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Redescription of *Eimeria escomeli* (Rastegaieff, 1930) from *Myrmecophaga tridactyla*, and a First Report from Bolivia

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ABSTRACT: *Eimeria escomeli* (Rastegaieff, 1930) Levine and Becker, 1933, is redescribed from the giant anteater, *Myrmecophaga tridactyla* (L.), from the departamento de La Paz, Bolivia. This is the first report of parasites from *M. tridactyla* from Bolivia and only the third time that coccidians have been recorded from this host.

KEY WORDS: *Eimeria escomeli*, Coccidia, Apicomplexa, giant anteater, *Myrmecophaga tridactyla*, departamento de Beni, Bolivia, Xenarthra.

During a survey of the parasites of mammals of Bolivia from 1984 to 1986, several xenarthrans were examined for coccidian parasites. Of 2 individual armadillos examined, neither *Chaetophractus vellerosus* (Gray) or *C. nationi* (Thomas) had coccidians in their feces. Of representatives of 2 species of anteaters examined (*Cyclopes didactylus* (L.) and *Myrmecophaga tridactyla* L.), only the feces of *M. tridactyla* contained oocysts at the time of sampling. These oocysts conform most closely in size and shape to (gen. ?) *escomeli* Rastegaieff, 1930, originally described from *M. tridactyla* (see Rastegaieff, 1930). The specimens described by Rastegaieff (1930) were unsporulated and could not be properly identified. Although Levine and Becker (1933) tentatively placed *E. escomeli* in the genus *Eimeria*, Pellerdy (1974) confirmed the placement of this species in the genus *Eimeria*. During our fieldwork in Bolivia, we obtained sufficient numbers of sporulated oocysts from the feces of an individual of *M. tridactyla* to allow a complete description. In the present paper, we redescribe *E. escomeli* and properly confirm its place in the genus *Eimeria*.

Materials and Methods

Methods and procedures of study follow McAllister and Upton (1988) and Lambert et al. (1988). Measurements are in micrometers, with the mean given first followed by the range. Unless stated otherwise, $N = 30$.

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Description

Eimeria escomeli (Rastegaieff, 1930) Levine and Becker, 1933 (Figs. 1–4)

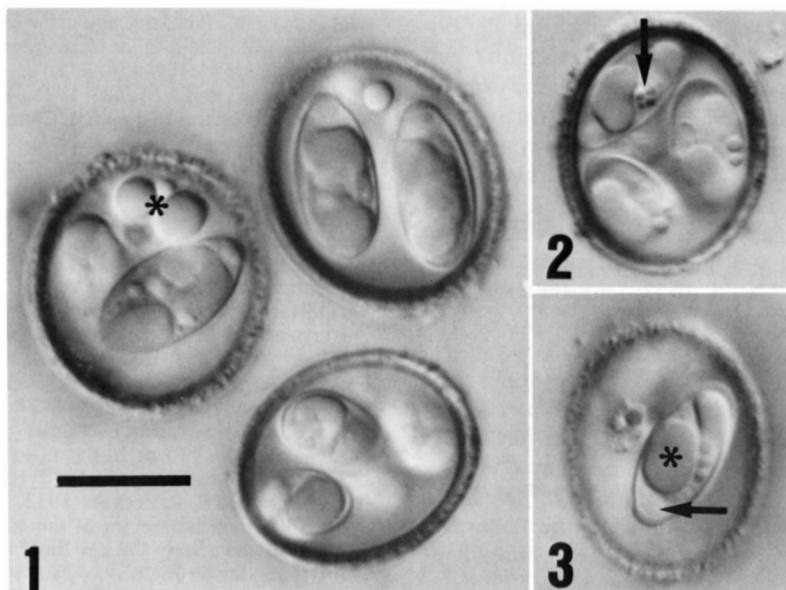
Oocysts subspherical to ellipsoidal, 21.6×19.0 ($17.6\text{--}26.4 \times 15.2\text{--}23.2$), with bi-layered wall 1.6 ($1.2\text{--}2.0$) thick; shape index (length/width ratio) 1.15 ($1.0\text{--}1.3$). Outer layer of wall about 1.0 thick and slightly pitted externally; inner layer thin and smooth. Micropyle and polar granule usually absent; many oocysts containing debris, perhaps remnants of a polar granule. Oocyst residuum present, formed from 1 to several homogeneous globules (Fig. 1), each 5.0 ($3.2\text{--}8.0$) in diameter ($N = 18$). Sporocysts 13.2×6.5 ($10.8\text{--}15.2 \times 5.6\text{--}7.4$), with a smooth, single-layered wall. Stieda body present, consisting of a flattened dome at 1 end of sporocyst about 0.8 high \times 2.4 wide; substieda body present (Fig. 3), about 1.6 high \times 2.2 wide and homogeneous. Sporocyst residuum present, formed of either a loose mass of homogeneous granules of various sizes (Fig. 2) or as scattered granules. Sporozoites elongate, lying parallel and head-to-tail. Posterior ends of sporozoites curved back along poles of sporocysts. Each sporozoite contains a large, ellipsoidal posterior refractile body (Fig. 3) and 3/30 (10%) contained a smaller spherical anterior refractile body. Nucleus rarely seen.

TYPE HOST: *Myrmecophaga tridactyla* L.

TYPE LOCALITY: Bolivia, La Paz, North Bank of the Rio Beni (long. $13^{\circ}16'S$, lat. $67^{\circ}17'E$), 240 m elevation.

DATE COLLECTED: 8 September 1985.

AGE OF OOCYSTS WHEN MEASURED: 1,010 days.



