

Six new species of *Myrsidea* Waterston, 1915 (Phthiraptera: Menoponidae) from New World jays of the genus *Cyanocorax* Boie (Passeriformes: Corvidae), with notes on the chorionic structure of eggs

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Abstract The only species of previously named *Myrsidea* Waterston, 1915 from Neotropical jays of the genus *Cyanocorax* Boie (Passeriformes: Corvidae), *Myrsidea fallax* Kéler, 1938 (type-host *Cyanocorax cyanomelas* Vieillot), is redescribed and six new species of lice in the genus *Myrsidea* are described: *Myrsidea pseudofallax* n. sp. [type-host *C. c. chrysops* (Vieillot)]; *M. moriona* n. sp. [type-host *C. m. morio* (Wagler)]; *Myrsidea daleclaytoni* n. sp. [type-host *C. v. violaceus* Du Bus de Gisignies]; *Myrsidea lindolphoi* n. sp. [type-host *C. caeruleus* (Vieillot)]; *Myrsidea melanocyanei* n. sp. [type-host *C. melanocyaneus chavezii* (Miller & Griscom)]; and *Myrsidea cristatelli* n. sp. [type-host *C. cristatellus* (Temminck)]. A key to the identification of both sexes of these seven species is provided. Immature stages of *M. daleclaytoni* n. sp. (all instars) and *M. cristatelli* n. sp. (nymph III) are described. External chorionic architecture of the eggs is described and illustrated for

six *Myrsidea* spp. from corvine birds: *M. picae* (Linnaeus, 1758) ex *Pica p. pica* L.; *M. cornicis* (DeGeer, 1778) ex *Corvus c. corone* L.; *M. isostoma* (Nitzsch in Giebel, 1866) ex *Co. f. frugilegus* L.; *M. interrupta* (Osborn, 1896) ex *Co. brachyrhynchus* Brehm; *M. fallax* ex *Cy. cyanomelas*; and *M. moriona* n. sp. ex *Cy. m. morio*. This is the first review of the data on *Myrsidea* spp. infesting Neotropical Corvidae.

Introduction

The last worldwide checklist counts a total of 206 species included in the genus *Myrsidea* Waterston, 1915 (see Price et al., 2003), but currently the genus comprises 360 named species, which means that about a third of the known species of this genus were described in last 10 years! Of these, 74 species are parasitic on birds of the family Corvidae in the Old World (Price et al., 2003) and are relatively well studied (e.g. Klockenhoff et al., 1979; Klockenhoff, 1971, 1972, 1974, 1980, 1981, 1984). Two species of *Myrsidea* have been described or reported on Neotropical jays: *M. fallax* Kéler, 1938 and *M. chiapensis* Zavaleta, 1944, described from *Calocitta formosa* (Swainson) (Price et al., 2003). *Myrsidea fallax* Kéler, 1938 (ex *C. cyanomelas* Vieillot) represents the only species of this genus recognised from New World jays of the genus *Cyanocorax* (Passeriformes: Corvidae) (Kéler, 1938). *Myrsidea fallax* has been reported in faunistic papers (Clayton et al., 1992; Cicchino &

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Castro, 1998; Oniki, 1999) but no taxonomic treatment was employed for the *Myrsidea* spp. parasitising birds of the genus *Cyanocorax* in literature since its original description.

Materials and methods

Imagoes previously held in spirit collections were mounted in permanent preparations following Palma (1978). Eggs attached to the facial feathers of six corvid species were collected, labelled and stored in 70% ethanol. For SEM examination, eggs were cleaned during 20–30 seconds in acetone by means of an ultrasonic vibrator, mounted on several stubs in different positions, coated with gold-palladium in a Jeol vacuum metallizer, and subsequently examined with a Jeol T-100 scanning electron microscope. For each *Myrsidea* spp., identification of the eggs has been carefully checked by comparison with mature eggs isolated by dissection from identified female specimens.

Nomenclature of the head and body setae follows Clay (1966, 1969, 1970); that related to the distribution of abdominal setae in nymphs follows Price & Hellenthal (1996). All measurements and chaetotaxy accounts were taken in complete accordance with Valim & Weckstein (2013). Additionally, measurements were made for the setae which compose the aster of sternite II; these are presented from the inner setae to the outer most setae (s1, s2, s3 etc.). Some bilateral counts (e.g. metasternal plate) are presented by number in both sides such as “3+4” (i.e. total number = 7). The morphometric data were gathered using the software Leica Application Suite (LAS) v.4.1.0. All measurements are in millimetres and taken from slide-mounted specimens, in all cases identified by the following abbreviations: *dhs*, dorsal head setae; TW, temple width; PoW, preocular width (at level of *dhs11*); HL, head length at midline; PW, prothorax width; MW, metathorax width; PrL, prosternal plate length; MtL, metasternal plate length (at its midline); AW, abdomen width at segment IV; GL, male genitalia length; GsL, male genital sclerite length; AnW, female anus width; TL, total length of the body (see Supplementary file 1).

Host scientific and common names and classification follow Dickinson (2003). The specimens studied are deposited in the Field Museum of Natural History,

Chicago, USA (FMNH); Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (MZUSP); Price Institute for Phthirapteran Research, Salt Lake City, USA (PIPeR).

Species of *Myrsidea* from *Cyanocorax* spp.

There is only one species of *Myrsidea* previously known from the Neotropical corvid genus *Cyanocorax*, *M. fallax*, and since the original description (Kéler, 1938) no other taxonomic data have been published about it. This species was only found on its type-host, *C. cyanomelas*, in ecological and faunistic papers carried out in Peru, Argentina and Brazil (Clayton et al., 1992; Cicchino & Castro 1998; Oniki, 1999). Two other records without specific identification were made from two species of jays, *Cyanocorax violaceus* Du Bus de Gisignies and *C. cristatellus* (Temminck) (Clayton et al., 1992; Valim et al., 2005).

The six new species from hosts of the corvid genus *Cyanocorax* described here belong to the *fallax* species group since they share the following characters:

- Hypopharynx fully developed (Fig. 13);
- Ventral head fringe with 11 setae (rarely 10 or 12 on one or both sides; less often 13 on one side);
- Labial setae 5, about 0.06–0.09 mm in length;
- Gular setae 4+4, the most posterior longer and thicker;
- Pronotum with 3+3 posterior marginal setae (occasionally 4 on one side);
- Outer dorso-lateral setae 5 (rarely 4 or 6) and outer ventro-lateral setae 3 on first tibia;
- Metasternum usually with 3–4 setae on each side (occasionally 2 or 5 on one side);
- Pleurites V–VII (also III or IV in some species) with thin, long innermost setae (Fig. 29) or innermost setae short (Fig. 30);
- Post-spiracular setae III much shorter and thinner than II;
- Post-spiracular setae V and VI noticeably short in females, medium-long in males;
- Post-spiracular setae VII and VIII subequal, very long in both sexes;
- Sternum I very wide, without seta;
- Spermatheca fig-shaped (much as in Figs. 37, 38);
- Vulvar margin at least lightly spiculated (Fig. 36), with 12–20 setae;

- Anal fringe without anterior setae, some specimens with 3–4 smaller setae distributed on each fringe, with about 30–45 setae (smaller included) on each dorsal and ventral side, the lateral being the longest;
- Male internal anal setae 8 (rarely 7 or 9), dorsal anal setae 3 (rarely 4);
- Male genital sclerite unlike in other *Myrsidea* spp. infesting Corvidae, but reminiscent of some species parasitic on Turdidae (see Clay 1966), with medial sclerotisation and long, curved lateral arms (Figs. 34, 35). Without significant differences between the seven species studied.

Although they resemble in some points the species described from corvids in the Old World, the species within the *fallax* species group differ in the number of posterior pronotal and metasternal setae. On the other hand, they share items 1 and 3–9 with the *thoracica* species group of *Myrsidea* spp. infesting thrushes (Turdidae) (see Clay, 1966), as well as the general shape of the spermatheca (spherical with thickened rim) and male genitalia.

The species of *Myrsidea* from *Cyanocorax* spp. show different modifications on metanotum and abdominal tergites I and II but these seem to be of little phylogenetic importance (Clay & Hopkins, 1960; Clay, 1966). As a result, other characters must be found by which phylogenetically related species can be grouped such as the male genital sclerite, thus choosing those which do not appear to be directly adaptive to the environment (or host) (Clay, 1966; Klockenhoff, 1984). Using the shape of the male genital sclerite as the main guide, we may cluster some species into discrete species groups with phylogenetic value. These groups become good tools for testing the degree of correlations that may exist between each *Myrsidea* species group and a host family, host related genera within a family, a host genus, or the geographical range of a single host species. All species examined here show little variation in the male genital sclerite (see its general shape in Figs. 34, 35): we therefore consider this as a distinctive character for the *fallax* species group. Fig. 33 shows an abnormal specimen with lateral arms of the genital sclerite broken off.

Myrsidea fallax Kéler, 1938

Type-host: *Cyanocorax cyanomelas* (Vieillot) (Corvidae), purplish jay.

Type-locality: [Santísima] Trinidad (25°15'S, 57°38'W), Asunción, Paraguay.

Material examined: 3 males and 2 females (MZUSP 6250–51) ex *Cyanocorax cyanomelas*, Salobra, Estado Mato Grosso do Sul, Brazil, viii.1940, col. C. Carvalho; 1 male and 1 female (PIPeR) ex *C. cyanomelas*, #185. Parque Nacional Defensores del Chaco, Departamento Chaco, Paraguay, col. N. Lopez, 10.viii.1983; 7 males and 3 females (FMNH 94040–42) ex *C. cyanomelas*, Hacienda Amazonia, near Atalaya, Departamento Madre de Dios, Peru, col. D.H. Clayton, 25.vii.1985; 2 males and 6 females (MZUSP 2027–29, 6246–47) ex *C. cyanomelas*, Manatiales, Provincia Corrientes, Argentina, 7.vii.1947; 2 males and 2 females (MZUSP 6248–49) ex *C. cyanomelas*, Santa Tecla, Ituzaingo, Provincia Corrientes, Argentina, 18.iv.1944.

Morphometric data: Supplementary file 1.

Records: Kéler (1938); Hopkins & Clay (1952); Clayton et al. (1992); Cicchino & Castro (1998); Oniki (1999); Price et al. (2003).

Redescription (Figs. 1–5, 7, 19, 21, 22, 30, 31, 34, 35, 37, 67–70)

Female. Head with flatly rounded temples (Fig. 7). Dorsal head seta 10 (*dhs10*) 0.07–0.09 long; *dhs11* 0.11–0.12 long; ratio *dhs10/11* 0.6–0.8. Labial setae 5 (*ls5*) 0.05–0.08 long, latero-ventral fringe with 11 setae (rarely 9, 10, 12 or 13 on one side). Metanotum enlarged, arched medially, usually with distinct pair of central setae, separated from left and right set of posterior setae, with 10–15 (2 specimens with 20 and 22) setae on posterior margin, 1 short outermost seta and 2–6 medium-long setae on each side in regular row, plus medial and detached pair of long setae (Fig. 1); metapleura with 4 short, spine-like setae on each side (some specimens with 3 or 5 setae on one side); metasternal plate with 4+4 setae (rarely 3 on one side). Setae of femoral brush 21–26 in number. Tergite I with distinct median enlargement, tergites II–IV with less noticeable median modification (Fig. 1). Each tergal setal row of segments IV–VIII (rarely III–VIII) with small, discernible median gap. Tergum I with assortment of short to medium-long setae arranged in 2 vaguely defined rows (best shown in Fig. 1). Terga II–VIII with single row of posteriorly located setae; medial segments III–VIII with pair of medium-long setae delimiting median gap and

