

## SYSTEMATICS, MORPHOLOGY AND PHYSIOLOGY

A New Species of *Aquanirmus* Clay & Meinertzhagen (Phthiraptera: Philopteridae) Parasitic on the Great Grebe, *Podiceps major* (Aves: Podicipedidae), in Argentina and ChileARMANDO C CICCHINO<sup>1</sup>, DANIEL A GONZÁLEZ-ACUÑA<sup>2</sup>

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Una Nueva Especie de *Aquanirmus* Clay & Meinertzhagen (Phthiraptera: Philopteridae) Parásito de Huala, *Podiceps major* (Aves: Podicipedidae), en Argentina y Chile

RESUMEN - Se describe e ilustra la nueva especie *Aquanirmus major* Cicchino & González Acuña hospedada en ejemplares de *Podiceps major* provenientes de distintas localidades de Argentina y Chile, entregando afinidades y diferencias con las restantes tres especies incluidas en el complejo *A. emersoni*.

PALABRAS CLAVE: Piojo masticador, piojo de aves, Ichnocera, Sudamérica, ectoparásito

ABSTRACT - The new species *Aquanirmus major* Cicchino & González Acuña found on the Great Grebe, *Podiceps major*, from different localities of Argentina and Chile, is described and illustrated, giving comments on its affinities and differences with the remaining three species included in the *Aquanirmus emersoni*-species complex.

KEY WORDS: Chewing lice, bird lice, Ischnocera, South America, ectoparasite

Grebes are parasitized by species belonging to three genera: *Aquanirmus* Clay & Meinertzhagen (Ischnocera: Philopteridae) (12 species exclusively restricted to Podicipedidae), *Pseudomenopon* Mjoeberg (Amblycera: Menoponidae) [nine species, eight on Gruiformes and Charadriiformes (Jacanidae), and one in Podicipedidae], and *Eulaemobothrion* Cummings (Amblycera: Laemobothriidae) (13 species on Opisthocomiformes, Ciconiiformes and Gruiformes, and one in Podicipedidae) (Price *et al* 2003). Edwards (1965) reviewed the known species of *Aquanirmus* and described five new taxa, with additional species subsequently added by Kettle (1974) and Castro & Cicchino (2000). A list of the lice species found on Grebes from Argentina was subsequently published by Cicchino & Castro (1998a, 1998b). In this contribution, we describe a new species of *Aquanirmus* found on *Podiceps major* Boddaert in Argentina and Chile.

Birds from Argentina were captured with mist-nets. Each netted bird was immediately wrapped with an absorbent paper, put in individual plastic bags containing *ca.* 2 cm<sup>3</sup> ethyl acetate in order to kill lice *in situ*, and then frozen as soon as possible. In the laboratory each bird was carefully searched for lice by a feather-by-feather procedure. Chilean lice specimens were obtained from Museum study skins,

in all cases corroborated by the presence of eggs typical of *Aquanirmus* species (see Cicchino & Castro 2000), or came from birds crashed by vehicles in roads.

Lice were slide-mounted following conventional procedures (Price *et al* 2003). Drawings were made using a *camera lucida* attached to a Wild m-20 microscope. All measurements were taken from mounted specimens by means of a calibrated eyepiece, all expressed in millimeters and those of the body are identified by the following abbreviations: HL head length, HW maximum width of the head, PTW maximum width of prothorax, MTW maximum width of metathorax, TL total body length, GL maximum length of the genitalia, GW maximum width of the latter. Measurements include ranges and, in parenthesis, mean and standard deviation, of all the specimens examined. Antennal segments were measured along their longitudinal axis, that is, expressing their maximum length without their membranaceous ends. The length of the whole antenna has been calculated considering all segments in a straight line, including the scape. The term "antennomere" used in descriptions refers to the segments of the antennal flagellum only, that is, scape is not included. Discrepancies in some of the body measurements expressed in Table I and those given by Eibel (1965) are due to the

Table 1 Body measurements (in mm) of the males and females of the *Aquanirmus emersoni*-species group.

