

## A Review of *Ciconiphilus* Bedford (Mallophaga : Menoponidae)<sup>1</sup>

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### Abstract

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Eight species of *Ciconiphilus* from the Ciconiiformes and Anseriformes are discussed and illustrated; two of these are newly described: *melanolophi* (type-host: *Gorsachius m. melanolophus*) and *cygni* (type-host: *Cygnus cygnus*). New synonymies include: *quadripustulatus* (Burm.) (= *maculipes* Gieb., *planiceps* Piag., *cingulatum* Piag.); *temporalis* (Piag.) (= *femoratum* Piag.); *decimfasciatus* (B. & L.) (= *nyctarde* Denny, *obscurum* Gieb., *castaneum* Piag., *boisduwali* Eichler, *doriabagla* Ansari). *C. matosi* (Tendeiro) is a new combination. A key is given to the species.

The genus *Ciconiphilus* Bedford, 1939, contains 14 recognized species of lice whose known distribution is limited to certain members of the host orders Ciconiiformes and Anseriformes. Since there has been no comprehensive systematic study of this genus and since many of the species are unrecognizable from the available descriptions, it is our purpose here to evaluate the status of all names pertaining to this genus, to redescribe all known species, to describe two new species, and to present a key for identification of these species. For this

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we have studied over 1,275 adult specimens of *Ciconiphilus* from 29 genera and 40 species of Ciconiiformes and 5 genera and 10 species of Anseriformes.

All specimens studied represent material mounted on slides. A value in parentheses following a statement of range is the mean. Measurements, where given, are in millimeters; consistent with our lack of reliance upon dimensions as a diagnostic feature, we give very few measurements, yet they may be readily calculated from the figures if desired. The host nomenclature follows that of Peters (1931). Unless stated to the contrary, descriptive details are restricted to lice from the type-host of the species under discussion.

### Genus *Ciconiphilus* Bedford

*Ciconiphilus* Bedford, 1939, *Onderstepoort J. Vet. Sci.* 12: 141. Type-species: *Colpocephalum quadripustulatum* Nitzsch.

*Anseriphilus* Eichler, 1944, *Dtsch. ent. Z.* 1943: 57. Type-species: *Colpocephalum pectiniventre* Harrison.

Bedford (1939), in describing this genus, offers characters of such a general nature as to be applicable to certain other menoponid genera: "Head about one-third or less wider than long. Forehead and temples rounded. On each side of the forehead in front of the eyes there is a broad slit. Eyes well developed. Mandibles with a single tooth. Oesophageal sclerite and glands well developed. Antennae four-jointed, the second segment with a large anterior expansion, the third constricted at the base. Prothorax with acute wings. Mesonotum short, separated from the metanotum by a suture; the latter with the lateral margins divergent. Legs, normal, the posterior femora with combs on the venter. Abdomen elongate-oval, with the apical segment rounded in both sexes. Tergites and sternites with well developed plates. Third sternite only with combs at the latero-posterior angles of the plate. Male genitalia with the basal plate rod-like."

We would add the following to this to characterize further all lice now considered as *Ciconiphilus*: (1) head relatively wide, with narrow preocular slit, not a wide notch; (2) 4 short to minute middorsal head setae; (3) all occipital setae long; (4) 3 very long marginal temple setae; (5) terminal antennal segment essentially globose, about as long as greatest width of second segment; (6) abdominal tergal plates on I-IX not divided medially; (7) postspiracular setae very long on I-VIII; (8) female with sternites VII-VIII fused; (9) vulva without lateral auxiliary row of hooked setae; (10) anus of female more or less oval, usually without inner setae; (11) females without obvious internal reticulate structure of genital chamber; (12) male genital sclerite with lateroposterior projections; and (13) little sexual dimorphism other than that associated with size, ventral terminalia, and certain features of abdominal chaetotaxy.

### *Ciconiphilus quadripustulatus* (Burmeister)

*Colpocephalum 4-pustulatum* Burmeister, 1838, *Handb. Ent.* 2: 438. Type-host:

*Ciconia alba* = *Ciconia ciconia ciconia* (L.).

*Menopon maculipes* Giebel, 1874, *Insecta Epizoa*: 298. Type-host: *Tantalus loculator* = *Mycteria americana* L. **New synonym.**

*Menopon Tantali* Giebel, 1874, *Insecta Epizoa*: 298. Nomen novum for *M. maculipes* Giebel.

