

Phthiraptera (Amblycera and Anoplura) parasites of the Family Octodontidae, Ctenomyidae and Abrocomidae (Mammalia: Rodentia) from Chile

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Resumen

Phthiraptera (Amblycera y Anoplura) parásitos de la Familia Octodontidae, Ctenomyidae y Abrocomidae (Mammalia, Rodentia) de Chile

Ocho especies de piojos (Insecta: Amblycera & Anoplura) son reportados en nueve especies de roedores pertenecientes a las familias Octodontidae, Ctenomyidae y Abrocomidae. Ellos son *Gyropus distinctus* (Amblycera, Gyropidae) y *Ferrisella chilensis* (Anoplura, Hoplopleuridae) colectados desde *Octodon degus*; *G. distinctus* colectado de *Octodon lunatus*; *Gyropus elongatus* colectado de *Aconaemys fuscus*; *Ferrisella disgrega* colectado de *Octodontomys gliroides*; *Phtheiropoios pearsoni* (Amblycera, Gyropidae) colectado de *Abrocoma bennetti*; *Phtheiropoios pollicaris* colectado de *Ctenomys magellanicus*; *Phtheiropoios nematophallus* colectado de *Ctenomys opimus* y *Gyropus parvus* colectado de *Ctenomys maulinus*. Los piojos chupadores *Ferrisella disgrega*, *Phtheiropoios pearsoni* y *Phtheiropoios nematophallus* son reportados en Chile por primera vez. Reportamos *Octodontomys degus* como nuevo hospedador para *Ferrisella chilensis*, *Abrocoma benetti* para *Phtheiropoios pearsoni*, *Ctenomys maulinus* para *Gyropus parvus*, y *Abrocoma bennetti* para *Phtheiropoios pearsoni*.

Zusammenfassung

Phthiraptera (Amblycera und Anoplura) aus den Nagerfamilien Octodontidae, Ctenomyidae und Abrocomidae (Mammalia, Rodentia) von Chile

Acht Arten von Tierläusen (Amblycera und Anoplura) wurden auf neun Nagetier-Arten der Familien Octodontidae, Ctenomyidae und Abrocomidae nachgewiesen. Dies sind: *Gyropus distinctus* (Amblycera, Gyropidae) und *Ferrisella chilensis* (Anoplura, Hoplopleuridae) ex *Octodon degus*; *Gyropus distinctus* ex *Octodon lunatus*; *Gyropus elongatus* ex *Aconaemys fuscus*; *Ferrisella disgrega* ex *Octodontomys gliroides*, *Phtheiropoios pearsoni* ex *Abrocoma bennetti*, *Phtheiropoios pollicaris* ex *Ctenomys magellanicus*, *Phtheiropoios nematophallus* ex *Ctenomys opimus* und *Gyropus parvus* ex *Ctenomys maulinus*. *Ferrisella disgrega*, *Phtheiropoios pearsoni* und *Phtheiropoios nematophallus* wurden zum ersten Mal in Chile festgestellt. Vier bisher unbekannte Wirt-Parasit-Beziehungen sind nachgewiesen worden, und zwar *Octodontomys degus* als neuer Wirt von *Ferrisella chilensis*, das gleiche *Abrocoma benetti* von *P. pearsoni*, *Ctenomys maulinus* von *Gyropus parvus* und *Abrocoma bennetti* von *Phtheiropoios pearsoni*.

Summary

Eight species of animal lice (Insecta: Phthiraptera) are reported from nine species of rodents belonging to the families Octodontidae, Ctenomyidae and Abrocomidae. They are *Gyropus distinctus* (Amblycera, Gyropidae) and *Ferrisella chilensis* (Anoplura, Hoplopleuridae) off *Octodon degus*; *Gyropus distinctus* off *Octodon lunatus*; *Gyropus elongatus* collected from *Aconaemys fuscus*; *Ferrisella disgrega* collected from *Octodontomys gliroides*; *Phtheiropoios pearsoni* (Amblycera, Gyropidae) collected from *Abrocoma bennetti*; *Phtheiropoios pollicaris* collected from *Ctenomys magellanicus*; *Phtheiropoios nematophallus* collected from *Ctenomys opimus* and *Gyropus parvus* collected from *Ctenomys maulinus*. The lice *Ferrisella disgrega*, *Phtheiropoios pearsoni* and *Phtheiropoios nematophallus* are reported from Chile for the first time. We report *Octodontomys degus* as a new host for *Ferrisella chilensis*, *Abrocoma benetti* for *Phtheiropoios pearsoni*, *Ctenomys maulinus* for *Gyropus parvus*, and *Abrocoma bennetti* for *Phtheiropoios pearsoni*.

