

# REPORT ON A COLLECTION OF MALLOPHAGA, LARGELY MEXICAN (PART II)<sup>1</sup>

M. A. CARRIKER, JR.

This is the second installment of a paper dealing with a collection of Mallophaga in the Louisiana State University Museum of Zoology. Many of the lice here treated were taken from birds in the state of San Luis Potosí, Mexico, by persons connected with the Museum. The remainder were collected in various parts of the United States, chiefly around Lawrence, Kansas.

The present installment terminates the treatment of the Ischnocera. The greater portion of the genus *Philopterus*—all those species not included in Part I or in the present installment—will be omitted from this report. The final part, which will appear at a future date, will contain the remainder of the species of the Amblycera, those not already treated in Part I.

This report lists all species found in the collection (excepting those of *Philopterus* as mentioned above), describing all which appear to be new and giving critical notes on, and figures of, little known or controversial forms. All measurements are in millimeters, and all drawings were prepared by me. All types have been returned to Louisiana State University, such paratypes and other duplicates as were available having been retained in my collection.

## *Superfamily ISCHNOCERA*

*Philopterus tropicalis*, n. sp.

(Figures 1, 2, 3 and 4)

Type, male adult, from *Stelgidopteryx ruficollis serripennis* (Audubon), collected by R. J. Newman at Tamaín, S. L. P., México, January 4, 1947 (in L. S. U. M. Z. coll.).

DIAGNOSIS.—Resembles in many ways *P. domesticus* (Kellogg), from *Progne subis*, but is smaller in most measurements, especially those of the head. There is much less difference in size of thoracic segments; the head is proportionately longer, with narrower frons; the anterior plate is of same width, but shorter; the prothorax is proportionately shorter and wider; and the pterothorax has much more divergent sides.

There are many differences in the shape of the abdominal sclerites and their chaetotaxy (see figures). In the figure of *tropicalis* the sternite of segment III is not shown, but it is somewhat similar to IV, shown in its proper position in front of the genital sternite.

The male genitalia are also quite different, those of *domesticus* being very much larger, with larger paramers, and a quite different basal plate

---

<sup>1</sup> Part I appeared in Nos. 3 and 4, Vol. 37, of THE FLORIDA ENTOMOLOGIST, 1954.



- Fig. 1. *Philopterus tropicalis* n. sp. ♂, body complete except abdominal segments III and IV
- Fig. 2. *P. tropicalis*, n. sp. ♂, genitalia
- Fig. 3. *P. domesticus* (Kell.) ♂, head, thorax and segments of abdomen I, VII, VIII, and IX
- Fig. 4. *P. domesticus* (Kell.) ♂, genitalia
- Fig. 5. *Craspedorhynchus obscurus* (Giebel) ♀, head, thorax, and abdominal segments I, II, VII, VIII, and IX; also genital sternite of ♂
- Fig. 6. *C. obscurus* (Giebel) ♂, genitalia
- Fig. 7. *C. candidus* (Rudow) ♀, head, thorax, and abdominal segments I, II, VII, VIII, and IX; also genital sternite of ♂
- Fig. 8. *C. candidus* (Rudow) ♂, genitalia
- Fig. 9. *C. dilatatus* (Rudow) ♀, head, thorax, and abdominal segments I, II, and VI to IX; also genital sternite of ♂
- Fig. 10. *C. dilatatus* (Rudow) ♂, genitalia

and mesosome. Figures of the body and male genitalia of *P. domesticus* are also presented in order to show the differences.

The female of *tropicalis* is not known, but it will doubtless show the same sexual differences as in *domesticus*. The species may be easily recognized by the above diagnosis and the figures given. All of the Philopteri which I have seen from neotropical swallows seem to be of this same type, but they all differ, one from another—those from *Progne dominicensis*, *P. tapera*, *P. chalybea* and *P. fuscus* all differing at least subspecifically from *domesticus*, while those from the other genera of swallows are usually specifically distinct. The specific differences in this difficult genus are often small and are not always appreciated. The species is represented by the male holotype and two female paratypes.

MEASUREMENTS OF *Philopterus domesticus* AND *P. tropicalis*.

	<i>domesticus</i>				<i>tropicalis</i>	
	Male		Female		Male	
	Length	Width	Length	Width	Length	Width
Body .....	1.50	....	1.736	....	1.32	....
Head (at clavi) .....	....	.325	....	.358	....	.293
Head (temples) .....	.532	.505	.585	.558	.49	.437
Prothorax .....	.22	.293	.225	.335	.175	.28
Pterothorax .....	.217	.402	.26	.488	.205	.39
Abdomen .....	.746	.685	.868	.78	.63	.586
Antennae .....	.175	.048	.206	.045	.175	.04
Basal plate .....	.194	.071	....	.133	.07	....
Paramer .....	.048	.018	....	.026	.013	....
Mesosome .....	.054	.076	....	.035	.07	....

Genus *Craspedorhynchus* Keler, 1938

This Philopteroid genus is parasitic exclusively on Raptores (Falco-noidea). Twenty-seven species are listed in the 1952 checklist, of which 11 are from the Western Hemisphere, with seven of neotropical origin. Eight of the 11 species found in the New World are in my collection, together with about 20 undescribed species, in addition to the four Mexican species described in this paper.

The genus, as a whole, seems to be very homogenous, there being but very few abnormal species, and, as far as I have been able to determine from the available material, no two hosts harbor the same species of parasite. I have not been able to check many parasites from closely related subspecies of hosts, but specimens from two subspecies of *Busarellus nigricollis*, *Buteo magnirostris*, and *Leucopternis albicollis* are reconizably different.

While many of the species are superficially quite similar in appearance, there are a surprisingly large number of characters by which they may be separated. The best characters for separating the species are: size and shape of head; shape of anterior plate; amount and shape of the hyaline margin surrounding the anterior portion of head; the endocarinae; the genital sternites of both sexes, and, lastly, the male genitalia.

The basal plate is fairly large, but the paramers are very small and nonmovable (merely flexible at point of attachment) and the endomeral sclerites are numerous, small, and very complicated. The chaetotaxy differs but little in the species, and as a rule the setae are exceedingly slender and delicate, so that in many cases, where great care in handling has not been taken, many setae will be missing.

Before describing the new species I wish to make a few remarks on several species which were described by Rudow, Giebel, and myself.

*Craspedorhynchus obscurus* (Giebel), 1874

(Figures 5 and 6)

*Docophorus obscurus* Giebel, *Insecta Epizoa*, p. 72. Host: "*Rostrhamus hamatus*" probably equals: *R. sociabilis* Vieillot, *fade* Guimarães, 1943, p. 430, but perhaps *Helicolestes hamatus* (Temminck), another member of the same subfamily.

Dr. Guimarães contends that the true host of this species is much more likely to be *Rostrhamus sociabilis* than *Helicolestes*, which is a very rare bird, and on these grounds I agree with him. I have a series of five males and five females of this genus from *Rostrhamus sociabilis*, collected in Colombia, and a comparison of them with Giebel's description of *obscurus* adds further proof to Guimarães' contention. Giebel's description is very meager and most of the characters which he uses might apply to many species of the genus. However, he ends his remarks with the following words: "Das letzte Segment des Wiebschens hat eine sehr breite Einkerbung."

The apical abdominal segments of the females in this genus usually are more or less as shown in the figures. Segment VIII is usually covered almost entirely by a deeply colored tergal plate, while IX, closely fused with VIII, is almost entirely hyaline. However, in some species (including the one from *R. sociabilis*) there is a sternal sclerite which extends backward from VIII across IX and would give the appearance of the tip of the abdomen with a "sehr breite Einkerbung."

There is nothing about these specimens from *R. sociabilis* which disagrees with Giebel's description. He says: "Head longer than wide", and these measure about .91 x .81 (female), which is strong proof in favor of the host's being *R. sociabilis*, since I know of but one other species (from *Busarellus nigricollis*) with head having these proportions. The anterior margin of the anterior plate is concave, also agreeing with Giebel's description.

With so much evidence in favor of *R. sociabilis* being the host of *C. obscurus* (Giebel), and practically none against it, I would consider the matter definitely proved. The species is easily recognized by the long head, shape of anterior plate, premarginal carinae (both dorsal and ventral) and male genitalia.

*Craspedorhynchus candidus* (Rudow), 1870

(Figures 7 and 8)

*Docophorus candidus* Rudow, *Zeit. ges. Naturwiss.* 35, p. 457. Host: *Buteo ghiesbreghti* Du Bus equals: *Leucopternis albicollis ghiesbreghti* (Du Bus).

The description of this species by Rudow is quite useless, while Piaget merely confirms the impossibility of recognizing it. I have a series of nine males and nine females of this genus taken from the type host of *C. candidus* (Rudow), collected by myself at Cerro Tuxtla, Veracruz, México, March 19, 1940.

This species is among the smaller ones (see table of measurements), with head longer than wide, but not excessively so, as in *obscurus* (female, .88 x .845 against .895 x .80); the hyaline margin of the anterior portion of the clypeal area is very narrow, beginning near end of premarginal carinae; the anterior plate is long and narrow, scarcely widened medially, with anterior margin slightly thickened and undulating; the preantennal nodus is strongly developed, is rounded posteriorly, and has a semi-hyaline band down the center. A unique character, not present in any other species treated in this paper, is the type of anterior mandibular condyle, this being exactly as shown in the figure.

The genital sternites are slightly different and the male genitalia have a shorter than usual basal plate, with paramers and endomeral sclerites quite distinct.

Since Rudow's type of this species is certainly lost, I herewith designate a pair of this series as neotypes and the remainder as neoparatypes of *Craspedorhynchus candidus* (Rudow). For measurements see table at end of genus.

*Craspedorhynchus dilatatus* (Rudow), 1869

(Figures 9 and 10)

*Docophorus dilatatus* Rudow, Beitr. Kenntn. Mall. p. 14. Host: *Falco lagopus* equals: *Buteo lagopus lagopus* (Pontoppidan).

*Docophorus taurocephalus* Kellogg, 1896, Proc. California Acad. Sci. (2), 6, p. 471; pl. 65, fig. 1. Host: *Archibuteo lagopus sancti-johannis* equals: *Buteo lagopus sancti-johannis* (Gmelin).

In the 1952 checklist *C. taurocephalus* (Kell.) is given as a synonym of *dilatatus* (Rudow), and since I have no material from *B. l. lagopus* for comparison with the specimens from *B. l. sancti-johannis*, I accept this ruling.

I have before me one male and two females of this genus taken on *B. l. sancti-johannis*, collected by R. Baker in Colorado County, Texas, March 23, 1941. Kellogg's figure of *taurocephalus* is very poor, especially with regard to the head, but there is nothing about it which disagrees with the single male examined. Kellogg's measurements differ slightly, but not more, I think, than would be found in individual variation. For the male he gives: body, 2.06 against 1.91; head, .78 x .78 against .79 x .78. For the female he gives: body, 2.53 against 2.32; head, .87 x .87 against .89 x .86. Doubtless the types of *dilatatus* are also lost, but since these specimens from Texas are not from the type host they cannot be used for establishing neotypes. A figure is given of the female, showing the details of the head, thorax, and abdominal segments I, II and VI to IX, with genital sternites of both sexes and the male genitalia. There are no outstanding characters to distinguish this species, merely a combination of details which a careful examination of the figures will show.

The setae of the whole body are very slender, those of the head being longer than usual while the anterior plate has a darker, shield-shaped area over its anterior portion (see figure). The male genitalia are also quite distinctive. Complete measurements are given in the table at end of the genus. In addition to the three specimens collected in Mexico by Mr. Baker, I have in my own collection two males from the same host collected by L. Bruner at Lincoln, Nebr., October 9, 1894, and two males from same host taken at Turnavik, Labrador, by Harry Lance in August, 1934.

*Craspedorhynchus umbrosus* (Carriker), 1903

(Figures 11 and 12)

*Docophorus platystomus umbrosus* Carriker, Univ. Nebraska Stud., 3, p. 126. Host: *Leucopternis semiplumbea* Lawrence.

The original description is short and of little value, since it was compared with specimens wrongly identified as *C. platystomus* (Nit.) from "*Buteo borealis costaricensis*," a bird wrongly identified, being in reality *Buteo swainsoni*.

The species was described from a single male (female unknown), which was well mounted and is still in good condition.

DIAGNOSIS.—It is one of the longer species (2.08) and has by far the longest head of the eight species identified (male, .868 x .78), but the width at the preantennal suture is proportionately great (.326). The anterior plate is long and slender and but little expanded medially; the preantennal portion of head is short and wide; the preantennal nodus has a narrow, clear, median stripe, found in but few species (see figure).

The genital sternite is characteristic of the species, as are the marginal carinae of the basal plate, the endomerale plates, and the seminal duct, which in this species is *double*, a tube running back from each side of the endomera, through the basal plate and disappearing in segment II. This is the only species which I have thus far examined which has two seminal ducts. The marginal carinae of the basal plate are of the same type as in *femoralis* n. sp., but longer. Measurements are given at end of the genus.

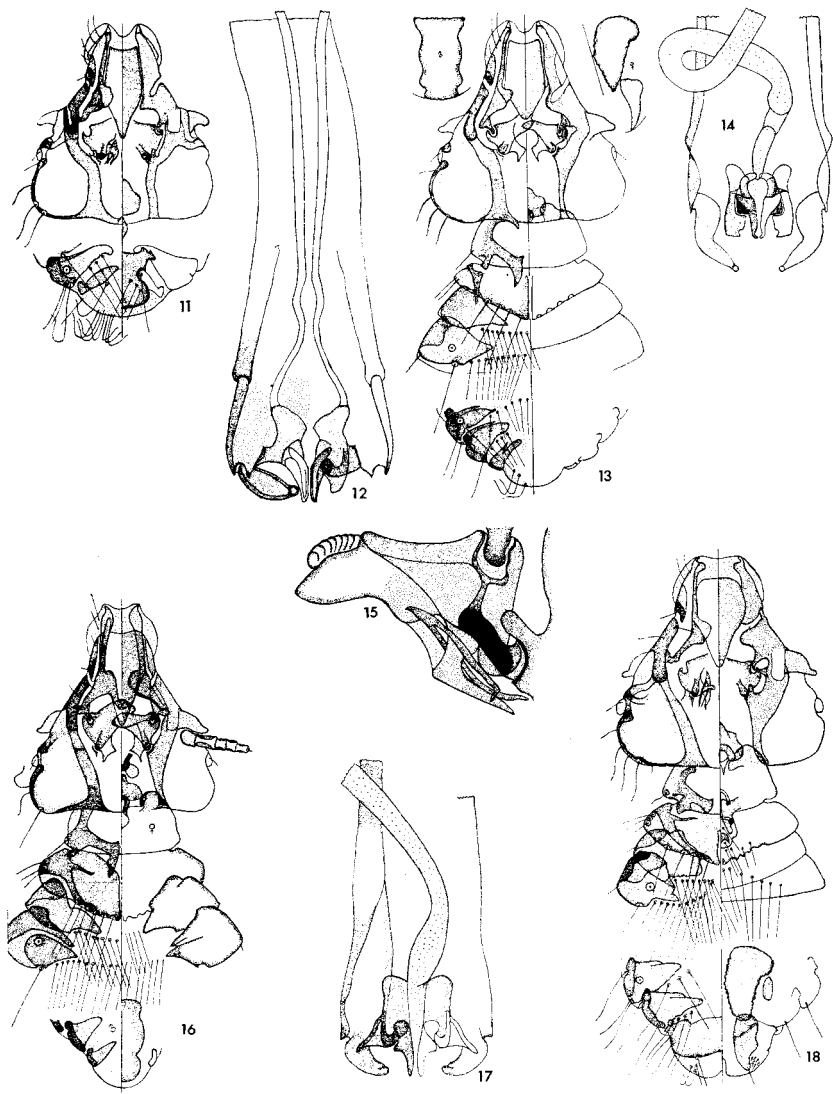
*Philopterus transversifrons* (Carriker), 1903

*Docophorus transversifrons* Carriker, Univ. Nebraska Studies No. 3, p. 127; pl. I, fig. 1. Host: *Micrastur guerrilla* Cassin equals: *Micrastur ruficollis interestes* Bangs.

*Craspedorhynchus transversifrons* (Carriker), Checklist of Mallophaga, 1952, p. 193.

The original description of this species is very complete, as far as it goes, but it lacks many details, while the figure is very poor.

A very careful examination of the type reveals the fact that it really is a *Philopterus*, as originally described, and not a *Craspedorhynchus* at all. It lacks entirely the characters which so definitely characterize *Craspedorhynchus*, viz.—the long clypeal area and the long inner pre-marginal (clypeal) carinae, which do not extend beyond the front of the anterior plate. The chaetotaxy of head and abdomen also differs, as well as the mandibular condyles, while the male genitalia are decidedly not the type found in *Craspedorhynchus*.



- Fig. 11. *Craspedorhynchus umbrosus* (Carr.) ♂, head and tip of abdomen, drawn from type  
 Fig. 12. *C. umbrosus* (Carr.) ♂, genitalia  
 Fig. 13. *C. brevicapitis*, n. sp. ♀, head, thorax, and abdominal segments I and II and tip of ♂ abdomen  
 Fig. 14. *C. brevicapitis* ♂, genitalia  
 Fig. 15. *C. brevicapitis*, right mandible (dorsal view)  
 Fig. 16. *C. tubulus*, n. sp. ♀, head, thorax, and abdominal segments I and II; also tip of ♂ abdomen  
 Fig. 17. *C. tubulus* ♂, genitalia  
 Fig. 18. *C. hirsutus*, n. sp. ♀, head, thorax, abdominal segments I, II, and VI to IX

It is very probable that *Micrastur* is not the true host, and I would consider its host as being unknown. The type series (two males and a female) have been cleared and remounted so that all details are clearly visible.

*Craspedorhynchus brevicapitis*, n. sp.

(Figures 13, 14 and 15)

Types, male and female adults, from *Buteo magnirostris griseocauda* (Ridgway), collected by R. Newman, at Xilitla, S. L. P., Mexico, Feb. 12, 1947 (in L. S. U. M. Z. coll.).

