

The correct type hosts and designation of a lectotype for the louse *Nirmus triangulatus alpha* (Insecta: Phthiraptera: Philopteridae)

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The published type hosts of the louse taxon *Nirmus triangulatus alpha* Kellogg, 1914 are discussed and changed based on the examination of the syntype series and syntype slide label data. A lectotype is designated from specimens whose bird host is regarded as a natural, regular host (i.e. *Catharacta chilensis* (Bonaparte, 1857)). Records published after the original description of *N. t. alpha* are listed and discussed, and the current taxonomic status of this louse is given as *Quadraceps normifer alpha* (Kellogg, 1914).

Keywords: *Nirmus triangulatus alpha*; *Quadraceps normifer alpha*; Philopteridae; louse; lectotype; type host; *Catharacta chilensis*; *Catharacta antarctica*

Introduction

Kellogg (1914, p. 84) described a new louse taxon as a variety of the species *Nirmus triangulatus* Nitzsch, 1866 from two host species (the type hosts): ‘*Megalestris antarctica*’ (now *Catharacta antarctica*, southern skua) and ‘*Oceanodroma leucorhoa*’ (Leach’s storm petrel) collected in the ‘South Tropical Atlantic’ and the ‘North Tropical Atlantic’, respectively. The new louse variety, originally named *Nirmus triangulatus alpha*, was later transferred to various other genera, but it is now placed in the genus *Quadraceps* Clay & Meinertzhagen, 1939 (see ‘Synonymy’).

Subsequent authors ignored Leach’s storm petrel as a host of Kellogg’s new variety, perhaps realising that it could not be a correct host for a genus of louse that had not been recorded from storm petrels before. Consequently, they only mentioned the skua as the type host, but using various synonyms: *Megalestris antarctica* in Harrison (1916), *Catharacta skua antarctica* in Eichler (1951), Hopkins & Clay (1952), Clay & Moreby (1967) and Złotorzycka (1967), and *Catharacta skua* in Emerson (1972). The most recent checklist of chewing lice (Price et al. 2003), gives *Catharacta antarctica* (Lesson, 1831) as the only type host of *Nirmus triangulatus alpha* (as *Quadraceps alpha*), also ignoring the other type host. However, Leach’s storm petrel is still a ‘type host’ of *Nirmus triangulatus alpha*.

This article has two purposes. First, to change the type hosts of *Nirmus triangulatus alpha* Kellogg, 1914 based on the examination of the syntype series and the information given on the slide labels of the syntypes. Second, to designate a lectotype from the host regarded as a natural, regular host of this louse species, in view that the other type host record is almost certainly the result of a contamination.

Material examined

I could find no evidence that any of the authors who have dealt with this louse taxon had actually examined Kellogg's type material of *Nirmus triangulatus alpha* (now = *Quadriceps normifer alpha* (Kellogg, 1914)). However, through the courtesy of Peter T. Oboyski, who found the unmarked syntype series, I have been able to examine seven syntypes of *Nirmus triangulatus alpha*: six of them (three males and three females) mounted on three slides labelled as from a skua (R.C.M. 1362), and one female labelled as from a storm petrel (R.C.M. 1299).

In addition to the syntype series, I have examined the following samples of *Quadriceps normifer alpha*:

Ex *Catharacta chilensis* (Bonaparte, 1857): 2♂, 2♀, Canal Smyth, Magallanes, Chile, 9 Feb. 1903 (MONZ AI.017781).

Ex *Catharacta maccormicki* (Saunders, 1893): 12♂, 26♀, Cape Adare, Ross Dependency, Antarctica, 2 Feb. 1961, B. Reid (MONZ AI.017779 – AI.017780).

Discussion

Not without surprise, I realised that the species names of both type hosts written on the slide labels are not the same as those published by Kellogg (1914, p. 84). The name of the skua species is given on the labels as '*Megalestris chilensis*' (Figures 1 and 2) (now *Catharacta chilensis*), and that of the storm petrel as '*Oceanodroma castro*'. This disagreement in the species names of the type hosts between those on the slide labels and those in the publication is difficult to explain. Kellogg (1914, p. 80) wrote: 'The birds were collected by Mr. Robert C. Murphy on his South Georgia Island Expedition in 1912–13 and determined by him'.

