The lice of the Tristan da Cunha Archipelago

(Insecta: Phthiraptera)

With 1 plate, 1 map and 2 tables

CHRISTINE HÄNEL and RICARDO L. PALMA

Summary
All the louse species reported in the literature from the Tristan da Cunha Archipelago have been compiled, listed and discussed, including five additional species records based on material recently collected or identified in previous collections. A total of 54 louse species (including 6 records identified at the generic or subgeneric level only), belonging to 21 genera, have been listed together with their hosts: 20 bird species and one mammal. A brief discussion on the history of louse collections made on and around the archipelago, and detailed louse records from the four main islands are also given.

Zusammenfassung

Key words
Phthiraptera, Tristan da Cunha, Nightingale, Inaccessible, Gough, South Atlantic Ocean, seabirds, landbirds

Introduction
The Tristan da Cunha archipelago consists of four main islands and a few islets that lie in the central South Atlantic, approximately 2,800 km from South Africa and 3,200 km from the nearest point of South America. Three of the islands, Tristan da Cunha, Nightingale (with its associated Middle and Stoltenhoff Islets) and Inaccessible, lie within 40 km of each other around 37°S, 12°W, while the fourth, Gough Island, is positioned some 426 km further to the south-south-east of Tristan da Cunha, at 40°18’ S, 09°56’ W (Figure 1).
The islands are all of volcanic origin, with Tristan da Cunha still being active; the most recent seismic event of significance having occurred in July 2004 as a result of a submarine eruption, some 25 km out to sea from the 1961 eruption at the Edinburgh settlement (Brock, 2004). Tristan da Cunha is also the largest of the group, measuring close to 100 km² in area and 40 km around its conical perimeter, with the central peak rising to about 2060 m. It is the only island of the archipelago with a permanent human settlement of about 275 people, holding the status of being 'the most remote inhabited island on Earth'. The second largest of the islands is Gough with an area of 65 km², followed by Inaccessible (area 14 km²) and Nightingale (approximately 3 km²). Two of the islands are protected areas, Gough as a Wildlife Reserve, and Inaccessible as a Nature Reserve, both having been awarded World Heritage Site status. Accordingly, access to them is restricted, especially at Gough where it is principally limited to the personnel servicing the South African weather station, and the occasional group of scientists carrying out research projects (Hänel et al., 2005).

Birds and mammals

The islands are known primarily for their bird life, rating globally amongst the most important areas for breeding seabirds. As many as 28 breeding bird species, with at least 34 vagrant species arriving at the islands in varying degrees of abundance, have been recorded from the entire archipelago (see Appendices 2, 3). Among the breeding birds, 22 species are seabirds of which, the largest proportion are petrels and albatrosses (Order Procellariiformes). Four seabirds, the Atlantic yellow-nosed mollymawk (Thalassarche chlororhynchos (Gmelin, 1789)), the Tristan albatross (Diomedea dabbenena Mathews, 1929), the Spectacled petrel (Procellaria conspicillata Gould, 1844), and the Atlantic petrel (Pterodroma incerta Schlegel, 1863)) are endemic to the archipelago. The remaining six species are all endemic landbirds. Except for poultry living at Tristan da Cunha, there is no other introduced species in the archipelago (Hänel et al., 2005;...
RYAN & GLASS, 2001; GLASS & SANDERS, 2006). For this paper, we have extracted all bird records for the archipelago, as well as the nomenclature of bird taxa, from RYAN & GLASS, (2001) and HÄNEL et al. (2005).

The native mammals breeding on the islands consist of two marine species, the Subantarctic fur seal Arctocephalus tropicalis (GRAY, 1872) and the Southern elephant seal Mirounga leonina (LINNAEUS, 1758). Apart from humans that have settled on Tristan and visit the other islands of the archipelago, at least 10 other terrestrial species have been introduced which include vermin (mice and rats), domestic animals (dogs and cats) and livestock (cattle, sheep, pigs, donkeys and horses) (see Appendix 3), all of which are restricted to Tristan da Cunha, with the exception of mice that also occur on Gough Island.

Lice

Together, the birds and mammals of the Tristan da Cunha archipelago represent potential hosts for many louse species (Order Phthiraptera). Given that each seabird species is known to host lice belonging to several genera (CLAY & MOREBY, 1967; PILGRIM & PALMA, 1982; PRICE et al., 2003), the number of louse species represented at the islands can be expected to be high. However, besides a study conducted in 1985 on the louse fauna of Gough Island (FURNESS & PALMA, 1992), collections and information about the lice from the other three major islands of the Tristan da Cunha archipelago are still sparse and fragmented. Published records of lice from the Tristan da Cunha archipelago are scattered in several scientific publications dating from 1914 to 2002 (see Appendix 1).

In an attempt to fill some of the gaps about the invertebrate knowledge relating to Tristan da Cunha and Nightingale – the island more regularly visited – a brief project was initiated in 2005 that aimed at empowering the people of Tristan da Cunha with information and collecting techniques (HÄNEL, 2005). As part of that project, an insect collection was made at Nightingale Island, including lice from birds.

Fig. 2: Photographs of seabird lice from Tristan da Cunha. (A) Harrisiella hopkinsi: male (left, total length 9.25 mm) & female (right, total length 8.95 mm) found on Tristan albatross. (B) Saemundssonia marina: male (left, total length 1.45 mm) & female (right, total length 1.68 mm) found on white-faced storm petrels. (Photographs taken by Jean-Claude Stahl, MONZ).
Collections of Tristan da Cunha lice

The following institutions (with their acronyms) are known to hold and care for louse material collected from hosts at the Tristan da Cunha archipelago:

MONZ: Museum of New Zealand Te Papa Tongarewa, Wellington, New Zealand.

NHML: Natural History Museum, London (formerly British Museum (Natural History)), England.

NRTC: Natural Resources Department, Tristan da Cunha.

NICD: National Institute for Communicable Diseases, Johannesburg, South Africa. (Formerly: South African Institute for Medical Research).

SAMS: South African Museum, Cape Town, South Africa.

ZMON: Zoologisk Museum, University of Oslo, Oslo, Norway.

Materials and methods

In this paper we have compiled all available information relevant to the lice found on hosts from the islands of the Tristan da Cunha archipelago. This is based on published and un-published information, and specimens from the 2005 collection as well as older material that was re-examined (principally housed in the MONZ).

The 2005 collection comprised 27 lice of seven different species. These were obtained from Nightingale Island by hand searches from three bird species, namely one dead Broad-billed Prion *Pachyptila vittata* (Forster, 1777), a pile of dead Great Shearwaters *Puffinus gravis* (O'Reilly, 1818), and two Yellow-nosed Albatrosses *Thalassarche chlororhynchos* (Gmelin, 1789), (one juvenile carcass and one live adult). All lice were preserved in 70% Ethanol, of which 22 specimens were subsequently mounted on glass slides following the technique in Palma (1978), and positively identified by R.L.P. Among the 27 lice, 10 specimens were deposited in the University of Glasgow collection for DNA analysis, three specimens in the MONZ and the remaining material in the NRTC.

Results

Included in this paper are five new records of species for the archipelago, four new records of species for Nightingale Island, and three new records for Gough Island. Most of the new records are the result of brief collections made at Gough Island by Richard Cuthbert during 2000–2001 (see details under Collections of Tristan da Cunha lice), and at Nightingale Island during the invertebrate project conducted by C.H. in 2005 (see Appendix 1).

