

Mites associated with the eared dove, *Zenaida auriculata* (Des Murs, 1847), in São Paulo State, Brazil*

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* *In*: Moraes, G.J. de & Proctor, H. (eds) Acarology XIII: Proceedings of the International Congress. Zoosymposia, 6, 1–304.

Abstract

The aim of this study was to report the mite species found in association with the eared dove, *Zenaida auriculata* (Des Murs, 1847), in São Paulo State, Brazil. A total of 34 bird specimens was examined, and mites were found on 31 of them. The following numbers of mite species were found: Astigmata: Falculiferidae - three species; Analgidae - two species; Dermoglyphidae, Epidermoptidae, Hypoderatidae and Pyroglyphidae - one species each. Prostigmata: Cheyletidae, Cheyletiellidae and Syringophilidae - one species each. Mesostigmata: Macronyssidae and Rhinonyssidae - one species each. We present the first report of *Z. auriculata* as host of *Diplaegidia columbae* Buchholz, 1869; *Diplaegidia columbigallinae* Cerný, 1975; *Byersalgae talpacoti* Cerný, 1975; *Pterophagus spilosikyus* Gaud & Barré, 1992; *Hypodectes propus* (Nitzsch in Giebel, 1861), *Ornithocheyletia columbigallinae* Fain & Bochkov, 2002; *Ornithonyssus bursa* (Berlese, 1888) and *Tinaminysus zenaidurae* (Crossley, 1952).

Key words: Eared-dove, ectoparasites, feather mites, quill mites.

Introduction

Data concerning rates of infestation of bird-associated mites are rare, especially from tropical regions. The eared dove, *Zenaida auriculata* (Des Murs, 1847) (Columbiformes: Columbidae), occurs from the Antilles to Tierra del Fuego, throughout most of Brazil, including Fernando de Noronha Island where it is abundant (Sick, 2001). They live in savanna regions, benefiting from deforestation and expansion of agriculture. Large flocks of this dove may become pests in grain crops. Its population has increased in the last few decades, reaching extensively urbanized areas as the city of São Paulo, probably displacing the ruddy-ground dove [*Columbina talpacoti* (Temminck, 1810)] (Santiago, 2007).

Mites associated with *Z. auriculata* are only known from an extensive study conducted by González *et al.* (2004) in Chile and from four short studies conducted in Brazil (Boas Filho & Prado, 2005; Boas Filho *et al.*, 2006; Goulart *et al.*, 2009a, b).

The objective of this study is to present new records of mites associated with *Z. auriculata* in São Paulo State, Brazil.

Materials and Methods

Thirty-four specimens of *Z. auriculata* were examined in this study; these were received between 2005 and 2010 from the following localities in São Paulo State: Campinas (22°49'11"S; 47°4'12"W, alt. 604 m), Valinhos (22°58'14"S; 47°59'45"W, alt. 660 m), Jaguariúna

(22°42'20"S; 46°59'09"W, alt. 584 m), Santa Bárbara d'Oeste (22°45'13"S; 47°24'49"W, alt. 565 m) and Ourinhos (22°58'44"S; 49°52'14"W, alt. 483 m). These correspond to specimens accidentally killed or that died naturally.

Identification was performed with the help of taxonomic keys and other information of the following publications: Cerný (1975), Clark (1964), Crossley (1952), Fain & Bochkov (2002) and Gaud & Barré (1992). Identification of birds was done based on Sick (2001) and Sigrist (2006).

Corpses of *Z. auriculata* were placed in a container with 70% alcohol solution and detergent, which was sealed and agitated. The liquid was then filtered through Whatmann number 5 filter paper to collect the mites under a stereomicroscope. Quills of the wing and tail feathers (rectrices and remiges) were opened with scissors for examination under a stereomicroscope.

Mites of the nasal cavity, larynx, trachea, bronchi and air sacs were collected using Yunker's technique (Yunker, 1961). This technique is based on injecting alcohol with a syringe in one nostril, collecting the alcohol coming out of the other nostril and to filter it through Whatmann number 5 filter paper. Additionally, a cut was done from the beak to the ears (Fain, 1957), to allow examination of the nasal cavity under a stereomicroscope.