DIAGNOSIS.—This is one of the smaller of the known species found in America. Indeed, the male is the smallest (1.82) of the nine identified species seen by me. The length and width of head are equal in both sexes; the abdomen of the male is very short and wider than long (.86 x .93), while that of the female is more rounded than in most species (1.24 x 1.06). The hyaline margin of the front of the head is well developed, extending backward beyond the middle of that portion of the premarginal carinae anterior to the preantennal suture. Its anterior margin is deeply indented much more so than in any other of the eight American species I have seen (see figure). The preantennal margin of the head is *straight* (very unusual); the premarginal carinae and nodi are narrow; the temporal carinae are broken in anterior portion (see figure) and the occipital carinae are only half as wide in the posterior portion.

The pterothorax is unusually small, with posterior margin strongly pointed medially and with four large, clear-cut emarginations (in reality they are pustules), from which arise the strong setae. The carinae of the pterothorax are unusually small; the male and female genital sternites are of normal size and shape, these sclerites always differing more or less in the different species (see figures).

The male genitalia are rather striking in appearance, especially the marginal carinae of the basal plate, the unusually long paramers, without marginal carinae, and the strongly developed seminal duct leading from the endomera back through the basal plate and finally disappearing in anterior portion of abdomen. The chaetotaxy is normal for the genus, the setae of the head being fairly short and those of the abdomen somewhat coarser than in most species but of normal length (about 1½ times as long as the width of the succeeding segment); the setae on the ventral surface are finer and shorter. The types, and only specimens, are not in the best condition and many setae are missing. For measurements see the table at end of the genus.

*Craspedorhynchus tubulus*, n. sp.

(Figures 16 and 17)

Types, male and female adults, from *Busarellus n. nigricollis* (Latham), collected by C. Shaw at Tamuín, S. L. P., México, Sept. 19, 1946 (types in L. S. U. M. Z. coll.).

DIAGNOSIS.—Species of medium size but may be readily distinguished by the shape of the head, the marginal carinae, genital sternites, and male genitalia.



The head is longer than wide (female, .89 x .80), while that portion anterior to the preantennal suture is unusually long and narrow, with hyaline margin very wide and extending far beyond the end of the anterior plate (see figures). The anterior plate is short and wide, with straight sides which are completely covered (and concealed) by both dorsal and ventral preantennal carinae. The preantennal nodus is neither rounded nor expanded laterally, being no wider than the carina; the temporal carinae are broken in anterior portion (see figure) and the occipital carinae taper to a point at occipital margin.

The abdomen in both sexes is unusually round (male, .92 x .89; female, 1.20 x 1.13); in the male abdominal segments VIII and IX are closely fused and appear as one segment, but there is no tergal plate on IX, which is rounded posteriorly and strongly protruding.

The pleurites in both sexes are strongly developed and deeply pigmented (more so in male) and have well developed "heads" of unusual shape (see figure). In the female holotype segment IX and the genital sternites are mutilated, making them impossible to figure.

In the male the abdomen is somewhat heart-shaped, being widest at segment III, tapering from there to the rounded, narrow IX. The genitalia are distinctive (see figure). The seminal duct is well developed, but differs in structure from that of *brevicapitis*.

The basal plate is long (.45), with simple, narrow marginal carinae; the paramers are very short, with a different type of tip (not tubular as in most species), the endomerall plates are very large and of distinctive shape, although their complex structure is not always possible to differentiate clearly. The species is represented only by the female holotype and male allotype. Table of measurements appears at the end of this genus.

*Craspedorhynchus hirsutus*, n. sp.

(Figure 18)

Type, female adult, from *Buteo regalis* (G. R. Gray), collected by K. Abegg in Kansas (?). (Type in L. S. U. M. Z coll.).

DIAGNOSIS.—One of the smaller species (body length, 2.20), with rather short, egg-shaped abdomen, widest at segment III (1.11 x .94); the head as wide as long (.88), with short, very wide clypeal area (.26 x .38), and well developed and pigmented carinae, including the postmarginal carinae, a feature not present in many species.

The thoracic segments are small but have well developed carinae and five strong, pustulated setae on each side of posterior margin of pterothorax. The tergites are rather small, and the paratergals narrow, with small "heads," most strongly developed in segments IV to VII.

The chaetotaxy is normal and of medium length and texture, the setae of abdomen being finer than in some species. Segment IX is well developed, and hyaline, except for the posterior genital sternite, which extends across VIII and IX. The genital sternites across VI and VII are of the usual type, as is the small sclerite at their outer edges (see figure). The patch of short, thickened setae at sides of VIII is not found in all species (in the figure these setae are incorrectly shown as being on IX).

The species is represented by the female holotype and one female paratype (male, unknown).

## MEASUREMENTS FOR SPECIES OF CRASPEDORHYNCHUS.

Species	Body Length	Length and Width of Head at Temples; Width at Clypeal Suture	Pro-thorax		Pterothorax		Abdomen		Basal Plate		Parameters		Endomera	
			Length	Width	Length	Width	Length	Width	Length	Width	Length	Width	Length	Width
<b>Males</b>														
<i>C. candidus</i> (Rudow) .....	1.85	.825x.79 .315	.22	x.48	.195x.575	.846x.82	.40	x.15	.065x.025	.093x.098				
<i>C. dilatatus</i> (Rudow) .....	1.91	.79 x.78 .35	.242x.434		.24	x.59	.89	x.955	.51	x.175	.054x.024	.11	x.12	
<i>C. obscurus</i> (Giebel) .....	2.12	.80 x.715 .350	.22	x.415	.25	x.565	1.05	x.815	.41	x.15	.05	x.021	.084x.097	
<i>C. umbrosus</i> (Carr.) .....	2.08	.868x.781 .326	.27	x.48	.22	x.62	.93	x.91	.46	x.17	.066x.026	.097x.11		
<i>C. tabulus</i> , n. sp. ....	1.89	.78 x.74 .30	.21	x.42	.25	x.61	.92	x.89	.45	x.15	.05	x.026	.066x.12	
<i>C. brevicapitis</i> , n. sp. ....	1.82	.74 x.735	.23	x.41	.217x.542	.86	x.93	.35	x.15	.087x.026	.076x.07			
<i>C. genitalis</i> , n. sp. ....	1.90	.79 x.78 .305	.195x.467		.22	x.597	.90	x.91	.445x.15	.07	x.025	.09	x.108	
<b>Females</b>														
<i>C. candidus</i> (Rudow) .....	2.20	.88 x.845	.22	x.51	.28	x.655	1.11	x.93						
<i>C. dilatatus</i> (Rudow) .....	2.32	.89 x.86 .35	.28	x.49	.293x.695	1.21	x.106							
<i>C. obscurus</i> (Giebel) .....	2.68	.895x.80 .38	.235x.49		.285x.65	1.46	x.106							
<i>C. tabulus</i> , n. sp. ....	2.36	.89 x.80 .31	.25	x.50	.285x.69	1.20	x.113							
<i>C. brevicapitis</i> , n. sp. ....	2.37	.85 x.85 .347	.26	x.50	.24	x.63	1.24	x.106						
<i>C. genitalis</i> , n. sp. ....	2.29	.87 x.85 .35	.22	x.50	.24	x.65	1.08	x.104						
<i>C. hirsutus</i> , n. sp. ....	2.20	.88 x.88 .38-.41	.26	x.49	.303x.673	1.11	x.94							

*Craspedorhynchus genitalis*, n. sp.

(Figures 19 and 20)

Types, male and female adults, from *Geranospiza n. nigra* (Du Bus), collected by R. Newman at Hacienda Capulín, S. L. P., México, July 1, 1947 (types in L. S. U. M. Z. coll.).

DIAGNOSIS.—This species resembles in some ways *C. dilatatus* (Rudow), especially in the size and shape of the head and type of male genitalia. The head is about as long as wide in both sexes (male, .79 x .78; female, .87 x .85), while that of the male of *dilatatus* is exactly the same and that of the female is .89 x .86. However, it differs from *dilatatus* in many details. The premarginal carinae are narrower, with the portion anterior to the suture much shorter, while the preantennal nodus has a prominent, median hyaline streak. The anterior plate is much narrower, scarcely expanded medially, and quite different in shape (see figures). That portion of the head anterior to the preantennal suture is also narrower. The temporal carinae are very narrow, less than half the width of those bands in *dilatatus*.

There is a difference in the shape of the thoracic segments, as well as in the abdominal tergites and their incrassations, while the genital sternite of the female is very different (see figure).

The male genitalia seem to be entirely without seminal duct (at least none is visible), the same as in *dilatatus* and *candidus*, while the basal plate is similar in shape to that of *dilatatus*. The paramers are, however, much longer in *genitalis*, and more slender, and there are the usual differences in the complicated sclerites of the endomera.

The species is represented by the female holotype, male allotype, and two male and three female paratypes. See table of measurements following the genus.

Genus *Saemundssonina* Timmermann, 1935

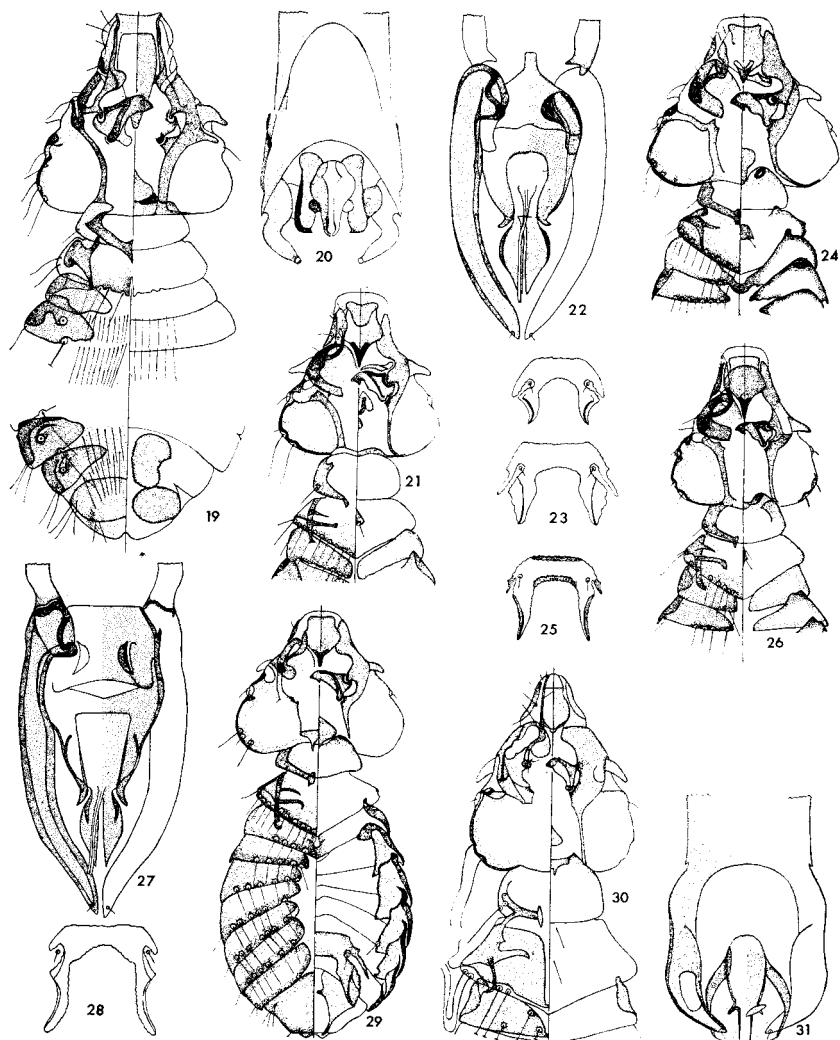
This genus contains numerous species already described and many more yet undescribed. It is parasitic on shore birds, gulls, terns, and other maritime hosts, and the greater portion of the described forms are from Old World hosts. There are but four species described from New World gulls, and these are quite different from the species described below from *Larus atricilla*.

*Saemundssonina atricilla*, n. sp.

(Figures 21, 22 and 23)

Types, male and female adults, from *Larus atricilla* Linné, collected by the author at Nuquí, Dept. Chocó, Colombia, March 3, 1951 (in coll. U. S. Nat. Mus.).

DIAGNOSIS.—This is one of the smaller species, with slight difference in size between the sexes; the head is slightly longer than wide in the male and slightly wider than long in the female. The portion of the head anterior to the preantennal suture is long and narrow (.24 long x .24 wide at tips of premarginal carinae (female) and only .27 at the suture). The premarginal carinae are wide and heavily chitinized, with inner margin undulating; the anterior plate is composed of two portions, the main plate, with deeply colored posterior point, and a somewhat shield-shaped plate at anterior end (see figure). The gular plate is very small and the prothorax extends but slightly beneath the head; the mesosternum is small, is pointed



- Fig. 19. *Craspedorhynchus genitilis*, n. sp. ♀, head, thorax, and abdominal segments I, II, and VI to IX
- Fig. 20. *C. genitilis*, n. sp. ♂, genitalia
- Fig. 21. *Saemundssonina atricilla*, n. sp. ♀, head, thorax, and abdominal segments I and II
- Fig. 22. *S. atricilla*, n. sp. ♂, genitalia
- Fig. 23. *S. atricilla*, n. sp. and *S. steganopa*, genital sternites of ♀
- Fig. 24. *S. humeralis americana*, n. subsp. ♀, head, thorax, and abdominal segments I to III
- Fig. 25. *S. humeralis americana*, n. subsp. ♀, genital sternite
- Fig. 26. *S. haemastica*, n. sp. ♀, head, thorax, and abdominal segments I and II
- Fig. 27. *S. haemastica*, n. sp. ♂, genitalia
- Fig. 28. *S. haemastica*, n. sp. ♀, genital sternite
- Fig. 29. *S. tricolor*, n. sp. ♀, body
- Fig. 30. *Penenirmus auritus californiensis* (Kell.) ♀, head, thorax, and abdominal segment I
- Fig. 31. *P. a. californiensis* (Kell.) ♂, genitalia

anteriorly and has a single pustulated seta on each side of the posterior margin; the carinae of the pterothorax consist of a curved longitudinal band extending from anterior margin of segment into tergite I and two transverse carinae extending inward from it, the anterior one shorter, slender, and pointed apically.

The genital sternite of the female is fairly simple in structure, as compared with that of other species (see figure).

The male genitalia are large and massive, characteristic of the genus, the combined basal plate and paramers extending from the posterior margin of tergite II to the tip of the abdomen. There are numerous details of structure, both in paramers and endomera, which distinguish the species.

Compared with the other American species of the genus, it differs from *S. gonothorax* (*Larus marinus*) in the shape of the head and from *S. lari* and *tridactyla* (*L. hyperboreus* and *Rissa tridactyla*) in the male genitalia. I have no data on *S. parva* (Piaget) from *Larus dominicanus*.

*S. atricilla* seems to be most nearly related to a series of undescribed specimens from *Larus serranus* Tschudi, of Peru, resembling also, but in a lesser degree, specimens from *Larus modestus* Tschudi, also from Peru. For measurements see table at end of the genus.

The species is represented by the female holotype, male allotype and eight male and three female paratypes, also a male and female from the type host collected by myself at Lincoln, Nebraska, March 11, 1900, and by two males and a female from the type host collected by R. Newman at Baton Rouge, La., August 19, 1947, these three specimens being in the coll. of the L. S. U. Museum of Zoology.

*Saemundssonina humeralis americana*, n. subsp.

(Figures 24 and 25)

Type, female adult, from *Numenius a. americanus* Bechstein, collected by Rollin Baker in Colorado Co., Texas, May 25, 1940 (in coll. L. S. U. M. Z.).

DIAGNOSIS.—Resembles strongly *S. h. humeralis* (Denny), from *Numenius arquata*, but is easily separated on size alone, being very much smaller in all measurements. Body (female) 1.92 against 2.67; head, .705 x .792 against .825 x .945 (width at suture .328 against .40). The remaining measurements are proportionately smaller (see table at end of genus). The structure of head and body is quite similar to that of *humeralis* but differs in several details, especially in the premarginal carinae and pre-antennal nodus, as well as in the temporal and occipital carinae.

Unfortunately no males were secured. It is possible that the genitalia will show distinguishing characters. In addition to the female holotype, the race is represented by three female paratypes. This series has been compared with a female and four males of *S. h. humeralis* (Denny), from the type host. Measurements of *S. h. humeralis* are included in the table for comparison.

*Saemundssonina haemastica*, n. sp.

(Figures 26, 27 and 28)

Types, male and female adults, from *Limosa haemastica* Linné, collected by J. C. Crawford, Jr., at Lincoln, Nebraska, May 20, 1899 (in coll. of M. A. C., Jr.).

DIAGNOSIS.—Differs quite strongly from both *S. limosae* (Denny) (from *Limosa lapponica*) and *S. thompsoni* Timmermann (from *L. l. limosa*). The head is of quite a different shape, being longer and narrower, and the male genitalia are quite different.

It is nearest to *thompsoni* in shape of head, but the head is longer (male, head .63 x .542 (.26 at suture) against .61 x .58; female, .67 x .62 (.303 at suture) against .67 x .66). The portion of head anterior to the preantennal suture is longer and narrower, with sides more divergent than in *thompsoni*; the anterior plate differs in shape and structure, as well as the cranial carinae. The genital sternite of the female is very close to that of *thompsoni* (see figure), but the male genitalia differ strongly, having much longer paramers and entirely different endomera.

The species is represented by the female holotype, male allotype and one male and one female paratype, also two males and two females from the type host collected by G. H. Lowery at Lawrence, Kansas, May 15, 1947, which are in the collection of the L. S. U. Museum of Zoology. There are no discernible differences between the type series and the specimens from Kansas.

*Saemundssonina tricolor*, n. sp.

(Figure 29)

Type, female adult, from *Steganopus tricolor* Vieillot, collected by D. S. Farner near Lawrence, Kansas, May 18, 1946 (in coll. L. S. U. M. Z.).

DIAGNOSIS.—Characterized by the extremely short, wide head, with broadly expanded temples and very short anterior portion of head (clypeal area). The anterior plate is short and wide, with short, blunt posterior tip; the gular plate is unusually large; tergite I of the abdomen is unusually wide in median portion, and tergite VIII very large; the genital sternite is also unusually large (see figures).

Unfortunately the male is unknown, but the male genitalia will undoubtedly present additional distinguishing characters. This is the first record for this genus from any species of the family Phalaropidae. The new species is represented only by the female holotype.