*Menopon planiceps* Piaget, 1885, *Pediculines Suppl.*: 115. Type-host: *Ardea leucolopha* = *Tigriornis leucolopha* (Jardine)—probably error. **New synonym.**

*Menopon cingulatum* Piaget, 1885, *Pediculines Suppl.*: 153. Type-host: *Polyborus vulgaris*—error. **New synonym.**

**FEMALE.** As in Fig. 1. Head with well developed occipital and preocular nodi but weak associated carinae. Subocular comb row with 3-4 medium setae anterior to it. Esophageal sclerite much as in Fig. 13. Pronotum marginally with 5 long and 3 short setae on each side. Margin of metanotum with 16-17 setae; metasternal plate with 14-15. Marginal abdominal tergal setae, of several long among considerably shorter setae, number: I-IV, 21-27; V-VI, 19-22; VII, 13-17; VIII, 12. Tergites generally without anterior setae, although 1 or more may occasionally have 1-3 such setae. Last tergite (IX) with 2 very long and 1 medium setae laterally and 7-10 medium inner posterior setae. Sternites with medium setae: I, 6-11; II-III, 4+51; IV, 69-78; V, 61-69; VI, 54-60; VII, 42-47. Vulva with 21-23 medium marginal setae, 31-35 anterior setae of various lengths. Plate bordering ventral anus deeply cleft medially. Anus with 48-50 setae both dorsally and ventrally; 1 prominent inner seta on each side. Dimensions: preocular width, 0.49-0.50; temple width, 0.64-0.66; prothorax width, 0.44-0.45; total length, 2.27-2.32.

**MALE.** Head and thorax as for female. Abdomen as in Fig. 3. Chaetotaxy of tergites I-VIII differs from female principally in more numerous anterior setae: I, 5-7; II-IV, 13-23; V, 12-17; VI, 10-16; VII, 7-12; VIII, 3-5. Tergite IX with only 2 medium inner posterior setae (specimens from other series with up to 4). Genitalia (Fig. 2) with genital sclerite having pointed lateroposterior projections and short blunt median process; penis slender distally, unbarbed. Dimensions: preocular width, 0.46-0.48; temple width, 0.61-0.64; prothorax width, 0.40-0.42; total length, 2.03-2.18.

**REMARKS.** *Ciconiphilus planiceps* is represented by a single female at the British Museum (Natural History); Dr. Clay has compared this specimen with our description and found it to be conspecific with *C. quadripustulatus*, although some setal counts may fall outside of the ranges given by 1-2 setae. We have seen the male type-specimen of *C. cingulatus* and have found it to be conspecific with *C. quadripustulatus*. Unfortunately, the genitalia are distorted in position, but the lateroposterior points of the genital sclerite and the long slender unbarbed penis seem to agree with *C. quadripustulatus*; also, all other features of chaetotaxy and structure are similar. The type-host, given as a Falconiformes, is undoubtedly in error.

**MATERIAL.** 3 ♀ ♀, 7 ♂ ♂, *Ciconia c. ciconia*, Kenya, Palestine, New York (Zoo); 19 ♀ ♀, 14 ♂ ♂, *Mycteria americana* L., Brazil, Guatemala, U.S.A.; 2 ♀ ♀, 3 ♂ ♂, *Sphenorhynchus abdimii* (Lichtenstein), Africa; 14 ♀ ♀, 2 ♂ ♂, *Xenorhynchus a. asiaticus* (Latham), India; 2 ♀ ♀, 4 ♂ ♂, *Anastomus lamelligerus* Temminck, Africa; 2 ♀ ♀, 2 ♂ ♂, *A. oscitans* (Boddaert), India; 13 ♀ ♀, 4 ♂ ♂, *Dissoura e. episcopius* (Boddaert), India; 24 ♀ ♀, 1 ♂, *Ephippiorhynchus senegalensis* (Shaw), Africa; 1 ♂ (Type of *Menopon cingulatum*), *Polyborus vulgaris*—error.

### *Ciconiphilus temporalis* (Piaget)

*Menopon temporale* Piaget, 1880, *Pediculines*: 487. Type-host: *Leptoptilus argala* = *Leptoptilos dubius* (Gmelin).

*Colpocephalum femoratum* Piaget, 1885, *Pediculines Suppl.*: 124. Type-host: *Mycteria americana* L. — perhaps error (see Clay 1951, p. 180). **New synonym.**

**FEMALE.** As in Fig. 6. Differs from *C. quadripustulatus* as follows. Head with well developed carinae. Pronotal seta 3 longer. Prosternum usually with 2 (less often 1 or 3) longer median setae in addition to usual pair of short setae. Metanotal margin with 10-18 (12.6) setae; metasternal plate with 9-17 (13.6). Marginal abdominal tergal setae: I, 18-23; II-V, 20-27; VI, 17-20; VII, 14-19; VIII, 8-12. Without anterior tergal setae. Tergite IX with 7-9 short inner posterior setae. Medium sternal setae: I, 12-18; II-III, 47-63; IV, 79-88; V, 65-77; VI, 55-63; VII, 41-49. Anus ventrally with 61-70 setae of varying lengths, including at least 15 longer slightly thicker setae, and dorsally with 54-58 setae, with 10 or so slightly longer; no inner setae.

