The Genus *Psittacobrosus* (Mallophaga: Menoponidae) of the Neotropical Psittaciformes[1]

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ABSTRACT

Descriptions and keys are given for the known species. The 11 new species and their type-hosts are: ***hyacinthini*** from *Anodorhynchus hyacinthinus*, ***rubrogenysi*** from *Ara rubrogenys*, ***mitratae*** from *Aratinga mitrata*, ***farinosae*** from *Amazona farinosa*, ***chloropterae*** from *Ara chloroptera*, ***carrikeri*** from *Ara militaris*, ***brotogerisi*** from *Brotogeris jugularis*, ***pyrrhurae*** from *Pyrrhura picta*, ***molinae*** from *Pyrrhura molinae*, ***patagoni*** from *Cyanoliseus patagonus*, and ***aratingae*** from *Aratinga aurea*. There are 2 new synonymies: *P. genitalis* Carriker (= *Psittacobrosus nobilis* Carriker) and *P. forpi* Carriker (= *Colpocephalum burhinoides* Carriker).

The menoponid genus *Psittacobrosus* Carriker, 1954, represents 1 of 6 genera of comb-bearing lice of the large *Colpocephalum*-complex known to occur on parrots (Psittaciformes). Price and Beer (1966) briefly discussed the problems associated with generic recognition within this group of parrot lice and presented a tentative key to these 6 genera. It is the purpose of this paper to give the results of our study of the available specimens of *Psittacobrosus*.

We thank the following for providing specimens for study and for otherwise assisting in this review: Dr. Theresa Clay, British Museum (Natural History); Dr. K. C. Emerson, Arlington, Virginia; and the late Mr. M. A. Carriker, Jr., whose extensive collection of *Psittacobrosus* was made available to us through the courtesy of the United States National Museum.

In the following descriptions, the value in parentheses following a statement of range is the mean. All measurements are in millimeters. Unless stated to the contrary, reference to tergites, pleura, or sternites pertains to the abdomen, and descriptive details and illustrations are based on specimens from the type-host. The postspiracular setae, even though they may be recessed from the margin, are included in the marginal tergal setal counts. Anterior tergal setae on III–VIII refer only to those mediad from the spiracles, on I–II to those in an estimated comparable area. Sternal setae on III include only those between the comb rows. The nomenclature of the psittaciform hosts follows that of Peters (1937).

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Genus *Psittacobrosus* Carriker, 1954

Psittacobrosus Carriker, 1954: 150. Type-species: *Psittacobrosus kelloggi* Carriker (= *P. burmeisteri kelloggi* Carriker).

The known members of this genus may be characterized as follows.

Head: Wider than long, with moderately expanded temples. With narrow, shallow preocular slit. Preocular nodus medium, occipital nodus small to essentially absent, interconnected at most only by narrow occipital carina. Four minute to short middorsal head setae. Both pairs of occipital setae usually minute to short. One short to medium postocular seta on each side. Each temple margin with 3 very long setae. No ventral spinous head processes. Terminal antennal segment undivided, typically projecting beyond head margin, and varying from about as long to longer than wide. Gular plate weakly developed, posteriorly rounded, usually with 4 + 4 setae, but less often with 3 or 5 on a side. Sitophore sclerite of hypopharynx of generalized type for *Colpocephalum* s. str. (Price and Beer 1966: Fig. 5). Usually only 2 longer setae preceding subocular comb row.

Thorax: Pronotum marginally with 15–19 setae (typically 16–17), of variable lengths; dorsal setae short to minute. Poorly developed prosternal plate, with or without longer setae in addition to usual median minute pair. Metanotum, with 1 known exception, with only 2–3 pairs of minute medioanterior setae. Mesosternal plate narrow, elongate, with variable number of longer setae. Metasternal plate roughly trapezoidal. With at least 2 comb rows of spiniform setae on venter of each femur III.

Abdomen: Very little sexual dimorphism except that associated with abdominal tergal chaetotaxy, terminalia, and size. Both sexes with tergites II–III at most only slightly enlarged, I and IV–VIII essentially of similar lengths; with 2 very long setae on each side of last segment; sternite I present, with setae; sternite III with 2 or more comb rows on each side, IV typically without comb row (rarely up to 3–4 short spiniform setae forming short row). Female with median dorsal terminal plate on last segment; sternites VII–IX fused; posterior margin of fused sternites VIII–IX (vulva) flattened to concave, with marginal row of 8–19 even-length medium setae; with such complex vulval chaetotaxy of lateral hooked setae in addition to others as to negate meaningful quantitative comparisons; vulva submarginally also with 3 long to very long setae on each side; anus with median indentation dorsally, with 4–6 stouter inner dorsal setae, with 6–8 longer ventral setae in or near to ventral fringe, and with fringes ventrally of 30–47 setae, dorsally, 40–62; inner reticulate structure of genital chamber present, and some, perhaps all, with faint small ringlike structure anterior to this. Male with all tergites undivided; with sternites VIII–IX (genital plate) completely to less often partially fused; genitalia with slender elongate basal plate.

Hosts.—Known distribution restricted to Neotropical parrots, with specimens known from 10 genera of the Psittacinae.

In the following discussions, the 18 recognized species have been arranged in 3 species groups. Each group is first characterized, then individual species within it are treated without repetition of either group or generic characters.

burmeisteri-group

1. Male genitalia as in Fig. 3, 11, 15, 17, or 19, symmetrical, with genital sclerites at each side of penis base as in Fig. 2, and penis with weakly developed winglike projections.
2. Female tergites I–VIII apparently undivided.
3. Female usually without medioanterior setae on I–VIII (occasionally a total of 1–5 lateroanterior setae on each of III–V); ♂ usually with medioanterior setae on some tergites, especially III–VIII.
4. Without longer prosternal setae.
5. Male usually with moderately developed internal pleural thickenings, especially on IV–VIII.
6. Female with spiracles situated within tergites III–VIII.
7. Posterior margin of femur III with only 1–2, much less often 3, setae.

The 7 species recognized in this group are very close to one another, being separable usually by quantitative features in conjunction with male genitalia type and certain qualitative aspects of chaetotaxy. The host distribution of these species lies primarily within the genus *Ara*, with 1 species taken on *Anodorhynchus*, 1 on *Aratinga*, and 1 on *Amazona* (this perhaps an erroneous host).

In addition to the lice considered to be within these 7 species, we have also 2 ♂ from *Ara militaris* (L.) and 2 ♀, 2 ♂ from *Ara macao* (L.); these series are of such poor quality that we can only place them within the *burmeisteri*-group.

Psittacobrosus burmeisteri (Kellogg)

(Fig. 1–6)

Colpocephalum burmeisteri Kellogg, 1906, J. New York Entomol. Soc. 14: 48. Type-host: *Ara chloroptera* G. R. Gray.

FEMALE.—As in Fig. 1. Mesosternal plate with 2–3 longer setae; metasternal plate with 3–4 setae. Margin of metanotum with 20–24 (22.0) setae, with lengths as shown. Each femur III with 3 well-developed ventral comb rows. Marginal tergal setae: I, 24–27 (25.7); II, 32–33; III, 31–32; IV, 29–31; V, 28–29; VI, 27–30 (28.7); VII, 26–27; VIII, 23–24; total on I–VIII, 224–230 (226.7). Tergocentral setae of VIII with longer among shorter, some of longer at least twice length of shorter. Postspiracular setae very long on I–VIII. Last tergite with 5–7 medium inner posterior setae. Sternal setae: I, 4–8 (5.7); II, 29–36 (32.7); III, 27–31 (28.3); IV, 43–47 (43.7); V–VII, 28–38 (31.8). Sternite III with 3 well-developed comb rows on each side. Vulva as in Fig. 5, with 2 very long setae close together on each side and placed lateroanteriorly, and 1 very long seta at each side of medioposterior submarginal setal cluster. Dimensions: preocular width 0.37–0.40; temple width 0.53; head length 0.38–0.41; prothorax width 0.38–0.41; metathorax width 0.46–0.52; total length 2.43–2.55.

MALE.—As in Fig. 4. Mesosternal plate with 2–3 longer setae; metasternal plate with 4–8 (6.8) setae.

