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New species and additional data on the chewing louse genus *Myrsidea* (Phthiraptera: Menoponidae) from wild Neotropical Passeriformes (Aves)

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Abstract

Twenty-four species of chewing lice of the genus *Myrsidea* Waterston, 1915 (Phthiraptera: Menoponidae) from Neotropical Suboscines (Passeriformes: Formicariidae, Furnariidae, Pipridae, Thamnophilidae, Tityridae, Tyrannidae) are recorded and discussed. They include: eight new species which are described and illustrated (*Myrsidea capeki* new species ex *Chiroxiphia caudata*; *Myrsidea leptopogoni* new species ex *Leptopogon superciliaris*; *Myrsidea leucophthalmi* new species ex *Automolus leucophthalmus*; *Myrsidea pachyramphi* new species ex *Pachyramphus polychopterus*; *Myrsidea philydori* new species ex *Philydor rufum*; *Myrsidea pyriglenae* new species ex *Pyriglena leucoptera*; *Myrsidea scleruri* new species ex *Sclerurus scansor* and *Myrsidea zuzanae* new species ex *Furnarius rufus*), as well as nine previously known species with additional data on intraspecific morphological variability, host associations and geographical distribution (*Myrsidea barbati* Price, Hellenthal & Dalgleish, 2005; *Myrsidea dalgleishi* Valim, Price & Johnson, 2011; *Myrsidea flaviventris* Price, Hellenthal & Dalgleish, 2005; *Myrsidea klimesi* Sychra, 2006; *Myrsidea meyi* Valim, Price & Johnson, 2011; *Myrsidea oleaginei* Price, Hellenthal & Dalgleish, 2005; *Myrsidea olivacei* Price, Hellenthal & Dalgleish, 2005; *Myrsidea pitangi* Price, Hellenthal & Dalgleish, 2005 and *Myrsidea spellmani* Price, Johnson & Dalgleish, 2008b). Seven further species are recorded at genus level only due to lack of adequate material. A 379 bp portion of the mitochondrial cytochrome oxidase I (COI) gene was sequenced from seven species in order to assess relative genetic divergences among *Myrsidea* populations.

Key words: Phthiraptera, Menoponidae, *Myrsidea*, new species, new data, COI, Passeriformes, Suboscines, Formicariidae, Furnariidae, Pipridae, Thamnophilidae, Tityridae, Tyrannidae, Brazil, Costa Rica, Honduras, Paraguay, Perú

Introduction

The suborder Tyranni (Passeriformes: Suboscines) represents a basal clade among passerine birds that includes more than 1200 species (Table 1), the large majority of which occur in the Neotropical Region (Ohlson *et al.* 2013; Clements *et al.* 2017). Neotropical Suboscines (Infraorder Tyrannides) include birds from ten families: Conopophagidae (gnateaters and gnatpittas), Cotingidae (cotingas), Formicariidae (ant-thrushes), Furnariidae (ovenbirds and woodcreepers), Grallariidae (antpittas), Pipridae (manakins), Rhinocryptidae (tapaculos), Thamnophilidae (antbirds), Tityridae (tityras and allies), and Tyrannidae (tyrant-flycatchers).

Despite the high number of potential suboscine hosts, data concerning their chewing lice are scarce and incomplete. The louse genus *Myrsidea* Waterston, 1915 is one of the most speciose within Phthiraptera, with approximately 380 species known worldwide. About 240 species of *Myrsidea* parasitise birds in the Neotropical Region; however, only 41 species have been recorded from Neotropical Suboscines (Table 1; Dalgleish & Price 2005; Valim *et al*. 2011).

The aim of this paper is to follow up on our previous studies of *Myrsidea* from Neotropical hosts (Sychra *et al.*

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2006, 2007, 2010; Valim *et al*. 2011; Valim & Weckstein 2013; Kolencik *et al.* 2016, 2017) by (1) describing eight new species, (2) presenting new data on the distribution of other *Myrsidea* species found on suboscine passerines from Brazil, Costa Rica, Honduras, Paraguay and Perú, and (3) comparing sequences of a portion of the COI gene obtained from selected *Myrsidea* species against those from other species available in GenBank.

TABLE 1. List of families of Neotropical Suboscines with numbers of species (following Clements *et al.* 2017) and numbers of identified species of *Myrsidea* recorded from them

Host families	Species	Hosts of *Myrsidea*	%	*Myrsidea* spp.	References
Conopophagidae	11	0	0	0	–
Cotingidae	66	0	0	0	–
Formicariidae	11	3	27	3	Sychra *et al.* (2006); Valim & Weckstein (2013)
Furnariidae	303	9	3	7	Sychra *et al.* (2007); Valim *et al.* (2011)
Grallariidae	53	0	0	0	–
Pipridae	54	8	15	4	Dalgleish & Price (2003); Sychra *et al.* (2010)
Rhinocryptidae	59	0	0	0	–
Thamnophilidae	234	6	3	6	Sychra *et al.* (2006); Price *et al.* (2008b)
Tityridae	33	3	9	2[1]	Dalgleish & Price (2005)[2]; Valim *et al.* (2011)
Tyrannidae	419	19	5	20[1]	Price *et al.* (2005); Valim *et al.* (2011); Valim & Weckstein (2013)
TOTALS	1243	**48**	4	**41**	

[1] one species—*Myrsidea cinnamomei* Dalgleish & Price, 2005—is known to parasitise hosts from both families Tityridae and Tyrannidae (Dalgleish & Price, 2005; Valim & Weckstein, 2013).
[2] two species originally described as from Cotingidae.

Material and methods

We used mist nests at various locations in five countries of the Neotropical region—Brazil, Costa Rica, Honduras, Paraguay and Perú—to trap wild birds, which were searched for chewing lice. See Sychra *et al*. (2014) and Kolencik *et al*. (2016) for details of the coordinates of the study sites and detailed methods of collection. We used the standard method to prepare and slide-mount chewing lice, as described by Palma (1978), but modified as follows: (1) lice treated in a solution of 20% KOH for at least 5 hours, (2) 30 minutes in water, (3) 30 min in 10% acetic acid, (4) 30 min in 50% ethanol, (5) 30 min in 70% ethanol, (6) 30 min in 96% ethanol, and (7) at least 24 hours in clove oil. Most preserved specimens of *Myrsidea* contain black crop and gut contents that impede observing important morphological details. Therefore, we remove them as much as possible by gentle pressing the body in water, after maceration with KOH (Fig. 1).

We followed the setal counting system for metanotal and tergal setae as recommended by Valim & Weckstein (2013), as follows: (1) the number of metanotal setae does not include the most posterolateral setae; (2) the number of tergal setal on tergite I does not include the postspiracular setae; and (3) the numbers of tergal setal on tergites II–VIII neither include the postspiracular setae nor the short associated setae. In the following descriptions, all measurements are in millimeters. Abbreviations for dimensions are: *dhs*, dorsal head seta; *ls5*, labial setae 5; TW, temple width; POW, preocular width; HL, head length at midline; PW, prothorax width; MW, metathorax width; AWIV, abdomen width at level of segment IV; TL, total length; ANW, female anus width; GW, male genitalia width; GSL, genital sac sclerite length. 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).

The taxonomy and nomenclature of the birds follow those in Clements *et al.* (2017). The species of *Myrsidea* reported below are grouped within each bird family, arranged in alphabetical order. All samples, including the type specimens of the new species described in this paper, are deposited in the Moravian Museum, Brno, Czech Republic (MMBC). Two exceptions are: *Myrsidea scleruri* n. sp., deposited in the Museu de Zoologia da Universidade de São Paulo, Brazil (MZUSP), and one female *Myrsidea dalgleishi* Valim, Price & Johnson, 2011 which is kept at the Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica (INBIO).

A 379 bp fragment of mitochondrial COI gene was amplified and sequenced from samples of selected *Myrsidea*, and a 347 bp fragment of nuclear elongation factor 1-alpha (EF1α) was amplified and sequenced from two specimens of *Myrsidea philydori* n. sp. from different hosts, using the technique described by Johnson *et al.* (2002). The sequences (GenBank MF563529–MF563538 and MF574203–MF574204, respectively) were edited and aligned using Geneious 9.1.8 (Kearse *et al.* 2012), and compared to GenBank database using the BLAST algorithm (Altschul *et al.* 1990). Genetic divergences of sequences from already published data were assessed by computing p-distances in Geneious 9.1.8 (Kearse *et al.* 2012).

In order to summarize all the data we have accumulated over the years concerning records of *Myrsidea* from Neotropical Suboscines, we have included in Table 3 all the species collected and recorded by us from the Neotropical region. However, to avoid repetition of published data, seven taxa listed in Table 3 are not dealt with in the systematic section of this paper. They are: *Myrsidea andylolsoni* Dalgleish & Price, 2003, *M. calvi* Sychra, 2007, *M. mcleannani* Sychra, 2006, *M. ochrolaemi* Sychra, 2007, *M. rekasii* Dalgleish & Price, 2003, *M. souleyetii* Sychra, 2007 and *Myrsidea* sp. from *Dendrocincla fuliginosa* (Sychra *et al.*, 2006, 2007, 2010).

FIGURE 1. Removal of crop contents from a specimen of *Myrsidea*.

TABLE 2. Summary of records of *Myrsidea* from Neotropical suboscine birds in this study

	Numbers examined		Numbers parasitized		Nº of lice	Mean intensity
	Birds	Species	Birds (%)	Species (%)		
Formicariidae	5	1	3 (60)	1 (100)	16	5.3
Furnariidae	214	45	18 (8)	12 (27)	106	5.9
Pipridae	216	11	20 (9)	3 (27)	102	5.1
Thamnophilidae	67	17	6 (9)	4 (24)	28	4.7
Tityridae	12	3	4 (33)	1 (33)	13	3.3
Tyrannidae	334	47	98 (29)	12 (26)	529	5.4
TOTALS	848	124	149 (18)	33 (27)	794	5.3

Results

A total of 848 host individuals of 124 Neotropical suboscine bird species were examined. One hundred and fourty-nine birds (18%) of 33 species were parasitized with 794 chewing lice (mean intensity = 5.3 lice per bird) belonging to twenty-five species of *Myrsidea* (Table 2). A total of 33 host-louse associations were found (Table 3). Prevalence of *Myrsidea* species ranged between 4% and 100%. Ranges of mean intensities and mean abundances were 1–17 and 0.4–10.3, respectively. In 87% (129/149) of parasitized birds the rate of infestation was very low

TABLE 3. List of hosts and the *Myrsidea* recorded from them by the authors in the Neotropical region.

Host family & species	**P**	**E**	***Myrsidea* species**	♂	♀	Nymphs	**Locality (Country)**
Formicariidae							
Formicarius analis (d´Orbigny & Lafresnaye, 1837)	2	4	#[1]*Myrsidea klimesi* Sychra, 2006	2	4	3	Hitoy Cerrere (CR)
<< " " " >>	1	1	*Myrsidea klimesi*	0	0	7	Las Tablas (CR)
Furnariidae							
§*Anabacerthia lichtensteini* (Cabanis & Heine, 1859)	1	2	***Myrsidea philydori* n. sp.	1	0	1	San Rafael (PY)
Automolus ochrolaemus (Tschudi, 1844)	2	3	#[2]*Myrsidea ochrolaemi* Sychra *in* Sychra *et al.*, 2007	3	4	1	Hitoy Cerrere (CR)
<< " " " >>	0	1	–	–	–	–	Las Tablas (CR)
§*Automolus leucophthalmus* (Wied, 1821)	3	10	***Myrsidea leucophthalmi* n. sp	6	5	4	San Rafael (PY)
Dendrocincla fuliginosa (Vieillot, 1818)	1	1	#[2]*Myrsidea* sp.	1	0	0	Barbilla (CR)
<< " " " >>	0	1	–	–	–	–	Hitoy Cerrere (CR)
<< " " " >>	0	3	–	–	–	–	Iquitos (PE)
<< " " " >>	0	6	–	–	–	–	San Rafael (PY)
Furnarius rufus (J.F. Gmelin, 1788)	2	2	***Myrsidea zuzanae* n. sp.	3	3	0	Tres Gigantes (PY)
<< " " " >>	0	1	–	–	–	–	Agripino Enciso (PY)
<< " " " >>	0	5	–	–	–	–	Nova Andranina (BR)
<< " " " >>	0	7	–	–	–	–	Pantanal (BR)
Glyphorynchus spirurus (Vieillot, 1819)	1	9	*Myrsidea dalgleishi* Valim, Price & Johnson, 2011	0	1	0	Barbilla (CR)
<< " " " >>	0	10	–	–	–	–	Hitoy Cerrere (CR)
<< " " " >>	0	5	–	–	–	–	Tapantí (CR)
<< " " " >>	0	3	–	–	–	–	Las Tablas (CR)
<< " " " >>	0	3	–	–	–	–	Iquitos (PE)
<< " " " >>	0	6	–	–	–	–	Atlántida (HO)
Lepidocolaptes souleyetii (Des Murs, 1849)	1	1	#[2]*Myrsidea souleyetii* Sychra, 2007	1	1	1	Hitoy Cerrere (CR)
§*Philydor rufum* (Vieillot, 1818)	1	2	***Myrsidea philydori*	4	3	10	San Rafael (PY)
Sclerurus guatemalensis (Hartlaub, 1844)	2	3	#[2]*Myrsidea calvi* Sychra, 2007	9	8	9	Hitoy Cerrere (CR)
Sclerurus scansor (Menetries, 1835)	1	1	*Myrsidea scleruri* n. sp.	1	0	5	San Rafael (PY)
Syndactyla subalaris (P.L. Sclater, 1859)	1	1	*Myrsidea meyi* Valim, Price & Johnson, 2011	1	1	2	Tapantí (CR)
§*Thripadectes rufobrunneus* (Lawrence, 1865)	2	2	***Myrsidea meyi*	7	2	8	Tapantí (CR)

……*continued on the next page*

TABLE 3. (Continued)

Host family & species	P	E	*Myrsidea* species	♂	♀	Nymphs	Locality (Country)
Pipridae							
Ceratopipra mentalis P.L. Sclater, 1857	4	8	#[3]*Myrsidea rekasii* Dalgleish & Price, 2003	2	1	12	Hitoy Cerrere (CR)
<< " " " >>	0	2	–	–	–	–	Barbilla (CR)
§*Chiroxiphia caudata* (Shaw, 1793)	10	15	***Myrsidea capeki* n. sp.	18	13	49	San Rafael (PY)
Chiroxiphia linearis (Bonaparte, 1838)	6	109	#[3]*Myrsidea andylolsoni* Dalgleish & Price, 2003	3	2	2	Rincón de la Vieja (CR)
Thamnophilidae							
Hylophylax naevioides (Lafresnaye, 1847)	1	6	*Myrsidea spellmani* Price, Johnson & Dalgleish, 2008b	0	0	2	Rincón de la Vieja (CR)
Phaenostictus mcleannani (Lawrence, 1860)	2	2	#[1]*Myrsidea mcleannani* Sychra, 2006	2	2	4	Hitoy Cerrere (CR)
Pyriglena leucoptera (Vieillot, 1818)	1	1	***Myrsidea pyriglenae* n. sp.	8	5	3	San Rafael (PY)
§*Taraba major* (Vieillot, 1816)	1	1	***Myrsidea* sp. 1	0	1	0	Tres Gigantes (PY)
<< " " " >>	1	3	***Myrsidea* sp. 1	0	0	1	Agripino Enciso (PY)
Tityridae							
Pachyramphus polychopterus (Vieillot, 1818)	2	2	***Myrsidea pachyramphi* n. sp.	0	2	3	Tarapoto (PE)
<< " " " >>	2	2	***Myrsidea pachyramphi*	4	2	2	Iquitos (PE)
Tyrannidae							
Contopus virens (Linnaeus, 1766)	1	2	*Myrsidea* sp.	0	0	3	Rincón de la Vieja (CR)
<< " " " >>	0	1	–	–	–	–	Islas de la Bahía (HO)
§*Elaenia frantzii* Lawrence, 1865	1	24	*Myrsidea* sp.	0	0	1	Barva (CR)
§*Leptopogon amaurocephalus* Tschudi, 1846	1	1	*Myrsidea* sp. 2	2	4	0	Tarapoto (PE)
<< " " " >>	3	10	*Myrsidea* sp. 2	2	2	7	San Rafael (PY)
§*Leptopogon superciliaris* Tschudi, 1844	3	4	***Myrsidea leptopogoni* n. sp.	2	2	20	Tapantí (CR)
<< " " " >>	0	1	–	–	–	–	Las Tablas (CR)
Mionectes oleagineus (Lichtenstein, 1823)	17	27	*Myrsidea oleaginei* Price, Hellenthal & Dalgleish, 2005	54	19	22	Hitoy Cerrere (CR)
<< " " " >>	6	6	*Myrsidea oleaginei*	21	21	20	Barbilla (CR)
<< " " " >>	3	5	*Myrsidea oleaginei*	2	1	2	Rincón de la Vieja (CR)
<< " " " >>	0	1	–	–	–	–	Las Tablas (CR)
<< " " " >>	1	1	*Myrsidea oleaginei*	1	0	0	Tarapoto (PE)

……continued on the next page

TABLE 3. (Continued)

Host family & species	P	E	*Myrsidea* species	♂	♀	Nymphs	Locality (Country)
<< " " " >>	0	6	–	–	–	–	Iquitos (PE)
<< " " " >>	6	7	*Myrsidea oleaginei*	5	8	12	Atlántida (HO)
Mionectes olivaceus Lawrence, 1868	41	54	*Myrsidea olivacei* Price, Hellenthal & Dalgleish, 2005	64	38	148	Tapantí (CR)
<< " " " >>	7	8	*Myrsidea olivacei*	14	6	12	Rincón de la Vieja (CR)
§*Myiobius sulphureipygius* (P.L. Sclater, 1857)	1	2	***Myrsidea barbati* Price, Hellenthal & Dalgleish, 2005	0	1	2	Hitoy Cerrere (CR)
<< " " " >>	0	1	–	–	–	–	Rincón de la Vieja (CR)
Pitangus sulphuratus (Linnaeus, 1766)	1	1	*Myrsidea pitangi* Price, Hellenthal & Dalgleish, 2005	1	0	0	Tarapoto (PE)
<< " " " >>	1	2	*Myrsidea pitangi*	1	0	1	Tres Gigantes (PY)
<< " " " >>	1	1	*Myrsidea pitangi*	1	1	0	Atlántida (HO)
<< " " " >>	0	1	–	–	–	–	Hitoy Cerrere (CR)
<< " " " >>	0	6	–	–	–	–	Nova Andranina (BR)
§*Ramphotrigon megacephalum* (Swainson, 1835)	1	7	*Myrsidea* sp.	0	1	0	San Rafael (PY)
§*Rhynchocyclus brevirostris* (Cabanis, 1847)	1	1	*Myrsidea* sp.	0	0	1	Tapantí (CR)
Tolmomyias sulphurescens (Spix, 1825)	1	1	***Myrsidea flaviventris* Price, Hellenthal & Dalgleish, 2005	0	1	2	Atlántida (HO)
<< " " " >>	0	1	–	–	–	–	Rincón de la Vieja (CR)
<< " " " >>	0	1	–	–	–	–	San Rafael (PY)
§*Zimmerius vilissimus* (P.L. Sclater & Salvin, 1859)	1	1	*Myrsidea* sp.	0	0	1	Cerro de la Muerte (CR)
<< " " " >>	0	2	–	–	–	–	Tapantí (CR)

P = number of birds parasitized; E = number of birds examined; § = first recorded louse from this host; ** = new host-louse association; #[1] = reported by Sychra *et al.* (2006); #[2] = reported by Sychra *et al.* (2007); #[3] = reported by Sychra *et al.* (2010); BR = Brazil; CR = Costa Rica; HO = Honduras; PY = Paraguay; PE = Perú.