**MALE.** As for female, except for some specimens with one or more of abdominal tergites I-VII each with 1-6 medium anterior setae, with total number for II-VII of 0-23 (9.7) (Fig. 5); for fewer (3-7) inner posterior setae on tergite IX; for slightly fewer sternal setae; and for

differences in terminalia. Genitalia (Fig. 4) with genital sclerite close to *C. quadripustulatus*, but with broader penis with a semicircular transverse heavily pigmented line across the median portion (Fig. 7).

REMARKS. Dr. Clay has kindly remounted and examined the types of *Ciconiphilus femoratus* and found that there is little doubt that the male is *C. temporalis*, although the details of the genitalia are not very clear. The male lectotype has a total of 4 anterior setae on tergites II-VII and the paratype male 18 such setae, both of which are consistent with *C. temporalis*.

MATERIAL. 5 ♀ ♀, 5 ♂ ♂, *Leptoptilos dubius*, **Burma, India** (Zoo); 7 ♀ ♀, 1 ♂. *L. javanicus* (Horsfield), **India, Java**.

#### *Ciconiphilus africanus* Bedford

*Ciconiphilus africanus* Bedford, 1939, *Onderstepoort J. Vet. Sci.* 12: 143. Type-host: *Ephippiorhynchus senegalensis* (Shaw).

FEMALE. Apparently indistinguishable from *C. temporalis*.

MALE. As for *C. temporalis*, except for usually a few more anterior tergal setae on abdominal segments II-VII — a total of 32-35 (33.3) on type-host specimens and 20-37 (29.6) on all specimens available — and for differences in the penis (Fig. 8); penis distinctly shorter, lacking transverse pigmented median line, but with slight projection near distal third, giving an irregular appearance in lateral view.

MATERIAL. 1 ♀, 3 ♂ ♂, *Ephippiorhynchus senegalensis*, **West Africa** (London Zoo) — lice bearing same data as specimens used by Bedford (1939) for *C. africanus*; 3 ♀ ♀, 4 ♂ ♂, *Leptoptilos crumeniferus* (Lesson), **Africa**; 4 ♀ ♀, 2 ♂ ♂, *Balaeniceps rex* Gould, Zoo.

#### *Ciconiphilus matosi* (Tendeiro), new combination

*Colpocephalum matosi* Tendeiro, 1958, *Publ. cult. Cia. Diamant. Angola* No. 40: 92. Type-host: *Ibis ibis* (L.).

FEMALE. In general resembles *C. quadripustulatus* (Fig. 1), except for terminal segments (Fig. 15). Specimen from type-host with tergal and sternal setal numbers at or slightly below lower values given for *C. quadripustulatus*; however, the series from *Ibis leucocephalus* (Pennant) overlaps the counts of lice from both *I. ibis* and *Ciconia ciconia* and points up the inadequacy of these for separation. Tergocentral setae on VIII relatively short; last segment with only 1 very long seta on each side, with only 4 short inner posterior setae (lice from *I. leucocephalus* with up to 8), and with small detached tergal plate lateroposteriorly. Anus essentially as for *C. temporalis*, except for only 44-50 setae in each fringe. Head approximately 0.08 narrower than preceding species; otherwise, in size, as for *C. quadripustulatus*.

MALE. Head and thorax as for female. Abdominal chaetotaxy close to *C. quadripustulatus* (Fig. 3), but without anterior setae on tergite VIII. Principal difference from all preceding species concerns genitalia (Figs. 14A-B); genital sclerite with broad median process and each lateroposterior projection with a cleft tip resulting in 2 short apical points (Fig. 14B); penis with distinct apical barbs.

REMARKS. This and the preceding 3 species are restricted in their known distribution to the family Ciconiidae, the storks. The only records we have of these lice outside of this family are Piaget's specimens of *C. planiceps* from *Tigriornis leucolopha* (Ardeidae) and *C. cingulatus* from *Polyborus vulgaris* (Falconidae), as well as some zoo specimens from *Balaeniceps rex* (Balaenicipitidae), all of these perhaps representing hosts not normally parasitized by these lice. Of the 17 species of storks, we have found 13 to be infested with species of *Ciconiphilus*. Only *Ephippiorhynchus senegalensis* is apparently parasitized by 2 species of this genus, although all specimens we have of *C. africanus* from this host are from zoo birds and may represent stragglers to this host species. *Ciconiphilus matosi* is of particular interest since its general structure and chaetotaxy are so close to *C. quadripustulatus* and related lice, yet the male genitalia

are quite close to those of the otherwise-divergent 2 species found on the Anseriformes.