*Saemundssonina cephalosa* (Carriker) 1902

*Docophorus cephalosus* Carriker, Journ. New York Ent. Soc., vol. 10, p. 217; pl. 20, fig. 1. Host: *Colaptes cafer* (error) equals *Tringa s. solitaria* Wilson.

While engaged in the study of the above new forms I compared with the type of *S. cephalosa* all of the material in my collection from kinds of birds which might have been collected at Lincoln, Nebr., where the type host of *cephalosa* was taken. I found a single male in fine condition, from *Tringa s. solitaria*, collected at Mamotoco, D. Magdalena, Colombia, Sept. 5, 1913, which is an exact duplicate, in all respects, of the type of *S. cephalosa*. There is no question but what they are one and the same thing, and since *Tringa solitaria* was a common migrant at Lincoln at that time, there is no reason to doubt the correctness of this identification.

Genus *Penenirmus* Clay and Meinertzhagen, 1938

Genotype: *Pediculus albiventris* (Scopoli) = *Docophorus troglodytes* Waterston.

TABLE OF MEASUREMENTS FOR SPECIES OF *Saemundssonina*

Species	Body	Head (Pre- anten- nal Suture)	Pro- thorax	Ptero- thorax	Abdo- men	Basal Plate	Para- mers	Endo- mera
<b>Females</b>								
<i>S. atricilla</i> .....	1.68	.587x.61 (.27)	.174x.327	.25 x.456	.935x .77			
<i>S. haemastica</i> .....	2.09	.673x.62 (.303)	.185x.358	.27 x.51	1.13 x .90			
<i>S. humeralis humeralis</i> ....	2.67	.825x.945 (.40)	.217x.50	.31 x.738	1.60 x1.37			
<i>S. humeralis americana</i> ..	1.92	.705x.792 (.328)	.163x.385	.27 x.53	1.00 x .78			
<i>S. tricolor</i> .....	1.81	.62 x.725 (.28)	.195x.37	.29 x.53	1.00 x .825			
<b>Males</b>								
<i>S. atricilla</i> .....	1.63	.586x.57 (.24)	.193x.337	.228x.46	.87 x .705	.358x.175	.29 x.174	.217x.098
<i>S. haemastica</i> .....	1.67	.63x.542 (.26)	.185x.326	.217x.445	.868x .79	.29 x.17	.326x.174	.26 x.13
<i>S. humeralis humeralis</i> ....	2.25	.74 x.81 (.372)	.217x.456	.282x.67	1.26 x1.17	.456x.26	.434x.25	.39 x.174

A very careful study has been made of the description and figures of the type of this genus, as given by Waterston<sup>2</sup> and Hopkins and Clay,<sup>3</sup> comparing them with a pair of *Penenirmus* from *Troglodytes musculus striatulus* from Colombia, which is very similar to *albiventris*, although at least subspecifically distinct, and there can be no question of their congeneric relationship.

I have also studied a large series of the *Penenirmus* group parasitic on the Picidae (woodpeckers), having had a pair of neoparatypes of *P. auritus* (Scopoli) = *P. superciliosus* (Burmeister), from the common European woodpecker, for comparison with the New World forms. The latter are so closely related to *auritus* (Scopoli) that most of those which I have seen are conspecific with it, though all seem to be separable subspecifically.

This group of *Penenirmus*, parasitic on the woodpeckers, is very different from the genotype in the structure of the anterior portion of the head, so much so that it leads one to doubt whether or not it is congeneric with *Pediculus albiventris* (Scopoli). The woodpecker parasites of the genus *Penenirmus*, of which *P. californiensis* is the typical New World representative, are a very large group of species, found on most woodpeckers, and a surprisingly homogenic group, but further discussion of its relationship with *albiventris* will be deferred for a future article.

*Penenirmus auritus californiensis* (Kellogg), 1896  
(Figures 30 and 31)

*Docophorus californiensis*, Proc. California Acad. Sci., 2 (6), p. 483; Pl. 66, fig. 6. Host: *Melanerpes formicivorus bairdi* Ridgway.

A pair of this species (male and female) from *Melanerpes f. formicivorus*, collected by R. J. Newman at Xilitla, S. L. P., México, June 12, 1947, is in L. S. U. M. Z. coll. I also have a large series of this species from Costa Rica taken on *Melanerpes formicivorus formicivorus* and another larger series from Colombia taken on *M. f. flavigula*, but I have not seen specimens from the type host *M. f. bairdi*. A careful examination of this series shows that the species varies greatly in measurements. Generally speaking, specimens from Costa Rica and Mexico are smaller than Kellogg's types and smaller than Colombian material, but there are specimens from Costa Rica as large as the types and almost as large as the largest from Colombia, but, excepting in size, no other differences were found in the whole series.

The range in measurements in Costa Rican females is body: 1.76 x .575 to 1.98 x .694; and head: .532 x .67 to .57 x .51. The range in males is body: 1.59 x .575 to 1.63 x .586; and head: .52 x .467 to .50 x .445. Mexican specimens fall within these extremes, while the largest Colombian specimen (a female) measures 2.08 x .69 (body) and .575 x .51 (head). Kellogg's types measured (female), body: 1.90 x .72; head, .60 x .53; (male), body: 1.75 x .62 and (head) .53 x .47. It may be noted that the largest Colombian female has the head smaller than the type (.57 x .51 against .60 x .53). In view of the above series of measurements it would be very foolish to attempt any separation of this series on size alone, while other differences

<sup>2</sup> Waterston, 1915. Zool. Jb., Abt. Syst., 39: 27, fig. F.

<sup>3</sup> Hopkins & Clay, 1951. Bull. Brit. Mus. Nat. Hist., Ent., Vol. 2, No. 1, p. 28, figs. 38-40.



do not exist. It is possible that Kellogg's female type was an unusually large specimen, since the measurements he gives for the male show the head to be but slightly larger than Costa Rican and Colombian males. It is also possible that an error was made in the measurements of the female. It would, therefore, seem advisable to identify specimens from all of the races of *Melanerpes formicivorus* merely as *P. californiensis* (Kell.).

This species, by the way, is very closely related to *P. auritus* (Scopoli) = *P. superciliosus* (Burm.). I have compared my specimen with a pair of neoparatypes of *auritus* and they are surprisingly alike. Kellogg states that *californiensis* differs from *superciliosus* in the presence and absence of certain setae of the prothorax and abdomen. This, however, is incorrect, since their chaetotaxy is exactly the same. The difference between the two species lies in the shorter head of *auritus*, especially the portion anterior to the preantennal suture, which in *auritus* measures (female) .13 x .25, while in *californiensis* it is .163 x .228. There are also differences in the structure of the pleurites, those of *californiensis* having the median ridge higher and more sharply defined; the pterothorax of *auritus* is wider in the female (.526 against .51) and narrower in the male (.423 against .456).

There is very little difference in the male genitalia. The width at base of paramers is the same, as well as the width of the central, deeply colored portion of the endomera, but the posterior, almost hyaline portion is longer and wider in *auritus*, and the median portion much longer, as well as the penis. Considering the very slight differences between *auritus* and *californiensis* it seems best to consider them as conspecific, so that the latter becomes a subspecies of the former.

*Penenirmus auritus evagens* (Kellogg), 1896<sup>4</sup>

(Figure 32)

*Docophorus evagens* Kellogg, Proc. California Acad. Sci., vol. 6 (2), p. 480, pl. 66, fig. 2. Host: *Dryobates pubescens* = *Dendrocopus pubescens medianus* (Swainson).

This species was described from a single male; host collected at Lawrence, Kansas. In my own collection there is a single female from the type host, taken at Lincoln, Nebr., April 20, 1901. This female agrees in all respects with Kellogg's description of the male, excepting for size and slight discrepancies in chaetotaxy. He gives the head measurements as .53 x .47, while my female (which should be larger) measures only .50 x .456, with a total length of 2.06 against Kellogg's measurement of 2.00 for the male. In this group there is an average difference in size of head of .05 to .07 in both length and width. I am beginning to suspect that we cannot always depend on Kellogg's measurements. They seem to

<sup>4</sup>Two female adults and one female immature from *Piculus aeruginosus* (Malherbe) collected at Xilitla, S. L. P., Mexico, January 25, 1947, are practically impossible to separate from *evagens*, all head measurements being the same, not varying in any case more than .02. The anterior plate is a little longer and a trifle wider; the pterothorax and abdomen are a trifle wider. Unfortunately no males are available for comparison of the genitalia, nor have I seen the male of *evagens*. It seems best, from lack of material, to identify them merely as *P. auritus evagens*.

run greater than they should in many instances, another example being the measurements of *P. californiensis*.

In his description and figure of *evagens* the frons is noticeably wider than in *californiensis*, and he places considerable stress on this character. In my female from *D. pubescens*, which must be *evagens*, the frons is noticeably wider than in *californiensis*, being actually .022 at the tips of the preantennal carinae, while the anterior plate is wider (.108 x .10 against .108 x .087). Kellogg also says that "the trabeculae are acute and reach to end of segment I of antennae," which agrees exactly with my specimen, the clavi being longer than in *californiensis*, with very straight sides and sharp point, while in *californiensis* the posterior margin is concave and the tip less sharply pointed.

*P. evagens* also differs from *californiensis* in the shape of the abdominal sternites, which, in the latter species are wider (transversely) and occupy only the anterior half of the segment, while in *evagens* they are as wide as the tergites.

I have examined three females which are apparently this species, taken from *Dendrocopus scalaris giraudi*, collected by R. Newman at Ciudad del Maiz, S. L. P., Mexico, March 23, 1947, and which are in the collection of the L. S. U. Museum of Zoology.

These females are exactly like my female from *pubescens*, except for slight discrepancies in measurements and their wider frons. They agree in this respect exactly with Kellogg's figure of *evagens*, averaging about .09 in width, while my female from *pubescens* measures .065 and *californiensis* averages about .043. The anterior plate is also larger, being .15 x .108 against .108 x .10 for the *pubescens* female.

MEASUREMENTS OF *P. auritus auritus* AND *P. a. californiensis*

	<i>auritus</i>				<i>californiensis</i>			
	Male		Female		Male		Female	
	Length	Width	Length	Width	Length	Width	Length	Width
Body .....	1.67	....	2.04	....	1.63	....	1.93	....
Head (at clavi) ....	....	.347	....	.38	....	.31	....	.314
Head (at temples) .54	.50		.575	.532	.52	.456	.545	.456
Prothorax .....	.14	.27	.185	.306	.185	.285	.185	.293
Pterothorax .....	.237	.423	.24	.52	.217	.46	.228	.495
Abdomen .....	.92	.553	1.27	.716	.90	.50	1.15	.685
Basal plate .....	.20	.094			.15	.10		
Paramer .....	.046	.016			.06	.026		
Endomera .....	.08	.053			.07	.048		

Taking into consideration the great individual variation in measurements of the series of *californiensis*, it would seem rational that the same thing would be found in *evagens*. The heads of the three females from *scalaris* measure .553 x .488; .542 x .467; and .55 x .467, while the female

from *pubescens* measures .51 x .456. I do not consider that the differences between *auritus* and *evagens* justify specific rank and have made the latter a race of *auritus*.

*Penenirmus auritus varius* Emerson, 1953

(Figure 33)

*Penenirmus varius* Emerson, Jour. Kansas Ent. Soc., vol. 26, No. 4, October, 1953, p. 134; figs. 6 and 8, p. 135. Host: *Sphyrapicus v. varius* (Linné).

I would consider Emerson's species to be a race of *P. auritus* (Scopoli). It is very close to the nominate form, resembling more closely *auritus* than any of the other races I have seen, although it is very close also to *evagens* (Kellogg). It is in no sense an outstanding subspecies.

A series of five males and three females were taken on the type host collected by R. Newman at Xilitla, S. L. P., México, on January 25, 1947.

*Penenirmus auritus aurifrons*, n. subsp.

(Figures 34 and 35)

Types, male and female adults, from *Melanerpes aurifrons grateloupensis* (Lesson), collected by G. H. Lowery at Ebano, S. L. P., México, February 25, 1947 (in coll. L. S. U. M. Z.).

DIAGNOSIS.—Very close to *evagens* (Kell.), agreeing with that race in practically all measurements. *P. a. aurifrons* differs in size, shape and position of the anterior plate, that sclerite being set much further back from margin of frons. It is much shorter and differently shaped in posterior portion (see figure).

The preantennal carinae (back of suture) are considerably wider; the inner carinae which support the anterior plate are much shorter and wider in median portion; the area between the outer and inner carinae is deeply chitinized and mottled; the preantennal nodus is much smaller, tapering to a round tip; there are distinct dorsal temporal carinae, extending from preantennal nodus to anterior margin of prothorax. These are absent in the other races. The male genitalia are smaller, the basal plate being narrower and the component parts more slender (see figure). The species is represented by the female holotype, male allotype and seven male and seven female paratypes. Measurements will be found beyond.

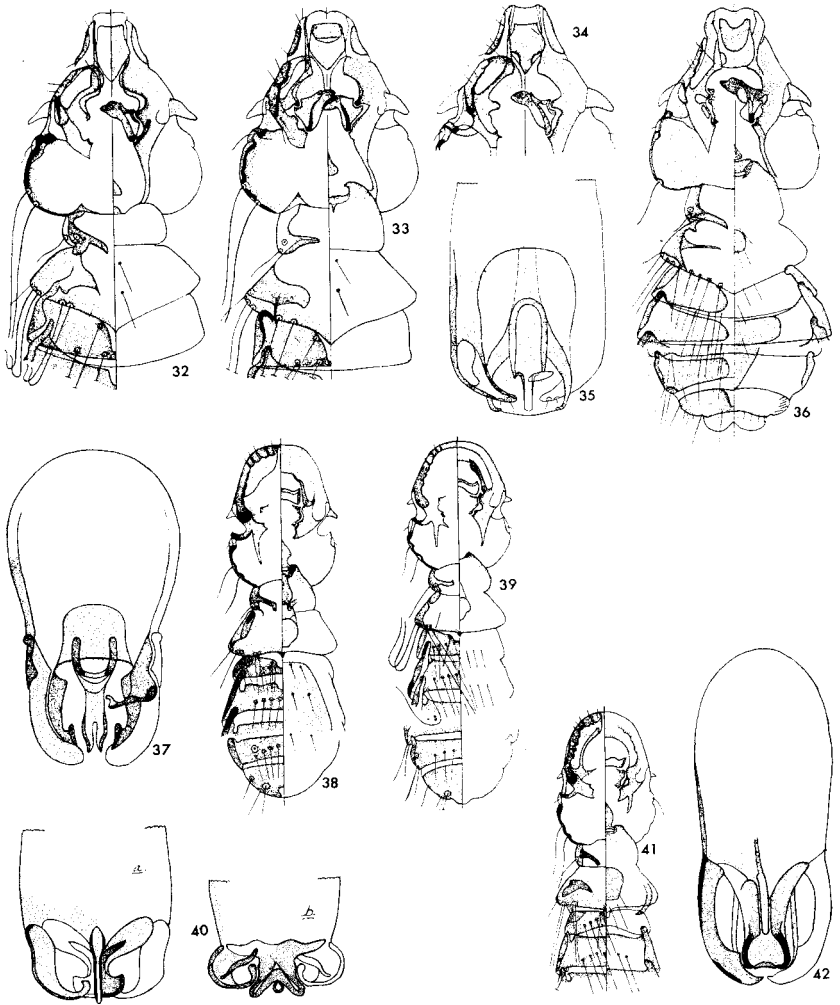
*Sturnidoecus caliginus* (Carriker), 1903

*Nirmus caliginus* Carriker, Univ. Nebraska Stud. vol. III, p. 22, pl. III, fig. 2. Host: *Merula grayi* = *Turdus grayi casius* (Bonaparte).

*Penenirmus caliginus* (Carriker), Carriker, Proc. U. S. Nat. Mus., 1949, vol. 100, No. 3266, p. 384. List of types described by the author 1903-1910; Checklist of Mallophaga, Hopkins and Clay, 1952, p. 274.

When I published the list of my types in 1949, with their proper generic allocations, I had not seen authentic specimens of *Sturnidoecus* Eichler, and I do not remember whether I or Dr. Hopkins was responsible for the allocation of *Nirmus caliginus* in *Penenirmus*.

Since I had no occasion to work with this genus until the present time, this error was not previously discovered. Meanwhile, I had received from



- Fig. 32. *Penenirmus auritus evagens* (Kell.) ♀, head, thorax, and abdominal segment I
- Fig. 33. *P. a. varius* Emerson ♀, head, thorax, and abdominal segment I
- Fig. 34. *P. a. aurifrons*, n. subsp. ♀, anterior portion of head
- Fig. 35. *P. a. aurifrons*, n. subsp. ♂, genitalia
- Fig. 36. *Sturnidoecus caliginosus mexicanus*, n. subsp. ♀, head, thorax, and abdominal segments I, II, and VII to IX
- Fig. 37. *S. c. mexicanus*, n. subsp. ♂, genitalia
- Fig. 38. *Degeeriella borealis*, n. sp. ♀, head, thorax, and portions of abdomen
- Fig. 39. *D. falconoidea*, n. sp. ♀, head, thorax, and portions of abdomen
- Fig. 40a. *D. falconoidea*, n. sp. ♂, genitalia
- Fig. 40b. *D. borealis*, n. sp. ♂, genitalia
- Fig. 41. *D. genitilis*, n. sp. ♀, head, thorax, and abdominal segments I and II
- Fig. 42. *D. genitilis*, n. sp. ♂, genitalia

Miss Clay neoparatypes of *Sturnidoecus sturni* (Schrank) (type of the genus) and a pair of *S. capensis* (Giebel). When these were compared with the types of *Nirmus caliginus*, the relationship was instantly apparent.

*Nirmus caliginus* is a typical *Sturnidoecus* in all respects and proves to be the type of that genus most commonly found on the Neotropical Turridae, as well as occasionally on other Passeriformes of the New World. The species is easily recognized by the structure of the anterior portion of the head, the inner preantennal carinae and anterior plate extending far beyond the tips of the outer, marginal carinae.

*Sturnidoecus caliginus mexicanus*, n. subsp.

(Figures 36 and 37)

Types, male and female adults, from *Turdus infuscatus* (Lafresnaye), collected by R. Newman at Cerro Conejo, S. L. P., México, May 27, 1947 (in coll. L. S. U. M. Z.).