Figures 1–3. Photomicrographs of sporulated oocysts of coccidia recovered from the feces of *Myrmecophaga tridactyla*. Bar = 10.8 μm . 1. Sporulated oocyst showing oocyst residuum consisting of several homogeneous globules (*). 2. Note sporocyst residuum composed of a loose mass of homogeneous granules. 3. Sporocysts with homogeneous subtieda body (arrow), and large ellipsoid posterior refractile body (*). Note thick, externally pitted outer wall.

MATERIAL DEPOSITED: Phototype (=photographs, see Bandoni and Duszynski, 1988) of sporulated oocysts USNM Helm. Coll. No. 81056.

COLLECTOR: O. C. Jordán, personal field catalog number OCJ/85-169.

Discussion

Little information is available concerning coccidian parasites of Xenarthra in the Neotropics. Up to the present time, only 3 species of *Eimeria* have been described from anteaters, 1 from the sloth (*Bradypus* sp.) and 4 from armadillos. Representatives of this group of mammals occur only in the Nearctic and Neotropical regions (Simpson, 1980); thus, no comparisons will be made with coccidians described from any of the pholidote anteaters occurring in other biogeographic regions.

Eimeria escomeli differs from *E. tamanduae* Lainson, 1968, from *Tamandua tetradactyla* (L.) in being smaller and without a highly refractile spherule in the stieda body (Lainson, 1968). The oocysts of *E. escomeli* are smaller than *E. cyclopei* Lainson and Shaw, 1982, from *Cyclopes didactylus* (L.), and possess an oocyst residuum.

Eimeria escomeli can be recognized as distinct from *E. travassoi* Da Cunha and Muniz, 1928, from *Euphractus* and *Dasypus* spp. and from *E. dacunhai* Levine, 1984, from *Cabassous* sp. and

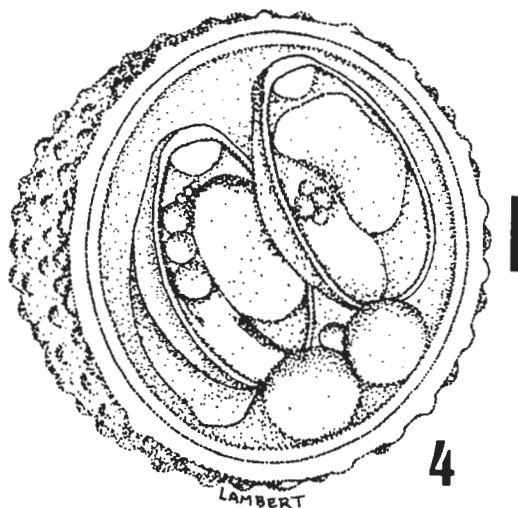


Figure 4. Line drawing of *Eimeria escomeli* recovered from feces of *Myrmecophaga tridactyla*. Bar = 3 μm .

Chaetophractus sp. in having much smaller oocysts and smaller sporocysts (Da Cunha and Muniz, 1928). *Eimeria escomeli* differs from *E. cabassusi* Carini, 1933, from *Cabassous* sp. in having ellipsoidal to subspherical oocysts and a well-developed oocyst residuum, and also differs from *E. choloepi* Lainson and Shaw, 1982, from *Choloepus didactylus* (L.) in having an oocyst residuum and well-developed stieda and substieda bodies (Carini, 1933; Lainson and Shaw, 1982).

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Literature Cited

- Bandoni, S. M., and D. W. Duszynski.** 1988. A plea for improved presentation of type material for coccidia. *Journal of Parasitology* 74:519-523.

- Carini, A.** 1933. Sur deux nouvelles *Eimeria* rencontrées dans l'intestin d'un jeune tatou. *Annales de Parasitologie* 11:469-474.
- Da Cunha, A. M., and J. Muniz.** 1928. Sur un nouveau sporozoaire, parasite du tatou. *Compte Rendus de la Société Brésilienne de Biologie* 98:624-627.
- Lainson, R.** 1968. Parasitological studies in British Honduras III. Some coccidial parasites of mammals. *Annals of Tropical Medicine and Parasitology* 62:252-259.
- , and **J. J. Shaw.** 1982. Coccidia of Brazilian edentates: *Eimeria cyclopei* n. sp. from the silky anteater, *Cyclopes didactylus* (L.) and *Eimeria choloepi* n. sp. from the two-toed sloth, *Choloepus didactylus* (L.). *Systematic Parasitology* 4:269-278.
- Lambert, C. R., S. L. Gardner, and D. W. Duszynski.** 1988. Coccidia (Apicomplexa: Eimeriidae) from the subterranean rodent *Ctenomys opimus* Wagner (Ctenomyidae) from Bolivia, South America. *Journal of Parasitology* 74:1018-1022.
- Levine, N. D., and E. R. Becker.** 1933. A catalog and host-index of the species of the coccidian genus *Eimeria*. *Iowa State College Journal of Science* 8: 83-106.
- McAllister, C. T., and S. J. Upton.** 1988. *Eimeria trachemydis* n. sp. (Apicomplexa: Eimeriidae) and other eimerians from the red-eared slider, *Trachemys scripta elegans* (Reptilia: Testudines), in northcentral Texas. *Journal of Parasitology* 74: 1014-1017.
- Pellerdy, L. P.** 1974. *Coccidia and Coccidiosis*, 2nd ed. Verlag Paul Parrey, Berlin. 959 pp.
- Rastegaieff, F. E. F.** 1930. Zur Frage über Coccidien wilder Tiere. *Archiv für Protistenkunde* 71:377-404.
- Simpson, G. G.** 1980. *Splendid Isolation, the Curious History of South American Mammals*. Yale University Press, New Haven. 266 pp.