

***Balantidium* SP. IN OSTRICHES (*Struthio camelus* L., 1758) IN THE STATE OF RIO DE JANEIRO, BRAZIL**

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ABSTRACT:- EDERLI, N.B.; OLIVEIRA, F.C.R. *Balantidium* sp. in ostriches (*Struthio camelus* L., 1758) in the State of Rio de Janeiro, Brazil. [*Balantidium* sp. em avestruzes (*Struthio camelus* L., 1758) no estado do Rio de Janeiro, Brasil]. *Revista Brasileira de Parasitologia Veterinária*, v. 17, supl. 1, p. 327-330, 2008. Laboratório de Sanidade Animal, Hospital Veterinário, CCTA, Universidade Estadual do Norte Fluminense Darcy Ribeiro, Avenida Alberto Lamego, 2000, Campos dos Goytacazes, RJ 28.013-602, Brasil. E-mail: foliveira@uenf.br

The aim of this work was report for the first time the occurrence of *Balantidium* sp. in ostriches reared in Rio de Janeiro state, Brazil. Feces samples from 82 ostriches were examined by the Ziehl-Neelsen technique and morphometric analyses were made of the cysts. The data were compared by a simple linear regression analysis. The cysts found ranged in size from 60.39 by 34.62 mm and 59.13 by 33.92 m in diameters. The spherical shape was confirmed by observing the shape index of 1.05 and $r = 0.9630$, which suggested there were cysts of different sizes with similar shapes. In spite of polymorphism, cysts measurements were uniform in their distribution, evidencing the possibility of a single species ($R^2 = 0.9274$). The cysts were morphologically indistinguishable from the *Balantidium* sp. cysts already reported in ostrich feces or *B. coli*. This is the first report of parasitism by *Balantidium* sp. in ostriches in Brazil. In spite of the high *Balantidium* sp. frequency, no clinical sign was observed.

KEY WORDS: Ratites, Ciliophora, *Balantidium* sp.

RESUMO

O objetivo deste artigo é relatar pela primeira vez a ocorrência de *Balantidium* sp. em avestruzes criados no Rio de Janeiro-Brasil. Amostras fecais de 82 avestruzes foram examinadas pela técnica de Ziehl-Neelsen e feitas análise morfológica dos cistos. Os dados foram analisados por regressão linear simples. Os cistos encontrados tinham tamanhos variando de 60,39 por 34,62 e 59,13 por 33,92m de diâmetros. O formato esférico foi ser confirmado pelo índice morfológico de 1,05 e $r = 0,9630$, o que sugere haver cistos de tamanhos diferentes com formas semelhantes. Estes cistos são morfológicamente indistinguíveis dos cistos de *Balantidium* sp. já descritos nas fezes de avestruzes ou de *B. coli*. Este é o primeiro relato do

parasitismo por *Balantidium* sp. em avestruzes no Brasil. Apesar do polimorfismo, as medidas dos cistos tiveram distribuição uniforme, evidenciando tratar-se de uma única espécie ($R^2 = 0,9274$). Embora a alta frequência de *Balantidium* sp. (60%), nenhum sinal clínico foi observado.

PALAVRAS-CHAVE: Ratitas, Ciliophora, *Balantidium* sp.

Commercial ostrich rearing in the world started about 150 years ago, for feather production, and more recently for leather and meat production (BLACK, 2001). Ratites (ostriches, *Struthio camelus* and emus, *Rhea americana*) have currently gained great economical importance in several regions of Brazil. There is a flock of approximately 200,000 birds that has triggered interest because of their good adaptation and potential profit. Ostrich introduction and production in Brazil started in the early 1990s. Even with the difficulties that arose resulting from the lack of technical knowledge, ostrich rearing has become a promising market and is the target of big investors (ACAB, 2007). A variety of species can parasite

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ostriches including protozoa, helminths and arthropods, and most are found in the gastrointestinal tract (PONCE GORDO et al., 2002).

