

Lice and ticks parasitizing Audouin's Gull *Larus audouinii* Payraudeau, 1826 (Aves, Laridae) in the Chafarinas Islands (W Mediterranean)

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Lice and ticks parasitizing Audouin's Gull Larus audouinii Payraudeau, 1826 (Aves, Laridae) in the Chafarinas Islands (W Mediterranean).— Data on lice and ticks parasitizing gulls are scarce. Here data on 58 adult and 10 young Audouin's gulls from the Chafarinas Islands are provided. Three species of chewing lice *Austromenopon transversum* (prevalence/mean intensity: 20%–2), *Koeniginirmus punctatus* (100%–15.5), and *Saemundssonina lari* (10%–3.2) and one tick *Ornithodoros maritimus* (100%–18) were found. *A. transversum*, *S. lari*, and *O. maritimus* are recorded for the first time for *L. audouinii*.

Key words: Chewing lice, Ticks, *Larus audouinii*.

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Introduction

Audouin's gull, *Larus audouinii* Payraudeau 1826, is an endemic species in the western Mediterranean during its breeding period, having its most numerous breeding colonies in Spain (more than 90% of the breeding population in the world, see PEDROCCHI & RUIZ, 1995).

Information about the ectoparasites of *Larus audouinii* is very scarce, the only data available to date being the study by TIMMERMANN (1952) on ectoparasites of some specimens. There is also little information available on the ectoparasites of other species of gulls (TIMMERMANN, 1952; CASADO ESCRIBANO et al., 1985; GUIGUEN et al., 1986; CHASTEL et al., 1987; GUIGUEN et al., 1989; MARTÍN-MATEO, 1989).

The aim of this work was to provide data on ectoparasites of Audouin's gull from the Chafarinas Islands.

Materials and methods

Of the Spanish breeding colonies of *Larus audouinii*, one of the most important is that on the Chafarinas Islands (ÁLVAREZ, 1992). From 1993 to 1995, the ectoparasite fauna in this colony of Audouin's gulls was studied. The Chafarinas Islands are located in the West Mediterranean at 35° 11' N, 2° 26' W (fig. 1). The archipelago is formed by three volcanic islands covered by xerophytic scrub. Mean annual temperature is around 18°C, and mean annual rainfall is 360mm (ÁLVAREZ, 1992).

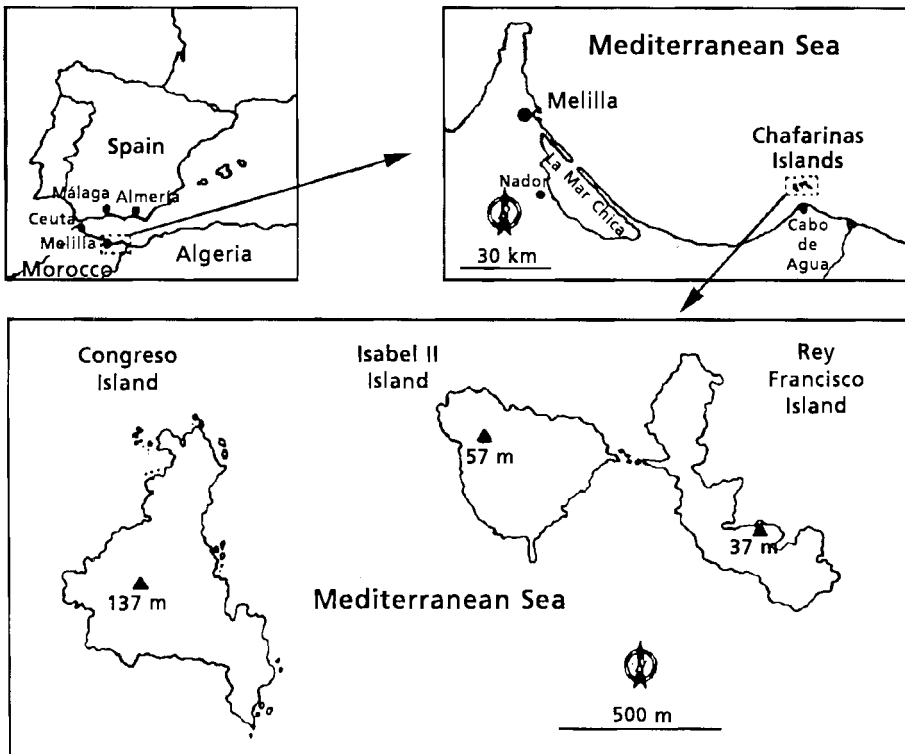


Fig. 1. Location of the Chafarinas Islands in the Mediterranean Sea.
Localización de las islas Chafarinas en el mar Mediterráneo.

