THE GENUS BEDFORDIELLA (MALLOPHAGA: PHILOPTERIDAE) AND A NOTE ON THE LICE FROM THE KERGUELEN PETREL (PTERODROMA BREVIROSTRIS)

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ABSTRACT

The history of the genus Bedfordiella is outlined. Examination of 22 lice samples from Pterodroma brevirostris type host of B. unica containing many specimens belonging to Bedfordiella, has shown that only one species should be recognised, i.e. B. unica Thompson, 1937. Bedfordiella simsi Timmermann, 1961 is placed as a junior synonym and its type host, Pachyptila vittata vittata, is regarded as a wrong host for lice of the genus Bedfordiella. The relationships of the Kerguelen Petrel based on its mallophagan parasites are discussed.

INTRODUCTION

Two species of the genus Bedfordiella Thompson, 1937 have been described. They are B. unica Thompson, 1937, so far known only from two females, and B. simsi Timmermann, 1961, known only from the holotype male. The study of several additional samples of Bedfordiella, including many male and female specimens, has led to the conclusion that only one species should be recognised, i.e. B. unica, and that B. simsi is a junior synonym.

TAXONOMY


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Bedfordiella Thompson, 1937


The genus Bedfordiella was based on a single female specimen collected from the Kerguelen Petrel, Pterodroma brevirostris (Lesson, 1831), ordered Procellariiformes. Hopkins & Clay (1952) were doubtful about the validity of this genus but retained it provisionally. However, Timmermann (1961, 1965), Clay & Moreby (1967) and other authors have recognised Bedfordiella as a distinct genus related to Pseudonirmus and Philocenus, also parasitic on procellariiform birds. Bedfordiella can be identified by referring to Thompson (1937) and Timmermann (1961).

Bedfordiella unica Thompson, 1937

(Figs 1A, 1B)


Both sexes of Bedfordiella unica (the name as B. simsi) have been well described and figured by Thompson (1937), Timmermann (1961, 1965), and Clay & Moreby (1967). Therefore, it has been considered unnecessary to include descriptions in this paper. Photographs of the male (Fig. 1A) and the female (Fig. 1B) are given here to assist in the identification of the genus and the species.

Material examined: All samples were collected from Pterodroma brevirostris. The specimens listed below are all mounted on microslides; many more preserved in alcohol from the same samples are available but have not been included here. All localities are within New Zealand, unless stated otherwise.

Kapiti Is., Jul. 1934, 4 ♀ σ, 8 ♀ σ (NMNZ); Portland, Victoria, Australia, 4 Aug. 1954, 3 ♀ σ, 2 ♀ σ (BMNH); Ohope Beach, 15 Aug. 1965, 5 ♀ σ, 5 ♀ σ (NMNZ); Pukerua Bay, 24 Aug. 1972, 1 ♀, 1 ♀ σ (NMNZ); Oreti Beach, 26 Aug. 1972, 2 ♀ σ (NMNZ); Hokio Beach, 15 Sep. 1973, 3 ♀ σ, 4 ♀ σ (NMNZ); Ocean Beach, Tasmania, Australia, 11 Aug. 1974, 1 ♀, 1 ♀ σ (BMNH); Mahine, 9 Aug. 1975, 4 ♀ σ, 6 ♀ σ (NMNZ); Greymouth, 12 Sep. 1975, 2 ♀ σ, 3 ♀ σ (NMNZ); CLCP, BMNH, BIPM, USNM; Greymouth, 14 Sep. 1975, 25 ♀ σ, 20 ♀ σ (NMNZ); RLCB, BIPM, USNM; Stewart Is., 22 Sep. 1975, 2 ♀ σ (NMNZ); Paekakariki, 29 Jul. 1978, 6 ♀ σ, 6 ♀ σ (NMNZ); Invercargill, 5 Aug. 1980, 4 ♀ σ, 2 ♀ σ (NMNZ); Henderson, 7 Aug. 1980, 1 ♀ σ (NMNZ); Paraparaumu, 18 Sep. 1980, 5 ♀ σ, 3 ♀ σ (NMNZ); Nelson, Aug. Sep. 1980, 1 ♀ σ, 3 ♀ σ (NMNZ); Wellington, 18 Aug. 1981, 3 ♀ σ, 2 ♀ σ, (NMNZ); Otahuhu, 6 Sep. 1981, 1 ♀ σ, 1 ♀ σ (NMNZ); Totara Bay, 8 Sep. 1981, 6 ♀ σ, 6 ♀ σ (NMNZ); Tawa, Wellington, 26 Sep. 1981, 6 ♀ σ, 9 ♀ σ (NMNZ); Waitakere Ranges, 26 Sep. 1981, 6 ♀ σ, 6 ♀ σ (NMNZ); New Zealand, no date, 1 ♀ (NMNZ).

