New records of chewing lice (Insecta, Phthiraptera) from birds of southern Brazil, with description of a new species

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ABSTRACT. A collection of chewing lice was studied from the Natural History Museum of the Universidade Católica de Pelotas, Rio Grande do Sul, Brazil. Twenty three samples from 16 bird species were examined. Included therein was a new species of the genus *Plegadiphilus* Bedford, 1939 which is described, illustrated and compared to *P. cayennensis* Emerson & Price, 1969. An updated list of chewing lice species recorded from birds of that state is presented.

KEYWORDS. Phthiraptera, Amblycera, Ischnocera, *Plegadiphilus riograndesis* sp. nov., Brazil.

RESUMO. Novos registros de malófagos (Insecta, Phthiraptera) em aves do sul do Brasil, com a descrição de uma nova espécie. Foi estudada uma coleção de malófagos depositada no Museu de História Natural da Universidade Católica de Pelotas, Pelotas, Rio Grande do Sul, Brasil. Vinte e três amostras provenientes de 16 espécies de aves foram identificadas, dentre as quais uma nova espécie do gênero *Plegadiphilus* Bedford, 1939 é descrita, ilustrada e comparada com *P. cayennensis* Emerson & Price, 1969. Uma lista atualizada com as espécies de malófagos registradas em aves no Estado do Rio Grande do Sul é apresentada.

PALAVRAS-CHAVE. Phthiraptera, Amblycera, Ischnocera, *Plegadiphilus riograndesis* sp. nov., Brasil.

The Brazilian State of Rio Grande do Sul has 610 bird species from 21 orders reported to date (Belton, 1994), which represents approximately 35% of the Brazilian avifauna. Despite such richness and diversity, the avian ectoparasites of the state are not well known. A few studies focusing on chewing lice (Insecta, Phthiraptera) have been conducted in this region, mostly on captive birds in rehabilitation centers. The relative ease of obtaining birds from such centers has stimulated additional studies in other parts of Brazil (Freitas *et al.*, 2002; Silva *et al.*, 2004, 2009; Valim *et al.*, 2005).

The first two native species of bird lice in Rio Grande do Sul were recorded in taxonomic papers made by Guimarães (1943, 1947), after which one species was included by Price & Beer (1968). However, the first published list of avian ectoparasites from the state, including chewing lice (Freire, 1958), reported only species from three domestic hosts, all of which are exotic to the Brazilian fauna. The most recent list of bird ectoparasites for Rio Grande do Sul (Oliveira & Gonzales, 1990) includes, in addition to the three host species presented by Freire (1958), seven hosts, five of which are indigenous to Brazil. Although 13 species of chewing lice have been reported on birds from Rio Grande do Sul (Freire, 1958; Azevedo, 1973; Oliveira & Gonzales, 1990), none of these were recorded on birds of the local fauna.

More recently, a few species of chewing lice were reported in the state on birds of the orders Anseriformes (Brum *et al.*, 2005), Ciconiiformes (Brum *et al.*, 2003; Coimbra *et al.*, 2005; Albano *et al.*, 2005), Falconiformes (Valente *et al.*, 2001; Brum & Rickes, 2003), Gruiformes (Brum *et al.*, 2003); Rheiformes (Sinkoc *et al.*, 2005), Sphenisciformes (Brum & Becker, 2002). From these accounts, 13 species of chewing lice are currently known from native birds and 15 from birds introduced in Rio Grande do Sul. Additional studies of the chewing lice of birds from the state, their host relationships and geographical distribution are still unavailable.

Although chewing lice are permanent and obligate ectoparasites with a high degree of host specificity (Johnson & Clayton, 2003), some are less host specific (Clay, 1964; Weckstein, 2004). Thus there is great value in knowing the geographic distribution of the lice. Faunistic surveys, given the poor level of knowledge of such ectoparasites in Brazil, increase the chance of discovering new species, even on hosts from which many chewing lice have been described (e.g. *Phimosus infuscatus* (Lichtenstein, 1823)).

The present paper, in addition to contributing the description of a new louse species, also doubles the species known from Rio Grande do Sul and lists twelve new records for Brazil.

MATERIAL AND METHODS

Chewing lice were collected during the preparing of study skins at the Museu de História Natural da Universidade Católica de Pelotas (MUCPel) in Rio Grande do Sul, Brazil. In the present study only the birds processed from 2000 to 2006 and parasitized by chewing lice are considered.

The lice were initially preserved in 70% ethanol and some were mounted in permanent microscope slide preparations following the technique described by Palma (1978). Most of the specimens examined were deposited in the entomological collection of the MUCPel. Type series are deposited in the entomological collection of the Instituto Oswaldo Cruz (CEIOC), Fiocruz, Rio de Janeiro, Brazil.

The scientific nomenclature and English names of birds follow the world list of DICKINSON (2003), the Portuguese names follow BELTON (1994), and nomenclature of chewing lice is that of PRICE *et al.* (2003).

Abbreviations of measured characters in the new species description are: HL, head length; FW, front width; TW, temporal width; CI, cephalic index (TW/HL); POW, prothorax width; PEW, pterothorax width; AW, abdomen width (at segment V level); PL, paramer length; GW, genitalia width (at basal plate level); TL, total length. Measurements are in millimeters and shown with their ranges.

RESULTS AND DISCUSSION

Twenty three samples of chewing lice from 16 host species representing 11 families and nine orders of birds are reported. All hosts belong to the native fauna of Rio Grande do Sul (BELTON, 1994), from six towns in the state. Only four towns were previously reported regarding chewing lice and their hosts: Passo Fundo (SINKOC *et al.*, 2005), Pelotas (VALENTE *et al.*, 2001; SINKOC *et al.*, 2005), Rio Grande (BRUM & BECKER, 2002; SINKOC *et al.*, 2005), and Sapucaia do Sul (BRUM & RICKES, 2003). Additional reports for the state lack information on geographical data of the hosts (BRUM *et al.*, 2003, 2005; COIMBRA *et al.*, 2005; ALBANO *et al.*, 2005). Thus, we report for the first time chewing lice species in the towns of Arroio Grande, Cidreira, Piratini and Santa Vitória do Palmar in Rio Grande do Sul, southern Brazil.

