NEW SPECIES AND OTHER RECORDS OF MALLOPHAGA FROM THE MARQUESAS *

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INTRODUCTION

In presenting this report upon the Mallophaga collected by members of the Pacific Entomological Survey, the writer wishes first of all to make clear his point of view. It is his belief that whatever value mere lists of identifications, accompanied by descriptions of new species, may have in connection with other groups of organisms, their value in connection with the Mallophaga approaches the vanishing point. In this particular group the problems of distribution have a special significance which has been pointed out by various writers, a significance that can only be explored by the most careful of systematic studies. The identification of species and the grouping of species into genera and other categories need here, above all, to be guided and controlled by ideals of accuracy and a clear conception of biological principles if conclusions as to the problems of distribution are to have any special value.

That a very large part of the systematic work upon the Mallophaga has not thus been guided and controlled is clear. A glance at the synonymy presented under the names of certain of the species discussed in this paper should make this statement understandable. The situation disclosed, involving as it does confusion of most easily recognizable species, is certainly characteristic of the conditions to be found in much of the systematic work on the Mallophaga. In the face of such conditions, the presentation of unadorned lists of identifications can contribute little to understanding. A researching of the data is needed. I have therefore chosen to figure all the species discussed, whether they be presumably "new" species or not. The number of new species is gratifyingly low; but two are included in the list. Certain material from domesticated hosts, representing well known species, has been omitted. Twelve species are here dealt with.

FAMILY MENOPONIDAE HARRISON

Recent authors have segregated certain genera in this family on the basis of the absence of gastric teeth. It is my belief that gastric teeth are present

* Pacific Entomological Survey Publication I, article 5.

in all the species. They occur, at least, in all the species that I have examined. They are not indicated in the accompanying figures.

Genus COLPOCEPHALUM Nitzsch

Like the other large and meaningless genera of the Mallophaga, this genus has been somewhat reduced of recent years by the removal of a number of groups. It still remains a heterogeneous assemblage.

Colpocephalum angulaticeps Piaget (fig. 8, *a-f*).

Colpocephalum angulaticeps Piaget, Les Pédiculines, p. 569, pl. 47, f. 8, 1880.

Colpocephalum spineum Kellogg, California Acad. Sci. Occ. Papers, 6, p. 38, pl. 4, f. 1, 1899; Kellogg and Kuwana, Washington Acad. Sci. Proc., 4, p. 484, 1902; Waterston, Natural History Report, British Antarctic Expedition, Zoology, 3, p. 270, 1921.

Marquesas: Atuona, Hivaoa, March 20, 1929, from *Fregata minor,* Mumford and Adamson. From frigate bird, Ceylon, Stanford collection. Originally described by Piaget from *Fregata minor,* without indication of origin. Previously collected in the Galapagos and Revillagigedo Islands from *Sula websteri, Anous stolidus, Puffinus subalaris,* and *Geospiza fuliginosa,* Kellogg and Kuwana; Panama, the Galapagos and Revillagigedo Islands, Ascension and south Trinidad islands, from frigate birds.

The availability of specimens from the type host of *Colpocephalum angulaticeps* reveals the synonymy of *Colpocephalum spineum* with this species. It is evidently a characteristic parasite of frigate birds and the other host records are to be regarded with doubt, although perhaps the occurrence of the species upon hosts of the genus *Sula* is normal.

Colpocephalum angulaticeps departs from the type of the genus only in the strong sexual dimorphism, but there seems no reason to suppose that this male and female do not belong together. The accompanying figures make an extended discussion of the species unnecessary.

Genus DENNYUS Neumann

This is a very small genus, including about a half dozen presumably valid species, which occur on swifts (Cypselidae). Certain species from other birds (*Nitzschia latifrons* Carriker, from *Riparia riparia,* of which *Nitzschia piageti* Kistiakowsky from the same host is probably a synonym), referred to this genus, probably do not belong here. I am entirely in accord with Ewing in placing the genus *Takamatsuia* of Uchida as a synonym of *Dennyus.* One species of the genus is at hand.

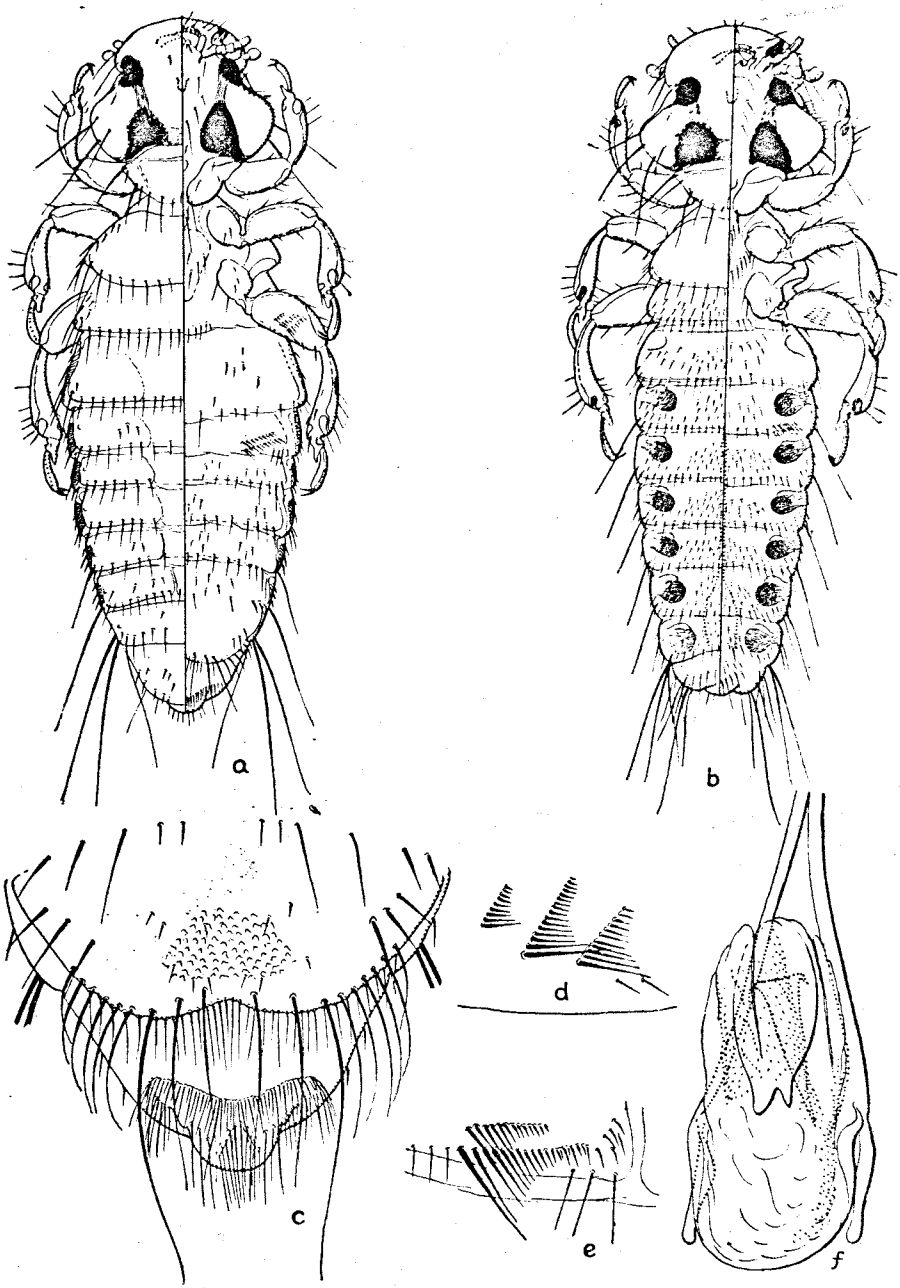

FIGURE 8. *Colpocephalum angulaticeps* Piaget, from specimens from *Fregata minor*, Marquesas: *a*, female; *b*, male; *c*, genital region of female; *d*, combs of posterior femur; *e*, combs of third abdominal sternite; *f*, genitalia of male.