DIAGNOSIS.—The anterior portion of the head in the whole *caliginus* group is the same, and we have the following structure: The dorsal preantennary carinae are unbroken and heavily chitinized, terminating in a slender point apically; the inner carinae, which encircle the buccal cavity, continue forward on each side of the anterior plate, but there is a third, ventral(?) carina arising from between the two dorsal carinae and extending far beyond their tips (see figure). There is a slight suture running backward between the point of the outer carinae and the median ventral one which actually forms the anterior portion of the head and encloses the anterior portion of the anterior plate.

The prothorax is short and much wider than long, with almost straight, slightly divergent sides; the pterothorax is larger, with strongly divergent, convex sides and posterior margin pointed medially, with a series of seven strong setae, evenly spaced, along each side. The abdominal tergites are all broken medially in both sexes, excepting in VIII, where it is entire at the posterior margin; there are no pustulated setae on the tergites as in *Penenirmus*, but there are three on each side, set in the clear space between the tergites and the posterior margin of the segment, in II to VII, and two on VIII; there are two shorter setae on each side of the posterior margin of the sternal side of the pterothorax and three on each side of the sternum; there is a single longer, heavier seta on posterior margin of tergites III to VII, just behind the spiracles; a single submarginal seta on each side of posterior margin of sternites I to VI.

The sternites are entire transversely, but widely separated from the pleurites; the genital sternite is small, ending posteriorly in a point at the anterior margin of segment VIII; segment IX is much narrower than VIII (in female), hyaline and deeply incised medially; there are five short setae on each side of posterior margin of VIII, and six short, sternal setae, pointing inward, at each side of segment.

In the male, segment VIII is short, but almost as wide as VII, while IX is longer and much narrower than VIII, with circular posterior margin set with six rather long setae on each side. The male genitalia are well developed but have a very short basal plate, expanded apically; the paramers are comparatively large, with broadly rounded tips curved inward and touching; there are deeply colored carinae extending inward from the

basal portion of the paramers which possibly support the mesosome, but this detail is not clear. These carinae are characteristic of the species; at least all of the few males of this group which I have seen possess them, and all have more or less similar genitalia. The structure of the mesosome is rather complicated and difficult to differentiate, so that there may possibly be some slight errors in the figure.

MEASUREMENTS OF THE TYPES OF *Penenirmus a. aurifrons* AND *Sturnidoecus caliginus mexicanus*.

	<i>P. a. aurifrons</i>				<i>S. c. mexicanus</i>			
	Male		Female		Male		Female	
	Length	Width	Length	Width	Length	Width	Length	Width
Body .....	1.73	....	1.99	....	1.27	....	1.45	....
Head (at coni) ....	.34	....	.358	....	.295	....	.314	....
Head (at temples) .564	.477	.597	.50	.47	.445	.488	.456	
Prothorax .....	.174	.314	.174	.30	.14	.24	.15	.267
Pterothorax .....	.25	.477	.26	.48	.174	.37	.195	.39
Abdomen .....	.955	.605	1.19	.65	.625	.445	.80	.52
Basal plate .....	.17	.09	....	....	.16	.11	....	....
Paramer .....	.05	.02	....	....	.06	.01	....	....
Mesosome .....	.076	.048	....	....	.08	.058	....	....

Genus *Degeeriella* Newmann, 1906

This genus has been restricted to the species parasitic on the Birds of Prey (Suborder Falcones). They are characterized by a deeply colored, heavily chitinized premarginal carina, usually corrugated along the inner margin and with well developed preantennal nodus. In some species this carina (dorsal portion) is interrupted in the median portion of the frons, in others almost interrupted, and in still others with no trace of a median constriction or interruption. There is present a more or less well developed marginal temporal carina. The preocular and postocular nodus and post-marginal carinae are less well developed and pigmented. There is no trace of a preantennal suture or anterior plate and the clavi are small, pointed and hyaline.

The thoracic segments are small, the pterothorax with strongly divergent sides and more or less transverse posterior margin, with a short median point and bearing two pairs of long setae on each side of posterior margin and one at lateral angle. The abdomen is elongated oval, the pleurites with very long heads; the legs are short and stout; and the male genitalia are minute, but with component parts rather complicated.

There is a row of six to eight (usually eight) longish setae across the median portion of the tergites and usually four to six shorter ventral setae, slightly posterior to the dorsal row, often difficult to see; there is a single

long, pustulated seta on the posterior margin of the tergites, just within the head of the pleurites on segments II to VI, in addition to the usual setae in the angles of the abdominal segments.

The genus is a large one, now containing 32 valid species and certainly many undescribed forms. While many of the species are very similar in appearance there are numerous small differences which may be used for their separation. The most important of these are the following: Size of body, size and shape of head, width and outline of preantennal carina, thoracic sternal sclerites, shape of pleurites and their heads, but perhaps the most important of all are the male genitalia.

*Degeeriella borealis*, n. sp.

(Figures 38 and 40b)

Types, male and female adults, from *Buteo jamaicensis borealis* (Gmelin), collected by D. S. Farner at Lawrence, Kansas, U.S.A., December 4, 1946 (in. coll. L. S. U. M. Z.).

DIAGNOSIS.—The size of the body is medium, with head considerably longer than wide (female: .61 x .456), and almost as wide at clavi as at temples (female: .434 x .456). There is very little difference in size between the sexes.

The frons is flatly rounded, with sides of head in preantennal portion almost straight; the dorsal preantennal carina is rather wide and strongly corrugated on inner margin and deeply incised in middle of frons, but not completely interrupted; there are five transverse "canals" on each side of frons, leading to minute marginal setae; there are inner, preantennal carinae extending from the sides of mandibles and encircling the buccal cavity, and it is not completely clear whether these carinae are dorsal or ventral, but they are shown in figure as being ventral. The pulvinus is well developed, as in the entire genus, with but little variation in the different species. The temporal carinae are short, joined basally with the postmarginal carinae and preantennal nodus, as well as with the posterior mandibular condyle. These carinae seem to be dorsal, with ventral carinae absent (see figure).

The thoracic sternal plates are unusually large, especially that of the prothorax, which extends beyond the occipital margin of head. In segment I of abdomen there is a row of six setae across the middle of tergite, with another at anterior edge on each side of the median emargination; sternite VII also has six setae (figure incorrect in this detail), while II to VI have eight; there are three sternal setae on each side of median line in segments I to VI; in the female the heads of pleurites II to IV are long and wide, with rounded ends, but they decrease rapidly in size from V to VII, while in the male those of II to V are smaller and the reduction in size back to VI is very little.

The male genitalia are very small, with the ends of the paramers curved back alongside the endomera, and with a bar from the lateral wings of the endomera across the inner basal portion of the paramers; only the tip of the penis is visible. The species is represented by the female holotype, male allotype, and one female paratype. Measurements are given after the following species.

*Degeeriella falconoidea*, n. sp.

(Figures 39 and 40a)

Types, male and female adults, from *Falco mexicanus* Schlegel, collected by C. Shaw at San Luis Potosí, S. L. P., México, December 12, 1946 (in coll. L. S. U. M. Z.).

DIAGNOSIS.—This species differs strongly from *borealis*, the male being much smaller than the female, and the abdomen in both sexes much slenderer; the head is much shorter, with frons narrower and sides of preantennal region more strongly divergent (female: head, .54 x .42 against .61 x .45).

The preantennal carina is of uniform width across the frons, with no trace of median interruption; the inner margin, along sides of head, is strongly corrugated, but in the frontal portion the margin is straight, and the carina narrower; there are four "canals" across the carina to marginal setae, but none near the middle of frons as in *borealis* (see figure); the preantennal nodus is much smaller than in *borealis* and the marginal temporal carinae are narrower and more uniform; the temporal carinae are faintly chitinized, but there are apparently both dorsal and ventral bands, while in *borealis* there is only the dorsal.

MEASUREMENTS OF TYPES OF *D. borealis* AND *D. falconoidea*.

	<i>borealis</i>				<i>falconoidea</i>			
	Male		Female		Male		Female	
	Length	Width	Length	Width	Length	Width	Length	Width
Body .....	1.93	....	2.09	....	1.73	....	2.08	....
Head (at temples) ..	.575	.434	.61	.456	.51	.40	.542	.423
Head (at clavi) ....	....	.40	....	.434	....	.358	....	.40
Prothorax .....	.185	.28	.195	.282	.163	.25	.195	.26
Pterothorax .....	.195	.45	.205	.475	.14	.326	.185	.38
Abdomen .....	1.13	.57	1.25	.63	1.02	.39	1.30	.542
Antennae .....	.23	.045	.24	.045	.217	.043	.217	.043
Basal plate .....	.16	.09			.15	.098		
Paramers .....	.04	....			.055	....		
Endomera .....	.04	.06			.05	.077		

The pterothorax is much smaller than in *borealis* (female: .185 x .38 against .205 x .475). The thoracic sternites are quite different from those of *borealis*; there are eight setae on tergite I, in addition to the one on each side of the median emargination, and eight on all of the remaining tergites except VII, which has six. There are six sternal setae on segments I to VI, those on VI small and set further back on segment.

The pleurites are long, all with long heads except VII, and there are deep emarginations on the anterior side of tergites just within the pleurites; the outer half of pleurites are more deeply colored than the inner (the



ventral); segment VIII is very similar to *borealis*, except for a median protuberance in *falconoidea*. There is practically no difference between the sexes, except in size and the shape and chaetotaxy of abdominal segments VII and VIII. The male genitalia are considerably larger than in *borealis* and very different in structure (see figures). The species is represented by the female holotype, male allotype and one male and three female paratypes; also a male and female in my collection from the type host collected by Lawrence Bruner at Harrison, Nebraska, February 25, 1896.

*Degeeriella genitalis*, n. sp.

(Figures 41 and 42)

Types, male and female adults, from *Buteo regalis* (G. R. Gray), collected by M. A. Carriker, Jr., at Lincoln, Nebraska, U.S.A., October 19, 1900 (in coll. of M. A. C.).

DIAGNOSIS.—The shape of the head differs from the other three species treated in this paper, the frons being more rounded and whole head narrower, with very little difference in width between the bases of the clavi and the temples (female: .39 against .43 and male: .39 against .423).

The preantennal carinae is interrupted in the male and female; a distinguishing character is the almost identical size of the male and female, most all measurements being either the same or very close, even those of the abdomen (see table of measurements). There is no sexual dimorphism in the head. Another character distinguishing the species is the coloration of preantennal carinae, with the corrugations almost black and with a series of five rounded clear spots (not hyaline) along each side of the head. The gular plate is small and very narrow, and the metasternum very large (see figure).

There is no distinguishing character in the abdomen, and the chaetotaxy is typical, a series of four setae on each side of median portion of tergites I to VI, and three on VII, with an extra seta on I at each side of the median emargination on anterior side; there are two sternal setae on each side of the median line of segments I to VI, slightly posterior to the dorsal setae; a long, strong pustulated seta just within head of pleurites on posterior margin of tergites II to VI.

The most distinguishing character is the male genitalia, with small basal plate and very large paramers and with differently constructed endomera (see figure).

The species is represented by female holotype, male allotype and two male and one female paratypes. A single male in rather poor condition in the collection of the L. S. U. Museum of Zoology was collected from the type host by K. Abegg in Kansas(?). Measurements follow together with next species.

(To be continued)

REPORT ON A COLLECTION OF MALLOPHAGA,  
LARGELY MEXICAN (PART II)

M. A. CARRIKER, JR.

(Continued from p. 43, Vol. 39, No. 1)

*Degeeriella angusta* (Giebel), 1874

(Figures 43 and 44)

*Nirmus angusta* Giebel, Insecta Epizoa, p. 126. Host: *Buteo*<sup>5</sup> *lagopus*  
(Pontoppidan).

Giebel's description gives very few characters not common to many species of the genus; however there is nothing which does not agree with the specimens before me from *Buteo lagopus sancti-johannis*. Also, to further corroborate this identity, Hopkins & Clay give the same species of *Craspedorhynchus* from both *Buteo l. lagopus* and *B. l. sancti-johannis*, so that there seems to be no valid reason for not doing the same with *Degeeriella*, particularly since the two hosts are very closely related subspecies.

The only character of value mentioned by Giebel in his description of the species is the shape of the prothorax ("rectangular"), which agrees with the present specimens. These have the exposed sides of the prothorax nearly straight and the posterior angles but slightly curved. Most species of this genus have the prothorax with noticeably convex sides. No measurements are given by Giebel.

DIAGNOSIS.—There is a slight sexual dimorphism in the shape of the head and structure of the preantennal carina; the male has the frons flatter and narrower than the female; the carina is slightly wider and is *unbroken* medially at the frons, while in the female there is a decided interruption (see figure); there are four setae "canals" on each side of the frons, more or less as in *falconoidea*. The abdomen is very similar to that of *borealis*, with no special distinguishing characters.

The male genitalia are closer to *falconoidea*, but the shape of the endomera is quite different, with much smaller lateral wings and concave posterior margin, while the penis is much shorter. The distinguishing characters seem to be the shape of the preantennal portion of the head, the sexual dimorphism of the head, the shape of the prothorax and the male genitalia. The species is represented by 2 males and 2 females from *Buteo lagopus sancti-johannis*, collected by R. Baker at Colorado Co., Texas, March 23, 1941; also by 3 females in my collection from the same host collected by J. S. Hunter, at Lincoln, Nebraska, October 9, 1894.

---

<sup>5</sup> There seems to be a strong similarity between specimens of parasites from the different groups of raptores, those from *Buteo* being of one type, with longer head and heavy preantennal carina with flattened frons and often with strong sexual dimorphism of the head. Those from *Falco* are smaller, with shorter, more rounded head, and those from the kites have a long head, tapering to a narrow frons, these last being the most aberrant forms of the genus that I have seen.

MEASUREMENTS OF TYPES OF *D. genitalis* AND MALE AND FEMALE OF  
*D. angusta* (GIEBEL).

	<i>genitalis</i>				<i>angusta</i>			
	Male		Female		Male		Female	
	Length	Width	Length	Width	Length	Width	Length	Width
Body .....	1.94	.....	1.96	.....	1.78	.....	2.09	.....
Head (at clavi) ....	.....	.39	.....	.39	.....	.391	.....	.412
Head (at temples) .564	.43	.564	.423	.53	.413	.586	.445	
Prothorax .....	.163	.287	.185	.28	.165	.222	.19	.26
Pterothorax .....	.205	.434	.205	.434	.185	.375	.185	.435
Abdomen .....	1.14	.564	1.193	.57	1.025	.477	1.30	.54
Antennae .....	.22	.045	.228	.048	.....	.....	.....	.....
Basal plate .....	.128	.087	.....	.....	.24	.086	.....	.....
Paramers .....	.077	.076	.....	.....	.036	.015	.....	.....
Endomera .....	.063	.066	.....	.....	.043	.056	.....	.....

Genus *Picicola* Clay & Meinertzhagen, 1938.

Genotype: *P. praeposterus* Clay and Meinertz. Host: *Dendrocopus assimilis*. The genus was originally established for three species of Ichneocera, parasitic on the Picidae, the genotype from India and the other two from Africa (*P. campethera* and *P. thripis*). I have not seen material of any of these three species, but have two pairs of *P. marginitulus* Harrison (= *Nirmus marginatus* Osborn) from *Dryocopus pileatus picinus*, as well as several undescribed species from neotropical hosts. In the present collection there is a series of six specimens of the genus from *Melanerpes carolinus zebra* (Boddaert) which are very closely related to *P. praeposterus*, the genotype.

Later (in the 1952 checklist) other species, not parasitic on Picidae, were placed in the genus, one of them, *Nirmus foedus* Kellogg and Chapman, 1899, is of special interest. This species, together with closely allied forms, is found on very many species of Passerine birds, both of North and South America, especially on the Tyrannidae and Furnariidae, and I am very doubtful of its congeneric relationship with *Picicola*. In typical *Picicola* the dorsal preantennal carinae encircle the whole front of the head from base of clavi, unbroken and uniform in width, heavily chitinized, and with four to six narrow "canals" across it on each side of the anterior portion, leading to marginal setae; the sternal carina also encircles the front but it is not always heavily chitinized and is somewhat wider than the dorsal carina. The inner carina, attached to the anterior mandibular condyle and the outer carina, encircles the large buccal cavity parallel to the maginal carina. There is no trace of any plate in the front of the head as in *Oxylipeurus*, *Trogonnirmus*, *Epicolinus* and *Cotingacola*.

In the *Nirmus foedus* group we have the preantennal carina heavily chitinized to the point where the sides of the head begin to curve around the frons, and here it is almost broken in some species and entirely so in others. From this point the carina widens and continues unbroken and

faintly chitinized around the frons, with 4 short, stout setae across its posterior margin. Posterior to this encircling, marginal carina the front of the head is filled by a plate extending backward to the point where the marginal carina is almost broken and where there is unquestionably a somewhat obsolete preantennal suture crossing the head. The posterior margin of this frontal plate is more or less thickened and corrugated, the whole front of the head resembling very strikingly that of the species of *Oxyliperus* found on the genus *Ortalis*.

This group contains numerous, quite distinct species. Many of those from South American Tyrannidae and some Furnariidae tend to have the frons slightly pointed instead of flatly convex as in *Foedus*, but all have the same type of genitalia, abdominal structure, chaetotaxy and head structure, with the transverse suture very clear in some species, slightly obscured in others.

The abdominal tergites are continuous transversely in both sexes, quite strongly chitinized in some species, less so in others (almost colorless). The male genitalia resembles those of typical *Picicola* but differ in several details. The abdomen in the males is very small, tapering rapidly posteriorly from segment V to VIII, but IX is comparatively large, larger than in *Picicola* (see figures).

It seems logical to me that this large group of species, parasitic on entirely different families of birds, and with head structure so distinct, should merit at least subgeneric rank, and I have, accordingly, given them the name *Tyrannicola* subgenus novum, since they are most abundant on the Tyrannidae.

*Picicola praeposterus americana*, n. subsp.

(Figures 45 and 46)

Types, male and female adults, from *Melanerpes carolinus zebra* (Boddaert), collected by G. H. Lowery at Lawrence, Kansas, October 27, 1946 (in L. S. U. M. Z. coll.).