A total of 718 chewing lice specimens were collected, representing 26 species, one of them new to science, from three families: Menoponidae (11), Ricinidae (2) and Philopteridae (13) (Tab. I). Three samples could not be specifically identified due to the absence of adult specimens or morphological disagreement between the individuals collected and published descriptions.

The following bird species are reported for the first time as hosts of chewing lice: *Anas platalea* Vieillot, 1816, *Turdus albicollis* Vieillot, 1818 and *Xolmis irupero* (Vieillot, 1823).

Colpocephalum brachysomum Kellogg & Chapman, 1902

Material examined. BRAZIL, **Rio Grande do Sul**: Rio Grande (Praia do Cassino, 32°11'S 52°10'W), *Asio flammeus* (Pontoppidan, 1763) (Strigiformes, Strigidae), Short-eared Owl, "Mocho-dos-banhados", 2♀, 1N, 6.VIII.2000, M. H. S. Vaz col. (MUCPel).

Remarks. *Asio flammeus* is the type host for *C. brachysomum* (PRICE & BEER, 1963a; PRICE *et al.*, 2003). This is the first record of this host-parasite association for Brazil.

Colpocephalum infuscati Price & Emerson, 1967

Material examined. BRAZIL, **Rio Grande do Sul**: Rio Grande (32°02'S 52°06'W), *Phimosus infuscatus* (Ciconiiformes, Threskiornithidae), Bare-faced Ibis, "Maçarico-de-cara-pelada" or "Chapéu-velho", 1♂, 2♀, 17.I.2001, A. R. Lemos col. (MUCPel); same locality, same host, 25♂, 14♀, 27N, 18.XII.2003, A. R. Lemos col. (MUCPel).

Remarks. *Phimosus infuscatus* is the type and only known host for *C. infuscati* (PRICE *et al.*, 2003), and was recorded from Ceará, northeastern Brazil by PRICE & EMERSON (1967). Recently, this chewing lice was reported in Rio Grande do Sul by COIMBRA *et al.* (2005), however this record is questionable because the host, *Plegadis chihi* (Vieillot, 1817), is normally infested with two different species of *Colpocephalum* Nitzsch, 1818.

Colpocephalum pectinatum Osborn, 1902

Material examined. BRAZIL, **Rio Grande do Sul**: Arroio Grande (32°15'S 53°05'W), *Athene cunicularia* (Molina, 1782) (Strigiformes, Strigidae), Burrowing Owl, "Coruja-do-campo", 4♂, 7♀, 3N, 28.IX.2003, A. R. Lemos col. (MUCPel).

Remarks. *Athene cunicularia* is the type host for *C. pectinatum* (PRICE & BEER, 1963a; PRICE *et al.*, 2003). This host-parasite association was recently reported for Brazil (SILVA *et al.*, 2009).

Dictesia tristis (Giebel, 1874)

Material examined. BRAZIL, **Rio Grande do Sul**: Rio Grande (Estação Ecológica do Taim, 32°30'S 52°35'W), *Chauna torquata* (Oken, 1816) (Anseriformes, Anhimidae), Southern Screamer, "Tachã", 1♀, 15.IV.2005, F. C. Bonow col. (MUCPel).

Remarks. PRICE (1968) and PRICE *et al.* (2003) list *D. tristis* as a typical ectoparasite of *C. torquata*. It was previously recorded from Rio Grande do Sul by BRUM *et al.* (2005).

Holomenopon brevithoracicum (Piaget, 1880)

Material examined. BRAZIL, **Rio Grande do Sul**: Santa Vitória do Palmar (Lagoa Mirim, 33°32'S 53°22'W), *Coscoroba coscoroba* (Molina, 1782) (Anseriformes, Anatidae), Coscoroba Swan, "Caporoca", 1♂, 17.VII.2000, A. R. Lemos col. (MUCPel).

Remarks. *Holomenopon brevithoracium* is commonly found on anatids from around the world (PRICE, 1971; PRICE *et al.*, 2003). In Brazil it has been reported only on *Cygnus melanocoryphus* (Molina, 1782) (BRUM *et al.*, 2005; VALIM *et al.*, 2005). *Holomenopon boehmi* Eichler, 1954 was described from a single male of *Coscoroba coscoroba* from a zoo and the authenticity of that finding has been questioned by PRICE (1971), although it is still considered a valid species (PRICE *et al.*, 2003). The only specimen we found does not fit the morphological description of EICHLER (1954), resembling instead *H. brevithoracium* (PRICE, 1971). Thus, this species is recorded for the first time on *C. coscoroba*.

Kurodaia (*Kurodaia*) *fulvofasciata* (Piaget, 1880)

Material examined. BRAZIL, **Rio Grande do Sul**: Santa Vitória do Palmar (33°32'S 53°22'W), *Buteo magnirostris* (Gmelin, 1788) (Falconiformes, Accipitridae), Roadside Hawk, "Gavião-carijó", 1♀, 1N, 16.V.2006, R. Mendes col. (MUCPel).

Remarks. PRICE & BEER (1963b) and PRICE *et al.* (2003) list *K. fulvofasciata* as a typical ectoparasite of *B. magnirostris*. It was previously recorded from São Paulo from this host by OLIVEIRA *et al.* (2004) as "*Colpocephalum cholibae*" (see VALIM & PALMA, 2007).

Table I. Chewing lice (Insecta, Phthiraptera) currently known from birds in Rio Grande do Sul, Brazil (†, introduced species to Brazilian bird fauna; *, questionable records).