**MATERIAL.** 1 ♀, 1 ♂, *Ibis ibis*, **Belgian Congo**; 133 ♀ ♀, 136 ♂ ♂, *I. leucocephalus*, **India, Thailand**.

***Ciconiphilus decimfasciatus* (Boisduval and Lacordaire)**

*Liotheum 10-fasciatum* Boisduval and Lacordaire, 1835, *Faune ent. Environs Paris*: 123. Type-host: Le héron = *Ardea cinerea cinerea* L.

*Colpocephalum importunum* Denny, 1842, *Mon. Anopl. Brit.*: 199, 214. Type-host: *Ardea cinerea* L.

*Colpocephalum nyctarde* Denny, 1842, *Mon. Anopl. Brit.*: 199, 215. Type-host: *Ardea Nycticorax* = *Nycticorax nycticorax nycticorax* (L.). **New synonym.**

*Colpocephalum obscurum* Giebel, 1874, *Insecta Epizoa*: 273. Type-host: *Ardea egretta* = *Casmerodius albus egretta* (Gmelin). **New synonym.**

*Menopon sulcatum* Piaget, 1880, *Pediculines*: 485. Type-host: *Ardea egretta* = *Casmerodius albus egretta* (Gmelin).

*Colpocephalum importunum* var. *major* Piaget, 1880, p. 549 (nec p. 519), *Pediculines*: 549. Type-host: *Ardea garcetta* = *Egretta garzetta* (L.).

*Colpocephalum trochioxum* var. *minor* Piaget, 1885 (nec *C. minus* Piaget, 1880), *Pediculines Suppl.*: 128. Type-host: *Ardea russata* = *Bubulcus ibis* (L.).

*Colpocephalum castaneum* Piaget, 1885, *Pediculines Suppl.*: 153. Type-host: *Cygnus atratus* = *Chenopsis atrata* (Latham) — probably error. **New synonym.**

*Colpocephalum laticeps* Kellogg, 1896, *Proc. Calif. Acad. Sci.* (2) 6: 149. Type-host: *Ardea egretta* = *Casmerodius albus egretta* (Gmelin).

*Colpocephalum veratrum* Kellogg, 1910, *Wiss. Ergebn. schwed. Zool. Exped. Kilimandjaro* 3 (15): 52. Type-host: *Ardea (Herodias) alba* = *Casmerodius albus melanorhynchus* (Wagler).

*Colpocephalum tamamurensis* Uchida, 1926, *J. Coll. Agric. Tokyo* 9: 37. Type-host: *Nycticorax nycticorax nycticorax* (L.).

*Colpocephalum boisduvali* Eichler, 1937, *S.B. Ges. naturf. Fr. Berl.* 1937: 96. Nomen novum for *major* Piaget, 1880, p. 549 (nec p. 519). **New synonym.**

*Pseudocolpocephalum doriabagla* Ansari, 1951, *Proc. nat. Inst. Sci. India* 17: 154. Type-host: *Bubulcus ibis coromandus* (Boddaert). **New synonym.**

**FEMALE.** As in Fig. 12. Head with weakly developed occipital nodi and associated carinae; subocular comb row preceded by only 1-2 medium setae. Remainder of head and prothorax as for *C. quadripustulatus*. Margin of metanotum with 10 long setae; metasternal plate with 8-10 setae. Abdominal tergites I-VII each with 11-15 medium to very long marginal setae; VIII with 8. Sparse short to medium anterior setae: I, 0-2; II-IV, 2-6; V, 1-2; VI, 0-2; VII, 0-1; VIII, 0; total number of anterior setae on II-VI of 7-18 (12.3). Last tergite with 1 very long lateral seta preceded by 1-2 short setae and with 1, less often 2-3, inner posterior setae on each side. Abdominal sternites with short to medium setae: I, 4-6; II-III, 22-31; IV, 37-52; V-VI, 28-41; VII, 29-35. Margin of vulva with 9-14 setae, anteriorly with 22-33. Plate bordering ventral anus not indented medially. Anal fringes of 31-37 ventral and 23-36 dorsal setae, all short and of fairly uniform length; no inner setae. Dimensions: preocular width, 0.42-0.44; temple width, 0.57-0.58; prothorax width, 0.36-0.38; total length, 1.89-2.03.

Specimens from hosts other than the type-host show occasional departures from the above-cited ranges; however, none of these is consistent enough to enable specific or sub-specific differentiation. Principal deviations for certain specimens consist of (1) up to 16-20 marginal tergal setae on some of abdominal segments II-VII, (2) up to 4 more anterior tergal setae on some of segments II-VI, (3) occasionally a few more anal setae in one or the other fringe, and (4) somewhat smaller dimensions. The total of anterior setae on tergites II-VI for a composite of 142 females representing various hosts ranges from 3-26 (12.3), with only 1 specimen showing 3 and 4 with 4.