History of louse collections and publications

The history of the people who collected lice at the Tristan da Cunha archipelago and the fate of their collections, together with their repository institutions, have not been entirely unravelled. However, the information available is fascinating, showing that some of the earliest louse records from Southern Ocean islands may have been from or around Tristan da Cunha.

The earliest collection appears to be that made during October–November 1901 by the Deutsche Südpolar-Expedition 1901–1903 and reported by Enderlein, (1917). The records are all of lice collected from petrels and albatrosses at sea while the vessel travelled past Tristan da Cunha towards South Africa.

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The next collection, the first made on the islands proper, was by a P. Bonomi, who took lice from
albatrosses and petrels at Tristan da Cunha in 1904, and deposited them in the SAMS at Cape
Town. In 1912, Dr. Péringuery submitted the louse material for identification to James Waterston
in England. Subsequently, an account was published by Waterston, (1914) in which, amongst
many other lice from elsewhere, he identified specimens from Inaccessible Island as belonging to
two louse species (now known as Docophoroides brevis (Dufour, 1835) and Paraclisis diomedae
(J.C. Fabricius, 1775)) parasitizing two species of albatrosses, D. dabbenaena and T. chlororhyn-
chos (see Appendix 1 & note 1). The report by Waterston, (1914) appears to be the first publica-
tion to document lice from the Tristan da Cunha archipelago.

The next louse collection known to us comprises five lice of the species Paraclisis diomedae extracted by R.L.P. from an Atlantic yellow-nosed mollymawk, T. chlororhynchos, collected at Tristan
da Cunha by a certain M.J. Nicoll on 17 January 1906, and lodged in MONZ at Wellington,
New Zealand (registration number N.M. 18652). Unfortunately, we have not been able to ob-
tain further information about that albatross and its collector, but we have found that the Earl of
Crawford (former President of the Royal Astronomical Society) called at Tristan da Cunha pre-
cisely on the 17 January 1906 with his yacht Valhalla. However "... Owing to the poor weather
he was not able to land, but was met by the governor, Andrea Repetto, with eleven Islanders in
two boats .... and the Earl gave the Islanders the mail and stores ..." (Faustini, undated, before
1990).

In 1922, the Quest visited all the islands of the Tristan da Cunha archipelago and set ashore par-
ties to investigate and collect specimens. Amongst them was the ship’s naturalist George Hubert
Wilkins who, on going ashore at Nightingale was described as follows (Wild, 1923): "... Mr.
Wilkins kept shooting birds on the way up, but we had great difficulty in finding them in the
grass. We were drenched to the skin ... sliding down the soaking rotten earth, stumbling blindly
through the long grass and slipping into the holes". Whether purposefully or inadvertently, some
lice specimens remained on the preserved skins made from that collection, including three
specimens of Perineus circumfasciatus Kéler, 1957 from a Sooty albatross, Phoebetria fusca, dated
25 May 1922, now lodged in MONZ (Palma & Pilgrim, 1988: 583).

It was during 1937–1938 that the first and so far the only thorough entomological study was
made of the three northern islands by the Norwegian Scientific Expedition to Tristan da Cunha.
The terrestrial zoologist, Dr. Yngvar Hagen, made a collection of the invertebrates, which in-
cluded lice from birds at Tristan da Cunha, Inaccessible and Nightingale. The specimens were
deposited in ZMON, and some duplicates in NHML. Two publications on lice emanated from
that collection, the first part being by Clay, (1957) listing the identified specimens, and the sec-
ond by Timmerman, (1957) reviewing the genus Longimenopon Thompson, 1948. A specimen
collected by Dr. Hagen was later included in the description of a new louse species from Giant
petrels, Macronectes giganteus (Gmelin, 1789), by Palma & Pilgrim, (1988: 584).

In 1949–1950, a collection of lice was made by Mrs. M. K. Rowan from birds at the three northern
islands, later deposited in the NICD at Johannesburg, South Africa. Kéler, (1951, 1952)
published two accounts of the species included in that collection: the first paper contains the de-
scriptions of two new louse species found on the flightless and endemic Inaccessible rail, Atlantisia
rogersi Lowe, 1923, while the second includes detailed redescriptions of several louse species col-
clected from petrels, and descriptions of two new species from penguins.
Hugh Francis Ivo Elliott, an officer of the British Colonial Service, assumed duty as Administrative Officer of Tristan da Cunha on 31 January 1950. He collected birds on the islands of the archipelago, including Gough Island, for the British Museum (Natural History) – now NHML – during 1951–1952. Several samples of lice were extracted from these birds, which are now deposited in the NHML, and most have been studied and reported in several publications (e.g. Clay, 1957; Kéler, 1957; Timmermann, 1954, 1957; Palma & Pilgrim, 1988, 2002), which include two species, Austromenopon elliotti Timmermann, 1954 and Longimenopon elliotti Timmermann, 1957, named after H.F.I. Elliott (see Table 1 & Appendix 1).

During the summer of 1955–1956, the focus shifted to Gough when a systematic study of the island was made by the Gough Island Scientific Survey. The expedition’s leader, Martin W. Holdgate, was the entomologist who carried out the investigations concerning invertebrates. His collection of lice was also deposited in the NHML and reported in some publications (e.g. Kéler, 1956; Holdgate, 1965; Palma & Pilgrim, 2002). However, the most comprehensive collection of lice from the island group was made in 1985 by Robert W. Furness from birds at Gough Island. The results were published by Furness & Palma, (1992), and the collection is deposited in MONZ.

The most recent invertebrate work of significance carried out at the archipelago was during 1999–2002, being the Gough Island Terrestrial Invertebrate Survey at Gough Island [GITIS] (Jones, 2001; Jones et al., 2003b). A small collection of lice from birds was made as part of that survey, but no report has hitherto been produced about them. Our attempts to study that collection and to include it in this paper failed despite repeated efforts to locate it in the NHML. This institution appears the most likely repository considering that Jones et al., (2003b) indicate that all GITIS samples were “… returned to the UK to be identified …” and, in their acknowledgments, they list several of the NHML staff members for their help and advice.

Other collections have been made by volunteers as opportunities arose, including that made by R. Cuthbert in 2000–2001; these lice were used to extract DNA for phylogenetic studies carried out at the University of Glasgow and are now deposited in MONZ. The most recent contribution is that of C.H. who collected at Tristan da Cunha and Nightingale Islands in early 2005 during an invertebrate project that formed part of a larger program entitled Empowering the People of Tristan da Cunha to Implement the CBD that was run through the Royal Society for the Protection of Birds [RSPB] (Hänel, 2005).

Louse records

In this paper, we have added five new records of species for the archipelago: Austromenopon paululum (Kellogg & Chapman, 1899), A. pinguis (Kellogg, 1896), Philoceanus fasciatus (Carriker, 1958), Saemundssonia (Puffinoecus) peusi (Eichler, 1949) and Pediculus humanus capitis De Geer, 1778; four new records of species for Nightingale Island: Austromenopon paululum, A. pinguis, Paracallis diomedae and Saemundssonia (Puffinoecus) sp.; and three new records of species for Gough Island: Docophoroides simplex (Waterston, 1914), Harrisoniella hopkinsi Eichler, 1952 and Paracallis diomedae. Therefore, the number of louse species recorded from all the islands of the Tristan da Cunha archipelago now amounts to 54 – including one species which is believed to have been eradicated, four straggler or contaminant records, and 6 records which have been identified to generic level only – representing 21 louse genera (see Table 1 and

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One further species needs confirmation because, at present, it is an unidentifiable record (see *Colpocephalum furcatum* in Appendix 1).