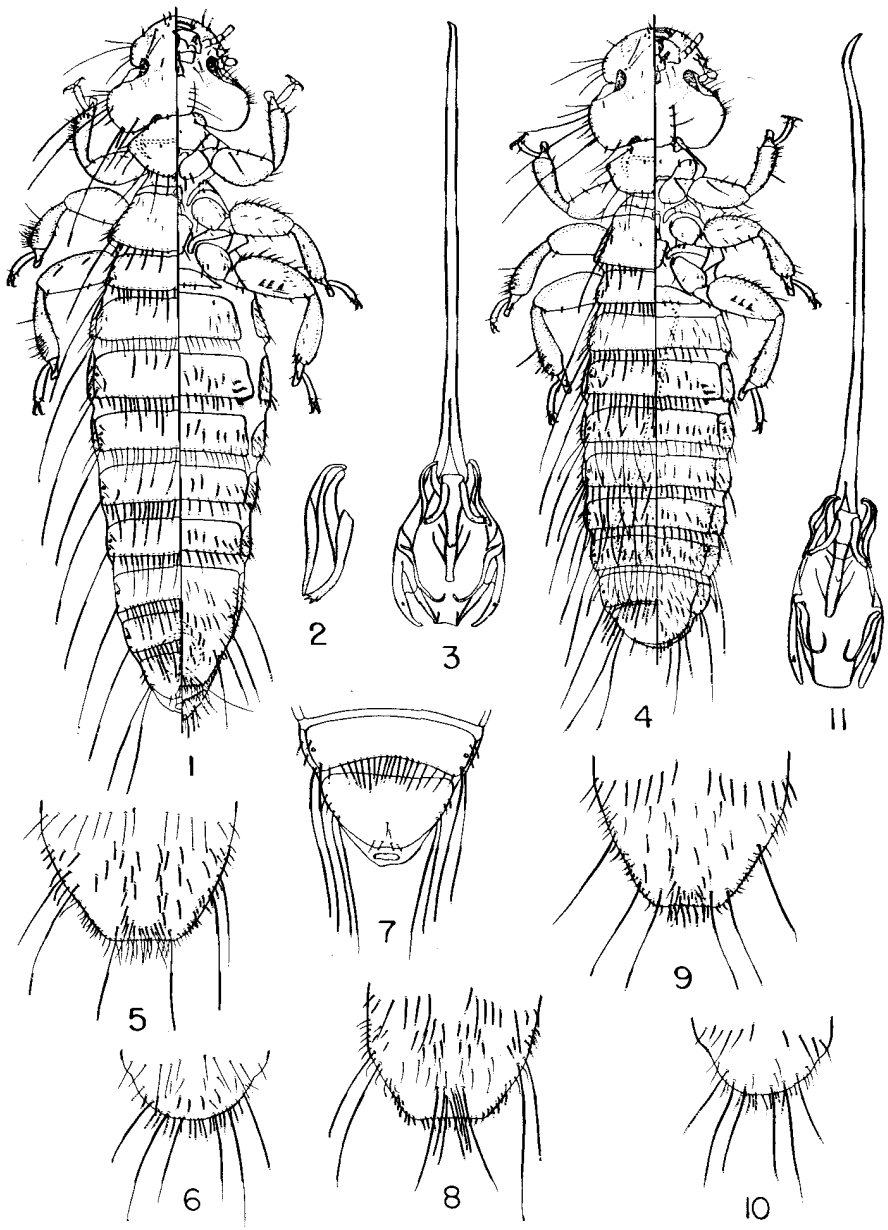

FIG. 1–6.—*Psittacobrosus burmeisteri*. 1, female; 2, male genital sclerite (left); 3, male genitalia; 4, male; 5, female vulva; 6, male genital plate.
FIG. 7, 8.—*P. kelloggi*, female. 7, dorsal terminalia; 8, vulva.
FIG. 9, 10.—*P. hyacinthini*. 9, female vulva; 10, male genital plate.
FIG. 11.—*P. ambiguus*, male genitalia.

Margin of metanotum with 16–17 setae. Venter of femur III each with 3 well-developed comb rows. Marginal tergal setae: I, 21–24 (22.8); II–III, 25–30 (27.9); IV–V, 21–29 (25.6); VI, 20–26 (23.8); VII, 18–25 (22.3); VIII, 18–23 (20.5); total on I–VIII, 177–207 (196.3). Anterior tergal setae: I, 0; II, 1–3; III, 4–6; IV–VII, 6–14 (10.3); VIII, 5–10 (8.0); arranged in row of anterior setae across tergites IV–VIII. Postspiracular setae very long on I–VIII. Sternal setae: I, 4–6; II, 23–38 (31.5); III, 25–30 (27.8); IV, 35–45 (41.3); V–VII, 29–39 (33.2); VIII, 26–33 (29.0). Sternite III with 3 well-developed comb rows on each side. Chaetotaxy of posterior portion of genital plate as in Fig. 6, with 9–11 medium setae between the 6 very long posterior submarginal setae and the row representing the marginal setae of sternite VIII. Genitalia as in Fig. 3, with inwardly curving parameres, and endomeral plate slightly concave along narrowed posterior margin. Dimensions: preocular width 0.34–0.36, temple width 0.49, head length 0.32–0.36, prothorax width 0.36–0.37, metathorax width 0.44–0.45, total length 1.90–2.01, genitalia length 0.89–0.93, genitalia width 0.12–0.16.

Material Examined.—3 ♀, 4 ♂, *Ara chloroptera*, Bolivia, Colombia, Venezuela.

Psittacobrosus kelloggi Carriker

(Fig. 7, 8)

Psittacobrosus burmeisteri kelloggi Carriker 1954: 151. Type-host: *Ara ararauna* (L.).

FEMALE.—Close to *P. burmeisteri*. Margin of metanotum with only 15–19 (17.1) setae. Tendency for slightly fewer total marginal tergal setae on I–VIII, 194–238 (217.5). Tergocentral setae of VIII of fairly uniform length (Fig. 7), not extending far across last tergite. Vulva as in Fig. 8, with mediposterior submarginal cluster of setae recessed distinctly farther from posterior margin.

MALE.—Apparently inseparable from *P. burmeisteri*. The separation of *P. kelloggi* from *P. burmeisteri* is admittedly tenuous, based as it is only on several features of female terminalia chaetotaxy. However, we do feel that they are consistently separable by these characteristics, and that there are suggestions of other differences. Consistent with our reluctance to recognize subspecies of lice at our present state of knowledge, we prefer the maintenance of *P. kelloggi* as a recognized species rather than to consider it as conspecific with *P. burmeisteri*.

Carriker (1954), in comparing his *P. burmeisteri kelloggi* with *P. b. burmeisteri*, states that *P. b. burmeisteri* has a shorter abdominal chaetotaxy and fewer marginal tergal setae, but gives no supporting quantitative data. From material we have studied, the tendency is toward the opposite of this.

Material Examined.—28 ♀, 26 ♂ (including 2 ♀, 2 ♂ paratypes of *P. burmeisteri kelloggi* Carriker), *Ara ararauna*, Bolivia, Colombia, Trinidad, Brazil; 2 ♀, *Amazona farinosa* (Boddaert), Bolivia (perhaps a host error).

Psittacobrosus hyacinthini, new species

(Fig. 9, 10)

Type-host: *Anodorhynchus hyacinthinus* (Latham).

FEMALE.—Quantitatively near to *P. kelloggi*, with only 14–17 (15.0) marginal metanotal setae and with small number of marginal tergal setae: I, 19–24 (21.2); II, 20–26 (23.0); III, 24–27 (25.0); IV, 23–25 (23.9); V–VI, 22–25 (23.4); VII, 19–23 (21.6); VIII, 18–22 (20.7); total on I–VIII, 177–187 (181.9). Lengths of tergocentral setae on VIII much as for *P. burmeisteri* (Fig. 1). Tergite III with 0–3 (1.2) medium setae mediad from spiracles, IV–V typically with none, less often IV with 1 on single side. Differs from all other known species of this group, except *P. rubrogenysi*, new species, in the distribution of the submarginal very long setae on the vulva, with 2 such setae close together on each side of mediposterior submarginal cluster and 1 seta removed considerably lateroanterior to these (Fig. 9).

MALE.—Very close to *P. burmeisteri* and *P. kelloggi*, differing only in having from 1 to 5 (2.9) medium setae on posterior portion of genital plate between the 6 very long submarginal posterior setae and row representing the marginal setae of sternite VIII (Fig. 10).

Material Examined.—Holotype ♀, *Anodorhynchus hyacinthinus*, Brazil, Meinertzhagen Collection, Slide 8393; at British Museum (Natural History). 16 ♀, 15 ♂ paratypes, same data as holotype.

Psittacobrosus ambiguus Carriker

(Fig. 11, 18)

Psittacobrosus burmeisteri ambiguus Carriker, 1954: 154. Type-host: *Ara ambigua ambigua* (Bechstein).

FEMALE.—Very close to *P. burmeisteri*. Tendency for more marginal tergal setae: I, 27–34 (31.0); II, 29–36 (32.3); III, 30–39 (33.9); IV, 29–36 (33.3); V, 27–35 (30.8); VI, 27–34 (30.1); VII, 26–30 (28.1); VIII, 24–29 (25.9); total on I–VIII, 222–264 (246.6). Tergocentral setae on VIII of more equal length, much as for *P. kelloggi* (see Fig. 7).

MALE.—Close to *P. burmeisteri* and *P. kelloggi*. Dorsal abdominal chaetotaxy as in Fig. 18. Tendency for more marginal tergal setae: I, 23–28 (25.3); II, 27–31 (29.0); III, 29–33 (30.6); IV, 27–32 (29.3); V–VI, 25–29 (27.2); VII, 24–27 (25.1); VIII, 22–25 (23.2); total on I–VIII, 212–230 (217.5). Separable from *P. burmeisteri*, *P. kelloggi*, and *P. hyacinthini* in having fewer anterior tergal setae on IV–VIII, 1–7 (5.2), arranged laterally, without setae across medial portion (rarely 1–2 medioanterior setae, but not forming good row across tergite). Genitalia as in Fig. 11, parameres comparatively straight, and endomeral plate broader and slightly convex along posterior margin.

Carriker (1954) stressed the larger size of *P. b. ambiguus* in comparison to *P. b. burmeisteri* and *P. b. kelloggi*. However, we have been unable to associate any significant size differential among these series. He stated also that the chaetotaxy and structure of female sternite IX of *P. b. ambiguus* differs considerably from the other two, but he neither expands on this statement nor provides illustrations. Whereas we found the chaetotaxy of sternite IX differing from that of *P. kelloggi*, we found no difference from that of *P. burmeisteri*.

Material Examined.—9 ♀, 14 ♂ (including 2 ♂ paratypes of *P. burmeisteri ambiguus* Carriker), *Ara ambigua*, Colombia; 39 ♀, 26 ♂, *A. militaris* (L.), Colombia.

Psittacobrosus rubrogenysi, new species

(Fig. 17)

Type-host: *Ara rubrogenys* Lafresnaye.

FEMALE.—Close to *P. hyacinthini*. Slightly higher total number of marginal tergal setae on I–VIII, 184–202 (196.2). More medium setae mediad from spiracles on III, 2–4 (3.0); IV, 2–5 (3.4); and V, 0–4 (2.2). Smaller in certain dimensions: prothorax width 0.36–0.37, metathorax width 0.45–0.50, total length 2.11–2.25.

MALE.—Chaetotaxy consistently close to *P. burmeisteri*, but with genitalia (Fig. 17) close to, and perhaps inseparable from, those of *P. ambiguus*; genitalia appear to be shorter and with slenderer tapered basal plate. Smaller in certain dimensions: prothorax width 0.35, metathorax width 0.42, total length 1.88, genitalia length 0.81.

Material Examined.—Holotype ♂, *Ara rubrogenys*, Ele-Ele, Bolivia, 13 Oct. 1937, M. A. Carriker, Jr.; at United States National Museum (USNM). 5 ♀ paratypes, same data as holotype.

Psittacobrosus genitalis Carriker

(Fig. 19, 20)

Psittacobrosus genitalis Carriker, 1962, Ann. Mag. Nat. Hist. (ser. 13) 5:460. Type-host: *Ara manilata* (Boddaert).

Psittacobrosus nobilis Carriker, 1962, Ann. Mag. Nat. Hist. (ser. 13) 5: 461. Type-host: *Ara nobilis nobilis* (L.). NEW SYNONYMY.