Discussion

The history of the genus Bedfordiella shows the importance of having both sexes available when describing a new species of Mullophaga. Until now, the name Bedfordiella unica has been applied to females only. An unfortunate multiple coincidence, i.e. a sample comprising a single male, a case of extreme sexual dimorphism, and an accidental change of host, led Timmermann (1961) to believe that he had an undescribed species before him. Hence he described B. simsi from a male collected from Pachyptila vivata at Gough Island by the Discovery Expedition in 1927. Although he suspected that P. vivata may not have been the true host of B. simsi, it appears that he did not consider the possibility that its original host could have been Pterodroma brevirostris, the type host of B. unica. If he had considered it, he may have refrained from describing a new species.

On two occasions, Timmermann (1961, 1965) examined the same female specimen of B. unica, as well as the only known specimen of B. simsi, i.e. the holotype male. Clay & Moreby (1967) included B. simsi (the male only) in their key to antigenic genera of Phloiopeda and figured the holotype male. Ledger (1980) listed both species of Bedfordiella following Timmermann (1961, 1965) but without citing any material examined.

All specimens of Bedfordiella collected in the course of this study have been found on Pterodroma brevirostris only. Hundreds of lice samples collected from birds nesting on the genera and most of the species currently accepted within the order Procellariiformes, from many different localities around the world, have been examined without finding any other host for Bedfordiella. Among these samples there were many from all the species of Pachyptila including Pachyptila vittata, the type host of B. simsi.

There are two feasible answers to the question of how the louse described as B. simsi was found on or associated with a specimen of Pachyptila vittata from Gough Island. Firstly, by natural straggling: both Pterodroma brevirostris and Pachyptila vittata breed on Gough Island, nesting on the ground (Watts, 1975). The sharing of a breeding locality gives ample opportunity for the accidental transfer of lice from one host species to another, particularly among ground nesting species. On the Snares Islands, Horning, Palma & Pilgrim (1980) reported 14 species of lice suspected of being stragglers, all associated with seabirds, including Pachyptila vittata. The male B. simsi may have transferred to its type host in this way. Secondly, by an accidental contamination due to human agency: this could have occurred by placing the type host of B. simsi together with a specimen of Pterodroma brevirostris, or in a container which had previously held the latter.

Our specimens of Bedfordiella unica show insignificant morphological variations only, and...
Table 1. Measurements of Bedfordiella unica (mm)

<table>
<thead>
<tr>
<th>Specimens</th>
<th>Head width/Head length</th>
<th>Total body length</th>
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<tbody>
<tr>
<td>35 cr σ</td>
<td>0.445 0.721 3.017 (0.43-0.46) (0.69-0.76) (2.96-3.10)</td>
<td></td>
</tr>
<tr>
<td>σholotype of B. simsi )</td>
<td>0.45 0.72 3.03 (from Timmerman, 1961)</td>
<td></td>
</tr>
<tr>
<td>35 3 q</td>
<td>0.521 0.725 3.408 (0.51-0.55) (0.68-0.75) (3.34-3.55)</td>
<td></td>
</tr>
<tr>
<td>υholotype (from Thompson, 1937)</td>
<td>0.54 0.72 3.46</td>
<td></td>
</tr>
<tr>
<td>additional 3</td>
<td>0.50 0.72 3.38 (from Timmerman, 1961)</td>
<td></td>
</tr>
</tbody>
</table>

3. Saemundsonia pterodroma is a very distinct species with no near affinities. Timmerman (1965) placed it in the "occidentally" group of species; this is questionable but if we prove to be correct, it will relate the Keruguen Petrel well to the genus Fulkmarus, Thalassoca, Pagodroma, and Daption, rather than to Pterodroma. The occurrence of S. pterodroma on Haloboaes caerulea can be interpreted either as clear evidence of a relationship between the Blue Petrel and the Keruguen Petrel, or as the result of successful secondary interbreeding between two unrelated petrels which have several breeding localities in common (Watson, 1975). There are few other records of Saemundsonia from Pterodroma petrels, and the species are so different from S. pterodroma that no relationships between their hosts and Pterodroma brevisris can be deduced.

4. The monotypic genus Bedfordiella is found only on Petrel Keruguen Petrel. Therefore it gives no indication of relationships between both the genera and any other Pterodroma petrel.

It is possible that the species of Bedfordiella occupies an ecological niche similar to that of the "other" species of Haloperaus and Nautaeus; comparison and considerations may be applied to Saemundsonia and the "missing" species of Trabuculus. However, this is speculative because little is known about the ecological requirements of these lice.

The louse fauna of Pterodroma brevisris suggests that it is regarded as a very distinct species with the genus, perhaps in a group of its own. Timmerman (1965) placed it as a "species incerta sedis" together with Pterodroma aiurtina, the latter without any record of Malagasy; although he considered they have not many samples from the Keruguen Petrel, he pointed out the special position of this bird. Jousain & Mounig (1979) grouped Pterodroma brevisris with P. ultima, P. mollis "and perhaps P. inexpectata" in a superspecies. The evidence from the Malagash louse from this species does not fit such grouping (Pilgrim & Palma, 1982). However, the louse of P. brevisris is very distinctive, both osteologically and behaviourally, from P. mollis and P. ultima, in its current study of the anatomy and biology of the genus Pterodroma species. Considering Pterodroma brevisris to be an atypical member of the genus...