Keywords: Phthiraptera, sucking lice, chewing lice, new records, Rodents, Octodontidae, Ctenomyidae, Abrocomidae, Chile.

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Introduction

The South American mammalian fauna contains an ancient (Oligocene) and diverse lineage of Caviomorph rodents. They have distinctive characters such as their dental formula (1/1, 0/0, 1/1, 3/3), small litter size, long gestation period, and precociality; they are also herbivores and live mainly in burrows (WOODS 1982, REDFORD & EISENBERG 1992). The family Octodontidae ranges in weight from 100 to 300 g, has a simplified occlusal pattern in the shape of an 8, and is distributed from southwestern Peru to southern Chile and Argentina. It includes desert adapted rodents and also fossorial and semifossorial species (CONTRERAS *et al.* 1987). The Abrocomidae is a monotypic family (genus *Abrocoma*) whose species range from 200 to 300 g, and is found from Peru to central Chile and Argentina. These species have soft fur, short limbs, and large ears and tails (REDFORD & EISENBERG 1992; SPOTORNO & WALKER 2000). The diverse family Ctenomyidae includes the single genus *Ctenomys*, adapted for a fossorial life, with a very short tail, small eyes and ears, and very long front claws. *Ctenomys* is distributed from southern Peru and Brazil to Tierra del Fuego (CONTRERAS *et al.* 1987, REDFORD & EISENBERG 1992).

Parasites from the order Phthiraptera are poorly studied in Chile. For the Octodontidae there are reports of *Gyropus parvus* WERNECK, 1936 in *Octodon degus* MOLINA, 1782 (WERNECK 1951); *G. elongatus* CASTRO, CICCHINO & TORRES-MURA, 1987 in *Aconaemys fuscus* WATERHOUSE, 1842 (CASTRO *et al.* 1987), and *G. distinctus* CASTRO & CICCHINO, 2002 in *O. degus* and *O. lunatus* OSGOOD, 1943 (CASTRO & CICCHINO 2002). For the family Ctenomyidae, WERNECK (1948) reported *Phtheiropoios pollicaris* EWING, 1924 in *Ctenomys magellanicus* BENNET, 1836 and CASTRO *et al.* (1987) reported *G. p. parvus* in *C. magellanicus*. For the family Abrocomidae, WERNECK (1948) reported *Gyropus longus* NEUMANN, 1912 in *Abrocoma bennetti* WATERHOUSE, 1837 and PRICE & TIMM (2000) reported *Abrocomophaga chilensis* EMERSON & PRICE, 1976 for the same host.

Materials and methods

All rodent specimens analyzed were from the collections of the National Museum of Natural History in Santiago, Chile. The lice were collected from the following species: 51 specimens of *Octodon degus*, distributed from Huasco

(28° 28' S; 71° 13' W) to Santiago (33° 27' S; 70° 38' W), three *Octodon lunatus* from National Park Fray Jorge (30° 39' S; 71° 40' W) and Peñuelas National Reserve (33° 09' S; 71° 32' W), 19 *Aconaemys fuscus* distributed from Baños del Flaco (35° 57' S; 70° 26' W) to Vilches National Reserve, nine *Aconaemys sagei* from Malleco Lagoon (38° 12' S; 71° 50' W) and Paso Reigolil (39° 07' S; 71° 25' W), 15 *Octodontomys gliroides* distributed from Zapahuira (18° 20' S; 69° 36' W) and Chuzmiza (19° 41' S; 69° 11' W). For the family Ctenomyidae, there were five *Ctenomys maulinus* from Maule Lake (36° 04' S; 70° 30' W), four *Ctenomys magellanicus* from Tierra del Fuego (54° 04' S; 68° 57' W), and three *Ctenomys opimus* from Japu Bajo (18° 24' S; 69° 16' W). For the family Abrocomidae, 13 specimens of *Abrocoma bennetti* distributed from Huasco to Itata River (36° 50' S; 72° 24' W) were examined. The recovered Phthiraptera were stored in alcohol, and for better identification they were later mounted according to PALMA (1978). The lice are deposited in the collection of the Laboratory of Zoology, Faculty of Veterinary Medicine, University of Concepción, Chillán, Chile. The material was collected by LUCILA MORENO SALAS and DANIEL GONZÁLEZ-ACUÑA.

