

Eimeria minima* n. sp. (Apicomplexa: Eimeriidae) from the Japanese quail (*Coturnix coturnix japonica*) in Brazil

***Eimeria minima* n. sp. (Apicomplexa: Eimeriidae) da codorna (*Coturnix coturnix japonica*) no Brasil**

Marcel Teixeira,** Carlos Wilson Gomes Lopes***

Abstract

Oocysts from feces of Japanese quails (*Coturnix coturnix japonica*) were described. Sporulated oocysts were spherical to subspherical and measured 17.31 ± 1.87 to 16.45 ± 1.72 μm in size with shape index 1.05 ± 0.04 . The oocyst wall was thin and smooth, and was consisted of two distinct layer, outside layer was brownish while the inner one was hyaline. Few polar granules were present but without a micropyle or an oocyst residuum. Sporocysts were ovoid with 10.43 ± 1.11 to 5.92 ± 0.58 μm in diameter. Sporocyst residuum was present with visible granules with tactful Stieda body. Each sporocyst had two sporozoites. For the sake of small size in comparison to the others species found in the Japanese quail, *Eimeria minima* was proposed.

Keywords: *Eimeria minima*; japanese quail; *Coturnix coturnix japonica*; Brazil.

Resumo

Oocistos obtidos nas fezes de codornas (*Coturnix coturnix japonica*) quando esporulados mediam de $17,31 \pm 1,87$ por $16,45 \pm 1,72$ μm de diâmetro com índice morfométrico de $1,05 \pm 0,04$, caracterizando-os como esféricos para subesféricos. A parede do oocistos era constituída por duas camadas distintas, a de fora era de coloração marrom, enquanto a de dentro era transparente. Alguns grânulos polares faziam-se presentes no oocisto, porém sem micrópila e resíduo. Os esporocistos eram ovóides com $10,43 \pm 1,11$ por $5,92 \pm 0,52$ μm de diâmetro. Um evidente corpo de Stieda e resíduo no esporocisto faziam-se presentes. Cada esporocistos continha dois esporozoítas. Por ser uma das menores espécies encontradas em codornas, foi dada a esta espécie o nome de *Eimeria minima*.

Palavras-chave: *Eimeria minima*; codorna doméstica; *Coturnix coturnix japonica*; Brasil.

Introduction

Species of the genus *Eimeria* have been described in quails of the genus *Coturnix* where the first citation was described by Chakravat and Kar (1947) in *C. coturnix coturnix*, common gray quail denominating it as *E. coturnicis*. Later, Bhatia et al. (1965) when described *E. bateri*, confirmed this species could parasite both the common gray quail and the Japanese quail (*C. c. japonica*). In addition, other species were described parasiting quails as *E. uzura* (Tsunoda and Muraki, 1971) and *E. tsunodai* (Tsutsumi, 1972) from the Japanese quail, *E. taldykurganica* (Svanbaev and Utebaeva, 1973) from common gray quail in the Azerbaijan, and *E. tahamensis* (Amoudi, 1987) from quails of the Arabic peninsula (*C. delegorguei arabica*). Recently, the opportunity to examine grow-up Japanese quails for coccidia parasites, a new species in the genus *Eimeria* was reported.

Material and methods

The oocysts used in this work were obtained from feces of a group of 120 Japanese quails, which coming from a semi-extensive breeding located at the Municipality of Petrópolis in the State of Rio de Janeiro, They were maintained at the W.O.Neitz experimental station for parasitological researches of the Departamento de Parasitologia Animal, Instituto de Veterinária in the Universidade Federal Rural Rio de Janeiro (www.ufrj.br).

For the identification, the oocysts was obtained through the exam of the samples of feces, collected by the morning of the quails for 6 serial days using the centrifugal-flotation technique with saturated sugar solution. To follow the material contends the oocysts was placed in Potassium Dicromate Solution 2.5%, at 27° C and They were submitted to aeration with aid of a fishbowl bomb. After having confirmed the sporulation of the

*Supported by CNPq.

**PIBIC (UFRRJ/CNPq) scholarship, Departamento de Parasitologia Anima (DPA), Instituto de Veterinária, Universidade Federal Rural do Rio de Janeiro (UFRRJ), BR-465 Km 07 – CEP 23890-000 Seropédica, RJ, Brazil. E-mail: teixeira@ufrj.br

***Departamento de Parasitologia Animal, IV, UFRRJ. E-mail: lopescw@ufrj.br

oocysts, these were concentrated through the same centrifugal-flotation technique by wash with Phosphate Buffered Solution (PBS) pH 7.0 and was centrifugated at 3000 rpm for 10 minutes. The concentrated oocysts was suspended in PBS again, and later they were stored in Eppendorf's tubes under refrigeration at 4° C.

