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The Genus *Meromenopon* (Mallophaga: Menoponidae) from the Coraciiformes (Aves)[1]

ROGER D. PRICE[2] AND K. C. EMERSON[3]

ABSTRACT

Four species of *Meromenopon* are recognized, described, and keyed. These include *M. marshalli*, a new species from *Merops leschenaulti* from Thailand and Burma. *M. concii* Tendeiro is placed in synonymy with *M. meropis* Clay and Meinertzhagen.

The genus *Meromenopon* Clay and Meinertzhagen contains a small assemblage of menoponid mallophagans restricted in their known distribution to the Bee-eaters (Meropidae) and Rollers (Coraciidae) of the avian order Coraciiformes. To date, 6 specific names have been applied to *Meromenopon*, these representing 4 recognized species. Since there has been no critical review of the members of this genus, it is our intent here to review the status of these names, to describe any new species found, and to present a key for specific identification.

Morphological terminology and numbers of certain head and prothoracic setae used here are essentially as given by Clay (1969). Measurements are in millimeters. The nomenclature of the hosts follows that of Peters (1945).

The species of *Meromenopon* may be characterized as being menoponids with the following features: Head with preocular notch; long occipital setae 21, 22, and 23, with alveoli in straight line; short marginal temple setae 24 and 25; alveoli of marginal temple setae 26 and 27 close together, with seta 26 much finer and shorter than 27; short mid-dorsal setae 17 and 18; without dorsal sensilla *c* or *d*; with at least 3 preocular setae on each side; without ventral spinous processes; with reduced hypopharynx (Fig. 1).

Pronotum typically with 12 long, 2 short marginal setae; inner central pronotal seta 2 much shorter than outer seta 1; prosternal plate well developed but without setae; with typical oblong postnotum; mesonotum with 4 medioanterior setae, paired close together on each side; tibiae II-III with patch of laterodorsal setae; venter of femur III with dense brush.

Abdominal tergites of essentially same length, undivided; post-

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[1] Paper No. 9522, Scientific Journal Series, Minnesota Agricultural Experiment Station, St. Paul, Minnesota 55108.

[2] Department of Entomology, Fisheries, and Wildlife, University of Minnesota, St. Paul, Minnesota 55108.

[3] 2704 North Kensington Street, Arlington, Virginia 22207.

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spiracular setae very long on I–VIII; last segment with 2 very long setae on each side; sternite I apparently absent; with well developed lateral brush on sternites IV–V, less developed on III and VI. Female with sternites VII–VIII apparently fused into subgenital plate, with row of short posterior marginal setae; anus oval, without inner setae. Male genitalia symmetrical, much as in Fig. 5, but with variable sclerites associated with small spiculate sac.

Little sexual dimorphism other than that associated with dimensions and terminalia.

Meromenopon meropis Clay and Meinertzhagen (Fig. 7)

Meromenopon meropis Clay and Meinertzhagen, 1941 (April), Ann. Mag. Nat. Hist. (11)7: 336. Type-host: *Merops apiaster* Linnaeus.

Tamaninia rara Conci, 1941 (September), Boll. Soc. Ent. Ital. 73: 106. Type-host: *M. apiaster*.

Meromenopon concii Tendeiro, 1961, Mem. l'Inst. Franc. d'Afr. Noire No. 62: 291. Type-host: *Melittophagus bulocki bulocki* (Vieillot). New synonymy.

Description: Much as in Fig. 2. With 3 preocular setae on each side (POS: Fig. 2). Subocular setae (Fig. 6) including 1 large seta usually barbed near base. Gular plate long, narrow (GP: Fig. 4), with 4–9 setae on each side in parallel rows. Prosternal plate (PP: Fig. 4) much longer than wide. Metanotum with 8 long, 2–4 short marginal setae; mesosternal plate (MSP: Fig. 4) triangular, with 1 long, 2 short setae; metasternal plate (MTP: Fig. 4) as shown, with 4, less often 5, setae. Marginal tergal setae: I, 8–17; II, 14–30; III–V, 15–39; VI, 14–36; VII, 13–27; VIII, 8–19. With 0–19 anterior setae on tergites II–VIII, 0 on I. Last tergite with 6–13 inner posterior setae for male, 4–5 for female. Pleurites II–IV with pronounced posterior projection at medioventral corner, not on II–V as shown in Fig. 2. Sternal setae: II, 10–16; III, 37–70; IV–V, 23–38 between brushes of 50 or so setae each; VI, 45–98; VII, 27–56; male VIII, 13–24; female subgenital plate with 14–27 marginal, 25–32 anterior setae; male subgenital plate with 6–9 setae. Female anal fringes ventrally with 41–54 setae, dorsally with 35–53. Male genitalia grossly as in Fig. 5, but with shallowly arched anterior sac sclerite and interrupted posterior sac sclerite (Fig. 7). Dimensions: preocular width, male 0.40–0.46, female 0.43–0.48; temple width, male 0.49–0.62, female 0.53–0.65; head length, 0.39–0.46; prothorax width, male 0.35–0.44, female 0.38–0.48; metathorax width, male 0.45–0.57, female 0.54–0.69; total length, male 1.80–2.21, female 2.12–2.82; male genitalia length 0.48–0.66, width 0.12–0.16.

