

Eimeria curvata n. sp. (Apicomplexa: Eimeriidae) in *Columbina talpacoti* and *Scardafella squammata* (Aves: Columbidae) from Brazil

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Eimeria curvata is a new coccidian described in the doves *Columbina talpacoti* and *Scardafella squammata* from western of the State of São Paulo, Brazil. The oocysts are ovoid to ellipsoid, 18.3 (17-19) μm x 15.5 (15-17) μm , with a shape index of 1.2 (1.1-1.3). The wall is colorless, smooth and double-layered. A polar granule is present, but there is no micropyle or oocyst residuum. The sporocysts are elongate, 12.3 (11.5-13) μm x 5.8 (5.5-6) μm with a curved anterior portion and a smooth, thin, single-layered wall. The Stieda body is protuberant and nipple-like; there is no substieda body. The sporozoites lie head-to-tail in the sporocyst and contain a large refractile body at the extremities. The sporocyst residuum contains small granules uniformly distributed in the middle of the sporocyst. The prevalence of *E. curvata* n. sp. was 17.4% and 12.8% in *C. talpacoti* and *S. squammata*, respectively.

Key words: *Eimeria curvata* n. sp. - *Columbina talpacoti* - *Scardafella squammata* - coccidia - Apicomplexa - Brazil

At least 65 species of the family Columbidae occur in the neotropical region (Stotz et al. 1996). *Columbina talpacoti* Temminck, 1810, a small dove found in dry, open areas such as fields and farms as well as around human dwellings (Hilty & Brown 1986), occurs mainly in the tropics and, occasionally, in the subtropics (Schauensee & Phelps Jr 1978). *Scardafella squammata* Lesson, 1831, another small columbid, is also common in arid scrub areas and around dwellings. This species occurs only in the neotropics (Schauensee & Phelps Jr 1978).

There is no record of coccidian parasites in these columbid species. In this paper, we report in both *C. talpacoti* and *S. squammata* the occurrence of a previously undescribed *Eimeria* species. The parasite is described as a new species of *Eimeria*.

MATERIALS AND METHODS

Forty-six adult specimens of *C. talpacoti* and 39 adult specimens of *S. squammata* were captured using gauze-traps (Ibama 1994) in the municipality of Junqueirópolis, in western of the State of São Paulo, Brazil (21°31'S, 51°27'W), between

January and December 1998. The birds were housed individually in appropriate cages for 2 h, tagged and then released. Faecal samples from all birds were stored in 2.5% potassium dichromate solution ($\text{K}_2\text{Cr}_2\text{O}_7$), maintained at room temperature (23-28°C) and examined microscopically after flotation using Sheather's sugar solution.

Photomicrographs were obtained using a Zeiss Standard microscope and Kodak TMAX 100 film. Thirty-six oocysts and 32 sporocysts were measured and compared with those of *Eimeria* species already reported for the family Columbidae. All measurements and averages are given in μm , followed by the range within parentheses and then by the shape-index (ratio of length/width).

RESULTS

Eight out of 46 *C. talpacoti* and five out of 39 *S. squammata* were found to contain coccidian oocysts. Morphological differences were observed between these oocysts and all other known *Eimeria* spp. from Columbiformes. This finding lead us to regard this oocyst as belonging to a new species of *Eimeria*. The parasite is described below.

Eimeria curvata n. sp.
(Figs 1-5)

Description: ovoid to ellipsoidal oocysts (Figs 1-2) (n=36), 18.3 (17-19) x 15.5 (15-17); shape index 1.2 (1.1-1.3). The bilayered wall is 1.3 thick, and is composed of a colourless outer layer 0.9 thick, and a brown inner layer 0.4 thick. Micropyle and oocyst residuum are absent. A polar gran-

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ule is present (Fig. 1). Sporocysts elongate (Figs 3-5) (n=32), 12.3 (11.5-13) x 5.8 (5.5-6), shape index 2.1 (2-2.2), with a curved anterior portion and a smooth, thin, single-layered wall (Figs 3-5). Sporozoites lie head-to-tail in the sporocyst, each with a large refractile at the extremities. There is a protuberant, nipple-like Stieda body (Figs 4-5) but no apparent substieda body. The sporocyst residuum is composed of small granules uniformly concentrated in the middle of the sporocyst.