Balantidium coli, a normal element of the intestinal fauna of domestic and wild pigs (PAKANDL, 1994), is a ciliated protozoa found in a wide variety of hosts, including man. Trophozoites are destroyed by fluctuation solutions, but can be seen in a feces smear. The cyst form is the most frequent stage observed in routine feces examinations (SLOSS et al., 1999) and the kidney and bean shaped nuclei can be seen. *Balantidium coli* reproduces by transverse friction and cysts form of up to 60µm in diameter. Although they are not pathogenic to pigs and are normally not pathogenic to man, *B. coli* occasionally causes ulceration of the large intestine in man, manifested clinically as diarrhea and occasionally as dysentery. The diarrhea caused in people with immune suppression may result in infirmities that are difficult to treat (JUCKETT, 1996). Acute enteritis characterized by liquid diarrhea was observed in four gorillas in the Los Angeles zoological and attributed to infection by *B. coli* (TEARE; LOOMIS, 1982). Blood and mucus were observed in the feces of one of the severely affected gorillas. This gorilla like the other gorillas recovered rapidly with treatment and *B. coli* was not seen in fecal samples after their recovery. However, gorillas with balantidiosis in the Chuputepec zoo in Mexico City did not accept metronidazole well and were treated with intramuscularly injections of dehydroemetine dihydrochloride (GUAL-SILL; PULIDO-REYES, 1994). In 1934, Hegner reported a new species, *B. struthionis*, parasiting ostriches in a zoo in the United States and Sotiraki et al. (2001) considered this new species to be specific to ostriches. *Balantidium* sp. is found in the caecum and small intestine and has been associated with dysentery in ratites in South Africa (CRAIG; DIAMOND, 1996), but their pathogenicity is still uncertain, because most of the cases have no symptoms and when clinical manifestations are present, they include the symptoms of diarrhea and weight loss. Some authors report the association of these organisms to intestinal lesions (HUCHZERMEYER, 2005), and severe symptoms can occur in debilitated animals. *Balantidium* sp. cysts have been reported parasiting ostriches in Scotland (PENNYCOTT; PATTERSON, 2001), Greece (SOTIRAKI et al., 2001), Portugal and Spain (PONCE GORDO et al., 2002).

Studies on parasite infections in ostriches are important because they open the way to generate knowledge on these infirmities in addition to information regarding diagnosis of the species not yet reported in ratites in Brazil to improve specialized human resources, to help in the control process of new pathogens to increase productivity.

Fecal samples from 82 ostriches from seven farms located in different regions of Rio de Janeiro state were collected using labeled plastic bags and refrigerated until analysis. The samples were concentrated following the modified Ritchie technique (ALLEN; RIDLEY, 1970). The sediment was used to make smears that were stained by the modified Ziehl-Neelsen

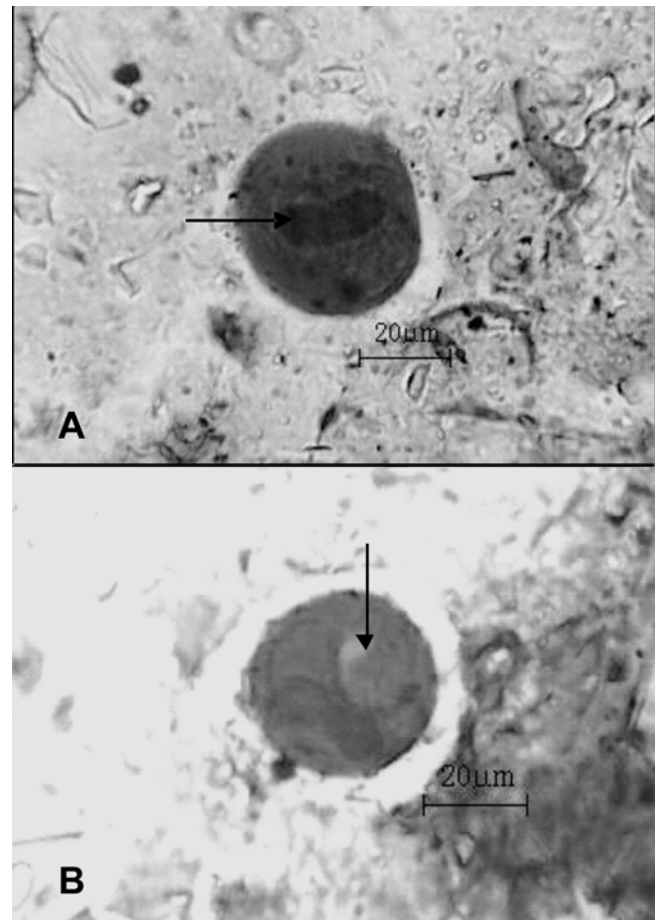


Figure 1. *Balantidium* sp. cysts in feces of ostriches reared in Rio de Janeiro state, Brazil. A and B, arrow showing macronuclei and contractile vacuole, respectively, stained by the modified Ziehl-Neelsen technique.

technique (HENRIKSEN; POHLENZ, 1981). These slides were observed under a light microscope and the morphometric analysis of the cysts was done using the "Microscopy Image Processing System-DN2 for windows" software image analysis and at 400 and 1000x magnification. The obtained data were submitted to descriptive analysis. The correlation between length and width was verified by simple regression with a 95% confidence level. All the calculations were performed using the program, Graph Pad Instat, Copyright 1992-2000, Graf Pad Software v3-05 for Windows.