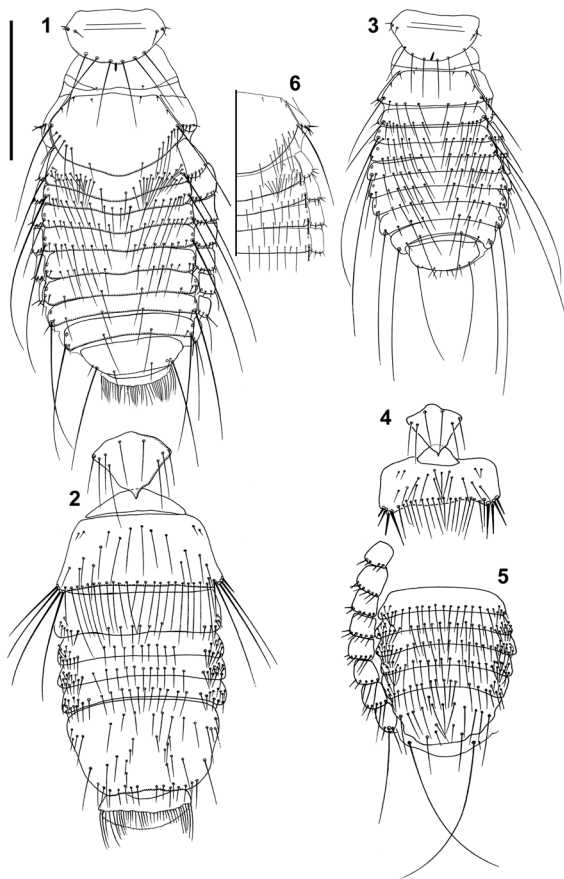


Fig. 1–6 *Myrsidea fallax* Kéler, 1938: 1, Female, thorax and abdomen, dorsal view; 2, Female, metasternum and abdominal sterna; 3, Male, thorax and abdomen, dorsal view; 4, Male, metasternum and sternites I and II; 5, Male, abdominal sterna. *Myrsidea pseudofallax* n. sp.: 6, Female, metathorax and tergites I–III. Scale-bar: 500 μ m

detached from lateral row of setae. Tergal setae number: I, 35–50; II, 15–24; III, 12–20; IV, 11–17; V, 11–14; VI, 4–8; VII, 4; VIII, 4. Tergite IX with single inner posterior seta on each side, 0.04–0.08 long. Sternum II with 12–27 setae anteriorly; posterior margin almost straight, with 19–27 setae; aster with 4 (less often 3 or 5) medium to very long setae (Figs. 2, 21). Aster setae length: s1, 0.31–0.38; s2, 0.29–0.37; s3, 0.23–0.32; s4, 0.04–0.06. Sternal setae number: III, 17–24; IV, 30–36; V, 34–42; VI, 26–36; VII, 12–18; subgenital plate with 9–16 setae; vulvar margin with 12–17 setae. Pleural setae number: I, 5–7; II, 6–8; III, 6–9; IV, 7–8; V, 6–7; VI, 6–7; VII, 4–5; on segments VI–VII 2 slender and longer setae on inner ventral side (Fig. 29). Pleurite VIII (Fig. 19) with inner setae

almost twice as long as outer. Anus with 31–39 ventral fringe setae and 34–43 dorsal setae.

Male. Head features and body similar to female. Metanotum with 6–8 (rarely 5) setae on posterior margin, 1 short outermost seta and 5–7 medium-long setae on each side (Fig. 3). Metapleura with 3 short, spine-like setae on each side (rarely 2 on one side only); metasternal plate with 3+3 (4) setae (or 4 (4) on one side). Setae of femoral brush 18–23. Tergal setae number: I, 13–17; II, 11–14; III, 12–15; IV, 12–15; V, 11–14; VI, 8–13; VII, 4–11; VIII, 2–4. Median gap in most I–VIII tergal rows of setae well developed (rarely only segment III with 1 continuous row of setae). Tergite IX with 1 inner posterior seta on each side, 0.05–0.10 long. Pattern of chaetotaxy of tergites and sternites as in Figs. 3–5. Sternal setae number: I, 0; II, aster with 4+4 (4 repetitions), 5+5 (4), or 5+4 (4) setae (Fig. 22), posterior margin with 17–21 setae, anterior margin with 10–14 setae; III, 24–31; IV, 35–42; V, 33–42; VI, 30–40; VII, 21–31; subgenital plate, 20–30. Pleural setae as in females. Genitalia as in Fig. 31, with distinctive long-armed sclerite (Figs. 34, 35).

Egg. Major diagnostic features and measurements are given in Table 1.

Remarks

Females of *M. fallax* share with three new species described below, *M. daleclaytoni* n. sp., *M. lindolphi* n. sp. and *M. moriona* n. sp., a very long and completely distinct from that in males aster of sternite II. *Myrsidea fallax* is readily separable from *M. daleclaytoni* n. sp. by the absence of anterior patch of setae on the metanotum and in having less than 28 setae located anteriorly on sternite II. This species can be distinguished from *M. lindolphi* n. sp. by the arrangement of metanotal setae in a single row at posterior margin and the smaller number of metapleural setae, and from *M. moriona* n. sp. by the shape of tergite I and the larger number of anterior setae in sternite II. A combination of the following characters distinguishes males of *M. fallax*: (i) metanotal setae in a single row; (ii) metasternal plate with six setae; (iii) pleurites III without long setae; (iv) sternite II with more than 10 setae anteriorly; and (v) sternite VII with more than 20 setae. Comparisons of several

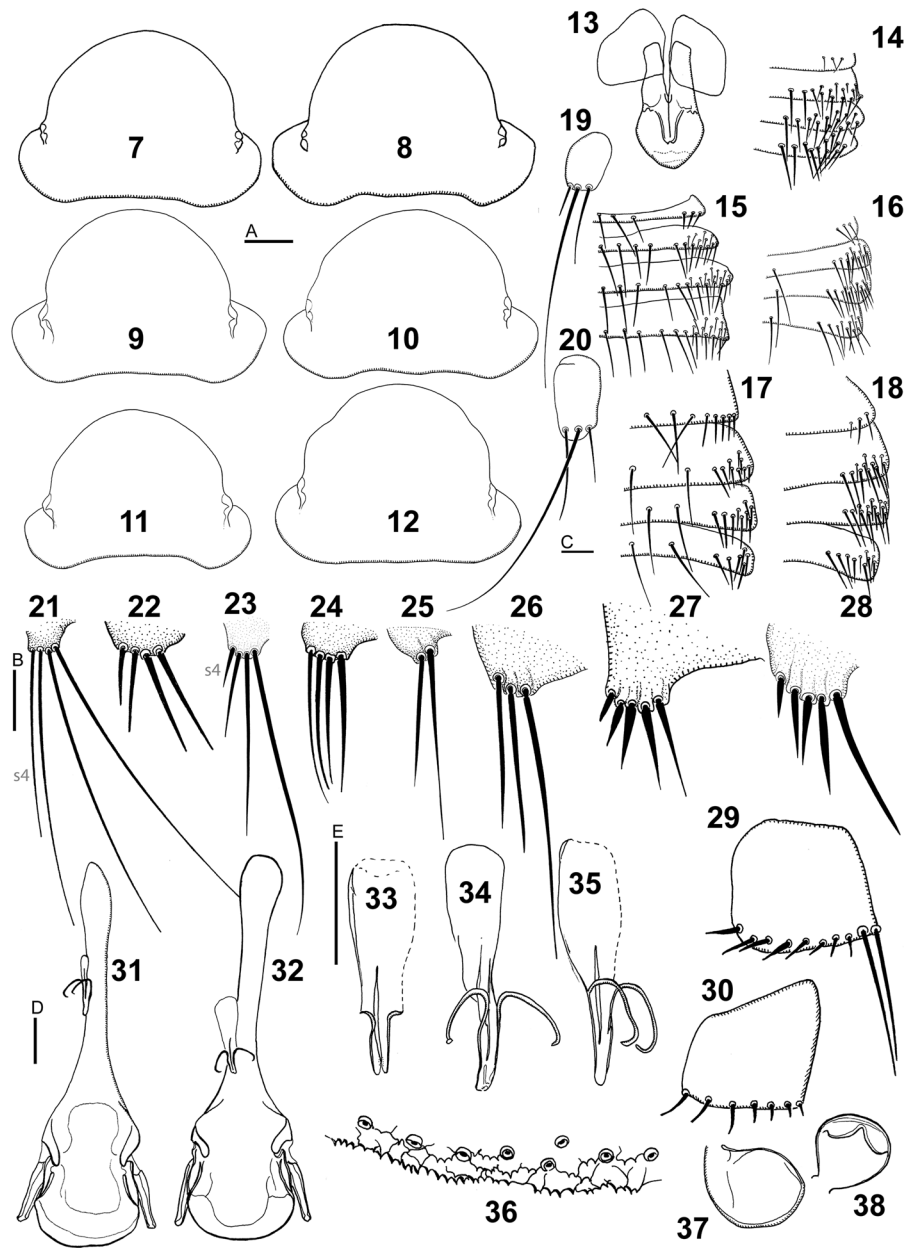


Fig. 7–38 *Myrsidea fallax* Kéler, 1938: 7, Male, head in outline; 19, Pleurite VIII; 21, Female, aster of sternite II; 22, Male, aster of sternite II; 30, Left pleurite III; 31, Male genitalia; 34–35, Male, genital sclerite; 37, Female, bursa copulatrix. *M. pseudofallax* n. sp.: 23, Female, aster of sternite II. *M. moriona* n. sp.: 8, Male, head in outline; 13, Hypopharynx; 14, Female, lateral chaetotaxy of sterna III–VI; 20, Pleurite VIII; 24, Female, aster of sternite II; 29, Left pleurite III; 32, Male genitalia; 33, Male, genital sclerite (broken); 36, Female, spiculations of the vulva; 38, Female, bursa copulatrix. *M. daleclaytoni* n. sp.: 9, Male, head in outline; 15, Female, lateral chaetotaxy of sterna III–VI; 25, Female, aster of sternite II. *M. lindolphi* n. sp.: 10, Male, head in outline; 16, Female, lateral chaetotaxy of sterna III–VI; 26, Female, aster of sternite II. *M. melanocyanei* n. sp.: 11, Male, head in outline; 17, Female, lateral chaetotaxy of sterna III–VI; 27, Female, aster of sternite II. *M. cristatelli* n. sp.: 12, Male, head in outline; 18, Female, lateral chaetotaxy of sterna III–VI; 28, Female, aster of sternite II. Scale-bars: A (Figs. 7–12), 100 μ m; D (Figs. 31, 32), 100 μ m; B (Figs. 21–30), 50 μ m; C (Figs. 14–20), 50 μ m; E (Figs. 33–38), 50 μ m

populations from different localities revealed no significant divergences in chaetotaxy and metrical data; these are here considered conspecific.

***Myrsidea pseudofallax* n. sp.**

Syn. *Myrsidea fallax* Kéler, 1938 (pro parte)
of Cicchino & Castro (1998)

Type-host: *Cyanocorax chrysops chrysops* (Vieillot) (Corvidae), purplish-crested jay.

Type-locality: Misiones, Argentina.

Type-material: Female holotype (MZUSP 6211) ex *Cyanocorax c. chrysops*, Provincia Misiones, Argentina, col. J. C. Bianchini. Paratypes: 6 males and 4 females (MZUSP 6212–17), same data as for the holotype.

Additional material: One female (MZUSP 6218) ex *C. c. chrysops*, Bella Vista, Provincia Corrientes, Argentina, v.1980, col. A. C. Cicchino; 1 male and 2 females (MZUSP 2030–32) ex *C. c. chrysops*, Misiones Province, Argentina, col. J. C. Bianchini.

Morphometric data: Supplementary file 1.

Etymology: The species name derives from the Greek prefix *pseudo-* (false) added to the epithet *fallax*, alluding to its superficial similarity with *Myrsidea fallax* Kéler, 1938.

Description (Figs. 6, 23)

Female. Head with flatly rounded temples (as in Fig. 7). Dorsal head seta 10 (*dhs10*) 0.07–0.09 long; *dhs11* 0.11–0.12 long; ratio *dhs10/11* 0.7–0.8. Labial setae 5 (*ls5*) 0.06–0.08 long, latero-ventral fringe with 10 setae (rarely 9 or 11 on one side). Metanotum as in *M. fallax* but with 20–27 setae on posterior margin, 1 short outermost seta and 6–12 medium-long setae in 2 irregular rows, plus 1 medial pair of long setae on each side (Fig. 6); metapleura with 4 short, spine-like setae on each side (rarely with 3 or 5 on one side); metasternal plate with 4+4 setae. Setae of femoral brush 16–19 in number. Tergal setae number: I, 33–39; II, 14–17; III, 12–17; IV, 10–14; V, 10–12; VI, 4–5; VII and VIII, 4. Tergite IX with single inner posterior seta on each side, 0.06–0.09 long. Sternum II with 12–18 setae anteriorly; posterior margin with 19–22 setae; aster with 4+4 (rarely 5 on one side) very long, spine-like setae (Fig. 23). Aster setae length: s1,

0.29–0.30; s2, 0.21–0.26; s3, 0.07–0.10; s4, 0.03–0.05. Sternal setae number: III, 16–21; IV, 28–30; V, 33–36; VI, 28–33; VII, 12–15; subgenital plate with 9–12 setae; vulvar margin with 13 setae. Pleural setae number: I, 4–6; II, 6–8; III, 6–9; IV, 6–8; V, 6–8; VI, 6–7; VII, 4–6; on segments VI–VII 2 longer and slender setae on inner ventral side. Anus with 30–38 ventral fringe setae and 33–45 dorsal setae.