Two of the three islands, Rey Island and Congreso Island, are uninhabited and harbour colonies of Audouin's gull. Isabel II Island is inhabited by scientists and military personnel, and no breeding colonies have settled there.

The sampling was done during the breeding seasons from 1993 to 1995: in total, 10 young birds were caught by hand and 58 adult gulls were caught during the incubation season. Adult birds were captured by means of nest traps (LAFUENTE, 1997). After capture, animals were given an overdose of chloroform and examined *in situ*.

Feathers from the head, wings, body and tail were examined for ectoparasites. We used visual examination for both lice and ticks, standardizing the examination by searching defined areas of the host for a constant amount of time (CLAYTON & WALTHER, 1997). A total of 22 nests for ticks were sampled *in situ* also by visual examination, i.e. counting the number of individuals visible in the nest (LEE & CLAYTON, 1995). Some authors (see CLAYTON & WALTHER, 1997) found that the number of ectoparasites visible in the nests is highly correlated with the total collected by subsequent destruction and sifting of nests.

The collected specimens were isolated and conserved in 70% alcohol. For taxonomic study, they were clarified and mounted in Hoyer medium (KRANTZ, 1978). Prevalence and mean intensity were calculated according to BUSH et al. (1997), although the value of mean intensity should only be considered as indicative.

Results

Four ectoparasite species were found on *Larus audouinii*: the chewing lice *Austromenopon transversum* (Denny, 1842) (Mallophaga, Menoponidae), *Koeniginirmus punctatus* (Timmermann, 1952), *Saemundssonina lari* (Fabricius, 1870) (Mallophaga, Philopterae), and the tick *Ornithodoros maritimus* (Vermeil et Marguet, 1967) (Acarina, Argasidae).

Austromenopon transversum (fig. 2)

Examined material: 1♂, 2♀

Prevalence: 20%

Mean intensity: 2

These specimens show the main morphological features of the species (TIMMERMAN,

1954; CLAY, 1959; ZLOTORZYCKA, 1968).

Table 1 shows the measurements of the specimens found in *L. audouinii*.

Koeniginirmus punctatus (fig. 3)

Examined material: 55♂, 71♀

Prevalence: 100%

Mean intensity: 15.5

The body, practically colourless, shows a series of pigmented black marks with characteristic arrangement. These marks show slight differences between dorsal and ventral sides in both sexes (fig. 3).

Measurements are indicated in table 2.

Saemundssonina lari (fig. 4)

Examined material: 6♂, 5♀

Prevalence: 10%

Mean intensity: 3.2

The morphological features, measurements (table 3) and chaetotaxy agree with the descriptions of the species (TIMMERMANN, 1951; ZLOTORZYCKA, 1978).

Ornithodoros maritimus

Examined material: 5♂, 5♀, 5 larvae

Prevalence: 100% (in young birds)

Mean intensity: 18 (in young birds)

This is a common species whose detailed morphology is described in VERMEIL & MARGUET (1967) and HOOGSTRAAL et al. (1976). The specimens studied agree with these descriptions.

Among the 22 examined nests, we found a mean number of 7.2 ticks (mainly adults) per nest. Among the 10 young birds (unfledged gulls), we found mainly larvae (a maximum of 49 on one bird). Three adult ticks were recovered from the nasal cavities of two young hosts. No ticks were found on adult gulls.

