

FEATHER LICE FROM SOOTY SHEARWATERS
Puffinus griseus IN THE FAROE ISLANDS
VEERLUIZEN BIJ GRAUWE PIJLSTORMVOGELS VAN DE
FAERØER EILANDEN

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Seven species of lice (Insecta: Phthiraptera) were found on 41 dead Sooty Shearwaters (Puffinus griseus) collected from two localities around the Faroe Islands in 1997. Four species (Ancistriona vagelli, Austromenopon paululum, Halipeurus diversus and Trabeculus hexakton) are regarded as regular ectoparasites on Sooty Shearwaters. The other three species (Halipeurus gravis gravis, Naubates harrisoni and Saemundssonina peusi) are treated as natural stragglers from other petrels. Possible explanations for the transferral of the three stragling louse species from their regular hosts to Sooty Shearwaters are discussed.

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INTRODUCTION

Sooty Shearwaters *Puffinus griseus* are common autumn migrants in Faroese waters, arriving around late August and departing in early October (Bloch & Sørensen 1984). From evidence of feather lice from a single bird found dead in Scotland, Zonfrillo (1988) speculated that Sooty Shearwaters in the north Atlantic may have their origins in the Falkland Islands. This was due to the presence of lice typical of the Great Shearwater *Puffinus gravis* suggesting that the lice had transferred through physical contact between individuals of these two species of shearwaters at a place where both species bred. The Falkland Islands were then the only known locality in the south Atlantic Ocean where Great Shearwaters breed alongside large numbers of Sooty Shearwaters. Since the publication of Zonfrillo's (1988) paper, Sooty Shearwaters have been found breeding on islands of the Tristan da Cunha group (Ryan *et al.* 1990). Here, we report further records of Great Shearwater lice from Sooty Shearwaters collected in the Faroe Islands. We now believe that the Tristan da Cunha group seems a more likely place where host-switching of Great Shearwater lice to Sooty Shearwaters has occurred.

MATERIALS & METHODS

On 14 August 1997, 35 dead Sooty Shearwaters were collected following fishing activities on Bill Bailey's Bank, around 100 km south-west of the Faroe Islands (62°N, 7°) and another six birds were collected similarly from around 15 km north of the Faroes on 15 October 1997. On collection, all birds were immediately wrapped individually for subsequent skinning and delousing. The resulting feather lice were first preserved in alcohol and then slide-mounted for identification following the technique published by Palma (1978). This material is now deposited in both the Natural History Museum, Tórshavn, Faroe Islands, and in the Museum of New Zealand Te Papa Tongarewa, Wellington, New Zealand.

RESULTS

Seven species of lice were collected belonging to six genera, *Ancistrona*, *Austromenopon*, *Halipeurus*, *Trabeculus*, *Naubates* and *Saemundssonina*. Numbers of birds infested by each louse species in the 35 bird sample, are recorded in Table 1. Numbers of lice, subdivided according to sex and status, collected from the sample of six northern birds are shown in Table 2.

DISCUSSION

Four of the seven louse species collected in this study have been recorded previously from Sooty Shearwaters (Pilgrim & Palma 1982; Palma & Barker 1996) and are regarded as regular parasites on this host. *Ancistrona vagelli* (J.C. Fabricius 1787), here recorded for the first time on a Sooty Shearwater from the north Atlantic Ocean, is also found on many other petrel species (Kéler 1952; Pilgrim & Palma 1982) and on Great Shearwaters (Foster *et al.* 1996). In the Faroe Islands it is common on Northern Fulmars *Fulmarus glacialis* (Jensen pers. obs.). *Austromenopon paululum* (Kellogg & Chapman 1899) is common on Sooty and Great Shearwaters (Pilgrim & Palma 1982; Foster *et al.* 1996) as well as on many other species of *Puffinus* (see Price & Clay 1972), including Manx Shearwaters *Puffinus p. puffinus* (Fowler & Shaw 1990). *Halipeurus diversus* (Kellogg 1896) is very common on Sooty Shearwaters but also lives on several other species of *Puffinus* (Edwards 1961; Fowler & Shaw 1990). It is the only species of *Halipeurus* that parasitises Sooty Shearwaters regularly. Finally, *Trabeculus hexakon* (Waterston 1914) is widespread on many petrel species of the genera *Puffinus*, *Pterodroma* and *Procellaria* (Pilgrim & Palma 1982), including Great Shearwaters (Foster *et al.* 1996).