Sporulation time: not determined.

Site of infection: unknown. Oocysts observed in the faeces.

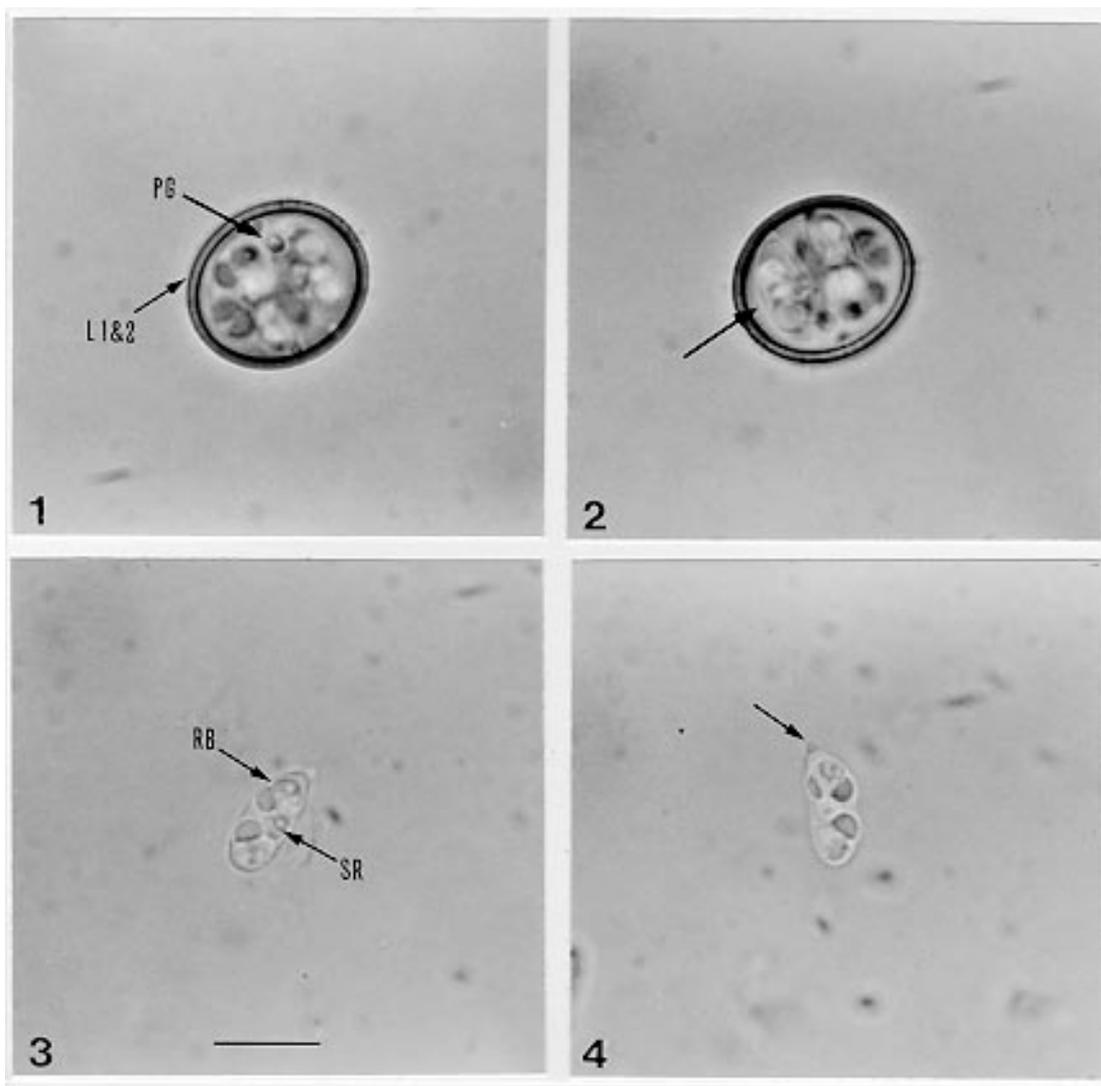
Type material: phototypes of oocysts are deposited in the Department of Parasitology, Institute of Biology, State University of Campinas, State of São Paulo, Brazil (n. 10/99).