Male. Head features and body similar to female. Metanotum with 6–9 setae on posterior margin, 1 short outermost seta and 3 (rarely 2 or 4 on one side) medium-long setae on each side. Metapleura with 3 short, spine-like setae on each side (rarely 2 or 4 on one side); metasternal plate with 4+4 setae. Setae of femoral brush 14–18. Tergal setae number: I, 9–13; II, 8–10; III, 8–10; IV, 7–11; V, 6–11; VI, 5–10; VII, 4–6; VIII, 4. Median gap in most I–VIII tergal rows of setae well developed. Tergite IX with 1 inner posterior seta on each side, 0.08 long. Sternal setae number: I, 0; II, each aster with 4 (one paratype with 3 and 5 on each side) setae, posterior margin with 15–20 setae, anterior margin with 6–11 setae; III, 16–25; IV, 27–34; V, 31–36; VI, 29–36; VII, 20–26; subgenital plate, 18–25. Pleural setae as in females. Genitalia and genital sclerite as in *M. fallax*.

Remarks

This species is very similar to *M. fallax* (see above); both species possess the same overall shape in both sexes, but exhibit some slight differences in morphometry and chaetotaxy that were supported by statistical analysis (t-tests, all $p < 0.05$). Thus, *M. pseudofallax* n. sp. is smaller: temporal width (0.54–0.56 vs 0.56–0.58 mm in females, and 0.48–0.49 vs 0.49–0.51 mm in males); prothorax width (0.33–0.35 vs 0.35–0.39 mm in females, and 0.30–0.31 vs 0.31–0.33 mm in males), and total length (1.63–1.66 vs 1.71–1.91 mm in females, and 1.36–1.44 vs 1.45–1.55 mm in males). It is important to note that in females seta s4 in aster is significantly shorter in *M. pseudofallax* n. sp. (0.07–0.10 vs 0.18–0.32 mm) (Figs. 21, 23). The chaetotaxy of most abdominal segments also differs with a tendency for a smaller number of setae in *M. pseudofallax* n. sp. on tergites I–V as follows: (i) in females: I 33–39 vs 36–50, II 14–17 vs 16–24, III 12–17 vs 14–20, IV

10–14 vs 8–17, V 10–12 vs 11–14; (ii) in males: I 9–13 vs 13–17, II 8–10 vs 11–14, III 8–10 vs 12–15, IV 7–11 vs 12–15, V 6–11 vs 11–14. In females the metathoracic chaetotaxy is distinctive for a specific separation: *M. pseudofallax* n. sp. has substantially more setae than *M. fallax* (20–27 vs 10–15) (Figs. 1, 6).

Myrsidea moriona n. sp.

Type-host: *Cyanocorax m. morio* (Wagler) (Corvidae), brown jay.

Type-locality: Campeche, Mexico.

Type-material: Holotype female (MZUSP 5818) ex *Cyanocorax m. morio*, Campeche, Mexico, col. D. H. Clayton, 5.iii.1998. Paratypes: 3 males and 2 females

(PIPEr) same data as for the holotype; 3 males and 3 females (PIPEr), same data as for the holotype except for collection date (17.iii.1998).

Additional material: One male (MZUSP 2042) ex *C. m. morio*, San Jose, Costa Rica, no other data.

Morphometric data: Supplementary file 1.

Etymology: The specific epithet is taken from the specific name of the type-host and is a noun in apposition.

Description (Figs. 8, 13, 14, 20, 24, 29, 32, 33, 36, 38, 39, 44, 45, 54, 59, 71–74)

Female. Head with expanded and slightly truncated temples (Fig. 8). Dorsal head seta 10 (*dhs10*) 0.05–0.07 long; *dhs11* 0.11–0.13 long; ratio *dhs10/11* 0.5–0.6. Labial setae 5 (*ls5*) 0.08–0.09 long, latero-

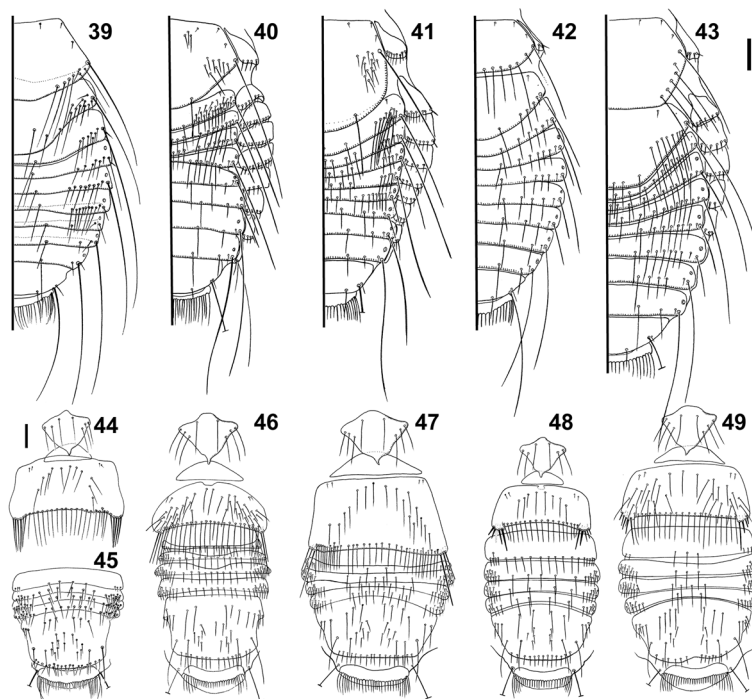


Fig. 39–49 *M. moriona* n. sp.: 39, Female, metanotum and abdominal terga; 44–45, Female, metathoracic sternal plate and abdominal sterna. *M. daleclaytoni* n. sp.: 40, Female, metanotum and abdominal terga; 46, Female, metathoracic sternal plate and abdominal sterna. *M. lindolphi* n. sp.: 41, Female, metanotum and abdominal terga; 47, Female, metathoracic sternal plate and abdominal sterna. *M. melanocyanei* n. sp.: 42, Female, metanotum and abdominal terga; 48, Female, metathoracic sternal plate and abdominal sterna. *M. cristatelli* n. sp.: 43, Female, metanotum and abdominal terga; 49, Female, metathoracic sternal plate and abdominal sterna. Scale-bars: 100 μ m

ventral fringe with 11 setae (rarely 10 or 12 on one side). Metanotum enlarged, arched medially, with 10–12 setae on posterior margin, composed by 5–6 long setae on each side (Fig. 39); metapleura with 3 short, spine-like setae on each side (2 specimens with 4 setae on both sides and 1 with 4 on one side); metasternal plate with 5+4 setae in holotype (variation: 4+4 in 2 specimens; 4+3; 3+3; 3+4). Setae of femoral brush 18–23 in number. Tergite I strongly enlarged medially, pushing medially segment II into posterior end; segments III–IV slightly modified (Fig. 39). Small median gap discernible on each tergal setal row of segments II–VIII. Tergum I with assortment of short to medium-long setae arranged in 2 vaguely defined rows, best shown in Fig. 39. Terga II–VIII with single row of posteriorly located setae, median gap of tergal row of setae present on I–VIII. Tergal setae number: I, 18–28; II, 12–13; III, 9–12; IV, 9–12; V, 10–16; VI, 4–6; VII, 4; VIII, 4. Tergite IX with 1 inner posterior seta on each side, 0.16–0.21 long. Sternum II with its posterior margin almost straight, with 20–23 setae; anterior margin with 6–11 setae; aster with 4+4 (2), 5+5 (2) or 5+4 (2) very long spine-like setae (Fig. 24). Aster setae length: s1, 0.15–0.20; s2, 0.11–0.17; s3, 0.13–0.18; s4, 0.13–0.17. Sternal setae number: III, 9–11; IV, 25–31; V, 28–33; VI, 21–30; VII, 13–15; lateral set on III–VI shown in Fig. 14; subgenital plate with 15–16 setae; vulvar margin with 13–18 setae. Pleural setae number: I, 8–11; II, 7–10; III, 8–10; IV, 6–9; V, 5–7; VI, 4–6; VII, 5–6; on segments III–VI 1 or 2 longer and slender setae on inner ventral side; on segment VII 3 distinctly longer setae; pleurite VIII as in Fig. 20, with inner setae almost twice as long as outer. Anus with 35–38 ventral fringe setae and 34–45 dorsal setae.

Male. Head features and body shape similar to female. Metanotum with 7–9 setae on posterior margin, 1 short outermost seta and 4 (rarely 3 or 5 on one side) medium-long setae on each side (Fig. 54). Metapleura with 3–4 short, spine-like setae on each side (rarely 2 on one side); metasternal plate with 3+3 (3) or 4+3 (3) setae. Setae of femoral brush 15–22 in number. Tergal setae number: I, 12–16; II, 11–13; III, 12–13; IV, 12–14; V, 12–14; VI, 11–13; VII, 8–11; VIII, 4–6. Median gap in most I–VIII tergal rows of setae well developed (rarely first tergite with single continuous row of setae). Tergite IX with single inner posterior seta on each side,

0.06–0.08 long. Pattern of chaetotaxy of tergites and sternites as in Figs. 54, 59. Sternal setae number: I, 0; II, each aster with 4 setae (1 paratype with 5 on both sides), posterior margin with 16–20 setae, anterior margin with 7–14 setae; III, 19–22; IV, 30–34; V, 33–40; VI, 28–37; VII, 22–28; subgenital plate, 22–32. Pleural setae as in females. Genitalia shown in Fig. 32, with distinctive long-armed sclerite (as in Figs. 34–35).

Egg. Major diagnostic features and measurements are given in Table 1.

Remarks

Females of *M. moriona* n. sp. are morphologically close to *M. fallax*, *M. daleclaytoni* n. sp. and *M. lindolphi* n. sp. which possess very long, and completely distinct from those in males, setae on aster of sternite II. The new species can be further distinguished from *M. daleclaytoni* n. sp. by the absence of anterior patch of setae on metanotum and in having less than 30 setae anteriorly on sternite II (*vs* > 30 setae in *M. daleclaytoni* n. sp.), and from *M. lindolphi* n. sp. by the arrangement of the metanotal setae in a single row at the posterior margin (*vs* setae in irregular patches on each side in *M. lindolphi* n. sp.) and by the smaller number of metapleural setae (3–4 *vs* 8–11 in *M. lindolphi* n. sp.). *Myrsidea moriona* n. sp. differs from *M. fallax* by the shape of tergite I (very well enlarged *vs* only slightly enlarged in *M. fallax*) and in having fewer anterior setae on sternite II (6–11 *vs* 12–25). In males, the thoracic breadth in *M. moriona* n. sp. is greater than in *M. fallax* and *M. pseudofallax* n. sp. (≥ 0.48 *vs* ≤ 0.45 mm); in addition, long and thin setae are present on pleurites III–VIII (in *M. fallax* and *M. pseudofallax* n. sp. these setae are present on VI–VIII).

Myrsidea daleclaytoni n. sp.

Syn. *Myrsidea* sp. of Clayton et al. (1992)

Type-host: *Cyanocorax v. violaceus* Du Bus de Gisignies (Corvidae), violaceous jay.

Type-locality: Hacienda Amazonia, near Atalaya, Departamento Madre de Dios, Peru.

Type-material. Holotype female (MZUSP 5819) ex *C. v. violaceus*, Hacienda Amazonia, near Atalaya,

Departamento Madre de Dios, Peru, 13.ix.1985, col. D. H. Clayton. Paratypes: 6 males and 5 females (MZUSP 5819 and FMNH 94039, 29879), same data as for the holotype. Nymphs (not regarded as types): 2 NI, 1 NII, 4 NIII (MZUSP 5819), same data as for the type-series.

Morphometric data: Supplementary file 1.

Etymology: This species is named after our colleague Dale H. Clayton (University of Utah, Salt Lake City, USA) in recognition of his efforts in collecting bird parasites in Peru; he always makes them available in favour of taxonomy of the bird lice in the Neotropics. It is a noun in genitive case.

