

# Parasitism underground: lice (Insecta: Phthiraptera) from *Ctenomys talarum* (Rodentia: Ctenomyidae) along its coastal distribution in Argentina

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## Abstract

Species of South American subterranean rodents belonging to the genus *Ctenomys* (commonly called tuco-tucos) are widely distributed across the southern Neotropical region. Despite their relatively well-studied biology and reproductive physiology, current knowledge of their ectoparasite fauna is limited to a few ambiguous studies, based on scattered samples from a small number of host individuals. *Ctenomys talarum* is the most widely distributed species in the genus. Lice (Phthiraptera) were collected from these tuco-tucos throughout their entire coastal range. Two species, one chewing louse (*Gyropus parvus*), and one sucking louse (*Eulinognathus americanus*) were collected. The distribution ranges for both louse species were extended with new locality records. No lice were found in two host populations. Furthermore, co-occurrence of both ectoparasites was not detected.

## Keywords

Subterranean rodents, *Ctenomys talarum*, ectoparasites, lice, Phthiraptera, *Gyropus*, *Eulinognathus*, geographic distribution, host-parasite system

## Introduction

South American subterranean rodents of the genus *Ctenomys* comprise 62 species (Bidau and Dias de Avila-Pires 2009), with 42 of them found in Argentina (Bidau 2006; Bidau and Dias de Avila-Pires 2009).

In particular, *Ctenomys talarum* (commonly known as “tuco-tuco de los talares”) inhabits individual and safe, permanently sealed, burrow systems (Malizia *et al.* 2000) and it is the most widely distributed species in the genus (Justo *et al.* 2003). This species occurs all along the coast of central Argentina in areas with dense vegetation and shallow soils, especially on the grassland dunes of the Province of Buenos Aires (Fig. 1) (Pearson *et al.* 1968; Malizia *et al.* 2000).

Although some aspects of the life history, sociality, reproduction and general biology of *Ctenomys talarum* are relatively well known (Pearson *et al.* 1968), there have been only a few parasitological studies (Rossin and Malizia 2002; Rossin *et al.* 2010). Considering their lice, there is only scant information about the presence of these ectoparasites in scattered samples collected from very small numbers of host individuals in each locality (Castro *et al.* 1987; Castro and Cicchino

1986; Cicchino and Castro 1994, 1998 a,b,c; Contreras *et al.* 1999; Cicchino *et al.* 2000).