Discussion

TIMMERMANN (1954) considered all the described species of *Austromenopon* (Denny, 1842) from gulls (Larinae) belonging to *A. transversum* species, the nominal subspecies being *A. t. transversum*. This opinion is accepted by most authors. In fact, ZLOTORZYCKA (1968) studied

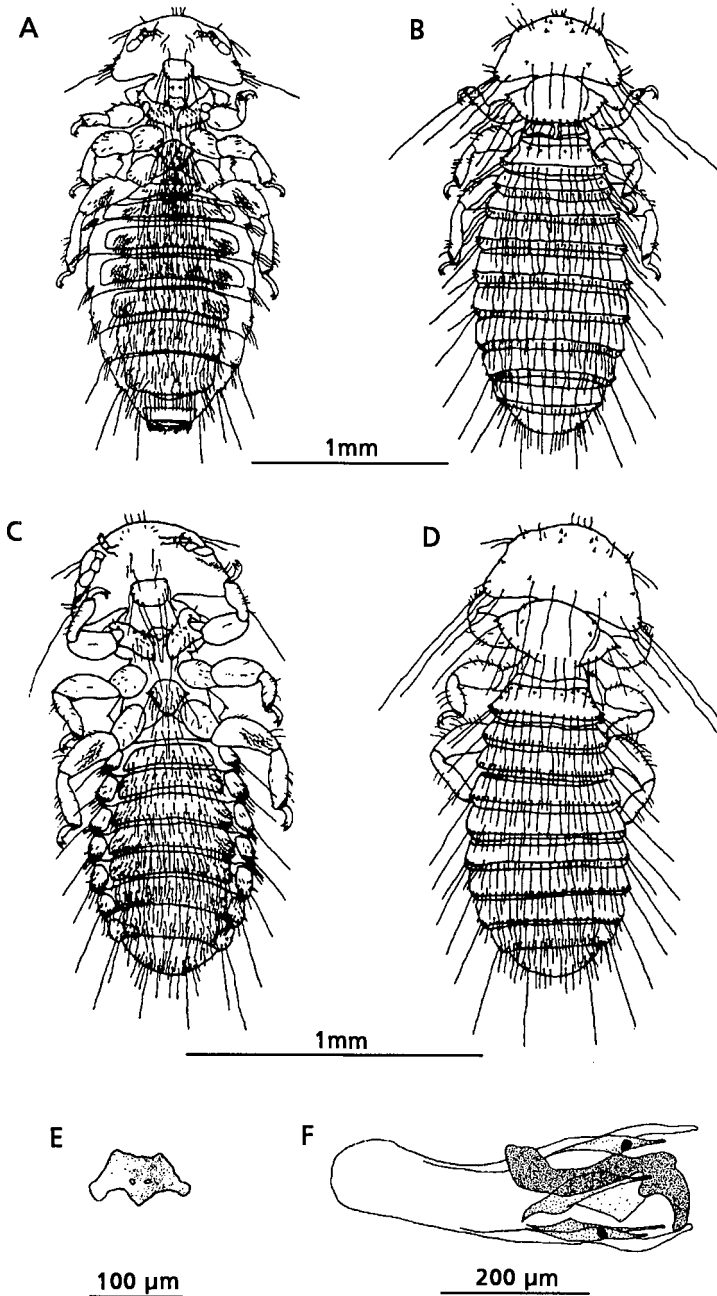


Fig. 2. *Austromenopon transversum*: A. ♀ ventral view; B. ♀ dorsal view; C. ♂ ventral view; D. ♂ dorsal view; E. ♀ prosternal plate; F. ♂ genitalia.

Austromenopon transversum: A. ♀ vista ventral; B. ♀ vista dorsal; C. ♂ vista ventral; D. ♂ vista dorsal; E. ♀ placa prosternal; F. ♂ genitalia.