Body measurement	Species	<i>Aquanirmus emersoni</i> Edwards	<i>Aquanirmus occidentalis</i> Edwards	<i>Aquanirmus podilymbus</i> Edwards	<i>Aquanirmus major</i> new species
HL	Male	0.470-0.480	0.510-0.530	0.480-0.500	0.495-0.530
	Female	0.620-0.630	0.590-0.630	0.560	0.632-0.668
HW	Male	0.390-0.420	0.390-0.440	0.360-0.370	0.426-0.440
	Female	0.510	0.490-0.210	0.420-0.430	0.551-0.612
An	Male	0.261-0.264	0.241-0.270	0.235-0.240	0.225-0.249
	Female	0.210-0.240	0.210-0.240	0.191-0.200	0.225-0.235
An I	Male	0.096-0.102	0.098-0.106	0.085-0.090	0.073-0.076
	Female	0.056-0.066	0.056-0.066	0.050-0.052	0.070-0.073
An II	Male	0.069-0.073	0.069-0.076	0.060-0.065	0.059-0.070
	Female	0.078-0.098	0.063-0.066	0.056-0.060	0.069-0.074
TL	Male	1.640-1.670	1.720-1.880	1.580-1.650	1.681-1.860
	Female	2.340-2.348	2.170-2.360	2.110-2.120	2.405-2.645
GL	Male	0.271-0.280	0.278	0.210-0.220	0.216-0.220
GW	Male	0.155-0.165	0.162-0.175	0.135-0.140	0.136-0.142
Source of information		Edwards (1965)	Edwards (1965)	Edwards (1965)	Present study

HL = head length, HW = maximum width of the head, TL = total body length, GL = maximum length of the genitalia, GW = maximum width of the latter, An = maximum length of the whole antenna, An I = length of the antennomere I, An II = length of the antennomere II

larger number of specimens in here examined, averaging 10 specimens for each sex.

Because general cephalic, thoracic and abdominal chaetotaxy is markedly conserved among species, as well as the lacking of abdominal discrete sterna plates (see Edwards 1965), these structures are omitted from the description.

Repository of specimens: holotype and paratypes from Argentina in the collection of Museo de La Plata, La Plata, Buenos Aires Province, Argentina (MLP). Paratypes from Chile in the collection of Facultad de Ciencias Veterinarias, Universidad de Concepción, Chillán, Chile (UNCC).

#### *Aquanirmus major*, new species (Figs 1-6, 8, 10, 12)

*Aquanirmus* sp.n. Cicchino & Castro 1998b: 121.