Chewing lice species	Bird host (Order, Family)	References
AMBLYCERA		
Menoponidae		
Bonomiella columbae Emerson, 1957	*Columba livia* Gmelin, 1789† (Columbiformes, Columbidae)	Ribeiro *et al.* (1998)
Ciconiphilus decimfasciatus (Boisduval & Lacordaire, 1835)	*Ardea alba* Linnaeus, 1758 (Ciconiiformes, Ardeidae)	Albano *et al.* (2005)
Colpocephalum brachysomum Kellogg & Chapman, 1902	*Asio flammeus* Pontoppidan, 1763 (Strigiformes, Strigidae)	present study
Colpocephalum infuscati Price & Emerson, 1967	*Plegadis chihi** (Vieillot, 1817) (Ciconiiformes, Threskiornithidae)	Coimbra *et al.* (2005)
	Phimosus infuscatus (Lichtenstein, 1823) (Ciconiiformes, Threskiornithidae)	present study
Colpocephalum maculatum Piaget, 1880	*Caracara plancus* (Miller, 1777) (Falconiformes, Falconidae)	Valente *et al.* (2001)
	*Buteo magnirostris** (Gmelin, 1788) (Falconiformes, Accipitridae)	Valente *et al.* (2001)
Colpocephalum pectinatum Osborn, 1902	*Athene cunicularia* (Molina, 1782) (Strigiformes, Strigidae)	present study
Colpocephalum turbinatum Denny, 1842	*Columba livia*†	Freire (1958)
Colpocephalum sp.	*Cariama cristata* (Linnaeus, 1766) (Gruiformes, Cariamidae)	Brum *et al.* (2003)
	Ardea alba	Brum *et al.* (2003)
Cuculiphilus alternatus (Osborn, 1902)	*Coragyps atratus* (Bechstein, 1793) (Cathartiformes, Cathartidae)	Brum & Rickes (2003)
Dictesia tristis (Giebel, 1874)	*Chauna torquata* (Oken, 1816) (Anseriformes, Anhimidae)	Brum *et al.* (2005); present study
Hohorstiella lata (Piaget, 1880)	*Columba livia*†	Ribeiro *et al.* (1998)
Holomenopon brevithoracicum (Piaget, 1880)	*Cygnus melanocoryphus* (Molina, 1782) (Anseriformes, Anatidae)	Brum *et al.* (2005)
	Coscoroba coscoroba (Molina, 1782) (Anseriformes, Anatidae)	present study
Holomenopon leucoxanthum (Burmeister, 1838)	*Netta peposaca* (Vieillot, 1816) (Anseriformes, Anatidae)	Brum *et al.* (2005)
Kurodaia fulvofasciata (Piaget, 1880)	*Buteo magnirostris*	present study
Menacanthus eurysternus (Burmeister, 1838)	*Turdus albicollis* Vieillot, 1818 (Passeriformes, Turdidae)	present study
Menacanthus pallidulus (Neumann, 1912)	*Gallus gallus* (Linnaeus, 1758)† (Galliformes, Phasianidae)	Freire (1958)
Menacanthus stramineus (Nitzsch, 1818)	*Gallus gallus*†	Freire (1958)
Menacanthus tyranni Price, 1977	*Pitangus sulphuratus* (Linnaeus, 1766) (Passeriformes, Tyrannidae)	present study
Menopon gallinae (Linnaeus, 1758)	*Gallus gallus*†	Freire (1958)
	Numida meleagris (Linnaeus, 1758)† (Galliformes, Phasianidae)	Ribeiro *et al.* (2003)
Myrsidea elegans Ansari, 1956	*Turdus rufiventris* Vieillot, 1818 (Passeriformes, Turdidae)	present study
Myrsidea sp.	*Turdus albicollis*	present study
Osborniella guiraensis (Kellogg, 1906)	*Guira guira* (Gmelin, 1788) (Cuculiformes, Cuculidae)	present study
Plegadiphilus riograndensis Valim sp. nov.	*Phimosus infuscatus*	present study
Psittacobrosus molinae Price & Beer, 1968	*Pyrrhura frontalis* (Vieillot, 1817) (Psittaciformes, Psittacidae)	Price & Beer (1968)
Laemobothriidae		
Laemobothrion glutinans Nitzsch, 1861	*Coragyps atratus*	Brum & Rickes (2003)
Ricinidae		
Ricinus arcuatus (Kellogg & Mann, 1912)	*Xolmis irupero* (Vieillot, 1823) (Passeriformes, Tyrannidae)	present study
Ricinus marginatus (Children, 1836)	*Pitangus sulphuratus*	present study

Table I (cont.)

ISCHNOCERA		
Philopteridae		
Anaticola sp.	*Anas platalea* Vieillot, 1816 (Anseriformes, Anatidae)	present study
	Coscoroba coscoroba	present study
Ardeicola praegracilis Carriker, 1960	*Phimosus infuscatus*	present study
Austrogoniodes bifasciatus (Piaget, 1885)	*Spheniscus magellanicus* (Forster, 1781) (Sphenisciformes, Spheniscidae)	BRUM & BECKER (2002); present study
Bothriometopus macrocnemis (Burmeister, 1838)	*Chauna torquata*	present study
Brueelia sp.	*Turdus albicollis*	present study
Campanulotes compar (Burmeister, 1838)	*Columba livia*†	FREIRE (1958)
Chelopistes meleagridis (Linnaeus, 1758)	*Meleagris gallopavo* Linnaeus, 1758† (Galliformes, Phasianidae)	FREIRE (1958)
Chelopistes sp.	*Cariama cristata**	BRUM *et al.* (2003)
Columbicola columbae (Linnaeus, 1758)	*Columba livia*†	FREIRE (1958)
Craspedorrhynchus brevicapitis Carriker, 1956	*Buteo magnirostris*	present study
Cuclutogaster heterographus (Nitzsch [in Giebel], 1866)	*Gallus gallus*†	FREIRE (1958)
Goniocotes gallinae (DeGeer, 1778)	*Numida meleagris*†*	RIBEIRO *et al.* (2003)
Goniodes dissimilis Denny, 1842	*Gallus gallus*†	OLIVEIRA & GONZALES (1990)
Goniodes gigas (Taschenberg, 1879)	*Gallus gallus*†	FREIRE (1958)
Goniodes pavonis (Linnaeus, 1758)	*Pavo cristatus* Linnaeus, 1758† (Galliformes, Phasianidae)	AZEVEDO (1973)
Halipeurus diversus (Kellogg, 1896)	*Puffinus puffinus* (Bunnich, 1764) (Procellariiformes, Procellariidae)	present study
Ibidoecus phimosus Carriker, 1947	*Phimosus infuscatus*	present study
Lipeurus caponis (Linnaeus, 1758)	*Gallus gallus*†	FREIRE (1958)
Lipeurus sp.	*Numida meleagris*†	RIBEIRO *et al.* (2003)
Naubates fuliginosus (Taschenberg, 1882)	*Procellaria aequinoctialis* Linnaeus, 1758 (Procellariiformes, Procellariidae)	present study
Neophilopterus subincompletus (Nitzsch [in Giebel], 1866)	*Ajaia ajaja* Linnaeus, 1758 (Ciconiiformes, Threskiornithidae)	GUIMARÃES (1943)
Oxylipeurus polytrapezius (Burmeister, 1838)	*Meleagris gallopavo*†	FREIRE (1958)
Paragoniocotes pyrrhurae Guimarães, 1947	*Pyrrhura frontalis* (Vieillot, 1817) (Psittaciformes, Psittacidae)	GUIMARÃES (1947)
Picicola foedus (Kellogg & Chapman, 1899)	*Xolmis irupero*	present study
Quadraceps elongatus (Piaget, 1885)	*Rynchops niger* Linnaeus, 1758 (Charadriiformes, Laridae)	present study
Strigiphilus cursor (Burmeister, 1838)	*Asio flammeus*	present study
Struthiolipeurus struthionis (Gervais, 1844)	*Rhea americana* (Linnaeus, 1758)* (Struthioniformes, Rheidae)	SINKOC *et al.* (2005)
Trabeculus aviator (Evan, 1912)	*Puffinus puffinus*	present study
Trabeculus hexakon (Waterston, 1914)	*Procellaria aequinoctialis*	present study
Vernoniella bergi (Kellogg, 1906)	*Guira guira*	present study