Material: 6 ♂♂, 6 ♀♀ (including ♂♀ paratypes of *M. meropis*),

Merops apiaster, Afghanistan, Czechoslovakia, Egypt, Morocco; 1 ♂, 1 ♀, *M. nubicus* Gmelin, N. Cameroon; 6 ♂♂, 3 ♀♀, *M. orientalis* Latham, India, Sudan, Thailand; 2 ♂♂, 1 ♀, *M. ornatus* Latham, West Australia; 15 ♂♂, 15 ♀♀, *M. philippinus* Linnaeus, Burma, India, Thailand; 15 ♂♂, 11 ♀♀, *M. superciliosus* Linnaeus, Cyprus, Egypt, India, Philippines; 14 ♂♂, 12 ♀♀, *M. viridis* Linnaeus, India, Malaysia, Philippines, Thailand; 3 ♂♂, 3 ♀♀, *Melittophagus bulocki*, Ghana, Nigeria; 3 ♂♂, 5 ♀♀, *M. pusillus* (P. L. S. Müller), N. Rhodesia, Transvaal; 2 ♂♂, 5 ♀♀, *Dicrocercus hirundineus* (A. A. H. Lichtenstein), Mozambique, Rhodesia.

Meromenopon **marshalli** n. sp.

(Figs. 1–6)

Description: Male as in Fig. 2; female differing principally in details of terminalia (Fig. 3). Much as for *M. meropis*, except as follows. Marginal tergal setae: I, 15-23; II, 26-35; III-V, 25-49; VI, 20-37. Pleurites II-V with pronounced posterior projection at medioventral corner. Sternal setae: III, 58-100; IV-V, 30-60 between brushes; VI, 66-120; VII, 43-66; female subgenital plate with 27-36 anterior setae. Female anal fringes ventrally with 44-61 setae. Male genitalia (Fig. 5) with deeply arched anterior sac sclerite and continuous posterior sac sclerite.

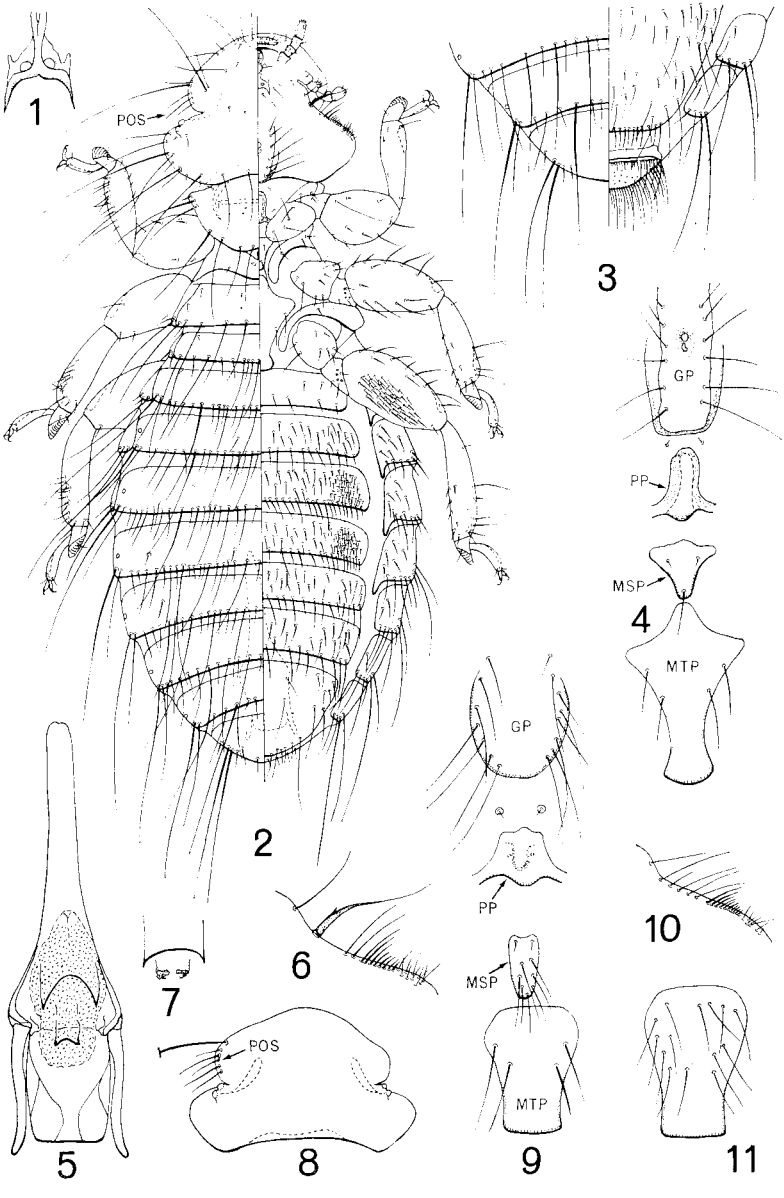
Type-host: *Merops leschenaulti* Vieillot.