Dennyus distinctus Ferris (figs. 9, *a*, *b*; 10, *a-h*).

Dennyus distinctus Ferris, Canadian Ent., 48, pp. 310-311, tf. 15, 1916.

Marquesas: Vaipaee Valley, Uahuka, September 22, 1929, 1 male and 2 females from *Collocalia ocista*, Adamson. Previously collected from *Collocalia* species, from Samarang, Java.

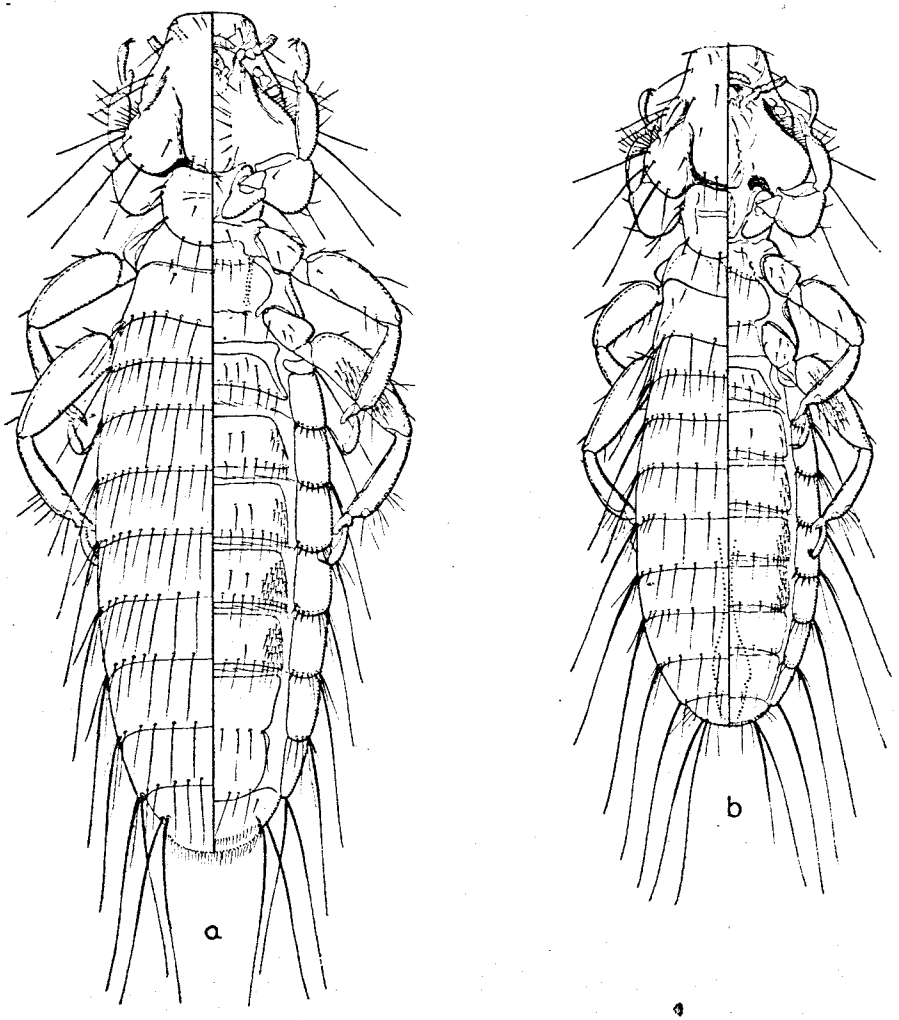

FIGURE 9. *Dennyus distinctus* Ferris, from specimens from *Collocalia ocista*, Marquesas: *a*, female; *b*, male.

In the original description of this species the male alone was figured, and opportunity is here taken to present fuller illustrations and additional

notes. As noted in the original description, the truncate head (fig. 10, *f*) is a marked feature of the species, separating it from any other named form. The antennae (fig. 10, *b*) are relatively very small, with the third segment closely united with the fourth. The femoral and abdominal brushes of setae (fig. 10, *g, h*) are strongly developed. The posterior margin of the paratergites (fig. 10, *c*) is beset with short, thorn-like setae. The genital region of the female (fig. 10, *a*) bears a single large plate formed by the fusion of the seventh and eighth sternites; the margin of the vulva is smoothly convex and beset only with small, slender setae.

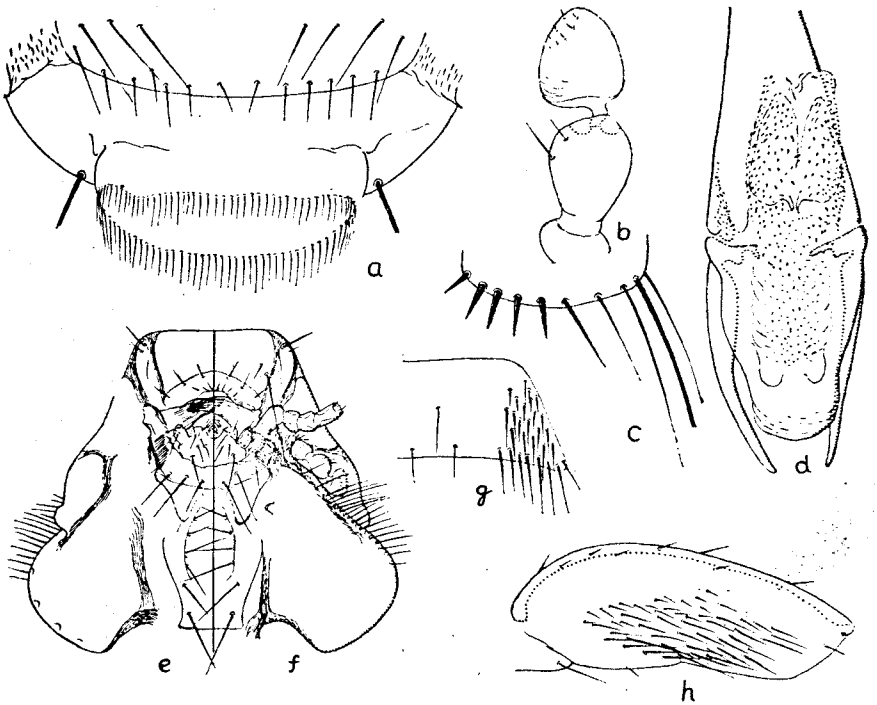

FIGURE 10. *Dennyus distinctus* Ferris: *a*, genital region of female; *b*, antenna; *c*, posterior margin of paratergite; *d*, genitalia of male; *e*, dorsal aspect of portion of head; *f*, ventral aspect of portion of head; *g*, brush of setae from fifth sternite of female; *h*, ventral aspect of posterior femur.