FEMALE.—As in Fig. 20. Mesosternal plate with 1 longer seta; metasternal plate with 2 setae. Margin of metanotum with 17–18 setae. Each femur III ventrally with only 2 well-developed comb rows, with abortive proximal third row of only 2–3 setae. Marginal tergal setae: I, 22–25 (23.8); II, 26–31 (28.8); III, 28–33 (30.0); IV, 27–29; V, 25–27; VI, 23–27 (25.3); VII, 22–25 (23.0); VIII, 20–21; total on I–VIII, 198–215 (205.3). Tergocentral setae of VIII intermediate in length between *P. burmeisteri* and *P. kelloggi*. Chaetotaxy of terminalia and sternites as for *P. burmeisteri*, except as follows: Sternal setae on IV, 34–38 (36.0); V, 26–32 (29.0); VI, 25–28 (26.8); VII, 26–29 (27.5). Only 2 well-developed comb rows on each side of sternite III (third row of only 1–3 compact setae on a side). Shorter postspiracular setae on IV–V, never extending across 2 or more tergites. Dimensions: preocular width 0.32–0.34, temple width 0.40–0.44, head length 0.33–0.35, prothorax width 0.36–0.37, metathorax width 0.46–0.49, total length 2.15–2.16.

MALE.—As for *P. burmeisteri*, except as follows: Comb rows on venter of femur III and sternite III as for female *P. genitalis*. Total marginal tergal setae on I–VIII within range for *P. burmeisteri*, but average less, 178–183 (180.3). Only 2–4 medioanterior setae on posterior portion of genital plate, as for *P. hyacinthini* (see Fig. 10). Genitalia as in Fig. 19, with rounded endomeral plate and long slender parameres extending beyond endomeral plate, although not always as far as illustrated. Dimensions: preocular width 0.31–0.32, temple width 0.38–0.42, head length 0.32, prothorax width 0.32–0.33, metathorax width 0.41–0.43, total length 1.73–1.86.

The combination of reduced proximal, or third, comb row on femur III and anterior, or third, comb row on sternite III, the rounded endomeral plate and long slender parameres of the male genitalia, and the shorter postspiracular setae on tergites IV–V of the female, enable this species to be separated from any of the aforementioned species. The series from *Ara severa* (L.), while showing a tendency toward a few more spiniform setae in the third comb rows and for longer postspiracular setae on IV–V, is not considered sufficiently different to justify separation at this time.

Material Examined.—4 ♀, 4 ♂ (including 3 ♀, 3 ♂ paratypes of *P. genitalis* Carriker), *Ara manilata*, Brit. Guiana; 2 ♀, 2 ♂ (all paratypes of *P. nobilis* Carriker), *A. nobilis*, Brit. Guiana; 9 ♀, 7 ♂, *A. severa*, Bolivia.

Psittacobrosus mitratae, new species

(Fig. 15, 16)

Type-host: *Aratinga mitrata* (Tschudi).

FEMALE.—Very close to *P. genitalis*, but with fewer marginal setae on tergites III, 23–24, and IV, 23–26, resulting in a lesser total of marginal tergal setae on I–VIII, 184–188. Postspiracular setae on IV–V variable, either as for *P. genitalis* or longer.

MALE.—Likewise closest to *P. genitalis*. Dorsal abdomen as in Fig. 16. Fewer marginal tergal setae: I, 18–21; II, 21–22; III–IV, 20–23; V, 20–21; VI, 18–19; VII, 17–18; VIII, 15–17; small number of total marginal tergal setae on I–VIII, 153–161 (157.0). Fewer anterior tergal setae on IV, 0–1; V, 1; VI, 1–2; VII, 1–5 (3.0); VIII, 1; obviously, with so few setae, at no time forming anything resembling a good row across these tergites. Genitalia (Fig. 15) close to those of *P. genitalis*, but with shorter parameres.

Material Examined.—Holotype ♂, *Aratinga mitrata*, Santaipata, Bolivia, 10 Nov. 1937, M. A. Carriker, Jr.; at USNM. 3 ♀, 2 ♂ paratypes, same data as holotype.

amazonicus-group

1. Male genitalia as in Fig. 23, 25, or 27, symmetrical; with evenly-rounded endomeral plate; parameres extending to end of endomeral plate; penis tapered, barbed, usually with slight bend at tip; genital sclerite at each side of penis base as in Fig. 26.

2. Female tergites IV–VIII either weakly tripartite

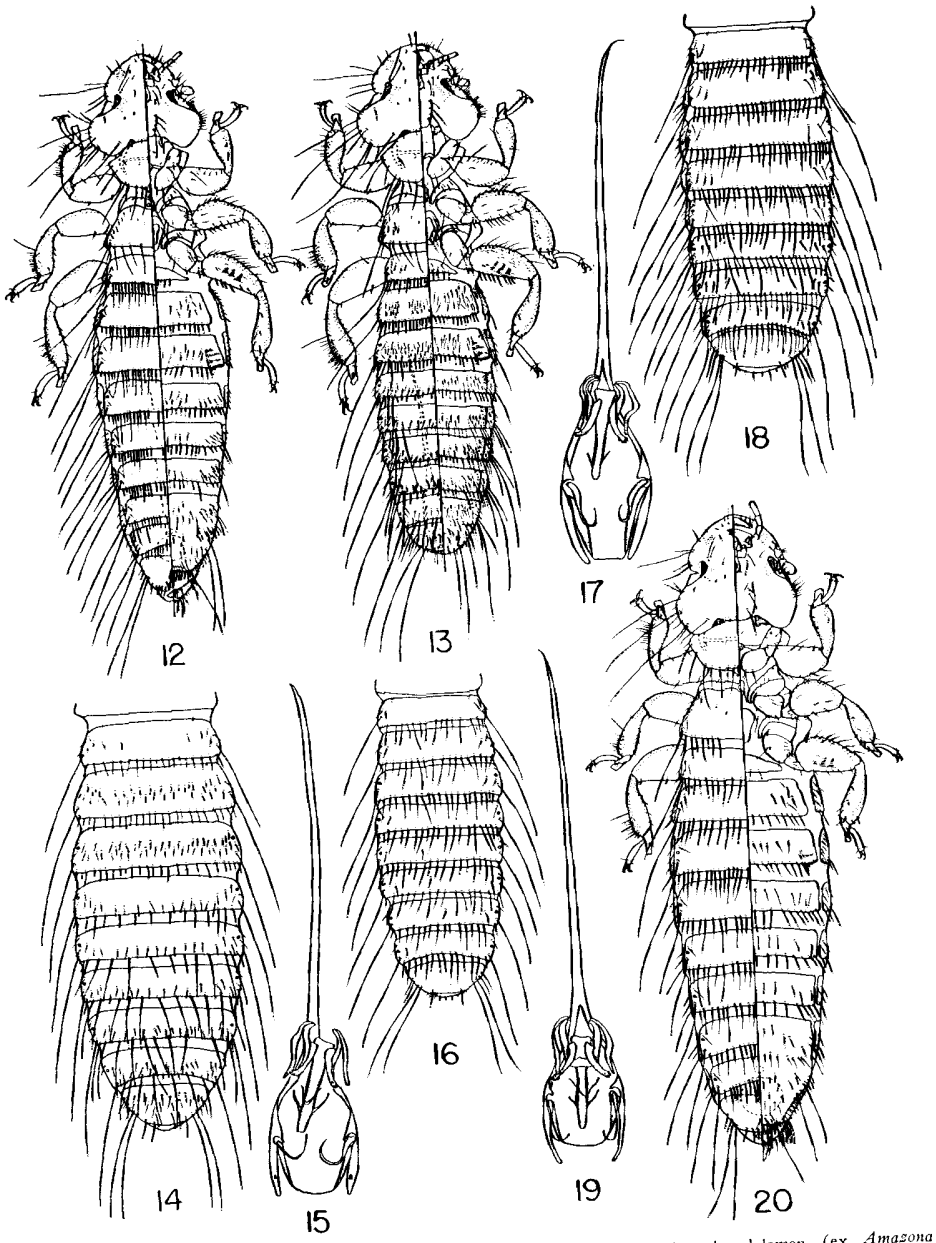

FIG. 12–14.—*Psittacobrosus amazonicus*. 12, female; 13, male; 14, dorsal male abdomen (ex *Amazona leucocephala*).
FIG. 15, 16.—*P. mitratae*, male. 15, genitalia; 16, dorsal abdomen.
FIG. 17.—*P. rubrogenysi*, male genitalia.
FIG. 18.—*P. ambiguus*, dorsal male abdomen.
FIG. 19, 20.—*P. genitalis*. 19, male genitalia; 20, female.

or with pale areas indicating a possible tripartite state; last tergite deeply indented mediposteriorly.

3. Female without anterior tergal setae; male with anterior tergal setae, but chaetotaxy markedly different from female.

4. With or without longer prosternal setae.

5. Male typically with moderately to well-developed internal pleural thickenings.

6. Female with at least some of the posterior spiracles placed between pleura and tergites.

7. Posterior margin of each femur III with at least 3–4 setae.

Of the 4 species recognized in this group, the distribution of the first two lies among hosts of the genera *Amazona*, *Pionopsitta*, *Pionus*, and *Pyrrhura*. Unfortunately, the last 2 species are known only by males from 2 *Ara* species, and these are the species most divergent from the others; it is assumed, for the present at least, that the genitalic features and numerous posterior marginal setae of femur III relate them to this group.

We have also 1 ♀, 4 ♂ from *Amazona imperialis* Richmond belonging to this species group, but we are unable to place them to species because of their poor condition.

Psittacobrosus amazonicus Carriker

(Fig. 12–14, 25, 26)

Psittacobrosus amazonicus Carriker, 1962, Ann. Mag. Nat. Hist. (ser. 13) 5: 462. Type-host: *Amazona amazonica amazonica* (L.).