Results

Suborder Amblycera

Family Gyropidae

Genus *Gyropus* NITZSCH, 1818

Gyropus elongatus CASTRO, CICCHINO & TORRES MURA, 1987

Type host: *Aconaemys fuscus* WATERHOUSE, 1842
Other host: *Aconaemys sagei* PEARSON, 1984
(CASTRO *et al.* 1987)

Examined: 19 *Aconaemys fuscus*, positive to lice six, from El Flaco Hot Springs, Las Cabras (34° 38' S; 70° 41' W) and Vilches National Reserve. Nine *Aconaemys sagei*, positive to lice three, from Malleco Lagoon and Paso Reigolil.

Material examined: three males, three females, three larvae (nymphs).

Gyropus distinctus CASTRO & CICCHINO, 2002

Type host: *Octodon degus* (MOLINA, 1782)
Other hosts: *Octodon lunatus* OSGOOD, 1943
(CASTRO & CICCHINO 2002)

Examined: 51 *O. degus*, animals positive to lice 13, from Los Dominicos (33° 27' S; 70° 38' W), Coquimbo (29° 57' S; 71° 22' W), National Park

Fray Jorge ($30^{\circ} 39' S$; $71^{\circ} 40' W$), Lagunillas ($30^{\circ} 06' S$; $71^{\circ} 21' W$), Peñuelas National Reserve ($33^{\circ} 09' S$; $71^{\circ} 32' W$). Three *O. lunatus*, positive to lice one from Peñuelas National Reserve.
Material examined: seven males, 12 females.

Gyropus parvus EWING, 1924

Type host: *Ctenomys magellanicus* BENNET, 1836
Other hosts: *Ctenomys mendocinus* PHILIPPI, 1869; *C. t. talarum* THOMAS, 1898; *C. porteuosi* THOMAS, 1916; *C. australis* RUSCONI, 1934; *C. sericeus* ALLEN, 1903; *C. opimus* WAGNER, 1848; *C. colburni* ALLEN, 1903; *C. haigi* THOMAS, 1919; *C. chasquensis* CONTRERAS, MANCEÑIDO & RIPAS ALSINA, 1970; *C. azarae* THOMAS, 1903; *C. saltarius* THOMAS, 1912 (WERNECK 1951; CASTRO et al. 1987).
Examined: five *C. maulinus* PHILIPPI, 1872, one positive to lice from Maule Lake ($36^{\circ} 04' S$ $70^{\circ} 30' W$).
Material examined: two males, three females.

Genus *Phtheiropoios* EICHLER, 1940

Phtheiropoios pearsoni WERNECK, 1948

Type host: *Abrocoma cinerea* THOMAS, 1919
Examined: 13 *Abrocoma bennetti*, five positive to lice from Fray Jorge National Park.
Material examined: one male, four females.

Phtheiropoios pollicaris (EWING, 1924)

Syn.: *Gyropus pollicaris* EWING, 1924

Type host: *Ctenomys magellanicus osgoodi* (ALLEN, 1905)
Other host: *C. magellanicus fueguinus* BENNETT, 1836 (WERNECK 1948)
Examined: four *C. magallanicus fueguinus*, one positive to lice from Tierra del Fuego.
Material examined: five females.

Phtheiropoios nematophallus (WERNECK, 1935)

Syn.: *Gyropus nematophallus* WERNECK, 1835

Type host: *Ctenomys luteolus* THOMAS, 1900
Other host: *Ctenomys opimus* WAGNER, 1848 (WERNECK 1948)
Examined: three *C. opimus*, two positive to lice from Japu Bajo ($18^{\circ} 24' S$; $69^{\circ} 16' W$).
Material examined: four females, three nymphs (larvae).

Suborder Anoplura

Family Hoplopleuridae

Genus *Ferrisella* EWING, 1929

Ferrisella chilensis (WERNECK, 1937)

Syn.: *Hoplopleura chilensis* WERNECK, 1937

Type host: *Octodon degus* (MOLINA, 1782)
Examined: 51 *O. degus*, positive to lice one from Santiago.
Material examined: one female.