The male is very similar in general form to the female, apparently differing only in the genital structures. The genitalia (fig. 10, *d*) are of a simple type, the parameres slender and slightly curved, inclosing between them the sclerotic terminal portion of the preputial sac, the membranous basal portion of which is beset with small teeth and shows a pair of slightly sclerotic plates that terminate each in a mesal hook.

Genus MENOPON Nitzsch

Like others of the old and all inclusive genera of Mallophaga, the genus *Menopon* has been somewhat reduced by the removal of various groups. It still remains a heterogeneous assemblage of whose included species very few are strictly congeneric with the type. Certainly the two species herein dealt with are not Menopons, but no genus exists for them and I am not prepared to define such genera at present.

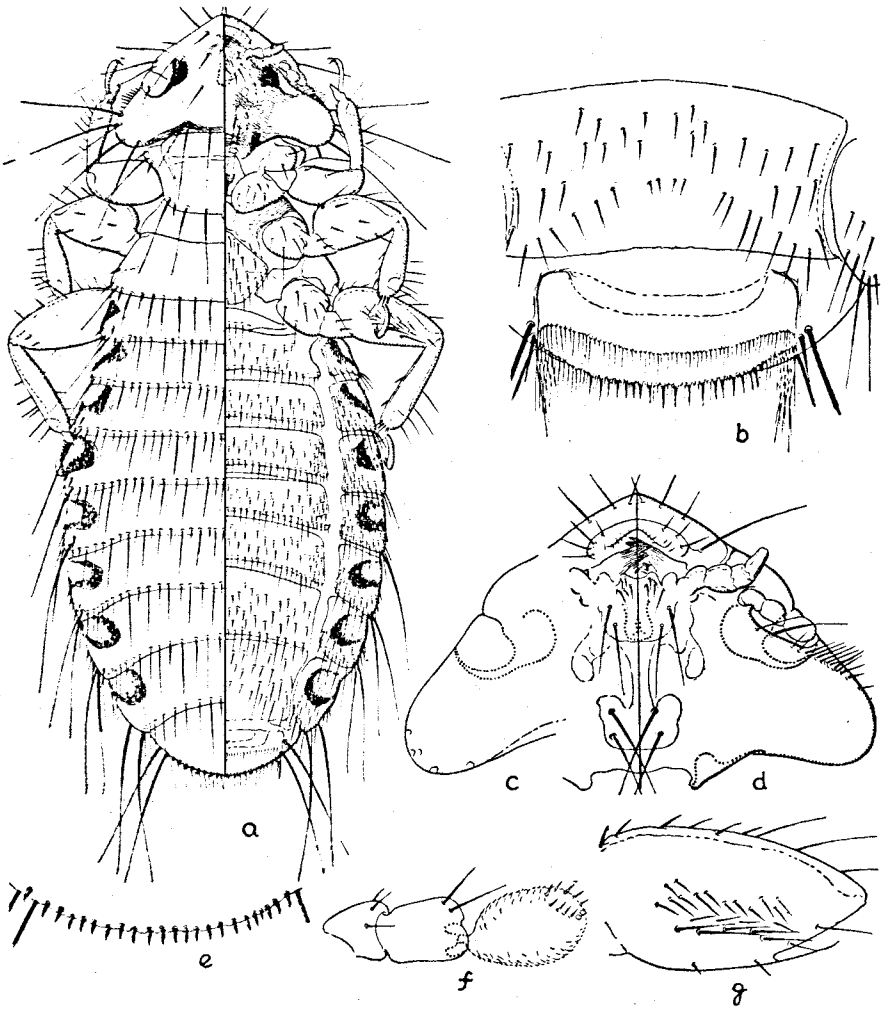

FIGURE 11. *Menopon singularis* Kellogg and Kuwana, from specimen from *Fregata minor*, Marquesas: *a*, female; *b*, genital region of female; *c*, dorsal aspect of portion of head; *d*, ventral aspect of portion of head; *e*, apical margin of ninth tergite; *f*, antenna; *g*, ventral aspect of posterior femur.

Menopon singularis Kellogg and Kuwana (fig. 11, *a-g*).

Menopon singularis Kellogg and Kuwana, Washington Acad. Sci. Proc., 4, p. 485, pl. 31, *f.* 1, 1902; Kellogg, Am. Ent. Soc. Trans., 32, p. 321, 1906.

Marquesas: Hatutu [Hatutaa], November 28, 1931, 1 female from *Fregata minor,* LeBronnec and Tauraa. Previously recorded from the Galapagos and Revillagigedo Islands and adjacent waters from *Anous stolidus, Sterna fuliginosa, Sula variegatus, Sula nebouxii,* and *Phaethon aetherus.*

The original description omits many characters of significance. The accompanying figures should make its features clear.

Menopon sternophilum new species (fig. 12, *a-f*).

Female

Length, 2 mm. A moderately pigmented species. Head (fig. 12, *c*) considerably broader than long, the lateral margins of the forehead noticeably convex, without any indication of a slit or notch, the antennal fossa entirely roofed over. Ventral side with a pair of sclerotic, longitudinal gular bands, each with several long setae. Antennae (fig. 12, *d*) clearly four-segmented. Pronotum broad and large, mesonotum distinct, metathorax very broad. Abdomen with the tergites strongly sclerotic and pigmented, separated by a very narrow suture from the large paratergites (pleurites), bearing setae along the posterior margins. Sternites quite strongly developed, beset with many small setae, the seventh and eighth fused into the genital plate. Ventral brushes of setae, on both femora and sternites, scarcely recognizable. Vulva (fig. 12, *e*) very close to the apex of the body, presenting no specially distinctive features.

Male

Length, 1.25 mm. In general form closely resembling the female. Genitalia (fig. 12, *f*) with the basal plate strongly expanded at the apex and slightly asymmetrical, parameres widely separated, slender and curved, much exceeding the apex of the preputial sac, preputial sac small, beset mesally with small teeth and bearing a pair of flat plates of somewhat irregular form, one terminating in a strong hook.

Marquesas: Teuaua, off Uahuka, September 21, 1929, Adamson. Holotype female, allotype and 4 paratypes from *Sterna fuscata.*

I am unable to associate this species definitely with any named form. It is evidently very similar to *Menopon fuscofasciatum* Piaget, which was described from terns, and may possibly be that species. However, Piaget's figure indicates the margin of the forehead as concave. It is not the same, at least, as specimens in the Stanford collection identified by Kellogg as that species, although it is of a similar type.