MALE. Head and thorax as for female. Abdominal setae with lengths essentially as for female, but with fewer anterior tergal setae (I, 0; II, 0-3; III, 1-3; IV, 1-4; V-VI, 0-1; VII-VIII, 0) and with 2 very long lateral setae on each side of tergite IX. Genitalia (Fig. 11) with elongate genitalic sclerite having pair of prominent lateroposterior points and a rounded median process; penis (Fig. 10) elongate, slender, with almost straight basal margin and evenly rounded apical bend. Dimensions slightly smaller than for female: preocular width, 0.40-0.41; temple width, 0.51-0.53; prothorax width, 0.33-0.34; total length, 1.64-1.70.

Males from the other series showed only minor deviations from the above quantitative data, having no known significant means for separation from the type-host series.

REMARKS. This species, together with the closely related new species *C. melanolophi*, represents the only *Ciconiphilus* known from the family Ardeidae, the bitterns and herons. That we have examined specimens of *C. decimfasciatus* from 16 genera and 22 species of Ardeidae and *C. melanolophi* from an additional 3 genera and 5 species attests to the widespread distribution of these lice among this host family.

MATERIAL. 10 ♀♀, 7 ♂♂, *Ardea c. cinerea*, **England**; 11 ♀♀, 3 ♂♂, *A. purpurea* L., **France, Fr. Cameroun, India**; 1 ♀, 3 ♂♂, *A. cocoi* L., **Trinidad**; 87 ♀♀, 32 ♂♂, *A. herodias* L., **U.S.A., Canada**; 2 ♂♂, *Notophoxyx picata* (Gould), London Zool. Gdns.; 56 ♀♀, 30 ♂♂, *Florida caerules* (L.), **U.S.A.**; 4 ♀♀, 5 ♂♂, *Ardeola ralloides* (Scopoli), **Senegal**; 5 ♀♀, 2 ♂♂, *A. bacchus* (Bonaparte), **Thailand**; 2 ♀♀, 3 ♂♂, *A. idae* (Hartlaub), **Madagascar**; 3 ♀♀, *Ardeola* sp., **Thailand**; 27 ♀♀, 25 ♂♂, *Bubulcus ibis*, **Thailand, Formosa, Egypt, Israel, Maldive Islands**; 4 ♀♀, 2 ♂♂, *Melanophoxyx ardesiaca* (Wagler), **Madagascar**; 10 ♀♀, 8 ♂♂, *Dichromanassa rufescens* (Gmelin), **U.S.A.**; 69 ♀♀, 40 ♂♂, *Casmerodius albus* (L.) (including ♀ and ♂ types of *Colpocephalum veratrum* Kellogg), **U.S.A., Mexico, Nicaragua, Madagascar**; 9 ♀♀, 6 ♂♂, *Egretta garzetta*, **Japan, Formosa, Bechuanaland, N. Rhodesia**; 2 ♀♀, 1 ♂, *Demigretta gularis* (Bosc), **Port Sudan**; 2 ♀♀, *D. sacra* (Gmelin), **Australia**; 39 ♀♀, 23 ♂♂, *Mesophoxyx intermedia* (Wagler), **Japan**; 15 ♀♀, 2 ♂♂, *Leucophoxyx thula* (Molina), **U.S.A.**, London Zool. Gdns.; 16 ♀♀, 8 ♂♂, *Hydranassa tricolor ruficollis* (Gosse), **U.S.A., Trinidad**; 45 ♀♀, 24 ♂♂, *Nycticorax nycticorax*, **Japan, Thailand, Israel, Egypt, Panama**; 8 ♀♀, 3 ♂♂, *Nyctanassa violacea* (L.), **U.S.A., Cuba**; 6 ♀♀, 6 ♂♂, *Botaurus lentiginosus* (Montagu), **U.S.A., Trinidad**; 1 ♀, 1 ♂, *Sturnus cineraceus* Temminck, **Japan** (probably host error); 1 ♀, 1 ♂ (paratypes of *Colpocephalum castaneum* Piaget), *Cygnus atrata* (no data) — probably host error.

