Mem. Inst. Oswaldo Cruz, Rio de Janeiro, Vol. *88* (4): 567-569, oct./dec. 1993

PHILOPHTHALMUS GRALLI (DIGENEA: PHILOPHTHALMIDAE) PARASITE OF *ANAS BAHAMENSIS* AND *AMAZONETTA BRASILIENSIS,* FROM LAGOONS OF MARICÁ COUNTY, RIO DE JANEIRO, BRAZIL

LUÍS CLÁUDIO MUNIZ-PEREIRA/+ & SUZANA B. AMATO*

Curso de Pós-Graduação em Medicina Veterinária – Parasitologia Veterinária, Universidade Federal Rural do Rio de Janeiro, Caixa Postal 11077, 20236-970, Rio de Janeiro, RJ, Brasil *Departamento de Biologia Animal, UFRRJ, Caixa Postal 74512, 23851-970, Seropédica, RJ, Brasil

Forty ducks, 18 Anas bahamensis *(white-cheecked pintail) and 22* Amazonetta brasiliensis *(Brazilian duck) from Maricá and Guarapina lagoons, Maricá, RJ, Brazil, were examined. The prevalence of* Philophthalmus gralli *in* A. bahamensis *was 22.2% and in* A. brasiliensis *was 27.27%. This is the first record of* P. gralli *in the Neotropical region, and* A. bahamensis *and* A. brasiliensis *are new host records for* P. gralli.

Key words: *Philophthalmus gralli* – *Philophthalmus* – Digenea – Anatidae – *Anas* – *Amazonetta* – migratory birds – Neotropical region – Brazil

Philophthalmus gralli, an eyefluke, was described without illustration by Mathis & Leger (1910) based on specimens collected from chickens *Gallus gallus* (dom.) (L.) in Tonkin, Vietnam. Sugimoto (1928) redescribed *P. gralli* from *G. gallus* (dom.) (L.) collected in Formosa and described *P. anatinus* from the mallard *Anas platyrhynchus* (dom.) (L.), which was considered a junior synonym of *P. gralli* by Ching (1961). West (1961) redescribed *P. gralli* from experimentally infected *G. gallus* (dom.) and added a new natural host, a green heron *Butorides virescens* (L.), to this species. Yamaguti (1934) described *P. nyrocae* based on a single specimen, from an European pochard, *Aythya ferina* (L.) in Japan, but West (1961) and Ching (1961) considered *P. nyrocae* to represent an intraspecific variation of *P. gralli.* Ching (1961) studying species of *Philophthalmus* recorded *P. gralli* in Hawaii from the American coot *Fulica americana* (Gmelin). Nollen & Murray (1978) extended the known geographical distribution of this parasite to Texas, USA. *Philophthalmus gralli* was also registered in the former USSR by Skrjabin, 1947, Kasimov, 1956, Shevtsov & Zaskind, 1960 in McDonald (1969).

MATERIALS AND METHODS

A total of 18 *Anas bahamensis* (L.) and 22 *Amazonetta brasiliensis* (Gmelin) were shot (by J. B. Nacinovic, with license from the IBAMA, Instituto Brasileiro do Meio Ambiente), with a 12-gauge shotgun, using No. 9, 5 and 11 shotsizes. Collections were made between November 1989 and January 1992, from Maricá and Guarapina lagoons and mudflat areas, in Maricá County, State of Rio de Janeiro, Brazil. Host specimens were placed on ice in individual plastic bags for a few hours and later were frozen for examination in the next morning. Their sex (with a free hand sketch of the gonads), weight, total length and wing length were recorded. The birds were deposited in the Ornithological Collection of the Museu Nacional do Rio de Janeiro, Rio de Janeiro, RJ. During necropsy all organs including the eyes, cavities, ducts and bursa of Fabricius were examined for helminths, and when they were found on the eyes they were removed with the aid of a small brush. The helminths were collected, fixed and prepared as described by Amato et al. (1991). The ecological terms prevalence, mean intensity of infection, and site of infection are defined according to Margolis et al. (1982). The measurements given in the description of the specimens are in micrometers, unless otherwise specified. The numbers inside parenthesis are the mean value, and "n" is the number of specimens measured. Figures were drawn with the aid of a drawing

Supported by CNPq.

+Present address: Universidade Castelo Branco, Rio de Janeiro.

*Research Fellow CNPq.

Received 4 February 1993.
Accepted 31 March 1993.

tube on a Wild M11 light microscope. Voucher specimens were deposited in the Coleção Helmintológica da Fundação Instituto Oswaldo Cruz (CHIOC), Rio de Janeiro, RJ, Brazil.