DIAGNOSIS.—These specimens are in very poor condition for describing and figuring. They are possibly immature and were also evidently left too long in the clearing solution, so that many important details are invisible. This is very unfortunate since they constitute the second record of the genus from the New World, and the specimens are very similar to the genotype, apparently conspecific with it, differing more from *marginatula* (mentioned above) than from *praeposterus*. Unfortunately, Miss Clay gave no measurements with her description of the genotype, and only figured the head and genitalia, so that it is impossible to give full details of the differences between the two races.

The anterior portion of the head is more uniformly rounded in *americana*, with sides more divergent; the preantennal carina is wider, marginal, and uniformly, but not deeply, colored; the marginal temporal carinae are also narrow, very slightly submarginal, and pitchy black; the carinae of the thorax are also deeply colored (dark brown, almost pitchy in anterior portion of pterothoracic carinae).

Very little can be distinguished of the abdominal structure; however, the chaetotaxy seems to be the same as described by Clay for the male, excepting on segment IX, where in *americana* there are many more setae on the sides.

Miss Clay does not mention the abdominal sternites, but they are more deeply pigmented in *americana* than the tergites, which can be distinguished with difficulty, and are entire transversely but widely separated from the pleurites, and are visible only in the posterior segments of the abdomen. There is a faint outline, uncolored, of the cellulation along the inner edge of the cephalic carina, which is so conspicuous in several undescribed species in my collection and which is shown in the figure of *praeoposterus*.

The genitalia are not clearly visible in the three males of *americana*, and the details of the median portion of the mesosome are impossible to delineate, so that there may be some errors in the figure here presented. The type of genitalia is the same, however, as in *praeoposterus*, differing only in details, which, together with the other characters mentioned above, are sufficient to warrant subspecific rank.

There is one immature male in the series which presents a curious variation from the adults in the chaetotaxy of the entire body, all setae being almost double the length of those of the adults, even to the abundant setae on segment IX. This male must be in the preadult stage, since the genitalia are quite well developed, though they differ in some details from those of the adults.

The tip of the abdomen of the female agrees with Clay's description, being rounded and slightly bilobed; there is a small, pigmented, transverse sternite across anterior portion of IX; the sternite in VI is deeply colored and that in V somewhat less, while in I to IV the sternites are not visible.

Across the posterior portion of VII may be seen a flatly curving line, which is, apparently, the posterior margin of the genital plate ("valve" of Clay) and which is sparsely set with short setae.

MEASUREMENTS OF THE TYPE OF *Picicola praeoposterus americana*.

	Male		Female	
	length	width	length	width
Body .....	1.58	.....	1.74	.....
Head (at clavi) .....	.....	.293	.....	.326
Head (temples) .....	.475	.347	.495	.358
Prothorax .....	.14	.25	.152	.25
Pterothorax .....	.13	.38	.152	.37
Abdomen .....	.87	.445	1.02	.446
Basal plate .....	.25	.10		
Paramer .....	.06	.....		
Endomera .....	.054	.086		

This structure may be clearly seen in *P. marginatula*, as well as in other undescribed females of my collection. Clay says of the female of *praeoposterus*: "somewhat similar to the male, with thorax and abdomen broader," but gives no further details. In the females of *americana*, and other undescribed forms, the abdominal tergites are clearly divided medially, but in the males which I have seen they are entire. The tergites in most

specimens are very faintly colored, and often quite invisible in the median portion of abdomen, so that their divided character is easily overlooked. The species is represented by the male holotype, female allotype, 1 male and 1 female adult and 2 male immature paratypes.

Subgenus *Tyrannicola*, new subgenus

Type species: *Nirmus foedus* Kellogg & Chapman, 1899.

DIAGNOSIS.—Most nearly related to *Picicola* Clay and Meinertz., from which it differs in the structure of the anterior portion of the head, resembling in this respect species of *Oxylipeurus* parasitic on the genus *Ortalis*.

Differs also in the sexual dimorphism of the abdomen and antennae, the antennae of the males being longer and with larger first segment than in the females. In the genotype this character is not conspicuous, but in other undescribed species the 1st antennal segment in the male is twice as large as in the female; the abdomen of the male is slender apically and very small with segment IX large (see figure of *T. rubina*, n. sp.).

For more complete details of the differences between *Picicola* and *Tyrannicola* see remarks under *Picicola* on previous pages.

*Picicola (Tyrannicola) foedus* (Kell. & Chap.) 1899  
(Figures 47 and 48)

*Nirmus foedus* Kellogg and Chapman, Occ. Pap. California Acad. Sci., 6, p. 87, Pl. VI, fig. 7. Hosts: six hosts are given, three of them Tyrannidae, and the first mentioned is *Myiarchus c. cinerascens*. I have not seen specimens from *M. cinerascens* but have a series from another of Kellogg's hosts, viz: *Tyrannus verticalis* (Sioux Co. Nebraska), and from *Sayornis phoebe*, while he gives *S. s. saya* as one of his hosts. Since no particular host was designated by the describers I herewith designate *Tyrannus verticalis* as the type host of *Nirmus foedus*.

I also present figures of the male of this species from *Tyrannus verticalis*, together with the genitalia. Apparently these specimens are slightly immature, or were cleared too much, since the details of the abdominal structure, especially in the male, are not clearly visible. Also the abdomen of the male seems to be expanded laterally, specially in the posterior portion, being much wider than in other, closely related species of the genus (see figure of male of *P. rubina*, described below).

The species has been quite fully described under the remarks concerning the genus *Picicola* and *Tyrannicola* on previous pages.

*Picicola (Tyrannicola) rubina*, n. sp.  
(Figure 49)

Types, male and female adults, from *Pyrocephalus rubinus mexicanus* Slater, collected by R. Newman at Xilitla, San Luis Postosí, México, January 25, 1947 (in L. S. U. M. Z. coll.).

DIAGNOSIS.—Male very much smaller than male of *P. t. foedus*, especially in thorax and abdomen; sides of head in preantennal portion more divergent, with frons narrower and slightly pointed medially (see figure).

Abdominal segments I to III are much longer than the remainder, and

longer than in *foedus*, with the heads of the pleurites II to V extending far under succeeding segment; pleurites are narrow dorsally, with a narrow, submarginal, pitchy black stripe, but wider on ventral side and paler; tergites are entire and rather deeply and uniformly pigmented, almost filling the segments; sternites are also entire transversely, but widely separated from pleurites and deeply and uniformly pigmented; the genital sternite is large, covering median portion of segments VII and VIII and anterior part of IX; segment IX is longer than VIII and almost as wide, proportionately much larger than in *foedus*.

The legs are well developed and stout, as in *foedus*, with same style of marginal carinae; antennae are also similar.

The male genitalia are not clearly visible and could not be figured, but they apparently differ very little from those of *foedus*, excepting in size, the basal plate being slightly narrower basally, but the whole mesosome wider. A single female in my own collection from *Pyrocephalus rubinus saturatus* (Venezuela) seems to be inseparable from the Mexican material. The species is represented by the male holotype, female allotype, 1 male and 6 female paratypes.

MEASUREMENTS OF *P. (Tyrannicola) foedus* AND *P. (T.) rubina*.

	<i>foedus</i>				<i>rubina</i>			
	Male		Female		Male		Female	
	length	Width	length	Width	length	Width	length	Width
Body .....	1.54		1.89		1.31		1.67	
Head (at clavi) .....	.337	.337		.38		.293		.358
Head (at temples) .....	.51	.38	.553	.412	.456	.338	.52	.39
Prothorax .....	.135	.263	.14	.27	.14	.22	.152	.24
Pterothorax .....	.174	.412	.195	.423	.13	.314	.14	.36
Abdomen .....	.80	.542	1.085	.586	.66	.347	.998	.565
Antennae .....	.26	.06	.217	.054	.217	.054	.195	.043
Basal plate .....	.158	.115			.12	.10		
Paramer .....	.074	.026			.05	.018		
Mesosome .....	.077	.09			.095	.097		

Genus *Lunaceps* Clay & Meinertzhagen, 1939

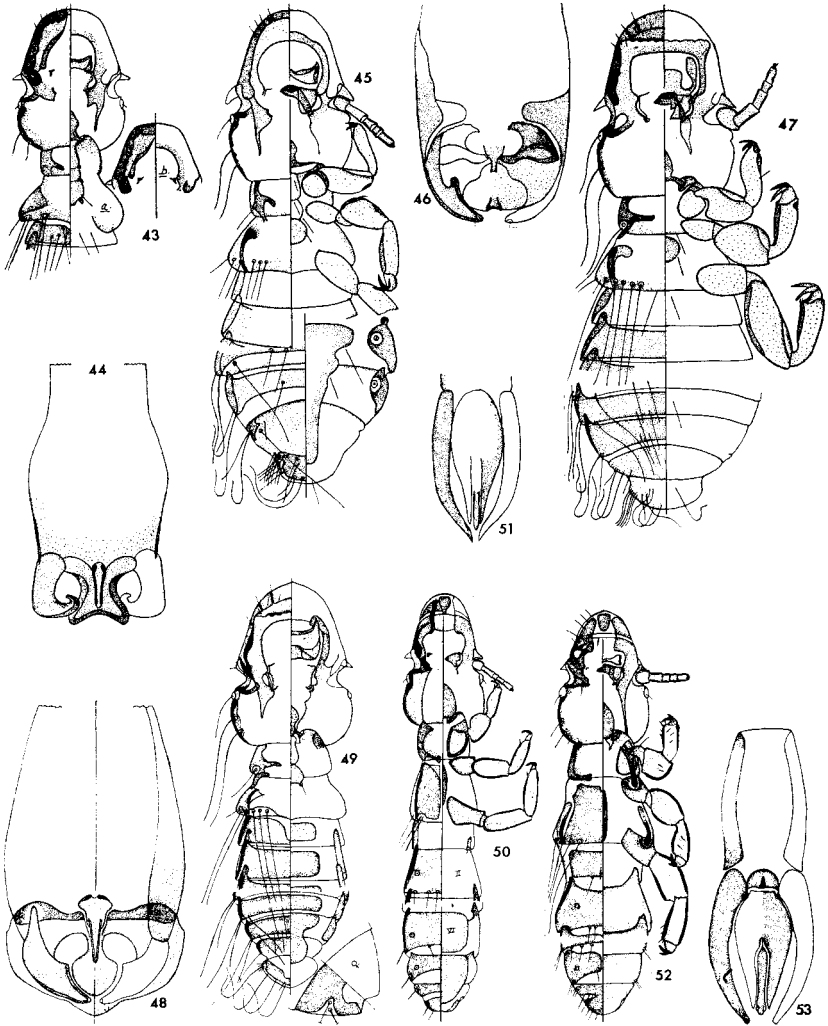
Genotype: *Docophorus actophilus* Kellogg & Chapman,

*Lunaceps pusillus*, n. sp.<sup>6</sup>

(Figures 50 and 51)

Type, male adult, from *Ereunetes pusillus* (Linné), collected by G. H. Lowery at Lawrence, Kansas, May 15, 1947 (in coll. L. S. U. M. Z.).

<sup>6</sup> Timmermann has recently described eleven new species of this genus, only one of which I possess (*drosti*), but with the exception of one host (*Ereunetes mauri*) all are Old World species or of genera very different from *Ereunetes*. I have not yet seen this paper. It is possible that the present species (*pusillus*) will closely resemble *cabanisi* Timmermann, from *E. mauri*. Measurements appear after the next species.



- Fig. 43a. *Degeeriella angusta* (Giebel) ♀ head, thorax, and abdominal segment I  
 Fig. 43b. *D. angusta* (Giebel) ♀, front of head  
 Fig. 44. *D. angusta* (Giebel) ♂, genitalia  
 Fig. 45. *Picicola praeposterus americana*, n. subsp. ♂, head, thorax, and portions of abdomen.  
 Fig. 46. *P. p. americana*, n. subsp. ♂, genitalia portions of abdomen  
 Fig. 47. *P. (Tyrrannicola) foedus* (Kell. and Chap.), ♂, head, thorax, and portions of abdomen  
 Fig. 48. *P. (Tyrrannicola) foedus* (Kell. and Chap.) ♂, genitalia  
 Fig. 49. *P. (Tyrrannicola) rubina*, n. sp. ♂, head, thorax, and parts of abdomen; tip of ♀ abdomen  
 Fig. 50. *Lunaceps pusillus*, n. sp. ♂, head, thorax, and portions of abdomen  
 Fig. 51. *L. pusillus*, n. sp. ♂, genitalia  
 Fig. 52. *L. wilsoni*, n. sp. ♂, head, thorax, and portions of abdomen  
 Fig. 53. *L. wilsoni*, n. sp. ♂, genitalia



DIAGNOSIS.—The head, thorax, and abdomen are narrower than in *actophilus*, the shape of the head being more nearly as in *phaopi* (Denny), but the pterothorax, as well as the abdomen, is much narrower, and the marginal carinae of the head and the thorax are quite different, as is also the anterior plate of the head; there are also differences in the male genitalia.

From *numenii* (Denny) it differs in more slender and differently shaped thorax and abdomen, more slender legs and decidedly different male genitalia and thoracic carinae.

*C. drosti* Timmermann is also quite different, more closely resembling the species *actophilus* in the shape of its head, and in other characters.

The male genitalia of the type are partially obscured by foreign matter (at basal portion of paramers and endomera), so that a complete figure was impossible to draw. The genitalia of the single male paratype are in much worse condition. This is unfortunate, since the genitalia are very important characters for separating these closely related species. No females were taken. The species is represented only by the male holotype and 1 male paratype.

*Lunaceps wilsoni*, n. sp.<sup>7</sup>

(Figures 52 and 53)

Type, male adult, from *Charadrius w. wilsoni* Ord, collected by D. S. Farner near Lawrence, Kansas, May 25, 1946 (in L. S. U. M. Z. coll.).

DIAGNOSIS.—This species seems to be closer to *actophilus* in shape of head and body segments. The head is, however, narrower in anterior portion, as well as more attenuated and longer in the portion anterior to the preantennal suture; it also lacks the prominent, deeply colored, narrow submarginal carina which in *actophilus* encircles the whole front of the head, anterior to the suture; there is a slight difference in the pattern of the preantennal carinae.

The thoracic carinae differ in shape, while the acetabular bars of the 2nd pair of coxae are entirely different, those of *wilsoni* being quite complicated and apparently unique (see figure).

The paramers are thicker apically and less curving and lack the strongly developed nodi on inner side at base to which the endomera is attached; the apical prongs of the endomera are twice as long in *wilsoni* as in *actophilus*, and the whole endomera is slightly shorter (.076 x .038 against .087 x .04). The species is represented by a single male, the holotype.

Genus *Brüelia* Keler, 1936

The genotype of *Brüelia* is *Nirmus brachythorax*, 1936, Giebel, from *Bombycilla garrulus*, and is of the same type as quite a large number of species found on the Thraupidae and Fringillidae of the Western Hemisphere, it seems to be nearest to *B. angustifrons* (Carriker) but has wider temples, while *cedrorum* (Piaget) is apparently very close to *infrequens* (Carriker) but has a wider frons and the sides of the preantennal portion of head are straight, not flatly convex. The species of this group are closely related and not easy to separate, but I doubt very much that exactly

<sup>7</sup> A single male from *Charadrius wilsoni beldingi*, collected on the Pacific coast of Colombia, S. A., is very close to *wilsoni*, as would be expected, but seems to be subspecifically distinct.

the same subspecies is found on any two host species. It seems advisable at this time, in connection with the description of new species of the genus to review some of the old species described from New World hosts and to publish new, enlarged figures of them. The species most commonly recorded from North American passerine birds is *B. vulgata* (Kell.), which the describer has listed from quite a number of hosts. This species will be considered first.

MEASUREMENTS OF THE TYPES OF *L. pusillus* AND *L. wilsoni*.

	<i>pusillus</i>		<i>wilsoni</i>	
	length	width	length	width
Body .....	1.52	.....	1.57	.....
Head (at clavi).....		.175	.....	.217
Head (at temples) .....	.36	.23	.37	.255
Prothorax .....	.13	.14	.13	.198
Pterothorax .....	.163	.187	.163	.282
Abdomen .....	.93	.24	.955	.303
Antennae .....	.14	.03	.14	.038
Basal plate .....	.084	.051	.115	.054
Paramers .....	.097	.056	.105	.07
Endomera .....	.077	.033	.076	.038

*Brüelia vulgata* (Kellogg), 1896  
(Figures 54 and 55)

*Nirmus vulgatus* Kellogg, Occ. Pap. California Acad. Sci. (2)6, p. 495, pl. 67, fig. 5. Eight hosts are given.

Kellogg did not designate any particular host as the type, and we cannot be certain which host furnished the specimens from which his description and figure were made and from which measurements were taken. The first host mentioned is *Carpodacus purpureus californicus*, which, accordingly may be accepted as the type host. Whether or not the material from the other hosts given by him is identical with the specimens from *Carpodacus* cannot be determined without actual examination of the material. I have not seen specimens from *Carpodacus purpureus* but have specimens from two species of finches (*Zonotrichia querula* and *Passerherbulus caudacutus*), which agree very closely with Kellogg's description and figure of *vulgatus*. One of the hosts given by Kellogg was *Zonotrichia coronata*.

There is considerable variation in head measurements of females from the same bird, for example females from *Zonotrichia querula* measure: .36 x .282; .40 x .305; and .38 x .303. Kellogg's measurements for the female head are .37 x .29. Females from *Passerherbulus* measure: body, 1.63 x .435 and 1.67 x .40; head, .37 x .29 and .39 x .303. Males of the above series are somewhat smaller than Kellogg's measurements: body, 1.31 x .36 and 1.28 x .37; head, .31 x .25 and .345 x .25, against Kellogg's 1.47 x .40 and .33 x .28, but here again we have much individual variation. It will be seen that in the above measurements a female from both *Zonotrichia* and *Passerherbulus* has exactly the same head measurements as given by Kellogg for the type

of *vulgata*, viz: .37 x .29, but males from both hosts have heads of slightly different proportions (.345 x .25 and .31 x .25 against .33 x .28).

The figures of *vulgata* here presented are specimens from *Passerherbulus caudacutus*. The genitalia of the male from *Zonotrichia querula* are exactly the same as those shown from *Passerherbulus*, except that they are slightly smaller in size, while those of *B. parabolocybe* (Carr.) are of the same type, but have shorter, narrower paramers and smaller endomera.