The remaining three louse species are not regular parasites of Sooty Shearwaters. The first, *Halipeurus gravis gravis* Timmermann 1961, is commonly

Table 1. Lice from 35 Sooty Shearwaters collected at sea on Bill Bailey's bank, North Atlantic, on 14 August 1997 and the number of birds upon which each species was present.

Tabel 1. Veerluizen van 35 Grauwe Pijlstormvogels verzameld op Bill Bailey's Bank in het Noord-Atlantische gebied op 14 augustus 1997 en het aantal vogels waarop elke soort werd aangetroffen.

Louse species	An. <i>vagelli</i>	Au. <i>paululum</i>	H. <i>diversus</i>	H. <i>gravis</i> <i>gravis</i>	N. <i>harrisoni</i>	S. <i>peusi</i>	T. <i>hexakon</i>
Birds infested	1	5	34	1	2	8	10

found on Great Shearwaters (Foster *et al.* 1996). Although the species *H. gravis* also lives on the Flesh-footed Shearwater *Puffinus carneipes* and the Pink-footed Shearwater *P. creatopus*, these populations are distinguished as the subspecies *H. gravis priapulius* Timmermann 1961. Thus, the Great Shearwater is the only known regular host for the subspecies *H. g. gravis*. Zonfrillo (1988) recorded one pair of *H. g. gravis* on a Sooty Shearwater, while Fowler & Shaw (1990) found one *H. g. gravis* among 230 deloused Manx Shearwaters. These louse records, and the two specimens we report here from Sooty Shearwaters in the Faroes, must be regarded as natural stragglers, i.e. transferring without human agency, on the Sooty and Manx Shearwaters. A second species, *Naubates harrisoni* Bedford, 1930 lives on a number of *Puffinus* species (Pilgrim & Palma 1982; Fowler & Shaw 1990) including the Great Shearwater (Foster *et al.* 1996). The two specimens of *N. harrisoni* we found on two Sooty Shearwaters from the Faroes represent the first record of this louse on this host, but they should be regarded as stragglers until further records suggest otherwise. Finally, *Saemundssonina peusi* (Eichler 1949) is a regular parasite of Cory's Shearwaters *Calonectris diomedea*. However, this louse has also been recorded on Great Shearwaters (Foster *et al.* 1996; Palma pers. obs.) despite the fact that this shearwater is also a host to *Saemundssonina puellula* Timmermann 1965 (see Palma 1994). The apparent regular presence of two different species of *Saemundssonina* on Great Shearwaters is unusual. A larger sample of Great Shearwaters needs to be systematically deloused to reveal the frequency and abundance of both *S. peusi* and *S. puellula* on this host, as these two louse species are likely to compete for a very similar niche. As many as 45 specimens of *Saemundssonina peusi* were found on 10 (24 %) of the 41 Sooty Shearwaters examined in this study. They represent the first record of this louse from this host. However, these are unusually high numbers of both lice and birds for an association probably due to natural straggling.

The finding of *Naubates harrisoni* and *Halipeurus gravis gravis* on Sooty Shearwaters, both of which are regular parasites of Great Shearwaters, suggests physical contact at a locality where both shearwaters breed or perhaps at

Table 2. Status and sex of lice from six Sooty Shearwaters collected at sea 15 km north of the Faroe Islands on 15 October 1997. M = male, F = female and Ny = nymphs.

Tabel 2. Geslacht van veerluizen bij zes Grauwe Pijlstormvogels verzameld op 15 km ten noorden van de Faerøer Eilanden op 15 oktober 1997. M= mannetje, F = vrouwtje, Ny = larve.