The two larger islands, namely Tristan da Cunha and Gough, have been more thoroughly and frequently sampled and therefore, have the highest number of louse species recorded, i.e. 32 and 33 species each respectively. Nightingale and Inaccessible Islands being much smaller and less sampled, have 13 and 11 louse species recorded respectively (see Table 1).

Among the 54 louse species listed in this paper, three (5.5%) can be considered endemic to the archipelago: two species parasitic on the Inaccessible rail and one on the Tristan thrush. The great majority, 50 species (92.6%), are native to the archipelago, and one species was introduced by humans (see note 7). The level of endemism is related directly to the number of endemic terrestrial bird and mammal species represented at the island. The situation reflected by the louse fauna of the Tristan da Cunha Archipelago is no different from that at other oceanic islands (see Horning et al., 1980; Pilgrim & Palma, 1982; Marris, 2000; Palma & Jensen, 2005).

**Hosts**

In terms of louse hosts, the archipelago potentially has 77+ species, being 64+ birds (28 breeding, 34+ vagrants and two+ alien introductions); and 13+ mammals (two native and 11+ alien introductions) that occur on the islands (see Appendix 2 & 3). Among these, 21 host species have lice recorded from them, of which 19 are breeding birds (17 seabirds and 2 landbirds), one is a vagrant bird and one is a mammalian host. (see Table 2 and Appendix 2). The Black-browed mollymawk, *Thalassarche melanophrys* (Temminck, 1828), counted here as the single vagrant host, is a frequent visitor that may have been a breeding species on Tristan da Cunha at the time that it was sampled (1937–1938). The single record of a mammal louse refers to human headlice, although it may now be absent from the islands (see note 7).

Surprisingly, apart from the single incident involving humans, there are no records of lice from the several mammal species of the archipelago, despite the fact that mice have been well established at Tristan da Cunha and Gough since early 1900, followed by rats at Tristan and farm animals (temporally at Gough between the 1950’s and 1970’s and permanently at Tristan) (see Appendix 3). The apparent absence of lice may be due to lack of collecting effort, or that the mammal populations are indeed free of lice because their ancestors arrived free of lice to the islands, an event called “missing the boat”, or that they had lice at their arrival but subsequently they became extinct (Paterson et al., 2003).

In summary, there are 56+ potential louse hosts from which no lice have been recorded yet. These are: 11 native breeding host species (5 seabirds, 4 landbirds and 2 marine mammals), 33+ vagrant birds, and 12+ species introduced by human agency (2+ poultry and 10+ alien mammals). They represent 73% of the total potential number of louse hosts for the archipelago, all without any louse record (see Appendix 3).
Tab. 1: Lice recorded from the Tristan da Cunha archipelago. Louse species are grouped alphabetically, first by family, then by genera and species, with their respective hosts and island locations.

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<td>marina</td>
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<td>(S.) sternae</td>
<td>√</td>
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<td></td>
<td>Puffinoecus</td>
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<td>Trabeculus</td>
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<td>Trabeculus hexakon</td>
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<td></td>
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<td>mirabilis</td>
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<td></td>
<td></td>
<td>schillingi</td>
<td>√</td>
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<td>21</td>
<td>54</td>
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**ISLANDS**

**HOSTS**

- Atlantic petrel, *Pterodroma incerta*
- Soft-plumed petrel, *Pterodroma mollis*
- Black-browed mollymawk, *Thalassarche melanophris*
- Tristan albatross, *Dioneaedea dabbenena*
- Great shearwater, *Puffinus gravis*
- Great-winged petrel, *Pterodroma macroptera*
- Broad-billed prion, *Pachyptila vittata*
- Atlantic petrel, *Pterodroma incerta*
- Atlantic yellow-nosed mollymawk, *Thalassarche chlororhynchos*
- Sooty albatross, *Phoebetria fusca*
- Black-browed mollymawk, *Thalassarche melanophris*
- Tristan albatross, *Dioneaedea dabbenena*
- Southern giant petrel, *Macronectes giganteus*
- Atlantic petrel, *Pterodroma incerta*
- White-bellied storm petrel, *Fregetta grallaria*
- Antarctic tern, *Sterna vittata*
- Inaccessible rail, *Atlantisa rogersi*
- Broad-billed prion, *Pachyptila vittata*
- Tristan skua, *Catharacta antarctica hamiltoni*
- Antarctic tern, *Sterna vittata*
- White-faced storm petrel, *Pelagodroma marina*
- Antarctic tern, *Sterna vittata*
- Atlantic yellow-nosed mollymawk, *Thalassarche chlororhynchos*
- Atlantic petrel, *Pterodroma incerta*
Tab. 2: Hosts and the louse species associated with them in the Tristan da Cunha archipelago.

<table>
<thead>
<tr>
<th>Class Aves</th>
<th>Order Procellariiformes (albatrosses and petrels)</th>
<th>LICE</th>
<th>ISLANDS</th>
<th>Number of louse species per host</th>
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<tbody>
<tr>
<td><strong>Diomedea dabbenena</strong></td>
<td>Tristan albatross</td>
<td><strong>Docophoroides brevis</strong></td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Harrioniella hopkinsi</strong></td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td><strong>Panalitis hyalina</strong></td>
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<tr>
<td><strong>Phoebetria fusca</strong></td>
<td>Sooty albatross</td>
<td><strong>Paraclisis diomedeae</strong></td>
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<tr>
<td></td>
<td></td>
<td><strong>Perineus circumfasciatus</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Thalassarche chlororhynchos</strong></td>
<td>Atlantic yellow-nosed mollymawk</td>
<td><strong>Austromenopon pinguis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Docophoroides simplex</strong></td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td><strong>Panalitis diomedeae</strong></td>
<td>√</td>
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<td></td>
<td></td>
<td><strong>Perineus circumfasciatus</strong></td>
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<td></td>
<td></td>
<td><strong>Docophoroides brevis</strong></td>
<td>[straggler]</td>
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<tr>
<td></td>
<td></td>
<td><strong>Saemundssonia (Puffinoecus) peusi</strong></td>
<td>[straggler]</td>
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<td><strong>Saemundssonia (P.) sp.</strong></td>
<td></td>
<td>√</td>
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<td><strong>Thalassarche melanophris</strong></td>
<td>Black-browed mollymawk</td>
<td><strong>Docophoroides simplex</strong></td>
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<td></td>
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<td><strong>Panalitis diomedeae</strong></td>
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<td><strong>Perineus circumfasciatus</strong></td>
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<td><strong>Macronectes giganteus</strong></td>
<td>Southern giant petrel</td>
<td><strong>Docophoroides murphyi</strong></td>
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<td></td>
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<td><strong>Panalitis obscura</strong></td>
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<td></td>
<td></td>
<td><strong>Perineus macronecti</strong></td>
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<td><strong>Puffinus assimilis</strong></td>
<td>Little shearwater</td>
<td><strong>Halipeurus (Halipeurus) mundae</strong></td>
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<td></td>
<td></td>
<td><strong>Trabeculius mirabilis</strong></td>
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<tr>
<td><strong>Puffinus gravis</strong></td>
<td>Great shearwater</td>
<td><strong>Ancistrona vagelli</strong></td>
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<td></td>
<td></td>
<td><strong>Austromenopon paululon</strong></td>
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<td><strong>Halipeurus (H.) abnormis</strong></td>
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<td><strong>Halipeurus (H.) gravis gravis</strong></td>
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<td></td>
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<td><strong>Naubates (Naubate) harrisoni</strong></td>
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<td><strong>Trabeculius hexakon</strong></td>
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<td>Kerguelen petrel</td>
<td><strong>Bedfordiella unica</strong></td>
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<td></td>
<td></td>
<td><strong>Longimenopon galeatum</strong></td>
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<td><strong>Pterodroma incerta</strong></td>
<td>Atlantic petrel</td>
<td><strong>Austromenopon popellus</strong></td>
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<tr>
<td></td>
<td></td>
<td><strong>Halipeurus (H.) procellariae</strong></td>
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<td><strong>Trabeculius schillingi</strong></td>
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<td>[straggler]</td>
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<td><strong>Pterodroma macroptera</strong></td>
<td>Great-winged petrel</td>
<td><strong>Naubates (G.) heteroproctus</strong></td>
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DOI: 10.21248/contrib.entomol.57.1.105-133
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<td>√</td>
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<td>Trabeculus schillingi</td>
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<td>√</td>
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<td>Ancistrona vagelli</td>
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<td>Saemundssonia (S.) marina</td>
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<td>Austromenopon sp.</td>
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<td>Order Gruiformes (rails)</td>
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<td>Inaccessible rail</td>
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<td>Order Passeriformes (perching birds)</td>
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<tr>
<td>Tristan thrush</td>
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<td>18 seabirds + 2 landbirds = 20</td>
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<td>Order Primates</td>
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<td>Homo sapiens</td>
<td>Pediculus humanus capitis</td>
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<tr>
<td>Humans</td>
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<tr>
<td></td>
<td>Most likely eradicated (see note 7)</td>
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</tr>
<tr>
<td>1 mammal</td>
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<td>TOTAL: 21 host species</td>
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Discussion