Menacanthus eurysternus (Burmeister, 1838)

Material examined. BRAZIL, **Rio Grande do Sul**: Piratini (31°27'S 53°06'W), *Turdus albicollis* (Passeriformes, Muscicapidae), White-necked Thrush, "Sabiá-coleira", 1♀,13.XII.2003, P. R. S. Santos col. (MUCPel).

Remarks. *Menacanthus eurysternus* is found on 20 families, 70 genera and 176 species (PRICE *et al.*, 2003), mostly from Passeriformes and a few Piciformes (PRICE, 1975). This is the first record of this host-parasite association, although this species has been reported recently in Brazil on *Turdus leucomelas* Vieillot, 1818 (ENOUT *et al.*, 2009).

Menacanthus tyranni Price, 1977

Material examined. BRAZIL, **Rio Grande do Sul**: Pelotas (31°45'S 52°20'W), *Pitangus sulphuratus* (Linnaeus, 1766) (Passeriformes, Tyrannidae), Great Kiskadee, "Bem-te-vi", 1♂, 1♀, 30.VII.2006, W. Lima col. (MUCPel).

Remarks. This species is known from three species of the genus *Tyrannus* Lacépède, 1799 (PRICE, 1977). It was recorded on *P. sulphuratus* by CASTRO & CICCHINO (1992) in Argentina. This is the first record of this host-parasite association for Brazil.

Myrsidea elegans Ansari, 1956

Material examined. BRAZIL, **Rio Grande do Sul**: Pelotas city (Granja Corrientes, 31°45'S 52°20'W), *Turdus rufiventris* Vieillot, 1818 (Passeriformes, Muscicapidae), Rufous-bellied Thrush, "Sabiá-laranjeira", 8♂, 11♀, 19N, 10.IX.2001, P. R. S. Santos col. (MUCPel).

Remarks. *Turdus rufiventris* is the type and only

known host of *M. elegans* (Price *et al*., 2003). There is a single record of this species from Rio de Janeiro, Brazil (Valim & Serra-Freire, 2002).

Myrsidea sp.

Material examined. BRAZIL, **Rio Grande do Sul**: Piratini (31°27'S 53°06'W), *Turdus albicollis*, 2♂, 2♀, 2N, 13.XII.2003, P. R. S. Santos col. (MUCPel).

Remarks. There are no species of chewing lice described from *T. albicollis* (Price *et al.*, 2003). It was not possible, using the generic revisions of *Myrsidea* Waterston, 1915 found on Turdidae (Ansari, 1956; Clay, 1966), to identify these specimens to species level. They probably represent a new species.

Osborniella guiraensis (Kellogg, 1906)