(1–10 lice per bird). Infestations of 11–20 lice per bird were found in 17 (11%) birds. The highest number of *Myrsidea* lice recorded per host was 25 individuals on one *Sclerurus guatemalensis* (Hartlaub, 1844), followed by one *Chiroxiphia caudata* (Shaw, 1793) and one *Mionectes olivaceus* Lawrence, 1868, which harboured 21 lice each. The overall sex ratio of lice was male-biased (246 males versus 165 females; $\chi^2 = 15.7$, $P < 0.001$). The overall age ratio of lice was equal (411 adults versus 383 immatures; $\chi^2 = 1.0$, $P > 0.05$).

Systematics

PHTHIRAPTERA Haeckel 1896: 703.

Amblycera Kellogg, 1896a: 68.

Menoponidae Mjöberg, 1910: 26.

***Myrsidea* Waterston, 1915: 12.**

Host family: Formicariidae

Myrsidea klimesi Sychra, 2006

Myrsidea klimesi Sychra, 2006 *in* Sychra *et al.* 2006: 55, figs 10–11, 14–15.

Type host. *Formicarius analis* (d´Orbigny & Lafresnaye, 1837)—black-faced ant-thrush.

Type locality. Hitoy Cerere BR, Provincia Limón, Costa Rica.

Material examined. Ex *Formicarius analis*: 7 nymphs II, Zona Protectora Las Tablas, Costa Rica (08°54'N, 82°47'W), 21 August 2010, O. Sychra & I. Literak (MMBC).

Remarks. Although we examined only nymphs, we believe they belong to *M. klimesi* because they are from the type host species, even if from a different locality in Costa Rica.

Host family: Furnariidae

Myrsidea dalgleishi Valim, Price & Johnson, 2011

Myrsidea sp. 2; Sychra *et al*. 2007: 123, fig. 13.
Myrsidea dalgleishi Valim, Price & Johnson, 2011: 10, figs 28–29, 33–35.

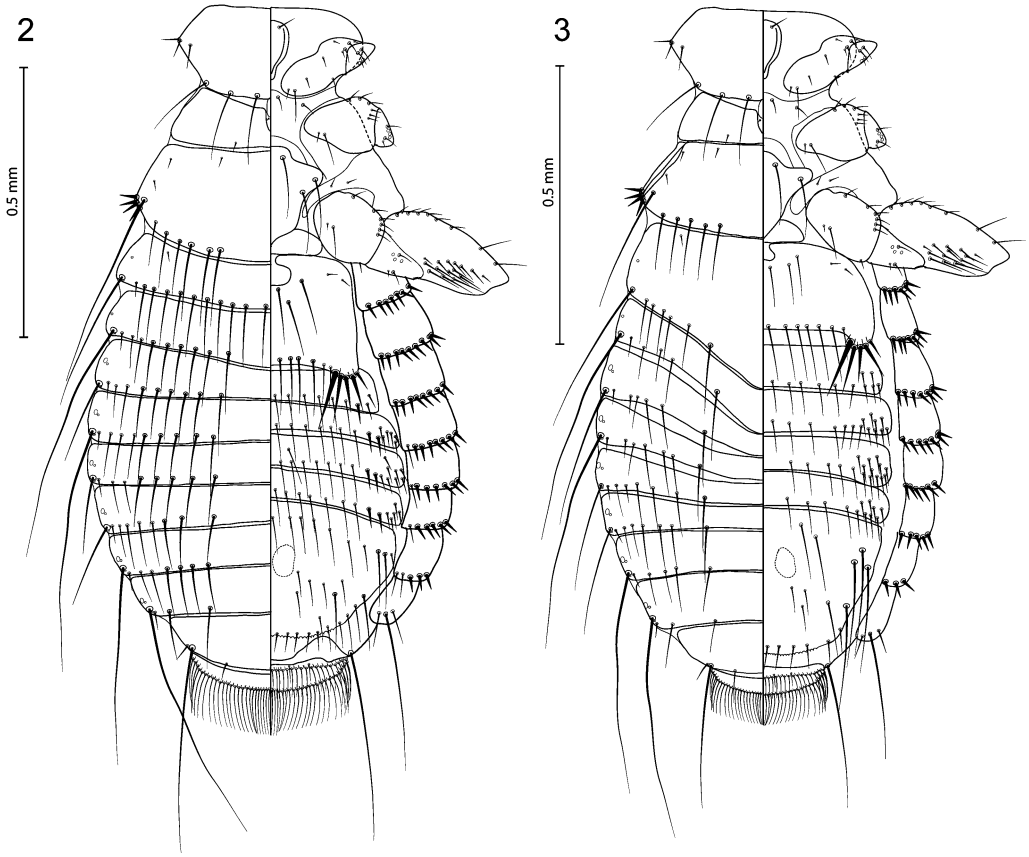
Type host. *Glyphorynchus spirurus* (Vieillot, 1819)—wedge-billed woodcreeper.

Type locality. San José, Tinamaste, 12 km SW San Isidro de El General, Costa Rica.

Material examined. Ex *Glyphorynchus spirurus*: 1♀, Barbilla National Park, Provincia Limón, Costa Rica (09°59'N, 85°27'W), 3 September 2004, I. Literak, M. Capek & M. Havlicek (INBIO—O. Sychra CR10).

Remarks. Here we confirm that a female described as "*Myrsidea* sp. 2" by Sychra *et al.* (2007) is conspecific with *M. dalgleishi* originally described from *G. spirurus* from a different location in Costa Rica. Our specimen differ from the original description of *M. dalgleishi* by setal counts and dimensions, as follows [data from Valim *et al.* (2011) are in parentheses]:

Female (n = 1). Length of *dhs* 10, 0.065 (0.03); *dhs* 11, 0.102 (0.09); ratio *dhs* 10/11, 0.64 (0.33). Gula with 5–6 (4–5) setae on each side. Tergal setae: II, 12 (8–10); IV, 12 (9–11); VI, 7 (10–11); VII, 4 (7–8); VIII, 4 (5–6). Sternal setae: IV, 26 (22–24); VI, 23 (19–21). Dimensions: TW, 0.42 (0.41); PW, 0.26 (0.24–0.25); AWIV, 0.53 (0.50–0.51).



FIGURES 2–3. Dorso-ventral views of female thorax and abdomen: **2**, *Myrsidea leucophthalmi* **n. sp.**; **3**, *Myrsidea philydori* **n. sp.**

***Myrsidea leucophthalmi*, new species**
(Figs 2, 6–7, 18–19)

Type host. *Automolus leucophthalmus* (Wied, 1821)—white-eyed foliage-gleaner.

Type locality. San Rafael National Park, Paraguay (26°30'S, 55°47'W).

Type material. Ex *Automolus leucophthalmus*: holotype ♀, San Rafael National Park, Paraguay (26°30'S, 55°47'W), 18 and 20 August 2012, I. Literak (MMBC). Paratypes: 2♀, 3♂ with the same data as holotype (MMBC).

Diagnosis. *Myrsidea leucophthalmi* n. sp. is morphologically close to *M. ochrolaemi* Sychra [in Sychra *et al*.], 2007 in the following characters: (1) male genital sac sclerite, (2) female metanotum slightly enlarged with rounded posterior margin and (3) shape of abdominal tergites of female. However, *M. leucophthalmi* is easily distinguished from *M. ochrolaemi* by (1) fewer setae on: female tergite I (19–21 vs 22–33), female tergites II–IV (14–17 vs 18–33); male tergite IV (12–14 vs 15–20) and tergite V (12–13 vs 14–17); (2) presence of continuous row of setae on tergite I only (vs continuous row of setae on tergite I–III in *M. ochrolaemi*) (3) fewer setae on female sternites IV and V (32–37 vs 39–48).

Description. Female (n = 3). As in Figs 2 and 18. Hypopharyngeal sclerites fully developed. Length of *dhs* 10, 0.043–0.063; *dhs* 11, 0.108–0.127; ratio *dhs* 10/11, 0.39–0.54; *ls5*, 0.03 long, latero-ventral fringe with 9–10 setae. Gula with 3–4 setae on each side. Pronotum with 6 setae on posterior margin and 3 short spiniform setae at each lateral corner. Prosternal plate with rounded anterior margin (Fig. 2). First tibia with 3 outer ventro-lateral and 4 dorso-lateral setae. Metanotum slightly enlarged with rounded posterior margin, with 11–15 marginal setae; metasternal plate with 6–8 setae; metapleurites with 3–4 short strong spiniform. Femur III with 14–19 setae in ventral setal brush. Tergites not enlarged and unmodified, only tergite I and II with very slightly rounded posterior

margin (Fig. 2). Abdominal segments with continuous row of setae on tergite I and median gap in the row of tergal setae on tergites II–VIII. Tergal setae: I, 19–21; II, 17; III, 15–17; IV, 14–16; V, 14; VI, 12–14; VII, 10–12; VIII, 4–5. Postspiracular setae very long on II, IV and VIII (0.45–0.50); long on I and VII (0.26–0.37); and short on III, V and VI (0.11–0.23). Inner posterior seta of last tergum not longer than anal fringe setae with length 0.02–0.05; length of short lateral marginal seta of last segment, 0.05. Pleural setae: I, 7–9; II, 9–10; III, 8–11; IV, 8–9; V, 7–8; VI, 6; VII, 5; VIII, 3. Pleurites mostly with short spine-like setae; slender and longer setae on pleurites IV–VII, 0–2; without anterior setae. Pleurite VIII with inner setae (0.05–0.06) as long as outer (0.05–0.06). Anterior margin of sternal plate II with a medial notch. Sternal setae: I, 0; II, 5 in each aster, aster setae length: *s1*, 0.10–0.12; *s2*, 0.07–0.11; *s3*, 0.05–0.06; *s4*, 0.05–0.06; *s5*, 0.03–0.04; with 11–13 marginal setae between asters, 4–6 medioanterior; III, 20–24; IV, 32–37; V, 33–37; VI, 30–31; VII, 16–19; VIII–IX, 13–16; and 14–18 setae on deeply serrated vulvar margin; in one specimen sternites IV–V with 1 medioanterior seta. Anal fringe formed by 43–51 dorsal and 45–47 ventral setae. Dimensions: TW, 0.49–0.50; POW, 0.37; HL, 0.34–0.35; PW, 0.30–0.32; MW, 0.48–0.51; AWIV, 0.65–0.66; ANW, 0.27; TL, 1.50–1.55.

Male (n = 3). As in Fig. 19. Similar to female except as follows: length of *dhs* 10, 0.048–0.050; *dhs* 11, 0.100–0.113; ratio *dhs* 10/11, 0.44–0.48; *ls5* 0.03–0.04 long, latero-ventral fringe with 9–10 setae. Gula with 3 setae on each side. Metanotum not enlarged with 8–10 marginal setae; metasternal plate with 7 setae; metapleurites with 3–4 short spiniform strong setae. Femur III with 11–15 setae in ventral setal brush. Abdominal segments with well-defined median gap in each row of tergal setae. Tergal setae: I, 12–16; II, 12–15; III, 11–15; IV, 12–14; V, 12–13; VI, 12–14; VII, 11; VIII, 4–6; Postspiracular setae very long on II, IV and VIII (0.45–0.49); long on I and VII (0.20–0.31); and short on III, V and VI (0.07–0.12). Length of inner posterior seta of last tergum, 0.04–0.05; short lateral marginal seta of last segment, 0.02. Pleural setae: I, 5–7; II, 7–9; III, 7–8; IV, 6–8; V, 5–7; VI, 4–5; VII, 4; VIII, 3. Pleurites I–III with only short spine-like setae; pleurites IV–VII with 1–2 slender setae; without anterior setae. Pleurite VIII with inner setae (0.05–0.06) twice as long as outer (0.02–0.03). Anterior margin of sternal plate II with a medial notch. Sternal setae: I, 0; II, 5 in each aster: *s1*, 0.08–0.10; *s2*, 0.07–0.10; *s3*, 0.06–0.07; *s4*, 0.04–0.06; *s5*, 0.03–0.04; with 12–13 marginal setae between asters, 5–6 medioanterior; III, 17–21; IV, 24–28; V, 28–30; VI, 25–28; VII, 19–20; VIII, 14; remainder of plate, 13–15; and with 5–6 setae posteriorly; in one species sternite VIII with 1 medioanterior seta. With 8 internal anal setae. Genital sac sclerite as in Figs 6–7. Dimensions: TW, 0.43–0.45; POW, 0.32–0.33; HL, 0.30–0.32; PW, 0.26–0.28; MW, 0.39–0.40; AWIV, 0.48–0.49; GW, 0.08–0.12; GSL, 0.08–0.12; TL, 1.28–1.29.

Etymology. The species epithet is a noun in apposition derived from the species name of the type host.

Remarks. This is the first record of a chewing louse from *Automolus leucophthalmus*. A portion of COI gene was sequenced from specimens of *M. leucophthalmi* from Paraguay (GenBank MF563529). As expected, the closest species among other published sequences of Neotropical *Myrsidea* was *M. ochrolaemi* (ex *Automolus ochrolaemus* (Tschudi, 1844), family Furnariidae, GenBank JN638820), with a sequence divergence of 11.7%. This divergence is close to the limit of accepted interspecific variation (see Price *et al*. 2008a; Kolencik *et al*. 2017) but, together with their morphological differences, we are confident that *M. leucophthalmi* and *M. ochrolaemi* represent separate species.

Myrsidea meyi Valim, Price & Johnson, 2011

Myrsidea meyi Valim, Price & Johnson, 2011: 8, figs 21, 26–27, 30–32.

Type host. *Syndactyla subalaris* (P.L. Sclater, 1859)—lineated foliage-gleaner.

Type locality. Palo Seco, Panamá.

Material examined. Ex *Syndactyla subalaris*: 1♀, 1♂, Tapantí National Park, Sector Tapantí, Costa Rica (09°46'N, 83°47'W), 3 August 2009, O. Sychra & I. Literak (MMBC).

Ex *Thripadectes rufobrunneus* (Lawrence, 1865)—streak-breasted treehunter: 3♀, 7♂, Tapantí National Park, Sector Tapantí, Costa Rica (09°46'N, 83°47'W), 31 July and 6 August 2009, O. Sychra & I. Literak (MMBC).

Remarks. This is the first record of a chewing louse from *Thripadectes rufobrunneus*, as well as the first record of *M. meyi* from Costa Rica. Our specimens differ from the original description of *M. meyi* by setal counts and dimensions, as follows [data from Valim *et al.* (2011) are in parentheses]:

Female (n = 4). Length of *dhs* 10, 0.055–0.065 (0.080); *dhs* 11, 0.115–0.125 (0.110); ratio *dhs* 10/11, 0.44–0.57 (0.72). Femur III with 13–18 (14) setae in ventral setal brush. Tergal setae: I, 6–8 (8); II, 9–11 (12); III, 11–13 (13); IV, 12–15 (14); V, 13–16 (14); VI, 13–16 (14); VII, 4–10 (8); VIII, 4 (2). Sternal setae: II, 5–6 (5) in each aster, with 13–15 (13) marginal setae between asters, 4–5 (10) medioanterior; III, 25–29 (25); IV, 27–31 (31); V, 27–31 (30); VI, 26–31 (25); VII, 19–25 (19); VIII–IX, 11–16 (12); and 9–14 (13) setae on vulvar margin. Anal fringe formed by 35–39 (31) dorsal and 34–37 (36) ventral setae. Dimensions: TW, 0.48–0.50 (0.49); HL, 0.30–0.35 (0.34); PW, 0.29–0.31 (0.31); MW, 0.44–0.50 (0.50); AW, 0.62–0.66 (0.65); ANW, 0.24–0.26 (0.24); TL, 1.57–1.60 (1.54).