Generally, lice make up a significant portion of the total number of genera and species represented in the invertebrate fauna of oceanic islands, especially of those situated in the Southern Ocean, such as the Subantarctic islands. For example, Hornung et al. (1980) recorded 53 species of lice from breeding and vagrant hosts collected in the Snares Islands, representing about a 30% of the estimated total fauna of terrestrial arthropods (D.S. Horning pers. comm., 2006), while Palma & Hornung (2002) listed 47 louse species from Macquarie Island vertebrate hosts, representing a 31.5% of a total of 150 species of terrestrial invertebrates (excluding mites) recorded on that island, and Marris (2000) reports 40 louse species from Antipodes Island, representing a 23.5% total of the 170 terrestrial invertebrates recorded.

The louse fauna of the Tristan da Cunha archipelago is expected to be proportionally as high among the total native insect fauna as those of other oceanic islands, but a great amount of further collecting is still needed to confirm that statement. Despite the paucity of records, it is already apparent that, among native insects, lice make up a substantial portion of the fauna. Holdgate (1965: 366) records 82 species of native pterygote insects for the entire archipelago, excluding parasites. If we add the 13 species of apterygote orders (Thysanura and Collembola), two species of fleas (Siphonaptera) and one louse-fly (Diptera: Hippoboscidae) listed by Holdgate (1965: 394, 396), the total would be 98 species, a figure very close to the 100 species estimated by Holdgate (1965: 366). Therefore, the known native louse fauna amounts to about a third of the total native insect fauna.

Considering that (1) there are other species of lice known to parasitize the hosts listed in Appendix 2 in other parts of the world (Price et al., 2003), which have not been found on Tristan da Cunha hosts yet, and (2) no lice have been recorded from 9 (32%) species of native breeding birds, the total number of louse species would increase considerably after a full ectoparasitic survey of the avifauna has been carried out. That number would be even greater if the remaining 33+ species of vagrant non-breeding birds that visit the archipelago were included in such a survey. The expectation that future collecting efforts are bound to produce additional new louse species records for that island and for the archipelago is further supported by the results of the 2005 collection which, despite the small number of birds sampled and the opportunistic collecting method used, produced three new records for Nightingale Island, and one new record for the entire island group, despite the fact that there have been previous collections made from Nightingale Island (see Appendix 1).

Once the total louse fauna of the archipelago is known, it could include over 100 species, that is more than 50% of the total native insect fauna.

The current knowledge gap regarding the invertebrate fauna and its role in the islands’ ecosystems is a concern that has in recent years become more prevalent, particularly at Tristan da Cunha, where the introduction of alien species is a problem affecting the livelihoods of its inhabitants as well as posing a threat to the indigenous fauna and flora (Wace & Holdgate, 1976). During the last two decades, pest-related problems have become more prevalent with the increase in access and imports to the inhabited Tristan da Cunha Island. Such increase in traffic has also increased the chances of both the introduction of economically important louse species – in particular those which parasitize sheep and cattle – and a re-introduction of human lice with their consequential health risks (RSPB, 2004–2005; Glass & Sanders, 2006).
Conclusions

The importance of invertebrates and their role in ecosystem dynamics have become more and more prevalent, as well as their value as indicators, not only of environmental pattern changes (Jones et al., 2003a), but also of human health and well-being. On a global scale, the terrestrial biodiversity of the islands in the Tristan da Cunha archipelago ranks extremely high in importance, yet the role that the invertebrates play is still poorly understood.

A comprehensive study of the three northern islands’ invertebrate fauna is urgently needed, if a sustainable human presence is to be maintained without the risk of loosing native species, including those that may still remain to be discovered. In this regard, parasitic lice are expected to form a substantial component of the total invertebrate fauna. This knowledge gap should be filled sooner than later, as the fauna of the Tristan da Cunha archipelago is depauperate and highly susceptible to changes, either from introductions of alien species or by the extinction of native ones.

Acknowledgements

We thank the people involved in the Tristan da Cunha Invertebrate Project. In particular, James Glass for subsequently entrusting the specimens to us for further examination. The Museum of New Zealand Te Papa Tongarewa is gratefully acknowledged for providing the materials and expertise to process and identify louse samples, and Jean-Claude Stahl for supplying the photographs of the lice. We are also grateful to Vera, Simon and James Glass for the information supplied relating to the infestation of human headlice that occurred at Tristan da Cunha in 1998.

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Notes

1. Waterston (1914: 305) recorded Docophoroides brevis (as Eurymetopus taurus) from Thalassarche chlororhynchos. This host-louse association is most likely the result of a contamination from Diomedea dabenena. The alternative possibility – i.e. a misidentification of Docophoroides simplex – is most unlikely because Waterston was familiar with the latter species, which he described as new on the previous pages to this record.

2. Halipeurus abnormis was originally described from Puffinus gravis by Piaget (1885). Despite Hopkins & Clay (1952: 163) regarding this host-louse association as erroneous, Clay (1957: 3) still believed that H. abnormis “… must be a true parasite of P. gravis, …”. However, several subsequent louse collections made from P. gravis (see Foster et al., 1996) did not include any specimen of H. abnormis but, instead, contained a great number of Halipeurus gravis gravis.