FEMALE.—As in Fig. 12. Without longer setae on prosternal plate. Margin of metanotum with 11–16 (13.8) setae. Mesosternal plate with 2–3 longer setae; metasternal plate with 2 setae. Posterior margin of each femur III with 3–5 setae. Marginal tergal setae, with lengths as shown: I, 30–35 (32.2); II–III, 34–40 (36.7); IV–V, 29–36 (32.8); VI, 27–34 (31.7); VII, 27–33 (29.3); VIII, 16–21 (18.8); total on I–VIII, 233–268 (251.4). Marginal tergal setae on III not noticeably longer medially than laterally. Postspiracular setae very long on I–VIII. Spiracles on tergites III–V, apparently between pleura and tergites on VI–VIII. Patch of 10–18 (13.0) medium inner posterior setae on last segment. Sternal setae: I, 8–10; II, 41–48 (44.3); III, 38–45 (41.7); IV, 48–58 (52.5); V, 43–56 (49.5); VI, 44–52 (48.5); VII, 45–57 (51.8); lateral patches of stouter setae on sternites posterior to IV. Sternite III usually with 4 well-developed comb rows on each side, less often only 3 on 1 side, 4 on the other. Dimensions: preocular width 0.42–0.44, temple width 0.63–0.65, head length 0.42–0.45, prothorax width 0.45–0.48, metathorax width 0.56–0.58, total length 2.55–2.90.

MALE.—As in Fig. 13. Head and thorax as for female, except mesosternal plate with 2–5 (3.6) longer setae; metasternal plate with 7–11 (9.4) setae; posterior margin of each femur III with 6–8 setae. Marginal tergal setae: I, 29–33 (32.0); II–III, 33–39 (35.8); IV–V, 20–25 (21.8); VI, 18–22 (20.6); VII–VIII, 17–20 (18.6); with lengths as shown, those on I–III close-set and of fairly uniform medium size, those on IV–VII short medially and with some very long setae laterally, and those on VIII intermixed long and short. Total marginal tergal setae on I–III, 96–110 (103.6). Surface of tergites IV–IX finely spiculose. Anterior tergal setae: I, 1–5 (2.5); II, 30–51 (42.8); III, 42–64 (52.4); IV, 20–32 (26.8); V, 10–29 (22.0); VI–VII, 15–30 (23.1); VIII, 19–31 (27.2). Postspiracular setae very long on I–VIII. Last tergite with 4–6 medium inner posterior setae and 20–28 medium anterior setae. More sternal setae than for female: I, 13–16; II, 67–81 (71.5); III, 41–51 (47.3); IV–VII, 52–70 (63.1); VIII, 52–60 (56.0). Sternite III with combs as for female, typically with 4 rows on each side. With well-developed internal pleural thickenings at least on III–VIII. Genitalia as in Fig. 25. Dimensions: preocular width 0.45–0.46, temple width 0.65–0.67, head length 0.43–0.45, prothorax width 0.45–0.47, metathorax width 0.54–0.58, total length 2.52–2.69, genitalia length 0.85–0.99, genitalia width 0.14–0.15.

Series from numerous other parrot species are considered conspecific with *P. amazonicus*, even though they present certain divergences from these descriptive data. Some possess more marginal tergal setae; for example, females from *Pionopsitta haematotis* (Sclater and Salvin) have total marginal tergal setae on I–VIII, 326–337, well above the range for lice from *Amazona amazonica*. But females from *Pionopsitta pyrilia* (Bonaparte) show a range of 274–331, and other series tend to bridge this gap so successfully as to make impractical reliable specific separation based on this feature. At the lower extreme is a series from *Amazona leucocephala* (L.) with a marginal tergal total of 185–239 (205.7) setae on I–VIII. There is also a degree of heterogeneity concerning dorsal male abdominal chaetotaxy, especially involving lengths of marginal tergal setae on V–VII. Material from *A. amazonica* is as in Fig. 13, with only short median tergocentral setae on V–VII; in other series, these setae tend to vary from slightly longer to predominantly much longer, especially on VI–VII. The male of the series from *A. leucocephala* not only has longer marginal tergal setae on at least VI–VII, but also has only 20–24 (22.0) marginal setae on tergite I, with total of 72–78 (75.0) on I–III (Fig. 14); however, the male from *A. aestiva* (L.), while quantitatively near to that from *A. leucocephala*, has lengths of abdominal tergal setae closer to that from *A. amazonica*. All of these data reinforce the need to await the availability of better series, at which time this complex may eventually be broken down into other species, but, until then, we choose to consider it *P. amazonicus* sensu lato.

Material Examined.—10 ♀, 6 ♂ (including 3 ♀, 3 ♂ paratypes of *P. amazonicus* Carriker), *Amazona amazonica*, Brit. Guiana, Trinidad, Colombia; 20 ♀, 6 ♂, *A. aestiva*, Brazil; 8 ♀, 7 ♂, *A. autumnalis* (L.), Mexico; 10 ♀, 5 ♂, *A. leucocephala*, Bahama Islands; 1 ♀, 1 ♂, *A. ochrocephala* (Gmelin), Venezuela, Colombia; 1 ♀, 2 ♂, *Pionopsitta caica* (Latham), Brit. Guiana; 7 ♀, 3 ♂, *P. haematotis*, Colombia;

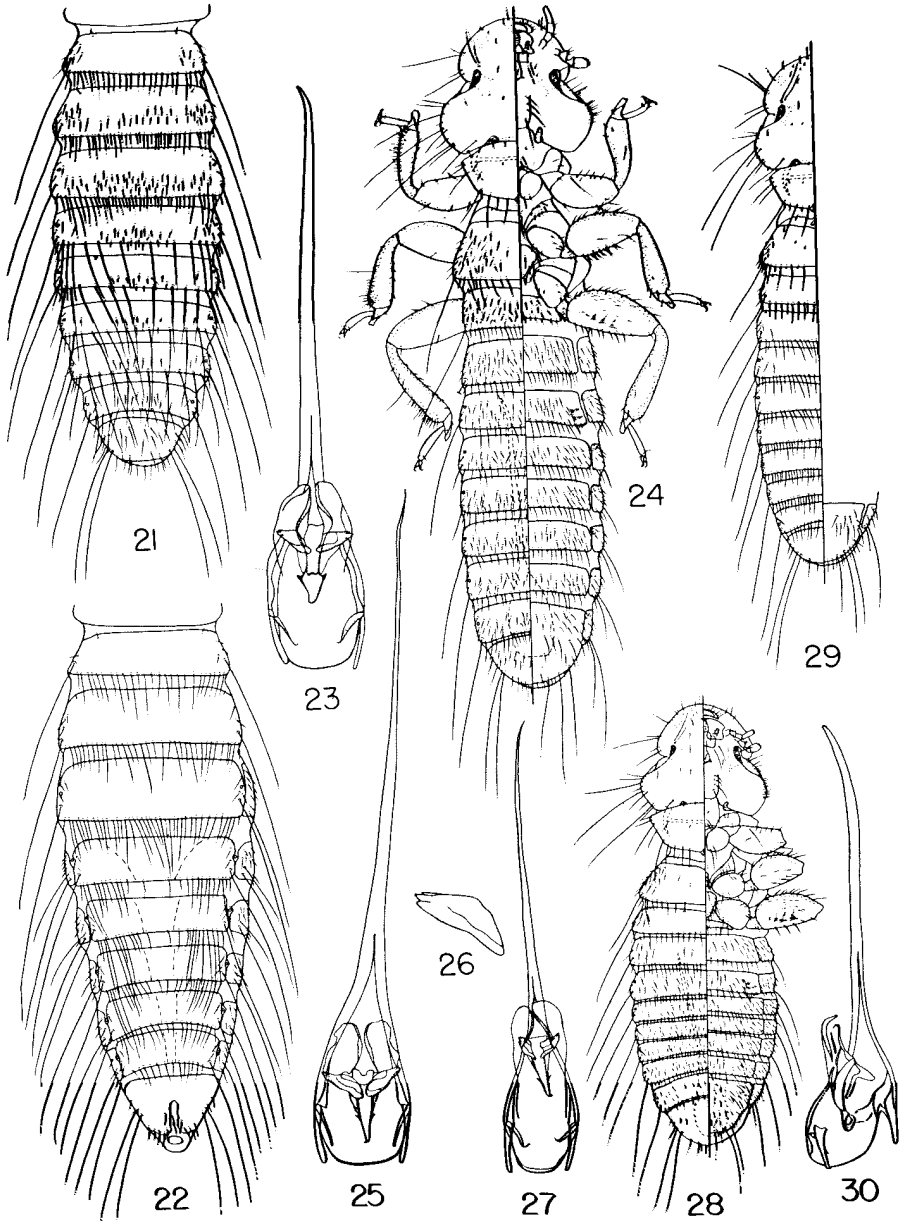

FIG. 21, 22.—*Psittacobrosus farinosae*, dorsal abdomen. 21, male; 22, female.
FIG. 23, 24.—*P. carrikeri*. 23, male genitalia; 24, male.
FIG. 25, 26.—*P. amazonicus*. 25, male genitalia; 26, male genital sclerite (left).
FIG. 27, 28.—*P. chloropterae*. 27, male genitalia; 28, male.
FIG. 29, 30.—*P. forpi*, male. 29, dorsum and genital plate; 30, genitalia.

5 ♀, 4 ♂, *P. pileata* (Scopoli), Brazil, Paraguay; 8 ♀, 7 ♂, *P. pyrilia*, Colombia; 1 ♂, *Pionus chalcopterus* (Fraser), Colombia; 2 ♂, *P. fuscus* (P. L. S. Müller), Colombia; 2 ♀, 1 ♂, *P. menstruus* (L.), Peru, Colombia; 2 ♀, 2 ♂, *P. senilis* (Spix), Mexico; 6 ♀, 12 ♂, *P. sordidus* (L.), Colombia, Bolivia; 1 ♀, *Pyrrhura devillei* (Massena and Souancé), Bolivia; 1 ♂, *P. viridicata* Todd, Colombia.

Psittacobrosus farinosae, new species

(Fig. 21, 22)

Type-host: *Amazona farinosa* (Boddaert).

FEMALE.—Head, thorax, and sternites as for *P. amazonicus*. Dorsal abdominal chaetotaxy as in Fig. 22. Fewer marginal tergal setae on: IV, 26–28; V, 25–26; VI, 24–27 (25.5); VII, 20–24 (22.0); VIII, 12–15 (13.7); total on I–VIII, 208–233 (225.0). Differs by having median marginal tergal setae on III markedly longer than those laterally and by having spiracles situated within tergite III but between pleura and tergites of IV–VIII. Smaller in certain dimensions: preocular width 0.38–0.41, temple width 0.57–0.62, head length 0.38–0.41, prothorax width 0.40–0.43, metathorax width 0.50–0.55, total length 2.27–2.80.