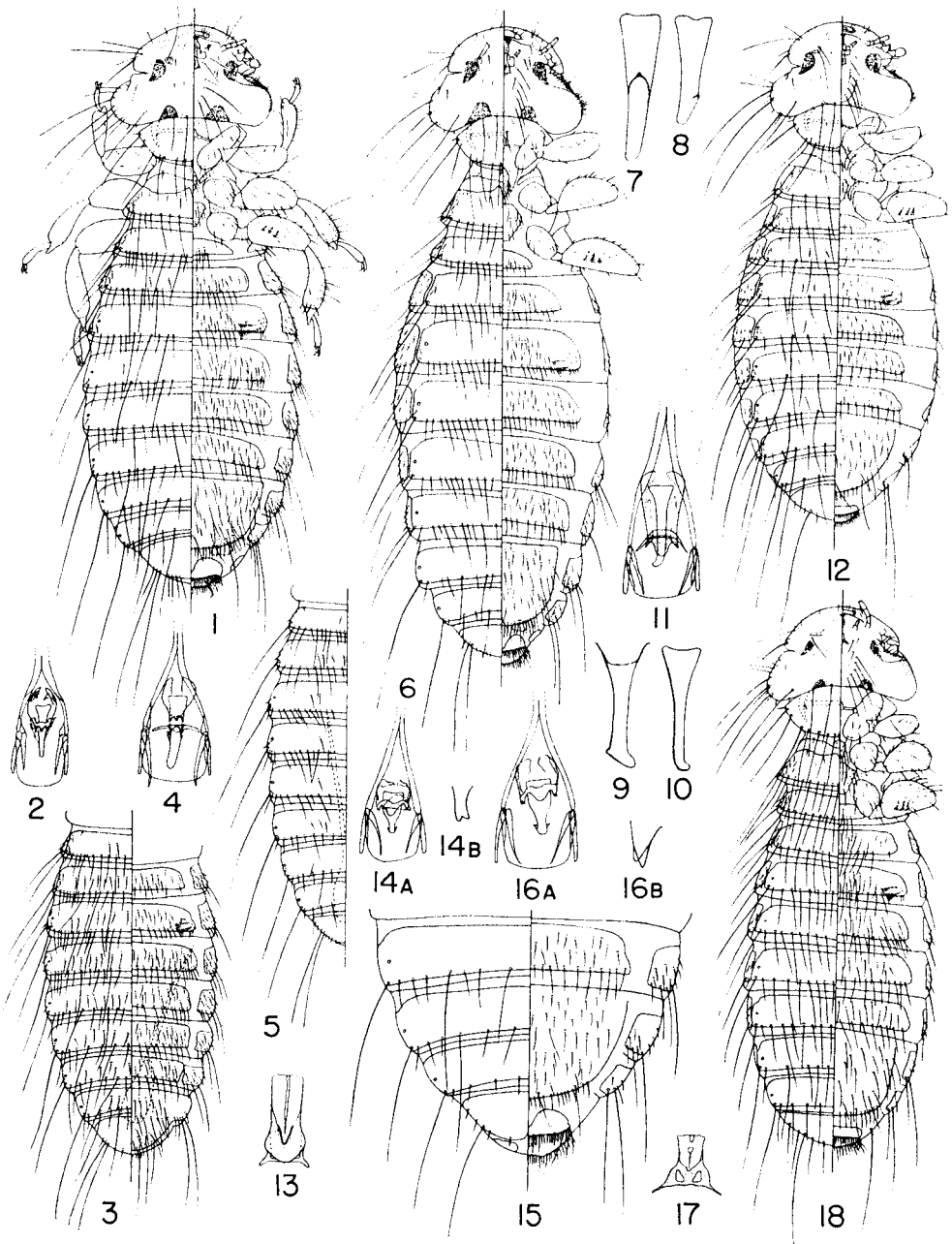
### *Ciconiphilus melanolophi*, new species

Type-host: *Gorsachius melanolophus melanolophus* (Raffles).

FEMALE. Very close to *C. decimfasciatus* (Fig. 12). Separable by having a total of only 0-2 (0.7) anterior setae on abdominal tergites II-VI, with half of specimens having none. All specimens from *Ardeola* and *Butorides* have only 0-1 such setae, with 26 of 28 specimens with none. Lice from *Ixobrychus* show 3 with 3 setae, 4 with 2, 1 with 1, and 2 with none. The 3 females from *Nyctanassa* have 1 seta each.

MALE. As for *C. decimfasciatus*, but with genitalic differences; penis (Fig. 9) with deeply concave basal margin and with heel-like projection at apical portion, best seen in lateral view.

REMARKS. Some of the material included within *C. melanolophi* has in the past undoubtedly been considered to be *C. decimfasciatus*. Only a study of good series of these closely related species from a number of hosts has enabled us to observe these differences and to verify their stability. Of further interest, where we have series of both species from the same host species (i.e., *Ardeola bacchus* and *Nyctanassa violacea*), *C. melanolophi* was obtained in a different collection than *C. decimfasciatus*. Apparently *C. melanolophi* represents the only