Male (n = 8). Metanotum not enlarged with 4–5 (4) marginal setae; metasternal plate with 6–8 (6) setae. Femur III with 14–16 (11–14) setae in ventral setal brush. Tergal setae: I, 4–6 (4–5); II, 8–11 (9–10); V, 10–12 (12); VI, 11–12 (10–11); VII, 6–8 (5–7); VIII, 4–5 (4). Anterior margin of sternal plate II with a medial notch. Sternal setae: II, with 11–14 (8–11) marginal setae between asters, 5 (8) medioanterior; III, 20–24 (20–22); VII, 15–17 (14–15); VIII, 6–11 (6–9; sternites VII–VIII with 0–1 medioanterior setae. Dimensions: TW, 0.44 (0.45); HL, 0.32–0.34 (0.31); PW, 0.27–0.29 (0.29–0.30); AWIV, 0.47–0.49 (0.49); GSL, 0.07 (0.06); TL, 1.30–1.35 (1.23–1.33).

Myrsidea philydori, new species

(Figs 3, 8–10, 20–21)

Type host. *Philydor rufum* (Vieillot, 1818)—buff-fronted foliage-gleaner.

Type locality. San Rafael National Park, Paraguay (26°30'S, 55°47'W).

Type material. Ex *Philydor rufum*: holotype ♀, San Rafael National Park, Paraguay (26°30'S, 55°47'W), 19 August 2012, I. Literak (MMBC). Paratypes: 2♀, 3♂, with the same data as holotype.

Other material, non-type. Ex *Anabacerthia lichtensteini* (Cabanis & Heine, 1859)—ochre-breasted foliage-gleaner: 1♂, San Rafael National Park, Paraguay (26°30'S, 55°47'W), 20 August 2012, I. Literak (MMBC).

Diagnosis. *Myrsidea philydori* n. sp. shares the same type of male genital sac sclerite as other *Myrsidea* from members of the Furnariidae. According to the shape of female tergites, *M. philydori* is close to *M. waterstoni* Valim, Price & Johnson, 2011 from *Anabacerthia variegaticeps* (P.L. Sclater, 1857) from Panamá. Female of *M. philydori* can be easily distinguished from those of *M. waterstoni* by the absence of a detached plate on tergite III and a larger number of setae on tergites IV–VI (12–14 vs 7–10 respectively). Males of *M. philydori* and of *M. waterstoni* are very similar in setal counts, but they can be separated by smaller dimensions in all measurements, especially TW (0.42–0.44 vs 0.47) and PW (0.26–0.28 vs 0.31). Comparing *M. philydori* with other Neotropical *Myrsidea*, the new species has modified tergites similar to those of *M. rekasii* Dalgleish & Price, 2003 and *M. baileyae* Dalgleish & Price, 2003, both described from the Pipridae. However, males of these latter species have completely different type of genital sac sclerite. Females of *M. philydori* differ from those of *M. rekasii* by smaller numbers of setae on tergites I–III (9–10 vs 12–14 on I; 6–8 vs 11–18 on II; 10–11 vs 13–16 on III) and from those of *M. baileyae* by smaller number of setae on tergite VIII (4 vs 8–9), as well as by smaller dimensions, especially TW (0.47–0.48 vs 0.54–0.55).

Description. Female (n = 3). As in Figs 3 and 20. Hypopharyngeal sclerites fully developed. Length of *dhs* 10, 0.051–0.055; *dhs* 11, 0.098–0.111; ratio *dhs* 10/11, 0.46–0.55; *ls5* 0.04 long, latero-ventral fringe with 10–11 setae. Gula with 4 setae on each side. Pronotum with 6 setae on posterior margin and 3 short spiniform setae at each lateral corner. First tibia with 3 outer ventro-lateral and 4–5 dorso-lateral setae. Metanotum not enlarged, with 8–11 marginal setae; metasternal plate with 4 setae; metapleurites with 4 short strong spiniform setae. Femur III with 13–15 setae in ventral setal brush. Tergites modified as follows: I–II strongly convex, III–IV are depressed by I–II (Fig. 3). Abdominal segments with well-defined median gap in each row of tergal setae. Tergal setae: I, 9–10; II, 6–8; III, 10–11; IV, 12–13; V, 12–14; VI, 12–14; VII, 7–8; VIII, 4; Postspiracular setae very long on II, IV, VII and VIII (0.35–0.46); long on I and III (0.23–0.32); and short on V and VI (0.13–0.20). Inner posterior seta of last tergum not longer than anal fringe setae with length 0.03–0.06; length of short lateral marginal seta of last segment, 0.03–0.06. Pleural setae: I, 6–7; II, 7–8; III, 7–8; IV, 6–7; V, 5–6; VI, 5–6; VII, 3–4; VIII, 3. Pleurites without slender and longer setae. Pleurite VIII with inner setae (0.02–0.04) as long as outer (0.02–0.04). Anterior margin of sternal plate II with a medial notch. Sternal setae: I, 0; II, 5 in each aster: *s1*, 0.10–0.12; *s2*, 0.09–0.10; *s3*, 0.07–0.08; *s4*, 0.05–0.06; *s5*, 0.04–0.05; with 13–14 marginal setae between asters, 6 medioanterior; III, 20–23; IV, 29–

34; V, 31–37; VI, 25–28; VII, 12–15; VIII–IX, 11–12; and 11–13 setae on deeply serrated vulvar margin; sternites III–VII without medioanterior setae. Anal fringe formed by 38–40 dorsal and 33–43 ventral setae. Dimensions: TW, 0.47–0.48; POW, 0.36–0.37; HL, 0.32–0.33; PW, 0.29; MW, 0.46–0.48; AWIV, 0.60; ANW, 0.20–0.25; TL, 1.47–1.55.

Male (n = 4). As in Fig. 21. Similar to female except as follows: length of *dhs* 10, 0.048–0.054; *dhs* 11, 0.092–0.100; ratio *dhs* 10/11, 0.48–0.59; *ls5* 0.03 long, latero-ventral fringe with 10–11 setae. Gula with 3–4 setae on each side. Metanotum not enlarged with 4–7 marginal setae; metasternal plate with 4 (6 in specimen from *A. lichtensteini*) setae; metapleurites with 3–4 short spiniform strong setae. Femur III with 10–14 setae in ventral setal brush. Abdominal segments with well-defined median gap in each row of tergal setae. Tergal setae: I, 7–9; II, 8–11; III–IV, 9–11; V, 11–12; VI, 9–11; VII, 4–6; VIII, 4; Postspiracular setae with the same pattern as in female but shorter. Length of inner posterior seta of last tergum, 0.05; short lateral marginal seta of last segment, 0.02. Pleural setae: I, 5–6; II, 6–7; III, 6–7; IV, 6; V, 5; VI, 4–5; VII, 3; VIII, 3. Pleurite VIII with inner setae (0.03–0.04) as long as outer (0.02–0.03). Anterior margin of sternal plate II with a medial notch. Sternal setae: I, 0; II, 4–5 in each aster: *s1*, 0.09–0.12; *s2*, 0.07–0.10; *s3*, 0.06–0.07; *s4*, 0.04–0.05; *s5*, 0.02–0.04; with 12–14 marginal setae between asters, 4–6 medioanterior; III, 16–23; IV, 24–28; V, 22–33; VI, 20–26; VII, 10–14; VIII, 4; remainder of plate, 8–10; and with 3–4 setae posteriorly; sternites III–VII without medioanterior setae. With 8 internal anal setae. Genital sac sclerite as in Figs 8–10. Dimensions: TW, 0.42–0.44; POW, 0.33–0.35; HL, 0.31; PW, 0.26–0.28; MW, 0.37–0.39; AWIV, 0.47–0.48; GW, 0.11–0.12; GSL, 0.08; TL, 1.23–1.33.

Etymology. The species epithet is a noun in apposition derived from the generic name of the type host.

Remarks. These are first records of chewing lice from both *Philydor rufum* and *Anabacerthia lichtensteini*. A portion of COI gene was sequenced from one specimen of *M. philydori* from *Anabacerthia lichtensteini* from Paraguay (GenBank MF563530). Comparing our sequence with other known sequences of Neotropical *Myrsidea*, divergences exceeded 19% in all cases, including that with *M. waterstoni* (ex *Anabacerthia variegaticeps*, family Furnariidae, GenBank FJ171278) being 19.3%. Curiously, comparing our sequence of *M. philydori* with all known *Myrsidea* sequences, the closest was that of *M. textoris* Klockenhoff, 1984 (ex *Ploceus intermedius* Rüppell, 1845 and *Ploceus velatus* Vieillot, 1819, family Ploceidae, GenBank KF768813 and KF768815) from South Africa, with a p-distance of about 17.5%. Furthermore, sequences of a portion of EF-1alpha gene of *M. philydori* from *Philydor rufum* and from *Anabacerthia lichtensteini* (GenBank MF574203–MF574204) were identical to each other, and diverged from that of *M. waterstoni* (GenBank FJ171305) by 3.4%. All these sequence divergences are large enough to confirm *M. philydori* as a new, separate species.

Myrsidea scleruri, new species

(Figs 4, 11, 22–23)

Myrsidea sp. 1; Kuabara & Valim, 2017: 150.

Type host. *Sclerurus scansor* (Menetries, 1835)—rufous-breasted leaftosser.

Type locality. Ilha Grande, Rio de Janeiro, Brazil (23°09'S, 44°14'W).

Type material. Ex *Sclerurus scansor*: holotype ♀ (MZUSP#6745), Ilha Grande, Rio de Janeiro, Brazil, 21 September 1944, H. Sick. Paratypes: 2♂, 1♀, (MZUSP#6743–44, 6746) with the same data as holotype (MZUSP).

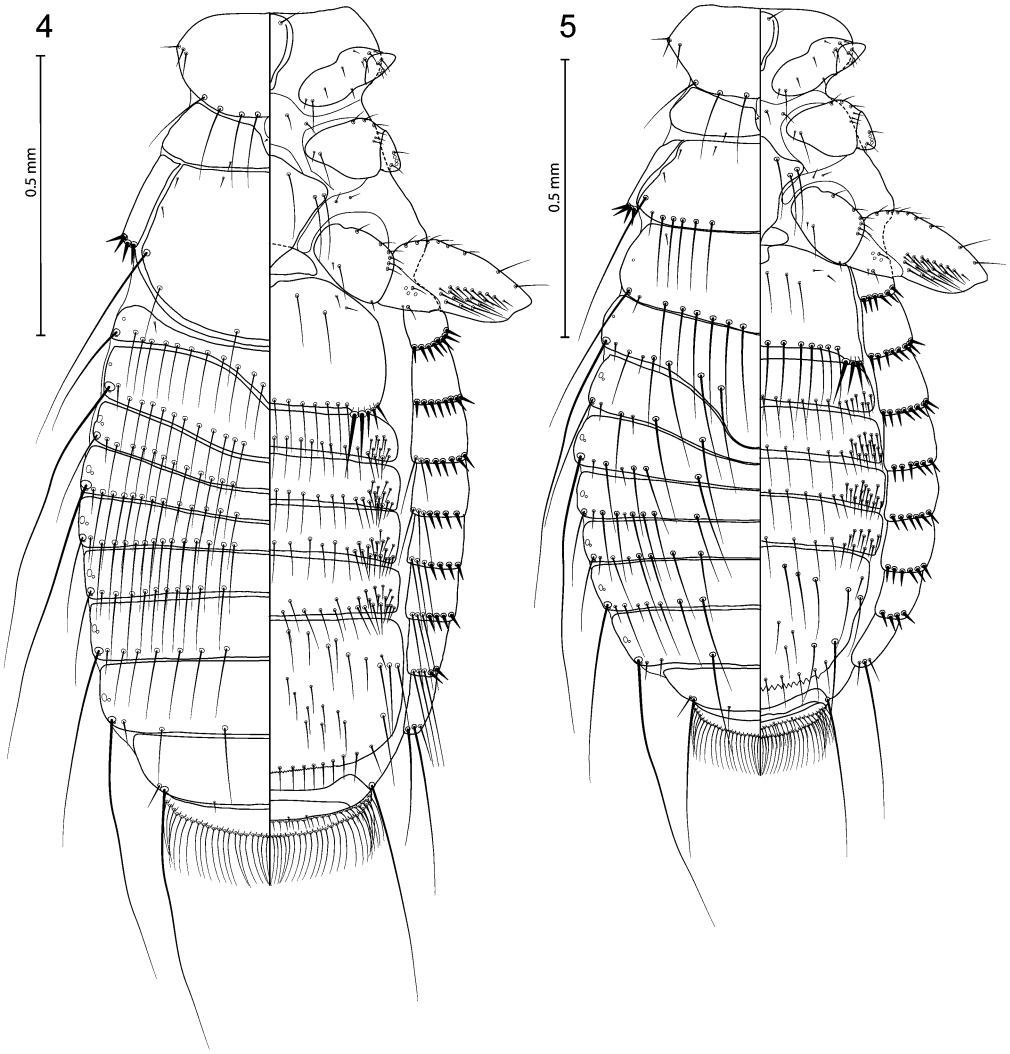
Other material, non-type. 1♂ San Rafael National Park, Paraguay (26°30'S, 55°47'W), 19 August 2012, I. Literak (MMBC).

Diagnosis. *Myrsidea scleruri* n. sp. has the same type of male genital sac sclerite as other species of *Myrsidea* from the Furnariidae. However, it can be easily distinguished from all Neotropical *Myrsidea* by a unique combination of characters: (1) pronotum with 8 setae on posterior margin, (2) pleurites III–VII with 2–4 slender and quite long setae, (3) the shape of the male genital sac sclerite (Fig. 11), and (4) shape of female tergites (Fig. 4).

Myrsidea calvi Sychra *et al*., 2007—described from *Sclerurus guatemalensis* (Hartlaub, 1844) in Costa Rica—is morphologically close to *M. scleruri* but both species can be easily separated by: (1) number of setae on the posterior margin of pronotum (6 setae vs 8 setae in *M. scleruri*), (2) shape of tergites I and II, and (3) female total length (1.52–1.60 vs 1.86–1.92).

There are five species of Neotropical *Myrsidea* with 8 setae on the posterior margin of pronotum, as follows: *M. aitkeni* Clay, 1966, *M. antiqua* Ansari, 1956, *M. carrikeri* (Eichler, 1943), *M. elegans* Ansari, 1956 and *M.*

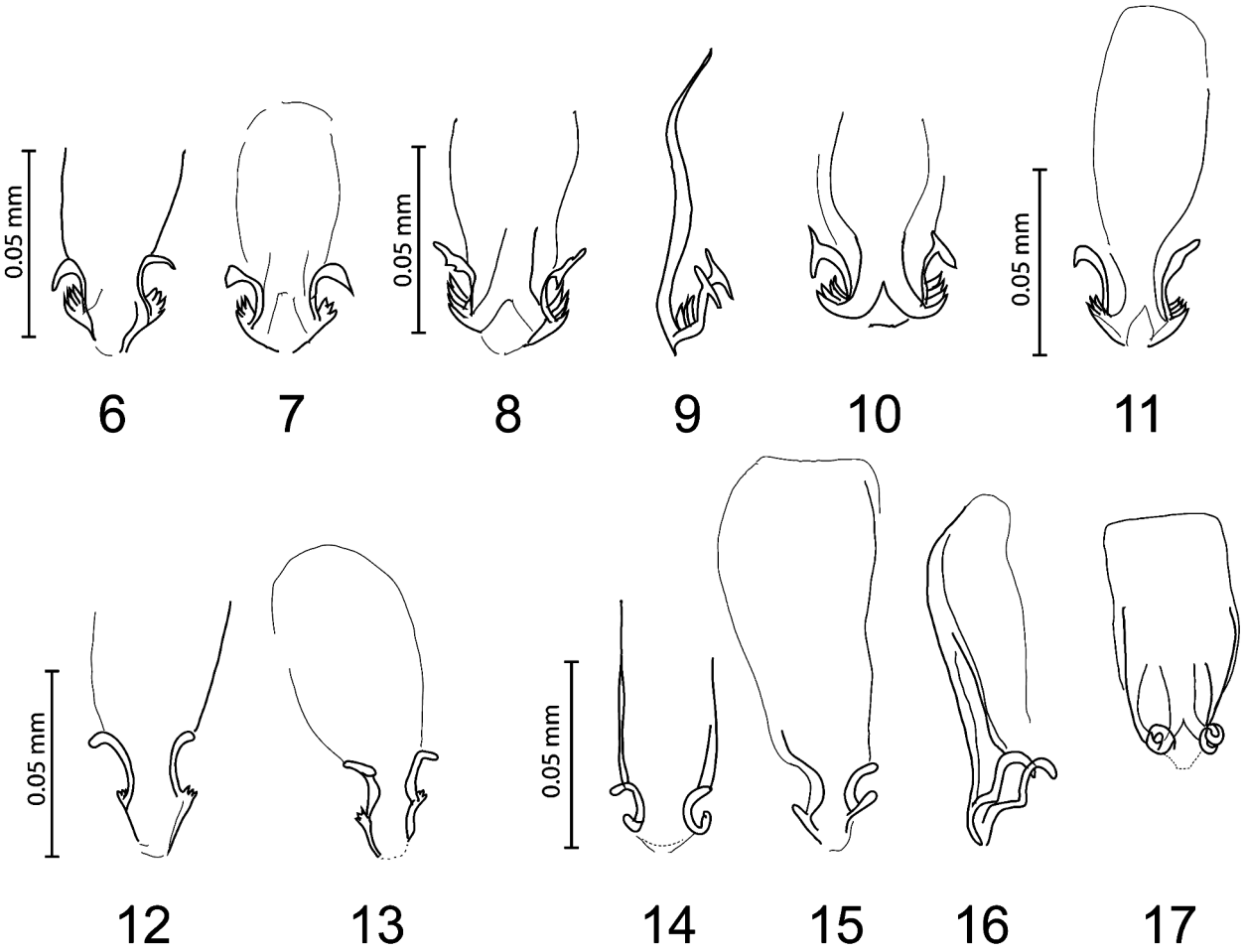
obsoleti Kounek & Sychra [in Kounek *et al.*], 2013. All these species were described from members of the Turdidae and are placed in the *carrikeri* species group (*sensu* Clay 1966). *Myrsidea scleruri* is easily distinguished from all these species by a completely different male genital sac sclerite and different modification of tergites in the female.