Type-material: Holotype ♂, *M. leschenaulti*, Salween River, Thailand, 20 April 1973, J. T. Marshall; in collection of U. S. National Museum. Paratypes (all from type-host): 2 ♂♂, 5 ♀♀, same data as holotype; 6 ♂♂, 3 ♀♀, Thailand (5 collections), Burma (1 collection).

Other material: 1 ♂, *Nyctyornis athertoni* (Jardine and Selby), Thailand.

Remarks: *M. marshalli* and *M. meropis* represent the only *Meromenopon* known from the Bee-eaters (Meropidae). As such they are readily distinguished from those of members of the Coraciidae by: (1) the gross head shape being proportionately longer and narrower (Fig. 2 vs Fig. 8); (2) having only 3 preocular setae on each side, instead of 4–6; (3) the presence of a conspicuously larger seta in the subocular row; (4) the gular plate being long and narrow, with only 4–9 setae on each side in parallel rows; (5) at least 3 abdominal segments bearing pleurites with a projection at the posterior medioventral corner; (6) having grossly different shape of the prosternal and mesosternal plates; as well as other features of chaetotaxy and dimensions.

M. marshalli is separable from the closely related *M. meropis* by: (1) having 4 segments (II-V) with pleurites bearing a conspicuous projection at the posterior medioventral corner; and (2) the male genital sac with the anterior sclerite deeply arched and the posterior sclerite uninterrupted medially.



FIGS. 1–11. 1-6, *Meromenopon marshalli*: 1, male hypopharynx; 2, male; 3, female terminalia; 4, male medioventral head and thorax; 5, male genitalia; 6, male subocular setae. 7, *M. meropis*, male genital sac sclerites. 8–10, *M. incisum*: 8, male head outline; 9, male medioventral head and thorax; 10, male subocular setae. 11, *M. brevicolle*, male metasternal plate.

Meromenopon incisum (Giebel)
(Figs. 8–10)

Menopon incisum Giebel, 1866, Z. Ges. Naturwiss. 28: 391. Type-host: *Coracias garrulus garrulus* Linnaeus.

Menopon virgo Giebel, 1874, Insecta epizoa: 288. Type-host: *C. g. garrulus*.

Description: With 4–6 preocular setae on each side (POS: Fig. 8). Subocular setae (Fig. 10) without unusually large seta in row. Gular plate rounded (GP: Fig. 9), with 7–13 setae on each side in outwardly curving rows. Prosternal plate about as long as wide (PP: Fig. 9). Metanotum with 14–15 marginal setae, including 9–11 long, 3–5 short setae; mesosternal plate (MSP: Fig. 9) elongate, narrow, with 4–7 long setae in addition to 2 short setae; metasternal plate (MTP: Fig. 9) as shown, with 4, less often 5, setae. Marginal tergal setae: I, 14–18; II, 19–25; III, 19–31; IV-V, 22–30; VI, 20–27; VII, 19–24; VIII, 16–20. Generally without anterior tergal setae, except occasionally 1–4 on VI-VIII recessed slightly from posterior margin. Last tergite with 14–18 inner posterior setae for male, 6–9 for female. No pleurites with posterior projection. Sternal setae: II, 18–28; III, 67–95, including brushes of 25 or so on each side; IV-V, 26–47 between well developed brushes; VI, 67–100, including brushes as on III; VII, 32–48 for male, 56–59 for female; male VIII, 11–15; female subgenital plate with 17–26 marginal, 37–38 anterior setae; male subgenital plate with 11–15 setae. Female anal fringes ventrally with 47–51 setae, dorsally with 33–43. Male genitalia essentially as for *M. meropis*, with sac sclerites as in Fig. 7. Dimensions: preocular width, male 0.51–0.53, female 0.53–0.56; temple width, male 0.64–0.67, female 0.68–0.73; head length, 0.36–0.41; prothorax width, male 0.42–0.46, female 0.44–0.51; metathorax width, male 0.57–0.59, female 0.61–0.69; total length, male 2.00–2.12, female 2.32–2.55; male genitalia length 0.62–0.70, width 0.14–0.15.