DESCRIPTION

Philophtalmus gralli Mathis & Leger, 1910

DESCRIPTION (based on 35 specimens mounted *in toto,* 9 measured): Philophthalmidae. Body elongate, 2.12-3.71 mm (2.71 mm) long, 0.604-1.28 mm (0.834 mm) wide. Tegument spinose in forebody. Oral sucker subterminal, with complex muscular apparatus, 204-329 (260) long, 277-421 (332) wide. Ventral sucker 343-549 (418) long, 343-494 (391) wide; oral sucker to acetabulum width ratio 1:1.1-1.3. Prepharynx short, 7-66 (29.3, n=3) long; pharynx well developed, 183-293 (226) long, 183-403 (277) wide, oral sucker to pharynx width ratio 1:0.6-1; esophagus 50-146 (113) long; ceca extending almost to posterior extremity. Testes intercecal, postovarian, tandem to oblique, anterior testis 161-416 (258) long, 234-445 (329) wide, posterior testis 161-438 (248) long, 241-504 (319) wide; cirrus pouch elongate, 0.060-1.08 mm (0.792 mm) long, 44-153 (101) wide, with internal seminal vesicle, pars prostatica, and spined, protractible cirrus. Ovary submedian, with tail-like projection posteriorly, 88-219 (153) long, 88-256 (181) wide; ovary to testis width ratio 1:0.9-3.1; oviduct short. Vitelline glands tubular, occupying 79-89% of space between posterior border of ventral sucker to anterior border of anterior testis. Mehlis' gland immediately postovarian, uterine seminal receptacle present; uterine loops ventral to ceca and to vitelline glands, reaching posterior border of acetabulum, sometimes extending beyond posterior testis; metraterm muscular, glandular, parallel to cirrus pouch; genital atrium bifurcal. Eggs numerous, miracidia fully developed, eyespots conspicuous or not, 64-90 (70) long, 22-40 (33) wide (collapsed). Excretory pore terminal, slightly dorsal; conspicuous, ascending dorsal arms reaching pharynx zone.

Taxonomic summary

Hosts: *Anas bahamensis* L., *Amazonetta brasiliensis* (Gmelin).

Site of infection: lower portion of the eye.

Locality; Lagoon of Maricá, Maricá County, State of Rio de Janeiro, Brazil.

Prevalence: *Anas bahamensis* 22.2%, *Amazonetta brasiliensis* 27.27%.

Mean intensity of infection: *Anas bahamensis* 3.25, *Amazonetta brasiliensis* 8.33.

Intensity of infection range: *Anas bahamensis* 1-8, *Amazonetta brasiliensis* 1-33.

Other hosts: AVES - Anseriformes: *Anser anser, A. anser* (dom.), *A. cygnoides, A. fabalis, Anas platyrhynchos* (dom.), *A. acuta, A. angustirostris, Aythya ferina, Gruiformes: Fulica americana,* Galliformes: *Melleagris gallopavo* (dom.), *Pavo cristatus, P. muticus.* MAMMALIA - Rodentia: *Rattus norvegicus* (lab.) [exper.], Lagomorpha: *Oryctolagus cuniculus* [exper.].

Geographical distribution: Europe (Dneiper river), Asia (Vietnam, Formosa), South America (Brazil), North America (USA).

Specimens deposited: Voucher specimens: CHIOC No. 33049 a and b.

Remarks

All the characters described, agree with those reported by West (1961) and Ching (1961), except for the ovary to testis width ratio, which was 1:0.9-3.1. Ching (1961) reported 1:2 for *P. gralli* and 0.8-3.0 for other nine species of *Philophthalmus,* so this character must be regarded as an interspecific variation.

The geographical distribution of *P. gralli* includes the Neartic, Paleartic and Oriental regions. The finding of this species in the State of the Rio de Janeiro, Brazil extends its known distribution to the Neotropical region. *Amazonetta brasiliensis* and *Anas bahamensis* are new host record for *P. gralli.* In Brazil, up to now, there was only one species of *Philophthalmus* registered, *P. lachrymosus* Braun, 1902, described from a gull, *Larus macullipenis* (Lichtenstein). *Philophthalmus lachrymosus* differs from *P. gralli* mainly by the vitelline glands, which in the former, are follicular.