FIGURES 4–5. Dorso-ventral views of female thorax and abdomen: **4**, *Myrsidea scleruri* **n. sp.**; **5**, *Myrsidea zuzanae* **n. sp.**

Description. Female (n = 2). As in Figs 4 and 22. Hypopharyngeal sclerites fully developed. Length of *dhs* 10, 0.090; *dhs* 11, 0.116; ratio *dhs* 10/11, 0.78; *ls5* broken, latero-ventral fringe with 10 setae. Gula with 4 setae on each side. Pronotum with 8 setae on posterior margin and 3 medium length spiniform setae at each lateral corner. First tibia with 3 outer ventro-lateral and 4 dorso-lateral setae. Metanotum enlarged, with 4 marginal setae; metasternal plate with 7–9 setae; metapleurites with 3–4 short strong spiniform setae. Femur III with 18–22 setae in ventral setal brush. Tergite I narrow with medium posterior enlargement; tergite II three times larger than I, with anterior margin medially concave due to enlargement of tergite I. Tergites III-IV slightly concave posteriorly as result of enlargement of first tergites. Abdominal segments II–VIII with well-defined median gap in each row of tergal setae (Fig. 4). Tergal setae: I, 17–20; II, 22–24; III, 22–23; IV, 22–26; V, 26; VI, 18–20; VII, 12; VIII, 2–4. Postspiracular setae very long on II, IV, VII and VIII (0.41–0.52); and shorter on I, III, V and VI (0.19–0.30). Inner posterior seta of last tergum with length 0.01; length of short lateral marginal seta of last segment, 0.03–0.04. Pleural setae: I, 8–9; II, 8–12; III, 8–10; IV, 6–11; V, 6–8; VI, 6–7; VII, 5–6; VIII, 3–4. Pleurites III–VII with 2–4 slender and longer setae. Pleurite VIII with length of inner setae 0.04–0.06 and outer 0.06–0.07. Anterior margin of sternal plate II with a small medial notch. Sternal setae: I, 0 (female paratype with 1 seta); II, 5 in each aster: *s1*, 0.11–0.13; *s2*, 0.08–0.11; *s3*, 0.05–0.07; *s4*, 0.03–0.04; *s5*, 0.02–0.03; with 14–16 marginal setae between asters,

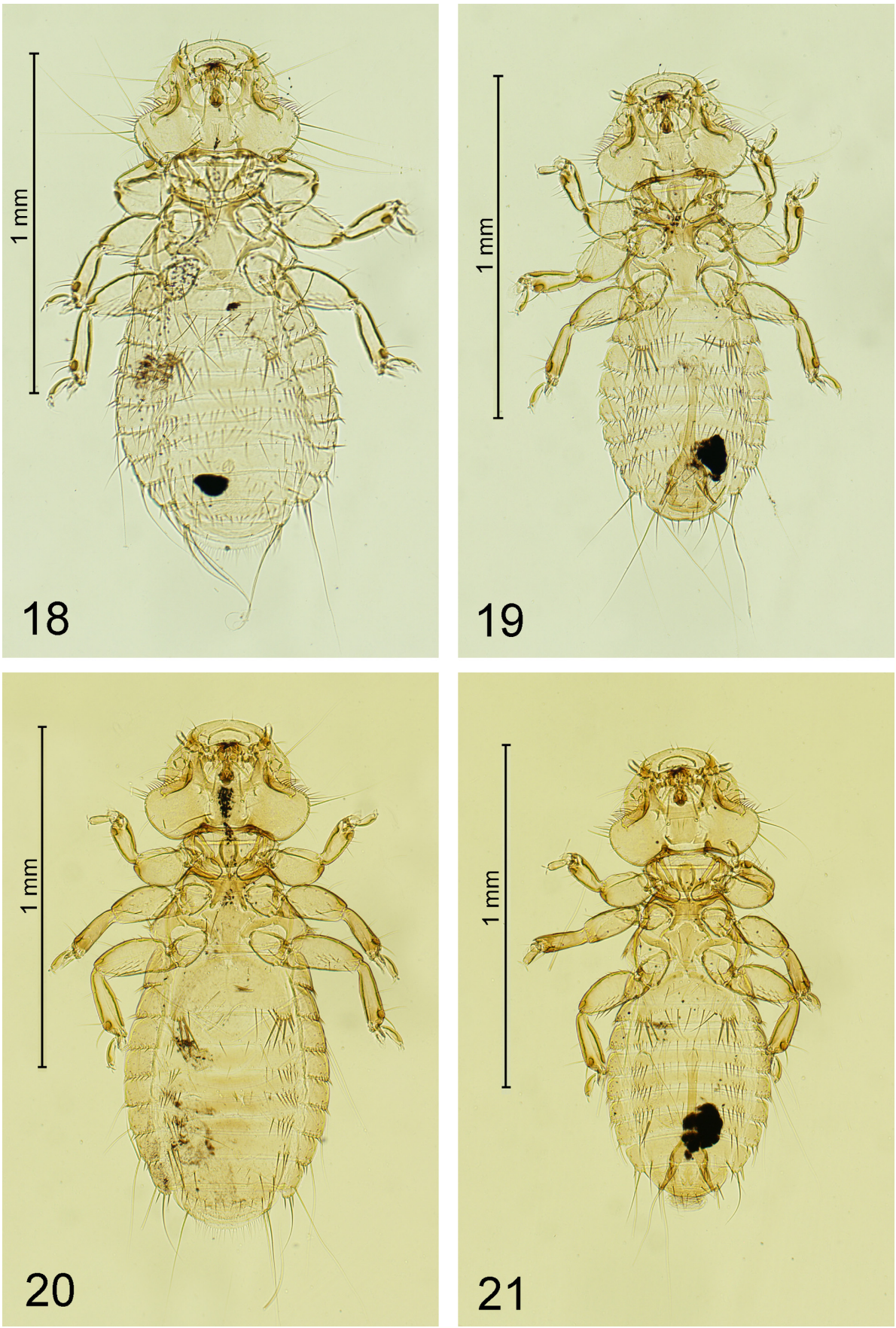
4–5 medioanterior setae; III, 40–46; IV, 44–48; V, 47–54; VI, 45–46; VII, 20–25; VIII–IX, 16–17; and 15–17 setae on scantly serrated vulvar margin, without medioanterior setae on sternites III–VII. Anal fringe formed by 42–45 dorsal and 41–42 ventral setae. Dimensions: TW, 0.50; POW, 0.35; HL, 0.35–0.41; PW, 0.35; MW, 0.55–0.60; AWIV, 0.76–0.88; ANW, 0.27–0.28; TL, 1.86–1.92.



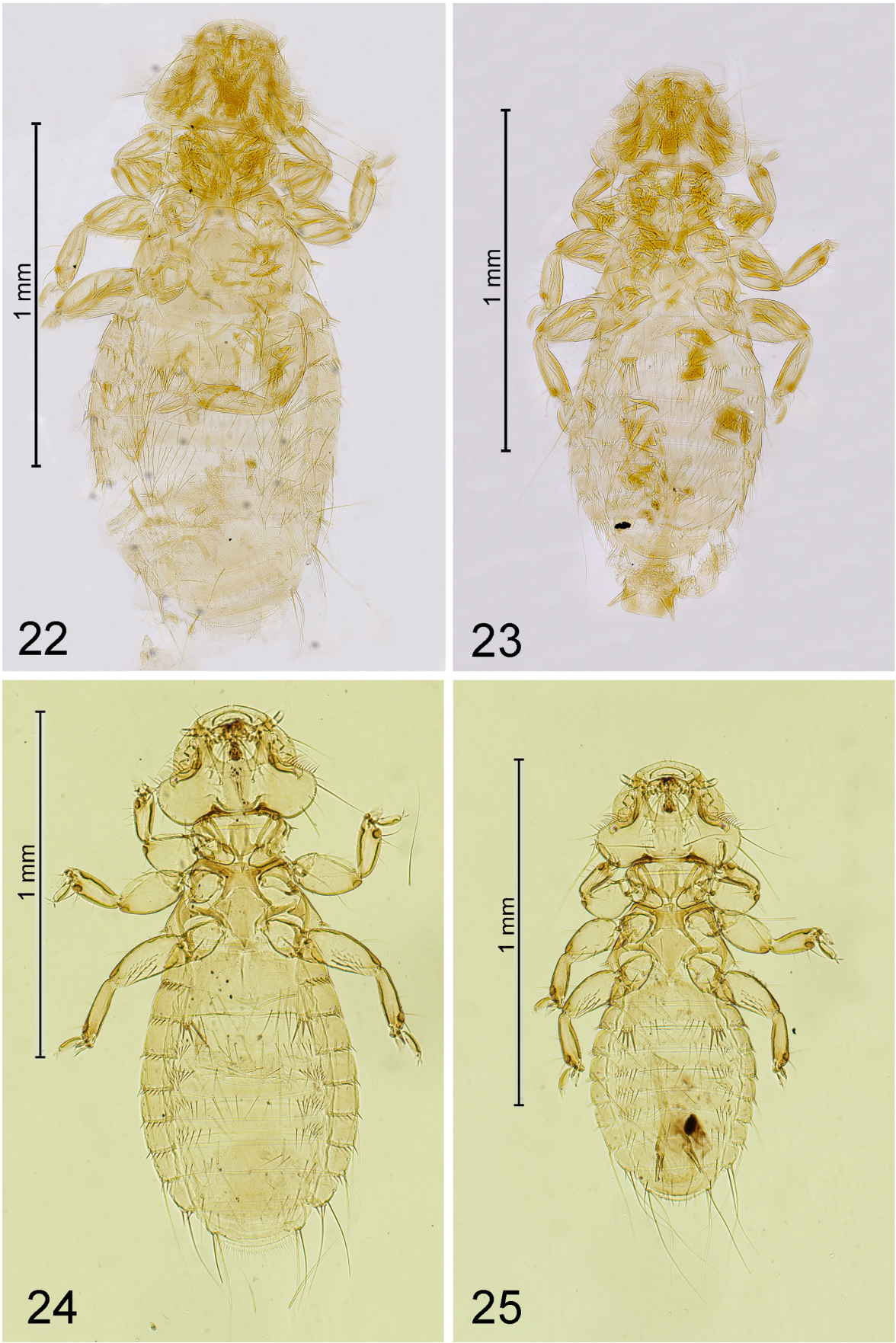
FIGURES 6–17. Male genital sac sclerites: **6–7**, *Myrsidea leucophthalmi* **n. sp.**; **8–10**, *Myrsidea philydori* **n. sp.**; **11**, *Myrsidea scleruri* **n. sp.**; **12–13**, *Myrsidea zuzanae* **n. sp.**; **14–17**, *Myrsidea pyriglenae* **n. sp.**

Male (n = 3). As in Fig. 23. Similar to female except as follows: length of *dhs* 10, 0.070–0.098; *dhs* 11, 0.110–0.112; ratio *dhs* 10/11, 0.64–0.89. Latero-ventral fringe with 10 setae (one specimen with 11 on one side). Gula with 4–5 setae on each side. Pronotum with 8 setae on posterior margin and 3 short spiniform setae at each lateral corner. First tibia with 3 outer ventro-lateral and 4–5 dorso-lateral setae. Metanotum with posterior margin roughly straight with 4 marginal setae; metasternal plate with 7–10 setae; metapleurites with 3–5 short spiniform strong setae. Femur III with 15–21 setae in ventral setal brush. Abdominal tergites with continuous row of setae on tergites I–V and with short median gap in the row of setae only on tergites VI–VIII. Tergal setae: I, 12–14; II, 18–21; III, 16–25; IV, 16–23; V, 18–21; VI, 15–22; VII, 12–19; VIII, 7–8. Postspiracular setae same with the same pattern as in female but shorter. Length of inner posterior seta of last tergum, 0.01–0.02; short lateral marginal seta of last segment, 0.01–0.02. Pleural setae: I, 5–7; II, 7–12; III, 7–13; IV, 6–12; V, 6–11; VI, 6–10; VII, 5–9; VIII, 3–5. Pleurites III–VII with 2–4 slender and longer setae: Pleurite VIII with inner setae (0.02) smaller as the outer one (0.03–0.05). Anterior margin of sternal plate II with a medial notch. Sternal setae: I, 0; II, 4–5 in each aster: *s1*, 0.08–0.10; *s2*, 0.07–0.10; *s3*, 0.05–0.07; *s4*, 0.03–0.04; *s5*, 0.02–0.03; with 15–17 marginal setae between asters, 7–14 medioanterior; III, 34–37; IV, 45–49; V, 48–52; VI, 47–51; VII, 28–31; VIII, 9–11; remainder of plate, 14–17; sternites VI–VIII with 0–2 medioanterior setae. Genital sac sclerite as in Fig. 11. Dimensions: TW, 0.43–0.49; POW, 0.31–0.33; HL and PW, 0.31–0.33; MW, 0.41–0.46; AWIV, 0.55–0.58; GW, 0.12–0.14; GSL, 0.10; TL, 1.45–1.54.

Etymology. The species epithet is a noun in apposition derived from the generic name of the type host.



FIGURES 18–21. Habitus: *Myrsidea leucophthalmi* **n. sp.**: **18**, holotype female; **19**, paratype male; *Myrsidea philydori* **n. sp.**: **20**, holotype female; **21**, paratype male.



FIGURES 22–25. Habitus: *Myrsidea scleruri* **n. sp.**: **22**, holotype female; **23**, paratype male; *Myrsidea zuzanae* **n. sp.**: **24**, holotype female; **25**, paratype male.

***Myrsidea zuzanae,* new species**
(Figs 5, 12–13, 24–25)

Type host. *Furnarius rufus* (J.F. Gmelin, 1788)—rufous hornero.

Type locality. Los Tres Gigantes Biological Station in the Paraguayan Pantanal, Paraguay (20°04'S, 50°09'W).

Type material. Ex *Furnarius rufus*: holotype ♀, Los Tres Gigantes Biological Station in the Paraguayan Pantanal, Paraguay (20°04'S, 50°09'W), 6–7 August 2012, I. Literak (MMBC). Paratypes: 1♀, 2♂ with the same data as holotype (MMBC).

Diagnosis. *Myrsidea zuzanae* n. sp. shares the same type of male genital sac sclerite as other *Myrsidea* from the Furnariidae, but it can be easily distinguished from them by its unique modification of female tergites, especially II being the only tergite with a prominent medioposterior convexity (Fig. 5). However, among species of Neotropical *Myrsidea* from other bird families, *M. zuzanae* has a similar modification of female tergites as that of *M. rufi* Price & Dalgleish, 2006 and *M. phoenicii* Price & Dalgleish, 2006 from the Thraupidae. However, males of these two species have a completely different type of genital sac sclerite. In addition, females of *M. zuzanae* differ from those of *M. rufi* by (1) fewer setae on tergite VIII (4–5 in *M. zuzanae* vs 6–8 in *M. rufi*), and (2) more setae on sternites III–V (total 117–124 in *M. zuzanae* vs 85–97 in *M. rufi*). Also, it differs from females of *M. phoenicii* by (1) more setae on tergite I (14–19 in *M. zuzanae* vs 10–12 in *M. phoenicii*), (2) more setae on sternites III–V (total 117–124 in *M. zuzanae* vs 72–95 in *M. phoenicii*), and (3) fewer setae on tergite VIII (4–5 in *M. zuzanae* vs 6–8 in *M. phoenicii*).