Several scenarios for such a disagreement are possible, for example:

- (1) The species names on the slide labels are those originally received by Kellogg from Murphy, who later changed them for the publication, with Kellogg not updating the slide labels.
- (2) The species names on the slide labels are those originally received by Kellogg from Murphy, but later changed by Kellogg for the publication from other sources, but not updating the slide labels.
- (3) The Chilean skua, *Catharacta chilensis*, was originally described as a subspecies of *C. antarctica* (see Peters 1934, p. 310). That might have prompted Kellogg to change the species name in his publication.

Furthermore, both *C. chilensis* and *C. antarctica* overlap in their geographical distribution in the South Atlantic Ocean (Dickinson & Remsen 2013, p. 223). Therefore, it is not possible to deduce the species of the type host of *Nirmus triangulatus alpha* from the locality given by Kellogg (1914, p. 84) as 'South Tropical Atlantic'. Similarly, both *Oceanodroma leucorhoa* and *O. castro* overlap in their geographical distribution in the North Atlantic Ocean (Dickinson & Remsen 2013, p. 174), so the locality given by Kellogg (1914, p. 84) as 'North Tropical Atlantic' does not allow an unequivocal identification of that host either.

The sequence of events resulting in such a disagreement of species names may never be elucidated. However, it exposes a possible dilemma on the concept of 'type host' applicable to any parasite. Which is the type host of a parasite? The species given in the original



Figure 1. Slide with male lectotype (on right) and female paralectotype of *Nirmus triangulatus alpha* Kellogg, 1914 from the Kellogg Collection (EMEC 225257), remounted by an unknown person, and bearing the original label on the right side.



Figure 2. Slide with two paralectotypes (male on right and female) of *Nirmus triangulatus alpha* Kellogg, 1914 from the Kellogg Collection (EMEC 225254), remounted by an unknown person in 1932, and bearing a subsequent label on the right side, added and written probably by the same person.

publication, or the species given on the label attached to the name-bearing type(s)? The definition of type host given in the glossary of the International Code of Zoological Nomenclature (International Commission on Zoological Nomenclature [ICZN] 1999, p. 120) is: ‘The host species with which the name-bearing type of a nominal species or subspecies was associated’. My interpretation is that the syntypes of *Nirmus triangulatus alpha* were, and still are, associated with the hosts named on the labels of the slides. Therefore, the type hosts are *Catharacta chilensis* and *Oceanodroma castro*, and not *C. antarctica* and *O. leucorhoa* (see also ‘Hosts, localities and published records’).

Considering that *O. castro* is not a natural host for *Nirmus triangulatus alpha*, it is advisable to designate a lectotype by choosing a syntype from the correct and natural host, *C. chilensis*. Thus, this host becomes automatically the type host of the louse.

Designation of a lectotype

As far as I know, the syntype series includes seven lice: three males and three females from *C. chilensis* mounted on three slides, each with one male/female pair, and one female from *O. castro*. From a comparison of the two types of labels (see Figures 1 and 2), the



Figure 3. Male lectotype of *Nirmus triangulatus alpha* Kellogg, 1914, designated in this article.

words ‘Remounted 1932’ on the labels of two slides with printed words ‘Stanford University – Natural History Museum’, and the fact that the lice are embedded in Canada balsam, a mounting medium not used by Kellogg (see Palma & Peck 2103, p. 7), it is obvious that the six syntypes from *C. chilensis* were remounted by someone else. Therefore, I choose the male louse on slide EMEC 225257, bearing the original ‘V. L. KELLOGG – STANFORD UNIVERSITY’ label, to be hereby designated as the lectotype of *Nirmus triangulatus alpha* Kellogg, 1914 (Figures 1 and 3). The remaining six syntypes (two males and four females) become paralectotypes, five from *C. chilensis* (Figure 2), and the single contaminant female labelled as from *O. castro*, now remounted in Canada balsam by myself.

Synonymy

Contrary to Price et al. (2003, pp. 223, 226, 228), I regard this louse – as well as *Quadriceps normifer parvopallidus* Eichler, 1951 and *Quadriceps normifer stellaepolaris* Timmermann, 1952 – as subspecies, not full species.

