

RESEARCH NOTE

FIRST REPORT OF *Tyzzeria parvula* (KOTLÁN, 1933) KLIMES, 1963 (APICOMPLEXA: EIMERIIDAE), IN SWAN GOOSE *Anser cygnoides* L., 1758, IN BRAZIL*

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ABSTRACT:- BERTO, B.P.; FLAUSINO, W.; LOPES, C.W.G. **First report of *Tyzzeria parvula* (Kotlán, 1933) Klimes, 1963 (Apicomplexa: Eimeriidae), in swan goose *Anser cygnoides* L., 1758, in Brazil.** [Primeiro relato de *Tyzzeria parvula* (Kotlán, 1933) Klimes, 1963 (Apicomplexa: Eimeriidae) no ganso sinaleiro *Anser cygnoides* L., 1758 no Brasil]. *Revista Brasileira de Parasitologia Veterinária*, v. 17, supl. 1, p. 326-328, 2008. Curso de Pós-Graduação em Ciências Veterinárias, Universidade Federal Rural do Rio de Janeiro (UFRRJ), BR 465, km 7, Seropédica, RJ 23890-000, Brasil. E-mail: bertobp@ufrj.br

This is the first description of *Tyzzeria parvula* from the swan goose (*Anser cygnoides*) in the State of Rio de Janeiro, Brazil. Fecal samples were collected from 15 swan geese, but only four of them shed oocysts in feces. After sporulation, the oocysts were spherical to sub-spherical, and measured 12.4 ± 1.0 (11-15) \times 10.4 ± 0.8 μ m (8-12). They presented a shape index of 1.2 (1.0-1.4), with a bi-layered wall that was 0.7 ± 0.1 μ m (0.6-0.8) thick. The outer side was smooth and colorless, while the inner side was pale greenish. Micropyles and polar granules were absent. The residuum sometimes formed a mass of spherules and granules and, at other times, was dispersed. Sporozoites had one rounded end and the other end was fine and slightly curved.

KEY WORDS: *Tyzzeria parvula*; sporulated oocysts; swan geese; *Anser cygnoides*.

RESUMO

Esta é a primeira descrição de *Tyzzeria parvula* do ganso sinaleiro *Anser cygnoides* no estado do Rio de Janeiro, Brasil. Amostras de fezes foram coletadas de 15 gansos sinaleiros, entretanto somente quatro gansos eliminaram oocistos nas fezes. Após a esporulação, os oocistos são esféricos a subesféricos, e medem $12,4 \pm 1,0$ (11-15) \times $10,4 \pm 0,8$ μ m (8-12). Eles apresentaram índice morfométrico de 1,2 (1,0-1,4), com uma parede dupla com espessura de $0,7 \pm 0,1$ μ m (0,6-0,8), sendo a externa lisa e clara e a interna esverdeada. Micrópila e grânulo polar estão ausentes. Resíduo, algumas vezes formou uma massa de esfera e grânulo e outras vezes,

estava disperso. Esporozoíta tem uma extremidade arredondada e a outra fina e levemente curva.

PALAVRAS-CHAVE: *Tyzzeria parvula*; oocistos esporulados; ganso sinaleiro; *Anser cygnoides*.

The swan goose (*Anser cygnoides* L., 1758) is a waterfowl listed by the IUCN (International Union for Conservation of Nature) as endangered, because its population is undergoing a very rapid decline as a result of habitat loss, particularly to agricultural development, and unsustainable levels of hunting (BIRD LIFE INTERNATIONAL, 2007). In Brazil, swan geese are mainly reared for monitoring and esthetic purposes (QUEVEDO et al., 2004).

In Europe and North America, geese in the Anatidae family, such as *A. anser* L., 1758, *A. albifrons* Scopoli, 1789, *A. caerulescens* L., 1758, *A. rossii* Cassin, 1861, *Branta canadensis* L., 1758, and *B. bernicula* L., 1758, are frequently found parasitized by the coccidian protozoan *Tyzzeria parvula*

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Table 1. Comparative aspects of descriptions of the oocysts of *Tyzzeria parvula*.