Description (Figs. 9, 15, 25, 40, 46, 50–52, 55, 60)

Female. Head with flatly rounded temples (Fig. 9). Dorsal head seta 10 (*dhs10*) 0.06–0.08 long; *dhs11* 0.11–0.13 long, ratio *dhs10/11* 0.5–0.6. Labial setae 5 (*ls5*) 0.07–0.08 long, latero-ventral fringe with 11 (rarely 12) setae. Metanotum enlarged, arched medially, with single distinctive pair of central setae separated from left and right sets of posterior setae, with 18–22 (one hirsute male with 43) setae on posterior margin, single irregular patch of 7–12 medium-long setae (18–23 in 1 hirsute male), plus single detached longer seta on each side; additional small patch of 6–10 (2 aberrant specimens bear 2+4 and 14+16) short to medium-long setae also present on each anterior side of metanotum (Fig. 40); metapleura with 4–5 short, spine-like setae on each side (rarely 2 or 3 on one side); metasternal plate with 4+4 (3) or 3+5, 5+4 setae. Setae of femoral brush 24–38 in number. Tergite I–III medially arched; tergite IV with concave anterior margin and straight posterior margin as remaining segments (Fig. 40). Small median gap discernible in each tergal setal row of segments IV–VIII. Tergum I with assortment of short to medium-long setae, arranged in 3 vaguely defined rows, best shown in Fig. 40. Terga II–VIII with single row of posteriorly located setae. Tergal setae number: I, 42–54; II, 15–19; III, 16–19; IV, 11–18; V, 4–7; VI, 4; VII, 4; VIII, 4. Tergite IX with single inner posterior seta on each side, 0.05–0.08 long. Sternum II with its posterior margin almost straight, with 22–30 setae; anterior margin with 29–47 setae; aster with 2 very long setae (Fig. 25) (1 specimen with 3+3 setae; additional seta 0.10 long). Aster setae length: s1,

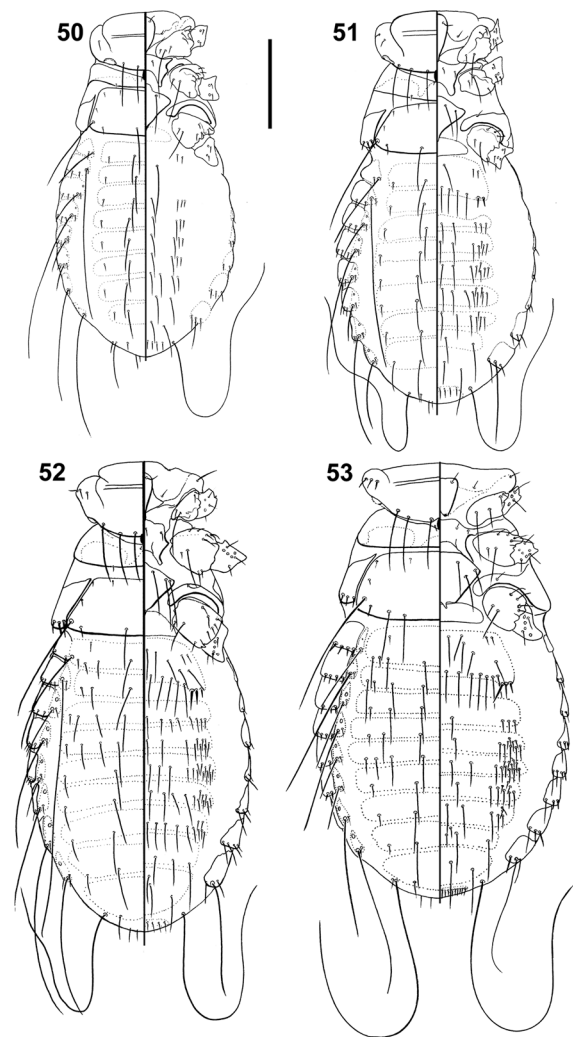


Fig. 50–53 *Myrsidea daleclaytoni* n. sp.: 50, Nymph I, thorax and abdomen, dorso-ventral view; 51, Nymph II, thorax and abdomen, dorso-ventral view; 52, Nymph III, thorax and abdomen, dorso-ventral view. *Myrsidea cristatelli* n. sp.: 53, Nymph III, thorax and abdomen, dorso-ventral view. Scale-bar: 200 μ m

0.11–0.14; s2, 0.09–0.11. Sternal setae number: III, 12–15; IV, 32–38; V, 37–46; VI, 33–42; VII, 15–20; lateral set on III–VI shown in Fig. 15; subgenital plate with 15–19 setae; vulvar margin with 14–19 setae. Pleural setae number: I, 6–7; II, 10–12; III, 9–13; IV, 9–10; V, 7–9; VI, 7–9; VII, 5–7; on segments V–VII 2 (1 specimen with 3) slender and longer setae on inner ventral side. Pleurite VIII as in Fig. 19, inner setae almost twice as long as outer. Anus with 35–42 ventral fringe setae and 36–44 dorsal setae.

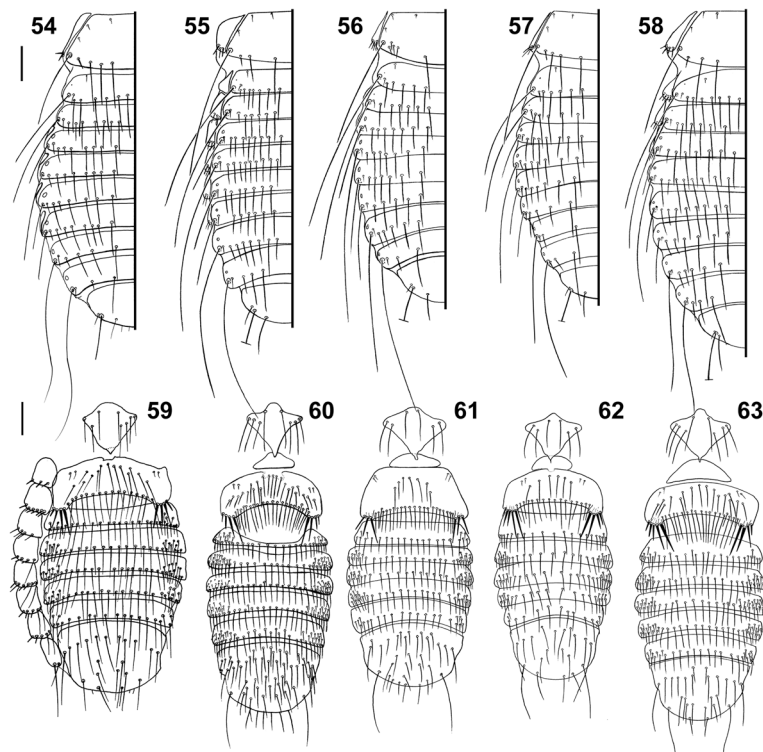


Fig. 54–63 *Myrsidea moriona* n. sp.: 54, Male, metanotum and abdominal terga; 59, Metathoracic sternal plate and abdominal sterna. *M. daleclaytoni* n. sp.: 55, Male, metanotum and abdominal terga; 60, Metathoracic sternal plate and abdominal sterna. *M. lindolphi* n. sp.: 56, Male, metanotum and abdominal terga; 61, Metathoracic sternal plate and abdominal sterna. *M. melanocyanei* n. sp.: 57, Male, metanotum and abdominal terga; 62, Metathoracic sternal plate and abdominal sterna. *M. cristatelli* n. sp.: 58, Male, metanotum and abdominal terga; 63, Metathoracic sternal plate and abdominal sterna. Scale-bars: 100 μ m

Male. Head features and body shape similar to female. Metanotum with 6–9 setae on posterior margin, single short outermost seta and 2–4 medium-long setae on each side (Fig. 55). Metapleura with 3 short, spine-like setae on each side (1 specimen with 4 on both sides); metasternal plate with variable pattern: 3+4 (2), 3+3 (1), 5+4 (1), 2+4 (1) or 4+4 (1) setae. Setae of femoral brush 23–32 in number. Tergal setae number: I, 13–17; II, 11–16; III, 13–18; IV, 12–18; V, 13–18; VI, 10–16; VII, 8–14; VIII, 4–7. All tergal rows of setae with well-developed median gap (except in 1 specimen with continuous row on tergite III). Tergite IX with single inner posterior seta on each side, 0.06–0.08 long. Pattern of chaetotaxy of tergites and sternites in Figs. 55, 60. Sternal setae number: I, 0; II, each aster with 4 setae (rarely 3 or 5 on one side), posterior margin with 15–22 setae, anterior margin with 14–21 setae; III, 23–37; IV, 34–52; V, 36–55; VI, 38–54; VII, 30–48; subgenital plate, 33–56. Pleural

setae as in females. Genitalia as in Figs. 31–32, with distinctive long-armed sclerite (as in Figs. 34–35).

Nymph I. Ratio *dhs10/11* 0.9. Latero-ventral fringe with 8 setae (7 on one side). Gular plate lacking setae. Prosternum and mesosternum without setae (except for the minute pair antero-lateral setae, always present on Menoponidae), metasternum with 2 medium-long setae. Pronotum with 4 posterior long setae, each antero-lateral corner with single short seta. Coxae of first and second legs with single long seta, reaching next coxa. Metanotum with 3 anterolateral minute setae on each side, and 6 posterior setae (1 median pair of long and 1 lateral pair of minute setae, plus the postero-lateral long setae usual for metanotum of Menoponidae) (Fig. 50). Metapleura lacking setae. Femoral brush with 8 setae. Sternite II: aster absent in lateral corners; chaetotaxy restricted to double pairs of short, antero-lateral setae and single pair of longer

setae on anterior portion of segment. Tergal chaetotaxy: I–VIII with 1 short longitudinal lateral and 1 medium-long longitudinal median rows of abdominal setae. Tergal and sternal chaetotaxy shown in Fig. 50.

Nymph II. Ratio *dhs10/11* 0.6. Latero-ventral fringe with 9 and 10 setae on each side (1 specimen examined). Gular plate with 2+2 setae, posterior pair longer. Prosternum and mesosternum without setae, metasternum with 4 setae. Pronotum with 6 posterior setae, each lateral corner with 3 short setae. Coxa of first leg with single long seta reaching mesocoxa. Metanotum with 3 anterolateral minute setae on each side, and 6 posterior setae (as in nymph I described above) (Fig. 51). Metapleura with 3 short, spiniform setae. Femoral brush with 14–16 setae. Sternite II: aster rudimentary in lateral corners; with 2 small, spiniform setae; posterior margin with 8 medium-long setae, plus anterior pair of long setae. Chaetotaxy of abdominal tergites as in nymph I. Tergal and sternal chaetotaxy shown in Fig. 51.

Nymph III. Ratio *dhs10/11* 0.6. Latero-ventral fringe with 10 setae (11 in 1 specimen). Gular plate with 3+3 setae, posterior pair longer. Prosternum and mesosternum without setae, metasternum with 6 setae. Pronotum with 6 posterior setae, each lateral corner with 3 short setae. Metanotum chaetotaxy with pattern as in nymph I. Metapleura with 3 spiniform setae (less frequent 4 setae on both or 1 side), the two most median longer. Femoral brush with 16–22 setae. Sternite II: aster very rudimentary on each lateral corner, with 3 spine-like setae crescent in length from lateral to medial; posterior margin and anterior portion with c.10 medium-long setae each. Chaetotaxy of abdominal tergites as in nymph I, except for length of setae and emergence of 2 (rarely only 1) setae between constant lateral and medial pairs on each side of segments I–IV. Tergal and sternal chaetotaxy shown in Fig. 52.

Remarks

Females of *M. daleclaytoni* n. sp. are morphologically close to *M. fallax*, *M. moriona* n. sp. and *M. lindolphi* n. sp., sharing the presence of very long setae on the aster of sternite II, very different from those present in males. *Myrsidea daleclaytoni* n. sp. is unique in having the following combination of characters: presence of

an anterior metanotal patch of setae, more than 30 anterior setae on sternite II, and only two long setae on aster of sternite II.

Myrsidea lindolphi n. sp.

Type-host: *Cyanocorax caeruleus* (Vieillot) (Corvidae), azure jay.

Type-locality: Rio Ribeira guapé, Iguapé, São Paulo, Brazil.

Type-material: Holotype female (MZUSP 6219) ex *Cyanocorax caeruleus*, Rio Ribeira de Iguapé, Iguapé, Estado São Paulo, Brazil, vii.1937, col. F. Lane. Paratypes: 13 males and 10 females (MZUSP 6219–31), same data as for the holotype.

Additional material: 6 males and 2 females (MZUSP 6232–36) ex *C. caeruleus*, Tabatinguera, Estado São Paulo, Brazil, 29.ix.1934, col. C. Worontzow; 4 males and 12 females (MZUSP 6237–45) ex *C. caeruleus*, Ilha do Cardoso, Estado São Paulo, Brazil, ix.1934, col. C. Worontzow.

Morphometric data: Supplementary file 1.

Etymology: This species is named in honour to Lindolpho R. Guimarães (1908–1998), for his substantial contribution to the knowledge of bird lice in Brazil. He earned the rank of the 15th most productive lice researcher, with 87% of his taxa still valid (Price et al., 2003). It is a noun in genitive case.

