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First records of lice (Insecta: Phthiraptera) from wild southern pudu, *Pudu puda* (Mammalia: Artiodactyla: Cervidae)

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Abstract The presence of two species of Phthiraptera, *Bovicola caprae* (Gurlt, 1843) (Ischnocera: Bovicoliidae) and *Solenopotes binipilosus* (Fahrenholz, 1916) (Anoplura: Linognathidae), is reported for the first time from *Pudu puda* (Molina, 1782).

Keywords Phthiraptera · *Bovicola caprae* · *Solenopotes binipilosus* · *Pudu puda* · Chile

Introduction

Studies on the parasites of the southern pudu, *Pudu puda* (Molina, 1782), are scarce. Reported endoparasites include: *Sarcocystis* sp. (Riobeco et al. 1976; Díaz et al. 1977); gastrointestinal nematodes [*Trichostrongylus axei* (Cobbold, 1879)]; *Oesophagostomum venulosum* (Rudolphi, 1809); nematodes of the genera *Ostertagia*, *Cooperia* and *Nematodirus* (Díaz et al. 1977; Sievers 1991); *Cysticercus tenuicollis* (larva of *Taenia hydatigena* Pallas, 1766) (Díaz et al. 1977; González-Acuña 2002), and *Linguatula serrata* (Fröhlich, 1789) (Fernández 1986). Regarding ectoparasites, two species of tick have been described from the southern pudu: *Ixodes elegans* Neumann, 1910 [later changed to *I. stilesi* (Neumann 1911) because the name *I. elegans* had been used], and *I. taglei* (Kohls 1969). Sievers (1991)

recorded *I. taglei*, a hippoboscid fly, *Lipoptena pudui*, chewing lice of the family Bovicoliidae, and an anopluran louse of the genus *Linognathus*, without identifying the species.

Materials and methods

Over a period of almost 4 years, seven wild southern pudu from different localities of the 8th Region of Chile were found infested with lice. The 8th Region is located in the subantarctic domain with a temperate climate (average temperature: 9.5°C in the north; 5.4°C in the south), and high rainfall, particularly in winter. All animals originated from wild populations and were submitted to the hospital of the Faculty of Veterinary Science for different reasons (road accident, dog attack, or unknown injury). Their faeces, blood, and skin samples as well as ectoparasites were examined. All ectoparasites were preserved in 70% alcohol, and mounted in Canada Balsam for identification. The specimens are deposited in the collection of the Zoology Department in the Universidad de Concepción, Chillán, Chile, and in the Museum of Natural History, Rudolstadt, Germany.

Results and discussion

All seven pudu were infested with lice. Two pudu carried adults of *Bovicola caprae* (Gurlt, 1843) (Ichnocera: Bovicoliidae) and three pudu had infestations of *Solenopotes binipilosus* (Fahrenholz, 1916) (Anoplura: Linognathidae); two were infested with both lice species (Table 1).

Lice are highly specialised obligate parasites of mammals and birds (Clayton and Drown 2001). Although the louse *B. caprae* has been reported to be a common parasite on goats (*Capra hircus* Linnaeus, 1758) worldwide, and in particular on Chilean goats (Tagle 1966), the present report from pudu constitutes a

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Table 1 Lice (Phthiraptera) collected from seven *P. puda* in the 8th Region of Chile

No.	Date	Age	Sex	Location	Coordinates	Source	Phthirapteran species
1	27 Dec 1999	Adult	Female	Coihueco	36°37'S 71°50'W; 250 m	Road accident	<i>S. binipilosus</i>
2	12 Sept 2000	Adult	Male	Cato	36°34'S 71°58'W; 200 m	Road accident	<i>S. binipilosus</i>
3	05 May 2001	Adult	Male	Ninhue	36°23'S 72°24'W; 95 m	Dog attack	<i>S. binipilosus</i>
4	14 June 2001	Adult	Female	Coelemu	36°29'S 72°42'W; 25 m	Dog attack	<i>B. caprae</i>
5	05 Feb 2002	Adult	Male	Ninhue	36°23'S 72°24'W; 95 m	Unknown injury	<i>B. caprae</i> and <i>S. binipilosus</i> ^a
6	25 March 2003	Adult	Female	Coelemu	36°29'S 72°42'W; 25 m	Dog attack	<i>B. caprae</i>
7	7 April 2003	Juvenile	Male	Rafael	36°38'S 72°47'W; 198 m	Dog attack	<i>B. caprae</i> and <i>S. binipilosus</i>

^aOne specimen of the tick *I. stiles* was also collected

new host record. However, we consider this infestation accidental, because of the close physical association between domestic goats and pudu, due to the expansion of the grazing and browsing areas for goats which invade normal pudu territory. If, on the contrary, all developmental stages of *B. caprae* can be found on pudu, we would suggest a case of successful host switching without speciation.

Solenopotes binipilosus has been recorded from several species of deer (Cervidae): *Mazama gouazoupira* (G. Fischer, 1814), *M. americana* (Erxleben, 1777), and *Odocoileus virginianus* (Zimmermann, 1780) (Castro and Cicchino 1998). It is probably a common louse species of the southern pudu. It may be facing competition from *B. caprae*, although the feeding habits of these two species of lice are very different.

This is the first report of *B. caprae* and *S. binipilosus* from the southern pudu, and the first report of *S. binipilosus* for Chile. We believe that *S. binipilosus* may also parasitise other native Chilean cervids such as the southern huemul, *Hippocamelus bisulcus* (Molina, 1782), and the northern huemul, *H. anticensis* (d'Orbigny, 1834).

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