3. Kéler, (1957: 282) reported two females of Paraclisis obscura (as Harrisoniella obscura) from Pterodroma incerta, collected by H. Elliott at Tristan da Cunha, and deposited in the NHML. No species of Pterodroma is known to be a regular and natural host to any species of Paraclisis (see Price et al., 2003: 371). We regard the record of P. obscura from P. incerta as the result of natural or human contamination from a species of Macronectes.
4. The lice reported by Furness & Palma (1992: 41) from Fregetta grallaria as "Philoeanus sp." have been further studied and identified as Philoeanus fasciatus by R.L.P.

5. A single male Saemundssonia (Puffinoecus) peusi collected by R. Cuthbert, and a single female Saemundssonia (Puffinoecus) sp. collected by C. Hänel, both from Thalassarche chlororhynchos, are either stragglers (resulting from a natural host-switch) or contaminants (resulting from a host transfer by human agency) from Puffinus gravis or Calonectris diomedea. There are no natural and regular records of any species of Saemundssonia (Puffinoecus) from any albatross species (see Price et al., 2003: 368).

6. Kéler, (1952: 205) identified a single Trabeculus nymph from Pterodroma incerta as Giebelia hexakon. This is most likely a misidentification of Trabeculus schillingi because further records show that this latter louse is the natural and regular Trabeculus species parasitizing Atlantic petrels. At present, nymphs of Trabeculus are unidentifiable without associated adults; therefore, we regard the nymph in question to be T. schillingi only on the basis of its host association.

7. We are not aware of any published record of human lice from the Tristan da Cunha archipelago. However, from a discussion and follow-up investigations between C.H. and the islanders of Tristan da Cunha in 2005 and 2006, it became evident that at least one outbreak of what appears to have been headlouse has occurred amongst the people of Tristan da Cunha during the last decade, and that previous outbreaks may also have occurred in the early 1900s with the arrival of sealers and ship-wrecked castaways.

The single traceable incident is dated March 1998, when the first patient, a young child, was taken to the doctor with nits in her hair. In total, 52 patients were infested, including 5 adults. With no supplies of appropriate medication in stock, a treatment was introduced based on paraffin and vinegar. Affected households were fumigated with insecticides. Patients were isolated until their heads were free of nits. Subsequent monitoring, in particular amongst the school children, was carried out by the doctor and the nursing staff. The community was kept informed by means of public posters. A talk was given to parents of the school children. Whether the lice were totally eradicated is not clear, but that appears to be the logical conclusion. The source of the headlouse is believed to have been a person who visited and stayed on the island for a few months. It is not known where that person originated from, but the principal means of transport to Tristan da Cunha is via vessels coming from South African ports. Since no samples were kept or examined under a microscope, we cannot confirm the identity of the species. However, judging from the above report, we assume that the lice were Pediculus humanus capitis.

References


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**Unpublished sources**


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APPENDIX 1.

Lice recorded from the Tristan da Cunha Archipelago

This list includes all the families, genera and species recorded from the four principal islands of the archipelago, i.e. Tristan da Cunha Island, Inaccessible Island, Nightingale Island and Gough Island.

Order **Phthiraptera** Haéckel, 1896
Suborder **Amblycera** Kellogg, 1896
Family **Menoponidae** Mjöberg, 1910
Genus **Ancistrona** Westwood, 1874

**Ancistrona vagelli** (J.C. Fabricius, 1787)
Hosts: *Puffinus gravis; Pachyptila vittata.*

Genus **Austromenopon** Bedford, 1939

**Austromenopon elliotti** Timmermann, 1954
Host: *Pelecanoides urinatrix.*

**Austromenopon fuscofasciatum** (Piaget, 1880)
Host: Catharacta antarctica hamiltoni.

**Austromenopon paululum** (Kellogg & Chapman, 1899) New Record for the archipelago
Austromenopon paululum – Nightingale (NRTC).
Host: *Puffinus gravis.*

**Austromenopon pinguis** (Kellogg, 1896) New Record for the archipelago
Austromenopon pinguis – Nightingale (MONZ); Gough (MONZ).
Host: *Thalassarche chlororhynchos.*

**Austromenopon popellus** (Piaget, 1880)
Austromenopon popellus; Furness & Palma, 1992: 40 – Gough.
Hosts: *Pterodroma incerta; Pterodroma mollis.*

**Austromenopon stammeri** Timmermann, 1963
Host: *Pachyptila vittata.*
Austromenopon sp.

Host: _Sterna vittata_.

Genus _Longimenopon_ Thompson, 1948

_Longimenopon elliotti_ Timmermann, 1957

Host: _Pterodroma incerta_.

_Longimenopon galeatum_ Timmermann, 1957

_HOSTS:_ _Pelagodroma marina; Lugensa brevirostris_.

Host: _Pterodroma mollis_.

Genus _Pseudomenopon_ Mjöberg, 1910

_Pseudomenopon rowani_ Kéler, 1951

_Pseudomenopon rowani_ Kéler, 1951: 34 – Inaccessible.
_Pseudomenopon rowani_; Holdgate, 1965: 397.
Host: _Atlantisia rogersi_.

Suborder _Ischnocera_ Kellogg, 1896
Family _Philopteridae_ Burmeister, 1838
Genus _Austrogoniodes_ Harrison, 1915

_Austrogoniodes concii_ (Kéler, 1952)

_Austrogoniodes concii_; Clay, 1957: 2 – Tristan da Cunha.
_Austrogoniodes conci_ (sic); Clay, 1967: 154 – Tristan da Cunha; Gough.
Host: _Eudyptes chrysocome moseleyi_.

_Austrogoniodes cristati_ Kéler, 1952

_Austrogoniodes cristati_; Clay, 1957: 2 – Tristan da Cunha.
_Austrogoniodes cristati_; Holdgate, 1965: 397.
Host: _Eudyptes chrysocome moseleyi._
Beitr. Ent. 57 (2007) 1

**Austrogioniodes** sp.

*Austrogioniodes* sp. (*cristati*-group); Clay, 1957: 2 – Tristan da Cunha. Host: *Eudyptes chrysocome moseleyi*.

*Austrogioniodes* sp.

*Austrogioniodes* sp. (*hamiltoni*-group); Clay, 1957: 2 – Tristan da Cunha. Host: *Eudyptes chrysocome moseleyi*.

**Genus Bedfordiella** Thompson, 1937

*Bedfordiella unica* Thompson, 1937


**Genus Brueelia** Kéler, 1936

*Brueelia* sp.


**Genus Docophoroides** Giglioli, 1864

*Docophoroides brevis* (Dufour, 1835)

*Eurymetopus taurus*; Waterston, 1914: 305 – Inaccessible.
*Eurymetopus taurus* (Nitzsch [in Giebel], 1866); Enderlein, 1917: 241 – North of Tristan da Cunha.

*Docophoroides brevis*; Holdgate, 1965: 397.


*Docophoroides brevis* – Gough (MONZ).

Hosts: *Diomedea dabbenena; Thalassarche chlororhynchos* [see note 1].

*Docophoroides murphyi* (Kellogg, 1914)

*Docophoroides hunteri*; Clay, 1957: 2 – Tristan da Cunha.

*Docophoroides hunteri*; Holdgate, 1965: 397.

Host: *Macronectes giganteus*.

*Docophoroides simplex* (Waterston, 1914)

*Docophoroides simplex*; Clay, 1957: 2 – Tristan da Cunha.

*Docophoroides simplex*; Holdgate, 1965: 397.