Material: 5 ♂♂, 4 ♀♀ (including 2 ♂♂, 2 ♀♀, neoparatypes of *M. incisum*), *Coracias garrulus*, Israel, Uganda; 2 ♀♀, *C. benghalensis* (Linnaeus), Burma; 1 ♂, *C. caudata* Linnaeus, Somaliland.

Meromenopon brevicolle (Piaget)
(Fig. 11)

Menopon brevicolle Piaget, 1885, Pediculines Suppl.: 108. Type-host: *Thinocorus rumicivorus* (an erroneous host in Charadriiformes) = some member of Coraciiformes, perhaps *Eurystomus* of Coraciidae.

Description: As for *M. incisum*, except in the following. Metanotum with 10–13 marginal setae, including 7–9 long, 2–4 short setae; mesosternal plate with 4–9 long setae in addition to 2 short setae; metasternal plate (Fig. 11) with 9–15 setae. Marginal tergal

setae: I, 11–14; II, 19–22; III, 19–28; IV–V, 20–31; VI, 20–33; VII, 16–28; VIII, 13–20. Last tergite for both sexes with 4–8 inner posterior setae. Sternal setae: II, 24–29; III (including brushes), 65–80 for male, 100–120 for female; IV–V (between brushes), 36–39 for male, 44–60 for female; VI (including brushes), 81–88 for male, 100–135 for female; VII, 37 for male, 47–65 for female; male VIII, 21; female subgenital plate with 29–44 anterior setae; male subgenital plate with 11–16 setae. Female anal fringes ventrally with 52–55 setae, dorsally with 41–47. Dimensions: preocular width, male 0.53–0.57, female 0.56–0.59; temple width, male 0.67–0.71, female 0.74–0.76; head length, male 0.38–0.42, female 0.42–0.45; prothorax width, male 0.43–0.44, female 0.49–0.52; metathorax width, male 0.55–0.61, female 0.65–0.71; total length, male 1.98–2.11, female 2.27–2.54; male genitalia length 0.59–0.63, width 0.15–0.17.

Material: 1 ♂, Type of *M. brevicolle*, slide 687 in Piaget Collection, British Museum (Natural History); 3 ♂♂, 1 ♀, *Eurystomus glaucurus* (P. L. S. Müller), Madagascar, Uganda; 1 ♂, 1 ♀, *E. orientalis* (Linnaeus), Malaya.

Remarks: *M. brevicolle* is separated from *M. incisum* by having 9–15 metasternal plate setae instead of only 4–5 and by having somewhat wider head dimensions.

Although the male type of *M. brevicolle* is in poor condition, with many setae missing and with the abdomen telescoped, sufficient details are visible to confirm the observation by Clay (1949) that this specimen is close to *M. incisum* and that the type-host is probably in error. From our study of *M. incisum* from 3 species of *Coracias* and *M. brevicolle* from 2 species of *Eurystomus*, these representing the only 2 genera placed in the subfamily Coraciinae by Peters (1945), it seems likely that the correct type-host for *M. brevicolle* would be some member of *Eurystomus*.

KEY TO SPECIES OF *MEROMENOPON*

1. Gular plate long and narrow, with setae in nearly parallel rows (Fig. 4); each side of head with only 3 preocular setae (Fig. 2); at least 3 abdominal segments having pleurites with posterior medioventral projection; from Meropidae 2
   Gular plate rounded, with setal rows not parallel (Fig. 9); each side of head with at least 4 preocular setae (Fig. 8); no abdominal pleurites with posterior medioventral projection; from Coraciidae 3
2. Only 3 abdominal segments (II–IV) with pleurites having posterior medioventral projection; male genital sac sclerites as in Fig. 7 ..... *meropis*
   With 4 abdominal segments (II–V) having pleurites with posterior medioventral projection (Fig. 2); male genital sac sclerites as in Fig. 5 ..... *marshalli*

3. Metasternal plate with only 4–5 setae (Fig. 9); from *Coracias* ..... *incisum*
   Metasternal plate with at least 9 setae (Fig. 11); from *Eurystomus* ..... *brevicolle*

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