FAMILY PHILOPTERIDAE BURMEISTER

Genus ESTHIOPTERUM Harrison

This genus has resulted from the division and restriction of the old genus *Lipeurus,* the latter now including only certain forms from gallinaceous birds. Further division and restriction will undoubtedly be necessary, for

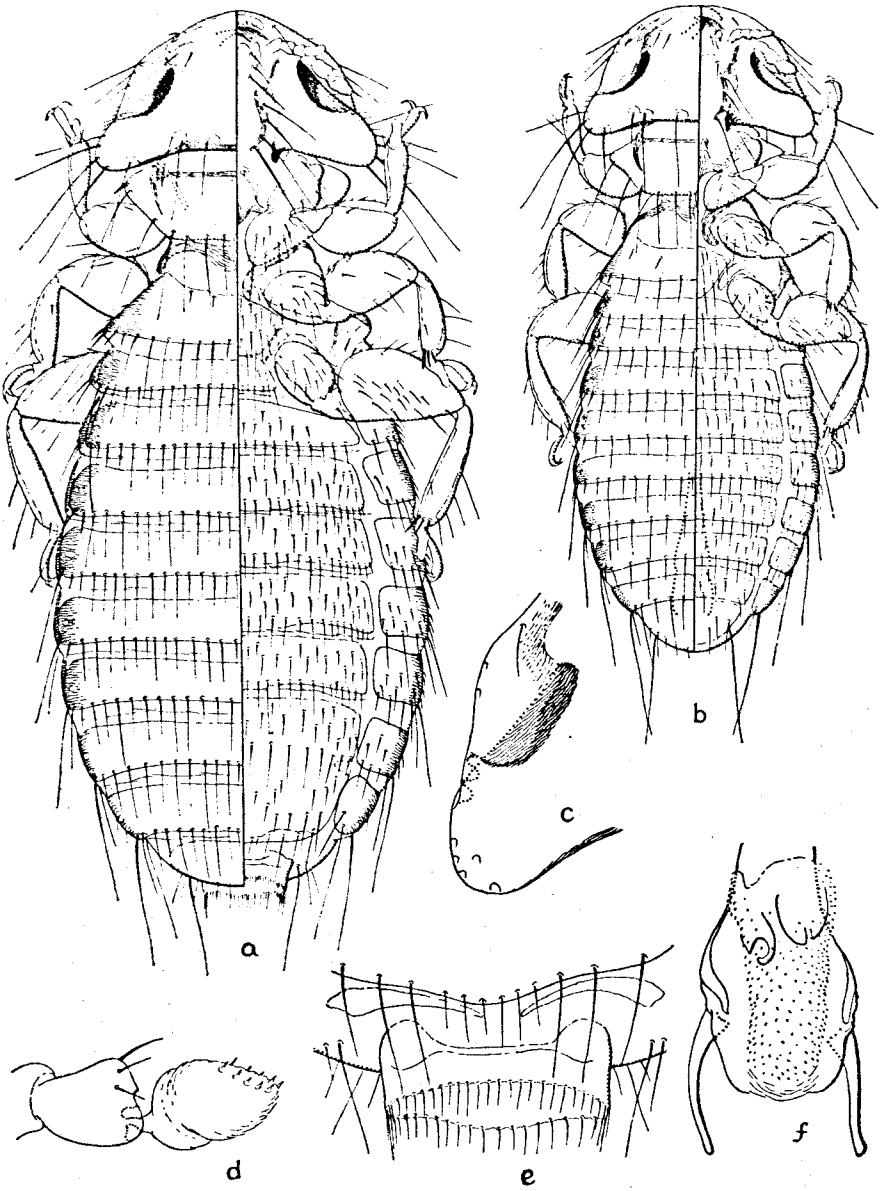

FIGURE 12. *Menopon sternophilum* new species: *a*, female; *b*, male; *c*, dorsal aspect of portion of head; *d*, antenna; *e*, genital region of female; *f*, genitalia of male.

comparatively few of the species now referred to *Esthiopterum* have any close similarity to its type, *Esthiopterum gruis* (Linnaeus) (= *Lipeurus hebraeus* Nitzsch). Certainly the two species here referred to this genus do not belong in it, but more extensive studies than I have been able to make in connection with this paper are necessary before the naming of new genera can be undertaken with confidence.

Esthiopterum gracilicornis (Piaget) (fig. 13, *a-e*).

Lipeurus gracilicornis Piaget, Les Pédiculines, p. 309, pl. 25, f. 6, (as to male), 1880.

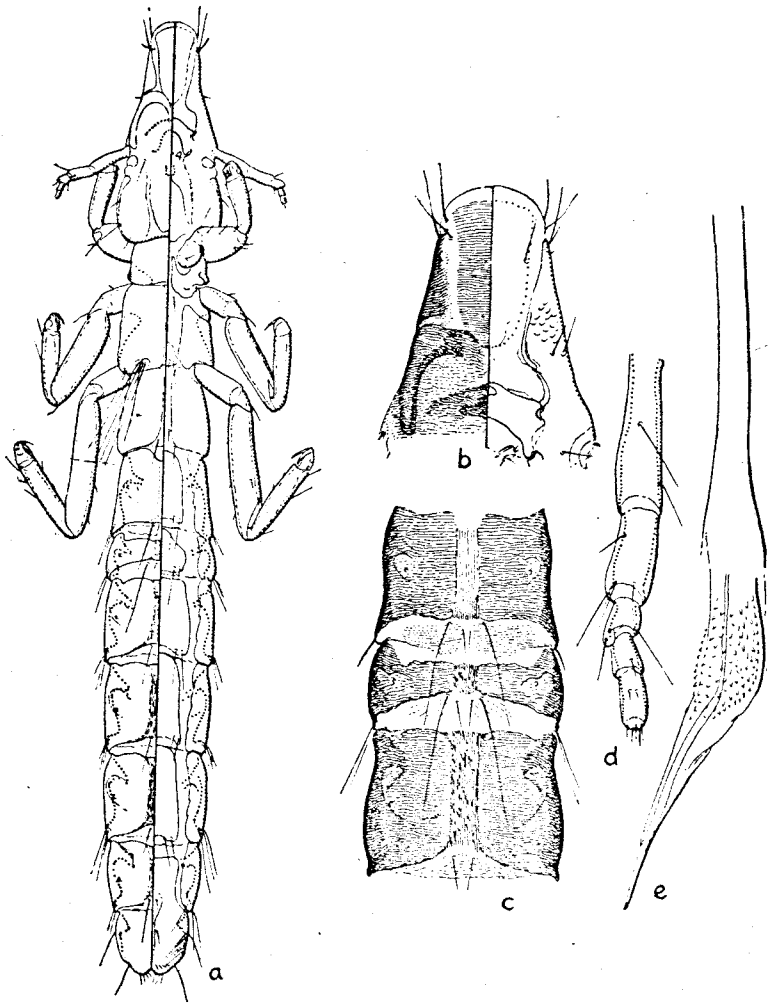

FIGURE 13. *Esthiopterum gracilicornis* (Piaget), from specimen from *Fregata minor*, Marquesas: *a*, male; *b*, anterior portion of head; *c*, flexing segment of abdomen; *d*, antenna of male; *e*, genitalia of male.

Lipeurus gracilicornis variety *major* Kellogg, California Acad. Sci. Occ. Papers, 6, p. 30, pl. 3, f. 3 (as to male), 1899; Kellogg and Kuwana, Washington Acad. Sci., Proc., 4, p. 477 (as to male), 1902; Kellogg, Am. Ent. Soc., Trans., 33, p. 321, 1906.

Marquesas: Hatutu [Hatutaa], April 28, 1931, from *Fregata minor*, LeBronnec and Tauraa; from frigate bird, Ceylon, Stanford collection. Males only are included in this material.

The original description of this species appears to have been based upon the male of one species and the female of another, and this error has been perpetuated by later authors. The male, having been described first by Piaget and having been quite clearly figured, may be accepted as the type. The female will be discussed in connection with *Pectinopygus sulae* (Rudow).