Feather of the chest and dorsum were removed to expose the subjacent skin, which was cut off with scissors. The subjacent subcutaneous area was then examined under stereomicroscope for presence of mites.

The mites were collected and maintained in lactophenol solution for at least four days, for hydration and initial clarification. They were subsequently mounted in Hoyer's medium on microscope slides.

Images were taken using IM50 (Image Manager 50) program and a Leica camera adapted to a Zeiss-Axioplan 2 microscope.

Results

Representatives of the following taxa were found in this study:

Astigmata - Analgidae: *Diplaegidia columbae* Buchholz, 1869 - 9.6% of the birds (Fig. 1A, B); *Diplaegidia columbigallinae* Cerný, 1975 - 32.2% (Fig. 1C, D); Dermoglyphidae: *Dermoglyphus columbae* Sugimoto, 1941 - 6.4% (Fig. 1E, F); Falculiferidae: *Byersalges talpacoti* Cerný, 1975 - 32.2 % (Fig. 2A, B); *Falculifer isodontus* Gaud & Barré, 1992 - 100% (Fig. 2C, D); *Pterophagus spilosikyus* Gaud & Barré, 1992 - 25.8% (Fig. 2E, F); Hypoderatidae: *Hypodectes propus* (Nitzsch in Giebel, 1861) - 3.2% (Fig. 2G, H); an unidentified species of Epidermoptidae - 3.2% (Fig. 3A, B); and an unidentified species of Pyroglyphidae - 3.2% (Fig. 3C, D).

Prostigmata - Cheyletidae: *Ornithocheyletia columbigallinae* Fain & Bochkov, 2002 - 6.4% (Fig. 3E); Syringophilidae: *Meitingsunes zenadourae* (Clark, 1964) - 6.4% (Fig. 3F); an unidentified species of Cheyletidae - 3.2% (Fig. 3G).

Mesostigmata - Macronyssidae: *Ornithonyssus bursa* (Berlese, 1888) - 16.1% (Fig. 3H); Rhinonyssidae: *Tinaminysus zenaidurae* (Crossley, 1952) - 6.4 % (Fig. 4A, B).

Discussion

The only two described species of *Diplaegidia* were found in this study. *Diplaegidia columbae* was collected from two other *Zenaida* species from North America - *Z. macroura* (Linnaeus, 1758) and *Z. asiatica* (Linnaeus, 1758) - and from various other columbiforms, such as in *Columba livia* (Gmelin, 1789), *Stigmatopelia senegalensis* (Linnaeus, 1766), *Streptopelia chinensis* (Scopoli, 1786) and *S. roseogrisea* (Sundevall, 1857). González *et al.* (2004) found 73.2% of 235 *Z. auri-*

culata parasited by *D. columbae* in Chile. *Diplaegidia columbigallinae* was originally described from *Columbina talpacoti* in Surinam. This is the first record of *Z. auriculata* as host of *D. columbigallinae*.

Dermoglyphus columbae was found on *Streptopelia semitorquata erythophrys* (Ruppell, 1837) in Cameroon (Gaud & Mouchet, 1959), on *C. livia* and *Streptopelia senegalensis aegytiaca* in Egypt (Shoker *et al.*, 2001), on *S. roseogrisea* in Burkina Faso, *S. semitorquata* in Cameroon, *S. senegalensis* in South Africa and *S. vinacea* (Gmelin, 1789) in Zaire (Gaud, 1976).