MALE.—Head, thorax, and sternites as for *P. amazonicus*. Dorsal abdomen as in Fig. 21. Differs from *P. amazonicus* as follows. Marginal tergal setae: I, 29–35 (32.2); II, 39–44 (41.2); III, 43–47 (44.8); IV, 20–25 (23.2); V, 17–21 (19.3); VI–VIII, 15–19 (16.7); larger number of total setae on I–III, 113–125 (118.3). Tendency for fewer anterior tergal setae on: IV, 12–23 (18.5); V, 10–18 (12.7); VI, 8–14 (10.5); VII, 7–12 (9.3); VIII, 7–15 (11.2). Only 8–12 (9.2) anterior setae on last tergite. Lengths of marginal tergal setae quite different, with predominantly very long setae on IV–VII, and relatively slender uniform medium-long setae across VIII. Dimensions: preocular width 0.41–0.44, temple width 0.58–0.62, head length 0.39–0.41, prothorax width 0.38–0.42, metathorax width 0.50–0.54, total length 2.11–2.46, genitalia length 0.81–0.84, genitalia width 0.13.

Material Examined.—Holotype ♂, *Amazona farinosa inornata* (Salvadori), Bellavista, Santander N., Colombia, 3 July 1943, M. A. Carriker, Jr.; at USNM. 2 ♀, 1 ♂ paratypes, same data as holotype; 1 ♀, 1 ♂ paratypes, *A. f. inornata*, El Bosque, La Guajira, Colombia, 12 June 1941, M. A. Carriker, Jr.; 5 ♀, 3 ♂ paratypes, *A. farinosa*, Chatarona, Bolivia, Sept. 1934, M. A. Carriker, Jr. Also, 4 ♀, 3 ♂, *A. mercenaria* (Tschudi), Colombia.

Psittacobrosus chloropterae, new species

(Fig. 27, 28)

Type-host: *Ara chloroptera* G. R. Gray.

FEMALE.—Unknown.

MALE.—As in Fig. 28. Divergent from other species of group in numerous features. Inner middorsal head setae longer than outer. Prosternum with 2–4 longer setae. Metanotal margin with 20–21 setae. Mesosternal plate with 4–5 longer setae; metasternal plate with 13–18 setae. Posterior margin of each femur III with 3 relatively stout setae. Except for very long postspiracular setae on I–VIII, marginal tergal setae uniformly short to medium: I, 25–28; II, 29–36; III, 42–46; IV, 39–43; V, 37–38; VI, 36–39; VII, 34–35; VIII, 17–18. Short anterior setae irregularly distributed across tergites: I, 5; II, 12–13; III, 21–23; IV–VII, 27–32; VIII, 11–16. Last tergite with 3–4 short lateroanterior setae. Sternal setae not counted due to telescoped abdomen. Sternite III with 3–4 comb rows on each side. Genitalia as in Fig. 27, small, but typical for group. Dimensions: preocular width 0.32–0.33, temple width 0.43, head length 0.32–0.34, prothorax width 0.37, metathorax width 0.45, total length 1.50–1.60 (telescoped), genitalia length 0.67–0.71, genitalia width 0.11–0.12.

The 2 ♂ upon which this species is based are together on a slide bearing the identification as paratypes of *Heterokodeia spinosa* Carriker, a species described also from *Ara chloroptera*. However, they obviously are not members of this genus, diverging markedly in features of chaetotaxy and structure as well as genitalia. Additionally, Carriker (1954) does not even list them as among his type-series in his description, even though they are apparently from the same collection. One can only conclude that the paratype designation was made after the description was prepared, and that no critical examination of the specimens was made.

Material Examined.—Holotype ♂, *Ara chloroptera*, La Pinta, Venezuela, 28 Mar. 1910, M. A. Carriker, Jr.; at USNM. 1 ♂ paratype, same data as holotype.

Psittacobrosus carrikeri, new species

(Fig. 23, 24)

Type-host: *Ara militaris* (L.).

FEMALE.—Unknown.

MALE.—As in Fig. 24. With certain similarities to *P. chloropterae*, but differing in the following ways: Both pairs of middorsal head setae of similar length; slightly longer occipital setae. Two pairs of outer dorsal pronotal setae. Numerous anterior metanotal setae. Posterior margin of each femur III with 8 setae. Generally fewer and longer marginal tergal setae, respectively on I–VIII, 26, 24, 25, 22, 23, 24, 22, and 23. More and longer anterior tergal setae, respectively on I–VIII, 58, 70, 58, 49, 46, 41, 39, and 38. Short postspiracular setae on IV–V. More anterior setae, 17, on last tergite. Apparently more sternal setae, but no counts made. Genitalia as in Fig. 23, with stouter, more heavily barbed penis, but otherwise as for group. Larger dimensions: preocular width 0.38, temple width 0.53, head length 0.40, prothorax width 0.39, metathorax width 0.50, total length 2.27, genitalia length 0.88, genitalia width 0.15.

Material Examined.—Holotype ♂, *Ara militaris*, El Bosque, La Guajira, Colombia, 19 June 1941, M. A. Carriker, Jr.; at USNM.

anduzei-group

1. Male genitalia variable (Fig. 30, 32, 35, 38, 40, or 43), but always with pronounced degree of asymmetry; penis without barbs or winglike projections and usually deflected sharply to 1 side.
2. Female tergites V-VIII variably weakly divided at midline; last tergite indented medioposteriorly to completely divided medially.
3. Both sexes with or without anterior setae on some tergites.
4. With or without longer prosternal setae.
5. Male usually without evident internal pleural thickenings.
6. Female with spiracles situated within tergites III–VIII.
7. Posterior margin of each femur III typically with 2 setae.

The 7 species of this group represent the most heterogeneous assemblage for any of the 3 groups, and leads us to believe that this grouping is not as natural as those of the others. The host distribution encompasses the genera *Aratinga, Amazona, Forpus, Brotogeris, Pyrrhura,* and *Cyanoliseus.*

In addition to these lice, we also have 1 ♀, 1 ♂ from *Aratinga leucophthalmus* (P. L. S. Müller); their condition is so poor that we can only place them in the *anduzei*-group.

Psittacobrosus anduzei (Stafford)

(Fig. 31–33)

Colpocephalum anduzei Stafford, 1943, Bol. Entomol. Venezol. 2: 43. Type-host: *Aratinga pertinax aeruginosa* (L.).

FEMALE.—As in Fig. 31. Prosternum with 1–2 longer setae. Margin of metanotum with 18–20 setae. Mesosternal plate with 3–5 longer setae; metasternal plate with 6–7 setae. Venter of each femur III with 3 comb rows. Marginal tergal setae: I, 29–34 (31.5); II–III, 33–38 (35.4); IV–V, 36–41 (38.4); VI, 34–38 (36.3); VII, 33–36 (34.0); VIII, 21–25 (22.8); total on I–VIII, 262–283 (272.0). A few lateroanterior tergal setae on II–III, 4–9 (5.9), and IV, 1–4 (2.5). Tergites V–VIII apparently divided at midline. Postspiracular setae long to very long on I–VIII. Last tergite divided at midline, with 10–16 (13.3) medium inner posterior setae; circular median terminal dorsal plate. Sternal setae: I, 4–6; II, 36–48 (42.7); III, 35–38 (35.8); IV, 43–51 (46.3); V, 34–43 (38.8); VI, 37–41 (40.0); VII, 43–48 (45.8). Sternite III with 3 well-developed comb rows on each side. Posterior margin of vulva concave. Dimensions: preocular width 0.37–0.38, temple width 0.45–0.49, head length 0.37–0.38, prothorax width, 0.38–0.40, metathorax width, 0.49–0.53, total length, 2.27–2.50.

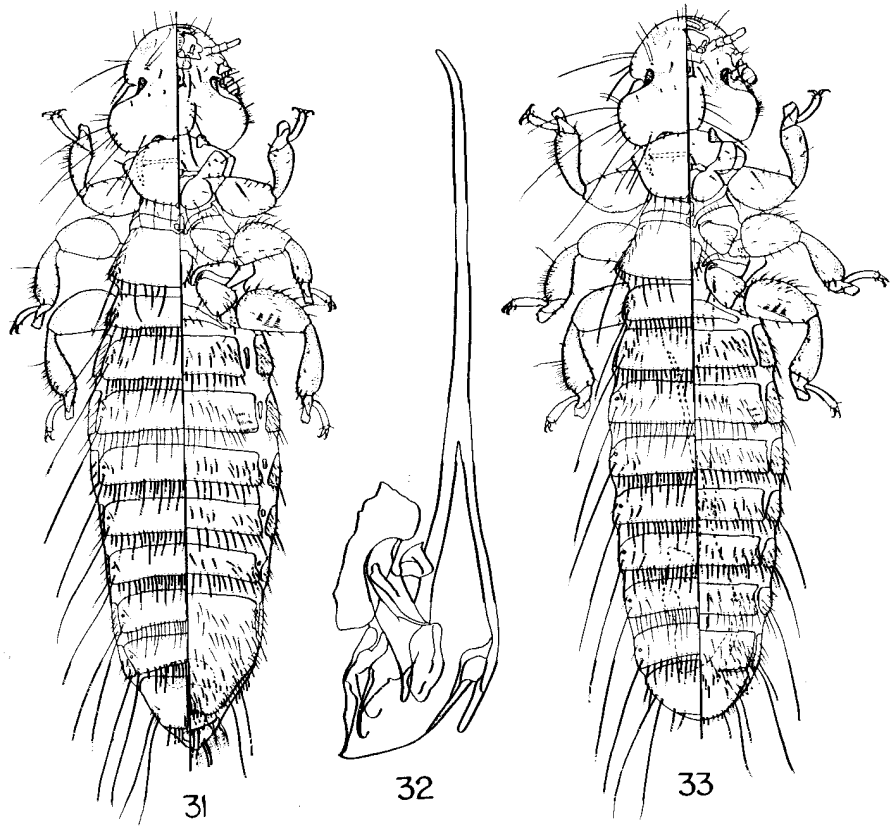

FIG. 31-33.—*Psittacobrosus anduzei.* 31, female; 32, male genitalia; 33, male.