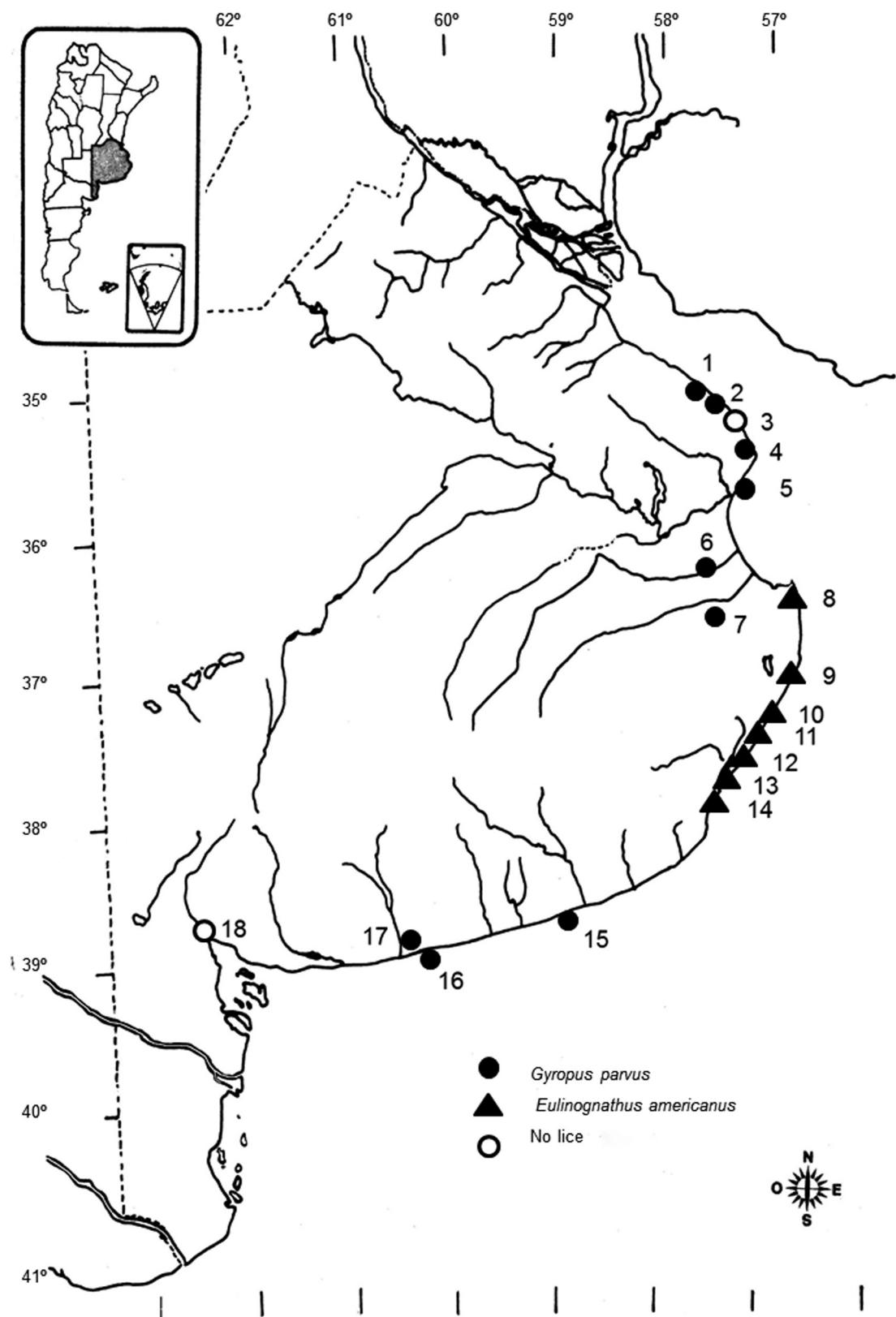
In this article, we report the community structure and patterns of geographic distribution of lice collected during an exhaustive survey of *C. talarum* populations, along their entire coastal distribution range.

## Materials and Methods

Between June 2004 and October 2008, 133 specimens of *C. talarum* and their lice were collected from 18 localities (Fig. 1; Table I). This sampling regime covered the entire coastal distribution of the host, comprising a distance of 860 km from Magdalena (35°08'01"S; 62°14'53"W) to Bahía Blanca (38°41'28"S; 62°14'53"W) in the Province of Buenos Aires (Fig. 1).

Handling of specimens was made according to approved guidelines for the capture and care of mammals (Sikes *et al.* 2011). The hosts were processed and ultimately deposited in the Mammal Collection (MMPMa) of the “Museo Municipal de Ciencias Naturales Lorenzo Scaglia” Mar del Plata, Province of Buenos Aires, Argentina (MMP).

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**Fig. 1.** Map showing locations of *Ctenomys talarum* populations and their louse species along their coastal distribution in the Province of Buenos Aires, Argentina. 1 – Reserva Pearson; 2 – Estancia El Bagual; 3 – Punta Indio; 4 – Punta Piedras; 5 – Estancia Juan Gerónimo; 6 – Ruta 11 Km 210; 7 – Tordillo; 8 – Punta Rasa; 9 – Faro Punta Médanos; 10 – Villa Gesell; 11 – Arenera Querandí; 12 – CELPA; 13 – Mar de Cobo; 14 – Comet Norte; 15 – Necochea; 16 – Reta; 17 – Cueva del Tigre; 18 – Campo Golf Club “Palihue”

**Table I.** Locations sampled, (N) number of hosts per location, geographical coordinates, and number of individuals of each species of lice (Phthiraptera) recorded from each population of *Ctenomys talarum* in the Province of Buenos Aires, Argentina (+ lice present; – no lice)