Byersalgus talpacoti is one of the only two species of this genus (Cerný, 1975). This species has been found on many birds, such as *Claravis pretiosa* (Ferrari-Perez, 1886), *Columbina minuta* (Linnaeus, 1766), *C. picui* (Temminck, 1813), *C. passerina* (Linnaeus, 1758), *C. talpacoti*, *C.*

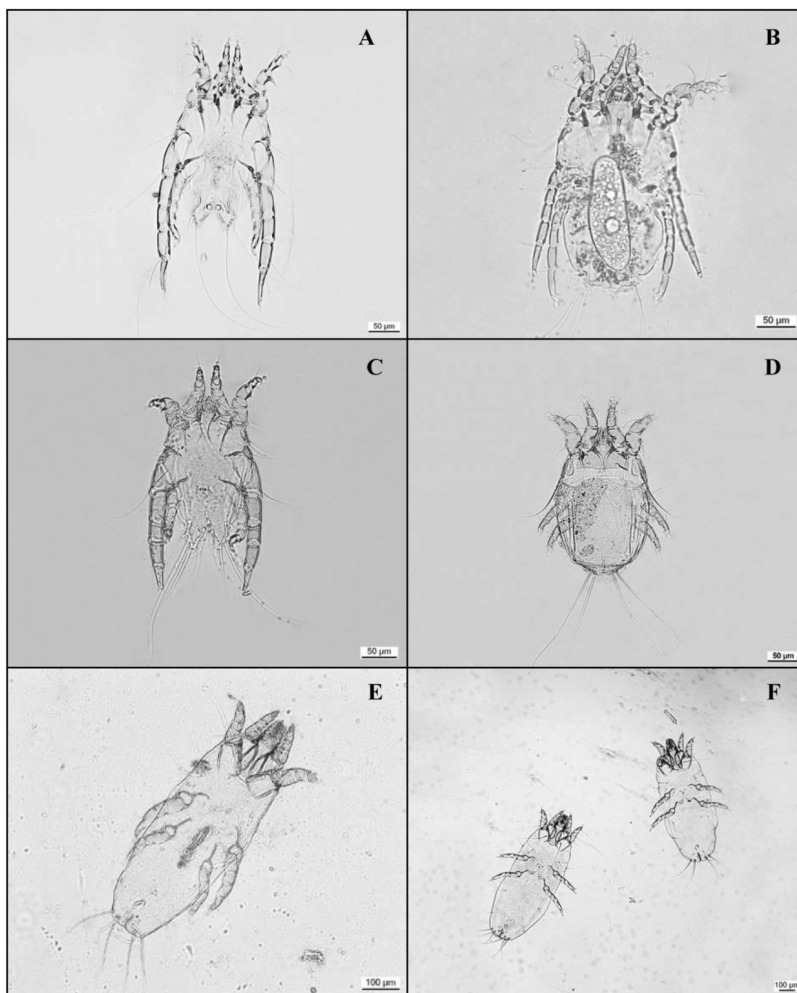


FIGURE 1. (A) *Diplaegidia columbae* male, ventral view; (B) *Diplaegidia columbae* female, ventral view; (C) *Diplaegidia columbigallinae* male, dorsal view; (D) *Diplaegidia columbigallinae* female, dorsal view; (E) *Dermoglyphus columbae* male, ventral view; (F) *Dermoglyphus columbae* female, ventral view.