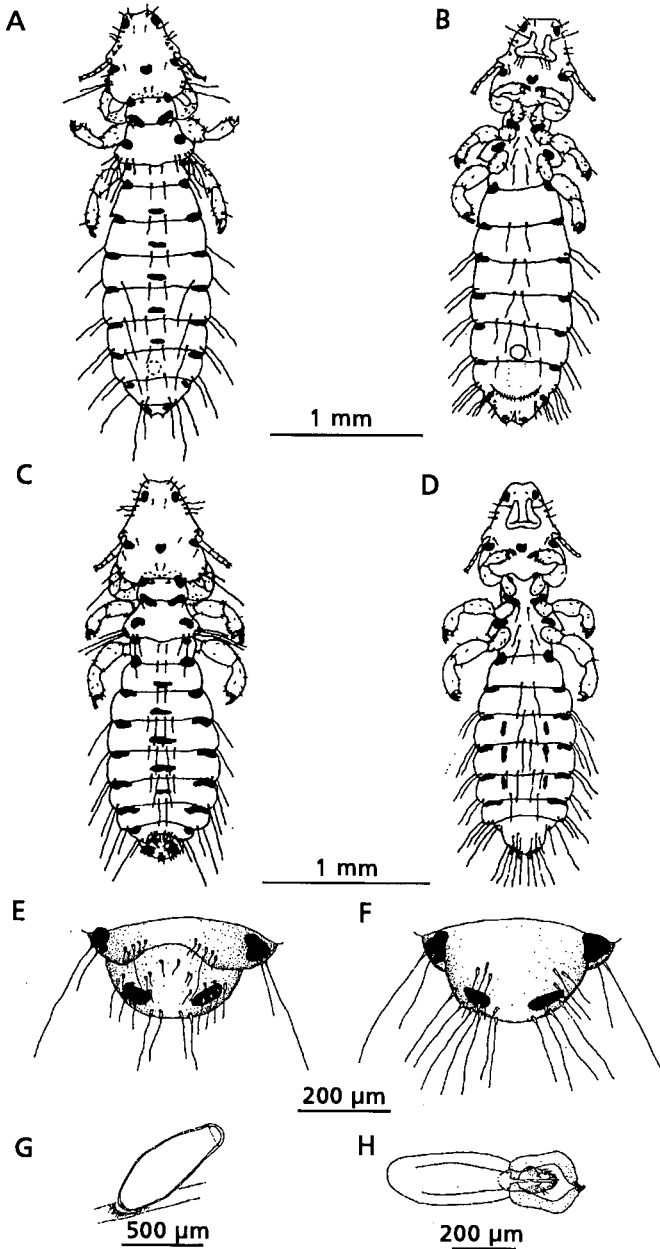


Fig. 3. *Koeniginirmus punctatus*: A. ♀ dorsal view. B. ♀ ventral view; C. ♂ dorsal view; D. ♂ ventral view; E. ♂ posterior end, dorsal view; F. ♂ posterior end, ventral view; G. Egg attached to a feather; H. Genitalia.

Koeniginirmus punctatus. A. ♀ vista dorsal. B. ♀ vista ventral; C. ♂ vista dorsal; D. ♂ vista ventral; E. ♂ parte trasera posterior, vista dorsal; F. ♂ parte trasera posterior, vista ventral; G. Huevo unido a una pluma; H. Genitalia.