MALE.—As in Fig. 33. Chaetotaxy, except for terminalia, close to that of female. Metasternal plate with 8–12 (10.3) setae. Few more marginal tergal setae, with total on I–VIII, 276–293 (283.8). More lateroanterior tergal setae: II, 6–8; III, 7–12 (9.0); IV, 5–8 (6.3); V–VI, 3–6 (4.1); VII, 2–4; VIII, 2. With 5 medium inner posterior setae on last segment. Tendency for more sternal setae: I, 5–7; II, 37–52 (46.3); III, 37–40 (38.3); IV, 56–58; V–VII, 42–49 (44.4); VIII, 41–54 (47.3). Partial division between sternites VIII–IX; posterior portion of genital plate with approximately 15 setae between long posterior submarginal setae and those of marginal row of sternite VIII. Genitalia markedly asymmetrical (Fig. 32), with distal portion of endomeral plate protruding to 1 side, and with short parameres. Since all specimens have genitalia so oriented, the condition apparently is a reflection of morphology rather than solely a distortion in mounting. Dimensions: preocular width 0.37–0.39, temple width 0.48–0.49, head length 0.37–0.40, prothorax width 0.39–0.40, metathorax width 0.49–0.51, total length 2.32–2.43, genitalia length 0.95–1.05, genitalia width 0.23–0.24.

Material Examined.— 5 ♀, 8 ♂, *Aratinga pertinax,* Brit. Guiana, Curacao, Venezuela, Colombia; 5 ♀, 6 ♂, *Amazona versicolor* (P. L. S. Müller), British West Indies; 2 ♀, 2 ♂, *Eupsittulus* sp., San Blas.

Psittacobrosus forpi Carriker

(Fig. 29, 30, 34)

Psittacobrosus forpi Carriker, 1954: 156.
Type-host: *Forpus conspicillatus conspicillatus* (Lafresnaye).
Colpocephalum burhinoides Carriker, 1963, Rev. Brasil. Biol. 23: 295.
Type-host: *Burhinus bistriatus vocifer* (L'Herminier) —probably error. NEW SYNONYMY.

FEMALE.—Specimen from *Forpus coelestis* (Lesson) as in Fig. 34. The following data are for specimens from *F. passerinus* (L.); the single female from *F. conspicillatus* compares favorably with these. Differs from *P. anduzei* as follows. Prosternum without longer setae. Mesosternal plate with only 1–2 longer setae; metasternal plate with only 2 setae. Marginal tergal setae: I, 26–29 (27.3); II, 31–36 (32.7); III, 35–37; IV, 39–42 (40.3); V, 43–48 (45.0); VI, 46–51 (48.7); VII, 40–47 (44.0); VIII, 30–32; total on I–VIII, 293–316 (305.0). Only 0–3 lateroanterior tergal setae on each of II–IV. Last tergite only partially divided medioposteriorly; median terminal dorsal plate wider than long. Fewer sternal setae: I, 5–7; II, 37–41; III, 34; IV, 35–39; V, 27–28; VI, 30; VII, 29–32. Posterior margin of vulva distinctly concave. Somewhat smaller dimensions: preocular width 0.33–0.36, temple width 0.43–0.45, head length 0.35–0.37, prothorax width 0.34–0.36, metathorax width 0.45–0.46; total length 2.11.

MALE.—Specimens from *F. passerinus* used as a basis for Fig. 29, 30 and for the following data. Much as for female, but with the following differences. Fewer marginal tergal setae: I, 21–23; II–III, 26–33 (29.9); IV, 30–35 (33.0); V, 33–39 (36.0); VI, 35–41 (37.0); VII, 31–36 (33.2); VIII, 20–24 (22.6); total marginal setae on I–VIII, 234–254 (243.8). Only 2 inner posterior setae on last tergite. Sternites VIII–IX completely fused; posterior portion of genital plate essentially without (occasionally 1 or so) setae between 6 very long posterior submarginal setae and those representing marginal row of sternite VIII. Distinctive asymmetrical genitalia (Fig. 30), with rounded endomeral plate and blunt irregular penis. Dimensions: preocular width 0.32–0.34, temple width 0.41, head length 0.33–0.34, prothorax width 0.32, metathorax width 0.41–0.42, total length 1.73–1.75, genitalia length 0.69, genitalia width 0.12–0.13.

With the essential similarities of females from 3 species of *Forpus,* including the type-host of *P. forpi,* it is assumed that the males from *F. passerinus* and *F. coelestis,* being similar to each other and in all respects to the illustrations and description by Carriker (1954), also are representative of the male of *P. forpi.* There is a chance this hypothesis might prove incorrect, but there is no reason to suspect this from the material studied here.

Material Examined.— 1 ♀, *Forpus conspicillatus,* Colombia; 4 ♀, 5 ♂, *F. passerinus,* Colombia; 3 ♀, 1 ♂, *F. coelestis,* Peru; 2 ♂ *Aratinga pertinax,* Venezuela; 2 ♀ (holotype and paratype of *Colpocephalum burhinoides* Carriker), *Burhinus bistriatus,* Colombia —probably host error.

Psittacobrosus brotogerisi, new species

(Fig. 35–37)

Type-host: *Brotogeris jugularis* (P. L. S. Müller).

FEMALE.—Dorsally as in Fig. 37. Head and thorax close to that of *P. anduzei,* especially in relation to more prosternal, 1–4 (2.3), mesosternal, 3–7 (4.9), and metasternal, 5–11 (8.1), setae, thereby differing from *P. forpi.* Venter of each femur III with 2–3 comb rows. Abdominal structure and chaetotaxy close to that of *P. forpi,* differing as follows. Marginal tergal setae, while comparable quantitatively, including some much longer ones at least on IV–VI, extending across following 2 tergites. With 2–4 lateroanterior setae on each of tergites V–VIII. More dorsal setae between lateral very long setae on last segment, 16–20 (18.2). Variable number of comb rows

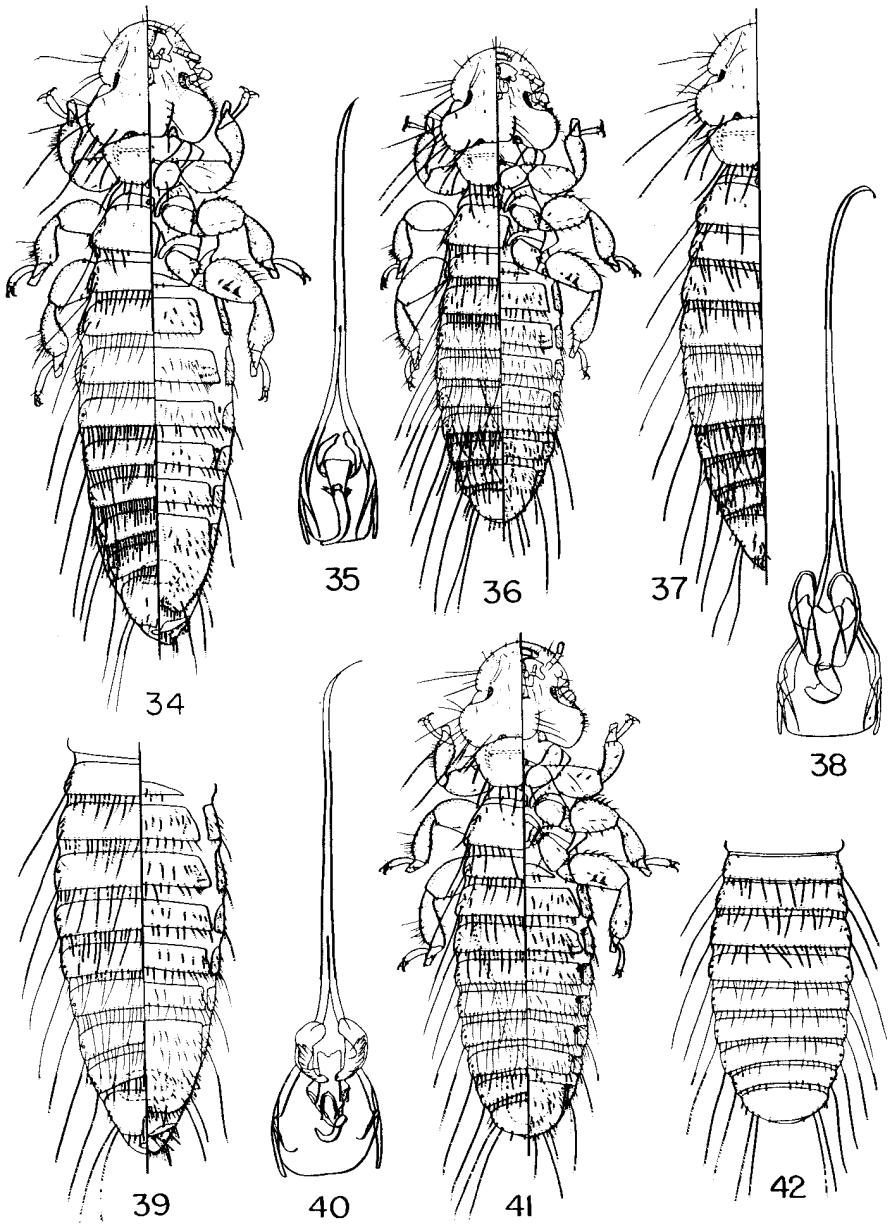

FIG. 34.—*Psittacobrosus forpi*, female (ex *Forpus coelestis*).
FIG. 35–37.—*P. brotogerisi*. 35, male genitalia (ex *Forpus coelestis*); 36, male (ex *F. coelestis*); 37, dorsal female.
FIG. 38.—*P. patagoni*, male genitalia.
FIG. 39–41.—*P. pyrrhurae*. 39, female abdomen; 40, male genitalia; 41, male.
FIG. 42.—*P. molinae*, dorsal male abdomen.

on sternite III, with from 2 on each side to 3 on each side. Posterior margin of vulva flat, not distinctly concave. Dimensions essentially as for *P. forpi*.

MALE.—Specimen from *Forpus coelestis* as in Fig. 36. Head and thorax as for female, except more variable number of marginal pronotal setae, 16–19. Abdomen quantitatively close to *P. forpi*, qualitatively as for female, with some much longer marginal tergal setae at least on IV–VI and with greater tendency for few lateroanterior setae on tergites V–VIII. Weakly developed internal pleural thickenings. Variable comb rows on sternite III; material from *Brotogeris* typically with 2 rows on each side, less often 3 on 1 side; material from *Forpus* with 3 on each side, less often 2 on 1 side. More setae on posterior portion of genital plate than for *P. forpi*, with about 10–15 between very long posterior submarginal setae and marginal row of sternite VIII. Genitalia (Fig. 35) distinctly different from both *P. anduzei* and *P. forpi*, but nearer to latter; essentially symmetrical except for pronounced apical bend in penis. Dimensions close to those of *P. forpi*.