The of sporulated oocysts were measured by using a triocular microscope WILD-M20 with an ocular micrometric K-15X in objective of 100X. Morphologic characterization was done by using a WILD drawing tube. Photograph was taken in a triocular microscope JENAPOL/Carl Zeiss with a photographic camera model f-KAS Automatic-2 and film Plus-X pan Kodak 125 ISO.

Results

Description: The sporulated oocysts (n=50) varied from spherical to subspherical by measuring from $17,31 \pm 1,87$ to $16,45 \pm 1,72$ μm in diameter with $1,05 \pm 0,04$ shape index. The wall of the oocysts was consisted by two distinct layers, being the outside layer was brownish when the inner one was hyaline. Polar granules in small number, even so the micropyle or residual body was not observed. Sporocysts were ovoids (n=50), measuring from $10,43 \pm 1,11$ to $5,92 \pm 0,58 \mu\text{m}$ in diameter, with a tactfull Stieda body. The sporocyst residual body was present

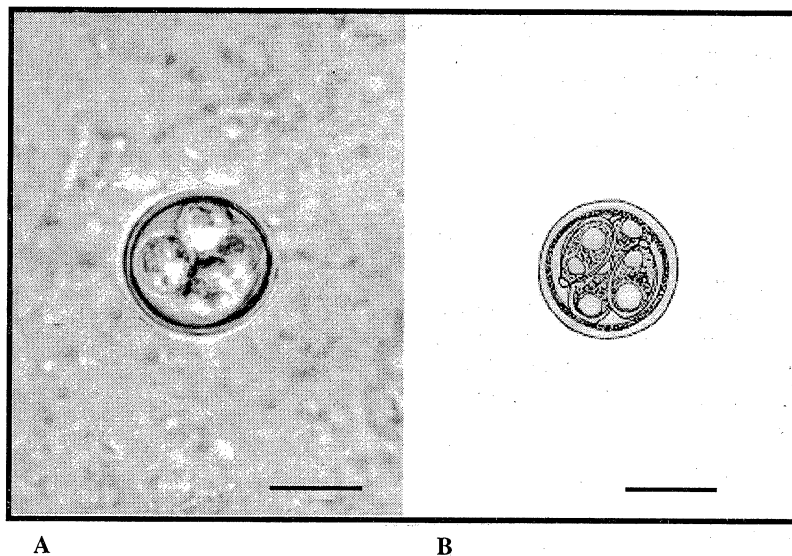


Figure 1: *Eimeria minima*. A- Potassium Dichromate Solution, B- drawing tube (— = 10)

with visible granules. Sporozoites into the sporocysts had a polar refractile globules of difficult visualization.

Host: *C. c. japonica*.

Location in the host: ignored, oocysts found in the feces.

Pre-patent period: unknow.

Sporulation: exogenous.

Locality: Municipality of Petrópolis in State of Rio de Janeiro, Brazil

Etymology: name of the species was given by being that the smallest oocyst among species found in Japanese quails.

Discussion

Several species of *Eimeria* were described in quails. It is important to mention that the specificity factor was not considered for quails of the genus *Coturnix*, where the proximity among the host subspecies has been favorable the transmission among them, as was pointed out by Norton e Pierce (1971) when they worked with *E. bateri* in Japanese quails, although this species was previously described in the common gray quail by Bhatia et al. (1965). Like this, other factor as the morphology of the oocysts has still been continued to be of great value in the differentiation among species of the genus *Eimeria* (Long and Joyner, 1984). The absence of micropyle and the residual body in the oocyst were factors that allowed to separate this species from others ones already described by Chakravat and Kar, (1947), Tsunoda and Muraki, (1971), Tsutsumi, (1972), Svanbaev and Utebaeva, (1973), and Amoudi, (1987). The measurements of the oocysts was fundamental because the size was not observed until then in one of the species described in quails of the genus *Coturnix*. However, Bhatia et al., (1965) found different forms of *E. bateri*, including a spherical form. This form resemble plenty the oocysts found in the present study and certainly it would be classify as similar, however, They did not evaluate the Stieda body in full detail, whose structure was pointed but discreet, expressing morphologic difference to spherical form of *E. bateri* with a prominent and piriform Stieda body. Being like this, it should be denominated as a new species different from the others described before, so it was named as *Eimeria minima*.

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