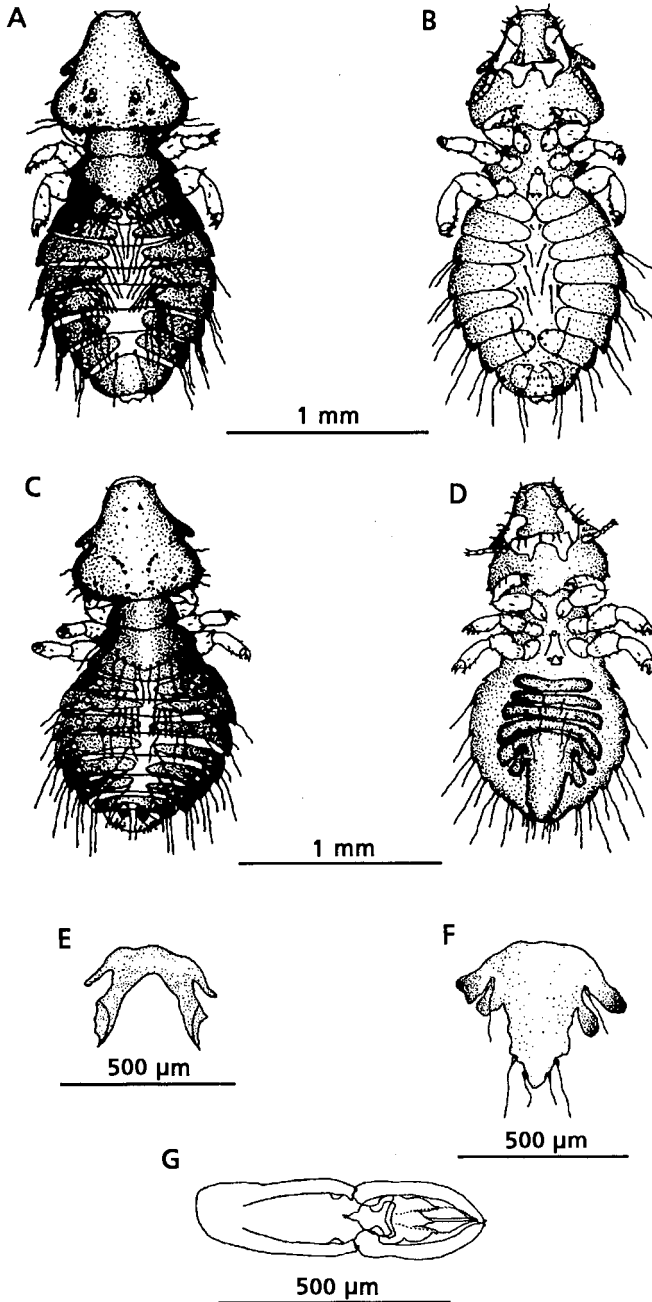


Fig. 4. *Saemundssonina lari*: A. ♀ dorsal view; B. ♀ ventral view; C. ♂ dorsal view; D. ♂ ventral view; E. ♀ genital plate; F. ♂ genital plate; G. ♂ genitalia.

Saemundssonina lari. A. ♀ vista dorsal; B. ♀ vista ventral; C. ♂ vista dorsal; D. ♂ vista ventral; E. ♀ placa genital; F. ♂ placa genital; G. ♂ genitalia.

Table 1. Measurements of *Austromenopon transversum* from *Larus audouinii* (in mm).
Medidas de Austromenopon transversum en Larus audouinii (en mm).

	♂ (n=1)	♀ (n=2)
Total length	1.5	2.0
Head length	0.3	0.3
Preantennal width	0.5	0.5
Temple width	0.6	0.6
Prothorax width	0.4	0.5
Metathorax width	0.4	0.5
Abdomen length	0.9	1.2
Abdomen width	0.6	0.8

four different subspecies from four species of *Larus* and concluded that there are very few differences among them and from the nominal subspecies. Our specimens are very similar to those described by these authors, showing only minor biometric differences probably due to adaptation to the host. This is the first record of this chewing louse on *L. audouinii*, previously cited in Spain on *L. argentatus*

Pontoppidan, 1763 and *L. ridibundus* L. (MARTÍN-MATEO, 1989).

K. punctatus was included by some authors in the genus *Nirmus* Burmeister, 1838 (WATERSON 1914). EICHLER (1940) designated it as the type species of the new genus *Koeniginirmus* for parasites of Laridae, showing characteristic partial chromatism in the body. Other authors do not consider this genus as valid and include *K. punctatus* in different genera, *Degeeriella* (Seguy 1944), and *Quadraceps* (HOPKINS & CLAY, 1953; EMERSON, 1972; LEDGER, 1980). ZLOTORZYCKA (1967) considered the genus *Koeniginirmus* as valid and differentiated *K. punctatus* from two other similar species parasitizing *Larus* spp, *K. lingulatus* Waterston, 1914 and *K. felix* Giebel, 1874.

TIMMERMANN (1952) established eight phylogenetic forms for *K. punctatus* that developed varying pigmentation patterns, from *K. p. felix* (the most pigmented form) to *K. p. pallidus*. Our specimens belong to *K. p. regressus*, the third less pigmented form, found by TIMMERMANN (1952) on yellow-legged gull, *L. cachinnans* Pallas 1811 and also on *L. audouinii*.

According to LEDGER (1980), all descriptions of the genus *Saemundssonina* may be considered as *S. lari sensu lato*, although some authors (TIMMERMANN, 1951; ZLOTORZYCKA, 1978) recognized several subspecies of *S. lari*. Our specimens are very similar to those

Table 2. Measurements of *Koeniginirmus punctatus* from *Larus audouinii* (in mm).
Medidas de Koeniginirmus punctatus en Larus audouinii (en mm).