*Docophoroides simplex* – Gough (MONZ). New locality record

Hosts: *Thalassarche chlororhynchos; Thalassarche melanophrys*. DOI: 10.21248/contrib.entomol.57.1.105-133
Genus *Haffneria* Timmermann, 1966

*Haffneria grandis* (Piaget, 1880)

Host: _Catharacta antarctica hamiltoni._

Genus *Halipeurus* Thompson, 1936
Subgenus *Halipeurus* Thompson, 1936

*Halipeurus* (*Halipeurus*) _abnormis*_ (Piaget, 1885)

_Halipeurus abnormis_; Holdgate, 1965: 397.
Host: _Puffinus gravis_ [see note 2].

*Halipeurus* (*Halipeurus*) _falsus pacificus_ Edwards, 1961

Host: _Pelecanoides urinatrix._

*Halipeurus* (*Halipeurus*) _gravis gravis* Timmermann, 1961

_Halipeurus sp. n.;_ Clay, 1957: 3 – Tristan da Cunha, Nightingale, Inaccessible
_Halipeurus gravis gravis_ – Nightingale (NRTC).
Host: _Puffinus gravis._

*Halipeurus* (*Halipeurus*) _mundae Edwards, 1961

Host: _Puffinus assimilis._

*Halipeurus* (*Halipeurus*) _procellariae_ (J.C. Fabricius, 1775)

_Lipeurus angusticeps_; Enderlein, 1917: 244 – South of Tristan da Cunha.
Hosts: _Pterodroma incerta; Pterodroma mollis._

Subgenus *Synnautes* Thompson, 1936

*Halipeurus* (*Synnautes*) _pelagicus_ (Denny, 1842)

Hosts: _Fregetta grallaria; Pelagodroma marina._

Genus *Harrisoniella* Bedford, 1929

*Harrisoniella ferox* (Giebel, 1867)

_Harrisoniella ferox_; Holdgate, 1965: 397.
Host: _Thalassarche melanophrys._

DOI: 10.21248/contrib.entomol.57.1.105-133
Harrisoniella hopkinsi EICHLER, 1952

Lipeurus ferox; WATERSTON, 1914: 311 – Tristan da Cunha.
Lipeurus densus; ENDERLEIN, 1917: 244 – North of Tristan da Cunha.
Lipeurus diomedae (sic); ENDERLEIN, 1917: 245 – North of Tristan da Cunha.
Harrisoniella hopkinsi – Gough (MONZ).  New locality record

Host: Diomedea dabbenena.

Genus Naubates BEDFORD, 1930

Subgenus Naubates BEDFORD, 1930

Naubates (Naubates) harrisoni BEDFORD, 1930

Naubates harrisoni; HOLDGATE, 1965: 397.
Naubates (Naubates) harrisoni; PALMA & PILGRIM, 2002: 21 – Tristan da Cunha; Gough.

Host: Puffinus gravis.

Subgenus Guenterion PALMA & PILGRIM, 2002

Naubates (Guenterion) heteroproctus HARRISON, 1937

Naubates (Guenterion) heteroproctus; PALMA & PILGRIM, 2002: 52 – Tristan da Cunha; Gough.

Host: Pterodroma macroptera

Naubates (Guenterion) prioni (ENDERLEIN, 1908)

Naubates prioni; HOLDGATE, 1965: 397.
Naubates (Guenterion) prioni; PALMA & PILGRIM, 2002: 38 – Tristan da Cunha; Nightingale; Gough.
Naubates (Guenterion) prioni – Nightingale (NRTC).

Host: Pachyptila vittata.

Naubates (Guenterion) pterodromi BEDFORD, 1930

Naubates sp.; CLAY, 1957: 3.
Naubates sp.; CLAY, 1957: 3.
Naubates pterodromi; FURNESS & PALMA, 1992: 40 – Gough.
Naubates (Guenterion) pterodromi; PALMA & PILGRIM, 2002: 46 – Tristan da Cunha; Gough; Inaccessible.

Hosts: Pterodroma mollis; Pterodroma incerta.
Genus *Paraclisis* Timmermann, 1965

*Paraclisis diomedeae* (J.C. Fabricius, 1775)
- *Perineus diomedeae*; Holdgate, 1965: 397.
- *Paraclisis diomedeae* – Gough (MONZ). New locality record
  - Hosts: *Thalassarche chlororhynchos*, *Thalassarche melanophrys*, *Phoebetria fusca*.

*Paraclisis hyalina* (Neumann, 1911)
- Host: *Diomedea dabbenena*.

*Paraclisis obscura* (Rudow, 1869)
- *Perineus obscurus*; Holdgate, 1965: 397
  - Hosts: *Macronectes giganteus*, *Pterodroma incerta* [see note 3].

Genus *Pelmatocerandra* Enderlein, 1908

*Pelmatocerandra setosa* (Giebel, 1876)
- Host: *Pelecanoides urinatrix*.

Genus *Perineus* Thompson, 1936

*Perineus circumfasciatus* Kéler, 1957
  - Hosts: *Thalassarche melanophrys*, *Thalassarche chlororhynchos*, *Phoebetria fusca*.

*Perineus macronecti* Palma & Pilgrim, 1988
  - Host: *Macronectes giganteus*.

Genus *Philoceanus* Kellogg, 1903

*Philoceanus fasciatus* (Carriker, 1958) New Record for the archipelago
- Host: *Fregetta grallaria* [see note 4].
Genus *Quadraceps* Clay & Meinertzhagen, 1939

*Quadraceps houri* Hopkins, 1949

*Quadraceps houri*; Clay, 1957: 4 – Tristan da Cunha.
*Quadraceps houri*; Holdgate, 1965: 397.
Host: *Sterna vittata*.

Genus *Rallicola* Johnston & Harrison, 1911

*Rallicola zumpti* (Kéler, 1951)

*Rallicola zumpti* (Kéler, 1951); Clay, 1957: 4 – Inaccessible.
*Rallicola sumpti* (sic); Holdgate, 1965: 397.
Host: *Atlantisia rogersi*.

Genus *Saemundssonia* Timmermann, 1936

Subgenus *Saemundssonia* (Saemundssonia) Timmermann, 1936

*Saemundssonia* (Saemundssonia) *desolata* Timmermann, 1959

Host: *Pachyptila vittata*.

*Saemundssonia* (Saemundssonia) *euryrhyncha* (Giebel, 1874)

*Saemundssonia (Saemundssonia) euryrhyncha*; Palma, 2000: 125 – Gough.
Host: *Catharacta antarctica hamiltoni*.

*Saemundssonia* (Saemundssonia) *lockleyi* Clay, 1949

*Saemundssonia lockleyi*; Holdgate, 1965: 397.
Host: *Sterna vittata*.

*Saemundssonia* (Saemundssonia) *marina* Timmermann, 1956

Host: *Pelagodroma marina*.

*Saemundssonia* (Saemundssonia) *sternae* (Linnaeus, 1758)

*Saemundssonia sterni* (sic); Holdgate, 1965: 397.
Host: *Sterna vittata*. 
Subgenus *Puffinoecus* Eichler, 1949

*Saemundssonia (Puffinoecus) peusi* (Eichler, 1949)  New Record for the archipelago

*Saemundssonia (Puffinoecus) peusi* – Gough (MONZ).

Host: *Thalassarche chlororhynchos* – straggler or contaminant, see note 5.

