY; CARPENTER, 2003).

Owners usually report *C. tripilis* mites as deposits of a white powdery material around the eyes, ears, and cheeks, associated with pruritus (PATERSON, 2006). Due to lack of knowledge, owners in this case believed that the animals had a zoonotic and non treatable disease. Moreover, they had trouble finding a veterinary clinic with exotic practice, so disease progressed for several months, ergo its severity.

Acariasis is often found with co-infection by dermatophytes (*Trichophyton erinacei*, *Microsporum canis*, and *M. gypsum*) or

even pyoderma, complicating clinical symptoms and treatment (SWEATMAN, 1962; BROCKIE, 1974; PATERSON, 2006). However, other pathogens were not evidenced in the cases presented, neither in the physical examination nor on the skin scrapings, so co-infection was discarded.

Infestation with *Caparinia* spp. may or may not be accompanied by clinical signs. Some normal symptoms include scratching or rubbing against objects, but many individuals do not demonstrate obvious signs of pruritus, such as the cases presented (GERSON; BOEVER, 1983). Several factors including stress, lack of hygiene and immune dysfunction may contribute to the onset of the disease (PRAZERES et al., 2011). In the cases described, the pathology was severe and may have been exacerbated by any of these factors, and could have contributed to weight loss of the hedgehogs. Acariasis also causes nonspecific signs such as lethargy and decreased appetite (PRAZERES et al., 2011).

A study performed by Fredes and Roman (2004) reported 87% positivity for mites in skin scrapings of hedgehogs; of which, 100% were *C. tripilis*. This finding suggests that *C. tripilis* may be considered a normal skin inhabitant of hedgehogs without causing any clinical signs. However, Brockie (1974) and Fain (1975), have considered this mite a low pathogenic parasite instead of a commensal. Considering the amount of *C. tripilis* mites observed in addition to the severity of clinical signs, psoroptic mange was diagnosed in the cases presented.

Ivermectin is often used as treatment for psoroptic mange, administered both topically and or subcutaneously once per week (MEREDITH; REDROBE, 2002). In this case, treatment was initiated with the recommended dose, but continuation of the treatment and further assessment was not possible. Although repeated administrations are usually needed to eliminate *C. tripilis* effectively (MEREDITH; REDROBE, 2002), it is possible that owners did not return due to improvement of the animals' condition, or they may have sought treatment elsewhere. It is important to note that ear canals should always be checked as they may be totally impacted with mites and debris, which must be mechanically removed.

Mites are common in pet hedgehogs in the United States, Europe and New Zealand (MEREDITH; REDROBE, 2002). In contrast, information for Costa Rica and the rest of Central America is scarce. The reason for introduction of this exotic species in these countries is to keep them as domestic pets, and currently there is no information regarding their population, prevalence of this particular ectoparasite, or any other factor that may contribute to the persistence of exotic mites in tropical environments of the region. Since *C. tripilis* is considered an exotic mite that has been introduced along with its host (SWEATMAN, 1962), further studies are necessary to assess how these and other exotic ectoparasites may affect local fauna.

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