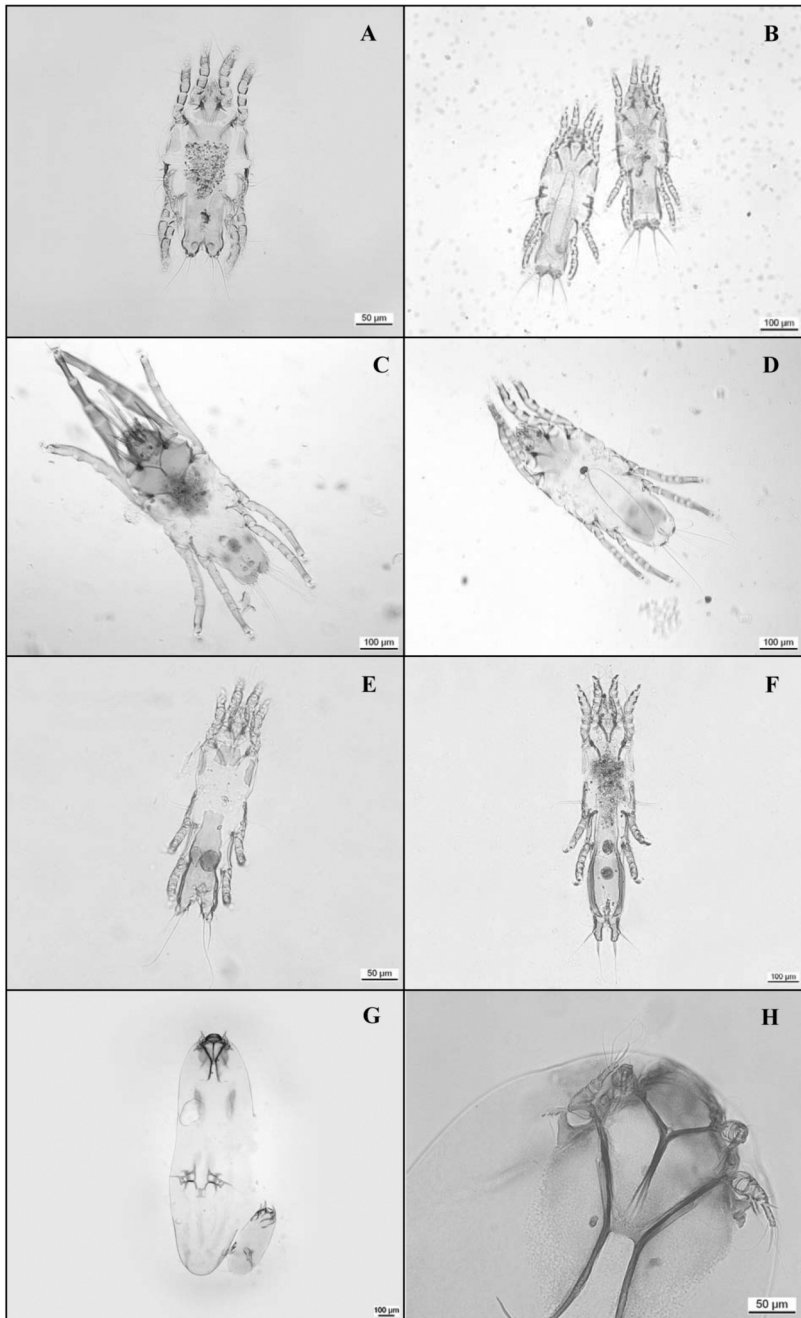


FIGURE 2. (A) *Byersalges talpacoti* male, dorsal view; (B) *Byersalges talpacoti* female, dorsal and ventral view; (C) *Falculifer isodontus* male, dorsal view; (D) *Falculifer isodontus* female, ventral view; (E) *Pterophagus spilosikyus* male, dorsal view; (F) *Pterophagus spilosikyus* female, dorsal view; (G) *Hypodectes propus* (hypopi); (H) *Hypodectes propus* (hypopi), ventral view, apical extremity.