Description. Female (n = 2). As in Figs 5 and 24. Hypopharyngeal sclerites fully developed. Length of *dhs* 10, 0.060–0.065; *dhs* 11, 0.102–0.105; ratio *dhs* 10/11, 0.36–0.57; *ls5* 0.06 long, latero-ventral fringe with 10–11 setae. Gula with 4 setae on each side. Pronotum with 6 setae on posterior margin and 3 short spiniform setae at each lateral corner. First tibia with 3 outer ventro-lateral and 4 dorso-lateral setae. Metanotum not enlarged, with 11–12 marginal setae; metasternal plate with 6 setae; metapleurites with 3–4 short strong spiniform setae. Femur III with 19–21 setae in ventral setal brush. Tergites modified as follows: tergite II with prominent medioposterior convexity and tergite III with widely rounded posterior margin (Fig. 5). Abdominal segments with well-defined median gap in row of tergal setae II–VIII. Tergal setae: I, 14–19; II, 12–13; III, 10; IV, 10; V, 12–13; VI, 12; VII, 12; VIII, 4–5. Postspiracular setae very long on I, II, IV, VII and VIII (0.31–0.46); and short on III, V–VI (0.16–0.27). Inner posterior seta of last tergum not longer than anal fringe setae with length 0.03; length of short lateral marginal seta of last segment, 0.04. Pleural setae: I, 6–7; II, 7–9; III, 8–9; IV, 6–9; V, 6–7; VI, 5–6; VII, 4–5; VIII, 3. Pleurites with only short spine-like setae. Pleurite VIII with inner setae (0.04) as long as outer (0.04–0.05). Anterior margin of sternal plate II with a medial notch. Sternal setae: I, 0; II, 4 in each aster: *s1*, 0.09–0.10; *s2*, 0.05–0.06; *s3*, 0.05; *s4*, 0.03; with 13–14 marginal setae between asters, 2–5 medioanterior; III, 30–33; IV, 43–47; V, 44; VI, 27–29; VII, 15; VIII–IX, 9; and 11–13 setae on deeply serrated vulvar margin; without medioanterior setae on sternites. Anal fringe formed by 40 dorsal and 36 ventral setae. Dimensions: TW, 0.45–0.46; POW, 0.35–0.36; HL, 0.30–0.32; PW, 0.29; MW, 0.45–0.46; AWIV, 0.63–0.65; ANW, 0.23; TL, 1.52–1.58.

Male (n = 2). As in Fig. 25. As for female, except as follows: length of *dhs* 10, 0.060; *dhs* 11, 0.95–0.98; ratio *dhs* 10/11, 0.61–0.63; *ls5* 0.04–0.06 long, latero-ventral fringe with 10–11 setae. Gula with 2–4 setae on each side. Metanotum not enlarged with 8–9 marginal setae; metasternal plate with 6 setae; metapleurites with 3–4 short spiniform strong setae. Femur III with 14–17 setae in ventral setal brush. Abdominal segments with well-defined median gap in each row of tergal setae. Tergal setae: I, 6–7; II, 8–11; III, 7–8; IV–V, 8; VI–VII, 7–8; VIII, 4. Postspiracular setae very long on II, IV, VII and VIII (0.42–0.45); long on I (0.29); and short on III, V and VI (0.13–0.23). Length of inner posterior seta of last tergum, 0.045–0.070; short lateral marginal seta of last segment, 0.020–0.025. Pleural setae: I, 4–5; II, 6–7; III, 5–6; IV, 5–6; V, 5–6; VI, 4; VII, 2–4; VIII, 3. Pleurite VIII with inner setae (0.03–0.04) as long as outer (0.03–0.04). Anterior margin of sternal plate II with a medial notch. Sternal setae: I, 0; II, 4 in each aster: *s1*, 0.07–0.11; *s2*, 0.05–0.06; *s3*, 0.04–0.05; *s4*, 0.03–0.04; with 12–14 marginal setae between asters, 4 medioanterior; III, 20–21; IV, 28–33; V, 33; VI, 26; VII, 15; VIII, 5–7; remainder of plate, 7–8; and with 3 setae posteriorly; without medioanterior setae on sternites. With 8 internal anal setae. Genital sac sclerite as in Figs 12–13. Dimensions: TW, 0.42; POW, 0.32–0.33; HL, 0.28–0.29; PW, 0.26–0.27; MW, 0.37–0.38; AWIV, 0.48–0.53; GW, 0.10–0.11; GSL, 0.08; TL, 1.28–1.36.

Etymology. This species is named in honour of Zuzana Kokeš, the sister of the first author, in recognition of her great support during his life.

Remarks. This is the first record of *Myrsidea* from *Furnarius rufus*. A portion of COI gene was sequenced from specimens of *M. zuzanae* from Paraguay (GenBank MF563531). Comparing our sequence with other known sequences of Neotropical *Myrsidea*, the divergences exceeded 19% in all cases. However, comparing our sequence of *M. zuzanae* with all known *Myrsidea*, the closest was that of *M. marksi* Johnson & Price, 2006 (ex *Phyllastrephus albigularis* (Sharpe, 1882), family Pycnonotidae, from the Democratic Republic of the Congo, GenBank KU187279–KU187280), with a p-distance of 17.9%. These sequence divergences are large enough to confirm *M. zuzanae* as a new, separate species.

Host family: Pipridae

***Myrsidea capeki*, new species**
(Figs 26, 30–34, 41–42)

Type host. *Chiroxiphia caudata* (Shaw, 1793)—swallow-tailed manakin.

Type locality. San Rafael National Park, Paraguay (26°30'S, 55°47'W).

Type material. Ex *Chiroxiphia caudata*: holotype ♀, San Rafael National Park, Paraguay (26°30'S, 55°47'W), 18–23 August 2012, I. Literak (MMBC). Paratypes: 6♀, 7♂ with the same data as holotype (MMBC).

Diagnosis. *Myrsidea capeki* n. sp. can be easily distinguished from other *Myrsidea* from the Pipridae and from other Neotropical species by the shape of female tergites (Fig. 26): (1) tergite I slightly enlarged with widely rounded posterior margin, (2) tergites II–III with convex posterior margin, (3) tergite I with continuous row of long setae reaching beyond the posterior margin of tergite III, and (4) tergites II–VIII with well-defined median gap in each row of tergal setae.

Males of *M. capeki* have a variable and widespread type of male genital sac sclerite (Figs 30–34), also found in other *Myrsidea* from members of the Pipridae, and in other Neotropical *Myrsidea* from the Cardinalidae, Emberizidae and Thraupidae. Comparing genetic sequences between *M. capeki* and other known sequences of Neotropical *Myrsidea* (see Remarks below), the closest species was *M. pagei* Price & Johnson, 2009 from the Thraupidae. However, males of *M. capeki* differ from those of *M. pagei* by (1) the number of setae on tergite I (12–18 in *M capeki* vs 7–10 in *M. pagei*), and (2) a shorter total length (1.17–1.25 in *M. capeki* vs 1.26–1.30 in *M. pagei*).

Description. Female (n = 7). As in Figs 26 and 41. Hypopharyngeal sclerites fully developed. Length of *dhs* 10, 0.040–0.045; *dhs* 11, 0.088–0.105; ratio *dhs* 10/11, 0.36–0.51; *ls5* 0.05–0.06 long, latero-ventral fringe with 9–10 setae. Gula with 4–5 setae on each side. Pronotum with 6 setae on posterior margin and 3 short spiniform setae at each lateral corner. First tibia with 3 outer ventro-lateral and 3–4 dorso-lateral setae. Metanotum not enlarged, with 6–8 marginal setae metasternal plate with 5–8 setae; metapleurites with 2–4 short strong spiniform setae. Femur III with 12–16 setae in ventral setal brush. Tergite I slightly enlarged with widely rounded posterior margin and continuous row of long setae reaching beyond the posterior margin of tergite III. Tergites II–III with convex posterior margin. Tergites II–VIII with well-defined median gap in each row of tergal setae (Fig. 26). Tergal setae: I, 19–22; II, 13–15; III, 12–17; IV, 13–16; V, 12–16; VI, 11–17; VII, 9–13; VIII, 8–11; Postspiracular setae very long on II, IV and VIII (0.39–0.45); long on I and VII (0.25–0.30); and short on III, V and VI (0.14–0.21). Inner posterior seta of last tergum longer than anal fringe setae with length 0.07–0.14; length of short lateral marginal seta of last segment, 0.03–0.06. Pleural setae: I–II, 6–8; III, 7–9; IV, 6–8; V, 5–7; VI, 5–6; VII, 4–6; VIII, 3–4. Pleurites V–VII with 0–3 slender and longer setae. Pleurite VIII with inner setae (0.05–0.13) as long as outer (0.05–0.09). Anterior margin of sternal plate II with a medial notch. Sternites V–VI narrow and arched. Sternal setae: I, 0; II, 5–6 (in one specimen one aster with 4) in each aster: *s1*, 0.06–0.08; *s2*, 0.06–0.07; *s3*, 0.05–0.08; *s4*, 0.03–0.06; *s5*, 0.03–0.05; s6, 0.03; with 12–16 marginal setae between asters, 4–6 medioanterior; III, 21–24; IV, 25–29; V, 28–34; VI, 28–31; VII, 15–20; VIII–IX, 10–12; and 8–12 setae on slightly serrated vulvar margin. Anal fringe formed by 29–39 dorsal and 29–32 ventral setae. Dimensions: TW, 0.44–0.46; POW, 0.34–0.37; HL, 0.28–0.30; PW, 0.27–0.29; MW, 0.42–0.44; AWIV, 0.55–0.60; ANW, 0.20–0.22; TL, 1.33–1.40.

Male (n = 7). As in Fig. 42. Similar to female except as follows: length of *dhs* 10, 0.037–0.045; *dhs* 11, 0.078–0.100; ratio *dhs* 10/11, 0.37–0.52; *ls5* 0.04–0.06 long, latero-ventral fringe with 9–10 setae. Gula with 4–6 setae on each side. First tibia with 3 outer ventro-lateral and 3–5 dorso-lateral setae. Metanotum not enlarged with 4–8

marginal setae; metasternal plate with 6–8 setae; metapleurites with 2–3 short spiniform strong setae. Femur III with 10–13 setae in ventral setal brush. Abdominal segments with well-defined median gap in each row of tergal setae. Tergal setae: I, 12–18; II, 10–13; III, 12–14; IV, 11–14; V, 11–13; VI, 10–13; VII, 9–12; VIII, 6–10; Postspiracular setae same with the same pattern as in female but shorter. Length of inner posterior seta of last tergum, 0.06–0.11; short lateral marginal seta of last segment, 0.02. Pleural setae: I–III, 5–7; IV, 6–7; V, 5–6; VI, 4–6; VII, 4–5; VIII, 3. Pleurites IV–VII with 1–3 slender and longer setae. Pleurite VIII with inner setae (0.08–0.10) almost three times as long as outer (0.03–0.04). Anterior margin of sternal plate II without a medial notch. Sternal setae: I, 0; II, 4–5 in each aster: *s1*, 0.06–0.08; *s2*, 0.05–0.07; *s3–s4*, 0.05–0.06; *s5*, 0.03–0.04; with 13–16 marginal setae between asters, 4–6 medioanterior; III, 18–23; IV, 21–24; V, 23–30; VI, 23–28; VII, 14–19; VIII, 4–8; remainder of plate, 5–8; and with 3 setae posteriorly; with 8 internal anal setae. Genital sac sclerite as in Figs 30–34. Dimensions: TW, 0.41–0.44; POW, 0.32–0.33; HL, 0.27–0.29; PW, 0.25–0.27; MW, 0.36–0.41; AWIV, 0.46–0.48; GW, 0.11; GSL, 0.08–0.09; TL, 1.17–1.25.

Etymology. This species is named in honour of our colleague and friend Miroslav Čapek (Institute of Vertebrate Biology, Academy of Sciences of the Czech Republic), a respected Czech ornithologist who participated in many of our fieldtrips, in recognition of his friendship and unmatched enthusiasm in the study of birds.

Remarks. This is the first record of chewing lice from *Chiroxiphia caudata*. A portion of COI gene was sequenced from specimens of *M. capeki* from Paraguay (GenBank MF563532). Comparing our sequence with other known sequences of Neotropical *Myrsidea*, the divergences exceeded 18% in all cases. The closest was that of *M. pagei* (ex *Ramphocelus dimidiatus* Lafresnaye, 1837, family Thraupidae, GenBank FJ171287), with a p-distance of 18.2%. These sequence divergences are large enough to confirm *M. capeki* as a new, separate species.

Host family: Thamnophilidae

***Myrsidea* sp. 1**

Material examined. Ex *Taraba major* (Vieillot, 1816)—great antshrike: 1♀, Los Tres Gigantes Biological Station in the Paraguayan Pantanal, Paraguay (20°04'S, 50°09'W), 7 September 2012, I. Literak (MMBC).

Remarks. This is the first record of a chewing louse from *Taraba major.* Our female is close to *Myrsidea dacostai* Price, Johnson & Dalgleish, 2008 from *Thamnophilus doliatus* (Linnaeus, 1764), although it is considerably larger than specimens from the type host in almost all dimensions. This size discrepancy could be the result of a correlation with the size differences between the two hosts: *Taraba major* with length 19–20cm and weight 50–70g against *Thamnophilus doliatus* with length 15–16cm and weight 24–30g (see Zimmer & Isler 2003). Such correlation of host and louse size within a given louse genus is known as Harrison's Rule (Price *et al.* 2003). Furthermore, both *Taraba major* and *Thamnophilus doliatus* have almost the same geographical distribution (Clements *et al.* 2017). More data are necessary to test if these differences are due to intraspecific variation or if our female represents another, distinct, species.

Our specimen differs from the original description of *M. dacostai* by setal counts and dimensions, as follows [data from Price *et al.* (2008b) are in parentheses]:

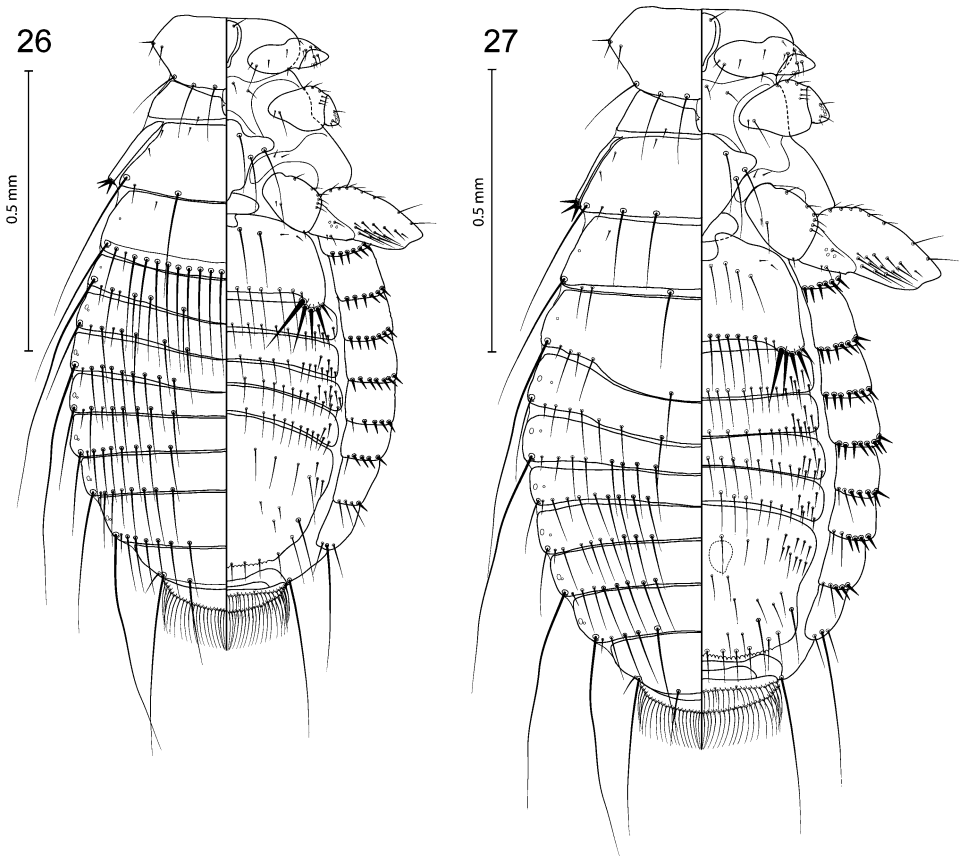
Female (n = 1). Metanotum with 7 (5–6) marginal setae. Tergal setae: I, 15 (12–14); III, 17 (11–14). Sternal setae: II, 11 (14–16) marginal setae between asters, 3 (8–9) medioanterior setae. Anal fringe formed by 51 (44–50) dorsal and 40 (45–47) ventral setae. Dimensions: TW, 0.53 (0.49–0.50); HL, 0.37 (0.33–0.34); MW, 0.52 (0.48–0.51); TL, 1.75 (1.58–1.66).

***Myrsidea pyriglenae*, new species**
(Figs 14–17, 27, 43–44)

Type host. *Pyriglena leucoptera* (Vieillot, 1818)—white-shouldered fire-eye.

Type locality. San Rafael National Park, Paraguay (26°30'S, 55°47'W).

Type material. Ex *Pyriglena leucoptera*: holotype ♀, San Rafael National Park, Paraguay (26°30'S, 55°47'W), 21 August 2012, I. Literak (MMBC). Paratypes: 6♀, 7♂ with the same data as holotype (MMBC).