Characteristics	Kotlán (1933)	Nieschulz (1947)	Levine (1952)	Klimes (1963)	Berto et al. (2007)	Present study
Host	Greylag goose (<i>Anser anser</i>)	Greylag goose (<i>Anser anser</i>)	Canada goose (<i>Branta canadensis</i>)	Greylag goose (<i>Anser anser</i>)	Greylag goose (<i>Anser anser</i>)	Swan goose (<i>Anser cygnoides</i>)
Shape	Spherical to ellipsoidal	Moderately ellipsoidal	Ellipsoidal	Moderately spherical to ellipsoidal	Spherical to sub-spherical	Spherical to sub-spherical
Length (µm)	(10-15) ^a	14.0 (12-16)	12.8 (10.5-15.1)	14.8 (12-17)	15.4 (12.4-18.0)	12.4 (11-15)
Width (µm)	(10-14)	11.5 (10-12.5)	10.8 (8.8-12.4)	12.8 (11-15)	13.4 (10.7-15.9)	10.4 (8-12)
Wall	Delicate and colorless	Delicate and colorless	Smooth, colorless and bi-layered (0.6 µm)	Colorless (0.5 µm)	Smooth, colorless and bi-layered (0.4 to 0.7 µm)	Smooth, colorless and bi-layered (0.7 µm)
Residual body	-	-	Larger and irregular	Larger and compact	Numerous granules and spherules	Forming a mass of granules or dispersed.
Sporozoites	-	One end round and the other fine and slightly curved	"Banana" shape	One end round and the other fine and slightly curved	One end round and the other fine and slightly curved	One end round and the other fine and slightly curved

^aSize ranges are in parentheses

(Kótlán, 1933) Klimes, 1963 (LEVINE 1985; ARSLAN et al., 2002). In Brazil, *T. parvula* was reported for the first time by Berto et al. (2007), parasitizing the greylag goose *A. anser*. Recently, Dolnik and Loonen (2007) described a new host, the barnacle goose *B. leucopsis* Bechstein, 1805. Although *T. parvula* has been considered to be the principal causative agent of intestinal coccidiosis in geese, this parasite has not been identified in the swan goose (*A. cygnoides*).

The aim of this paper was to present a morphological description of sporulated oocysts of *T. parvula* from the swan goose (*A. cygnoides*) in Brazil.

Fecal samples were collected from 15 birds from a swan goose breeder located in the municipality of Seropédica, State of Rio de Janeiro, Brazil. Fecal samples were collected immediately after defecation and placed in plastic vials containing potassium dichromate solution ($K_2Cr_2O_7$) at 2.5% 1:6 v/v. They were then transported to the Coccid and Coccidiosis Laboratory of the Federal Rural University of Rio de Janeiro. The samples were placed on Petri plates in a thin layer of liquid (~ 5 mm), and were kept at laboratory temperature (23-28°C) for ten days until 70% of oocysts had sporulated. The oocysts were recovered by flotation in Sheather's sugar solution (specific gravity 1.20) and were examined under an optical microscope using the technique of Duszynski and Wilber (1997). Morphological observations and measurements (in µm) were performed by using a binocular Carl Zeiss microscope with an apochromatic oil immersion objective lens and an ocular micrometer (K-15X PZO, Poland). Line drawings were prepared using a binocular microscope (Wild M-20) with a drawing tube. Pictures were prepared using a digital camera (Sony® model CD Mavica MVC-CD250). Size ranges have been stated in parentheses followed by means, standard deviations and shape index (length/width).

Four swan geese shed oocysts in feces. Initially, the oocysts were unsporulated; by day four, 70% had sporulated.