Figs. 1-18. Characters of *Ciconiphilus*. 1-3. *C. quadripustulatus* (Burm.): 1, female ( $\times 33$ ); 2, male genitalia ( $\times 61$ ); 3, male abdomen ( $\times 33$ ). 4-7. *C. temporalis* (Piag.): 4, male genitalia ( $\times 61$ ); 5, male dorsal abdomen ( $\times 33$ ); 6, female ( $\times 33$ ); 7, penis ( $\times 120$ ). 8. *C. africanus* Bedford, penis ( $\times 120$ ). 9. *C. melanolophi* n. sp., penis ( $\times 150$ ). 10-12. *C. decimfasciatus* (B. & L.): 10, penis ( $\times 150$ ); 11, male genitalia ( $\times 82$ ); 12, female ( $\times 33$ ). 13-15. *C. matosi* (Tend.): 13, esophageal sclerite ( $\times 155$ ); 14A, male genitalia ( $\times 78$ ); 14B, lateroposterior process of male genital sclerite; 15, female terminalia ( $\times 56$ ). 16-18. *C. cygni* n. sp.: 16A, male genitalia ( $\times 78$ ); 16B, lateroposterior process of male genital sclerite; 17, esophageal sclerite ( $\times 175$ ); 18, female ( $\times 33$ ).

*Ciconiphilus* known from birds in the genera *Butorides*, *Gorsachius*, and *Ixobrychus*.

**MATERIAL.** Holotype ♂ (at U.S. National Museum), 21 ♂, 33 ♀ paratypes, *Gorsachius m. melanophus*, **Thailand**: Khorat Sikiu, Musi Pu Khanun, 26 April 1953, R. E. Elbel, RE 1186, B-21004 Traub No. Additionally, 16 ♀ ♀, 9 ♂ ♂, *Butorides virescens* (L.), **U.S.A., Cuba, Trinidad, British West Indies**; 5 ♀ ♀, 3 ♂ ♂, *B. striatus* (L.), **Cuba, Thailand**; 3 ♀ ♀, *Ardeola grayii* (Sykes), **Thailand**; 4 ♀ ♀, 1 ♂, *A. bacchus*, **Thailand**; 3 ♀ ♀, 1 ♂, *Nyctanassa violacea*, **U.S.A.**; 14 ♀ ♀, 10 ♂ ♂, *Ixobrychus exilis* (Gmelin), **U.S.A.**

### *Ciconiphilus cygni*, new species

Type-host: *Cygnus cygnus* (L.).

**FEMALE.** Specimen from type-host as in Fig. 18. Head with weakly developed preocular and occipital nodi and associated carinae; temple region more angular and protruding somewhat posteriorly. Esophageal sclerite as in Fig. 17. Margin of pronotum with 1 short and 7-8 very long setae (occasionally 1 or 2 of these distinctly shorter, but still rather long). Margin of metanotum with 15-19 long to very long setae; several short medioanterior setae; metasternal plate with 10-15 setae. Predominantly long marginal tergal setae: I, 17-18; II-VI, 17-21; VII, 12-16; VIII, 10-11. Second marginal seta from outside long on both metanotum and abdominal tergite I, comparable to length of tergoventral setae; this second seta shorter on II-VI. No anterior tergal setae. Last segment with 2 very long lateral setae on each side and usually 4-5 long inner posterior setae. Medium to long sternal setae: I, 7-9; II-III, 23-39; IV, 47-51; V-VI, 33-44; VII, 25-32; sternite II with short detached marginal lateral seta. Vulva marginally with 14-18 medium setae, anteriorly with 18-23 long setae. Plate bordering ventral anus not indented medially. Anal fringes with 30-35 ventral and 21-32 dorsal rather short irregular setae; no inner setae. Dimensions: preocular width, 0.45-0.46; temple width, 0.57-0.60; prothorax width, 0.47-0.48; total length, 2.03-2.23.

**MALE.** Structure and chaetotaxy, except for ventral terminalia, much as for female. Genitalia (Figs. 16A-B) remarkably similar to those of *C. matosi* (Figs. 14A-B), but of slightly larger size and with each lateroposterior projection more deeply cleft, most often showing a blunter and a rather pointed tip on each side (Fig. 16B); penis distally barbed. Dimensions: preocular width, 0.44-0.45; temple width, 0.56-0.57; prothorax width, 0.43-0.44; total length, 1.95-2.03.

**REMARKS.** We had originally strongly suspected that our material from *Cygnus* and *Olor* represented specimens conspecific with *Ciconiphilus castaneus* (Piaget), whose type-host was reported as *Chenopsis atrata*, also a swan. However, a study of Piaget's type-specimens has shown *C. castaneus* to be a synonym of *C. decimfasciatus*, with the host designation undoubtedly in error.

**MATERIAL.** Holotype ♀ (at British Museum (Natural History)), 2 ♀, 3 ♂ paratypes, *Cygnus cygnus*, Silverdale, **Lancs.**, 19.i.1958, A. Hazelwood, Brit. Mus. 1958-96; paratypes from type-host: 8 ♀ ♀, 1 ♂, **Iceland**, May 1943, Meinertzhagen Collection, Slide 14862; 3 ♀ ♀, **S. Ulst.**, Nov. 1936, Meinertzhagen Collection, Slide 5426; 4 ♀ ♀, **Ireland**, 17.ix.1942, E. O'Mahony. Additionally, 8 ♀ ♀, 7 ♂ ♂, *C. olor* (Gmelin), **England, Ireland**; 5 ♀ ♀, 5 ♂ ♂, *Olor columbianus* (Ord), **U.S.A.**

### *Ciconiphilus pectiniventris* (Harrison)

*Menopon pectinatum* Neumann, 1912, *Arch. Parasit. Paris* 15: 368. Type-host: Oie domestica = *Anser anser domesticus*.