Material Examined.—Holotype ♂, *Brotogeris jugularis*, El Bosque, La Guajira, Colombia, 20 June 1941, M. A. Carriker, Jr.; at USNM. 12 ♀, 10 ♂ paratypes, same data as holotype. Additionally, 1 ♂, *Amazona ochrocephala*, Colombia; 3 ♂, *Forpus coelestis*, Peru.

Psittacobrosus pyrrhurae, new species

(Fig. 39–41)

Type-host: *Pyrrhura picta* (P. L. S. Müller).

FEMALE.—Prosternum without longer setae. Margin of metanotum with 17–18 setae. Mesosternal plate with 2–3 longer setae; metasternal plate with 3–4 setae. Venter of each femur III with only 2 comb rows. Abdomen as in Fig. 39. Marginal tergal setae, with lengths as shown: I, 26–31 (29.0); II–VI, 29–35 (31.6); VII, 28–31 (29.8); VIII, 17–22 (19.7); total on I–VIII, 225–251 (234.3). Usually without anterior tergal setae. Tergites VII–VIII bipartite. Postspiracular setae very long on I–VIII. Last tergite deeply indented at midline, with 6–10 (8.0) medium inner posterior setae; median terminal dorsal plate wider than long. Sternal setae close to those of *P. forpi*, but with only 2 comb rows on each side of sternite III, less often 3 on 1 side only. Posterior margin of vulva flat, lateroposterior corners broadly rounded. Dimensions: preocular width 0.32–0.35, temple width 0.43–0.47, head length 0.32–0.34, prothorax width 0.33–0.37, metathorax width 0.45–0.50, total length 1.94–2.12.

MALE.—As in Fig. 41. Prosternum with 0–1 longer setae. Margin of metanotum with 16–19 setae. Mesosternal plate with 2–3 longer setae; metasternal plate with 4–6 setae. Venter of each femur III with only 2 comb rows. Marginal tergal setae: I, 25; II–VI, 26–31; VII, 22–26; VIII, 17–19; total on I–VIII, 205. Usually without anterior tergal setae. Postspiracular setae very long on I–VIII. Last tergite with 2 medium inner posterior setae; no anterior setae. Pleura with well-developed internal thickenings. Sternal setae on I–VIII near to *P. forpi;* sternite III with only 2 comb rows on each side; posterior portion of genital plate as for *P. brotogerisi*. Genitalia (Fig. 40) basically symmetrical, except for uniquely bent penis, varying from as in Fig. 40 to near to that of Fig. 38; endomeral plate broadly rounded. Dimensions close to those of female, except total length 1.68–1.70, genitalia length 0.70–0.74, genitalia width 0.15.

This species is best separated from *P. forpi, P. brotogerisi,* and *P. anduzei* by the smaller number of marginal tergal setae in both sexes, the female by the flattened posterior vulval margin and only 2 femoral comb rows, and the male by the genitalia and well-developed internal pleural thickenings.

Material Examined.—Holotype ♂, *Pyrrhura subandina* = *P. picta*, Guamalito, Santander N., Colombia, 14 June 1943, M. A. Carriker, Jr.; at USNM. 4 ♀, 3 ♂ paratypes, same data as holotype; 3 ♀ paratypes, *P. subandina*, Nazaret, Bolivar, Colombia, 7 Mar. 1949, M. A. Carriker, Jr. Also, 2 ♀, *Brotogeris cyanoptera* (Salvadori), Colombia.

Psittacobrosus molinae, new species

(Fig. 42)

Type-host: *Pyrrhura molinae* (Massena and Souancé).

FEMALE.—Closest to *P. pyrrhurae*, differing as follows. Metanotum marginally with only 15 setae. Fewer marginal tergal setae on I–VIII, respectively, 22, 27, 27, 26, 25, 26, 25, and 13; total on I–VIII, 191; tergocentral setae shorter on all segments, rarely extending to bases of setae of following tergite, much as for male (Fig. 42).

MALE.—Likewise closest to *P. pyrrhurae*, differing in the same ways as female. Fewer and shorter marginal tergal setae on I–VIII, respectively, 20, 26, 26, 28, 25, 26, 22, and 13; total on I–VIII, 186, as in Fig. 42.

Material Examined.—Holotype ♂, *Pyrrhura molinae*, Samaipata, Bolivia, 4 Nov. 1937, M. A. Carriker, Jr.; at USNM. 1 ♀ paratype. *P. molinae*, Bolivia, M. A. Carriker, Jr. Also, 1 ♀, *P. frontalis* (Vieillot), Brazil.

Psittacobrosus patagoni, new species

(Fig. 38, 45, 46)

Type-host: *Cyanoliseus patagonus* (Vieillot).

FEMALE.—As in Fig. 45. Prosternum without longer setae. Margin of metanotum with 15 setae, mostly long. Mesosternal plate with 3 longer setae; metasternal plate with 6–8 setae. Venter of each femur III with 3 comb rows. Marginal tergal setae: I–IV, 21–23; V–VI, 24–25; VII, 20; VIII, 12–13; total of 170–171 on I–VIII. With medium to long anterior setae across tergites II–VIII: II, 9–10; III, 12–16; IV, 7–10; V, 6–7; VI, 4–6; VII, 4–7; VIII, 2. No conspicuous division of tergites I–VIII, but VIII questionably bipartite. Postspiracular setae very long on I–VIII. Last tergite deeply indented at midline, with 8 inner posterior setae. Terminal median plate slightly wider than long. Sternal setae quantitatively

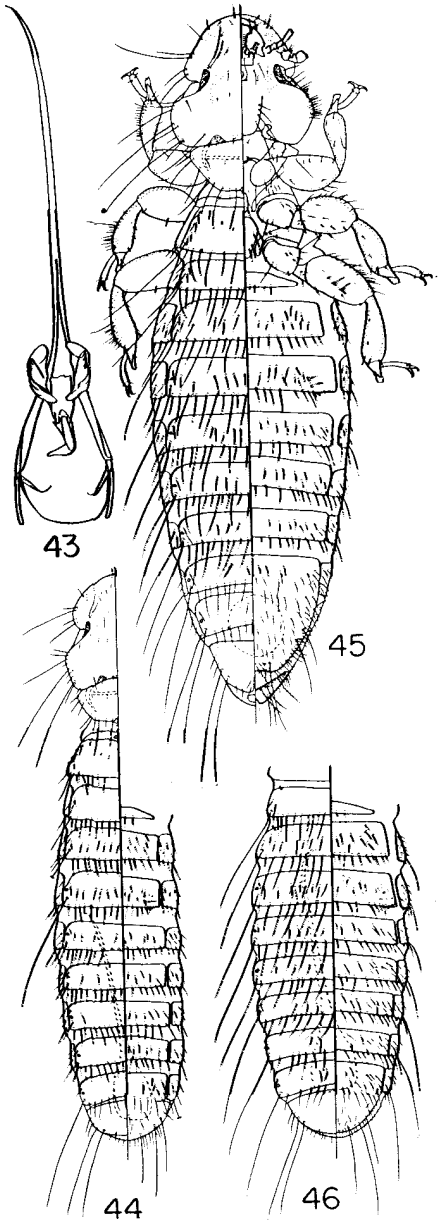

FIG. 43, 44.—*Psittacobrosus aratingae*. 43, male genitalia; 44, male.
FIG. 45, 46.—*P. patagoni*. 45, female; 46, male abdomen.

as for *P. anduzei*. Sternite III with 3 comb rows on each side. Posterior margin of vulva flat. Rather large and diffuse internal structure of genital chamber. Dimensions: preocular width, 0.38; temple width, 0.49–0.50; head length, 0.39–0.41; prothorax width, 0.37–0.39; metathorax width, 0.50–0.51; total length, 2.25–2.35.

MALE.—Chaetotaxy essentially as for female. Prosternum with 0–1 longer setae. Margin of metanotum with 14–15 mostly long setae. Mesosternal plate with 3–4 longer setae. Venter of each femur III with 2–3 comb rows. Slightly fewer marginal tergal setae: I, 20; II–VI, 18–22; VII, 17; VIII, 12–13; total of 146–148 on I–VIII. Anterior tergal setae across II–VIII: II, 11–13; III, 15–17; IV, 8–13; V–VI, 6–8; VII–VIII, 3–5 (Fig. 46). Last tergite without anterior setae, with 2–3 short inner posterior setae. Sternite III with 2–3 comb rows on each side. Genitalia (Fig. 38) with broad flattened endomeral plate, and stout penis abruptly bent to one side. Dimensions: preocular width 0.37, temple width 0.48–0.49, head length 0.37–0.40, prothorax width 0.35, metathorax width 0.44–0.45, total length 1.89–1.93, genitalia length 0.83–0.85, genitalia width 0.16.

The tergal chaetotaxy of both sexes, with the presence of anterior setae medioanteriorly on II–VIII, along with the unique male genitalia, easily distinguishes *P. patagoni* from *P. forpi*, *P. brotogerisi*, *P. pyrrhurae*, *P. molinae*, and *P. anduzei*.

Material Examined.—Holotype ♂, *Cyanoliseus patagonus byroni* (J. E. Gray), Angol. Chile, 29 June 1954, D. S. Bullock; at USNM. 2 ♀, 1 ♂ paratypes, same data as holotype.

Psittacobrosus aratingae, new species

(Fig. 43, 44)

Type-host: *Aratinga aurea* (Gmelin).

FEMALE.—Unknown.