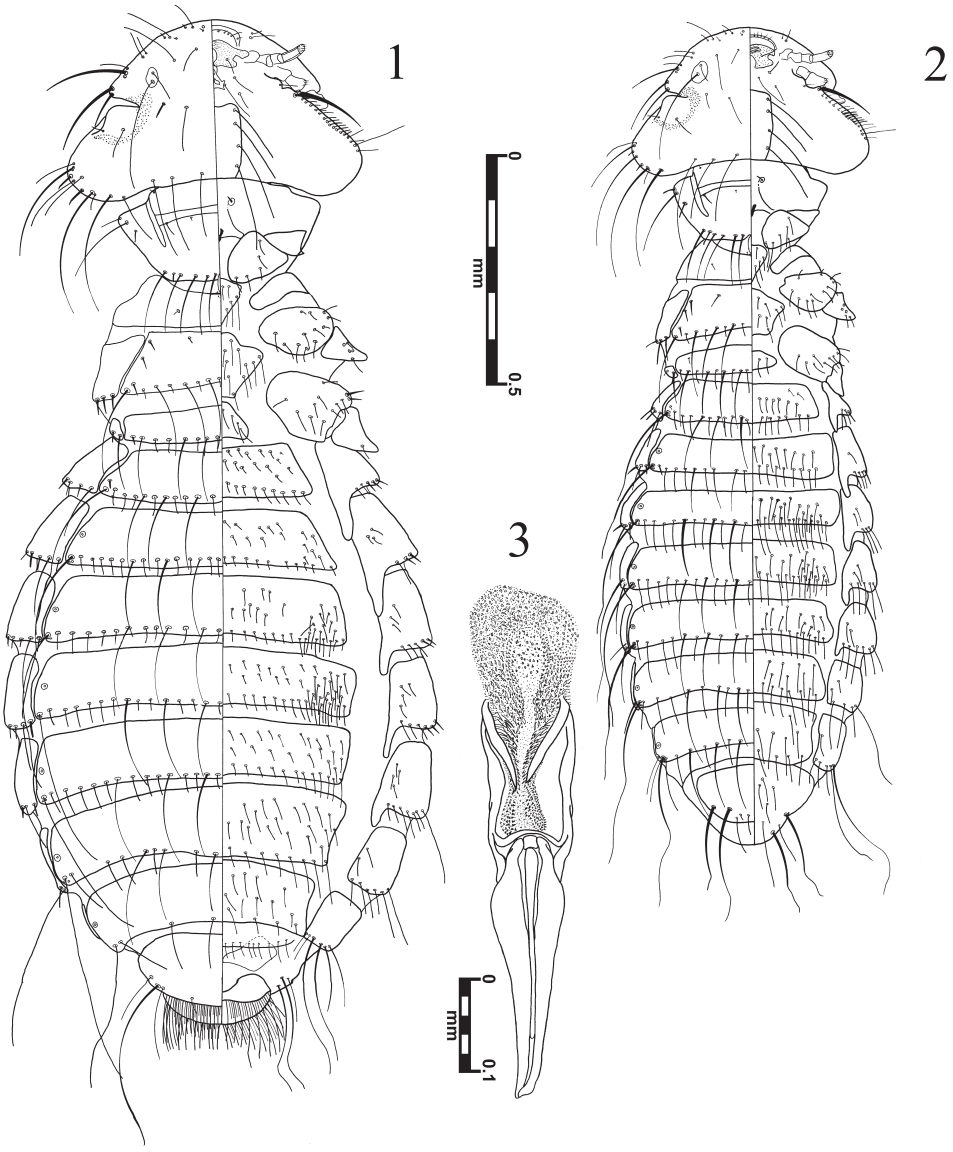
Material examined. BRAZIL, **Rio Grande do Sul**: Rio Grande (Lagoa Caiubá, 32°02'S 52°06'W), *Guira guira* (Gmelin, 1788) (Cuculiformes, Cuculidae), Guira Cuckoo, "Anu-branco", 2♀, 2N, 07.V.2006, C. Silva col. (MUCPel); Pelotas (31°45'S 52°20'W), same host, 1♀, 8N, 26.X.2006, F. M. Lambrecht col. (MUCPel).

Remarks. *Guira guira* is the type host for *O. guiraensis* (Price *et al*. 2003). This is the first record of this host-parasite association for Brazil.

Plegadiphilus riograndensis Valim sp. nov.
(Figs. 1-7)

Type material. BRAZIL, **Rio Grande do Sul**: Rio Grande (32°02'S 52°06'W), *Phimosus infuscatus*, ♂ holotype, 4♂, 5♀ paratypes, 17.I.2001, A.R. Lemos col. (CEIOC); 5♂, 5♀ paratypes, same data (MUCPel). Additional material: BRAZIL, Rio Grande do Sul: 23♂, 30♀ and 42N, from the same host specimen of the holotype and not regarded here as types. BRAZIL, Rio Grande do Sul: same locality and host species of holotype, 1♂, 6♀, 13N, 18.XII.2003, A.R. Lemos col. (MUCPel).

Female (Figs. 1, 4, 5). General shape and distribution



Figures 1-3. *Plegadiphilus riograndensis* Valim sp. nov.: 1, female; 2, male; 3, male genitalia.

of setae (Fig. 1). Head, rounded anteriorly (Fig. 4). Lateral margin notched, with a deep, narrow slit and chetotaxy as in figure 4.

Prothorax with 18 marginal tergal setae, 12 of these long and 6 short. Metanotum with 16–17 marginal setae, 8 of these long, 2 short medioanterior, 3 short lateroanterior setae. Mesosternal plate with 8–9 medium-length and 2 short setae; metasternal plate with 18–22 medium-length setae (Fig. 5). Range of the femoral brushes 20–28.

Number of abdominal marginal tergal setae (excluding postspiracular seta): I, 19–24; II, 20–25; III, 25–30; IV, 26–29; V, 25–31; VI, 24–28; VII, 14–19; VIII, 6–11. Postspiracular setae very long on segments II-VIII. Abdominal pleurites II-VI with posteroventral angles prolonged as pointed spines, forming a median ventral process. Number of pleural seta I, 2–3; II, 5–8; III, 6–8; IV, 7–8; V, 6–8; VI, 6–8; VII, 5–7; VIII, 4–5. All pleurites with one marginal seta longer than others. Number of abdominal sternal setae I, 4–8; II, 43–53; III, 56–65; IV, 74–100; V, 88–100; VI, 68–85; VII, 49–56; VIII, 24–32. Setae on segments IV-VI in brush like arrangement, but with two distinctive anterior irregular rows of setae. Vulvar margin with 21–25 medium sized setae. Anus ventrally with 30–36 medium-length setae and 34–44 short setae, dorsally with 26–36 medium-length setae and 30–44 short setae. Measurements: HL, 0.33–0.35; FW, 0.44–0.45; TW, 0.63–0.66; CI, 1.89–1.81; POW, 0.43–0.47; PEW, 0.57–0.60; AW, 0.91–0.96; TL, 1.64–1.84.

