Sanguinicola platyrhynchi n. sp. (DIGENEA: SANGUINICOLIDAE) PARASITE OF VISCERAL CAVITY OF Hemisorubim platyrhynchos (VALENCIENNES, 1840) (PISCES: PIMELODIDAE) FROM THE FLOODPLAIN OF THE UPPER PARANÁ RIVER, BRAZIL

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Received February 23, 2001 – Accepted May 31, 2001 – Distributed November 30, 2002
(With 2 figures)

ABSTRACT

A new species is of the genus Sanguinicola Plehn, 1905 described, Sanguinicola platyrhynchi n. sp., digenetic parasite of visceral cavity of Hemisorubim platyrhynchos (Valenciennes, 1840) from the floodplain of the upper Paraná River, Brazil. The species has been thus included because of the presence of separate dorsal genital pores, while differing from other species of the same genus mainly in digestive apparatus features, genital pore position, and infection site. Emendation of generic diagnosis is included.

Key words: Sanguinicola, Sanguinicola platyrhynchi n. sp., visceral cavity, Hemisorubim platyrhynchos, Baía River.

RESUMO

Sanguinicola platyrhynchi n. sp. (Digenea: Sanguinicolidae), parasita da cavidade visceral de Hemisorubim platyrhynchos (Valenciennes, 1840) (Pisces: Pimelodidae) da planície de inundação do alto rio Paraná, Brasil

É descrita uma nova espécie do gênero Sanguinicola Plehn, 1905, Sanguinicola platyrhynchi n. sp., digenético parasita da cavidade visceral de Hemisorubim platyrhynchos (Valenciennes, 1840), da planície de inundação do alto rio Paraná, Brasil. A nova espécie foi incluída neste gênero por possuir poros genitais separados e dorsais e diferir de outras espécies do mesmo gênero, principalmente pelas características do sistema digestório, da posição dos poros genitais e do local de infecção. É realizada uma emenda da diagnose genérica.

Palavras-chave: Sanguinicola, Sanguinicola platyrhynchi n. sp., cavidade visceral, Hemisorubim platyrhynchos, rio Baía.

INTRODUCTION

The host Hemisorubim platyrhynchos is a fish of the Pimelodidae family, widely distributed in the great rivers of South America, from the Orinoco to the basin of the Plata (Burgess, 1989).
world-wide (Yamaguti, 1958; Thatcher, 1993). In the South America Thatcher (1993) mentioned the occurrence of a species, *S. argentinensis*, a parasite of freshwater fishes in Argentina. Based on digestive apparatus features and infection site, an emendment of generic diagnosis is made.

**MATERIAL AND METHODS**

Specimens of *Hemisorubim platyrhynchos* were caught in the Baía River, on the floodplain of the upper Paraná River, State of Mato Grosso do Sul. Digeneans were removed and fixed in 5% formalin, stained in Hematoxilin or Langeron’s Chloridric Carmine, and mounted in Canada balsam (Eiras et al., 2000). Specimens destined for scanning electron micrographs (SEM) were fixed in 3% glutaraldehyde, buffered with 0.2M sodium cacodylate to pH 7.4 at approximately 7ºC, dehydrated in ethanol, dried by using the critical point technique, covered with gold, and examined with a Phillips SEM 505 electron microscope. The drawing was done with a drawing tube in a Nikon Alphaphot-2 microscope. Measurements (average and range appear inside brackets) are in millimeters. Term prevalence, mean intensity, and mean abundance of infection are used in accordance with Bush et al. (1997). Holotype and paratypes were deposited in the Helminthological Collection of Oswaldo Cruz Institute (CHIOC) under numbers 34360, 34361 a-b.

**RESULTS**

Family *Sanguinicolidae* Graff, 1907

Subfamily *Sanguinicolinae* Yamaguti, 1958

*Sanguinicola* Plehn, 1905

emended from Yamaguti, 1971

**Generic diagnosis:** Body is lanceolate, tegument with or without fine marginal striations and with or without denticulations, except for the extremities, from which the anterior may protrude in form of a proboscis. It sometimes presents a small muscular structure under the mouth. Esophagus is long, may present a fusiform swelling. Intestine is divided in 4 to 6 branches. Tests in two rows in median field between ovary and intestinal ceca. Cirrus pouch is present. Male genital pore is dorsal, median, submedian, or near posterior extremity. Ovary is divided into symmetrical lobes in the posterior half of body. Uterus is poorly developed, containing only one egg at a time, opening besides or anterior to male pore. Eggs with lateral projection, contain miracidia. Vitellaria are lateral to esophagus, intestine, and tests, and sometimes lateral and posterior to ovary; vitelline duct joins oviduct just before ootype is formed. It parasitic in the vascular system or visceral cavity of freshwater fishes.