Ferrisella disgrega (FERRIS, 1921)

Syn.: *Hoplopleura disgrega* Ferris, 1921

Type host: *Octodontomys gliroides* (GERVAIS & D'ORBIGNYI, 1844)
Other hosts: *O. degus* (CASTRO & GONZÁLEZ 1997)
Examined: 15 *O. gliroides*, six positive to lice from Zapahuira and Chuzmiza.
Material examined: one male, four females, three nymphs.

Discussion

Eight species of lice belonging to the genera *Gyropus*, *Ferrisella*, and *Phtheiropoios* are reported from nine hosts of the Caviomorph families Octodontidae, Abrocomidae, and Ctenomyidae. The genus *Ferrisella* EWING, 1929 was considered part of *Hoplopleura* but was confirmed as a genus by CASTRO & VERZI (2002). It has five species parasitizing the family Octodontidae, and is restricted to Bolivia, Argentina, and Chile. In the present study we report two additional species *Ferrisella disgrega* and *Ferrisiella chilensis*. *Gyropus parvus* is found on at least eleven species of *Ctenomys*, but future collections will probably augment this number considerably. *Gyropus parvus* is very uniform in size and morphology, even within different Caviomorph species/populations that serve as its host. Both *Gyropus elongatus* and *G. distinctus* have long bodies in both sexes and a greater number of setae, both characters that differentiate these two species from *G. parvus*. These characters possibly reflect a different niche from the one occupied by *G. parvus*. This is also supported by their different host families, *Ctenomys* vs. *Aconaemys* and *Octodon* (CASTRO & CICCHINO 2002). The differences in parasite morphology could be a consequence of one of two scenarios. The first would presume a common phylogenetic

origin for *Aconaemys* and *Octodon* on the one hand and for *Ctenomys* on the other. The second could be the result of a secondary colonization, contemporary or extemporaneous, of members of the taxon that finally led to *Aconaemys* and *Octodon* from a Ctenomyidae lineage. Both *Gyropus elongatus* and *G. distinctus* would not be sister species but rather species derived from a common trunk that share a convergent body shape. Indeed the hosts known for both species are allopatric. The two known hosts for *Gyropus distinctus*, *Octodon degus*, and *O. lunatus*, are partially sympatric in the central region of Chile (REDFORD & EISENBERG 1992), but they do not have similar habits. *Octodon lunatus* apparently is less fossorial and inhabits areas that are more humid and densely shrubbed than *O. degus*, therefore water availability might be an important factor in the distribution of both species (CONTRERAS *et al.* 1987). Nevertheless, the environmental and behavioral separation seems not to have influenced the differentiation of both populations of *Gyropus*, which are morphologically indistinguishable, and therefore considered the same species. The only known host for *Gyropus elongatus*, *Aconaemys fuscus*, exhibits a great environmental tolerance, and is found from steppes and subxeric grasslands to forests of *Nothofagus* and *Araucaria* of the central Andes of Chile and Argentina (REDFORD & EISENBERG 1992). It is semifossorial (CONTRERAS *et al.* 1987) and allopatric with respect to both species of *Octodon*. This allopatry also would have contributed to the genetic isolation of this species of *Gyropus* in comparison to *G. distinctus*, and it only lives on *Abrothrix longipilis* and *Notiomys valdivianus* (REDFORD & EISENBERG 1992). Both these sigmodontine rodents are hosts only for species of *Hoplopleura* ENDERLEIN, 1904 (Anoplura: Hoplopleuridae). *Gyropus parvus* (EWING, 1924) is closely associated with the *C. mendocinus* group and the Patagonian species. This suggests that *Gyropus parvus* is part of an ancestral lineage that derived exclusively from the western offspring of *Ctenomys*. Its presence in populations of the *Ctenomys mendocinus*-Patagonian species is consistent with the inferred evolutionary history of this genus. In turn its presence in *Ctenomys talarum* might be due to secondary infestations at the expense of species of the *C. mendocinus* group that are partially sympatric with it. Alternatively, it might be a normal component of *Ctenomys talarum*, given the taxonomic proximity of *C. talarum* with species

of the *C. mendocinus* group. Suggestively, *Gyropus parvus* is absent in some species of the eastern subgroup of the *Ctenomys mendocinus* group, which is parasitized primarily by *C. rionegrensis*.

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