Description (Figs. 10, 16, 26, 41, 47, 56, 61)

Female. Head with expanded and slightly truncated temples (Fig. 10). Dorsal head seta 10 (*dhs10*) 0.06–0.07 long; *dhs11* 0.11–0.12 long, ratio *dhs10/11* 0.6. Labial setae 5 (*ls5*) 0.07 long; latero-ventral fringe with 11 setae (1 specimen with 10). Metanotum very enlarged, roughly rounded in shape, with 26–35 setae on posterior margin, single irregular patch of 11–17 short setae, plus single detached medium-long seta on each side (Fig. 41); metapleura with 8–11 short, spine-like spines on each side; metasternal plate with 4+4 (4) (or 3+4, 4+3) setae. Setae of femoral brush 18–23 in number. Tergites I–III strongly arched medially (Fig. 41). Small median gap discernible in row of setae present in segments VI–VIII. Tergum I with short and long setae arranged in patch of setae (Fig. 41). Terga II–VIII with single row of posteriorly located setae; median gap in tergal row of setae discernible in VI–VIII. Tergal setae number: I, 29–31

(12–14 in antero-lateral patch plus 6–7 medial); II, 15–21; III, 12–17; IV, 11–17; V, 17–22; VI, 4–8; VII, 4–5; VIII, 4. Tergite IX with single inner posterior seta on each side, 0.08–0.11 long. Sternum II with its posterior margin almost straight, with 32–43 setae; anterior margin with 18–26 setae; aster with 3 spine-like setae (Fig. 26) (rarely 4 only on 1 side). Aster setae length: s1, 0.19–0.21; s2, 0.15–0.18; s3, 0.11–0.16. Sternal setae number: III, 6–7; IV, 22–32; V, 26–35; VI, 24–30; VII, 11–13; lateral set on III–VI shown in Fig. 16; subgenital plate with 14–18 setae; vulvar margin with 17–20 setae. Pleural setae number: I, 11–14; II, 11–12; III, 9–11; IV, 6–10; V, 4–5; VI, 4–5; VII, 3–4; on segments III–VII 1–2 slender, longer setae on inner ventral side. Pleurite VIII much as in Fig. 19, inner setae almost twice as long as outer. Anus with 35–41 ventral fringe setae and 35–44 dorsal setae.

Male. Head features and body shape similar to female. Metanotum with 7–12 setae on posterior margin, single irregular patch of 2–5 short setae, plus single detached medium-long seta on each side (Fig. 56). Metapleura with 4 short, spine-like setae on each side (rarely 5 on one side); metasternal plate with 4+4 (3) (or 3+3, 4+3, 5+3 (2)) setae. Setae of femoral brush 17–24 in number. Tergal setae number: I, 14–20; II, 12–18; III, 11–17; IV, 11–15; V, 10–15; VI, 9–11; VII, 6–9; VIII, 4. Median gap in all tergal rows of setae well developed (in some specimens tergites I–III with single continuous row of setae). Tergite IX with single inner posterior seta on each side, 0.08–0.11 long. Pattern of chaetotaxy of tergites and sternites shown in Figs. 56, 61. Sternal setae number: I, 0; II, each aster with 3 setae (rarely 4 on one side), posterior margin with 23–28 setae, anterior margin with 7–10 setae (15 in one specimen); III, 22–28; IV, 30–37; V, 31–42; VI, 31–35; VII, 22–27; subgenital plate, 26–33. Pleural setae as in females. Genitalia as in Figs. 31–32, with distinctive long-armed sclerite (as in Figs. 34–35).

Remarks

Females of *M. lindolphi* n. sp. are morphologically close to *M. fallax*, *M. daleclaytoni* n. sp. and *M. moriona* n. sp. sharing the presence of very long setae on the aster of sternite II, very different from those present in males. They can be differentiated from females of *M. daleclaytoni* n. sp. by the absence of

anterior patch of setae on metanotum (vs present in *M. daleclaytoni* n. sp.) and in having less than 30 setae anteriorly on sternite II (vs > 30 setae in *M. daleclaytoni* n. sp.). *Myrsidea lindolphi* n. sp. is unique in having chaetotaxy of the posterior margin of the metanotum set as one patch of medium-long setae on each side (both sexes), and in the larger number of metapleural setae in females (8–11 vs 3–5 in *M. fallax*, *M. daleclaytoni* n. sp. and *M. moriona* n. sp.). Unique characters of the males of *M. lindolphi* n. sp. comprise the metanotal chaetotaxy with one patch of 3–4 short setae (Fig. 56) and the presence of only three spine-like setae on sternite II (Fig. 61).

Myrsidea melanocyanei n. sp.

Type-host: *Cyanocorax melanocyaneus chavez* (Miller & Griscom) (Corvidae), bushy-crested jay (*chavez*).

Type-locality: Reserva Natural Miraflores Moropotente, Estelí, Nicaragua.

Type-material: Holotype female (FMNH 2960115) ex *Cyanocorax melanocyaneus chavez*, FMNH 481759, Finca Neblina del Bosque (13°14'47"N, 86°15'8"W; 1,441 m), Reserva Natural Miraflores Moropotente, c.30 km north-northeast of Estelí, Departamento Estelí, Nicaragua, 21.iv.2012, col. J. D. Weckstein. Paratypes: 3 males (FMNH 2960115–16), same data as for the holotype.

Morphometric data: Supplementary file 1.

Etymology: The specific epithet is taken from the specific name of the type-host, being its possessive.

Description (Figs. 11, 17, 27, 42, 48, 57, 62)

Female. Head with expanded and slightly truncated temples (Fig. 11). Dorsal head seta 10 (*dhs10*) 0.07 long; *dhs11* 0.11 long; ratio *dhs10/11* 0.6. Labial setae 5 (*ls5*) 0.07 long, latero-ventral fringe with 9 setae. Metanotum with straight posterior margin, with 12 setae on posterior margin, 1 short outermost seta and 5 medium-long setae on each side (Fig. 42); metapleura with 3 short, spine-like spines on each side; metasternal plate with 3+3 setae. Setae of femoral brush 15 in number. Tergite I enlarged, with arched posterior margin, tergites II–III with slightly arched posterior margins (Fig. 42). Small median gap discernible in each tergal setal row of segments I–VIII. Tergum I with assortment of short to medium-long setae,

arranged in defined row (Fig. 42). Terga II–VIII with single row of posteriorly located setae. Tergal setae number: I, 10; II, 13; III, 12; IV, 9; V, 8; VI, 6; VII, 4; VIII, 4. Tergite IX with single inner posterior seta on each side, 0.15 long. Sternum II with its posterior margin almost straight, with 17 setae; anterior margin with 8 setae; aster with 5 spine-like setae (Fig. 27). Aster setae length: s1, 0.09; s2, 0.08; s3, 0.06; s4, 0.04; s5, 0.03. Sternal setae number: III, 20; IV, 25; V, 22; VI, 16; VII, 10; lateral set on III–VI shown in Fig. 17; subgenital plate and vulvar margin with 12 setae each. Pleural setae number: I, 7; II, 7; III, 8; IV, 7; V, 6; VI, 5; VII, 4 (no indication of longer setae in the holotype). Pleurite VIII much as in Fig. 19, inner setae almost twice as long as outer. Anus with 31 ventral fringe setae and 37 dorsal setae.

Male. Head features and body shape similar to female. Metanotum with 10 setae (1 paratype with 9) on posterior margin, single short outermost seta and 3–4 of medium-long setae on each side (Fig. 57). Metapleura with 3 short, spine-like spines on each side (rarely 2 on one side); metasternal plate with 3+3 setae. Setae of femoral brush 14–16 in number. Tergal setae number: I, 10–11; II, 10–13; III, 12–15; IV, 12–14; V, 11–12; VI, 9–13; VII, 5–8; VIII, 4–5. Median gap in each (I–VIII) tergal row of setae well developed. Tergite IX with single inner posterior seta on each side, 0.08–0.10 long (1 paratype with setae 0.06 long on both sides). Pattern of chaetotaxy of tergites and sternites in Figs. 57, 62. Sternal setae number: I, 0; II, each aster with 5 setae (1 paratype with 4 on one side), posterior margin with 16–17 setae, anterior margin with 7–8 setae; III, 20–23; IV, 30–32; V, 29–32; VI, 24–26; VII, 14–18; subgenital plate, 17–20. Pleural setae number: I, 4–5; II, 5–6; III, 6; IV, 5–6; V, 5; VI, 5; VII, 4; on segments V–VII 2 slender, longer setae on inner ventral side. Genitalia as in Figs. 31–32, with distinctive long-armed sclerite (as in Figs. 34–35).

Remarks

Females of *M. melanocyanei* n. sp. are morphologically close to *M. cristatelli* n. sp. by the aster of sternite II being similar to that in males. However, the posterior margin of metanotum in *M. melanocyanei* n. sp. is straight and not enlarged whereas it is much enlarged posteriorly in *M. cristatelli* n. sp. *Myrsidea*

melanocyanei n. sp. also has fewer anterior setae on sternite II (8 vs 27–33 setae in *M. cristatelli* n. sp.).

Myrsidea cristatelli n. sp.

Syn. *Myrsidea* sp. of Valim et al. (2005)

Type-host: *Cyanocorax cristatellus* (Temminck) (Corvidae), curl-crested jay.

Type-locality: Brazil.

Type-material: Holotype female (MZUSP 6252) ex *Cyanocorax cristatellus*, a captive bird in Zoological Garden of São Paulo, Estado São Paulo, Brazil, 3.iv.2003, col. R. H. F. Teixeira. Paratypes: 5 males and 2 females (MZUSP 6253–57), same data as for the holotype.

Additional material: Two nymphs III, same data as for the holotype but not regarded as types.

Morphometric data: Supplementary file 1.

Etymology: The specific epithet is taken from the specific name of the type-host and is a noun in genitive case.

Description (Figs. 12, 18, 28, 43, 49, 53, 58, 63)

Female. Head with flatly rounded temples (Fig. 12). Dorsal head seta 10 (*dhs10*) 0.06–0.08 long; *dhs11* 0.12–0.13 long, ratio *dhs10/11* 0.5–0.6. Labial setae 5 (*ls5*) 0.08–0.09 long, latero-ventral fringe with 11 setae. Metanotum very enlarged, angular in shape with posterior margin nearly straight, with 10 setae on posterior margin (in holotype; 12–16 in paratypes), single short outermost seta and 4–7 relatively long setae on each side (Fig. 43); metapleura with 4 short, spine-like setae on each side (one paratype with 5+5); metasternal plate with 4+4 setae. Setae of femoral brush 22–25 in number. Tergite I very enlarged medially, tergites II–IV strongly arched medially, tergite V with medially concave anterior margin only (Fig. 43). Small median gap discernible in each tergal setal row of segments V–VIII (rarely IV–VIII). Tergum I with medium-long setae arranged in one horizontal row (not following metanotal margin) (Fig. 43). Terga II–VIII with single row of posteriorly located setae. Tergal setae number: I, 21–25; II, 19–24; III, 21–23; IV, 18–21; V, 17–21; VI, 14; VII, 6–9; VIII, 4. Tergite IX with single inner posterior seta on each side, 0.04–0.06 long. Sternum II with its posterior margin almost straight, with 21–24 setae,

anterior margin with 27–33 setae; aster with 5+4 spine-like setae (holotype, Fig. 28; 4+4 in paratypes). Aster setae length: s1, 0.12–0.16; s2, 0.06–0.08; s3, 0.04–0.05; s4, 0.03–0.04. Sternal setae number: III, 7–10; IV, 29–36; V, 31–36; VI, 23–27; VII, 17–19; lateral set on III–VI shown in Fig. 18; subgenital plate with 12–15 setae, vulvar margin with 15–17 setae and distinct medial concavity (Fig. 49). Pleural setae number: I, 9–10; II, 9–10; III, 7–10; IV, 7–9; V, 5–7; VI, 5–6; VII, 5; on segments III–VII 2 (IV with 3) slender and longer setae on inner ventral side. Pleurite VIII much as in Fig. 19, inner setae almost twice as long as outer. Anus with 37–42 ventral fringe setae and 40–46 dorsal setae.

Male. Head features and body shape similar to female. Metanotum with 6–8 setae on posterior margin, single short outermost seta and 2–3 medium-long setae on each side (Fig. 58). Metapleura with 4 short spine-like setae on each side (rarely 3 on one side); metasternal plate with 4+4 setae (1 paratype with 4+3). Setae of femoral brush 19–23 in number. Tergal setae number: I, 11–16; II, 12–15; III, 14–16; IV, 13–16; V, 13–18; VI, 11–14; VII, 9–12; VIII, 4–6. Median gap in most II–VIII tergal rows of setae well developed (one paratype with gap on tergite I). Tergite IX with single inner posterior seta on each side, 0.08–0.11 long. Pattern of chaetotaxy of tergites and sternites in Figs. 58, 63. Sternal setae number: I, 0; II, each aster with 4 setae (rarely with 5 on one side), posterior margin with 17–20 setae, anterior margin with 11–18 setae; III, 23–29; IV, 33–41; V, 40–47; VI, 35–44; VII, 26–29; subgenital plate, 22–28. Pleural setae as in females. Genitalia as in Figs. 31–32, with distinctive long-armed sclerite (as in Figs. 34–35).

Nymph III. Ratio $dhs_{10/11}$ 0.5–0.06. Latero-ventral fringe with 11 setae (10 on one side of 1 specimen). Gular plate with 3+3 setae, posterior pair longer. Prosternum and mesosternum without setae, metasternum with 6 setae. Pronotum with 6 posterior setae, each lateral corner with 3 short setae. Metanotum chaetotaxy with single short spine-like seta, plus 2 (rarely 1 or 3 on one side) medium-long setae on each side. Metapleura with 3 spiniform setae (less frequently with 2 setae on one side). Femoral brush with 18 setae. Sternite II: aster very rudimentary on each lateral corner, with 3 spine-like setae crescent in length; posterior margin with 13–15 setae; anterior

portion with 10–11 medium-long setae. Tergal and sternal chaetotaxy shown in Fig. 53.