It is a curious coincidence that this male and female should have been taken together several times and each without its proper opposite sex, which lead to the error noted. It may, of course, be suggested that the error is mine, but the evidence seems clear. No female which can be definitely assigned to accompany this male is at hand. The female should be a slender-bodied form.

The accompanying figures should make the characteristics of the species clear, and attention is only called to certain special points. The modified abdominal segment of the male, which permits the flexing of the body for purposes of copulation, is in this species the apparent third (fig. 13, *c*). The genitalia (fig. 13, *e*) are exceedingly small and delicate, and the parts are so modified that the homologies are greatly obscured.

Esthiopterum marquesanum new species (figs. 14, *a, b*; 15, *a-f*).

Female

Length, 4 mm. A very slender, strongly sclerotic and deeply pigmented form with very slender head. Signature (fig. 15, *c*) broader than long, the forehead marked dorsally by two submedian, longitudinal dark bands and with a ventral, internal pair of rather faint longitudinal bars. Abdomen with extremely heavy, longitudinal, marginal buttresses, the segments all closely fused and quite uniformly sclerotic. Pygidium without an apparent tenth segment, genital region very simple, the vulva appearing merely as a crescentic slit beset only with minute setae (fig. 15, *e*).

Male

Length, 3.5 mm. Head similar to that of female, but with the hind head somewhat narrower. Antennae (fig. 15, *a*) with the first segment much elongate and stout, the second about a third as long, the third modified with the anterior margin longer than the posterior, the fourth and fifth small. Abdomen with the apparent first to third segments closely fused, the posterior margin of the fourth (morphological fifth) tergite emarginate, the fifth and succeeding segments (fig. 15, *d*) with the tergites emarginate both anteriorly and posteriorly, thus allowing of flexion. The fifth segment is slightly shorter than either the fourth or sixth. Genitalia (fig. 15, *f*) very small and obscure, the terminal portion elongate and slender.

Marquesas: Hivaoa, Mount Temetiu, holotype female, allotype, and numerous paratypes from *Pterodroma rostrata,* December 30, 1930, Tauraa.

I am unable to connect this species with any described form. It is apparently not *Naubates pterodromi* Bedford. Its relationships are undoubtedly with such forms as *Esthiopterum diversum* (Kellogg), these species constituting a group that will eventually be placed as a distinct genus.

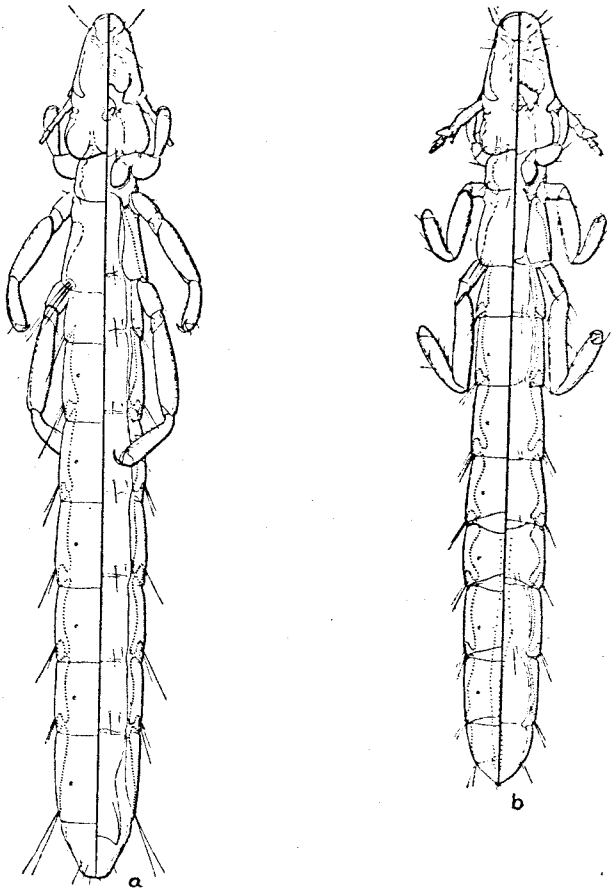

FIGURE 14. *Esthiopterum marquesanum* new species: *a*, female; *b*, male.

Genus PECTINOPYGUS Mjöberg

This genus was established originally for the single species, *Lipeurus bassanae* (Fabricius) (= *Lipeurus pullatus* Nitzsch). I am in entire accord with Waterston, who has expressed the view that the characters upon which the genus was founded are largely specific and that its definition must be

expanded to include certain other species that are characteristically parasites of gannets. The exact limiting of the genus awaits more extensive studies. For the present, *Lipeurus potens* Kellogg and Kuwana and *Lipeurus sulae* Rudow (= *Lipeurus helleri* Kellogg and Kuwana) may be referred to it.

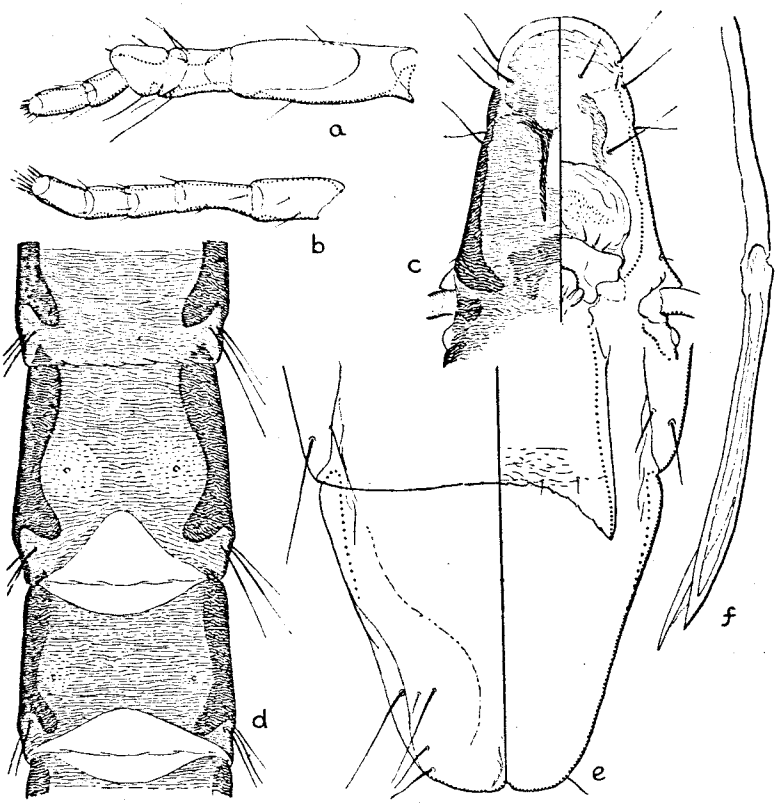

FIGURE 15. *Esthiopterum marquesanum* new species: *a*, antenna of male; *b*, antenna of female; *c*, anterior portion of head of female; *d*, flexing segments of abdomen of male; *e*, genital region of female; *f*, genitalia of male.

Pectinopygus sulae (Rudow) (figs. 16, *a, b*; 17, *a-d*).

Lipeurus sulae Rudow, Zeit. für ges. Naturw. 36, p. 134, 1870.

Lipeurus gracilicornis Piaget, Les Pédiculines, p. 309, (as to female?), 1880.