FIGURES 26–27. Dorso-ventral views of female thorax and abdomen: **26**, *Myrsidea capeki* **n. sp.; 27**, *Myrsidea pyriglenae* **n. sp.**

Diagnosis. *Myrsidea pyriglenae* belongs to the *mcleannani* species group (*sensu* Price *et al.* 2008b), based on the shape of the male genital sac sclerite and the deeply serrated female vulvar margin. According to setal counts and measurements, it is morphologically similar to *M. milleri* Price, Johnson & Dalgleish, 2008 ex *Gymnopithys rufigula* (Boddaert, 1783) from Venezuela. However, females of *M. pyriglenae* n. sp. are distinguished from those of *M. milleri* by having (1) modified tergites, especially enlarged tergite II (Fig. 27), and (2) larger number of setae on tergite VII (14–16 vs 6–10), tergite VIII (8–9 vs 4), and on anal fringe (83–88 vs 64–74). Males of *M. pyriglenae* differ from those of *M. milleri* by having a larger number of setae on tergites VII (11–15 vs 7–9) and VIII (7–8 vs 4). In addition, the host species of these two species of *Myrsidea* (*Pyriglena leucoptera* and *Gymnopithys rufigula*) have different geographical distributions (Clements *et al.* 2017) and are not phylogenetically closely related (Isler *et al.* 2013). Considering genetic data, *M. pyriglenae* is closest to *M. patersoni* Price & Johnson, 2009 (see Remarks below), but these two species clearly differ in such significant characters as (1) female tergites having completely different shapes (compare Fig. 27 with fig. 3 in Price & Johnson 2009), and (2) completely different genital sac sclerite in males (compare Figs 14–17 with fig. 4 in Price & Johnson 2009).

Description. Female (n = 4). As in Figs 27 and 43. Head with lateral sides of preantennal region conspicuously concave. Hypopharyngeal sclerites fully developed. Length of *dhs* 10, 0.050–0.064; *dhs* 11, 0.100–0.113; ratio *dhs* 10/11, 0.44–0.63; *ls5* 0.04–0.05 long, latero-ventral fringe with 9–10 setae. Gula with 4–5 setae on each side. Pronotum with 6 setae on posterior margin and 3 short spiniform setae at each lateral corner. First tibia with 3 outer ventro-lateral and 4 dorso-lateral setae. Metanotum not enlarged, with 4–7 marginal setae; metasternal plate with 6–7 setae; metapleurites with 3–4 short strong spiniform setae. Femur III with 14–16 setae in ventral setal brush. Tergites modified as on Fig. 27, with enlarged tergite II and widely convex posterior margin of tergites II and III. Abdominal segments with well-defined median gap in each row of tergal setae. Tergal setae: I, 5–8; II, 6–8; III, 11–12; IV–V, 15–18; VI, 15–17; VII, 14–16; VIII, 8–9. Postspiracular setae very long on II, IV, VII and VIII (0.35–0.45); long on I (0.23); and short on III, V and VI (0.11–0.16). Inner posterior seta of last tergum not longer

than anal fringe setae with length 0.07–0.09 inserted 0.060–0.075 from base of each very long seta; length of short lateral marginal seta of last segment, 0.03–0.04. Pleural setae: I, 6–8; II, 7–10; III, 7–9; IV, 8; V, 6–7; VI, 6; VII, 4–5; VIII, 3. Pleurites V–VII with 1–2 somewhat slender and longer setae. Pleurite VIII with inner setae (0.06–0.08) as long as outer (0.05–0.06). Anterior margin of sternal plate II with a medial notch. Sternal setae: I, 0; II, 4–6 in each aster: *s1*, 0.08–0.10; *s2*, 0.08–0.09; *s3*, 0.07–0.08; *s4*, 0.05–0.06; *s5*, 0.04; with 14–16 marginal setae between asters, 4–7 medioanterior; III, 27–30; IV, 33–36; V, 32–39; VI, 28–36; VII, 23–25; VIII–IX, 15–18; and 9–13 setae on deeply serrated vulvar margin; sternites without medioanterior setae. Anal fringe formed by 38–43 dorsal and 42–46 ventral setae. Dimensions: TW, 0.46–0.48; POW, 0.35; HL, 0.28–0.34; PW, 0.29–0.30; MW, 0.44–0.48; AWIV, 0.61–0.66; ANW, 0.21–0.26; TL, 1.55–1.63.

Male (n = 4). As in Fig. 44. Similar to female except as follows: length of *dhs* 10, 0.040–0.058; *dhs* 11, 0.089–0.100; ratio *dhs* 10/11, 0.45–0.64; *ls5* 0.04 long, latero-ventral fringe with 9–10 setae. Gula with 5 (one specimen with 4 on one side) setae on each side. First tibia with 3 outer ventro-lateral and 4–5 dorso-lateral setae. Metanotum not enlarged with 4 marginal setae; metasternal plate with 5–6 setae; metapleurites with 3 short spiniform strong setae. Femur III with 11–13 setae in ventral setal brush. Abdominal segments with well-defined median gap in each row of tergal setae. Tergal setae: I, 6–8; II, 6–11; III, 14–15; IV, 13–16; V, 15–17; VI, 14–18; VII, 11–15; VIII, 7–8. Postspiracular setae same with the same pattern as in female but shorter. Length of inner posterior seta of last tergum, 0.04–0.06; short lateral marginal seta of last segment, 0.02. Pleural setae: I, 5–6; II, 6–7; III, 7–8; IV, 6–7; V, 5–7; VI, 5–6; VII, 4; VIII, 3. Pleurites IV–VII with 0–3 slender and longer setae. Pleurite VIII with inner setae (0.04–0.05) as long as outer (0.04–0.05). Anterior margin of sternal plate II with a medial notch. Sternal setae: I, 0; II, 4–5 in each aster: *s1*, 0.08–0.09; *s2*, 0.07–0.08; *s3*, 0.06; *s4*, 0.05–0.06; *s5*, 0.03; with 12–15 marginal setae between asters, 4–7 medioanterior; III, 19–27; IV, 25–29; V, 26–32; VI, 25–27; VII, 19–22; VIII, 7–11; remainder of plate, 8–11; and with 3–4 setae posteriorly; with 8–9 internal anal setae. Genital sac sclerite as in Figs 14–17. Dimensions: TW, 0.41–0.43; POW, 0.31–0.32; HL, 0.27–0.30; PW, 0.26–0.28; MW, 0.35–0.38; AWIV, 0.46–0.47; GW, 0.10–0.11; GSL, 0.08–0.09; TL, 1.25–1.33.

Etymology. The species epithet is a noun in apposition derived from the generic name of the type host.

Remarks. This is the first record of *Myrsidea* from *Pyriglena leucoptera.* A portion of COI gene was sequenced from specimens of *M. pyriglenae* from Paraguay (GenBank MF563533). Comparing our sequence with other known sequences of Neotropical *Myrsidea*, the divergences exceeded 18% in all cases, the closest being that of *M. patersoni* Price & Johnson, 2009 (ex *Eucometis penicillata* (Spix, 1825), family Thraupidae, GenBank GQ454448), with a p-distance of 18.2%. Unfortunately, there are no genetic sequences known from *M. milleri*, the species morphologically closest to *M. pyriglenae*. However, considering the combination of morphological differences with *M. patersoni* and *M. milleri*, and the large sequence divergence with *M. patersoni*, we are confident that *M. pyriglenae* is a new, separate species.

Myrsidea spellmani Price, Johnson & Dalgleish, 2008

Myrsidea spellmani Price, Johnson & Dalgleish, 2008b: 58.

Type host. *Hylophylax naevioides* (Lafresnaye, 1847)—spotted antbird.

Type locality. Rio Mono, Panamá.

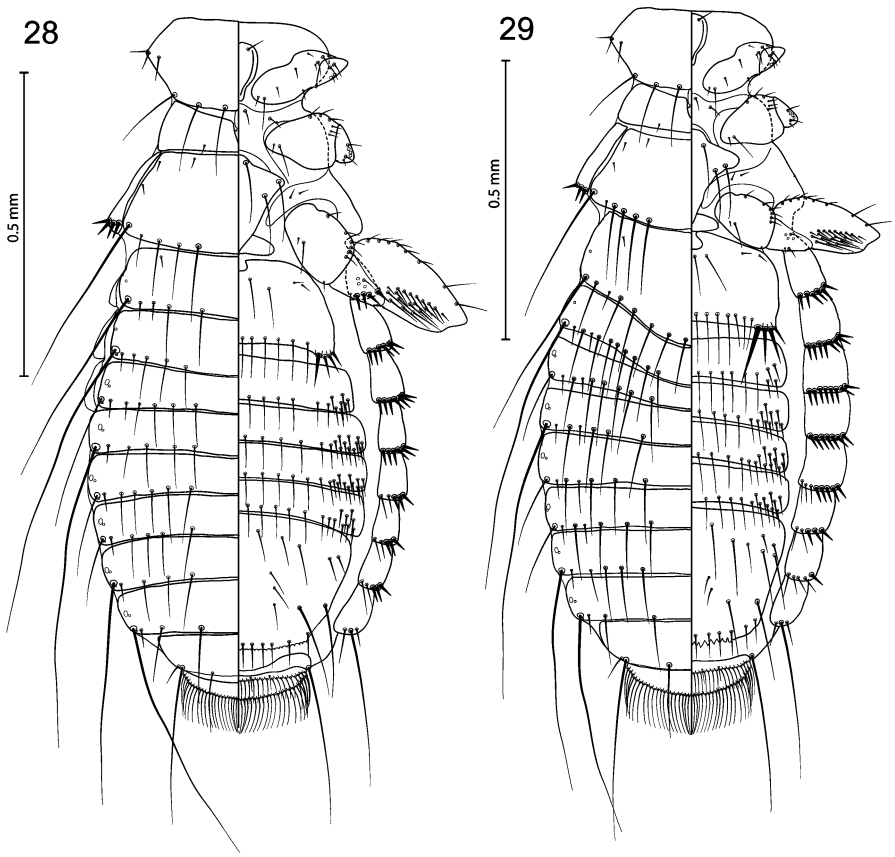
Material examined. Ex *Hylophylax naevioides*: 2 nymphs II, Rincón de la Vieja National Park, Sector Santa María, Sendero del Padre, Costa Rica (10°46'N, 85°18'W), 20 August 2009, O. Sychra & I. Literak.

Remarks. Although we only examined nymphs, we believe they are *M. spellmani* considering that our specimens were collected from the type host species.

Host family: Tityridae

Myrsidea pachyramphi, new species
(Figs 28, 35, 45–46)

Type host. *Pachyramphus polychopterus* (Vieillot, 1818)—white-winged becard.



FIGURES 28–29. Dorso-ventral views of female thorax and abdomen: **28**, *Myrsidea pachyramphi* **n. sp.**; **29**, *Myrsidea leptopogoni* **n. sp.**

Type locality. San Rafael National Park, Paraguay (26°30'S, 55°47'W).

Type material. Ex *Pachyramphus polychopterus*: holotype ♀, San Rafael National Park, Paraguay (26°30'S, 55°47'W), 8–15 August 2012, I. Literak (MMBC). Paratypes: 2♀, 3♂ with the same data as holotype (MMBC).

Diagnosis. *Myrsidea pachyramphi* n. sp. is morphologically similar to *M. incerta* (Kellogg, 1896b) and *M. pricei* Clay, 1966 from members of the Turdidae, and to *M. bessae* Price, Johnson & Dalgleish, 2008 and *M. alexanderi* Kolencik, Sychra, Valan & Literak, 2016 from members of the Troglodytidae. Combining genetic and morphological difference, the closest species is *M. incerta*. However, females of *M. pachyramphi* can be distinguished from those of *M. incerta* by having (1) a larger number of setae on the femoral brush (18–22 vs 13–17), and (2) larger dimensions, as follows: MW (0.42–0.43 vs 0.37) and AWIV (0.52–0.57 vs 0.50), while males differ by having a greater total number of setae on sternites IV–VII (85–96 vs 53–82). Further, females of *M. pachyramphi*, differ from those of *M. pricei* in (1) the shape of the first tergite (more concave in *M. pricei*); and (2) the number of setae on tergites I–IV (total 28–38 in *M. pachyramphi* vs. 40–52 in *M. pricei*). Males can be distinguished by the number of setae on tergites I–V (total 29–33 in *M. pachyramphi* vs. 39–53 in *M. pricei*). Females of *M. pachyramphi* can be easily distinguished from those of *M. bessae* by the shape of the metanotum and first two tergites. Finally, *M. pachyramphi* differs from *M. alexanderi* in the number of setae on tergites I–VII: females with a total of 44–61 setae in *M. pachyramphi* vs. 74–90 in *M. alexanderi*; males with a total of 38–43 vs. 63–71.

Description. Female (n = 3). As in Figs 28 and 45. Hypopharyngeal sclerites fully developed. Length of *dhs* 10, 0.045–0.055; *dhs* 11, 0.090–0.105; ratio *dhs* 10/11, 0.50–0.52; *ls5* 0.04–0.05 long, latero-ventral fringe with 10–11 setae. Gula with 4–5 setae on each side. Pronotum with 6 setae on posterior margin and 3 short spiniform setae at each lateral corner. First tibia with 3 outer ventro-lateral and 4 dorso-lateral setae. Metanotum not enlarged, with 8–9 marginal setae; metasternal plate with 6–7 setae; metapleurites with 3–4 short strong spiniform setae. Femur III with 18–22 setae in ventral setal brush. Tergites I and II slightly convex. Abdominal segments with well-defined median gap in each row of tergal setae. Tergal setae: I, 6–8; II, 8–11; III, 8–10; IV, 6–9; V, 7–10; VI, 5–8;

VII, 4–5; VIII, 4. Postspiracular setae very long on II, IV and VIII (0.45–0.51); long on I and VII (0.30–0.38); and short on III, V and VI (0.12–0.23). Inner posterior seta of last tergum not longer than anal fringe setae with length 0.06–0.08; length of short lateral marginal seta of last segment, 0.03–0.04. Pleural setae: I, 4–5; II, 6–8; III, 7–8; IV, 6–7; V, 5–6; VI–VII, 4–5; VIII, 3. Pleurite VIII with inner setae (0.07–0.09) twice as long as outer (0.04–0.05). Anterior margin of sternal plate II with a medial notch. Sternal setae: I, 0; II, 3–4 in each aster: *s1*, 0.05–0.06; *s2*, 0.04–0.05; *s3*, 0.03–0.04; *s4*, 0.02–0.03; with 13–16 marginal setae between asters, 3–4 medioanterior; III, 21–24; IV, 32; V, 33–35; VI, 27–30; VII, 10–11; VIII–IX, 8–10; and 10–12 setae on deeply serrated vulvar margin. Anal fringe formed by 40 dorsal and 35 ventral setae. Dimensions: TW, 0.45–0.46; POW, 0.35–0.36; HL, 0.31–0.32; PW, 0.27–0.28; MW, 0.42–0.43; AWIV, 0.52–0.57; ANW, 0.21–0.23; TL, 1.43–1.45.

Male (n = 3). As in Fig. 46. Similar to female exept as follows: length of *dhs* 10, 0.045–0.050; *dhs* 11, 0.093–0.100; ratio *dhs* 10/11, 0.48–0.50; *ls5* 0.05 long, latero-ventral fringe with 10–11 setae. Gula with 5 setae on each side. Pronotum with 6 setae on posterior margin and 3 short spiniform setae at each lateral corner. First tibia with 3 outer ventro-lateral and 4 dorso-lateral setae. Metanotum not enlarged with 6–7 marginal setae; metasternal plate with 6–7 setae; metapleurites with 3 short spiniform strong setae. Femur III with 13–17 setae in ventral setal brush. Abdominal segments with well-defined median gap in each row of tergal setae. Tergal setae: I, 4; II, 6–7; III, 6–8; IV, 7; V, 6–7; VI, 5–6; VII–VIII, 4; Postspiracular setae with the same pattern as in female but shorter. Length of inner posterior seta of last tergum, 0.03–0.05; short lateral marginal seta of last segment, 0.02. Pleural setae: I, 3–4; II, 4–5; III–IV, 5–6; V, 4–6; VI, 4–5; VII, 3–4; VIII, 2–3. Pleurite VIII with inner setae (0.06–0.07) as long as outer (0.02–0.03). Anterior margin of sternal plate II with a medial notch. Sternal setae: I, 0; II, 3–4 in each aster: *s1*, 0.05–0.06; *s2*, 0.03–0.04; *s3*, 0.03; *s4*, 0.02–0.03; with 8–10 marginal setae between asters, 2–4 medioanterior; III, 15–17; IV, 23–28; V, 27–29; VI, 22–25; VII, 13–14; VIII, 4; remainder of plate, 6–7; and with 3 setae posteriorly; with 8 internal anal setae. Genital sac sclerite as in Fig. 35. Dimensions: TW, 0.41–0.43; POW, 0.32–0.33; HL, 0.28–0.30; PW, 0.25–0.26; MW, 0.35–0.36; AWIV, 0.42–0.44; GW, 0.10–0.11; GSL, 0.08; TL, 1.23–1.28.

Etymology. The species epithet is a noun in apposition derived from the generic name of the type host.

Remarks. This is the first record of chewing lice from *Pachyramphus polychopterus*. A portion of COI gene was sequenced from two specimens of *M. pachyramphi* from Paraguay (GenBank MF563534–MF563535). Comparing our sequence with all known *Myrsidea* sequences, the closest were: (1) those of *M. incerta* (ex *Catharus ustulatus* (Nuttall, 1840), GenBank FJ171268–FJ171269, and *Catharus minimus* (Lafresnaye, 1848), GenBank FJ171270, family Turdidae), with p-distances of 11.9–12.9%, (2) those of *M. alexanderi* (ex *Pheugopedius maculipectus* Lafresnaye, 1845, GenBank MF563536), and *M. bessae* (ex *Pheugopedius fasciatoventris* Lafresnaye, 1845, GenBank EU289214, and *Cantorchilus semibadius* Salvin, 1870, GenBank EU289213 family Troglodytidae), with p-distances of 12.7–13.7%, and (3) that of *M. pricei* (ex *Catharus guttatus* (Pallas, 1811), GenBank FJ171273), with a p-distance of 13.7%. These divergences are close to the limit of accepted interspecific variation but, together with their morphological differences, we are confident that *M. pachyramphi* is a distinct species. Further molecular data are needed to clarify the phylogenetic relationships of these species within the species-complex and confirm their valid status as species or subspecies.