*Saemundssonia (Puffinoecus) sp.*

*Saemundssonia (Puffinoecus) sp.* – Nightingale (NRTC).  New locality record

Host: *Thalassarche chlororhynchos* – straggler or contaminant, see note 5.

Genus *Trabeculus* Rudow, 1866

*Trabeculus hexakon* (Waterston, 1914)


Host: *Puffinus gravis*.

*Trabeculus mirabilis* (Kellogg, 1896)


Host: *Puffinus assimilis*.

*Trabeculus schillingi* Rudow, 1866


*Giebelia hexakon*; Kéler, 1952: 205 – Nightingale  [see note 6].


*Trabeculus schillingi*; Holdgate, 1965: 397.


Hosts: *Pterodroma mollis, Pterodroma incerta*.

Suborder *Anoplura*

Family *Pediculidae*

Genus *Pediculus* Linnaeus, 1758

*Pediculus humanus capitis* De Geer, 1778  New record for the archipelago

*Pediculus humanus capitis* – Tristan da Cunha.

Host: *Homo sapiens*  [see note 7].

Unidentifiable Record

*Colpocephalum furcatum* Rudow, 1869

*Colpocephalum furcatum*; Enderlein, 1917: 245 – South of Tristan da Cunha.

*Colpocephalum furcatum*; Hopkins & Clay, 1952: 79. “Probably does not even belong to the Mallophaga”.

Host: *Pterodroma mollis*. 

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APPENDIX 2.

Host-louse associations
Non-breeding species are marked with an asterisk.

CLASS AVES
Order Procellariiformes

*Diomedea dabbenena* Mathews, 1929  Tristan albatross
*Docophoroides brevis* (Dufour, 1835)
*Harrisoniella hopkinsi* Eichler, 1952
*Paraclisis hyalina* (Neumann, 1911)

*Phoebetria fusca* (Hilsenberg, 1822)  Sooty albatross
*Paraclisis diomedeae* (J.C. Fabricius, 1775)
*Perineus circumfasciatus* Kéler, 1957

*Thalassarche chlororhynchos* (Gmelin, 1789)  Atlantic yellow-nosed mollymawk
*Austromenopon pinguis* (Kellogg, 1896)
*Docophoroides simplex* (Waterston, 1914)
*Paraclisis diomedeae* (J.C. Fabricius, 1775)
*Perineus circumfasciatus* Kéler, 1957
*Docophoroides brevis* (Dufour, 1835) straggler or contaminant, see note 1
*Saemundsonia* (Puffinoecus) *peusi* (Eichler, 1949) straggler or contaminant, see note 5
*Saemundsonia* (Puffinoecus) sp. straggler or contaminant, see note 5

*Thalassarche melanophrys* (Temminck, 1828)  Black-browed mollymawk
*Docophoroides simplex* (Waterston, 1914)
*Harrisoniella ferox* (Giebel, 1867)
*Paraclisis diomedeae* (J.C. Fabricius, 1775)
*Perineus circumfasciatus* Kéler, 1957

*Macronectes giganteus* (Gmelin, 1789)  Southern giant petrel
*Docophoroides murphyi* (Kellogg, 1914)
*Paraclisis obscura* (Rudow, 1869)
*Perineus macronecti* Palma & Pilgrim, 1988

*Puffinus assimilis* Gould, 1838  Little shearwater
*Halipeurus* (Halipeurus) *mundae* Edwards, 1961
*Trabeculus mirabilis* (Kellogg, 1896)
Puffinus gravis (O’Reilly, 1818)  
Great shearwater

Ancistrona vagelli (J.C. Fabricius, 1787)
Austromenopon paululum (Kellogg & Chapman, 1899)
Halipeurus abnormis (Piaget, 1885)  [see note 2]
Halipeurus (Halipeurus) gravis gravis Timmermann, 1961
Naubates (Naubates) harrisoni Bedford, 1930
Trabeculus hexakon (Waterston, 1914)

Lugensa brevirostris (Lesson, 1831)  
Kerguelen petrel

Bedfordiella unica Thompson, 1937
Longimenopon galeatum Timmermann, 1957

Pterodroma incerta (Schlegel, 1863)  
Atlantic petrel

Austromenopon popellus (Piaget, 1880)
Halipeurus (Halipeurus) procellariae (J.C. Fabricius, 1775)
Longimenopon elliottii Timmermann, 1957
Naubates (Guenterion) pterodromi Bedford, 1930
Trabeculus schillingi Rudow, 1866
Paraclisis obscura (Rudow, 1869) straggler or contaminant, see note 3

Pterodroma macroptera (Smith, 1840)  
Great-winged petrel

Naubates (Guenterion) heteroproctus Harrison, 1937

Pterodroma mollis (Gould, 1844)  
Soft-plumaged petrel

Austromenopon popellus (Piaget, 1880)
Halipeurus (Halipeurus) procellariae (J.C. Fabricius, 1775)
Longimenopon sp.
Naubates (Guenterion) pterodromi Bedford, 1930
Trabeculus schillingi Rudow, 1866

Pachyptila vittata (Forster, 1777)  
Broad-billed prion

Ancistrona vagelli (J.C. Fabricius, 1787)
Austromenopon stammeri Timmermann, 1963
Naubates (Guenterion) prioni (Enderlein, 1908)
Saemundssonia (Saemundssonia) desolata Timmermann, 1959

Fregetta grallaria (Vieillot, 1817)  
White-bellied storm petrel

Halipeurus (Synautes) pelagicus (Denny, 1842)
Philoceanus fasciatus (Carriker, 1958)  [see note 4]

Pelagodroma marina (Latham, 1790)  
White-faced storm petrel

Halipeurus (Synautes) pelagicus (Denny, 1842)
Longimenopon galeatum (Timmermann, 1957)
Saemundssonia (Saemundssonia) marina Timmermann, 1956

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Pelecanoides urinatrix (Gmelin, 1789)  Common diving petrel  
Austromenopon elliotti Timmermann, 1954  
Halipeurus (Halipeurus) falsus pacificus Edwards, 1961  
Pelmatocerandra setosa (Giebel, 1876)  

Order Charadriiformes  

Catharacta antarctica hamiltoni Hagen, 1952  Tristan skua  
Austromenopon fuscofasciatum (Piaget, 1880)  
Haffneria grandis (Piaget, 1880)  
Saemundsonia (Saemundsonia) euryrhyncha (Giebel, 1874)  

Sterna vittata Gmelin, 1789  Antarctic tern  
Austromenopon sp.  
Quadraceps houri Hopkins, 1949  
Saemundsonia (Saemundsonia) lockleyi Clay, 1949  
Saemundsonia (Saemundsonia) sternae (Linnaeus, 1758)  

Order Sphenisciformes  

Eudyptes chrysocome moseleyi Mathews & Iredale, 1921  Northern rockhopper penguin  
Austrogoniodes concii (Kéler, 1952)  
Austrogoniodes cristatus Kéler, 1952  
Austrogoniodes sp. (cristatus-group)  
Austrogoniodes sp. (hamiltoni-group)  

Order Gruiformes  

Atlantisia rogersi Lowe, 1923  Inaccessible rail  
Pseudomenopon rowani Kéler, 1951  
Rallicola zumpti (Kéler, 1951)  

Order Passeriformes  

Nesocichla eremita Gould, 1855  Tristan thrush  
Brueelia sp.  