<i>Au.paululum</i>			<i>H. diversus</i>			<i>H. gravis gravis</i>			<i>S.peusi</i>			<i>T. hexakon.</i>		
M	F	Ny	M	F	Ny	M	F	Ny	M	F	Ny	M	F	Ny
-	3	-	-	1	1	-	-	-	-	-	-	-	-	-
2	3	6	36	35	35	-	-	-	9	1	4	-	-	-
4	5	1	17	22	23	-	-	-	-	-	-	-	-	-
5	1	-	1	5	9	-	-	-	-	-	-	-	-	-
3	-	1	11	7	10	1	-	-	-	-	-	3	1	-
5	2	7	14	26	16	-	-	-	3	9	2	-	-	-

sea on the feeding grounds. Sooty Shearwaters have recently colonised Tristan da Cunha, where they have been found breeding (Ryan *et al.* 1990). A Sooty Shearwater shot off the Faroe Islands on 9 March 1977 had been ringed off the coast of southern Africa on 6 May 1968 (Jensen pers. obs.). This evidence strongly suggests that Sooty Shearwaters from around the Faroe Islands either come from Tristan da Cunha or at least visit it on a regular basis. The Falkland Islands hold around 50-100 breeding pairs of Great Shearwaters and many thousands of Sooty Shearwaters (Woods & Woods 1997). The number of Sooty Shearwaters breeding on Tristan da Cunha is also very small in comparison to the millions of Great Shearwaters estimated to breed there (Ryan *et al.* 1990).

Our records of *Saemundssonina peusi* on Sooty Shearwaters, a louse regularly associated with Cory's Shearwaters and now with Great Shearwaters, suggest that Cory's Shearwaters visit Great Shearwater and Sooty Shearwater colonies in the south Atlantic Ocean. Ryan *et al.* (1990) reported sightings of Cory's Shearwaters off Tristan da Cunha, although none has yet been found ashore. An alternative explanation is that Sooty Shearwaters and Great Shearwaters may sometimes come to land on islands in the north Atlantic Ocean where Cory's Shearwaters breed. Considering that Tristan da Cunha has been prospected and colonised by Sooty Shearwaters, these birds may be doing the same in the northern hemisphere. Salomonsen (1965) suggested that new genotypes of the Northern Fulmar (*Fulmarus glacialis*) were responsible for the rapid colonisation and expansion of this species' range in the north Atlantic. A similar set of circumstances may be operating with Sooty Shearwaters in its gradual colonisation of more islands in the Atlantic Ocean.

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SAMENVATTING

Op basis van de vondst van veerluizen die karakteristiek zijn voor de Grote Pijlstormvogel *Puffinus gravis* op een kadaver van een Grauwe Pijlstormvogel *P. griseus*, dood aangetroffen in Schotland, veronderstelde Bernie Zonfrillo (1988) dat de in onze omgeving doortrekkende Grauwe Pijlen van de Falkland Eilanden afkomstig zouden kunnen zijn. Tot dan toe, was het te zamen voorkomen van beide soorten alleen van deze eilandengroep bekend. Sindsdien werd echter bekend dat de Grauwe Pijlstormvogel ook op Tristan da Cunha broedt. Grauwe Pijlstormvogels zijn algemene doortrekkers rond de Faerøer Eilanden van augustus tot begin oktober en in dit artikel worden veerluizen beschreven die op 41 exemplaren werden aangetroffen, verzameld rond de Faerøer Eilanden op 14 augustus 1997 (35) en op 15 oktober 1997 (6). In totaal werden zeven soorten veerluizen aangetroffen. *Ancistrana vagelli*, *Austromenopon paululum*, *Halipeurus diversus* en *Trabeculus hexakon* kunnen op Grauwe Pijlstormvogels als algemene ectoparasieten beschouwd worden. De overige drie soorten (*Halipeurus gravis gravis*, *Naubates harrisoni* en *Saemundssonina peusi*) zijn 'dwaalgasten' die vaker op andere soorten stormvogelachtigen voorkomen. Eerstgenoemde is typisch voor de Grote Pijlstormvogel, de tweede komt op meerdere soorten pijlstormvogels voor, maar opnieuw ook vaak op de Grote Pijlstormvogel. *Saemundssonina peusi*, tenslotte, is een veerluis die geregeld bij de Kuhls Pijlstormvogel *Calonectris diomedea* voorkomt, maar die ook is aangetroffen bij de Grote Pijlstormvogel. De vondsten van *Halipeurus gravis gravis* en *Naubates harrisoni* suggereren dat Grote en Grauwe Pijlstormvogels geregeld fysiek contact maken, op de broedplaatsen of misschien op zee tijdens het foerageren. Tristan da Cunha, de belangrijkste kolonie Grote Pijlstormvogels in het Atlantische gebied, is nog maar kort geleden gekoloniseerd door Grauwe Pijlstormvogels en deze populatie is nog klein. Op de Falkland Eilanden, waar duizenden Grauwe Pijlstormvogels broeden, komen slechts 50-100 paren Grote Pijlstormvogels voor. Een verdere aanwijzing voor de herkomst van de hier doortrekkende Grauwe Pijlstormvogels (en dat zij in elk geval in de buurt van Tristan da Cunha komen) is de vondst van een bij Zuid-Afrika geringd exemplaar op de Faerøer Eilanden. De vondst van *Saemundssonina peusi* op een Grauwe Pijlstormvogel zou een aanwijzing kunnen zijn dat Kuhls Pijlstormvogels op de Zuid-Atlantische eilanden aan land gaan, of dat Grote en Grauwe Pijlstormvogels soms de kolonies van de Kuhls Pijlstormvogel bezoeken.