The sporulated oocysts were spherical to sub-spherical (Figure 1), and measured 12.4 ± 1.0 (11-15) \times 10.4 ± 0.8 µm (8-12) (n = 23). They presented a shape index of 1.2 (1.0-1.4),

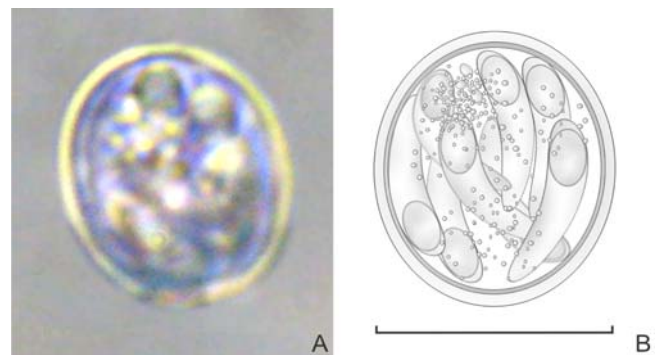


Figure 1. Sporulated oocyst of *Tyzzeria parvula* from the swan goose (*Anser cygnoides*). A - Saturated sugar solution. 1000X. B - Line drawing. Scale bar = 10 µm

with a bi-layered wall that was 0.7 ± 0.1 µm (0.6-0.8) thick. The outer side was smooth and colorless, while the inner side was pale greenish. Micropyles and polar granules were absent. The residuum sometimes formed a mass of spherules and granules and at other times was dispersed. Sporozoites had one rounded end and the other end was fine and slightly curved.

Based on all of the morphological characteristics mentioned, and compared with descriptions presented in Table 1, the species described is considered to be *T. parvula*. This is the first finding in swan geese (*A. cygnoides*).

REFERENCES

- ARSLAN, M.O.; GICIK, Y.; ÖZCAN, K. The Frequency of Eimeriidae Species in the Domestic Geese in Kars Province of Turkey. *Acta Protozoologica*, v. 41, n.4, p. 353-357, 2002.
- BERTO, B. P.; TEIXEIRA, M.; LOPES, C. W. G. *Tyzzeria parvula* (Kotlán, 1933) Klimes, 1963 (Apicomplexa: Eimeriidae) in the greylag goose (*Anser anser* Linnaeus, 1758) in Southeastern Brazil. *Revista Brasileira de Parasitologia Veterinária*, v. 16, n. 3, p. 156-158, 2007.
- BIRD LIFE INTERNATIONAL. *Anser cygnoides*. In: IUCN 2007. Red list of Threatened Species. Disponível on: <<http://www.iucnredlist.org>>. Access in: 11 mar. 2008.

- DOLNIK, O.V.; LOONEN, M.J.J.E. First finding of *Tyzzeria parvula* (Kotlán, 1933) Klimes, 1963 (Protozoa: Coccidiida) in Barnacle Geese (*Branta leucopsis* Bechstein, 1803) on Spitsbergen. *Zoosystematica Rossica*, v. 15, n. 2, p. 214, 2007.
- DUSZYNSKI, D.W.; WILBER, P.G. A guideline for the preparation of species descriptions in the Eimeridae. *Journal of Parasitology*, v. 83, n. 2, p. 333-336, 1997.
- KLIMES, B. Coccidia of the domestic goose (*Anser anser dom.*). *Zentralblatt für Veterinärmedizin, Reihe B*, v. 10, p. 427-448, 1963.
- KOTLÁN, S. Zur Kenntnis der Kokzidiose des Wassergeflügels. Die Kokzidiose der Hausgans. *Zentralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten*, v. 129, n. 1, p. 11-21, 1933.
- LEVINE, N.D. *Eimeria magnalabia* and *Tyzzeria sp.* from the Canada Goose. *Cornell Veterinarian*, v. 42, n. 2, p. 247-252, 1952.
- LEVINE, N.D. *Veterinary Protozoology*. 1^a ed. Ames: Iowa State University Press, 1985. 414 p.
- NIESCHULZ, O. Eine neue Kokzidienart bei der Haungs (*Tyzzeria anseris*). *Zentralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten*, v.152, p. 74, 1947.
- QUEVEDO, A.C.; ANTUNES, R.; MARQUES, H.L. Pescocão empinado. De cuidados básicos e baixo custo, a criação de gansos serve tanto para ornamentar como para vigília e corte. *Avicultura Industrial*, 20 ago. 2004. Disponível on: <<http://www.avicultura industrial.com.br>> Access in: 31 jan. 2008.

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