Type host: *Columbina talpacoti* Temminck, 1810 (Aves: Columbidae).

Additional host: *Scardafella squammata* Lesson, 1831 (Aves: Columbidae).

Locality: municipality of Junqueirópolis, western of the State of São Paulo, Brazil (21°31'S, 51° 27'W).

Prevalence: 8/46 (17.4%) *C. talpacoti* and 5/39 (12.8%) *S. squammata* were infected.



Photomicrographs of sporulated oocysts of *Eimeria curvata* n. sp. Fig. 1: cross-section of oocyst wall showing a colorless outer layer (L₁) and a brown inner layer (L₂). Note the polar granule (PG). Fig. 2: mature oocyst. Note the sporocyst. Photomicrographs of free sporocysts. Fig. 3: note the sporocyst residuum (SR) and refractile body (RB) in the extremities of the sporozoites. Fig. 4: protuberant Stieda body. Bar = 10 µm.

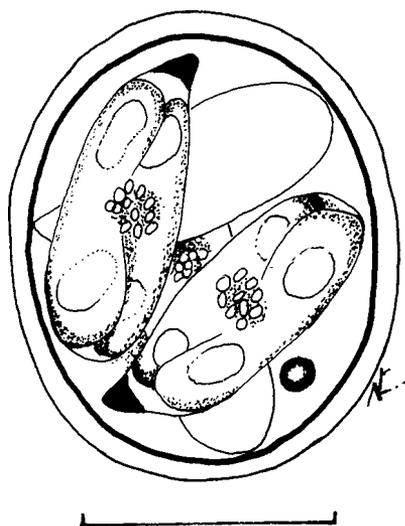


Fig. 5: line-drawing of a mature oocyst of *Eimeria curvata* n. sp. Bar = 10 μ m.

Pathogenicity: infected doves appeared healthy. The histopathology of the infection remains to be studied.

Etymology: the species name is based on the curved appearance of the sporocysts.

DISCUSSION

So far, only ten species of coccidian parasites have been described from Columbiformes (McQuiston 1991). These are *E. labbeana* Pinto, 1928, *E. columbarum* Nieschulz, 1935, *E. columbae* Mitra and Das-Gupta, 1937, *E. tropicalis* Malhotra and Ray, 1961 and *E. kapotei* Chatterjee and Ray, 1969, all parasites of *Columba* L., 1758 species; *E. waiganiensis* Varghese, 1978 of *Chalcoephaps indica* L., 1758 and *Otidiphaps nobilis* Gould, 1870; *E. gourai* Varghese, 1980 of *Goura victoria* Fraser, 1844; *E. duculai* Varghese, 1980 of *Ducula spilorrhoa* Gray, GR, 1858; *E. palumbis* McQuiston, 1990 of *Zenaida galapagoensis* Gould, 1839 and *Isospora gallicolumbae* Varghese, 1978 of *Gallicolumba beccarii* Salvadori, 1876.

This is the first report of an *Eimeria* species in *Columbina* Spix, 1825 and *Scardafella* Bonaparte, 1855. Comparison of *E. curvata* n. sp. with the nine previously described species mentioned above shows that the oocysts this new species of *Eimeria* most resemble those of *E. columbae*. However,

the oocysts of *E. curvata* n. sp. can be easily distinguished from those of *E. columbae* as they have only one polar granule, no oocyst residuum and a curved anterior portion of the sporocyst.

Lillehoj and Trout (1993) pointed out that *Eimeria* are generally very host-specific, with no species naturally infecting more than one host species. However, Long (1990) asserted that closely related species or subspecies may serve as adequate hosts for a given species of *Eimeria*. According to Lainson (1992), host specificity of *Eimeria* species is relatively strictly maintained, at least within host genus. Varghese (1978) reported *E. waiganiensis* in both *C. indica* and *O. nobilis*. According to the same author, *E. labbeana* also was reported parasitizing two species of host of two different genus *C. livia* and *Streptopelia orientalis* Latham, 1790. In the same way, *E. curvata* n. sp. was found in *C. talpacoti* and *S. squammata* suggesting that some *Eimeria* species of Columbiformes are specific at the family level.

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