*B. vulgata* may be recognized by the shape of the head and thorax and the detailed structure of these parts. The frons is narrow, with the entrance to the buccal cavity extremely small and with a rounded, hyaline protuberance (see figure). The buccal canal expands laterally to a point halfway to the buccal cavity, then abruptly narrows to same width as at frons. The buccal cavity is extremely small, being almost filled by the well developed mandibles.

Kellogg says that there is no "signature," but there is present a very minute one, rounded and pointed anteriorly, not easily distinguishable; he also gives the pterothorax as having a "flatly rounding posterior margin," which is incorrect, it being angulated medially, as in all of the species of this group here treated, excepting *parabolocybe*, in which it is flatly convex.

The thoracic segments are small, but abdominal segment I is usually long (see figure). The shape of the head in *vulgata* is closest to that of *infrequens* (Carriker), excepting that it is considerably narrower at temples, clavi, and frons and the buccal cavity is much smaller and the canal narrower and of a different shape; there is a slight emargination of the lateral margin of the head at the anterior end of the preantennal carinae, which is quite noticable and characteristic of the species. The genital sternite is very similar in this whole group, but unfortunately the male genitalia are wanting in several species. In my specimens, which I have called *vulgata*, the abdominal tergites of the female are closer together medially than stated by Kellogg ("a rather broad, uncolored median line"), while in the male they are almost touching. Kellogg also states that there is but one seta at the posterolateral angles of the abdomen, but there are 2 setae in my specimens in segments III to VI, 3 in VII, 1 in II and none in I. There is a single seta set on posterior margin of tergites I to VI, just inside the head of the pleurites, quite small on I and increasing in length to VI.

I do not assume that the insect here described and figured is typical *vulgata*, since it has not been compared with Kellogg's type or with specimens from its supposed host (*Carpodacus purpurascens californicus*) but merely compared with Kellogg's description and figure. It certainly is conspecific, if not subspecifically the same.

*Brüelia infrequens* (Carriker), 1902  
(Figure 56)

*Nirmus infrequens* Carriker, Jour. New York Ent. Soc., V, 10, p. 220; pl. 20, fig. 5. Host: *Calcarius I. lapponicus*; type in coll. of M. A. C.).

DIAGNOSIS.—The head is perhaps nearest in shape and structure to that of *vulgata* (as given in this paper) but differs in being wider at temples, clavi, and frons; the preantennal carinae are wider, the anterior

plate much larger and crescent-shaped; the buccal canal is much shorter and almost uniform in width; and the buccal cavity is much larger.

In *vulgata* the clavi are minute, pointed and colorless (as stated by Kellogg) but plainly visible, as in *infrequens*, although very difficult to observe in this species. The prothorax is much wider in *infrequens* but of same shape (sides strongly convex); the pterothorax is also much wider, with sides straight (convex in *vulgata*); and the thoracic carinae also differ (see figure). There is practically no difference in the abdominal sclerites, but the abdomen is somewhat wider. Measurements follow the next species.

*Brüelia angustifrons* (Carriker), 1902  
(Figure 57)

*Nirmus angustifrons* Carriker, Jour. New York Ent. Soc., vol. 10, p. 221; pl. 21, fig. 2. Host: *Chondestes grammacus strigatus* Swainson, Bad Lands of Sioux Co., Nebraska.

DIAGNOSIS.—This species has a very long, narrow head, very long in the preantennal portion. It is about the same width as in *vulgata* at temples but narrower at clavi, and the sides of head (anterior to clavi) are very flatly convex. The frons is about equal in width to that of *infrequens*, but buccal canal is wider, slightly expanded medially, and longer than in either *vulgata* or *infrequens*. The dorsal preantennal carinae are just as in *vulgata*, but the inner, ventral carinae differ (see figure); the anterior plate is round, as in *vulgata*, but longer; the thoracic segments are very similar to those of *vulgata*, except that the sides of the pterothorax are slightly concave instead of convex and the posterior margin is bluntly pointed medially (not flatly convex as shown in the figure here given). The abdominal sclerites are very similar to those of *vulgata*, excepting the genital sternite, which differs from that of both *vulgata* and *infrequens* (see figure). No males were taken, but "numerous females." Type and paratypes are in collection of M. A. Carriker.

MEASUREMENTS OF FEMALE HOLOTYPE OF *B. infrequens* AND *B. angustifrons*.

	<i>infrequens</i>		<i>angustifrons</i>	
	length	width	length	width
Body .....	1.65	.....	1.66	.....
Head (at clavi) .....	.....	.275	.....	.24
Head (at temples) .....	.38	.33	.38	.277
Prothorax .....	.12	.205	.12	.184
Pterothorax .....	.174	.314	.163	.284
Abdomen .....	.92	.42	1.05	.39

*Brüelia parabologybe* (Carriker), 1903  
(Figure 58)

*Nirmus parabologybe* Carriker, Univ. Nebraska Stud. III, p. 137, pl. 2, fig. 3.  
Host: *Tyrannus melancholicus chloronotus*, Costa Rica (type in coll. of M. A. C.)

DIAGNOSIS.—This is a well-marked species easily distinguished from the three previous species by the shape of the head, which is very broad at

the frons, the whole frontal end being broadly rounded, with sides very slightly concave in front of the clavi. The preantennal carinae are wide, with inner margin corrugated and narrowly pitchy black, the outer portion pale brown; the marginal temporal carinae are narrow, submarginal, and pitchy; and the buccal canal is very wide, expanding posteriorly to the transverse, curving anterior plate. Prothorax wide, as in *infrequens*, but considerably longer; pterothorax long and narrow posteriorly, with convex sides and *flatly rounded* posterior margin; thoracic sternal plate narrow as in *vulgata*, but of almost uniform width. Abdomen rather similar in size and shape to that of *infrequens*, but the dorsal markings of the pleurites differ (see figure); segment VIII is wide and transverse, with IX very small; the genital plate is large, being slightly longer than in any of the three previous species, but with the shape of that of *vulgata*.

The genitalia of the male allotype are small, especially the paramers and the endomera, and cannot be clearly seen for drawing, the paramers being doubled back over the endomera, but they seem to be similar to those of *vulgata*. Measurements are given with those of following species.

*Brüelia straminea* (Denny), 1842  
(Figures 59 and 60)

*Nirmus stramineus* Denny, Mon. Anop. Brit., p. 53, 139; pl. 8, fig. 9. Host: *Dendrocopus major anglicus*.

This is the first record of the taking of *Brüelia* on any New World species of Picidae, although two species, *B. superciliosa* (Nit.) and the present one, are known from European woodpeckers.

A series of 5 males, 1 female and 3 nymphs were taken on *Melanerpes carolinus zebra*, collected by G. H. Lowery near Lawrence, Kansas, on October 27, 1946, and are in the collection of the Louisiana State University Museum of Zoology.

In my own collection is a single female sent me by Col. Emerson, collected in Oklahoma, from the same host. In the L. S. U. M. Z. collection are 2 females from *Sphyrapicus varius*, collected by R. Newman at Cerro Conejo, S. L. P., Mexico, which seem to be very close to the series from *Melanerpes*, but they are in no condition for identification. I, also, have a good series of *Brüelia* from *Melanerpes formicivora flavigula* and *Chrysoptilus a. atricollis*, the former close to *straminea* but the latter quite different, possibly somewhat like *superciliosa* (Nit.), considering the shape of the head.

There are very few discrepancies between Denny's description, as far as it goes, and these specimens, while the figure also agrees very well. He says: "vertex concave," but it is flatly convex in these specimens; he further says: "prothorax transverse, rotundate before and behind." The meaning of this phrase is not entirely clear to me, but at any rate the prothorax has convex sides, rounded anterior margin and transverse posterior margin. The "metathorax" is also wider than the head in my specimens and has a rounded posterior margin. Until actual comparison can be made with typical *straminea*, it seems best to identify these specimens as that species.

Referring to the species treated in this report, *B. straminea* resembles most strongly *parabolocybe* (Carr.), from which it differs in larger size and much paler coloration throughout; head wider at temples and clavi, and with temples less rounded; sides of preantennal portion of head more divergent and anterior portion less rounded; the preantennal carinae narrower but

otherwise similar; chaetotaxy of head the same; prothorax very similar, but pterothorax much wider and with sides straight instead of convex.

The abdominal sclerites are very similar to those of *parabolocyclebe*, but much paler in color, and the abdomen is more pointed posteriorly (see figure).

The male genitalia differ from those of all of the males treated in this paper. There is no unusual difference between the sexes, merely the usual sexual dimorphism of size and shape of apical segments of the abdomen.

MEASUREMENTS OF SPECIMENS OF *Brüelia straminea* AND *B. parabolocyclebe* (Carr.).

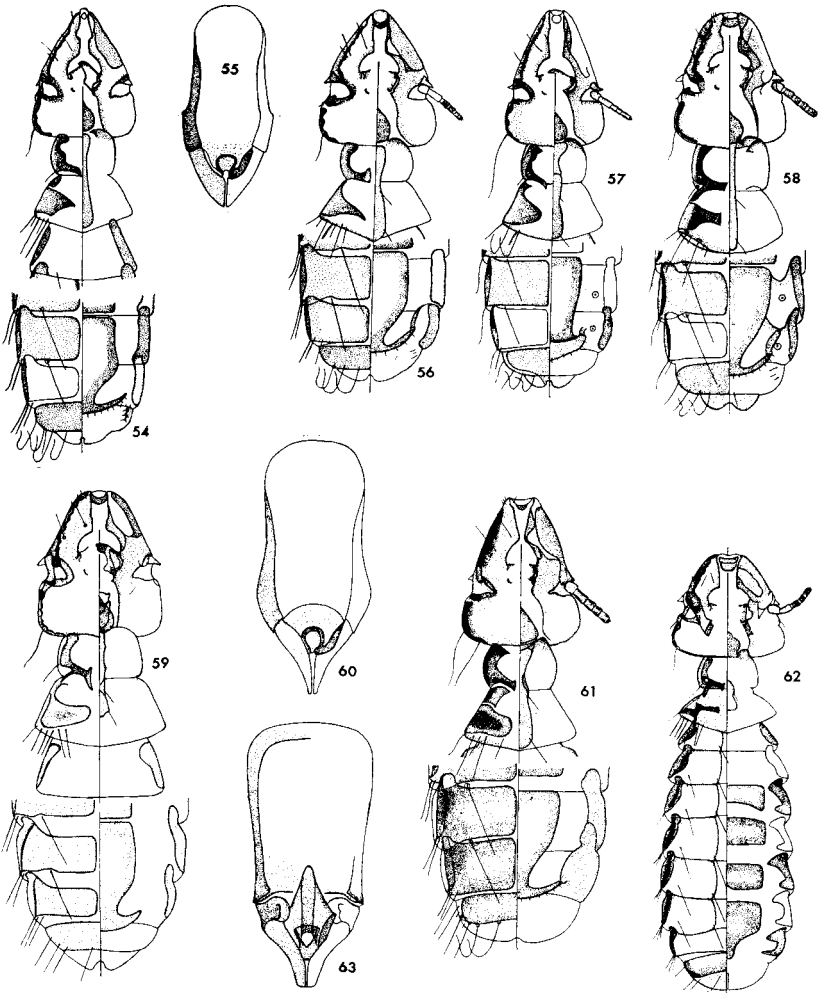
	<i>B. straminea</i>				<i>B. parabolocyclebe</i>			
	Male		Female		Male		Female	
	length	width	length	width	length	width	length	width
Body .....	1.46		1.84		1.38		1.73	
Head (at clavi) ....		.26		.282		.22		.25
Head (at temples) .35	.314		.41	.336	.326	.27	.393	.314
Prothorax .....	.108	.185	.13	.24	.12	.195	.15	.22
Pterothorax .....	.195	.303	.205	.37	.14	.255	.185	.293
Abdomen .....	.89	.412	1.21	.50	.835	.347	1.13	.423
Basal Plate .....	.13	.07			.13	.06		
Paramers .....	.043	.053			.026 (?)			
Endomera .....	.026	.04			.02	.03		

*Brüelia longifrons*, n. sp.  
(Figure 61)

Type, female adult, from *Parus atricapillus longicaudatus* Harris, collected by D. S. Farner, Douglas Co., Kansas, March 29, 1947 (in L. S. U. M. Z. coll.).

Dr. Kellogg has recorded *B. vulgata* from *Parus atricapillus*, but I suspect that what he had was the species described below, which, while resembling *vulgata* in some ways, differs very much in others. Unfortunately no male of *longifrons* was taken.

DIAGNOSIS.—A large species, the largest of the *vulgata* group, the female measuring 1.82 x .50. The head has a peculiar shape, the preantennal portion being very long, with flatly convex sides; the frons is of medium width and concave margin; the buccal canal narrows abruptly at posterior edge of the small, semilunar anterior plate, then gradually narrows to a very constricted opening into the long, narrow buccal cavity. No other species treated in the present report has a buccal canal approaching in shape that of the present species. The antennal sinus is V-shaped, with constricted inner end; the preantennal carinae are narrow, marginal, and pitchy black, but deeply shaded along inner side (see figure), the shading not uniform, but somewhat scalloped; the marginal temporal carinae are



- Fig. 54. *Brüelia vulgata* (Kell.) ♀, head, thorax, and portions of abdomen  
 Fig. 55. *B. vulgata* (Kell.) ♂, genitalia  
 Fig. 56. *B. infrequens* (Carr.) ♀, head, thorax, and apical segments of abdomen  
 Fig. 57. *B. angustifrons* (Carr.) ♀, head, thorax, and apical segments of abdomen  
 Fig. 58. *B. parabolocybe* (Carr.) ♀, head, thorax, and apical segments of abdomen  
 Fig. 59. *B. straminea* (Denny) ♀, head, thorax, and portions of abdominal segments  
 Fig. 60. *B. straminea* (Denny) ♂, genitalia  
 Fig. 61. *B. longifrons*, n. sp. ♀, head, thorax, and apical segments of abdomen  
 Fig. 62. *B. nitzschi moriona*, n. subsp. ♀, entire body  
 Fig. 63. *B. n. moriona*, n. subsp. ♂, genitalia

also pitchy black, and corrugated along inner edge, with adjacent area deeply shaded; the gular plate extends beyond occipital margin.

The pterothorax has straight sides, while the sides of the flatly pointed posterior margin are also straight; the thoracic carinae are also deeply colored and the thoracic sternite of distinct shape.

The abdomen is of the usual shape and structure of the *vulgata* group. The pleurites are narrow and of medium coloration, with a marginal hyaline border; the color of the pleurites becomes paler anteriorly, those of I and II being almost uncolored and III slightly colored. In fact almost the entire portion of segments I and II is without color, excepting a slight patch of brown on anterior portion of tergite adjoining the pleurite. Segments IV to VIII are of normal color, as shown in figure. The tergites are rather deeply colored contiguous to the paratergals, paler in median portion, and are more deeply colored than in most of the *vulgata* group. The genital sternite is typical of this group. The remaining sternites are of same density of color in V and IV, paler in III, and practically invisible in II and I. The chaetotaxy is characteristic of the group. The legs are unusually small, with much thickened femora and tibiae, the latter with expanded, rounded ends with one long straight claw and the other very minute; pitchy bands cross subapical portion of tibiae and various parts of femora.

The species is represented by a single specimen, the female holotype. Measurements appear with those of following species.

*Brüelia nitzschi moriona*, n. subsp.  
(Figures 62 and 63)

Types, male and female adults, from *Psilhorinus morio* (Wagler), collected by M. Newman at Xilitla, S. L. P., México, February 14, 1947 (in L. S. U. M. Z. coll.).

DIAGNOSIS.—Very similar to *B. nitzschi* Keler from *Cyanocorax cyanomelas*. The markings of the head, thorax and abdomen are exactly the same; the length of the female is the same (1.88), but head measurements differ (.49 x .45 against .442 x .454). The male measures (body) 1.49 against 1.47 for *nitzschi*; head, .445 x .44 against .405 x .417. The head in *moriona* is narrower at the clavi, with sides of preantennal area less convex, so that the whole head presents a somewhat triangular shape, with the three angles rounded, while in *nitzschi* the head has a more squarish appearance.

All of the segments of the legs are short and stout, largely hyaline, but with pitchy markings on both femora and tibiae; the 1st and 2nd segments of the antennae are hyaline, the last three deeply colored except for a narrow band across base.

Keler gives no data at all on the male genitalia, which in *moriona* are quite large for this genus, especially the paramers (see figure). The male is much smaller than the female, with a short, rounded abdomen (.85 x .58 against 1.20 x .54) and a protruding, rounded apical segment; the shape of head and thorax is the same, but smaller; the markings of the abdomen are also quite similar, though the genital sternite is slightly different in shape.

Comparison with other related species shows the following differences: the shape of the head is similar to that of *varia* (Burm.) from



*Corvus monedula*, but the markings are quite different; the abdominal markings are similar, but not the same; the head is much more pointed than in *multipunctata* (Clay) from *Nucifraga multipunctata*, while markings of both head and abdomen differ. It is also quite different from both *biocellata* (Piaget), *nigripicti* (Carriker) and *rotundata* (Osborn), all three from species of Corvidae.

Specimens from *Cyanocorax chrysops* (So. Bolivia) are extremely close to *nitzschi*, practically inseparable without the genitalia. Specimens from *C. violaceus* (E. Peru), while of the same type, have sides of pre-antennal area quite straight and frons narrow, with sides of temples less convex. Three males from *C. cyanus* (Venezuela) are also very close to *nitzschi*. A single male from *C. affinis* (Colombia) has the head the same shape as *moriona*, but small, as in *nitzschi*. A pair from *Xanthoura yncas* seems to be a distinct species. The new form is represented by female holotype, male allotype and 3 female paratypes, also 2 other females and a nymph from the type host.

MEASUREMENTS OF *B. longifrons* AND *B. nitzschi moriona*.