According to Canaris et al. (1981), parasites of migratory birds are unique in the sense that they may be transported over long distances. Tallman et al. (1985) suggesed that *Zonorchis microrchis* Travassos, 1944 collected from birds in Louisiana, probably were trans-

ported to the United States of America from South America. Considering that *P. gralli* was collected in Brazil from birds which stay during the whole year in a lagoon, which serves for wintering and staging grounds for some migratory birds such as *Tringa solitaria* (Wilson) and *T. melanoleuca* (Gmelin) among others, this digenean could have been transported from other localities by some migratory bird. Although *P. gralli* was not found or registered in any other migratory bird, from the lagoons of Maricá, RJ, other species of the genus *Philophthalmus* are known as parasites of some migratory charadriiform birds. According to McDonald (1969) *P. hegeneri* Penner & Fried, 1963, *P. muraschkinzeni* Tretiakova, 1948 and *P. nocturnus* Looss, 1907 are parasites of Charadriiformes.

Alicata & Ching (1960) identified the prosobranch snail, *Tarebia granifera* (Lamarck, 1816), as the intermediate host of *Philophthalmus* in Hawaii. *Tarebia granifera* and the related *Thiara (= Melanoides) tuberculata* (Müller, 1774) have been reported to occur together in Texas, USA, (Jacobson, 1975) and *T. granifera* have been found in Cuba, Puerto Rico and Dominican Republic (Jacobson, 1975). In the lagoon of Maricá thiariids, probably *T. tuberculata,* are abundant so the conditions for the maintenance of life cycle of *P. gralli* are there facilitating its establishment in this area.

ACKNOWLEDGEMENTS

To Prof. Jorge Bruno Nacinovic of the Ornithological Section, Museu Nacional do Rio de Janeiro (UFRJ), for the capture and identification of the birds, and for the discussion about the host's biology. To Prof. Dante M. Teixeira head of the Ornithological Section, Museu Nacional do Rio de Janeiro (UFRJ), for the acceptance of host specimens for deposit. To Dr. José Felipe R. Amato, for critically reviewing the manuscript.

REFERENCES

ALICATA, J. E. & CHING, H. L., 1960. Observations on the history of *Philophthalmus,* a species of eyefluke of birds in Hawaii, p. 67-73. In *Libro Homenaje al Dr. Eduardo Caballero y Caballero.* Editorial Politecnica, México, D. F., México.

AMATO, J. F. R.; BOEGER, W. A. & AMATO, S. B., 1991. *Protocolos para laboratório - coleta e processamento de parasitos do pescado.* Imprensa Universitária. Universidade Federal Rural do Rio de Janeiro, Seropédica, RJ, 81 p.

CANARIS, A. G.; MENA, A. C. & BRISTOL, J. R., 1981. Parasites of waterfowl from southern Texas: III. The green-winged teal, *Anas crecca. J. Wild. Dis., 17:* 57-63.

CHING, H. L., 1961. The development and morphological variation of *Philophthalmus gralli* Mathis and Leger, 1910 with a comparison of species of *Philophthalmus* Looss, 1899. *Proc. Helm. Soc. Wash., 28:* 130-138.

JACOBSON, N. K., 1975. The freshwater prosobranch *Tarebia granifera,* in Oriente, Cuba. *Nautilus, 89* (3): 106.

McDONALD, M. E., 1969. *Catalogue of helminths of waterfowl (Anatidae).* Bureau of Sport, Fish and Wildl., Spec. Sci. Rep. Wildl., No. 126, USA, 692 p.

MARGOLIS, L.; ESCH, G. W.; HOLMES, J. C.; KURIS, A. M. & SCHAD, G. A., 1982. The use of ecological terms in parasitology (report of an ad hoc committee of the American Society of Parasitologists). *J. Parasitol., 68:* 131-133.

MATHIS, C. & LEGER, L., 1910. Douve oculaire de la poule. *Bull. Soc. Path. Exot., 3:* 245-251.

NOLLEN, P. M. & MURRAY, H. D., 1978. *Philophthalmus gralli:* identification, growth characteristics, and treatment of an oriental eyefluke of birds introduced into the continental United States. *J. Parasitol., 64:* 178-180.

SUGIMOTO, M., 1928. On the trematode parasite (genus *Philophthalmus*) found in the eyes of Formosan domestic birds. *Dobutsugaku Zasshi, 40:* 343-351.

TALLMAN, E. J.; CORKUN, K. C. & TALLMAN, D. A., 1985. The trematode fauna of two intercontinental migrants: *Tringa solitaria* and *Calidris melanotos* (Aves: Charadriformes). *Amer. Midl. Nat., 113:* 374-383.

WEST, A. F., 1961. Studies on the biology of *Philophthalmus gralli* Mathis and Leger, 1910 (Trematoda: Digenea). *Amer. Midl. Nat., 66:* 363-383.

YAMAGUTI, S., 1934. Studies on the helminth fauna of Japan. Part 3. Avian trematodes II. *Jap. J. Zool., 5:* 543-583.