Remarks

The females of *M. cristatelli* n. sp. are morphologically close to *M. melanocyaneae* n. sp. in having the aster in sternite II similar to that in males. However, *M. cristatelli* n. sp. possesses much enlarged metanotum whereas in *M. melanocyaneae* n. sp. its posterior margin is not enlarged; the high number of anterior setae on sternite II (more than 25 vs less than ten setae in *M. melanocyaneae* n. sp.) is also distinctive. In addition, females of *M. cristatelli* n. sp. possess a median concavity at vulvar margin, whereas the latter is nearly straight in *M. melanocyaneae* n. sp. Males of *M. cristatelli* n. sp. possess more than ten anterior setae on sternite II (vs less than ten setae in *M. melanocyaneae* n. sp.) and long setae on pleurites III–VIII (vs on pleurites V–VIII in *M. melanocyaneae* n. sp.). Both sexes of *M. cristatelli* n. sp. exhibit fewer setae on latero-ventral fringe of head than in *M. melanocyaneae* n. sp.

Key to the species of *Myrsidea* from Neotropical jays of the genus *Cyanocorax*

- 1a Setae of aster on sternite II similar in both sexes (spine-like setae typical for the genus; Figs. 27–29) 2
- 1b Setae of aster on sternite II dimorphic (females with very long but rigid setae; males with spine-like setae typical for the genus; Figs. 21, 23–26) 3
- 2a **Females:** metanotum much enlarged (Fig. 43); 27–33 anterior setae on sternite II; vulvar margin with medial concavity (Fig. 49). **Males:** > 10 anterior setae on sternite II; long and thin setae on pleurites III–VIII ... *M. cristatelli* n. sp.
- 2b **Females:** metanotum not enlarged (Fig. 42); 8 anterior setae on sternite II; vulvar margin nearly straight (Fig. 48). **Males:** < 10 anterior setae on sternite II; long and thin setae on pleurites V–VIII *M. melanocyaneae* n. sp.
- 3a **Females:** patch of 3–4 setae present on each side of anterior portion of metanotum (Fig. 40); only two very long, rigid setae on each aster of

- sternite II (Fig. 25); sternite II anteriorly with > 30 setae. *Males*: long and thin setae on pleurites III–VIII *M. daleclaytoni* n. sp.
- 3b *Females*: patch of setae on anterior portion of metanotum absent; each aster of sternite II with more than two setae (Figs. 21–24, 26); sternite II anteriorly with < 30 setae. *Males*: long and thin setae on pleurites IV–VIII 4
- 4a *Females*: posterior margin of metanotum with irregular patch of 11–17 setae (Fig. 41); metapleura with 8–11 setae; each aster of sternite II with 3 long, rigid setae (Fig. 26); sternite III with 6–7 setae. *Males*: metanotal patch of 3–4 short setae, plus one medium-long seta detached from the middle on each side; each aster of sternite II with three spine-like setae (Fig. 61) *M. lindolphi* n. sp.
- 4b *Females*: posterior margin of metanotum not forming one patch of setae (Figs. 1, 6, 39); metapleura with 3–4 setae; each aster of sternite II with > 3 long, rigid setae (Figs. 21–24); sternite III with > 10 setae. *Males*: metanotal chaetotaxy comprising distinct row of one short and three medium-long setae on each side; each aster of sternite II with > 3 spine-like setae (Fig. 22) 5
- 5a *Females*: tergite I slightly projected posteriorly (Figs. 1, 6), pushing at most the anterior margin of tergite II; chaetotaxy of tergites I–V with an almost continuous row of setae interrupted by median gap (except on tergite III); sternite II with 12–25 setae anteriorly. *Males*: MW ≤ 0.45 mm; long and thin setae on pleurites VI–VIII 6
- 5b *Females*: tergite I enlarged (Fig. 39), pushing the tergite II and the anterior margin of tergite III; chaetotaxy of tergites I–V with median pair of setae detached from the lateral row set at midline of tergites, forming two lateral gaps in addition to the medial gap; sternite II with 6–10 setae anteriorly. *Males*: MW ≥ 0.48 mm; long and thin setae on pleurites III–VIII *M. moriona* n. sp.
- 6a *Females*: metathoracic chaetotaxy with 10–15 setae (Fig. 1). *Males*: TW ≥ 0.50 mm; tergal chaetotaxy on III 12–15; sternal chaetotaxy on III 24–31, IV 35–42 *M. fallax* Kéler, 1938
- 6b *Females*: metathoracic chaetotaxy with 20–27 setae (Fig. 6). *Males*: TW < 0.50 mm; tergal chaetotaxy on III 8–10; sternal chaetotaxy on III 16–25, IV 27–34 *M. pseudofallax* n. sp.

External chorionic architecture of the eggs in species of *Myrsidea*

As it occurs in all Phthiraptera, with the exception of *Meinertzhageniella* Eichler, 1940 (see Eichler, 1946), the chorion of the egg is formed wholly by the follicular cells of the polytrophic ovariole. After the deposition of the endochorionic layer over the vitelline cuticle, the exochorionic layer begins to be secreted. This layer is not produced uniformly, but is deposited in many cases more rapidly at the edge of the follicle cells than at their central areas and, in consequence, some kinds of deep areolae or more or less polygonal areas appear in the chorion opposite to each follicular cell. For this reason, the “pitted”, areolate or reticulate external surface of the eggs is a result of the follicular cells imprints during their production. This process has been pointed out, among others, by Beament (1946) for eggs of Hemiptera (Reduviidae).

For the sake of uniformity, we follow here the nomenclature formerly used by Abrahamovich & Cicchino (1985, 1990) for anatomical and topographical regions and chorionic structures of the eggs for the *Myrsidea* spp. The most relevant features of the operculum and amphora are briefly described below and eggs for three species of *Myrsidea* infesting passerine species are illustrated by line drawings for the first time in order to improve the comparison of the structures discussed: *M. seminuda* Eichler, 1951 ex *Thraupis s. sayaca* (Linnaeus); *M. elegans* Ansari, 1956 ex *Turdus rufiventris* Vieillot; and *M. psittaci* Carriker, 1965 ex *Pseudoleistes virescens* (Vieillot).

Operculum: Hexagonal imprints of the follicle cells always discernible on the opercular surface, lightly-impressed as in *M. fallax* (Fig. 69) and *M. psittaci* (Fig. 66) or strongly impressed as in *M. moriona* n. sp. (Fig. 73), *M. interrupta* (Osborn, 1896) (Figs. 75, 77), *M. cornicis* (De Geer, 1778) (Figs. 79, 81), *M. isostoma* (Nitzsch in Giebel, 1866) (Figs. 83, 86), *M. picae* (Linnaeus, 1758) (Figs. 87–89), *M. seminuda* (Fig. 65) and *M. elegans* (Fig. 64). The margined row of imprints alternates at irregular intervals with air chambers (see Fig. 69), always developed in the meridian ridges (see Fig. 69) of these imprints. These meridian ridges are in some species greatly developed and produced outwardly (*M. interrupta* and *M. cornicis*, Figs. 77, 82). The degree of development of the opercular callus seems to be correlated with those of the meridian ridges (compare Figs. 69, 73, 77,

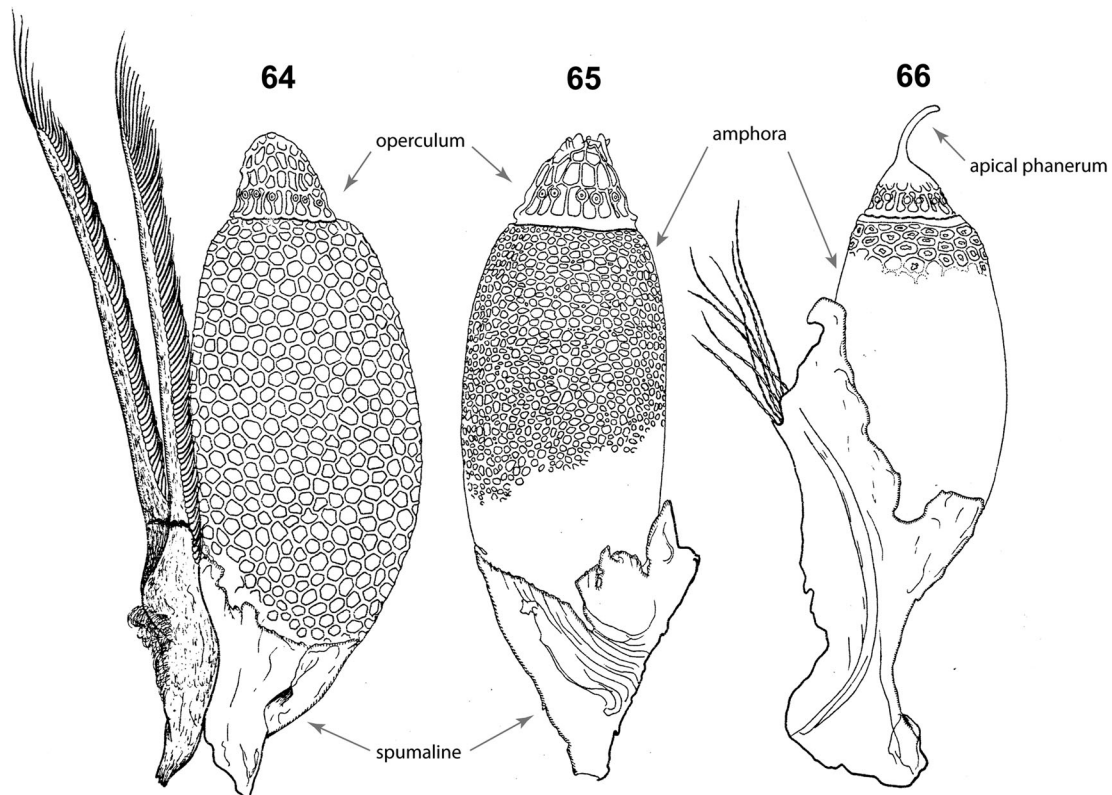


Fig. 64–66 Eggs. 64, *Myrsidea elegans* Ansari, 1956; 65, *M. seminuda* Eichler, 1951; 66, *M. psittaci* Carriker, 1955

82, 86, 89). The structure of the air chambers seems to be similar to that in species of *Osborniella* Thompson, 1948 (see Abrahamovich & Cicchino, 1990), except for two differences: first, they develop on the meridian ridges (see above), and second, the micropyle opens at the tip of a high crater-like elevation of the floor of operculum, and is easily visible through the external opening (see Figs. 70, 74, 78, 82, 90). Usually the apical pole is dome-shaped, less frequently subconical, with imprints more or less indistinct, but in some species [e.g. *M. diffusa* (Kellogg, 1896)] have a strong reticulation. The opercular tip may be produced in a strong cylindroid projection composed by a number of small strands like in some species of *Menacanthus* Neumann, 1912 (see Hohorst, 1939, Castro & Cicchino, 1978), as in *M. psittaci* (apical phanerum, Fig. 66) and some undescribed species from Icteridae (ACC, personal observation). Some species, e.g. *M. seminuda*, show a number of short to medium-long finger-like projections on meridian ridges, sometimes forming a characteristic appearance (Fig. 65).

Amphora: Like the operculum, the amphora, may or may not show imprints of the follicle cells. As a result, the surface of the amphora appears as smooth as in *M. fallax* (Fig. 68), *M. moriona* n. sp. (Fig. 72) or reticulate with 1–4 rows of hexagons as in *M. interrupta* (Fig. 76) and *M. psittaci* (Fig. 66) or with hexagonal mesh covering the apical third as in *M. diffusa*, the apical half as in *M. picae* (Figs. 87, 88), two-thirds of the amphora as in *M. seminuda* (Fig. 65), or the entire surface as in *M. elegans* (Fig. 64), *M. cornicis* (Figs. 79, 80) and *M. isostoma* (Figs. 83, 84). In a small number of species the amphora is globose or ventricose as in *M. serini* (Cicchino & Valim, unpublished data), but more often fusiform as in *M. fallax*, *M. moriona* n. sp., *M. interrupta*, *M. cornicis*, *M. isostoma*, *M. picae*, *M. elegans*, *M. seminuda*, *M. psittaci* (see figures cited above).