Host family: Tyrannidae

***Myrsidea barbati* Price, Hellenthal & Dalgleish, 2005**

Myrsidea barbati Price, Hellenthal & Dalgleish, 2005: 8, figs 9–10.

Type host. *Myiobius barbatus* (J. F. Gmelin, 1789)—whiskered flycatcher.

Type locality. 12 km SW San Isidro de El General, Tinamaste, San José Province, Costa Rica.

Material examined. Ex *Myiobius sulphureipygius* (P.L. Sclater, 1857)—sulphur-rumped flycatcher: 1♀, Hitoy Cerere BR, Provincia Limón, Costa Rica (09°40'N, 85°05'W), 28 August 2004, I. Literak, M. Capek & M. Havlicek (MMBC).

Remarks. This is the first record of a louse from *Myiobius suphureipygius*. Our specimen differs slightly from the original description of *M. barbati* by some setal counts, as follows [data from Price *et al.* (2005) are in parentheses]:

Female (n = 1). Sternal setae: IV, 31 (24–29); V, 34 (28–33). Anal fringe with 32 (25–31) dorsal setae.

***Myrsidea sp.* 2**

Material examined. Ex *Leptopogon amaurocephalus* Tschudi, 1846—sepia-capped flycatcher: 2♀, 1♂ Centro URKU, Tarapoto, Perú (06°27'S, 76°21'W), 8 August 2011, I. Literak (MMBC); 4♀, 1♂ San Rafael National Park, Paraguay (26°30'S, 55°47'W), 18 and 20 August 2012, I. Literak (MMBC).

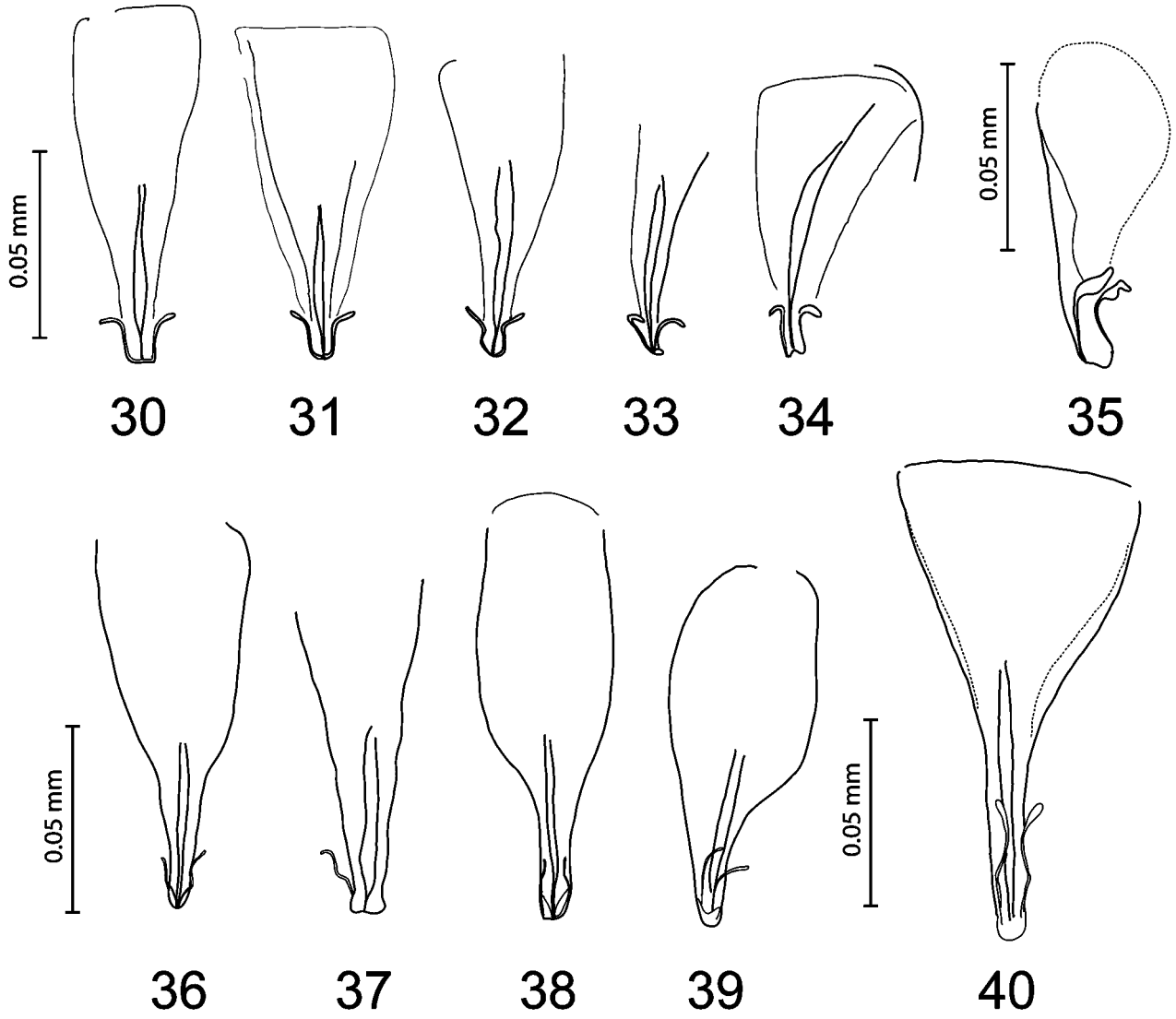
Remarks. This is the first record of *Myrsidea* from *Leptopogon amaurocephalus*.Our specimens are very close to *Myrsidea contopi* Price, Hellenthal & Dalgleish, 2005 ex *Contopus cinereus* (Spix, 1825) from Trinidad & Tobago by the shape of metanotum and tergites of female and similar type of genital sac sclerite in male, but differ by setal counts and dimensions, as follows [data from Price *et al.* (2005) are in parentheses]:

Female (n = 6). Metanotum with 8–11 (8–9) marginal setae. Tergal setae: I, 10–13 (6–8); II, 11–13 (9–11); III, 10–15 (11–13); IV, 9–13 (10–11); V, 9–12 (7–9); VI, 10–12 (7–9); VII, 6–11 (4); VIII, 4–6 (4). Sternal setae: II, with 14–19 marginal setae between asters, 4–7 medioanterior (in total 24 marginal and medioanterior setae); III, 22–24 (19–21); IV, 28–35 (30–32); V, 30–36 (34–35); VI, 25–36 (30); VII, 16–18 (12–14); VIII–IX, 7–11 (22–25 including vulvar setae); and 10–13 setae on deeply serrated vulvar margin. Anal fringe formed by 34–36 (35–36) dorsal setae. Dimensions: TW, 0.44–0.45 (0.43–0.44); HL, 0.29–0.31 (0.31–0.32); PW, 0.27–0.32 (0.27–0.28); MW, 0.39–0.41 (0.42–0.43); AWIV, 0.51–0.54 (0.56–0.58); ANW, 0.20–0.23 (0.20–0.21); TL, 1.40–1.42 (1.32–1.37).

Male (n = 2). Metanotum with 5–9 (7–8) marginal setae. Tergal setae: I, 8–10 (5–6); III, 14–15 (7–11); IV, 11–15 (6–10); V, 11–14 (6–8); VI, 9–13 (6); VII, 7–15 (4–6); VIII, 5–7 (4). Sternal setae: III, 21 (17–20); IV, 25–30 (23–29); V, 29–32 (28–30); VI, 28–30 (22–27); VII, 16–21 (13–16); VIII, 8–11 (6–7). Genital sac sclerite as in Figs 36–37. Dimensions: TW, 0.37–0.40 (0.40–0.41); MW, 0.32–0.36 (0.36–0.37); AWIV, 0.40–0.44 (0.45–0.46); TL, 1.05–1.18 (1.18–1.23).

Remarks. A portion of COI gene was sequenced from specimens of *Myrsidea* sp. 2 ex *Leptopogon amaurocephalus* from Paraguay (GenBank MF563537). Comparing our sequence with other known sequences of Neotropical *Myrsidea*, the divergences exceeded 16% in all cases including those of the two morphologically closest species: *M. elaeniae* Price, Hellenthal & Dalgleish, 2005 (ex *Elaenia flavogaster* (Thunberg, 1822), GenBank KF048117), with a p-distance of 19.5%, and *M. cnemotriccola* Valim & Weckstein, 2013 (ex *Cnemotriccus fuscatus,* GenBank KF048124), with a p-distance of 20.6%, both from species of Tyrannidae. The closest species was *M. lightae* Valim & Weckstein, 2013 from the Cardinalidae (GenBank EU289211), with a p-distance of 16.9%. These results show that our specimens differ from all Neotropical *Myrsidea* with known sequences of COI. Despite some morphological differences (especially the smaller number of setae on tergite I in both sexes), we found our specimens to be very close to *M. contopi*. However, molecular data from *M. contopi* from the type-host are necessary to confirm that our samples belong to *M. contopi*. Also, more morphological and genetic data are needed to evaluate the status of *Myrsidea* from *Leptopogon amaurocephalus* from different localities, especially because our single males from Paraguay and Perú show some differences in tergal setae (tergites VI–VII of male from Perú with 7–9 setae vs 13–15 in male from Paraguay) and measurements (TW 0.40 for male from Perú vs 0.37 for male from Paraguay). According to these characters, the male from Perú is conspecific with *M. contopi*, while the specimen from Paraguay could represent a separate species or subspecies. However, the male from Paraguay share the same shape of male genital sac sclerite with *M. contopi*, while that from Perú differs in this character (see Figs 36 and 37), but such difference maybe the result of a distortion. Contrary to Price *et al.* (2005), we think that it is not possible to use the tip of the male genital sac sclerite as a single character to separate species of *Myrsidea.*

Although both host species (*Contopus cinereus* and *Leptopogon amaurocephalus*) are not closely related (Rheindt *et al.* 2008), they have almost the same geographical distribution (Clements *et al.* 2017), implying that host-switching of lice between these host species (see Price *et al.* 2003) is a possible explanation for the unusual host distribution of these specimens of *Myrsidea*.



FIGURES 30–40. Male genital sac sclerites: **30–34**, *Myrsidea capeki* **n. sp.**; **35**, *Myrsidea pachyramphi* **n. sp.**; **36**, *Myrsidea contopi* from *Leptopogon amaurocephalus* from Perú; **37,** same but from Paraguay; **38–39**, *Myrsidea leptopogoni* **n. sp.**; **40**, *Myrsidea pitangi* from *Pitangus sulphuratus* from Paraguay.

Myrsidea flaviventris Price, Hellenthal & Dalgleish, 2005

Myrsidea flaviventris Price, Hellenthal & Dalgleish, 2005: 8.

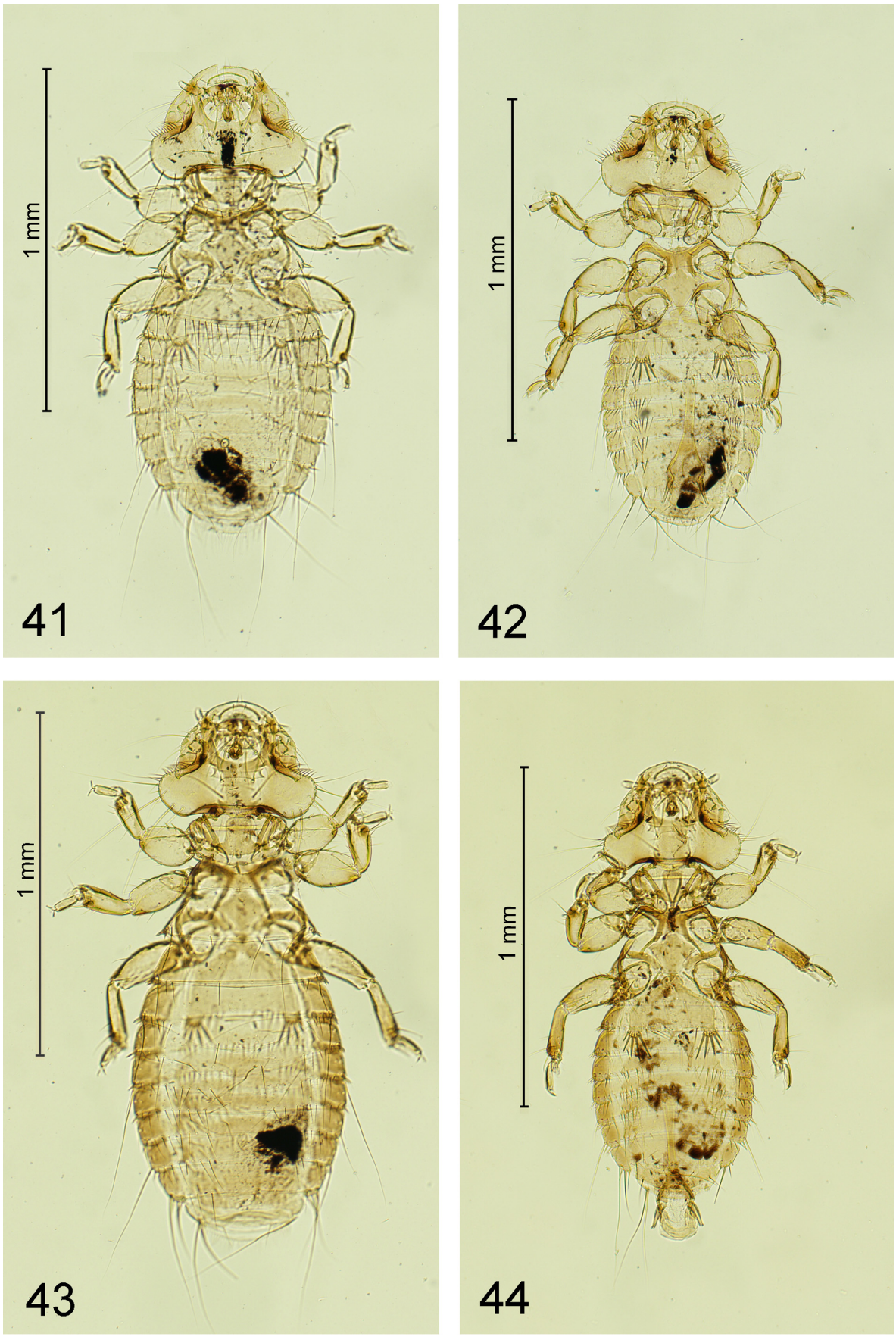
Type host. *Tolmomyias flaviventris* (Wied, 1831)—yellow-breasted flycatcher.

Type locality. Melajo Forest, Sangre Grande, Trinidad & Tobago.

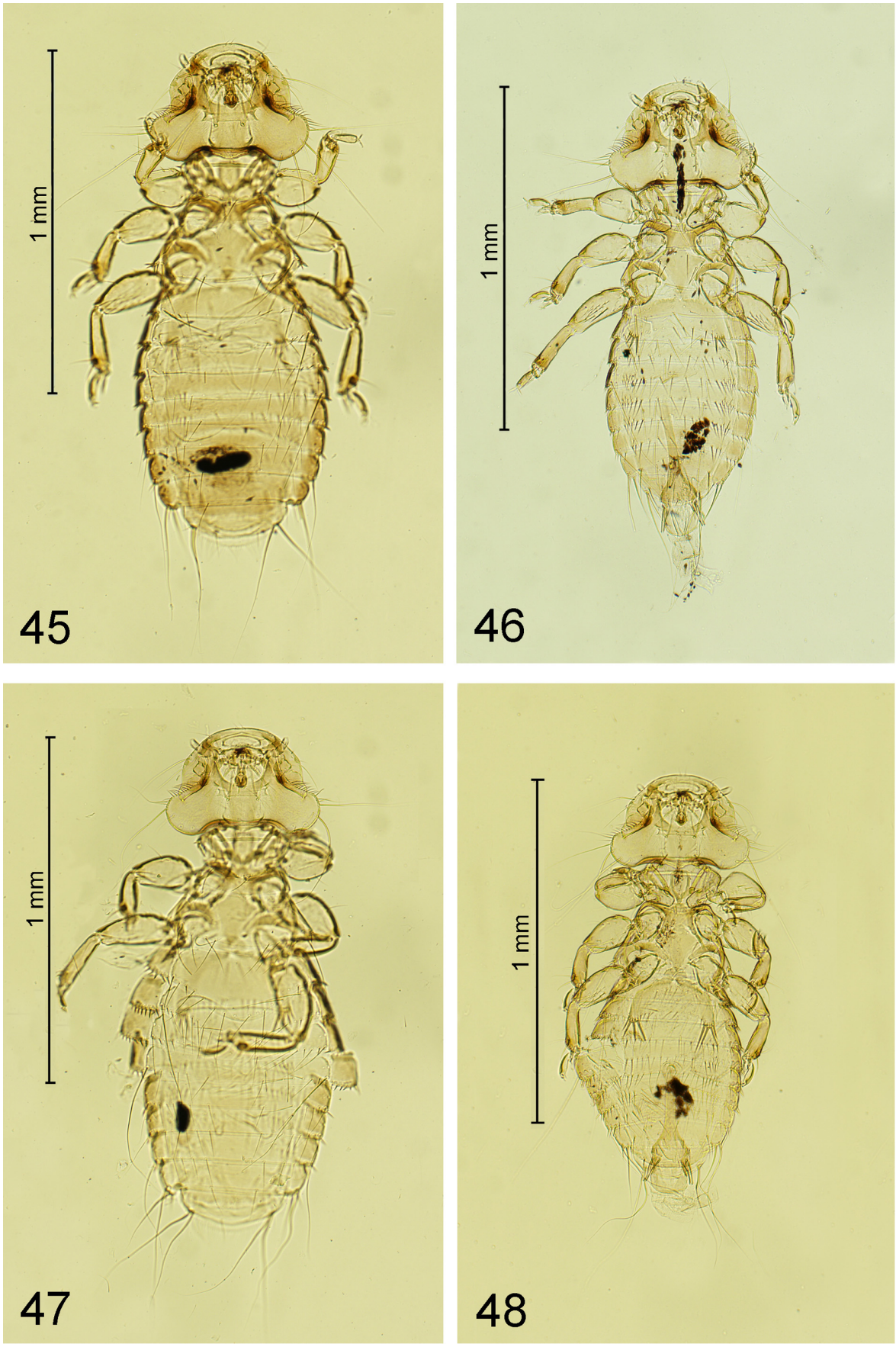
Material examined. Ex *Tolmomyias sulphurescens* (Spix, 1825)—yellow-olive flycatcher: 1♀, Atlántida, Tela, Lancetilla Botanical Garden, Honduras (15°44'N, 87°27'W), 10 August 2014, I. Literak (MMBC).