Geographic location	N	Longitude (South)	Latitude (West)	<i>Gyropus parvus</i>	<i>Eulinognathus americanus</i>
Reserva Pearson, Magdalena	17	35°08'01"	57°23'16"	48	–
Estancia El Bagual, Punta Indio	3	35°13'15"	57°17'37"	18	–
Punta Indio, Punta Indio	7	35°18'02"	57°13'03"	–	–
Punta Piedras, Punta Indio	4	35°23'08"	57°09'27"	38	–
Estancia Juan Gerónimo, Punta indio	2	35°31'42"	57°12'18"	15	–
Ruta 11 Km 210, Partido de La Costa	3	36°09'44"	57°24'58"	13	–
Tordillo, General Conesa.	5	36°21'28"	57°22'01"	50	–
Punta Rasa, Partido de la Costa.	3	36°18'41"	56°44'51"	–	18
Faro Punta Médanos, Partido de la Costa	4	36°53'09"	56°40'45"	–	15
Villa Gesell, Partido de la Costa.	2	37°14'36"	56°59'32"	–	12
Arenera Querandí, General Madariaga.	6	37°22'51"	57°06'07"	–	16
CELPA, Mar Chiquita.	5	37°43'50"	57°24'20"	–	45
Mar de Cobo, Mar Chiquita	9	37°46'07"	57°26'29"	–	65
Camet Norte, Mar Chiquita.	11	37°49'17"	57°29'09"	–	70
Necochea, Necochea.	17	38°37'49"	58°52'40"	48	–
Reta, Tres Arroyos	5	38°53'59"	60°20'52"	50	–
Cueva del Tigre, Tres Arroyos.	9	38°50'06"	60°32'02"	56	–
Campo Golf Club "Palihue", Bahía Blanca	21	38°41'28"	62°14'53"	–	–

Lice were obtained by brushing the host skins, then fixed in increasing ethanol solutions (10–70%), and cleared in 10% KOH. Lice were later mounted on permanent slides using the traditional Canada balsam technique as described by Palma (1978). Voucher specimens were deposited in the Parasitological Collection (MMPPa) of MMP.

## Results

Two species of lice were identified: *Eulinognathus americanus* Ewing, 1923 (Anoplura, Polyplacidae) found exclusively in seven *Ctenomys talarum* populations, and *Gyropus parvus* (Ewing, 1924) (Amblycera, Gyropidae) found exclusively in other nine host populations (Fig. 1). Table I shows the total number of lice of each species collected from host individuals in different localities.

*Gyropus parvus* appears to have a disjunct distribution with a northern region from Reserva Pearson to Tordillo, and a southern one, from Necochea to Reta (Fig. 1); whereas *E. americanus* infests the populations of *C. talarum* located in between the above regions (Fig. 1).

No lice were found on hosts sampled from two localities: Punta Indio and Palihue.

## Discussion

Although still poorly known, the diversity of lice parasitising members of the rodent genus *Ctenomys* has been studied by

several authors, by random sampling and from very small numbers of host individuals per locality (e.g. Ewing 1923, 1924; Castro 1982; Castro and Cicchino 1986; Castro *et al.* 1987; Cicchino and Castro 1994; 1998 a, b, c; Contreras *et al.* 1999; Cicchino *et al.* 2000).

In reference to *C. talarum*, our findings agree with those reported by Cicchino *et al.* (2000), who based the identification of both *Gyropus parvus* and *Eulinognathus americanus* in specimens from two localities: Atalaya and Estancia Los Ingleses, respectively. In contrast to that reported by Cicchino *et al.* 2000, we did not find *Ptheiropoios forficulatus* (Amblycera, Gyropidae) at any surveyed locality.

Our work resulted in the identification of Phthiraptera populations from 16 new localities with positive louse infestations on *C. talarum*, covering the entire coastal distribution of this host. However, no Phthiraptera were found in two of the localities surveyed and none of the louse positive populations carried more than one species of louse.

Future studies should explore possible causes for the unusual pattern of geographic specificity found in this study, as well as other factors affecting the interaction between *Ctenomys* hosts and their lice. Regarding *Gyropus parvus*, DNA studies of the disjunct populations are needed in order to determine their true relationships.

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