REFERENCES

- Bloch D. & S. Sørensen S. 1984. [Checklist of Faroese Birds.] Foroya Skulabokagrunnur. Tórshavn.
- Edwards R.L. 1961. Studies of the Philopteridae (Mallophaga) from the birds of the order Procellariiformes [sic]. 1. The genus *Halipeurus*. J. Parasitol. 47: 125-157.
- Foster G.W., Kinsella J.M., Price R.D., Mertins J.W. & Forrester D.J. 1996. Parasitic helminths and arthropods of Greater Shearwaters (*Puffinus gravis*) from Florida. J. Helminth. Soc. Washington 63: 83-88.
- Fowler J & Shaw G.J. 1990. Mallophaga of Manx Shearwaters *Puffinus p. puffinus* from Ynys Enlli, Wales. Seabird 12: 14-19.
- Kéler S. von 1952. On some Mallophaga of Sea-Birds from the Tristan da Cunha Group and the Dyer Island. J. Entomol. Soc. Southern Africa 15: 204-238.
- Palma R.L. 1978. Slide-mounting of lice: a detailed description of the Canada balsam technique. New Zealand Entomol. 6(4): 432-436.
- Palma R.L. 1994. New synonymies in the lice (Insecta: Phthiraptera) infesting albatrosses and petrels (Procellariiformes). New Zealand Entomol. 17: 64-69.

- Palma R.L. & S.C. Barker 1996. Phthiraptera. Pp 81-247, 333-361 (App. I-IV), 373-396 (Index) in Wells, A. (ed.) Zoological Catalogue of Australia. Vol.26. Psocoptera, Phthiraptera, Thysanoptera. Melbourne: CSIRO Publishing, Australia.
- Pilgrim R.L. & R.L. Palma 1982. A list of the chewing lice (Insecta: Mallophaga) from birds in New Zealand. *Notornis* 29 (suppl.): 1- 32.
- Price R.D. & T. Clay 1972. A review of the genus *Austromenopon* (Mallophaga: Menoponidae) from the Procellariiformes. *Ann. Entomol. Soc. America* 65(2): 457-504.
- Ryan P.G., W.R.J. Dean, C.L. Moloney, B.P. Watkins & S.J. Milton 1990. New information on seabirds at Inaccessible Island and other islands in the Tristan da Cunha group. *Mar. Ornithol.* 18 : 43-54.
- Salomonsen F. 1965. The geographical variation of the Fulmar (*Fulmarus glacialis*) and the zones of marine environment in the North Atlantic. *Auk* 82: 327-355.
- Woods R.W. & A. Woods 1997. Atlas of breeding birds of the Falkland Islands. Nelson, Oswestry.
- Zonfrillo B. 1988. The feather louse *Halipeurus gravis gravis* Timmermann, 1961 (Mallophaga: Philopteridae) from a Sooty Shearwater *Puffinus griseus* in Scotland. *Seabird* 11: 17-18.