Remarks. This is the first record of *Myrsidea* from *Tolmomyias sulphurescens*. Until now, *Myrsidea flaviventris* was known from Trinidad & Tobago and Perú (Price *et al.* 2005), and this is the first record from Honduras. Our specimen differs from the original description of *M. flaviventris* by setal counts and dimensions, as follows [data from Price *et al.* (2005) are in parentheses]:

Female (n = 1). Tergal setae: II, 15 (9–11); V, 12 (10–11). Sternal setae: II, in total 17 (24–25) medioanterior and marginal setae; III, 27 (23–25); IV, 36 (31–35); VI, 34 (35–37). Anal fringe with 32 (35–42) dorsal setae. Dimensions: TW, 0.47 (0.46); MW, 0.44 (0.41–0.42); ANW, 0.22 (0.20–0.21).



FIGURES 41–44. Habitus: *Myrsidea capeki* **n. sp.**: **41**, holotype female; **42**, paratype male; *Myrsidea pyriglenae* **n. sp.**: **43**, holotype female; **44**, paratype male.



FIGURES 45–48. *Myrsidea pachyramphi* **n. sp.**: **45**, holotype female; **46**, paratype male; *Myrsidea leptopogoni* **n. sp.**: **47**, holotype female; **48**, paratype male.

***Myrsidea leptopogoni*, new species**
(Figs 29, 38–39, 47–48)

Type host. *Leptopogon superciliaris* Tschudi, 1844—slaty-capped flycatcher.

Type locality. San Rafael National Park, Paraguay (26°30'S, 55°47'W).

Type material. Ex *Leptopogon superciliaris*: holotype ♀, Tapantí National Park, Sector Tapantí, Costa Rica (09°46'N, 83°47'W), 8 August 2009, O. Sychra & I. Literak (MMBC).

Paratypes: 2♂ with the same data as holotype (MMBC).

Diagnosis. *Myrsidea leptopogoni* n. sp. is morphologically close to *M. rekasii* Dalgleish & Price, 2003—from species of Pipridae—in setal counts and the shape of tergites, but both sexes of *M. leptopogoni* have larger dimensions. Furthermore, the female of *M. leptopogoni* can also be distinguished by the absence of a median gap among setae on tergite I (Fig. 29), and the male by the number of setae on tergites I–III (total 35–36 vs 19–28 in *M. rekasii*). Among the species of *Myrsidea* from members of the Tyrannidae, the closest morphological species to *M. leptopogoni* is *M. oleaginei*, but females can be easily distinguished by the shape of tergites I–II, being U-shaped in *M. leptopogoni* (Fig. 29), but V-shaped in *M. oleaginei*.

Description. Female (n = 1). As in Figs 29 and 47. Hypopharyngeal sclerites fully developed. Length of *dhs* 10, 0.035; *dhs* 11, 0.098; ratio *dhs* 10/11, 0.36; *ls5* 0.04 long, latero-ventral fringe with 10 setae. Gula with 4–5 setae on each side. Pronotum with 6 setae on posterior margin and 3 short spiniform setae at each lateral corner. First tibia with 3 outer ventro-lateral and 3 dorso-lateral setae. Metanotum not enlarged, with 10 marginal setae; metasternal plate with 6 setae; metapleurites with 4 short strong spiniform setae. Femur III with 14–15 setae in ventral setal brush. Tergites modified as on Fig. 29. Tergite I enlarged, compressing II–IV at midline. Abdominal segments with constant row of tergal setae on tergite I and with well-defined median gap on tergites II–VIII. Tergal setae: I, 14; II, 17; III, 13; IV, 10; V, 11; VI, 10; VII, 7; VIII, 4. Postspiracular setae very long on II, IV and VIII (0.44–0.48); long on I and VII (0.29–0.33); and short on III, V and VI (0.13–0.16). Inner posterior seta of last tergum not longer than anal fringe setae with length 0.07; length of short lateral marginal seta of last segment, 0.03–0.05. Pleural setae: I, 6; II, 9; III, 8; IV, 7–8; V, 7; VI, 6; VII, 5; VIII, 3. Pleurites with only short spine-like setae. Pleurite VIII with inner setae (0.07) longer as outer (0.05). Anterior margin of sternal plate II with a medial notch. Sternal setae: I, 0; II, 4 in each aster: *s1*, 0.10; *s2*, 0.06; *s3*, 0.05; *s4*, 0.04; with 17 marginal setae between asters, 5 medioanterior; III, 22; IV, 30; V, 32; VI, 29; VII, 15; VIII–IX, 9; and 12 setae on deeply serrated vulvar margin. Anal fringe formed by 32 dorsal and 32 ventral setae. Dimensions: TW, 0.45; POW, 0.35; HL, 0.27; PW, 0.27; MW, 0.42; AWIV, 0.55; ANW, 0.22; TL, 1.45.

Male (n = 2). As in Fig. 48. Similar to female except as follows: length of *dhs* 10, 0.022–0.035; *dhs* 11, 0.091–0.095; ratio *dhs* 10/11, 0.24–0.37; *ls5* 0.02–0.04 long, latero-ventral fringe with 9 setae. Gula with 4 setae on each side. Pronotum with 6 setae on posterior margin and 3 short spiniform setae at each lateral corner. First tibia with 3 outer ventro-lateral and 3–4 dorso-lateral setae. Metanotum not enlarged with 7–8 marginal setae; metasternal plate with 6 setae; metapleurites with 3 short spiniform strong setae. Femur III with 12 setae in ventral setal brush. Abdominal segments with well-defined median gap in each row of tergal setae. Tergal setae: I, 10; II, 13; III, 12–13; IV, 11–13; V, 9–11; VI, 10; VII, 6–9; VIII, 4–6. Length of inner posterior seta of last tergum, 0.05–0.06; short lateral marginal seta of last segment, 0.02. Pleural setae: I, 5; II, 5–6; III, 6–7; IV, 6; V, 6; VI, 6; VII, 4–5; VIII, 3. Pleurites with only short spine-like setae. Pleurite VIII with inner setae (0.05) as long as outer (0.03). Anterior margin of sternal plate II with a medial notch. Sternal setae: I, 0; II, 4 in each aster: *s1*, 0.08–0.10; *s2*, 0.05–0,08; *s3*, 0.04–0.06; *s4*, 0.03–0.05; with 14 marginal setae between asters, 4–6 medioanterior; III, 19–20; IV, 23–25; V, 27–29; VI, 23–24; VII, 15–16; VIII, 5–6; remainder of plate, 7; and with 3 setae posteriorly. With 8 internal anal setae. Genital sac sclerite as in Figs 38–39. Dimensions: TW, 0.40; POW, 0.31–0.32; HL, 0.25; PW, 0.25; MW, 0.34; AWIV, 0.44; GW, 0.11; GSL, 0.10; TL, 1.16–1.23.

Etymology. This species epithet is a noun in apposition derived from the generic name of the type host.

Remarks. This is the first record of chewing lice from *Leptopogon superciliaris*. A portion of COI gene was sequenced from specimens of *M. leptopogoni* from Costa Rica (GenBank MF563538). Comparing our sequence with other known sequences of Neotropical *Myrsidea*, the divergences exceeded 18% in all cases, including that with the morphologically close species *M. oleaginei* (ex *Mionectes oleagineus*, family Tyrannidae, GenBank KF048108), with a p-distance of 25.6%. The closest p-distance was with that of *M. cnemotriccola* (ex *Cnemotriccus fuscatus*, family Tyrannidae, GenBank KF048124), with a value of 18.1%. Unfortunately, there are

no genetic sequences known from *M. rekasii*, the species morphologically closest to *M. leptopogoni*. However, considering the combination of morphological differences between *M. oleaginei* and *M. rekasii*, and the large sequence divergence with *M. oleaginei*, we are confident that *M. leptopogoni* is a new, separate species.

Myrsidea oleaginei Price, Hellenthal & Dalgleish, 2005

Myrsidea oleaginei Price, Hellenthal & Dalgleish, 2005: 13, figs 15–16.

Type host. *Mionectes oleagineus* (Lichtenstein, MHC, 1823)—ochre-bellied flycatcher.

Type locality. Simla near Arima, Trinidad & Tobago.

Material examined. Ex *Mionectes oleagineus*: 3♀, 3♂, Hitoy Cerere BR, Provincia Limón, Costa Rica (09°40'N 85°05'W), 18 August 2004, I. Literak, M. Capek & M. Havlicek (MMBC); 3♀, 1♂, Centro URKU, Tarapoto, Perú (06°27'S, 76°21'W), 8 August 2011, I. Literak (MMBC); 4♀, 1♂, Atlántida, Tela, Lancetilla Botanical Garden, Honduras (15°44'N, 87°27'W), 10–18 August 2014, I. Literak (MMBC).

Remarks. This is the first record of *Myrsidea oleaginei* in Honduras. Our specimens differ from the original description of *M. oleaginei* by setal counts and dimensions, as follows [data from Price *et al.* (2005) are in parentheses]:

Female (n = 10). Metanotum with 10–11 (8–10) marginal setae. Tergal setae: I, 6–9 (8–13); III, 12–15 (10–14). Anterior margin of sternal plate II with a medial notch. Sternal setae: II, 4–5 (4) in each aster; III, 24–25 (20–24); IV, 30–36 (22–29); V, 29–32 (24–31); VI, 22–27 (19–25); VIII–IX, 7–9; and 9–11 setae on serrated vulvar margin (total number of VIII–IX sternal setae is 16–20 vs 18–22 in Price *et al.* 2005). Dimensions: PW, 0.26–0.29 (0.25–0.28); ANW, 0.19–0.21 (0.17–0.20).

Male (n = 5). Metanotum with 10 (6–8) marginal setae. Tergal setae: I, 10 (7–9); II, 12 (8–11); VI, 14 (10–13). Sternal setae: II, 3–4 (4) in each aster; III, 22 (17–20); V, 27 (19–26); VI, 23 (16–22). Dimensions: TW, 0.40 (0.36–0.39); PW, 0.27 (0.23–0.26); MW, 0.34 (0.30–0.33); AWIV, 0.43 (0.38–0.42); GSL, 0.10 (0.09).

Myrsidea olivacei Price, Hellenthal & Dalgleish, 2005

Myrsidea olivacei Price, Hellenthal & Dalgleish, 2005: 15, fig. 20.

Type host. *Mionectes olivaceus* Lawrence, 1868—olive-striped flycatcher.

Type locality. Simla near Arima, Trinidad & Tobago.

Material examined. Ex *Mionectes olivaceus*: 2♀, 2♂, Rincón de la Vieja, Costa Rica (10°46'N, 85°18'W), 22–24 August 2009, O. Sychra & I. Literak (MMBC); 2♂, Tapantí National Park, Sector Tapantí, Costa Rica (09°46'N, 83°47'W), 6 August 2009, O. Sychra & I. Literak (MMBC).

Remarks. This is the first record of *M. olivacei* from Costa Rica. Our specimens differ from the original description of *M. olivacei* by setal counts and dimensions, as follows [data from Price *et al.* (2005) are in parentheses]:

Female (n = 2). Metanotum with 9–10 (10) marginal setae Tergal setae: I, 8–9 (11); III, 13–15 (12–13); IV, 13–14 (12–13); V, 15–16 (12–13); VI, 12–14 (12–13); VII, 11–12 (10); VIII, 7–9 (6). Sternal setae: II, with 13–16 marginal setae between asters, 4–6 medioanterior (total number of setae on sternite II including aster setae is 25–30 vs 32 in Price *et al.* 2005); III, 22–24 (24); V, 34 (28–31); VI, 26–29 (28–31); VII, 16 (13); VIII–IX, 8–9; and 12–13 setae on serrated vulvar margin (total number of VIII–IX sternal setae is 20–22 in comparison with 18 in Price *et al.* 2005). Dimensions: HL, 0.28–0.29 (0.31); PW, 0.28–0.29 (0.28); MW, 0.41–0.42 (0.43); AWIV, 0.54–0.56 (0.55); ANW, 0.21 (0.20); TL, 1.46–1.49 (1.43).

Male (n = 4). Metanotum with 6–9 (8) marginal setae. Tergal setae: I, 7–8 (9); II, 12–14 (13); III, 12–13 (9–12); IV, 12–15 (9–12); V, 13–15 (9–12); VI, 11–14 (9–12); VII, 8–12 (8); VIII, 7–8 (6). Sternal setae: II, with 13–14 marginal setae between asters, 4–5 medioanterior (total number of setae on sternite II including aster setae is 25–27 vs 27 in Price *et al.* 2005); III, 17–21 (19); IV, 22–26 (21); V, 28–33 (26); VI, 24–26 (21); VII, 14–16 (12); VIII, 6–7 (5); remainder of plate, 6–9. Dimensions: TW, 0.39–0.40 (0.40); HL, 0.24 (0.28); PW, 0.25–0.26 (0.26); MW, 0.32–0.33 (0.35); AWIV, 0.41–0.42 (0.44); TL, 1.18–1.20 (1.12).

Myrsidea pitangi Price, Hellenthal & Dalgleish, 2005
(Fig. 40)

Myrsidea pitangi Price, Hellenthal & Dalgleish, 2005: 6, figs 4–6.

Type host. *Pitangus sulphuratus* (Linnaeus, 1766)—great kiskadee.

Type locality. Tumpuna Rd, Trinidad & Tobago.

Material examined. Ex *Pitangus sulphuratus*: 1♂ Los Tres Gigantes Biological Station in the Paraguayan Pantanal, Paraguay (20°04'S, 50°09'W), 7 September 2012, I. Literak (MMBC); 1♀ Atlántida, Tela, Lancetilla Botanical Garden, Honduras (15°44'N, 87°27'W), 13 August 2014, I. Literak (MMBC).

Remarks. *Myrsidea pitangi* was known from Trinidad & Tobago and Costa Rica, and our records are the first from Honduras, Paraguay and Perú. Our specimens differ from the original description of *M. pitangi* by setal counts and dimensions, as follows [data from Price *et al.* (2005) are in parentheses]:

Female (n = 1). Metanotum not enlarged, with 7 (10–11) marginal setae. Tergal setae: I, 8 (10–11); II, 11 (12–15); V, 11 (13–14); VII, 9 (6–7). Anterior margin of sternal plate II with a medial notch. Sternal setae: III, 34 (25–31); VII, 19 (13–15); Anal fringe with 41 (42–46) dorsal setae. Dimensions: HL, 0.39 (0.35–0.38); PW, 0.34 (0.35–0.37); MW, 0.50 (0.53–0.55); AWIV, 0.68 (0.73–0.79); ANW, 0.26 (0.28–0.29); TL, 1.72 (1.76–1.79).

Male (n =1). Tergal setae: I, 7 (8–11). Sternal setae: VII, 18 (15–16); VIII, 9 (7). Genital sac sclerite as in Fig. 40. Dimensions: PW, 0.30 (0.32–0.34); GSL, 0.12 (about 0.10 long).

Myrsidea sp.

We collected a few specimens of *Myrsidea* from five other species of Tyrannidae, as follows: *Contopus virens* (Linnaeus, 1766), *Elaenia frantzii* Lawrence, 1865, *Ramphotrigon megacephalum* (Swainson, 1835), *Rhynchocyclus brevirostris* (Cabanis, 1847), and *Zimmerius vilissimus* (P.L. Sclater & Salvin, 1859) (see Table 3). They represent first records of *Myrsidea* from *C. virens*, and of any louse from the other four hosts. Unfortunately, with one exception, they were all nymphs, from which we were unsuccessful in obtaining genetic data or meaningful morphological data for their identification. The exception was one female from *Ramphotrigon megacephalum* which, unfortunately, was destroyed during DNA extraction.

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