Lipeurus gracilicornis variety *major* Kellogg, California Acad. Sci. Occ. Papers, 6, p. 30, (as to female), 1899; Kellogg and Kuwana, Washington Acad. Sci., Proc., 4, p. 477, (as to female), 1902; Kellogg, Am. Ent. Soc., Trans., 32, p. 319, (as to female), 1906.

Lipeurus helleri Kellogg and Kuwana, Washington Acad. Sci. Proc., 4, p. 479, pl. 30, f. 3, 1902; Kellogg, Am. Ent. Soc. Trans., 32, p. 319, (part), 1906.

Lipeurus potens Kellogg and Kuwana, Washington Acad. Sci. Proc., 4, p. 477, (part), 1902; Kellogg, Am. Ent. Soc. Trans., 32, p. 319, (part), 1906.

Pectinopygus sulae (Rudow), Waterston, Ent. Soc. London, Trans., p. 289, 1923.

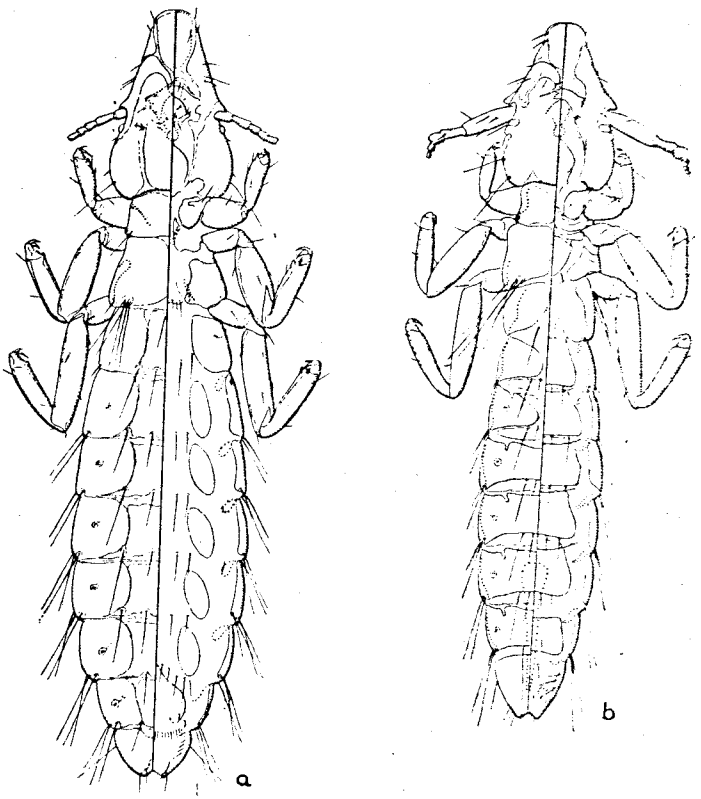

FIGURE 16. *Pectinopygus sulae* (Rudow): *a*, female from type slide of *Lipeurus gracilicornis* variety *major* Kellogg; *b*, male from type of *Lipeurus helleri* Kellogg and Kuwana.

Head (fig. 17, *b*) elongate, with markings as figured. Abdomen moderately stout, the tergites in the female all with a well-defined median area that is usually beset with minute points. In some specimens this area is more heavily pigmented than in others. Sternites of the abdomen membranous except for a pair of oval plates on each of the third (morphological) to seventh segments, the median area tending to be somewhat squamose. Genital area (fig. 17, *a*) as shown; terminal segment with a pair of small, slender lobes on each side.

Male more slender than the female and slightly shorter. Antennae (fig. 17, *c*) with the third segment much elongate and enlarged, the third somewhat globose. Tergites of first to third (apparent) abdominal segments divided medially, the remainder complete. Sternites undivided. Genitalia (fig. 17, *d*) small and slender, the terminal parts of the characteristic form shown, the preputial sac large and beset with small teeth.

Marquesas: Atuona, Hivaoa, from *Fregata minor,* June 20, 1929, Mumford and Adamson; Hatutu [Hatutaa], April 28, 1931, LeBronnec and Tauraa. From frigate bird, Ceylon, in the Stanford collection. Originally described by Rudow from *Sula fiber.*

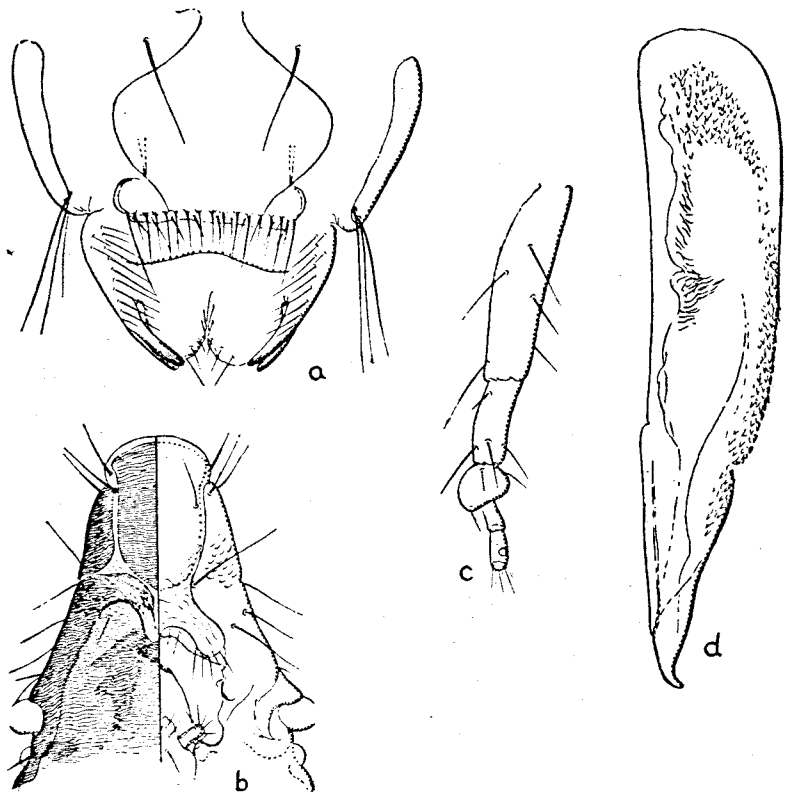

FIGURE 17. *Pectinopygus sulae* (Rudow): *a,* genital region of female; *b,* anterior portion of head of female; *c,* antenna of male; *d,* genitalia of male.

This species is very similar to *Pectinopygus potens* (Kellogg and Kuwana), but the two are readily separable. It is probable that the female recorded by Piaget under the name *Lipeurus gracilicornis,* from *Fregata minor,* is this species. Owing to the misidentifications indicated in the

synonymy, no published records can be accepted at their face value. On the basis of an examination of the material in the Kellogg collection, the following records may be accepted. From *Fregata aquila, Sula websteri, Sula cyanops* and *Sula variegata, Anous stolidus, Sterna fuliginosa, Puffinus subalaris,* and *Geospiza fuliginosa,* Galapagos and Revillagigedo Islands and adjacent waters. Some of these records are undoubtedly abnormal.