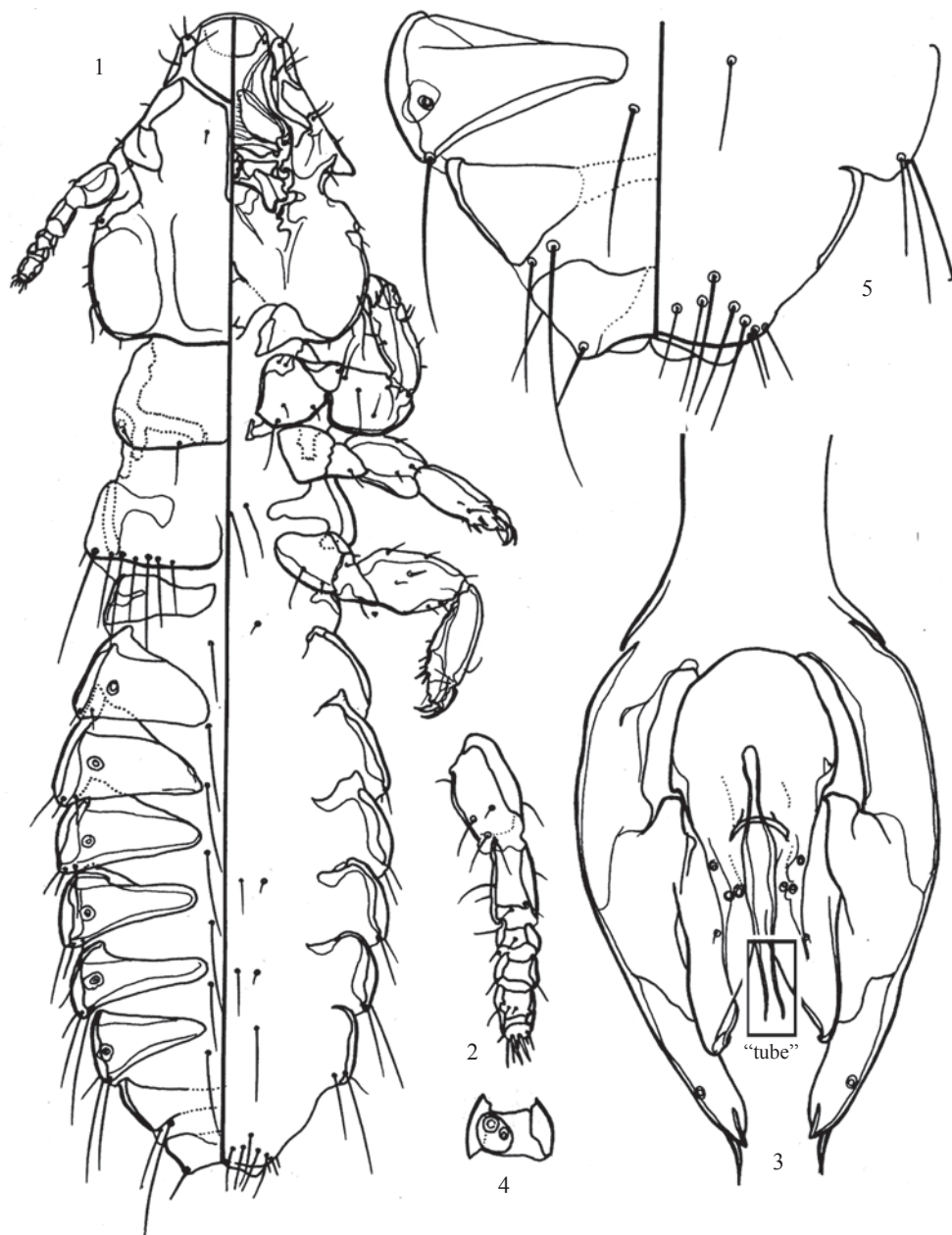
**Diagnosis.** A distinctive member of the *emersoni* species-group (*sensu* Edwards 1965), by having in both sexes large body measurements and wide head (cephalic index HL/OW = 1.11-1.48), and in males by having a long "tube" in the external genitalia.

**Male** (12 specimens measured). General habitus as in Fig 1. Pigmentation pattern much as for *A. emersoni*, best shown in Fig 6. Head short and wide, cephalic index HL/HW = 1.16-1.23 (Figs 1, 10). Antenna relatively shortened (Figs 2, 10), with antennomere I somewhat longer than II (see Table 1). Last abdominal tergite protruding beyond the abdominal apex (Fig 5). External genitalia (Figs 3, 12) with endomeral complex and proportions of parameres distinctive within the *emersoni*-species group, reminiscent of *A. podilymbus* Edwards (Fig 13)

in general structure and measurements, but differing chiefly in: sides of proximal portion of the basal plate slightly convex and almost parallel-sided, endomeral complex much larger, "tube" very long and parameres noticeably slender (cfr. Figs 12, 13). Body measurements (n = 10): HL 0.495-0.530 (0.517 ± 0.012), HW 0.426-0.440 (0.432 ± 0.006), PTW 0.320-0.325 (0.322 ± 0.003), MTW 0.370-0.390 (0.380 ± 0.008), GL 0.216-0.220 (0.218 ± 0.002); GW 0.136-0.142 (0.139 ± 0.003), TL 1.681-1.860 (1.765 ± 0.008).

**Female** (21 specimens measured). Chromatic features essentially as for male, and reminiscent of *A. podilymbus*, (cfr. Figs 8, 9). Head relatively short and wide (cephalic index = 1.11-1.48). Antenna short, 0.225-0.235; antennomere II short, 0.069-0.074 (Fig 4). Sternite VIII with 6-9 + 5-9 (averaging 7) medium long setae in a caudally convex outer row, and 7-9+7-10 (averaging 7) much shorter setae in an inner row. Body measurements (n = 10): HL 0.632-0.668 (0.652 ± 0.012), HW 0.551-0.612 (0.593 ± 0.008), PTW 0.380-0.410 (0.390 ± 0.008), MTW 0.450-0.456 (0.452 ± 0.003), TL 2.405-2.645 (2.523 ± 0.090).