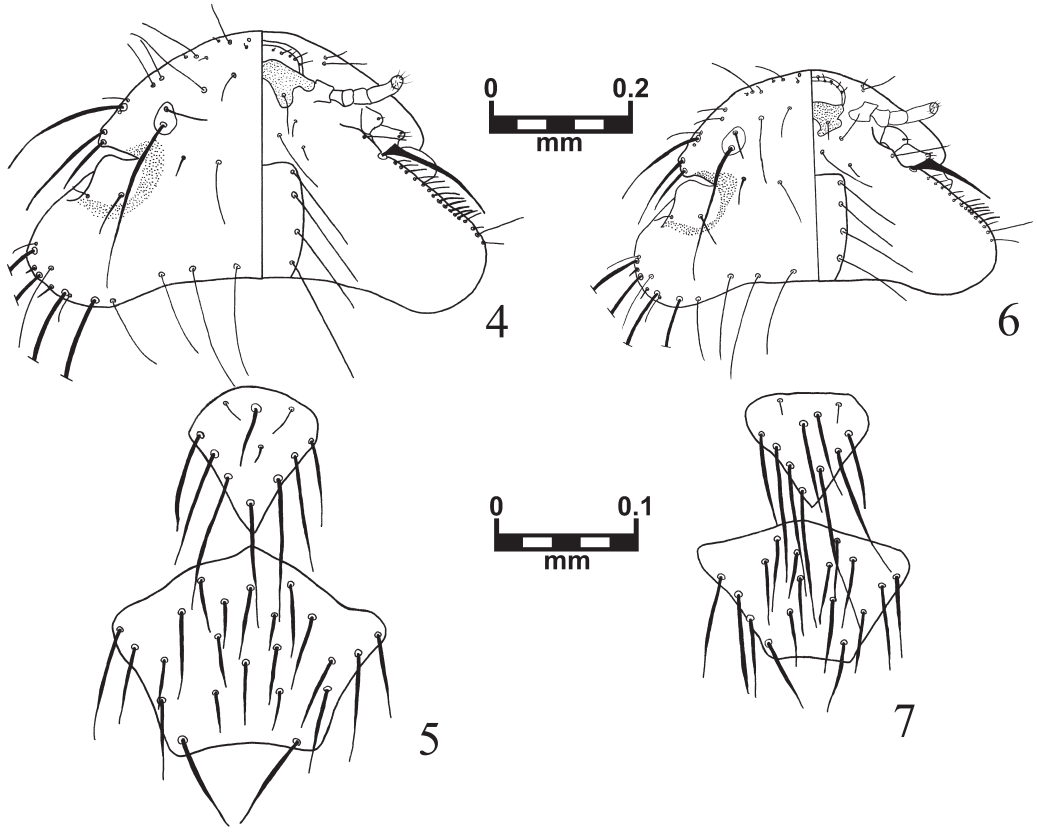
Male (Figs. 2, 3, 6, 7). General shape and distribution of the setae (Fig. 2). Head anteriorly rounded (Fig. 6). Lateral margin notched, with a deep, narrow slit. Head chetotaxy as in figure 6.

Prothorax with 18 marginal tergal setae, 12 of these long and 6 short. Metanotum with 14–16 marginal setae, 8 of these long; 2 short medioanterior, 3 short lateroanterior setae. Mesosternal plate with 7–10 medium-length and 2 short setae; metasternal plate with 16–20 medium-length setae (Fig. 7). Range of the third femoral brushes 16–20.

Number of abdominal marginal tergal setae (excluding postspiracular seta): I, 11–19; II, 13–19; III, 19–24; IV, 20–26; V, 20–27; VI, 20–24; VII, 17–22; VIII, 13–17. Postspiracular setae very long on segments II-VIII. Abdominal pleurites II-VI, with posteroventral angles prolonged as pointed spines, in the segment VI this ventral process is very small. Number of pleural seta I, 2; II, 5–6; III, 6–7; IV, 5–7; V, 6–8; VI, 6–8; VII, 5–6; VIII, 4–5. Number of abdominal sternal setae I, 3–6; II, 30–39; III, 31–41; IV, 46–56; V, 42–58; VI, 32–52; VII, 30–37; VIII, 14–27; IX+X, 8–12. In the segments IV-VI it forms a distinct brush with sternal setae on each side, and only one distinctive anterior irregular row of setae. Measurements: HL, 0.27–0.30; FW, 0.37–0.38; TW, 0.42–0.54; CI, 1.56–1.80; POW, 0.34–0.37; PEW, 0.40–0.43; AW, 0.52–0.60; PL, 0.27–0.30; GW, 0.08–0.09; TL, 1.26–1.52. Genitalia characteristic as in figure 3.

Etymology. The specific epithet refers to the Brazilian state in which the new species was discovered.

Differential diagnosis. The new species is similar to *P. cayennensis* Emerson & Price, 1969, sharing the



Figures 4-7. *Plegadiphilus riograndensis* Valim sp. nov.: 4, dorso-ventral aspects of female head; 5, meso and metasternal plates of female; 6, dorso-ventral aspects of male head; 7, meso and metasternal plates of male.

following characters: number of setae on tergites and sternites, with negligible variations; postspiracular setae long on tergites II-VIII; posterior projections on segments II-VI; female with one long seta on pleurites III-VI. But it may be promptly separable from latter species by the following characters: smaller in size in both sexes (total length 2.35 mm in female and 1.93 mm in males of *P. cayennensis*); in males, the parameres in genitalia are slightly straighter, bent only on their tips (curved on half of its length in *P. cayennensis*), all measurements taken were smaller for females of *P. riograndensis* Valim sp. nov. and the front margin of the head is more rounded (triangular shaped in *P. cayennensis*), metanotum with 16 marginal setae and only 8 of these long (instead of 12 long and total of 22 in *P. cayennensis*), vulvar margin slightly with more setae (only 20 in *P. cayennensis*).

Ricinus arcuatus (Kellogg & Mann, 1912)

Material examined. BRAZIL, **Rio Grande do Sul**: Rio Grande (32°02'S 52°06'W), *Xolmis irupero* (Passeriformes, Tyrannidae), White Monjita, "Noivinha", 2♂, 7♀, 13.II.1999, A. Bager col. (MUCPel).

Remarks. *Ricinus arcuatus* was previously reported from 11 hosts of the family Tyrannidae (Nelson, 1972; Price *et al*., 2003), and thus considered polyxevic (Nelson, 1972). *Xolmis irupero* had no previous records on literature as a host for any chewing lice species (Price *et al.*, 2003).

Ricinus marginatus (Children, 1836)

Material examined. BRAZIL, **Rio Grande do Sul**: Pelotas (31°45'S 52°20'W), *Pitangus sulphuratus*, 1♂, 6♀, 5N, 30.VII.2006, W. Lima col. (MUCPel).