The extrordinary tangle of misidentifications involving this species could be cleared up only by reference to the actual specimens upon which the literature has been based. The conclusions of Waterston as to the identity of *Lipeurus sulae* Rudow are here accepted without question. The identity of the species described by Piaget as *Lipeurus gracilicornis* is discussed in connection with *gracilicornis* under the genus *Esthiopterum.* It is probable that the female recorded by Piaget is the same as females at hand from *Fregata minor,* this being the form upon which Kellogg based his *Lipeurus gracilicornis* variety *major.* The fortunate presence of a male associated with this female and undoubtedly of the same species clears up the doubt that might have remained. That *Lipeurus helleri* Kellogg and Kuwana is the same species—within any definition of the word that may be based upon preserved specimens alone—is evident, as is the fact that specimens of this species were misidentified as *Lipeurus potens* Kellogg and Kuwana and specimens of the latter as *Lipeurus helleri.* The statement made by Kellogg that he was figuring the female of *Lipeurus gracilicornis* variety *major* was in error. The specimen he figures is a male.

Thus it appears that whereas *Pectinopygus sulae* Rudow is normally a parasite of the gannets (*Sula*) it is also normally to be found upon frigate birds. In the large amount of material at hand there is a certain amount of variation in the form of the head, some specimens having the head more elongate than others. Possibly a detailed study of masses of material would reveal the presence of races associated with particular hosts. Males are rare in the material from frigate birds, but common in the material from *Sula.*

The figures and notes presented here should make possible the definite recognition of the species.

Genus DEGEERIELLA Neumann

Not even a beginning has been made in the breaking up of this enormous and obviously heterogeneous group. Any attempt to do so must take into consideration, in all probability, species now referred to *Philopterus* as well. While recognizing that the two species here referred to *Degeeriella* are not congeneric with its type, one must leave them here for the present.

Degeeriella gloriosa (Kellogg and Kuwana) (fig. 18, *a-e*).

Nirmus gloriosus Kellogg and Kuwana, Washington Acad. Sci. Proc., 4, p. 467, pl. 29, f. 1 (part), 1902; Kellogg, Am. Ent. Soc. Trans., 32, p. 313, 1906; Kellogg and Paine, Ent. News 21, p. 125, 1910; Kellogg and Mann, Ent. News, 23, p. 58, 1912.

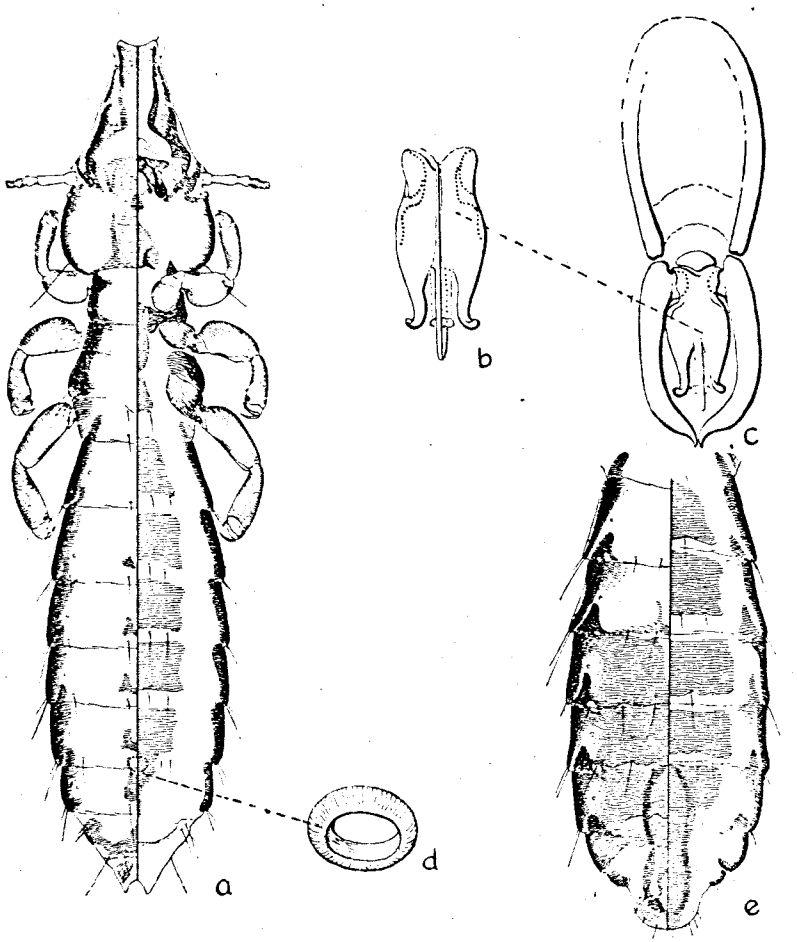

FIGURE 18. *Degeeriella gloriosa* (Kellogg and Kuwana), from *Sterna fuscata*, Marquesas: *a*, female; *b*, endomeral complex of genitalia of male; *c*, genitalia of male; *d*, spermatheca of female; *e*, abdomen of male, to larger scale than female.

Marquesas: Hatutu [Hatutaa], from *Sterna fuscata*, April 28, 1931, LeBronnec and Tauraa. Previously reported from the Galapagos and Revillagigedo Islands and adjacent waters from *Sterna fuliginosa, Sterna anathaeta, Anous stolidus, Camarhynchus affinis, Geospiza fuliginosa,*

Progne modesta, and *Nesominus barringtoni*, and Laysan I., from *Sterna lunata*.

Apparently species of *Sterna* are the normal hosts, and the records from other birds, especially the land species, are to be regarded as abnormal. No type was originally designated, and although the specimen figured was from *Progne modesta*, I herewith designate as the type a specimen from *Sterna fuliginosa*, Clipperton Island. In the original description specimens of *Degeeriella separata* (Kellogg and Kuwana) were mingled with this species. The species later described by Kellogg and Chapman as *Nirmus gloriosus* variety *emarginatus* is a synonym of *Degeeriella separata*.

The very striking markings of the species, as shown in the accompanying illustrations, make its identification simple. Attention should be called to the very conspicuous spermatheca (fig. 18, *d*). The gentalia of the male present the characters shown in figure 18, *b. c.* The species is evidently related to such forms as *Degeeriella phaeonota* (Nitzsch), of which specimens from *Sterna hybrida* are at hand.

Degeeriella separata (Kellogg and Kuwana) (fig. 19, *a-e*).

Nirmus gloriosus Kellogg and Kuwana, Washington Acad. Sci. Proc., 4, p. 467, (part), 1902.

Nirmus separatus Kellogg and Kuwana, Washington Acad. Sci. Proc., 4, p. 472, pl. 29, f. 6, 1902; Kellogg, Am. Ent. Soc. Trans., 32, p. 317 (part), 1906; Uchida, Annotationes Zoologicae Japonensis, 9, p. 484, 1918.

Nirmus gloriosus var. *emarginatus* Kellogg and Chapman, New York Ent. Soc. Jour., 10, p. 159, 1902.

Marquesas: Mohotani, from *Anous stolidus*, February 3, 1931, LeBronnec and Tauraa. Society Islands: Tahiti, Hitiaa, on the same host, November 22, 1928, Adamson (fig. 19).

Previously collected in the Galapagos and Revillagigedo Islands and adjacent waters from *Anous stolidus*, *Sterna fuliginosa*, *Geospiza conirostris*, and *Geospiza fortis*, *Progne modesta*, *Certhidea albemarlei* and *Nesopelia galapagensis*. Hawaii: Maui, from *Anous stolidus*. Specimens recorded by Kellogg from *Oceanodroma cryptoleucura* are another species.