**Remarks.** Within the *emersoni*-species group found in southern South America, *P. major* sp. nov. is comparable only with *P. podilymbus*, from which differs greatly in both sexes by size and most of the body measurements as well as in proportions of the head (Table 1, Figs 6-9), and, additionally in males by shape and proportions of the basal plate and endomeral complex of the external genitalia (Figs 12-13). Other close species not reaching this area is *A. emersoni* Edwards, from which *A. major* differs in both sexes by having consistently larger body measurements (Tables 1), in males by having the antennomere



Figs 1-5 *Aquanirmus major*, new species: 1. male, dorsal/ventral views; 2. right male antenna; 3. male external genitalia; 4. female antennomere II; 5. male abdominal terminalia, dorsal and ventral views.

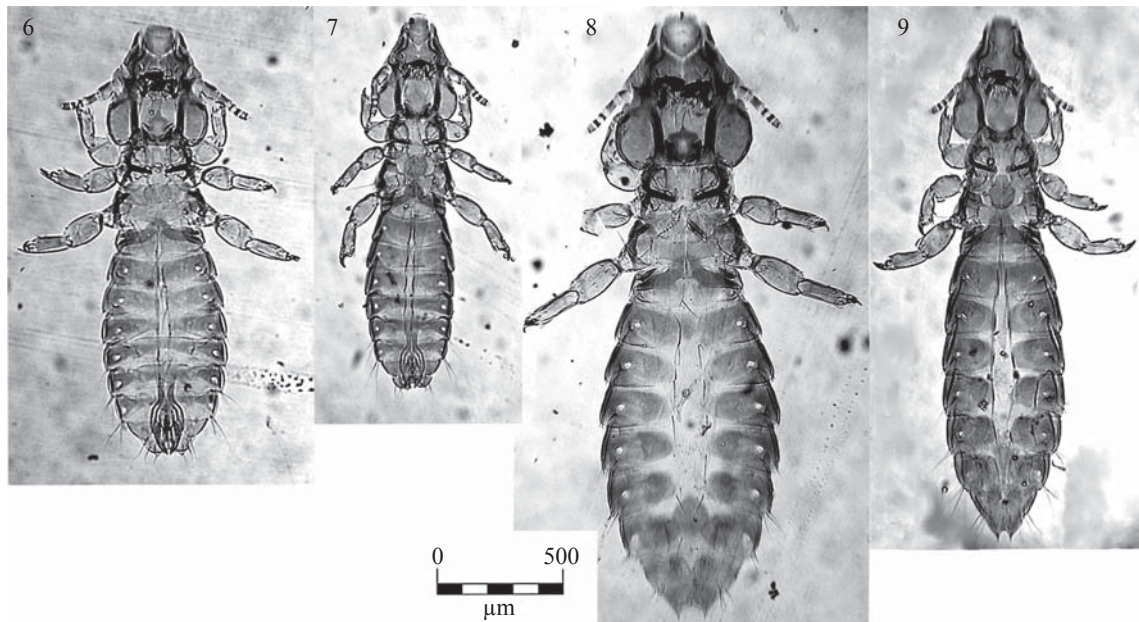
I noticeably short and proportions of the endomerall complex and longer “tube” of the same, and in females by the head proportionally wider and a shorter antennomere II (Table 1).

**Prevalence of parasitism.** Eight out of nine individual hosts examined from Argentina and Chile were parasitized by this species. Up to date, this is the only louse species found in this host.