CLASS Mammalia  

Order Primates  

Homo sapiens Linnaeus, 1758  Humans  
Pediculus humanus capitis De Geer, 1778  [see note 7]
APPENDIX 3.

Potential host species with no records of lice

Breeding species

Native seabirds

- *Puffinus griseus* (GMELIN, 1789) - Sooty shearwater
- *Garrodia nereis* (GOULD, 1841) - Grey-backed storm petrel
- *Procellaria conspicillata* (GOULD, 1844) - Spectacled petrel
- *Procellaria cinerea* (GMELIN, 1789) - Grey petrel
- *Anous stolidus* (LINNAEUS, 1758) - Brown noddy

Native landbirds

- *Nesospiza acunhae* CABANIS, 1873 - Tristan finch
- *Nesospiza wilkinsi* LOWE, 1923 - Wilkins' finch
- *Rowettia goughensis* (CLARKE, 1904) - Gough bunting
- *Gallinula comeri* (ALLEN 1892) - Gough flightless moorhen

Native marine mammals

- *Mirounga leonina* (LINNAEUS, 1758) - Southern elephant seal
- *Arctocephalus tropicalis* (GRAY, 1872) - Subantarctic fur seal

Introduced landbirds

- *Gallus gallus* (LINNAEUS, 1758) - Domestic chickens
- *Anas* sp. - Ducks

Introduced land mammals

- *Felis catus* LINNAEUS, 1758 - Cat
- *Canis familiaris* LINNAEUS, 1758 - Dog
- *Sus scrofa* LINNAEUS, 1758 - Pig
- *Bos taurus* LINNAEUS, 1758 - Cattle
- *Ovis aries* LINNAEUS, 1758 - Sheep
- *Equus asinus* LINNAEUS, 1758 - Donkey
- *Equus caballus* LINNAEUS, 1758 - Horse
- *Mus musculus* LINNAEUS, 1758 - House mouse
- *Rattus rattus alexandrinus* (GEOFFROY, 1881) - Alexandrine rat
- *Rattus rattus frugivorus* (RAFINESQUE, 1814) - Fruit rat
Non-breeding species

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<thead>
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<th>Seabirds</th>
<th>Landbirds</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Phoebetria palpebrata</em> (FORSTER, 1785)</td>
<td><em>Porphyryla martinica</em> (LINNAEUS, 1766)</td>
</tr>
<tr>
<td><em>Thalassarche chrysostoma</em> (FORSTER, 1785)</td>
<td><em>Bubulcus ibis</em> (LINNAEUS, 1758)</td>
</tr>
<tr>
<td><em>Thalassarche cauta</em> (GOULD, 1841)</td>
<td><em>Egretta intermedia</em> (WAGLER, 1829)</td>
</tr>
<tr>
<td><em>Calonectris diomedea</em> (SCOPOLI, 1769)</td>
<td><em>Egretta alba</em> (LINNAEUS, 1758)</td>
</tr>
<tr>
<td><em>Daption capense</em> (LINNAEUS, 1758)</td>
<td><em>Egretta thula</em> (MOLINA, 1782)</td>
</tr>
<tr>
<td><em>Fulmarus glacialoides</em> (SMITH, 1840)</td>
<td><em>Ardea cocoi</em> LINNAEUS, 1766</td>
</tr>
<tr>
<td><em>Oceanites oceanicus</em> (KUHL, 1820)</td>
<td><em>Calidris fuscicollis</em> (VIEILLOT, 1819)</td>
</tr>
<tr>
<td><em>Oceanodroma leucorhoa</em> (VIEILLOT, 1818)</td>
<td><em>Phalaropus fulicarius</em> (LINNAEUS, 1758)</td>
</tr>
<tr>
<td><em>Fregetta tropica</em> (GOULD, 1844)</td>
<td><em>Chionis alba</em> (GMELIN, 1789)</td>
</tr>
<tr>
<td><em>Macronectes halli</em> Mathews, 1912</td>
<td><em>Hirundo rustica</em> LINNAEUS, 1758</td>
</tr>
<tr>
<td><em>Procellaria aequinoctialis</em> LINNAEUS, 1758</td>
<td><em>Phylloscopus trochilus</em> (LINNAEUS, 1758)</td>
</tr>
<tr>
<td><em>Pterodroma lessonii</em> (GARNOT, 1826)</td>
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</tr>
<tr>
<td><em>Pachyptila belcheri</em> (Mathews, 1912)</td>
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<tr>
<td><em>Pachyptila desolata</em> (GMELIN, 1789)</td>
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<tr>
<td><em>Stercorarius longicaudus</em> VIEILLOT, 1819</td>
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<tr>
<td><em>Larus dominicanus</em> LICHTENSTEIN, 1823</td>
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<tr>
<td><em>Sterna paradisaea</em> Pontoppidan, 1763</td>
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<tr>
<td><em>Phalacrocorax olivaceus</em> (HUMBOLDT, 1905)</td>
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<tr>
<td><em>Aptenodytes patagonicus</em> MILLER, 1778</td>
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<tr>
<td><em>Pygoscelis antarctica</em> (FORSTER, 1781)</td>
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</tr>
<tr>
<td><em>Pygoscelis papua</em> (FORSTER, 1781)</td>
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<tr>
<td><em>Eudyptes chrysolophus</em> (BRANDT, 1837)</td>
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</tr>
<tr>
<td><strong>Light-mantled sooty albatross</strong></td>
<td><strong>Purple gallinule</strong></td>
</tr>
<tr>
<td><strong>Grey-headed albatross</strong></td>
<td><strong>Cattle egret</strong></td>
</tr>
<tr>
<td><strong>Shy albatross</strong></td>
<td><strong>Yellow-billed egret</strong></td>
</tr>
<tr>
<td><strong>Cory’s shearwater</strong></td>
<td><strong>Great white egret</strong></td>
</tr>
<tr>
<td><strong>Cape petrel</strong></td>
<td><strong>Snowy egret</strong></td>
</tr>
<tr>
<td><strong>Antarctic fulmar</strong></td>
<td><strong>Coco heron</strong></td>
</tr>
<tr>
<td><strong>Wilson’s storm petrel</strong></td>
<td><strong>White-rumped sandpiper</strong></td>
</tr>
<tr>
<td><strong>Leach’s storm petrel</strong></td>
<td><strong>Grey phalarope</strong></td>
</tr>
<tr>
<td><strong>Black-bellied storm petrel</strong></td>
<td><strong>Pale-faced or Snowy sheath-bill</strong></td>
</tr>
<tr>
<td><strong>Northern giant petrel</strong></td>
<td><strong>Barn swallow</strong></td>
</tr>
<tr>
<td><strong>White-chinned petrel</strong></td>
<td><strong>Willow warbler</strong></td>
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<tr>
<td><strong>White-headed petrel</strong></td>
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<tr>
<td><strong>Slender-billed prion</strong></td>
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<tr>
<td><strong>Antarctic prion</strong></td>
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<tr>
<td><strong>Long-tailed skua</strong></td>
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<tr>
<td><strong>Kelp gull</strong></td>
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<tr>
<td><strong>Arctic tern</strong></td>
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<tr>
<td><strong>Olivaceous cormorant</strong></td>
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<tr>
<td><strong>King penguin</strong></td>
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<tr>
<td><strong>Chinstrap penguin</strong></td>
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<tr>
<td><strong>Gentoo penguin</strong></td>
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<tr>
<td><strong>Macaroni penguin</strong></td>
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</tbody>
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