Sites of oviposition: The eggs of *Myrsidea* spp. are glued by means of a moderate amount of spumaline (which has hygroscopic properties, see Hinton, 1977) on the base of the egg to the underside, over side, or both at the same time, of the rachis or the vanus near it

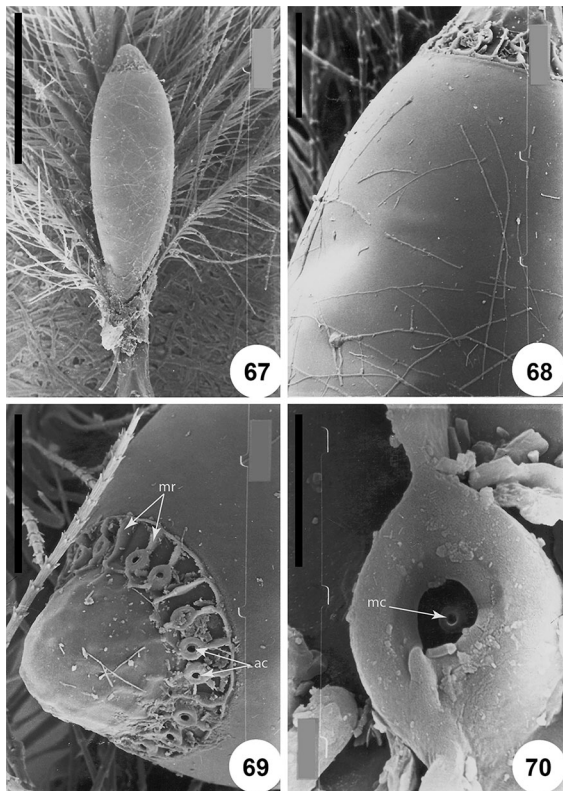


Fig. 67–70 *Myrsidea fallax* Kéler, 1938. 67, Egg cemented at the base of the rachis of a facial feather; 68, Upper half of the amphora and basal portion of operculum; 69, Operculum, semipolar view; 70, Air chamber. Abbreviations: ac, air chambers; mc, micopyle; mr, meridian ridges. Scale-bars: 67, 500 μ m; 68, 69, 100 μ m; 70, 10 μ m

(nomenclature after Chandler, 1916) of feather in the pterylae in the following regions: front, lores, face, auricular, chin, gula, and upper neck. Usually there is one egg per feather, but two or even more are found in heavily infested host individuals (Figs. 67, 71, 75, 79, 83, 87).

Characteristics of the eggs of *Myrsidea* spp. infesting Corvidae

Material examined: 17 eggs of *Myrsidea picae* ex *Pica p. pica*, Fonsagrada, Lugo, Spain; 6 eggs of *M. cornicis* ex *Co. c. corone* Linnaeus, Fonsagrada, Lugo, Spain; 7 eggs of *M. isostoma* ex *Co. f. frugilegus* Linnaeus, Fonsagrada, Lugo, Spain; 3 eggs of *M. interrupta* ex *Co. brachyrhynchus* Brehm, Princeton, New Jersey, USA; 8 eggs of *M. moriona* n. sp. ex *Cy.*

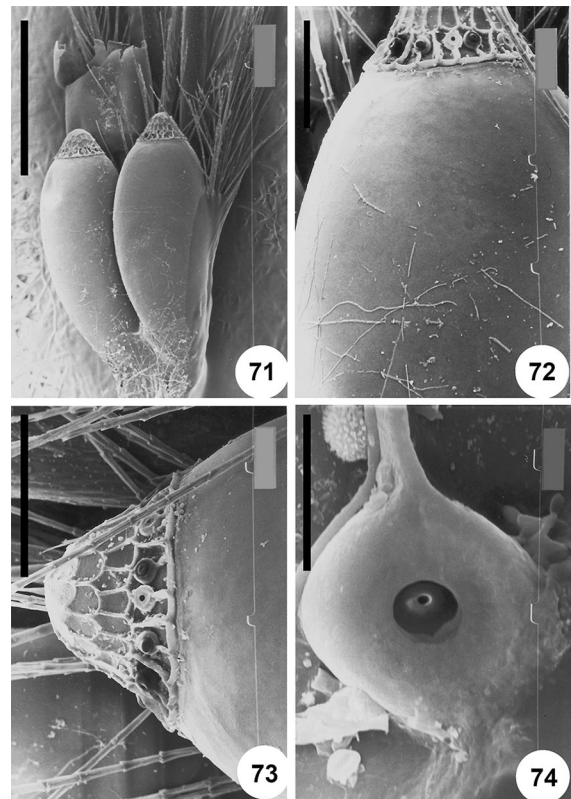


Fig. 71–74 *Myrsidea moriona* n. sp. 71, Two eggs cemented at the base of the rachis of a facial feather; 72, Upper half of the amphora and basal portion of operculum; 73, Operculum, lateral view; 74, Detail of the air chamber. Scale-bars: 71, 500 μ m; 72, 73, 100 μ m; 74, 10 μ m

morio, San José, Costa Rica; 13 eggs of *M. fallax* ex *Cy. cyanomelas*, Departamento. Ituzaingó, Corrientes, Argentina; 8 eggs of *M. seminuda* ex *Thraupis s. sayaca* (Thraupidae), Punta Piedras, Partido de Punta Indio, Provincia de Buenos Aires, Argentina; 6 eggs of *M. elegans* ex *Turdus rufiventris* (Turdidae), Punta Piedras, Partido de Punta Indio, Provincia de Buenos Aires, Argentina; 28 eggs of *M. psittaci* ex *Pseudoleistes virescens* (Icteridae), General Lavalle, Partido de Tordillo, Provincia de Buenos Aires, Argentina.

The features shared by the six species studied here are the lack of apical opercular phanerum, the air chambers rising from meridian ridges originating from opercular callus, the lack of callus on the apical portion of the amphora and the hydropile located basally and embedded in the spumaline. The

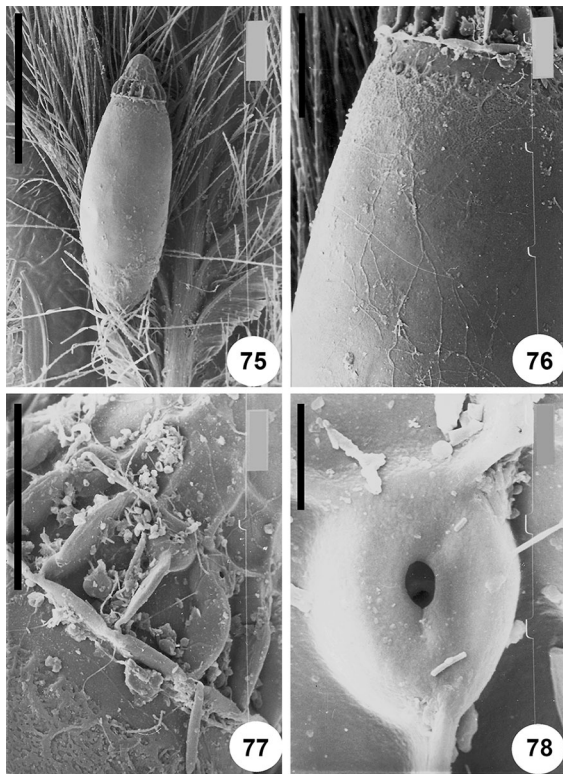


Fig. 75–78 *Myrsidea interrupta* (Osborn, 1896). 75, Egg cemented on the proximal barbs of the vanus of the facial feathers; 76, Upper half of the amphora and basal portion of operculum; 77, Operculum, detail of the basal portion; 78, Detail of the air chamber. Scale-bars: 75, 500 μ m; 76, 77, 100 μ m; 78, 10 μ m

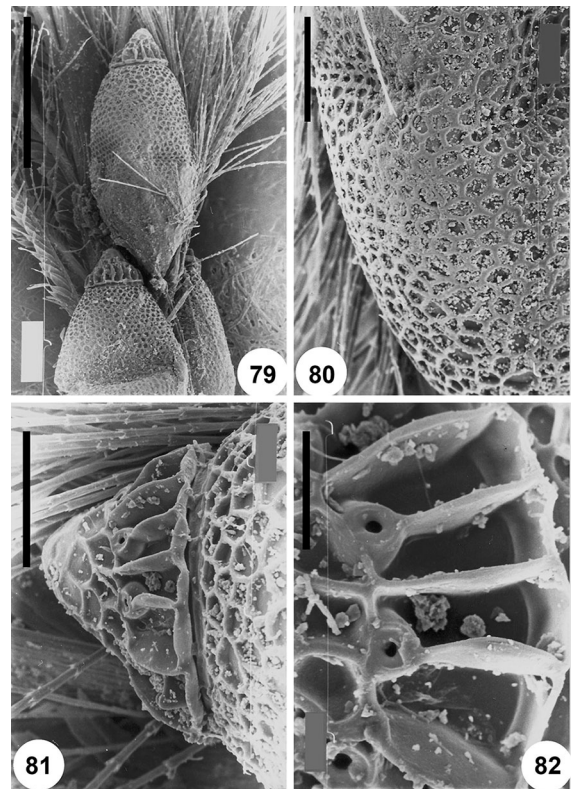


Fig. 79–82 *Myrsidea cornicis* (De Geer, 1778). 79, Eggs cemented at the base of the rachis and on the basal barbs of the vanus; 80, Detail of the amphora; 81, Operculum, lateral view; 82, Basal portion of the operculum. Scale-bars: 79, 500 μ m; 80, 81, 100 μ m; 82, 25 μ m

remaining characteristics, i.e. the degree of impression of the opercular mesh, the degree of development of the marginal ridges and opercular callus, and the ornaments of the amphora, appear in different combinations for each species, as shown in Table 1. However, the distribution of some of these characteristics among these species permit to discriminate their eggs in two morphological types:

- Type A (includes *M. fallax* and *M. moriona* n. sp.), characterised by light to moderately impressed opercular mesh, weakly developed marginal ridges and opercular callus, and amphora lacking ornamentation. These species differ in the degree of impression of the opercular mesh, stronger in *M. moriona* n. sp. (compare Figs. 69 and 73), as well as by the tendency to show a more ventricose silhouette in the latter (compare Figs. 67 and 71). Until more eggs of species within the *fallax* species

group are known to deviate from this hypothesis, this type based on egg morphology is here regarded as the equivalent for the *fallax*-species group, as defined above for imagoes.

- Type B (includes *M. interrupta* and *M. cornicis*), characterised by subconical in shape operculum, strongly impressed opercular mesh, very well-developed and greatly expanded marginal ridges and callus and amphora with at least 1–2 rows of hexagonal imprints. *Myrsidea cornicis* is distinguished from *M. interrupta* by the strongly impressed subhexagonal mesh, extended over the entire surface of the amphora (Figs. 75, 79) and by the less conical operculum (Figs. 75, 81).

The eggs of *M. isostoma* and *M. picae* cannot be associated with any of these types (Figs. 83, 87). However, assigning these to new monospecific egg-type groups would be premature due to our limited

Table 1 External chorionic features of the eggs of six species of *Myrsidea* infesting Corvidae

Egg feature / Species	<i>M. fallax</i> (Figs. 67–70)	<i>M. moriona</i> n. sp. (Figs. 71–74)	<i>M. interrupta</i> (Figs. 75–78)	<i>M. cornicis</i> (Figs. 79–82)	<i>M. isostoma</i> (Figs. 83–86)	<i>M. picae</i> (Figs. 87–90)
Degree of impression of the central mesh of operculum	light (Fig. 69)	strong (Fig. 73)	strong (Figs. 75, 77)	strong (Fig. 81)	strong (Fig. 85)	strong (Fig. 89)
Marginal ridges of the operculum	weakly developed (Figs. 68, 69)	weakly developed (Figs. 72, 73)	well developed, laminar (Fig. 77)	well developed, laminar (Figs. 79, 81)	weakly developed (Fig. 86)	weakly developed (Fig. 89)
Opercular callus	not expanded (Figs. 68, 69)	not expanded (Figs. 72, 73)	greatly expanded outwardly (Fig. 77)	greatly expanded outwardly (Figs. 81, 82)	lightly expanded upwardly (Fig. 86)	not expanded (Fig. 89)
Ornaments of the amphora	none (Figs. 67, 68)	none (Figs. 71, 72)	1–2 irregular rows of hexagons near operculum (Fig. 76)	sub-hexagonal mesh strongly impressed over entire surface (Figs. 79, 80)	sub-hexagonal mesh strongly impressed over entire surface (Figs. 83, 84)	sub-hexagonal mesh strongly impressed in upper half, fading gradually (Figs. 87, 88)
Maximum length: range (mean \pm SD)	0.644–0.805 (0.740 \pm 0.039) (n = 13)	0.708–0.793 (0.758 \pm 0.027) (n = 8)	0.854–0.878 (0.862 \pm 0.013) (n = 3)	0.805–0.878 (0.825 \pm 0.028) (n = 6)	0.830–0.903 (0.864 \pm 0.023) (n = 7)	0.830–0.927 (0.883 \pm 0.026) (n = 17)
Maximum width: range (mean \pm SD)	0.268–0.317 (0.292 \pm 0.013) (n = 13)	0.293–0.317 (0.311 \pm 0.011) (n = 8)	0.293–0.366 (0.342 \pm 0.042) (n = 3)	0.317–0.366 (0.346 \pm 0.018) (n = 6)	0.354–0.366 (0.363 \pm 0.036) (n = 7)	0.317–0.366 (0.352 \pm 0.018) (n = 17)