**Type species:** *Sanguinicola inermis* Plehn, 1905, in heart and gills of *Cyprinus carpio*, Europe.

**Other species:** *Sanguinicola argentinensis* Szigat, 1951 of *Prochilodus platensis* from Argentina; *S. armatus* Plehn, 1905 of *Tinca tinca* from Germany; *S. chalmersi* Odhner, 1924 of *Alcehoglanis occidentalis*, *Synodontes schall* from Sudan; *S. cistafer* (Erickson & Wallace, 1959) of *Notropis heterolepis*; *S. dentatus* (Paperna, 1964) Smith 1972 of *Clarias lazera* from Israel; *S. huronis* Fischthal, 1949 of *Huo salmoids*, *Micropterus d. dolomieu* from Wisconsin; *S. incognita* Akhmerov, 1959 of *Ctenopharyngodon idella* from RSFSR; *S. intermedius* Ejsmont, 1926 of *Tinca* spp., *Carassius* spp., *Cyprinus* spp. from Europe; *S. lophophorus* Erickson & Wallace, 1959 of *Notropis hudsonius* from Minnesota; *S. magnus* Hu, Long & Lee, 1965 of *Ctenopharyngodon idellus* from China; *S. occidentalis* Van Cleave & Mueller, 1932 of *Stizostedion vitreum*, *Perca flavescens* from Wisconsin; *S. skrjabini* Akhmerov, 1960 of *Hypophthalmichthys molitrix* from Amur Basin; *S. volgensis* Rašin, 1929 of *Pelecus cultratus*, *Alburnus alburnus* from Czechoslovakia.

**Remarks:** The emended diagnosis characterizes the genus *Sanguinicola* with species having (1) tegument without marginal striations; (2) denticulations in the anterior extremity of the body; (3) a small muscular structure under the mouth; (4) six intestinal ceca; (5) been found in visceral cavity.

*Sanguinicola platyrhynchi* n. sp.

(Figs. 1 and 2)

**Description:** Description was based on 20 mounted specimens in toto; among these 5 specimens were measured. Body is elongated, slender, flattened dorso-ventrally, 2.93 (2.30-3.34) long and 0.54 (0.35-0.70) wide. Smooth tegument. Mouth apical and very small, surrounded by four rows of denticles, followed by a muscular organ 0.006 (0.009-0.01) long. Esophagus is narrow, 0.02 (0.01-0.03) wide and 0.75 (0.64-0.84) long, with
Sanguinicola platyrhynchi n. sp. was described as a parasite in the visceral cavity of Hemisorubim platyrhynchos (Pisces: Pimelodidae), common name “jurupoca”. The host type is Hemisorubim platyrhynchos, and the locality type is Baía River on the floodplain of the upper Paraná River, Brazil. The location of infection was in the visceral cavity. The prevalence was 74.6%, the mean intensity was 4.2, and the mean abundance was 3.1. The deposited material is the Helminthological Collection of Oswaldo Cruz Institute (CHIOC) under numbers 34360, 34361 a-b.

The etymology of the specific name mentions the host species. The taxonomic summary includes the host type, locality type, location, prevalence, mean intensity, mean abundance, deposited material, and etymology.

The discussion section explores the appropriateness of the genus Plehniella and the genus Sanguinicola. It highlights the presence of two genital pores observed by the author of this species, Yamaguti (1958), who transferred it to the genus Sanguinicola. However, Lunaschi (1985) revalidated the genus Plehniella after observing the existence of a common genital pore in Argentinian specimens. The species was transferred again to this genus.

In spite of specimens analyzed in this paper presenting six intestinal ceca, a characteristic of the genus Plehniella, a detailed study of the genitals disclosed separate and dorsal genital pores, characteristic of the genus Sanguinicola. The male genital pore of Sanguinicola platyrhynchi n. sp. is hidden by an expanded tegument. Confirmation of the existence of these pores was possible using the SEM, which allowed observing a great mucus concentration in the posterior region of the body, suggesting the existence of glandular cells in this region.

Sanguinicola platyrhynchi differs from S. argentinensis, the only South American species, mainly in body dimensions, dilatation position at esophagus, intestinal ceca number, and infection site. S. argentinensis is a parasite of the heart and blood vessels of freshwater fishes in Argentina.
Fig. 1 — Ventral view of internal organs of *Sanguinicola platyrhynchi* n. sp. parasite of *Hemisorubim platyrhynchos*.
Sanguinicola platyrhynchi n. sp. PARASITE IN VISCERAL CAVITY

Fig. 2 — Scanning electron micrographs (SEM) of Sanguinicola platyrhynchi n. sp. parasite of Hemisorubim platyrhynchos. a) Dorsal view (scale bar: 1 mm); b) ventral view (scale bar: 1 mm); c) posterior end of body (scale bar: 0.1 mm); d) mouth (scale bar: 0.1 mm). Arrows indicate genital pores.
In spite of the absence of pharynx and oral sucker as features of the Sanguinicolidae, Kirk & Lewis (1993) observed a small muscular organ adjacent to the mouth of *S. inermis*, resembling that observed in our specimens of *S. platyrhynchi*. These authors suggested that it was a poorly developed oral sucker, and so excluded from descriptions, and likely present in a great number of sanguinicolid species such as *S. platyrhynchi*. Thatcher (1993) also presented measures of a muscular organ in *S. argentinensis* Szidat (1951). However, the author calls this organ a pharynx. McMichael-Phillips *et al.* (1994) showed the presence of this muscular complex well-developed in cercariae of *S. inermis*. These authors agreed with Kirk & Lewis (1993) who stated that this muscular element can be an oral sucker, but emphasized the need for further ultrastructural studies on other species of the family. Lunaschi (1985) treated these organs as “muscular structures which form the lumen of the mouth” in *P. coelomicola*.

Acknowledgments — We thank Nupélia (Center for Research in Limnology, Ichthyology, and Aquaculture) and the Graduate Course in Ecology of Continental Aquatic Environments, State University of Maringá for providing the facilities to carry out this work. We are also grateful Dr. Daura Regina Eiras Stofella, responsible for the Center of Electronic Microscopy of the Federal University of Paraná, and Dr. Marion Haruko Machado and Dr. Ricardo Massato Takemoto of the State University of Maringá, for their suggestions and reading of the manuscript.

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