*Colpocephalum pect.niventre* Harrison, 1916, *Parasitology* 9: 53. Nomen novum for *Colpocephalum pectinatum* (Neumann, 1912) (nec Osborn, 1902).

*Colpocephalum pectiniventre parvum* Blagoveshtchensky, 1948, *Mag. Parasit., Leningr.* 10: 269. Type-host: *Anser anser* (L.).

**FEMALE.** Head and prothorax as for *C. cygni*. Margin of metanotum with 14-16 setae, all long except for short second seta from outside. Abdominal chaetotaxy close to *C. cygni*, but with (1) fewer marginal tergal setae on I, 11-13; II, 12-17; VI, 11-16; VII, 10-12; VIII,



8-9; (2) short second seta from outside on margin of tergite I; (3) only 2, less often 3, inner posterior setae on tergite IX, all much shorter than in Fig. 18; and (4) no short detached marginal seta on either side of sternite II.

MALE. Head and thorax as for female. Lengths and arrangement of abdominal setae similar to female, but with fewer marginal tergal setae: I-II, 12; III-IV, 12-14; V, 12-13; VI, 10-13; VII, 10; VIII, 8. Tergite IX with only 2 short to long inner posterior setae. Genitalia as for *C. cygni* (Figs. 16A-B).

REMARKS. The 2 recognized species of anseriform *Ciconiphilus* are each apparently limited to different subfamilies of hosts in the Anatidae, with *C. cygni* occurring only on the Cygninae, the swans, and *C. pectiniventris* on the Anserinae, the geese.

MATERIAL. 1 ♀, 3 ♂♂, *Anser anser*, U.S.A., Yorkshire; 3 ♀♀, *A. brachyrhynchus* Baillon, Ireland; 3 ♀♀, *A. albifrons* (Scopoli), U.S.A.; 1 ♀, 1 ♂, *Branta canadensis* (L.), U.S.A.; 1 ♀, *B. bernicla nigricans* (Lawrence), U.S.A.; 2 ♀♀, 2 ♂♂, *B. leucopsis* (Bechstein), Ireland; 1 ♀, *Chen hyperborea* (Pallas), U.S.A.

**Key to the Species of *Ciconiphilus***

1. Prosternum with 1-3 long median setae in addition to usual pair of minute setae (Fig. 6) ..... 2  
 Prosternum with only the usual pair of minute median setae ..... 3
2. Male with penis as in Fig. 7; female apparently indistinguishable from below ..... *temporalis* (Piaget)  
 Male with penis as in Fig. 8 ..... *africanus* Bedford
3. Female with 2 inner anal setae (Fig. 1); male with over 8 anterior setae on each of tergites II-VI (Fig. 3) and with genitalia as in Fig. 2 ..... *quadripustulatus* (Burmeister)  
 Female without inner anal setae; male either with fewer than 8 anterior setae on majority to all of tergites II-VI, or, if more, then genitalia as in Figs. 14A-B ..... 4
4. Most abdominal segments with few long among considerably shorter tergo-central setae (Fig. 12); lateral margins of head as in Fig. 12; esophageal sclerite as in Fig. 13 ..... 5  
 Abdominal segments with relatively uniform long tergo-central setae (Fig. 18); head as in Fig. 18; esophageal sclerite as in Fig. 17 ..... 7
5. Subocular comb row with 3-4 medium setae immediately anterior to it; female with small detached lateroposterior tergal plate on last segment; male genitalia as in Figs. 14A-B ..... *matosi* (Tendeiro)  
 Subocular comb row with not over 2 medium setae immediately anterior to it; female without detached lateroposterior tergal plates on last segment; male genitalia close to Fig. 11 ..... 6
6. Female with abdominal tergites II-VI having total of over 3 anterior setae; male genitalia with penis as in Fig. 10 ..... *decimfasciatus* (Boisduval and Lacordaire)  
 Female with abdominal tergites II-VI having only a total of 0-3 anterior setae; male genitalia with penis as in Fig. 9 ..... *melanolophi* n. sp.
7. Margin of metanotum and abdominal tergite I with second seta from outside long, essentially same length as tergo-central setae (Fig. 18) ..... *cygni* n. sp.  
 Margin of metanotum and abdominal tergite I with second seta from outside very short, much shorter than adjacent setae ..... *pectiniventris* (Harrison)

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