Balantidium sp. cysts were found in the fecal samples analyzed (Figure 1) on a farm located at the Municipality of Cachoeira de Macacú in the State of Rio de Janeiro (Table 1). They were spherical in shape with the presence of one visible macronucleus (Figure 1A) and a micronucleus that was difficult to see. Light areas characteristic of contractile vacuole were observed in many of the stained parasites (Figure 1B). The cysts were different in size with Length ranging from 60.39 to 34.62 µm and width from 59.13 to 33.92 µm (Table 2), and their distribution along the regression line were uniform (Figure 2). The spherical shape was confirmed by observing the distribution of the points along the regression line and $r =$

Table 1. Diagnostic of *Balantidium* sp. in feces of ostriches (*Struthio camelus*) reared in the State of Rio de Janeiro, Brazil.

Municipalities	n ^a	Samples	Occurrence	
			Positive	%
Campos do Goytacazes	2	30	0	0
São Francisco do Itabapoana	2	5	0	0
Cabo Frio	2	17	0	0
Cachoeira de Macacú	1	30	18	60
Total	7	82	18	22

^aNumber of visited properties.

Table 2. Means of 93 cysts of *Balantidium* sp. observed in feces of ostriches (*Struthio camelus*) reared in Rio de Janeiro state, Brazil.

Statistic	<i>Balantidium</i> sp.		
	Length diameter	Width diameter	SI ^a
Mean	45,95	43,73	1,05
Standard Deviation	5,83	5,50	0,003
Minimum Value	34,62	33,92	1,018
Maximum Value	60,39	59,13	1,00

^aShape index (ratio of length by width).

0.9630 (Figure 2) in addition with the shape index 1.05 (Table 2).

This is the first report of parasitism by *Balantidium* sp. in ostriches in Brazil where cysts were detected in one of four farms examined with 60% of the animal parasited (Table 1). In spite of the high frequency of *Balantidium* sp., no clinical sign was observed compatible with those described in parasited ostriches (HUCHZERMEYER, 2005; CRAIG; DIAMOND, 1996), gorillas (GUAL-SILL; PULIDO-REYES, 1994; TEARE; LOOMIS, 1999) and man (JUCKETT, 1996).

The dispersion of the points along the line and the R² and r value (Figure 2) suggested that there were different sized cysts with similar shapes isolated in the ostrich feces. These cysts were morphologically indistinguishable from the *Balantidium* sp. cysts already described in ostrich feces (PENNYCOTT; PATERSON, 2001; SOTIRAKI et al., 2001; PONCE GORDO et al., 2002) or of *B. coli*, a protozoa normal in pig intestinal microbiote (PAKANDL, 1994) and a parasite of various animal species, including man (TEARE;

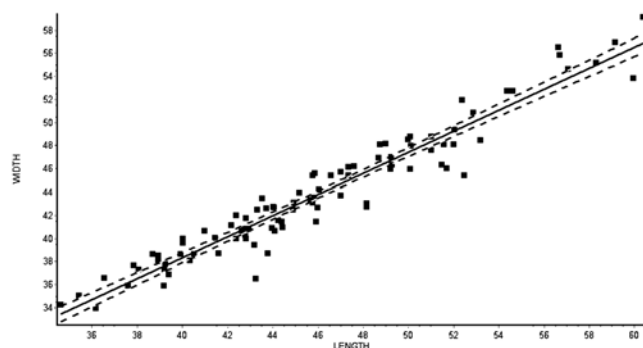


Figure 2. Linear regression of the higher diameter by smaller diameter for 93 cysts of *Balantidium* sp. Considered significant, where $Y = 1.985 + 0.9090X$, $R^2 = 0.9274$ e $r = 0.9630$.

LOOMIS, 1982; GUAL-SILL; PULIDO-REYES, 1994; JUCKETT, 1996; SLOSS et al., 1999). Therefore, the cyst morphology (Figures 1 and 2) and morphometry (Table 2) did not permit confirmation that they were *B. struthionis* (HEGNER, 1934) or species specific to ostriches as reported by Sotiraki et al. (2001).

The results of this research permit inference that *Balantidium* sp. occurs enzootically in ostriches reared in the State Rio de Janeiro and, probably, are present on farms throughout Brazil. Further research should be carried out to confirm whether the species present in the ostriches reared the State in Rio de Janeiro was *B. struthionis*, a protozoa specific to ostriches (SOTIRAKI et al., 2001) and exotic in Brazil and therefore, brought with importation of matrix is when a forming the flocks in this country or are *B. coli* and in this case characterize the importance of ostriches in the epidemiological chain of balantidiosis taking into consideration the zoonotic trait of the parasite in question.

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