	<i>B. longifrons</i>		<i>B. n. moriona</i>	
	Female		Female	
	length	width	length	width
Body .....	1.82	.....	1.50	.....
Head (at clavi) ... ..	.26	.....	.358	.....
Head (at temples) .40	.33	.445	.445	.48
Prothorax .....	.14	.205	.163	.27
Pterothorax .....	.185	.31	.17	.445
Abdomen .....	1.18	.50	.855	.586
Antennae .....	.....	.....	.24	.045
Basal Plate .....	.....	.....	.18	.13
Paramers .....	.....	.....	.095	.105
Endomera .....	.....	.....	.10	.06

(To be continued)

REPORT ON A COLLECTION OF MALLOPHAGA,  
LARGELY MEXICAN (PART II)

M. A. CARRIKER, JR.

(Continued from p. 84, Vol. 39, No. 2)

*Brüelia saltatora*, n. sp.  
(Figures 64, 65 and 66a)

Types, male and female adults, from *Saltator coerulescens vigorsii* G. R. Gray, collected by R. Newman at Xilitla, S. L. P., México, January 22, 1947 (in L. S. U. M. Z. coll.).

DIAGNOSIS.—Resembles somewhat *B. eustigma* and *B. interposita* (Kell.), but is considerably smaller than the former (female: 1.71 x .51 against 1.84 x .62) and larger than the latter (female: 1.71 x .51 against 1.41 x .41). The head also differs in size and proportion (female: .458 x .456 against .42 x .45 (*eustigma*) and .31 x .34 (*interpositus*)). The postantennal portion of the head is quite quadrangular in shape, tapering sharply to the frons, while in both *eustigma* and *interpositus* the whole head is triangular in shape.

The type of *eustigma* supposedly came from *Trochilus anna* (California), which I doubt very much, inasmuch as in all of my collecting I have never taken *Brüelia* on a hummingbird. Very likely the true host is some species of Fringillidae. The host of *B. interpositus* is likewise open to doubt, supposedly being *Dendroica bryanti* (Panama), though in my large series of this genus there is not a single specimen taken on any species of warbler.

Unfortunately, all of the material of this new species is in very poor condition. Many details are not clearly visible, including the abdominal sclerites and the male genitalia. Consequently there may be some slight errors in the figures. The thoracic sternites (see figure) are clearly visible and are of a type not commonly seen. This chain of hyaline sclerites extends from the posterior portion of the pterothorax to the oesophageal sclerite of the head. On the sternal side of the temples are a series of three, connected curving lines (see figure) which are present in all of the specimens of both sexes and which I have not seen in other species of the genus. I have a single female of *Brüelia* from *Saltator atriceps* (Mexico), which is very similar to *saltatora* in general appearance, but the structure of the anterior portion of the head is quite different, and the temples are more convex, as well as the sides of the preantennal portion of the head.

*B. cedrorum* (Piaget) from *Bombycilla cedrorum* is also of the same type as *saltatora*, as well as several other species from Old World hosts, but apparently they all differ in various details. The new species is represented by the female holotype, male allotype and 2 male and 2 female paratypes. Measurements are given with following species.

*Brüelia melanococca abbasi*, n. subsp.  
(Figures 66b and 67)

Type, female adult, from *Thraupis abbas* (Lichtenstein), collected by R. Newman at Xilitla, S. L. P., México, January 27, 1947 (in L. S. U. M. Z. coll.).

(Reprinted from *The Florida Entomologist*  
Vol. 39, No. 3, September, 1956)

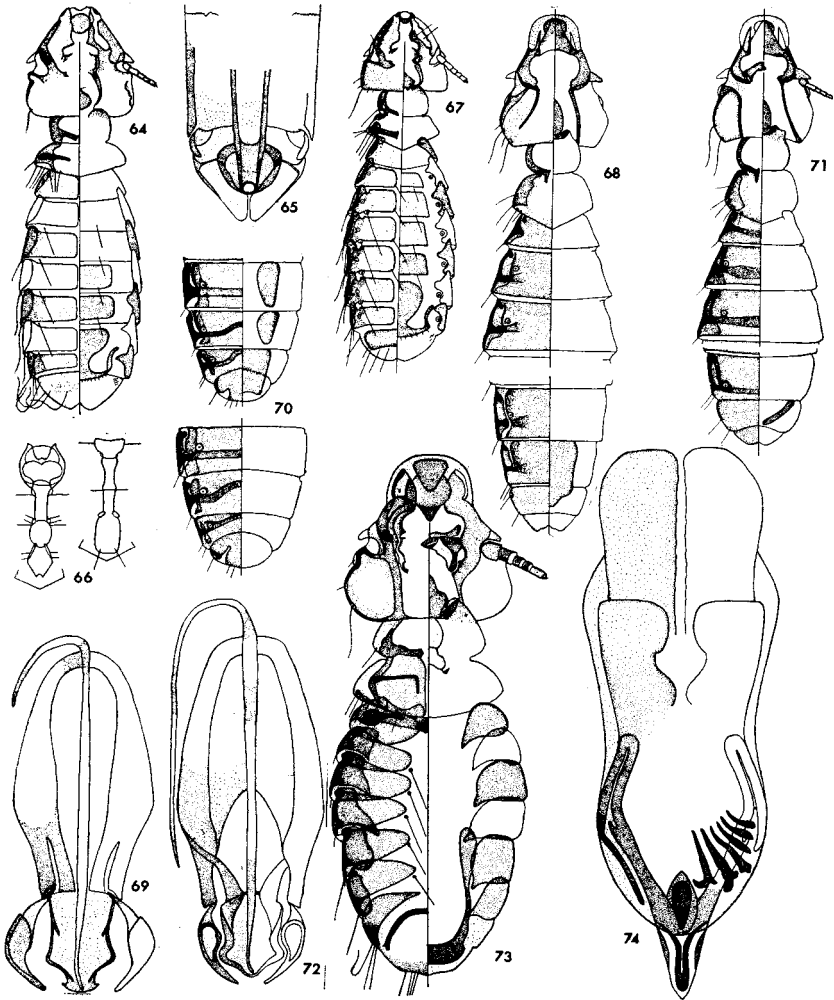
DIAGNOSIS.—This is one of a large group of very closely related forms parasitic on the Neotropical Thraupidae and some of the tanagerlike finches, such as *Saltator* (see *saltatora*). In my own collection there are specimens from seven genera of tanagers which are all undoubtedly conspecific with *melanococca* (Carriker), while some may not be even subspecifically distinct. *B. ptilogomys* (Carriker) also falls into this group, but it has a longer head than *melanococca*, longer than wide (female: .38 x .37 against .38 x .39).

*B. m. abbasi* differs from *melanococca* chiefly in the much smaller head (.337 x .358 against .38 x .39), shorter body and slightly wider abdomen (1.47 x .48 against 1.65 x .46). Unfortunately the type and only specimen of *melanococca* was accidentally lost several years ago when it was de-mounted for clearing, but the original description and figure are ample for its identification. The males are apparently very scarce, since there are only two in my series of this group, and there are none in the large series of *abbasi*. The genitalia of the two males examined (from different genera of hosts) are very similar, and very close to those of *saltatora*, n. sp.

*B. brasiliensis* (Giebel) from *Tanagra brasiliensis* undoubtedly belongs to this group and may possibly be conspecific with *melanococca*, but the description is insufficient to warrant a decision. I have specimens from *Tanagra vassori* which are very similar to *abbasi*. However, there are several statements in Giebel's description which do not agree with either *melanococca* or *abbasi*. He says: "the last three segments of the antennae equal in length, the prothorax with sides very slightly convex," while in the *melanococca* group we have the 3rd and 4th segments of antennae shortest and equal and the 5th longer, while the sides of the prothorax are decidedly convex. His description of the markings of head and body also disagrees, but the type and only specimen may have been immature.

The distinguishing characters of *melanococca* and its closely related allies are: head triangular, more or less as long as wide, with sides convex and occipital margin *transverse* and with temples decidedly angulated (see figure); frons narrow; the preantennal carinae are broken near anterior end; the anterior plate is very small and wider than long; the buccal cavity is very small, but the canal is quite wide.

The pterothorax is sharply angulated medially on posterior margin, is much wider than first abdominal segment, and has 5 rather long setae on each side in lateral portion. The abdomen is elongated oval (female), with dorsal portion of pleurites pitchy black and narrower than the sternal portion (see figure). The tergites are narrowly separated medially and are very faintly chitinized; the sternites are continuous medially but widely separated from the pleurites, are more deeply colored posteriorly, and are not visible in segment I, and are very faint in II; the genital sternite is characteristic and quite large, covering segments VI and VII and anterior portion of VIII, with posterior margin convex and sparsely set with short, fine setae (see figure). The legs (not shown in figure) are short and stout, with narrow, pitchy margins and fairly strong claws. The thoracic sternites are unique and seem to be a good character for separating the subspecies. This race of *melanococca* (*abbasi*) is represented by the female holotype and 8 female paratypes, also 1 nymph.



- Fig. 64. *Brüelia saltatora*, n. sp. ♀, entire body  
 Fig. 65. *B. saltatora*, n. sp. ♂, genitalia  
 Fig. 66a. *B. saltatora*, n. sp., thoracic sternites  
 Fig. 66b. *B. melanococca abbasi*, n. subsp., thoracic sternites  
 Fig. 67. *B. melanococca abbasi*, n. subsp. ♀, entire body  
 Fig. 68. *Carduceps eroliae*, n. sp. ♀, body complete, except median abdominal segments  
 Fig. 69. *C. eroliae*, n. sp. ♂, genitalia  
 Fig. 70a. *C. pusillus*, n. sp., apical segments of abdomen  
 Fig. 70b. *C. eroliae*, n. sp. ♂, apical segments of abdomen  
 Fig. 71. *C. pusillus*, n. sp. ♀, body, except median abdominal segments  
 Fig. 72. *C. pusillus*, n. sp. ♂, genitalia  
 Fig. 73. *Anatoecus autumnalis*, n. sp. ♂, entire body  
 Fig. 74. *A. autumnalis*, n. sp. ♂, genitalia

MEASUREMENTS OF THE MALE AND FEMALE TYPES OF *B. saltatora* AND FEMALE OF *B. m. abbasi*.

	<i>G. saltatora</i>				<i>B. m. abbasi</i>	
	Male		Female		Female	
	Length	Width	Length	Width	Length	Width
Body .....	1.33	.....	1.71	.....	1.49	.....
Head (at clavi) .....	.....	.326	.....	.37	.....	.31
Head (at temples) ....	.423	.434	.458	.456	.369	.375
Prothorax .....	.12	.24	.13	.26	.14	.217
Pterothorax .....	.155	.35	.152	.39	.155	.31
Abdomen .....	.716	.477	1.04	.51	.95	.456
Antennae .....	.195	.04	.20	.043	.152	.03
Basal plate .....	.19	.13				
Paramers .....	.06	.075				
Endomera .....	.08	.04				

*Brüelia biocellata nigropicta* (Carriker), 1901

*Nirmus biocellatus nigropicti* Carriker, Jour. New York Ent. Soc. 10, p. 219; pl. 21, fig. 1. Host: *Pica pica hudsonia*.

*Brüelia biocellata* (Piaget), 1880, Pediculines, p. 666, pl. 55, fig. 2. Host: *Pica leucoptera*, Hopkins & Clay, 1952, p. 54.

This subspecies of *biocellata* (Piaget) was reduced to a synonym of that species by Hopkins and Clay in the 1952 Checklist of Mallophaga.

It is true that in appearance the two insects are very similar, with strikingly unusual body markings, but apparently the measurements were not taken into consideration when the race was reduced to synonymy.

Piaget did not see the female, his description, figure and measurements having been taken from the male. On size alone the two forms are clearly separable, and possibly the male genitalia will show differences. I have not seen specimens of *biocellata*.

MEASUREMENTS OF MALES OF *biocellata* AND *nigropicta*.

	<i>biocellata</i>		<i>nigropicta</i>	
	Length	Width	Length	Width
Body .....	1.50	....	1.93	....
Head .....	.46	.47	.542	.526
Thorax .....	.32	.38	.303	.51
Abdomen .....	.83	.61	1.17	.75

The above measurements of *biocellata* are taken from Piaget, while those of *nigropicta* are made from the type. It may also be noted that the head is wider than long in *biocellata* and that the pterothorax in *nigropicti* is almost as wide as head, but much narrower in *biocellata*; the abdomen is very much longer and wider in *nigropicti*.

Two females of this species were taken on *Pica pica hudsonia* (Sabine),

collected by D. S. Farner at Hamilton, Montana, July, 1945, and are in the collection of the Louisiana State University Museum of Zoology.

Genus *Carduiceps* Clay & Meinertzhagen, 1939

Until quite recently little has been published concerning this genus. In October, 1953, Col. Emerson<sup>8</sup> described a new species, *C. lapponicus*, from a European host (*Limosa l. lapponica*), and gave figures of the genitalia of three other known species (*complexivus*, *cingulatus*, and *scalaris*).

In January, 1954, Mr. Timmermann published a review of the genus,<sup>9</sup> but apparently had not seen Col. Emerson's paper of the previous October, since no mention is made of *C. lapponicus*. Both authors agree that the species of the genus are very uniform in appearance, with differences between them small, and that the male genitalia are the best character for distinguishing the different species.

The type of the genus is *C. complexivus* (Kell. and Chap.) whose host is *Crocethia alba*. Timmermann would make *complexivus* a synonym of *C. zonaris* (Nit.), from *Erolia minuta*. He also places populations from *Erolia temmincki*, *E. minutilla*, *E. testacea*, *Calidris canutus*, *Ereunetes mauri*, and *E. pusillus* all under *C. zonaris* (Nit.) but says the "different populations are not absolutely identical."

In addition to the two species of the genus described below, I have specimens in my own collection from the following hosts: *Crocethia alba*, *Calidris canutus rufus*, *Arenaria interpres*, *Micropalama himantopus*, *Charadrius semipalmatus*, *Erolia melanotos*, *E. minutilla*, and *E. alpina sakhalina*. I have not made a minute study of the above series, but a casual examination shows that there are many small differences between the specimens from the different hosts in detail of head structure, proportionate size of various portions of body, marking of the abdomen, and the male genitalia. Apparently some will be found to be conspecific with others, but I would not care to say that there are any two which could not be easily separated subspecifically.

Timmermann states that the differences between *C. complexivus* (Kell. & Chap.) and *C. zonarius* (Nit.) are very small, yet admits that the difference in shape of the endomera are sufficient for subspecific distinction, "if one wished to preserve that name [*complexivus*]." Personally, I am very much in favor of preserving the name *complexivus*, especially since it represents the genotype of *Carduiceps*, even if it should have to be reduced to a subspecies of *zonaris* (Nit.).

To the list of shore birds given by Timmermann, from which *Carduiceps* has been recorded, I can add *Charadrius semipalmata* and *Arenaria interpres*, and confirm its presence on *Micropalama* (1 female).

*Carduiceps eroliae*, n. sp.  
(Figures 68, 69 and 70b)

Types, male and female adults, from *Erolia fuscicollis* (Vieillot), collected by D. S. Farner at Lawrence, Kansas, May 21, 1947 (type in L. S. U. M. Z. coll.).

<sup>8</sup> Proc. Ent. Soc. Wash. 55(5): 209.

<sup>9</sup> Ann. Magazine of Nat. History, Ser. 12, VII: 40.

DIAGNOSIS.—Differs from *D. complexivus* in shape of thoracic segments, in carinae of the tergites, and in the male genitalia.

The head measurements are the same as in *complexivus*; the prothorax has the sides more rounded and is slightly narrower (female, .153 against .18); the pterothorax is narrower (female, .225 against .29); the abdomen measures 1.09 x .37 against 1.01 x .41.

In the female the dark-colored transverse bands across the tergites are practically absent, there being merely a slight indication of their presence at each side of abdomen (see figure), while in *complexivus* they are of uniform width and density across the abdomen in both sexes and on all segments. In the male of *eroliae* these tergal bands are present but differ in shape from those of the male of *complexivus*. In segment VII this band is practically as in *complexivus*, but in VI it curves strongly forward in median portion (see figure), while in *complexivus* it is transverse. In the remaining segments (I - V) the bands are transverse in both species, but considerably narrower in *eroliae*, where they are of uniform width across the segment, instead of wider in median portion of abdomen, as in *complexivus*.

The male genitalia differ in several details. The basal plate is shorter but of same width (.158 x .09 against .22 x .087). The attachment of the endomera is distinct, the lateral carinae of the basal plate dividing at some distance from the posterior end of the plate, the inner branch forming the attachments for the endomera, the outer for the paramers. In *complexivus* the attachment is very similar to that of *pusillus* (n. sp. described below).

The paramers are of slightly different shape, with decidedly different marginal carinae.

The endomera is slightly shorter and narrower than in *complexivus* (.071 x 0.46 against .08 x .05), while the marginal carinae are very much narrower and of entirely different shape, especially towards the base, where they widen strongly in *complexivus*; the tip of the endomera is wider in *eroliae*, with slightly more prominent lateral hooks; the seminal duct is shorter, with lesser amount extending beyond the basal plate.

The species is represented by the male holotype, female allotype and 1 male and 3 female paratypes.

#### MEASUREMENTS OF THE TYPES OF *Carduceps eroliae*

	Male		Female	
	Length	Width	Length	Width
Body .....	1.39	.....	1.65	.....
Head .....	.33	.27	.37	.295
Prothorax .....	.11	.152	.12	.153
Pterothorax .....	.15	.206	.163	.225
Abdomen .....	.87	.38	1.095	.37
Antennae .....	.105	.....	.108	.....
Basal plate .....	.158	.09		
Paramers .....	.076	.02		
Endomera .....	.071	.046		

*Cardiuceps pusillus*, n. sp.

(Figures 70a, 71 and 72)

Types, male and female adults, from *Ereunetes pusillus* (Linné), collected by G. H. Lowery at Lawrence, Kansas, May 15, 1947 (in L. S. U. M. Z coll.).

DIAGNOSIS.—Very close to *eroliae* in measurements, differing as follows: length (male) 1.35 against 1.39; (female) 1.59 against 1.65; pterothorax (male) .13 x .195 against .15 x .206, (female) .152 x .205 against .163 x .225; abdomen (male) .835 x .305 against .87 x .38, (female) 1.04 x .37 against 1.095 x .37. Paramers longer and narrower (.081 x .015 against .076 x .02); endomera narrower (.073 x .036 against .076 x .046).

In the head both dorsal and ventral occipital carinae differ in positions and shape from those of both *eroliae* and *complexivus* (see figures), in which these structures are much alike. The sides of the pterothorax are less convex and the posterolateral angles more rounded, thus resembling *complexivus*. The dark bands across the tergites are continuous in both sexes, as in *complexivus*, but the shape of band in segment VII of the male is different, the median portion being bent sharply forward and more rounded than in VI (see figures); the incassations in lateral portion of tergites are also quite different, more so in the female than in the male (see figures).