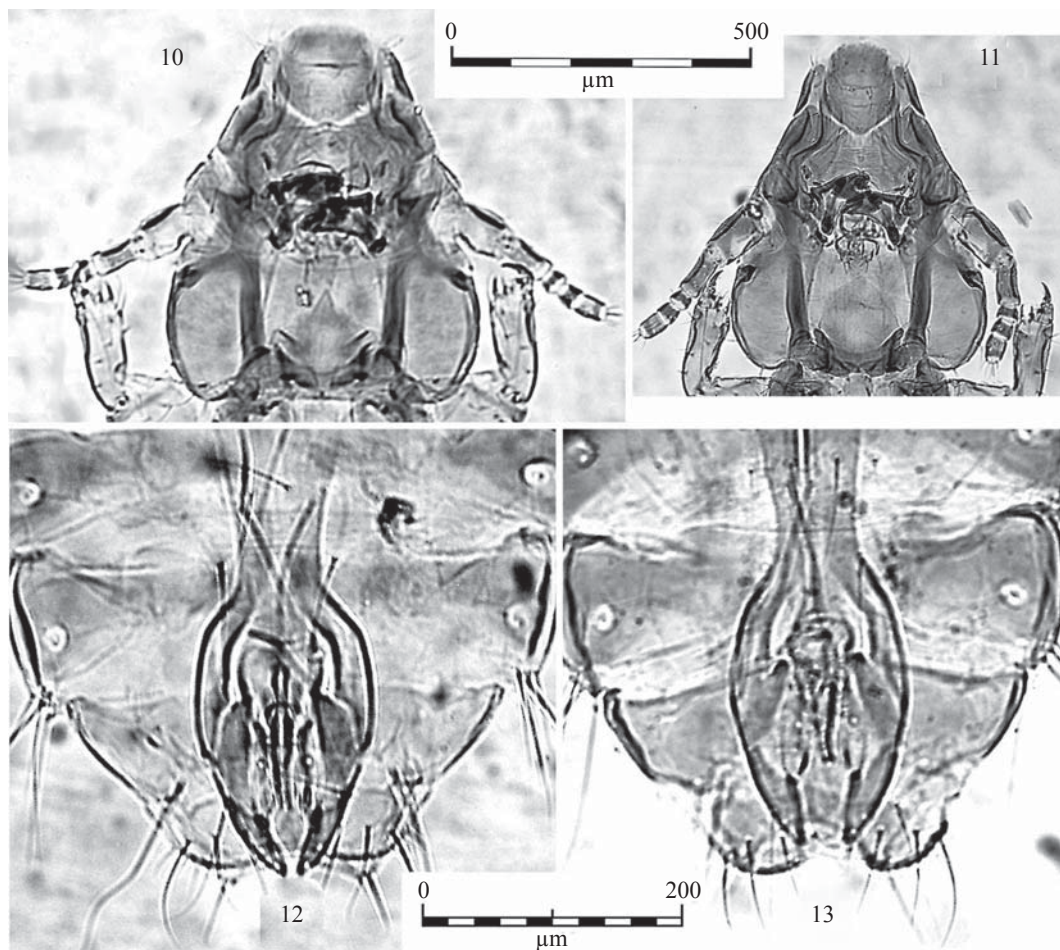
**Type host.** The Great Grebe, *P. major*. It inhabits both sides of the Andes, in almost all Argentine territory (Olrog 1979) and from Bahía Salada (Atacama) to Tierra del Fuego in Chile (Araya & Millie 1991). In addition, its range extends northward

to coastal areas of Peru, and eastward to Paraguay, Uruguay and south of Brazil. All specimens from both countries belongs to the nominotypic subspecies, *P. m. major*.

**Specimens examined. ARGENTINA. Buenos Aires Province:** male Holotype and 12 female paratypes, Laguna Chascomús, Chascomús District, XI-1981, A C Cicchino.; two male and two female paratypes, Laguna Guaminí, Guaminí District, 23-V-1994, A C Cicchino.; one female paratype, Laguna Mar Chiquita, Mar Chiquita District, V-2000, A C Cicchino.; five male and 11 female paratypes, Punta Mogotes, General Pueyrredón District, 10-X-2008 Tiranti-Cicchino. **Río Negro Province:** five male and six female paratypes, Lago Pellegrini,



Figs 6-9 6-7 males of: 6. *Aquanirmus major* new species; 7. *A. podylimbus* Edwards. 8-9 females of: 8. *A. major* new species; 9. *A. podylimbus*.



Figs 10-13 10-11 male heads of: 10. *Aquanirmus major* new species, 11 *A. podylimbus*. 12-13 male external genitaliae of: 12 *A. major* new species; 13 *A. podylimbus*.

General Roca District, 14-VI-1981, A C Cicchino. **CHILE**: three male, two female paratypes, Lago Rapel **VI Región**, 31-VII-1975 R Philippi; one male paratype, Bahía Inutil, Tierra del Fuego **XII Región**, VII 1955 J Carpeneto, one male paratype Rio Valdivia **XIV Región**, I-1942, J Carpeneto, (collected in June and July 2002 by Daniel González-Acuña).

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