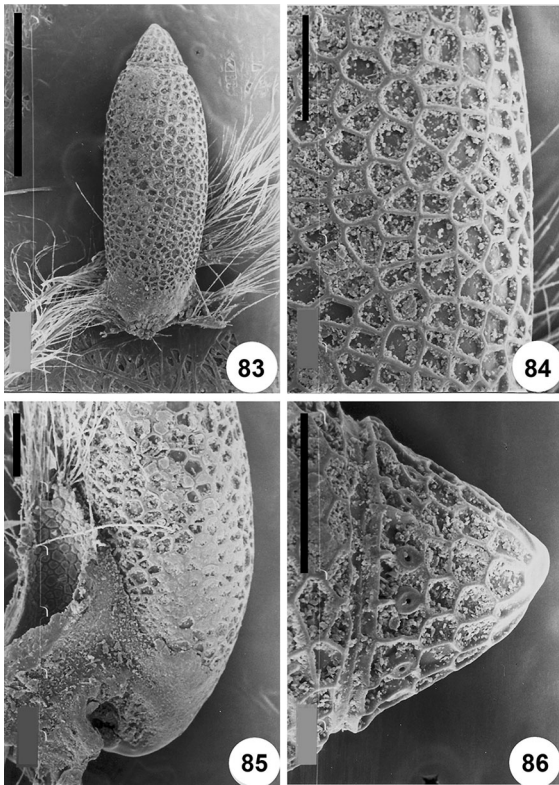


Fig. 83–86 *Myrsidea isostoma* (Nitzsch in Giebel, 1866). 83, Egg, panoramic; 84, Detail of the amphora; 85, Basal portion of the amphora: note the large amount of spumaline (sp) (the axis of the feather has been removed); 86, Operculum, lateral view. Scale-bars: 83, 500 μ m; 84–86, 100 μ m

knowledge on egg morphology for other species of the genus *Myrsidea*.

The combination of the features cited above and the measurements, in association with host identity, allow identification of *Myrsidea* spp. in concurrent infections in individual hosts in most cases. This is the case of the six *Myrsidea* spp. studied here (Table 1). This fact becomes particularly useful because museum skin collections, in which usually only the eggs remain firmly attached, are the only source of evidence for rare or even extinct bird species in biogeographical or parasitological studies. The chorionic structure still might be used as an excellent complement of data from fresh hosts when comparative studies on the prevalence in different geographical areas and differential seasonal abundance, linked or not with the host's breeding or molting seasons, are still needed in bird lice (see Foster, 1969a, b).

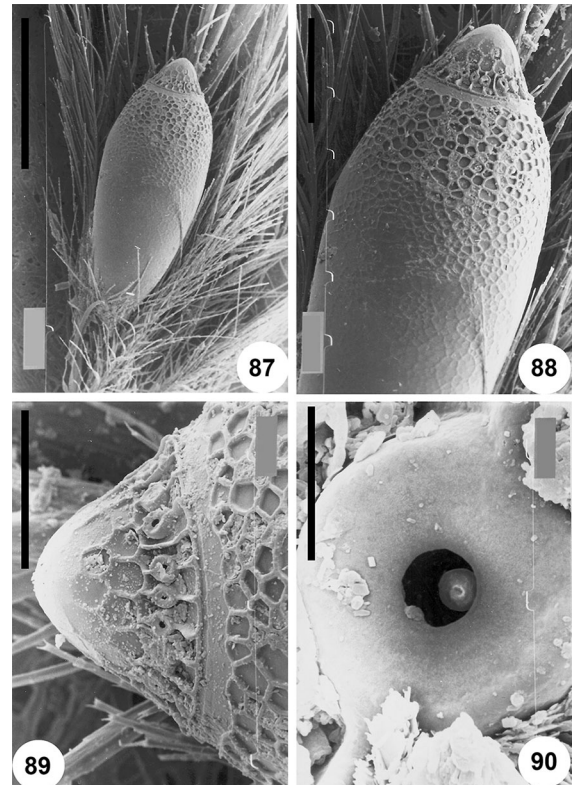


Fig. 87–90 *Myrsidea picae* (Linnaeus, 1758): 87, Egg, panoramic view; 88, Upper half of the amphora and operculum; 89, Operculum, lateral view; 90, Detail of the air chamber. Scale-bars: 87, 500 μ m; 88, 89, 100 μ m; 90, 10 μ m

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Electronic supplementary material for

Six new species of *Myrsidea* Waterston, 1915 (Phthiraptera: Menoponidae) from New World jays of the genus *Cyanocorax* Boie (Passeriformes: Corvidae), with notes on the chorionic structure of eggs

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Supplementary File 1: Morphometric data of the species of *Myrsidea* parasitic on New World jays of the genus *Cyanocorax*

All measurements are in millimetres. *Abbreviations*: TW, temple width; PoW, preocular width; HL, head length at midline; PW, prothorax width; MW, metathorax width; PrL, prosternal plate length; MtL, metasternal plate length; AW, abdomen width at segment IV; GL, male genitalia length; GsL, male genital sclerite length; AnW, female anus width; TL, total length of the body.

***Myrsidea fallax* Kéler, 1938**

Female from Argentina (n = 5): TW, 0.56–0.58; PoW, 0.40–0.45; HL, 0.38–0.42; PW, 0.36–0.38; PrL, 0.14–0.16; MW, 0.51–0.56; MtL, 0.18–0.20; AW, 0.62–0.72; AnW, 0.24–0.26; TL, 1.61–1.85.

Female from Brazil (n = 2): TW, 0.56–0.57; PoW, 0.42; HL, 0.36–0.39; PW, 0.35–0.36; PrL, 0.15–0.16; MW, 0.52–0.58; MtL, 0.19–0.20; AW, 0.68–0.72; AnW, 0.25–0.26; TL, 1.79–1.85.

Female from Paraguay (n=1): TW, 0.57; PoW, 0.43; HL, 0.39; PW, 0.36; PrL, 0.15; MW, 0.64; MtL, 0.20; AW, 0.70; AnW, 0.26; TL, 1.91.

Female from Peru (n = 3): TW, 0.57–0.58; PoW, 0.42; HL, 0.36; PW, 0.37–0.39; PrL, 0.15; MW, 0.60–0.63; MtL, 0.19–0.20; AW, 0.68–0.70; AnW, 0.24–0.26; TL, 1.76–1.81.

Male from Argentina (n = 4): TW, 0.50–0.51; PoW, 0.38–0.39; HL, 0.34–0.36; PW, 0.31–0.33; PrL, 0.12–0.13; MW, 0.42–0.44; MtL, 0.14–0.15; AW, 0.52–0.53; GL, 0.42–0.47; GsL, 0.07–0.10; TL, 1.45–1.55.

Male from Brazil (n = 3): TW, 0.49–0.51; PoW, 0.36–0.38; HL, 0.33–0.35; PW, 0.31; PrL, 0.11–0.12; MW, 0.42–0.44; MtL, 0.15–0.16; AW, 0.54–0.55; GL, 0.41–0.43; GsL, 0.09; TL, 1.46–1.49.

Male from Paraguay (n = 1): TW, 0.51; PoW, 0.39; HL, 0.31; PW, 0.33; PrL, 0.13; MW, 0.45; MtL, 0.15; AW, 0.55; GL, 0.45; GsL, 0.11; TL, 1.51.

Male from Peru (n = 5): TW, 0.50–0.51; PoW, 0.36–0.38; HL, 0.30–0.31; PW, 0.30–0.32; PrL, 0.13–0.16; MW, 0.43–0.45; MtL, 0.15–0.16; AW, 0.50–0.52; GL, 0.41–0.46; GsL, 0.10–0.11; TL, 1.46–1.49.

***Myrsidea pseudofallax* n. sp.**

Female (n = 7): TW, 0.54–0.56; PoW, 0.40–0.42; HL, 0.35–0.37; PW, 0.33–0.35; PrL, 0.13–0.14; MW, 0.52–0.55; MtL, 0.17–0.19; AW, 0.61–0.66; AnW, 0.24–0.26; TL, 1.63–1.66.

Male (n = 7): TW, 0.48–0.49; PoW, 0.36–0.38; HL, 0.32–0.33; PW, 0.30–0.32; PrL, 0.11–0.13; MW, 0.40–0.42; MtL, 0.15–0.16; AW, 0.50–0.53; GL, 0.41–0.48; GsL, 0.10–0.11; TL, 1.36–1.44.

***Myrsidea moriona* n. sp.**

Female (n = 6): TW, 0.59–0.61; PoW, 0.44–0.46; HL, 0.38–0.41; PW, 0.39–0.42; PrL, 0.15–0.17; MW, 0.62–0.66; MtL, 0.21–0.23; AW, 0.76–0.80; AnW, 0.28–0.30; TL, 1.81–1.97.

Male (n = 6): TW, 0.53–0.55; PoW, 0.36–0.42; HL, 0.32–0.35; PW, 0.35–0.36; PrL, 0.14; MW, 0.48–0.49; MtL, 0.16–0.18; AW, 0.58–0.59; GL, 0.47–0.59; GsL, 0.09–0.10; TL, 1.48–1.61.

***Myrsidea daleclaytoni* n. sp.**

Female (n = 5): TW, 0.59–0.62; PoW, 0.41–0.45; HL, 0.36–0.38; PW, 0.38–0.42; PrL, 0.15–0.17; MW, 0.56–0.67; MtL, 0.21–0.27; AW, 0.69–0.79; AnW, 0.26–0.30; TL, 1.78–1.97.

Male (n = 6): TW, 0.50–0.53; PoW, 0.35–0.38; HL, 0.31–0.34; PW, 0.31–0.34; PrL, 0.13–0.14; MW, 0.43–0.48; MtL, 0.15–0.17; AW, 0.50–0.53; GL, 0.40–0.50; GsL, 0.09–0.10; TL, 1.45–1.61.

Nymph I (n = 2): TW, 0.36–0.37; PoW, 0.27–0.29; HL, 0.25–0.26; PW, 0.23–0.24; MW, 0.29–0.31; AW, 0.40; TL, 0.94–1.04.

Nymph II (n = 1): TW, 0.41; PoW, 0.31; HL, 0.28; PW, 0.26; MW, 0.35; AW, 0.47; TL, 1.18.

Nymph III (n = 4): TW, 0.46–0.48; PoW, 0.33–0.35; HL, 0.29–0.32; PW, 0.29–0.31; MW, 0.40–0.42; AW, 0.49–0.53; TL, 1.32–1.39.

***Myrsidea lindolphoi* n. sp.**

Female (n = 5): TW, 0.60–0.63; PoW, 0.43–0.45; HL, 0.37–0.41; PW, 0.39–0.41; PrL, 0.16; MW, 0.63–0.67; MtL, 0.22–0.24; AW, 0.80–0.85; AnW, 0.26–0.28; TL, 1.77–1.93.

Male (n = 5): TW, 0.52–0.55; PoW, 0.37–0.39; HL, 0.33–0.36; PW, 0.33–0.36; PrL, 0.13–0.15; MW, 0.43–0.47; MtL, 0.16–0.18; AW, 0.54–0.56; GL, 0.48–0.54; GsL, 0.09–0.10; TL, 1.55–1.67.

***Myrsidea melanocyaneae* n. sp.**

Female (n = 1): TW, 0.54; PoW, 0.41; HL, 0.35; PW, 0.36; PrL, 0.15; MW, 0.57; MtL, 0.18; AW, 0.74; AnW, 0.27; TL, 1.80.

Male (n = 3): TW, 0.48–0.49; PoW, 0.36–0.37; HL, 0.31–0.32; PW, 0.30–0.32; PrL, 0.12–0.13; MW, 0.43–0.47; MtL, 0.13–0.15; AW, 0.53–0.55; GL, 0.45–0.48; GsL, 0.09–0.11; TL, 1.42–1.49.

***Myrsidea cristatellae* n. sp.**

Female (n = 3): TW, 0.59–0.62; PoW, 0.44–0.46; HL, 0.38–0.40; PW, 0.39–0.41; PrL, 0.15–0.16; MW, 0.66–0.69; MtL, 0.21–0.23; AW, 0.82–0.88; AnW, 0.30–0.31; TL, 1.93–2.01.

Male (n = 5): TW, 0.50–0.53; PoW, 0.38–0.40; HL, 0.34–0.39; PW, 0.34–0.38; PrL, 0.13–0.14; MW, 0.47–0.49; MtL, 0.16–0.18; AW, 0.57–0.59; GL, 0.47–0.50; GsL, 0.09–0.12; TL, 1.58–1.69.

Nymph III (n = 2): TW, 0.48–0.49; PoW, 0.37–0.38; HL, 0.32–0.34; PW, 0.31–0.33; MW, 0.46–0.48; AW, 0.61–0.62; TL, 1.51–1.53.