Remarks. *Ricinus marginatus* is known from 22 host species (Nelson, 1972; Price *et al.*, 2003). Although overlooked by Price *et al*. (2003), the host-parasite association found in the present study already was made by Cicchino & Castro (1998) in Argentina. This is the first record of this host-parasite association for Brazil.

Anaticola sp.

Material examined. BRAZIL, **Rio Grande do Sul**: Pelotas (Arroio São Gonçalo, 31°45'S 52°20'W), *Anas platalea* (Anseriformes, Anatidae), Red Shoveler, "Marreca-colhereira", 1♂, 9.VI.2000, A. R. Lemos col. (MUCPel); Santa Vitória do Palmar, (Lagoa Mirim, 33°32'S 53°22'W), *C. coscoroba*, 1♀, 17.VII.2000, A. R. Lemos col. (MUCPel).

Remarks. It is almost impossible to identify specimens of *Anaticola* Clay, 1936 unless both sexes are available. There are no generic revisions for this genus. The penis of the only male specimen collected is quite different, as shown by Clay & Hopkins (1951), from that of *A. crassicornis* (Scopoli, 1763), a common louse found on 23 species of the genus *Anas* Linnaeus, 1758 (Price *et al*., 2003). Neither *A. platalea* nor *C. coscoroba* are known hosts of any species of *Anaticola* (Price *et al*., 2003), although Guimarães (1943) found the same genus on the latter host species.

Ardeicola praegracilis Carriker, 1960

Material examined. BRAZIL, **Rio Grande do Sul**: Rio Grande (32°02'S 52°06'W), *Phimosus infuscatus*, 5♀, 2N, 17.I.2001, A. R. Lemos col. (MUCPel); same locality, same host, 5♂, 7♀, 27N, 18.XII.2003, A. R. Lemos col. (MUCPel).

Remarks. *Phimosus infuscatus* is the type host for *A. praegracilis* (Carriker, 1960; Price *et al*. 2003). This is the first record of this host-parasite association for Brazil.

Austrogoniodes bifasciatus (Piaget, 1885)

Material examined. BRAZIL, **Rio Grande do Sul**: Rio Grande (Praia do Cassino, 32°11'S 52°10'W), *Spheniscus magellanicus* (Forster, 1781) (Sphenisciformes, Spheniscidae), Magellanic Penguin, "Pinguim-de-Magalhães", 9♂, 6♀, 9.VI.2000, A. R. Lemos col. (MUCPel); Cidreira (Solimões Madeira, 30°11'S 50° 13'W), same host, 14♂, 7♀, 4N, 08.VII.2001, L. Vilagram col. (MUCPel); Rio Grande (32°02'S 52°06'W), same host, 40♂, 16♀, 16N, 10.IV.2002, R. Porciuncula col. (MUCPel); Rio Grande (32°02'S 52°06'W), same host, 19♂, 11♀, 4.X.2002, A. R. Lemos col. (MUCPel).

Remarks. *Spheniscus magellanicus* is the type host for *A. bifasciatus* (Clay, 1967; Price *et al*. 2003) and has been previously recorded as such in Brazil in São Paulo (Guimarães, 1938), Rio Grande do Sul (Brum & Becker, 2002), and Rio de Janeiro (Valim *et al*, 2004).

Bothriometopus macrocnemis (Burmeister, 1838)

Material examined. BRAZIL, **Rio Grande do Sul**: Rio Grande (Estação Ecológica do Taim, 32°30'S 52°35'W), *Chauna torquata*, 1♀, 5.X.2001, F. Mazim col. (MUCPel); same locality, same host, 1♀, 1.IV.2004, C. Calabrig col. (MUCPel).

Remarks. Price *et al*. (2003) list *B. macrocnemis* as a typical ectoparasite of *C. torquata*, and our few specimens were identified following the redescription presented by Cicchino & Mey (2007). This species was found in Brazil previously in Paraná.

Brueelia sp.

Material examined. BRAZIL, **Rio Grande do Sul**: Piratini (31°27'S 53°06'W), *Turdus albicollis*, 1♀, 13.XII.2003, P. R. S. Santos col. (MUCPel).

Remarks. No species of chewing lice are described from *T. albicollis* (Price *et al.*, 2003). With only a female is practically impossible to identify the *Brueelia* Kéler, 1936 species or adequately describe it as new.

Craspedorrhynchus brevicapitis Carriker, 1956

Material examined. BRAZIL, **Rio Grande do Sul**: Santa Vitória do Palmar (33°32'S 53°22'W), *Buteo magnirostris*, 15♂, 9♀, 5N, 16.V.2006, R. Mendes col. (MUCPel).

Remarks. *Buteo magnirostris* is the type and only host for *C. brevicapitis* (Price *et al*. 2003), which was previously recorded in Brazil by Valim *et al*. (2005), in São Paulo.

Halipeurus (*Halipeurus*) *diversus* (Kellogg, 1896)

Material examined. BRAZIL, **Rio Grande do Sul**: Rio

Grande (32°02'S 52°06'W), *Puffinus puffinus* (Brunnich, 1764) (Procellariiformes, Procellariidae), Manx Shearwater, "Bobo-pequeno", 11♂, 19♀, 8N, 22.V.2003, R. P. Junior col. (MUCPel).

Remarks. EDWARDS (1961) and PRICE *et al*. (2003) list *H. diversus* as a typical ectoparasite of *P. puffinus*, and it was recently recorded in Brazil by VALIM *et al*. (2006).

Ibidoecus phimosus Carriker, 1947

Material examined. BRAZIL, **Rio Grande do Sul**: Rio Grande (32°02'S 52°06'W), *Phimosus infuscatus*, 1♀, 1N, 17.I.2001, A. R. Lemos col. (MUCPel); same locality, same host, 1♀, 9N, 18.XII.2003, A. R. Lemos col. (MUCPel).

Remarks. *Phimosus infuscatus* is the type host for *I. phimosus* (CARRIKER, 1947; PRICE *et al*., 2003). This is the first record of this host-parasite association for Brazil.