As indicated by the synonymy, this species was recorded by Kellogg under three different names. The records involving land birds are to be regarded as abnormal. The normal host is evidently *Anous*.

The female possesses a spermatheca of essentially the same form as in *Degeeriella gloriosa*, but very weakly sclerotic and consequently obscure and easily overlooked. The anterior margin of the vulva (fig. 19, *d*) is a simple lobe beset with very small setae which are somewhat variable in size and

form. In the male the entire dorsum of the abdomen is sclerotic, the sclerites of at least the first three segments with a deep, narrow median notch. The genitalia of the male (fig. 19, *b, c*) are of the same form as in *Degeeriella gloriosa*, only differing in small details.

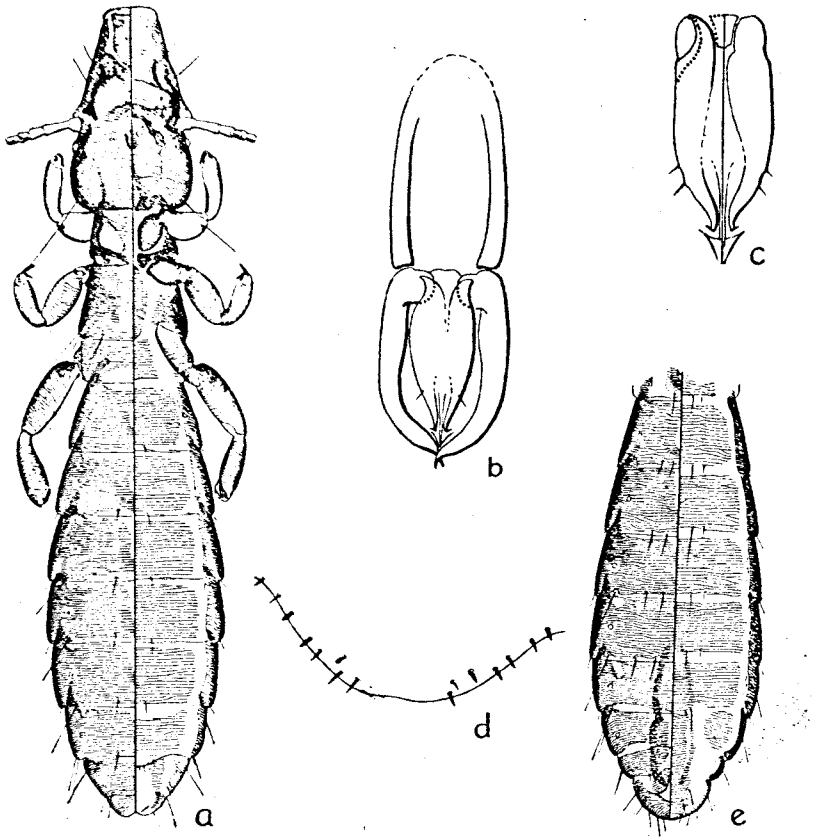

FIGURE 19. *Degeeriella separata* (Kellogg and Kuwana), from specimens of *Anous stolidus*, Tahiti; *a*, female; *b*, genitalia of male; *c*, endomeral complex of genitalia of male; *d*, margin of vulva of female; *e*, abdomen of male, to larger scale than female.

Genus PHILOPTERUS Nitzsch

Although rather extensive inroads upon this genus have been made by the breaking off of a number of groups, there still remains much to be done. One species in the material at hand may be treated as belonging to this genus.

Philopterus snyderi (Kellogg and Paine) (fig. 20, *a-d*).

Docophorus snyderi Kellogg and Paine, Ent. News, 21, p. 124, figs. 1, 2, 1910.

Marquesas: Hatutu [Hatutaa], from *Sterna fuscata,* 2 males, 1 female, April 28, 1931, LeBronnec and Tauraa. Previously collected from Laysan Island, from *Sterna lunata.*

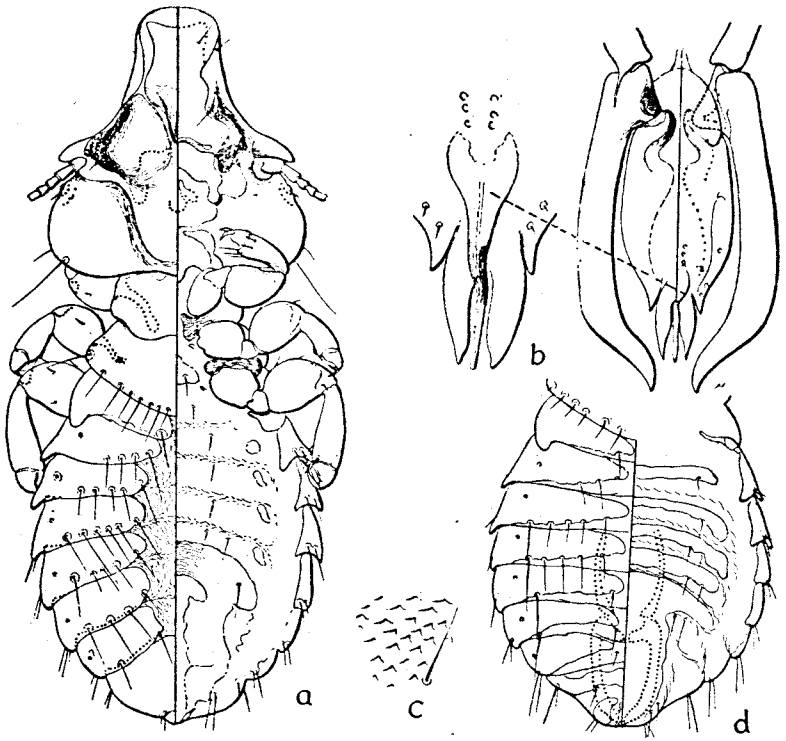

FIGURE 20. *Philopterus snyderi* (Kellogg and Paine), from specimens from *Sterna fuscata,* Marquesas: *a,* female; *b,* genitalia of male, with details of endomeral complex; *c,* ornamentation of venter of female; *d,* abdomen of male, to larger scale than female.

It is not practicable in this paper to enter into the problem of the identity of the species of *Philopterus* found on gulls and terns. It may merely be noted that the specimens here recorded seem referable to *Philopterus snyderi,* in spite of very slight differences in the endomeral pieces of the genitalia of the male which will probably fall within the range of normal variation. *Philopterus snyderi* in turn is certainly identical with specimens identified by Kellogg as *Philopterus melanocephalus* (Nitzsch). The distinguishing character given by Kellogg and Paine for *Philopterus snyderi,* "the rounded but

distinct median angle of the posterior margin of the prothorax," is entirely illusory.

Figures 20, *a-d*, show clearly the characteristics of the species. Attention is called to the wrinkled condition of the conjunctivum of the dorsum of the abdomen in the female and to the fact that the conjunctivum of the venter is thickly beset with minute, sclerotic squamations (fig. 20, *c*). The abdomen of the male is much more strongly sclerotic than that of the female. The genitalia of the male (fig. 20, *b*), are of a type common to a large group of species. In comparing them with the genitalia of similar species attention will need to be concentrated especially upon the form of the endomeral complex. How much allowance must be made for normal variation needs to be determined by the examination of many specimens.