The male genitalia differ strongly from those of both *complexivus* and *eroliae*. The paramers are more uniformly circular, with marginal carinae different from those of *eroliae* (more as in *complexivus*), while the endomera is very different from both, being shorter and wider and of entirely different shape and manner of attachment (see figure), the style of attachment being similar to that of *complexivus*; the seminal duct is very much longer than the duct in either of the above species.

Unfortunately all of the material of these two species was in a rather poor condition for study, many characters being invisible, especially details of the head.

This species is represented by the male holotype, female allotype, 3 male and 5 female paratypes.

MEASUREMENTS OF THE TYPES OF *Cardiuceps pusillus*.

	Male		Female	
	Length	Width	Length	Width
Body .....	1.35	.....	1.59	.....
Head .....	.33	.268	.35	.28
Prothorax .....	.108	.14	.12	.152
Pterothorax .....	.13	.195	.152	.205
Abdomen .....	.835	.305	1.04	.37
Antennae .....	.108	.....	.12	.....
Basal plate .....	.14	.07		
Paramer .....	.081	.015		
Endomera .....	.073	.036		



*Anatoecus autumnalis*, n. sp.<sup>10</sup>

(Figures 73, 74 and 75)

Types, male and female adults, from *Dendrocygna a. autumnalis* (Linné), collected by C. Shaw at Tamuín, San Luis Potosí, México, September 19, 1946 (in L. S. U. M. Z. coll.).

This is the first record for the genus *Anatoecus* from any species of *Dendrocygna*. In my own collection there is a female from *D. b. bicolor* and 2 females from *D. autumnalis discolor*. The first is undoubtedly specifically distinct from the present species, *autumnalis*, while the latter is probably merely a subspecies of it. Without the males it is not possible to describe these forms intelligently.

The present species has been compared with five known species of the genus and material (unstudied) from ten species of New World ducks and may be easily separated from all of them by just one character, the series of 12 heavily chitinized bars lying on top of the posterior portion of the rounded part of the male genitalia (see figure). There is one slightly immature male of the series which lacks the bars on the genitalia, but in all the others they are strongly developed.

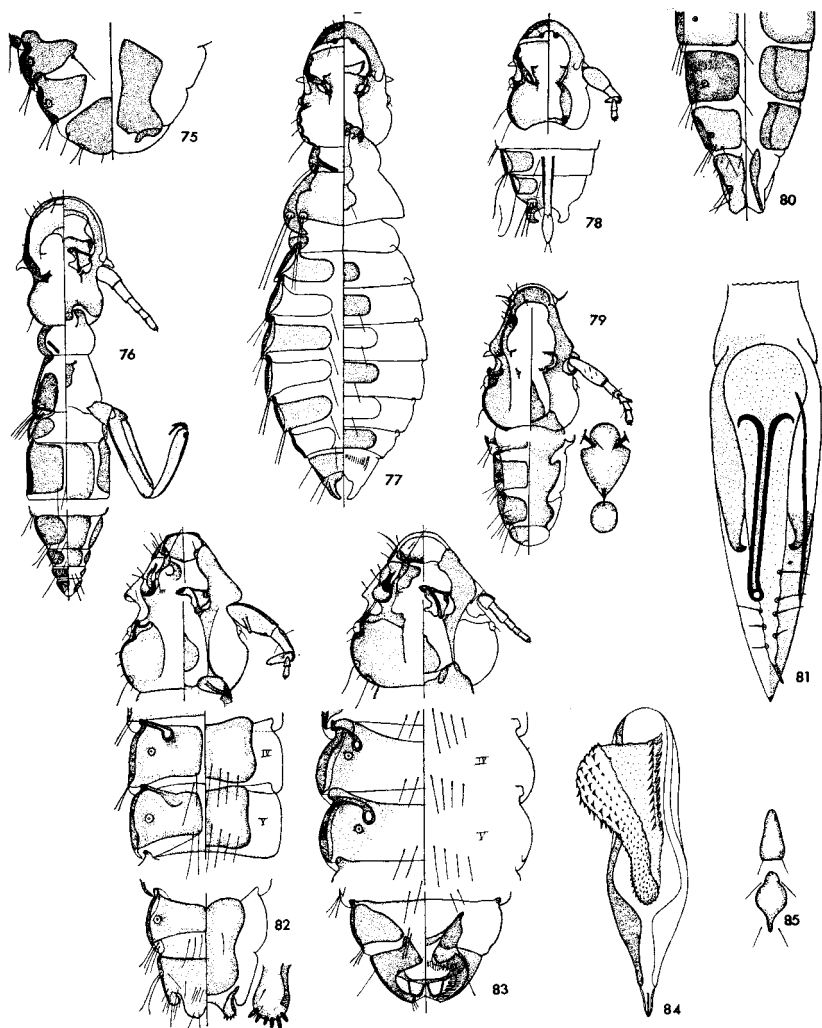
The head measurements are decidedly different, also, from those of *monteiroi* Guimãraes & Barrios Netto. The male of *autumnalis* has head measurements of .467 x .445 against .45 x .42 for *monteiroi*, while the anterior portion of head (surrounded by the hyaline margin) measures .14 x .28 in *autumnalis* against .19 x .23.

The species is represented by the male holotype and female allotype and 6 male and 14 female paratypes.

MEASUREMENTS OF THE TYPES OF *Anatoecus autumnalis*.

	Male		Female	
	Length	Width	Length	Width
Body .....	1.43	.....	1.53	.....
Head .....	.467	.445	.52	.49
Prothorax .....	.15	.303	.163	.326
Pterothorax .....	.175	.412	.175	.43
Abdomen .....	.76	.55	.79	.61
Antennae .....	.185	.045	.163	.043
Male genitalia .....	.575	.174		

<sup>10</sup> Clay and Hopkins go into considerable detail with *Anatoecus dentatus* (Scopoli) on pages 16 and 17 of *Early Literature on Mallophaga*, where a large figure of the male genitalia is given. In this figure are shown the 12 bars within the genitalia, more or less as in *A. autumnalis*, but of different shape. I have two males of *dentatus* from the type host, and there is no sign of these bars within the genitalia. I have examined males of 7 species of American ducks in which no bars are present, but they are present in specimens of *A. obtusus* (Giebel), from *Somateria m. mollissima*. Apparently this character needs further careful investigation.



- Fig. 75. *A. natoecus autumnnalis*, n. sp. ♀, apical segments of abdomen  
 Fig. 76. *Lipeurus bakeri*, n. sp. ♀ im., head, thorax, and portions of abdominal segments  
 Fig. 77. *Oxylipeurus (Epicolinus) abdominalis*, n. sp. ♀, entire body  
 Fig. 78. *O. (E.) abdominalis*, n. sp. ♂, head and apical segments of abdomen  
 Fig. 79. *Anaticola dafilensis*, n. sp. ♂, head, apical segments of abdomen, and thoracic sternites  
 Fig. 80. *A. dafilensis*, n. sp. ♀, apical segments of abdomen  
 Fig. 81. *A. dafilensis*, n. sp. ♂, genitalia  
 Fig. 82. *Pectinopygus (Epipelicanus) canadensis*, n. sp. ♂, head and portions of abdominal segments  
 Fig. 83. *P. (E.) canadensis*, n. sp. ♀, head and portions of abdomen  
 Fig. 84. *P. (E.) canadensis*, n. sp. ♂, genitalia  
 Fig. 85. *P. (E.) canadensis*, n. sp. ♀, thoracic sternites

*Lipeurus bakeri*, n. sp.

(Figure 76)

Type, female immature, from *Meleagris gallopavo intermedius* Sennett, collected by Rollin Baker, Kenedy Co., Texas, December, 1941 (in L. S. U. M. Z. coll.).

At the present time there is no species of the genus *Lipeurus* recognized as a parasite of the turkey, either domestic or wild. Hopkins and Clay (*Early Literature of Mallophaga*, Part I, p. 261) contend that *Pediculus meleagridis* Linné refers to the common *Chelopistes* parasitic on the turkey and is not a *Lipeurus* as given by some authors. Harrison restored Linné's name to the species in 1916. Undoubtedly this decision is correct, since it would not be possible to confuse *Chelopistes* with *Lipeurus* or *Oxylipeurus*, and furthermore, *Chelopistes* is the common mallophagan parasite of the turkey, and the one most likely to have been seen by Linné.

DIAGNOSIS.—The present species is clearly a *Lipeurus*. The type, an immature female, cannot be confused with either *Oxylipeurus corpulentus* or *O. polytrapezius*, both parasitic on the turkey. The shape of the head and its internal carinae is that of *Lipeurus*, as well as the apical segments of the abdomen, which are entirely different from these segments in immature specimens of *Oxylipeurus* and may be almost duplicated in the pre-adult instar of *Lipeurus numidae* (Denny).

The head is much wider at the base of the clavi than at the temples; there are no papillae on the inner margin of the marginal carina of the frons, as in *Oxylipeurus*; the structure of the posterior portion of the head is very unusual, possibly unique; the gular plate resembles somewhat that of *L. maculosus* Clay. The abdomen is almost parallel-sided and instead of having 8 segments, as in the adult female, has 10, with the 6th spiracle in segment VII, so that VIII, IX and X are combined into a single segment (VIII) in the adult. Just what the structure of this segment resembles is problematical.

In segment VIII the tergites are divided medially, as in the anterior segments, but in IX and X the tergite covers the entire segment, excepting a small portion of the tip of X. Unquestionably the type of this species and the single female paratype, of identical appearance, represent the pre-adult instar of a previously undescribed species of *Lipeurus*. They possess no characters suggesting that they might be immature specimens of either *Oxylipeurus polytrapezius* or *corpulentus*, although 7 females of *O. corpulentus* and 12 specimens of *Chelopistes meleagridis* were collected on the

MEASUREMENTS OF THE FEMALE HOLOTYPE OF *Lipeurus bakeri*.

	Length	Width
Body .....	2.26	.....
Head .....	.55	.37
Prothorax .....	.20	.25
Pterothorax .....	.26	.303
Abdomen .....	1.40	.35
Antennae .....	.37	.12

same individual host with them. Unfortunately no adults and no males of the new species were taken.

The fact that these two lice were collected from a wild bird and not a domestic turkey precludes all possibility of their acquisition from some domestic fowl. It is greatly to be desired that adult specimens of both sexes of this interesting louse be secured.

*Oxylipeurus (Epicolinus)*<sup>11</sup> *abdominalis*, n. sp.

(Figures 77 and 78)

Types, male and female adults, from *Dendrortyx barbatus* Gould, collected by R. Newman at Xilitla, S. L. P., México, June 12, 1947 (in L. S. U. M. Z. coll.).

DIAGNOSIS.—This species is typical of the subgenus *Epicolinus* Carriker, as would be expected from the close affinity of its host with the genus *Colinus*. However, it differs considerably from all of the other known species of that genus in having a shorter head and much wider abdomen in both sexes, as well as a shorter and wider pterothorax.

The tip of the abdomen in both sexes resembles somewhat those of *E. ovaticephalus*, but it lacks the conspicuous sexual dimorphism of the abdomen found in that species, both sexes having a rather short abdomen of the same shape, wider even than in the female of *ovaticephalus*.

The male genitalia are typical of the genus, the genitalia themselves being very minute, lying normally far back inside the sheath. There are two rather strong setae set on the upper side of the tip of the genital sheath, a character not hitherto seen in this group. The species is represented by the female holotype, male allotype and 2 male and 4 female paratypes.

MEASUREMENTS OF THE TYPES OF *Oxylipeurus abdominalis*.

	Male		Female	
	Length	Width	Length	Width
Body .....	1.87	.....	2.03	.....
Head (at clavi) .....	.....	.326	.....	.37
Head (at temples) .....	.50	.37	.564	.44
Prothorax .....	.217	.30	.205	.326
Pterothroax .....	.25	.49	.27	.53
Abdomen .....	.93	.51	1.19	.71
Antennae .....	.27	.078	.27	.043
Male genitalia .....	.36	.043		

<sup>11</sup> The genus *Epicolinus* Carriker was described in 1945, the genotype being *Lipeurus clavatus* McGregor, from *Colinus virginianus texensis* (Rev. Brasil. Biol. 5, 104). It was reduced to a subgenus of *Oxylipeurus* by Hopkins and Clay in the 1952 *Checklist of Mallophaga*. With all due respect to the authors of the *Checklist*, I do not think that it is congeneric with *Oxylipeurus*.

*Anaticola dafilensis*, n. sp.

(Figures 79, 80 and 81)

Types, male and female adults, from *Dafla acuta* (Linné), collected by M. A. C. at Lincoln, Nebraska, February 28, 1901 (in coll. of M. A. C.).

I have compared this series of 4 males and 9 females from *Dafla acuta* with authentic specimens of *A. crassicornis*, *A. cairinensis*, *A. mergiserrati*, *A. lepidotus*, *A. depuratus* and *A. rubro-maculatus*, and they differ in greater or less degree from all of them.

DIAGNOSIS.—Resembles more closely *crassicornis* in shape of head, but differs in various details. The penis is longer than in *crassicornis* and shorter than in *mergiserrati* (.195 against .152 and .22). Three males of *crassicornis* measure .152, .152, and .14, while the measurements for *mergiserrati* given by Clay and Hopkins are (1).20, (6).22, (3).23.

*A. dafilensis* also differs from *crassicornis* in the shape of the thoracic sternal plate. I have 2 females of *mergiserrati* from the type host, which differ strongly from *dafilensis*, as well as from my specimens of *crassicornis*, the abdomen being long and slender, sharply constricted at junction of segments II and III, and with apical segments tapering to a slender point, without trace of bifurcation; the large thoracic sternite is elongated oval, without lateral wings, and with bluntly pointed anterior end, but the small posterior sternite is rounded, as in *dafilensis*.

The color pattern of the tergites is different, as well as the shape of the genital sternite.

The present species differs from *cairinensis* in shape of head, cephalic carinae, abdominal markings, male genitalia and thoracic sternal plates. From *depuratus* it differs in the shape of the head, the front in that species being very narrow, tapering uniformly from eyes to frons; cephalic carinae also differ. *A. lepidotus* (from *Aix sponsa*) is very different, with a very narrow frons, narrower, even, than in *depuratus*; the cephalic carinae differ strongly as well as the thoracic sternite and abdominal tergites. *A. rubro-maculatus* is also quite different, the abdomen in the male being

MEASUREMENTS OF THE TYPE OF *Anaticola dafilensis*.

	Male		Female	
	Length	Width	Length	Width
Body .....	2.78	.....	3.56	.....
Head (at clavi) .....	.....	.324	.....	.39
Head (at temples) .....	.65	.38	.695	.46
Head (at frons) .....	.....	.185	.....	.19
Prothorax .....	.238	.314	.27	.347
Pterothorax .....	.465	.456	.50	.50
Abdomen .....	1.595	.42	2.28	.673
Antennae .....	.36	.07	.27	.046
Basal plate .....	.56	.11		
Paramers .....	.174	.10		
Penis .....	.195	.075		

short and strongly expanded posteriorly and constricted at I and II; the prothorax is as wide as pterothorax; and the head is short and wide, with preantennal portion narrowing and more tapering in the female.

From *constrictus* (Kellogg) it differs in being longer and narrower in the abdomen (male: 2.78 x .42 against 2.31 x .50); the head is longer and narrower (male: .65 x .38 against .53 x .41). In females the differences in measurements are greater. In *dafilensis* there are four fine, pustulated setae on each side of the canal posterior to the tips of the paramers, which I have not seen in other species and which are difficult to see and may be easily overlooked. The type series consists of the male holotype, female allotype, 2 male and 8 female paratypes. In addition, there is one male from the type host collected by R. Newman at Tamuín, S. L. P., México, November 17, 1946. This single male agrees in all respects with the holotype, and is in the Louisiana State University Museum of Zoology collection.

*Pectinopygus (Epipelicanus) canadensis*, n. sp.

(Figures 82 - 85)

Types, male and female adults, from *Pelecanus erythrorhynchos* Gmelin, collected by C. Shaw at Ajinche, S. L. P., México, November 10, 1946 (in L. S. U. M. Z. coll.).

DIAGNOSIS.—Of the same general type as the various species of this genus found on the pelicans, but most closely related to *P. occidentalis* Thompson, from *Pelecanus o. occidentalis* (type from Kingston, Jamaica).

When Thompson described *occidentalis*<sup>12</sup> he had not seen specimens from *P. erythrorhynchos* but was correct in assuming that they would also prove to be a new species.

I have compared a series of 5 males and 3 females of *canadensis* with 2 males and 3 females of *occidentalis* Thompson (from the type host) and with 4 males of *forficulatus* (Nit.), also from the type host, and find them to be different in many small characters. Thompson has published excellent figures of *occidentalis*, which may be compared with those here given for *canadensis*.

*P. canadensis* differs from *occidentalis* as follows: there is but a very faint indication of striations in the anterior portion of the anterior plate (well marked in *occidentalis*); the premarginal carinae differ decidedly in shape and chitinization; the gular plate is smaller; the thoracic sternites are quite different in shape (see figures); the abdominal tergites and sternites are also differently shaped, the former less widely separated medially; the male genitalia differ in shape of basal plate and paramers; the apical abdominal segments differ slightly in both sexes. In *canadensis* the male is larger (2.95 x .62 against 2.70 x .59) as is the female (3.12 x .93 against 2.80 x 1.00).

The species is represented by the male holotype, female allotype, 1 male paratype, also 3 males and 2 females from the type host, collected by J. C. Crawford, Jr., at Lincoln, Nebraska, November 30, 1900, the latter in the collection of M. A. C.

<sup>12</sup> Ann. & Mag. Nat. Hist. (II), 14, p. 318, figs. 1 - 9.

MEASUREMENTS OF THE TYPES OF *Pectinopygus canadensis*.

	Male		Female	
	Length	Width	Length	Width
Body .....	2.95	.....	3.12	.....
Head .....	.65	.54	.65	.635
Prothorax .....	.27	.456	.27	.50
Pterothorax .....	.347	.49	.38	.564
Abdomen .....	1.85	.62	1.95	.93
Antennae .....	.43	.108	.27	.054
Basal plate .....	.56	.175		
Paramers .....	.06	.033		