MALE.—As in Fig. 44. Unusually short head setae in following dorsal positions: (1) postocular, (2) adjacent to middle very long temple seta, and (3) immediately lateral to occipital nodus. Pronotal margin with 16 setae, mostly short to medium; prosternum without longer setae. Margin of metanotum with 18 setae, most tending to be short to medium. Mesosternal plate with 4 longer setae; metasternal plate with 7 setae. Venter of each femur III with only 2 comb rows. Marginal tergal setae, with lengths as shown: 20, 21, 22, 22, 22, 21, 19, and 15, on I–VIII, respectively; total of 162 on I–VIII. With medium anterior setae on II–VI, respectively, 12, 14, 9, 5, and 3. Considerably shorter postspiracular setae on IV–VIII. Last tergite without anterior setae, with 2 short inner posterior setae. Sternal setae on I–VIII, respectively, 5, 29, 25, 35, 29, 27, 31, and 27. Only 2 comb rows on each side of sternite III. Genitalia (Fig. 43) close to those of *P. pyrrhurae*, with rounded endomeral plate, and sharply deflected apical portion of penis. Dimensions: preocular width 0.30, temple width 0.38, head length 0.32, prothorax width 0.31, metathorax width 0.38, total length 1.90, genitalia length 0.74, genitalia width 0.15.

The presence of anterior setae across certain tergites allies this species with *P. patagoni*. However, distinctive head chaetotaxy, short postspiracular setae on IV–VII, and qualitative and quantitative aspects of other chaetotaxy, along with the type of male genitalia, easily separate *P. aratingae* from all other known species of the *anduzei*-group.

Material Examined.—Holotype ♂, *Aratinga canicularis aurea*, Chatarona, Bolivia, 20 Sept. 1934, M. A. Carriker, Jr.; at USNM.

KEY TO THE SPECIES OF *Psittacobrosus*

MALE

1. Posterior margin of each femur III with at least 3–4 setae, usually more; genitalia (Fig. 23, 25, 27) essentially symmetrical, with evenly rounded endomeral plate, usually slender barbed penis often slightly bent at tip, and genital sclerite at each side of penis base as in Fig. 26 2
   Posterior margin of each femur III usually with only 2, less often 3, setae; genitalia either basically symmetrical (Fig. 3, 11, 15, 17, 19) and with genital sclerite at each side of penis base as in Fig. 2, or markedly asymmetrical in some part (Fig. 30, 32, 35, 38, 40, 43) 5
2. With longer prosternal setae; tergocentral setae of posterior segments fairly short and uniform in length on each segment 3
   Without longer prosternal setae; tergocentral setae of at least 1 posterior segment with much longer among shorter setae 4
3. Short postspiracular setae on IV–V; more than 40 anterior setae on tergite III (Fig. 24) ..... *carrikeri*, n. sp.
   Very long postspiracular setae on IV–V; fewer than 40 anterior setae on tergite III (Fig. 28) ..... *chloropterae*, n. sp.
4. Tergocentral setae of VIII all thinner basally than corresponding setae of VII; longer median tergocentral setae of VIII usually not much over twice length of shorter and not reaching end of abdomen (Fig. 21) ..... *farinosae*, n. sp.
   Tergocentral setae of VIII with at least some of same thickness as corresponding setae of VII; longer median tergocentral setae of VIII much longer than shorter setae, or, less often all long extending to or beyond tip of abdomen (Fig. 13, 14) ..... *amazonicus* Carriker
5. With 8–15 anterior tergal setae across each of II–IV and short postspiracular setae on IV–VII (Fig. 44); genitalia as in Fig. 43 ..... *aratingae*, n. sp.
   With or without anterior setae across all of tergites II–IV; postspiracular setae very long on IV–VII; genitalia usually otherwise 6
6. With 5 or more anterior setae evenly distributed across each of tergites II–V; genitalia as in Fig. 38 ..... *patagoni*, n. sp.
   Either without such anterior tergal setae on II–V or genitalia markedly different 7
7. With 5 or more anterior setae distributed across each of tergites V–VIII 8
   Either without anterior setae on tergites V–VIII, or with fewer than 5 setae on each, or, if more, arranged primarily laterally 11
8. Genitalia with rounded endomeral plate and long slender parameres (Fig. 19) ..... *genitalis* Carriker
   Genitalia with narrowed, flattened endomeral plate and shorter parameres (Fig. 3, 17) 9
9. Genitalia as in Fig. 17, with comparatively straight parameres and broadly flattened posterior margin of endomeral plate ..... *rubrogenysi*, n. sp.
   Genitalia essentially as in Fig. 3, with inwardly curved parameres and narrower flatly concave posterior margin of endomeral plate 10
10. Posterior portion of genital plate with only up to 6 setae between submarginal posterior very long setae and row representing marginal setae of sternite VIII (Fig. 10) ..... *byacinthini*, n. sp.
    Posterior portion of genital plate with 8 or more setae in this position (Fig. 6) ..... *burmeisteri* (Kellogg)
    kelloggi Carriker
11. Genitalia as in Fig. 11, 15, essentially symmetrical, with genital sclerites on either side of penis base as in Fig. 2 12
    Genitalia with pronounced asymmetry of endomeral plate and/or penis (Fig. 30, 32, 35, 40) 13
12. Tergites II-VI each with fewer than 25 marginal setae (Fig. 16); genitalia with rounded endomeral plate (Fig. 15) ..... *mitratae*, n. sp.
    Some to all of tergites II-VI each with 25 or more marginal setae; genitalia with flatly convex endomeral plate (Fig. 11) ..... *ambiguus* Carriker
13. Tergocentral setae on IV–VI with some very long, extending across following 2 tergites; genitalia symmetrical, except for penis as in Fig. 35 ..... *brotogerisi*, n. sp.
    Longer tergocentral setae on IV–VI typically not extending across more than 1 tergite; genitalia otherwise (Fig. 30, 32, 40) 14
14. Tergite I with 28 or more marginal setae, II with 32 or more; genitalia large, with asymmetrical endomeral plate (Fig. 32) ..... *anduzei* (Stafford)
    Tergite I with fewer than 28 marginal setae, II with fewer than 32; genitalia smaller, with fairly symmetrical rounded endomeral plate (Fig. 30, 40) 15
15. More than 30 marginal tergal setae on each of V–VII; genitalia basically asymmetrical, as in Fig. 30 ..... *forpi* Carriker
    Fewer than 30 marginal tergal setae on each of V–VII; genitalia symmetrical, except for penis near to that of Fig. 40 16
16. Shorter marginal tergal setae, usually none on IV–VI reaching bases of setae of following segment; fewer marginal tergal setae on I, about 20, and VIII, about 13 (Fig. 42) ..... *molinae*, n. sp.
    Longer marginal tergal setae, with some on IV–VI reaching slightly beyond bases of setae of following segment; more marginal tergal setae on I, 22 or more, and VIII, 17 or more (Fig. 41) ..... *pyrrhurae*, n. sp.

FEMALE

(exclusive of *carrikeri*, *chloropterae*, and *aratingae*)

1. Posterior margin of each femur III with at least 3–4 setae; tergites IV–VIII with at least pale median areas indicating tripartite state 2
   Posterior margin of each femur III usually with only 2, less often 3, setae; tergites IV–VIII either without indication of division or with posterior tergites at least weakly divided at midline 3
2. Median tergocentral setae on III markedly longer than those laterally (Fig. 22); up to 15 marginal tergal setae on VIII ..... *farinosae*, n. sp.
   Median tergocentral setae on III not markedly longer than those laterally (Fig. 12); with 16 or more marginal tergal setae on VIII ..... *amazonicus* Carriker
3. With 5 or more anterior setae across each of tergites II–V (Fig. 45) ..... *patagoni*, n. sp.
   Without anterior setae across all of tergites II–V 4
4. Prosternum with at least 1 longer seta 5
   Prosternum without longer setae 6
5. Tergocentral setae on each of IV–VI including some longer setae extending well beyond following tergite (Fig. 37) ..... *brotogerisi*, n. sp.
   Tergocentral setae on each of IV–VI typically with no setae extending beyond following tergite (Fig. 31) ..... *anduzei* (Stafford)
6. Each of tergites VI–VII with 38 or more marginal setae (Fig. 34) ..... *forpi* Carriker

Each of tergites VI–VII with fewer than 35 marginal setae 7

7. With only 2 well-developed comb rows on each femur III and each side of sternite III (occasionally up to 1–3 setae in third row at several of these positions) 8
With 3 well-developed comb rows of 4 or more setae on each femur III and each side of sternite III (occasionally only 2–3 setae in third row at several, but not all, of these positions) 11

8. Each of segments IV–VI with about 8–10 longer tergocentral setae extending beyond following tergite (Fig. 39) ..... *pyrrhurae*, n. sp.
Some to all of segments IV–VI with fewer, if any, tergocentral setae approaching this length 9

9. Metasternal plate with 3 or more setae; mesosternal plate with 2 or more longer setae; fewer than 15 marginal tergal setae on VIII ..... *molinae*, n. sp.
Metasternal plate with only 2 setae; mesosternal plate with only 1 longer seta; more than 15 marginal tergal setae on VIII 10

10. Fewer than 26 marginal tergal setae on III ..... *mitratae*, n. sp.
More than 26 marginal tergal setae on III ..... *genitalis* Carriker

11. Very long submarginal setae of vulva as in Fig. 9, with 2 close together lateroposteriorly on each side of medioposterior setal cluster, 1 well removed lateroanteriorly 12
Very long submarginal setae of vulva as in Fig. 5, 8, with only 1 lateroposteriorly on each side of medioposterior setal cluster, 2 closer together lateroanteriorly 13

12. With 2 or more anterior setae distinctly mediad from spiracles on tergite IV, often 1 or more on V; prothorax width less than 0.38 ..... *rubrogenysi*, n. sp.
Usually without anterior setae distinctly mediad from spiracles on tergites IV–V (less often 1 on 1 side of IV); prothorax width more than 0.38 ..... *hyacinthini*, n. sp.

13. Medioposterior submarginal setal cluster of vulva well removed from posterior margin of vulva (Fig. 8) ..... *kelloggi* Carriker
Medioposterior submarginal setal cluster of vulva close to posterior margin of vulva (Fig. 5) 14

14. Mesosternal plate with only 1 longer seta; metasternal plate with only 2 setae; narrow preocular width, less than 0.35, and temple width, less than 0.48 (Fig. 20) ..... *genitalis* Carriker
Mesosternal plate with 2 or more longer setae; metasternal plate usually with 3 or more setae; wider preocular width, over 0.35, and temple width, over 0.48 15

15. Tergite I with 27 or more marginal setae, VIII with 24 or more; tergocentral setae on VIII with longer setae not over half again as long as shorter ..... *ambiguus* Carriker
With up to 27 marginal setae on tergite I, up to 24 on VIII; tergocentral setae on VIII with long setae about twice length of shorter (Fig. 1) ..... *burmeisteri* (Kellogg)

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