	♂ (n=55)			♀ (n=71)		
	\bar{x}	sd	range	\bar{x}	sd	range
Total length	2.25	0.116	2.04-2.44	2.54	0.110	2.25-2.73
Head length	0.58	0.035	0.53-0.64	0.61	0.031	0.56-0.65
Head width	0.53	0.034	0.49-0.58	0.57	0.032	0.52-0.62
Prothorax width	0.30	0.019	0.28-0.34	0.32	0.020	0.29-0.35
Pterothorax width	0.47	0.031	0.44-0.52	0.50	0.032	0.44-0.55
Abdomen length	1.27	0.101	1.09-1.41	1.51	0.010	1.27-1.67
Abdomen width	0.65	0.037	0.59-0.74	0.71	0.036	0.63-0.78

Table 3. Measurements of *Saemundssonina lari* from *Larus audouinii* (in mm).
Medidas de Saemundssonina lari en Larus audouinii (en mm).

	♂ (n=6)			♀ (n=5)		
	\bar{x}	sd	range	\bar{x}	sd	range
Total length	1.65	0.054	1.56–1.71	1.90	0.143	1.64–2.04
Head width	0.61	0.015	0.60–0.62	0.66	0.013	0.64–0.67
Prothorax width	0.34	0.007	0.33–0.34	0.36	0.007	0.35–0.36
Pterothorax width	0.45	0.009	0.44–0.47	0.49	0.010	0.46–0.50
Abdomen length	0.77	0.019	0.73–0.80	0.94	0.102	0.73–1.05
Abdomen width	0.79	0.020	0.74–0.82	0.87	0.009	0.74–0.94

described by TIMMERMANN (1952) and ZLOTORZYCKA (1961) with small differences in their measurements. Although this species has wide holarctic distribution and a wide range of hosts (DEL HOYO et al., 1996; EMERSON, 1972), this constitutes its first record on *L. audouinii*. In Spain, this species was found on *L. argentatus* and *L. ridibundus* (CASADO ESCRIBANO et al., 1985; MARTÍN-MATEO, 1989).

O. maritimus is a member of the *coniceps-capensis* group (MANILLA, 1990) which includes ticks living in rocky xeric areas used as breeding colonies by many marine birds. Its presence in one of the most important colonies of *L. audouinii* is not therefore surprising. However, GUIGUEN et al. (1986) recorded *O. maritimus* in many species of marine birds from Corsica, but not on *L. audouinii*. Therefore, this is the first record on *L. audouinii*.

We have not found any quantitative data about infection of these ectoparasite species transmitted to *L. audouinii* or other gull species. Only for *Ornithodoros maritimus* some data showing hyperinfection by ticks, have been published. Thus GUIGUEN & MONAT (1985) found 210 individuals in a nest of the gull *Rissa tridactyla* L. Chastel et al (CHASTEL et al., 1987) found 759, 931 and 3,503 individuals respectively on three young birds of *Rissa tridactyla*. And MANILLA (1990) found 900 individuals in a nest of *Larus cachinnans*. Hyperinfection has not been found in *L. audouinii* of Chafarinas Islands.

Resumen

Ectoparásitos de la gaviota de Audouin Larus audouinii Payraudeau, 1826 (Aves, Laridae) en las islas Chafarinas (Mediterráneo sudoccidental)

Se ha llevado a cabo por vez primera en España un estudio de los ectoparásitos de la gaviota de Audouin, *Larus audouinii* en su colonia de cría de las Islas Chafarinas (fig. 1). Se detectaron tres especies de piojos masticadores, *Austromenopon transversum* (fig. 2, tabla 1), *Koeniginirmus punctatus* (fig. 3, tabla 2) y *Saemundssonina lari* (fig. 4, tabla 3) y una garrapata, *Ornithodoros maritimus*, de todas las cuales se ofrecen los valores de prevalencia e intensidad media y sus dimensiones. *A. transversum*, *S. lari* y *O. maritimus* se citan por primera vez para *L. audouinii*.

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