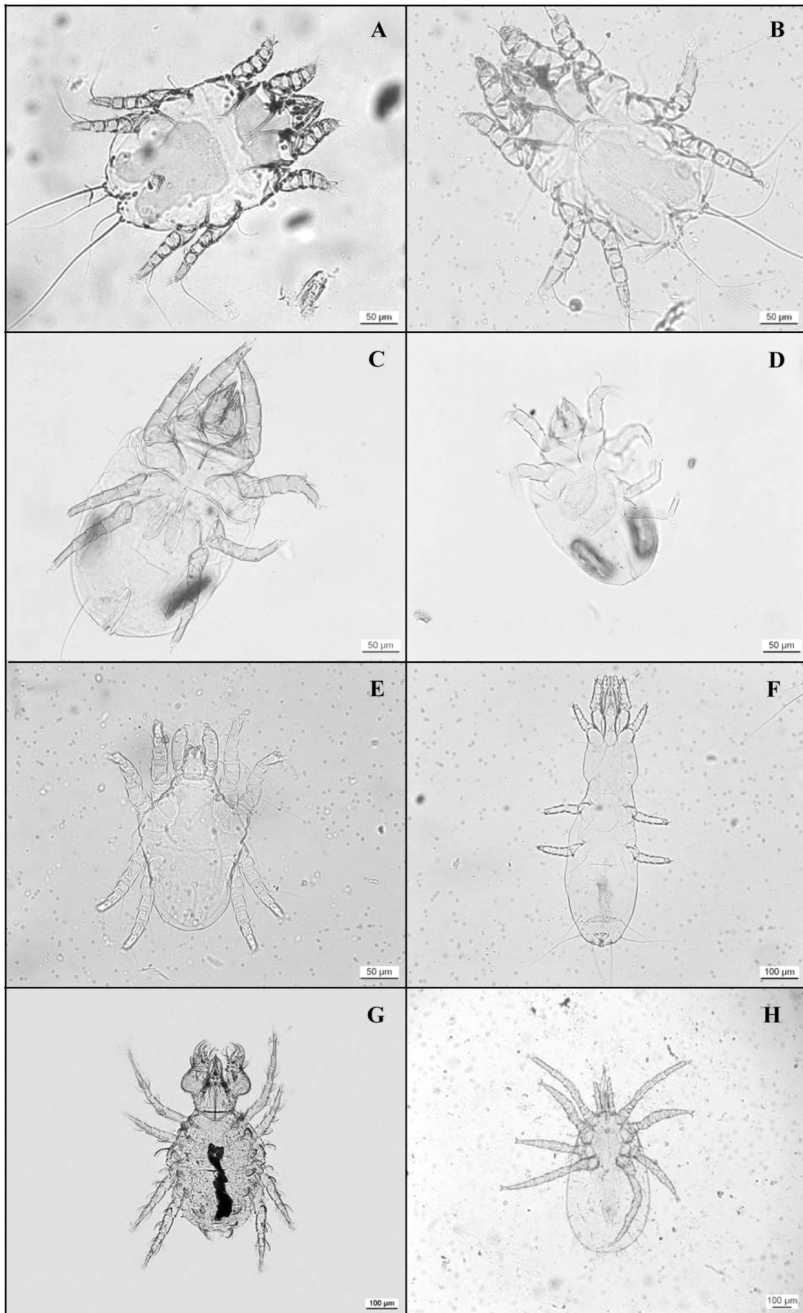


FIGURE 3. (A) Epidermoptidae sp. male, ventral view; (B) Epidermoptidae sp. female, ventral view; (C) Pyroglyphidae sp. male, dorsal view; (D) Pyroglyphidae sp. Female, dorsal view; (E) *Ornithocheyletia columbigallinae* nymph, dorsal view; (F) *Meitingsunes zenadourae* nymph, ventral view; (G) Cheyletidae sp. adult; (H) *Ornithonyssus bursa* male, ventral view.

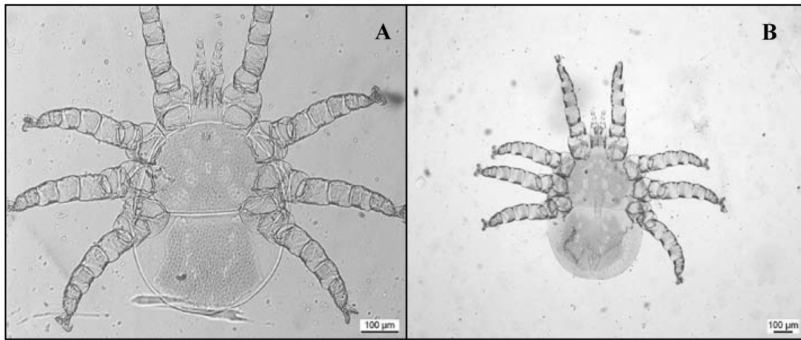


FIGURE 4. (A) *Tinaminysus zenaidurae* male, dorsal view; (B) *Tinaminysus zenaidurae* female, dorsal view.

squamata (Lesson, 1831), *Uropelia campestris* (Spix, 1825) (Atyeo & Winchell, 1984), *Z. asiatica* and *Z. aurita* (Temminck, 1809) (Gaud & Barré, 1992). Here we report the first record of *B. talpacoti* in association with *Z. auriculata*.