Quadriceps normifer alpha (Kellogg, 1914)

- Nirmus triangulatus* Nitzsch, var. *alpha* Kellogg, 1914, p. 84.
Degeeriella alpha Kellogg, 1914 [sic]; Harrison 1916, p. 107.
Koeniginirmus normifer alpha Kellogg, 1914 [sic]; Eichler 1951, p. 127.
Quadriceps alpha (Kellogg, 1914); Hopkins & Clay 1952, p. 308.
Quadriceps alpha (Kellogg, 1914); Clay & Moreby 1967, pp. 164, 169, fig. 93.
Koeniginirmus (Laminonirmus) normifer alpha (Kellogg, 1914); Złotorzycka 1967, p. 759.
Quadriceps normifer alpha (Kellogg, 1914); Emerson 1972, p. 141.
Quadriceps alpha (Kellogg, 1914); Pilgrim & Palma 1982, p. 22.
Quadriceps normifer alpha; Cohen et al. 1997, p. 186.
Quadriceps alpha (Kellogg, 1914); Price et al. 2003, p. 223.
Quadriceps alpha (Kellogg, 1914); Murray et al. 2006, p. 1965.
Quadriceps normifer alpha (Kellogg, 1914); Palma 2010, p. 408.

Hosts, localities and published records

Besides the Chilean skua (*Catharacta chilensis*, the type host of *Quadriceps normifer alpha*), the south polar skua (*Catharacta maccormicki*) is an additional host for this louse taxon recorded by Clay & Moreby (1967), Pilgrim & Palma (1982) and Cohen et al. (1997) based on actual examination of specimens. Cohen et al. (1997) also examined specimens from *C. chilensis*. Records by Harrison (1916), Hopkins & Clay (1952), Emerson (1972), Price et al. (2003), Murray et al. (2006) and Palma (2010) are only entries in taxonomic lists based on earlier records and not from the examination of specimens.

Eichler's (1951, p. 127) entry is confusing. He might have examined the type series of *Q. normifer alpha* because he wrote: '*Koeniginirmus normifer alpha* ... from *Catharacta skua antarctica* Less. (I determine emphatically this host as the type host and Kellogg's material as lectotype material) ...' (translation from German by Julia Kasper, Wellington). However, he did not: (1) clearly state that he examined the syntype series; (2) indicate which specimen would be the lectotype; (3) designate a lectotype in his paper; and (4) refer to the difference in host species names between Kellogg's publication and Kellogg's slide labels.

Considering the very brief entry for *K. (L.) normifer alpha* in Złotorzycka (1967, p. 759), it would appear that she did not examine any material. However, she included two localities for this louse – Falkland Islands and New Zealand – but, unfortunately, she does not give any indication regarding the source of these two locality records. I can only speculate that 'Falkland Islands' is likely to be taken from the original description by Kellogg (1914), but the record from 'New Zealand' is less clear. To the best of my knowledge, the only record of *Q. normifer alpha* published before Złotorzycka (1967), and which can be regarded as from New Zealand, is that in Clay & Moreby (1967, p. 164) who examined specimens from the 'Ross Ice Shelf, Little America' collected by J.L. Gressitt in 1959 and deposited

in the Bernice P. Bishop Museum in Honolulu, Hawaii. The Ross Ice Shelf is within the New Zealand Ross Dependency of Antarctica (see Checklist Committee et al. 2010, p. 500). Considering that Złotorzycka's (1967) paper is dated '30 XII 1967', she might have had access to Clay & Moreby (1967) and included that record in her publication.

Emerson (1972) is a geographical list which does not include any record of material examined. In his entry for *Quadriceps normifer alpha*, Emerson (1972, p. 141) quoted the type host as '*Catharacta skua* Brünnich', the great skua. Consequently, by ignoring the subspecies name '*antarctica*', he inadvertently associated this louse with an incorrect host. The great skua is parasitised by another subspecies (i.e. *Quadriceps normifer stel-laepolaris*). The confusion caused by Emerson (1972) is a good example of the potentially adverse consequences of ignoring subspecies.

From the foregoing, and to the best of my knowledge, it becomes evident that there is no actual record of *Quadriceps normifer alpha* from *C. antarctica*, the very species that has been incorrectly published as the type host of this louse. Future collections of lice from the southern skua may confirm that host-louse association. The close relationships among all the skuas breeding in the southern hemisphere (Cohen et al. 1997, p. 184), including the two hosts of *Q. n. alpha*, would indicate that *C. antarctica* is likely to be another host of this louse.

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