Naubates (*Naubates*) *fuliginosus* (Taschenberg, 1882)

Material examined. BRAZIL, **Rio Grande do Sul**: Rio Grande (Praia do Cassino, 32°11'S 52°10'W), *Procellaria aequinoctialis* Linnaeus, 1758 (Procellariiformes, Procellariidae), White-chinned Petrel, "Pardela-preta", 22♂, 21♀, 17N, 11.III.2002, L. Silva col. (MUCPel).

Remarks. PALMA & PILGRIM (2002) and PRICE *et al*. (2003) list *N. fuliginosus* as a typical ectoparasite of *P. aequinoctialis*, and it was recently recorded in Brazil by VALIM *et al*. (2006).

Picicola foedus (Kellog & Chapman, 1899)

Material examined. BRAZIL, **Rio Grande do Sul**: Rio Grande (32°02'S 52°06'W), *Xolmis irupero*, 1♀, 13.II.1999, A. Bager col. (MUCPel).

Remarks. No species of chewing lice have been described from *X. irupero* (PRICE *et al*., 2003), however this female specimen agrees with redescriptions provided by WILLIAMS (1979). *Picicola foedus* is a common louse of tyrannid birds and is already known from *Xolmis cinereus* (Vieillot, 1816) (PRICE *et al*., 2003).

Quadraceps elongatus (Piaget, 1885)

Material examined. BRAZIL, **Rio Grande do Sul**: Rio Grande (Praia do Cassino, 32°11'S 52°10'W), *Rynchops niger* Linnaeus, 1758 (Charadriiformes, Laridae), Black Skimmer, "Talha-mar", 12♂, 10♀, 1N, 09.XII.1999, G. Mastrantonio col. (MUCPel).

Remarks. PRICE *et al*. (2003) list *Q. elongatus* as a typical ectoparasite of *R. niger.* This is the first record of this host-parasite association for Brazil.

Strigiphilus cursor (Burmeister, 1838)

Material examined. BRAZIL, **Rio Grande do Sul**: Rio Grande (Praia do Cassino, 32°11'S 52°10'W), *Asio flammeus*, 1♂, 6.VIII.2000, M. H. S. Vaz col. (MUCPel).

Remarks. *Asio flammeus* is the type and only host for *S. cursor* (PRICE *et al*., 2003). This is the first record of this host-parasite association for Brazil.

Trabeculus aviator (Evans, 1912)

Material examined. BRAZIL, **Rio Grande do Sul**: Rio Grande (32°02'S 52°06'W), *Puffinus puffinus*, 7♂, 8♀, 1N, 22.V.2003, R. P. Junior col. (MUCPel).

Remarks. TIMMERMANN (1959) and PRICE *et al*. (2003) list *T. aviator* as a typical ectoparasite of *P. puffinus*, and it was recently recorded in Brazil by VALIM *et al*. (2006).

Trabeculus hexakon (Waterston, 1914)

Material examined. BRAZIL, **Rio Grande do Sul**: Rio Grande (Praia do Cassino, 32°11'S 52°10'W), *Procellaria aequinoctialis*, 1♂, 11.III.2002, L. Silva col. (MUCPel).

Remarks. TIMMERMANN (1959) and PRICE *et al*. (2003) list *T. hexacon* as a typical ectoparasite of *P. aequinoctialis*, and it was recently recorded in Brazil by VALIM *et al*. (2006).

Vernoniella bergi (Kellogg, 1906)

Material examined. BRAZIL, **Rio Grande do Sul**: Pelotas (31°45'S 52°20'W), *Guira guira*, 5♂, 2♀, 33N, 26.X.2006, F. M. Lambrecht col. (MUCPel).

Remarks. *Guira guira* is the type host for *V. bergi* (PRICE *et al*., 2003). This is the first record of this host-parasite association for Brazil.

Representatives of the family Menoponidae are specialized in living on the skin of their bird hosts, where they feed on skin desquamation, dermic secretions or blood (JOHNSON & CLAYTON, 2003). Four species of this family are herein reported for the first time in Brazil (*Colpocephalum brachysomum*, *Menacanthus tyranni*, *Osborniella guiraensis*, *Plegadiphilus riograndensis* sp. nov.), two additional species (*Myrsidea elegans* and *Kurodaia fulvofasciata*) are reported for the first time in Rio Grande do Sul.

Species of the family Ricinidae, like those of Menoponidae, live exclusively on the skin, however all members of the Ricinidae are obligate hematophagous (NELSON, 1972). The two species of ricinids identified in the present study are reported for the first time in Brazil, on new host species. Both *R. arcuatus* and *R. marginatus* are commonly found on various hosts of the family Tyrannidae (NELSON, 1972; PRICE *et al.*, 2003). The finding of *R. arcuatus* on *X. irupero* and *R. marginatus* on *P. sulphuratus* hereby appears for the first time. The hosts examined were free-living; the samples included many lice of both sexes and were made in totally separate and spaced dates, what eliminates the chances of contamination within the same sampling. Thus these new host-associations are considered valid.

The chewing lice belonging to the family Philopteridae have quite different habits from those of Menoponidae or Ricinidae. Philopterids live in specialized body areas of their bird hosts and feed mostly on feathers (JOHNSON & CLAYTON, 2003). Twelve out of thirteen species identified from this family are reported for the first time from Rio Grande do Sul (*Ardeicola praegracilis*, *Bothriometopus macrocnemis*, *Craspedorrhyncus brevicapitis*, *Halipeurus diversus*, *Ibidoecus phimosus*,

Naubates fuliginosus, *Picicola foedus*, *Quadraceps elongatus*, *Strigiphilus cursor*, *Trabeculus hexacon*, *T. aviator*, *Vernoniella bergi*) and, of these, five are new records for Brazil (*A. praegracilis*, *I. phimosus*, *Q. elongatus*, *S. cursor*, *V. bergi*).

The present paper doubles the number of bird lice known from Rio Grande do Sul; in addition, an updated list of chewing lice previously found on birds in this state is given. Therefore, further studies on the lice associated with birds from other localities in Rio Grande do Sul and in other Brazilian states are be highly encouraged.

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