Species of *Falculifer* are found on many columbiform birds in the Old World and New World. *Falculifer isodontus* was originally described from *Z. asiatica* from Cuba. This bird also lives in northern Chile in sympatry with *Z. auriculata*, from which it was first reported by González *et al.* (2004). In Brazil, it had been previously reported from *Z. auriculata* by Goulart *et al.* (2009a). The fact that *F. isodontus* was found in all examined specimens of *Z. auriculata* in this study indicates that it is a very common species in the region where the study was conducted.

Pterophagus pilosikyus was known only from the original description, from *Z. aurita* and *Geotrygon mystacea* (Temminck, 1811), until Goulart *et al.* (2009b) reported it from *Z. auriculata* from Brazil. This is the second report of this species in that country.

Deutonymphs (hypopi) of Hypoderatidae live subcutaneously and in other tissues of birds (Hypoderatinae) and rodents (Muridectinae). Most species are known only from that developmental stage. The complete life cycle of these mites is only known for *H. propus*, *Suladectes hughesae antipodus* (Fain & Clark, 1994) and *Tytodectes strigis* (Wurst, 1997) (Boas Filho *et al.*, 2006). *Hypodectes propus* was found for the first time in Brazil in nests of *Z. auriculata* (Boas Filho *et al.*, 2006). In this work, we observed for the first time the occurrence of hypopi of this species subcutaneously in *Z. auriculata*.

Ornithocheyletia columbigallinae was first described from *Columbina* sp., from Brazil. This is the first record of *Z. auriculata* as host for this mite. While most Cheyletoidea are considered to be free-living predators, some species are associated with other animals in various ways. The family Cheyletidae includes mites that are parasitic on birds and small mammals.

Syringophilid quill mites are known to parasitize 13 columbid species of eight genera (Skoracki & Glowska, 2008). From the five genera of quill mites known to parasitize doves, only *Peristerophila* is specific to columbiforms. *Meitingsunes zenadourae* is one of the only three species of this genus. It has been reported from *C. livia*, *Z. asiatica* and *Z. macroura*, in the USA (Casto, 1976; Kethley, 1970; Clark, 1964). Skoracki & Sikora (2003) reported *Z. auriculata* as a host of this mite in Argentina.

The nasal mite *T. zenaidurae* was reported from *Z. macroura* in the USA (Crossley, 1952; Knee *et al.*, 2008; Owen, 1958; Pence, 1973a). This mite was also found on the same host in Trinidad (Pence, 1973b). This is the first record of this mite on *Z. auriculata*.

Macronyssids are among the most important ectoparasites of wild and domestic birds and they often attack man in the absence of an avian host (Phillis *et al.*, 1976). The tropical fowl mite, *O.*

bursa is distributed throughout the warmer regions of the world, mainly in association with poultry, pigeon and sparrows (William *et al.*, 1976). This is the first record of this mite on adults of *Z. auriculata*.

In the study conducted by González *et al.* (2004), only two mite species were found on *Z. auriculata* in Chile. A much lower number of birds was examined in this study, but a much larger number of mite species was found, including the ones found by González *et al.* (2004), as well as those previously reported in Brazil by Boas Filho & Prado (2005), Boas Filho *et al.* (2006) and Goulart *et al.* (2009a, b). The much lower species diversity found in the work of González *et al.* (2004) is in part due to the fact that they evaluated only the ectoparasites, but they did not detail the method used to search the mites, stating only that the ectoparasites were searched manually.

Acknowledgements

To the Brazilian CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior) for the financial support. To two anonymous reviewers whose suggestions helped to improve the quality of this manuscript and to D. Vilas Boas Filho for the confirmation of the identification of the bird species.

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