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Chewing lice of the genus *Philopterus* (Phthiraptera: Philopteridae) from drongos (Passeriformes: Dicruridae)

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Abstract

The chewing lice of the genus *Philopterus* parasitic on drongos (Dicruridae) are reviewed. Both sexes of the two species previously known from dicrurid hosts—*P. trabecula* (Piaget, 1880) and *P. kalkalichi* Ansari, 1955—are redescribed and illustrated. A new species, *Philopterus petrescuae* Adam is described from *Dicrurus hottentottus* from Indonesia. A lectotype for *P. trabecula* is designated. A record of *Philopterus crassipes* (Burmeister, 1838) from *Dicrurus remifer* (Temminck) is discussed and considered to be the result of straggling or contamination.

Key words: Phthiraptera, lice, *Philopterus*, Dicruridae, drongos, redescrptions, new species, lectotype, India, Thailand, Taiwan, Indonesia

Introduction

Price *et al.* (2003: 341) listed only two species of chewing louse of the genus *Philopterus* Nitzsch, 1818 from drongos (Passeriformes: Dicruridae). The original description of the species *Philopterus trabecula* Piaget (1880) was based on twelve females from *Dicrurus “retifer”*. Since the epithet “*retifer*” is not a valid name or synonym for any species of drongo (Mayr & Greenway 1960, 1962), we believe it to be a misspelling of “*remifer*” and that the correct type host of *P. trabecula* is the lesser racket-tailed drongo *Dicrurus remifer* (Temminck) (see Hopkins & Clay 1952: 288; Price *et al.* 2003: 342). Unfortunately, there remain only two slides with two of the twelve females reported by Piaget (1880: 662), now deposited at the Natural History Museum in London (NHML) (Thompson 1938: 611). The second species, *Philopterus kalkalichi* Ansari, 1955, was described three times as a new species (Ansari 1955, 1956a, 1958) from the black drongo *Dicrurus macrocercus* Vieillot. Many descriptions of new species by Ansari (1955, 1956a, 1956b, 1958) are confusing and misleading (e.g. Palma & Price 2006), and his type material is probably lost. A third species of *Philopterus* from *Dicrurus hottentottus* collected in Indonesia is identified as new to science.

The aims of this paper are (1) to redescribe and illustrate both sexes of *Philopterus trabecula* and *P. kalkalichi* and to confirm these louse species as valid taxa, (2) to describe and illustrate *P. petrescuae* n. sp. from *Dicrurus hottentottus*, and (3) to designate a lectotype for *P. trabecula*.

Material and methods

We studied a series of *Philopterus* collected from two white-bellied drongos, *Dicrurus caerulescens* (Linnaeus) from the Rampur District (Uttar Pradesh, India), and a series of *Philopterus* collected from a hair-crested drongo, *Dicrurus hottentottus* (Linnaeus), from Bunaken Island (NE Sulawesi, Indonesia). Lice were collected as described by Saxena *et al.* (2007), and slide-mounted following the technique in Palma (1978). The dorsal head setae names follow that proposed by Clay (1951). Also, we examined the two extant syntypes of *Philopterus trabecula* deposited at NHML—one female from *Dicrurus remifer* and one female from *Artamus leucocephalus* (now *Artamella viridis* (Statius Müller)). Sixteen additional specimens were examined from other collections, as follows: (1) four males, two females, and two nymphs from *Dicrurus remifer* determined by K.C. Emerson as *Philopterus trabecula* (K.C. Emerson Museum, Oklahoma State University, U.S.A., KCEM), (2) two males, two females, and two nymphs from *Dicrurus macrocercus* determined by R.D. Price as *Philopterus kalkalichi* (Department of Entomology, University of Minnesota, U.S.A., UMSP), and (3) one male and one female from *D. macrocercus* determined by R.D. Price as *P. kalkalichi* (Price Institute for Phthirapteran Research, Department of Biology, University of Utah, U.S.A., PIPeR).

In the following descriptions, all measurements are in millimetres. Abbreviations for dimensions are as follows: FW, frons width (excluding hyaline margin); FHMW, frons width (including hyaline margin); HMI, hyaline margin index = FHMW / FW (this index gives an indication of the expansion of the hyaline margin on the latero-anterior angles of the head); PAW, preantennal width; TW, temple width; HL, head length at midline (including the hyaline margin); PAL, preantennal length; LHCL, lateral head carina length; DAPL, dorsoanterior plate length; DAPW, dorsoanterior plate width; PW, prothorax width; MW, metathorax width; AWV, abdomen width at level of segment V; SGPW, subgenital plate width; TL, total length; GL, male genitalia length; GW, male genitalia width.

Results

Four males, seven females and four nymphs of *Philopterus kalkalichi* were obtained from two specimens of *Dicrurus caerulescens* in India. This is the first record of an ischnoceran species from this host, and a new host-lice association for *P. kalkalichi*. Also, two males, two females and seven nymphs of an undescribed species were collected from *Dicrurus hottentottus* in Indonesia.

Philopterus trabecula (Piaget, 1880)

(Figs. 5–7, 15–20, 33)

Docophorus trabecula Piaget, 1880: 662, pl. 54, fig. 4.

Philopterus trabecula (Piaget, 1880); Hopkins & Clay, 1952: 288.

Type host: *Dicrurus remifer* (Temminck) (as *Dicrurus “retifer”*) — Lesser racket-tailed drongo.

Male (n = 1). Like *P. kalkalichi* except as follows. *Head:* Coni short (about 0.05) and curved upwards (Figs. 16–18). Dorsal anterior head plate as in Fig. 19; ventral anterior head plate narrow. Anterior seta 3 stout and relatively long. Anterior seta 1 (preconal seta of Price & Hellenthal 1998) short 0.02–0.03 in length. Postconal seta very short not > 0.01. Dorsal submarginal seta short, only 0.04–0.05 long (Fig. 15). *Thorax:* Pterothorax with 17 posterior setae. *Abdomen:* Abdominal chaetotaxy: tergal setae (including only tergo-lateral setae (!), tergo-central setae not visible): II, 10 (plus anterior pair); III, 6; IV, 9; V, 8; VI, 7; VII, 8; VIII, 6; IX, 2; sternal setae: II, not visible; III, 7; IV, at least 6; V, 9; VI, 8; subgenital plate as in Fig 5 with 4 long setae; pleural (paratergal) setae: II–III, 0; IV–V, 4; VI–VII, 5; VIII, 3; IX, 1. Lateral sternites on III–VI 0.03–0.04 wide (Fig. 5). Genitalia (Figs 6–7) with short, stout parameres fused with the basal plate; endomerale plate simple with pointed posterior margin, mesomere with two rounded projection posteriorly overlapping posterior margin of endomerale plate.

Dimensions: FW, 0.20; FHMW, 0.23; HMI, 1.15; PAW, 0.29; TW, 0.42; HL, 0.47; PAL, 0.24; LHCL, 0.09; DAPL, 0.23; DAPW, 0.13; PW, 0.27; MW, 0.38; AWV, 0.54; TL, 1.36; GL, 0.23; GW, 0.08.

Female (n = 3). Most features as in male. Pterothorax with 18–19 posterior setae. Abdominal chaetotaxy: tergal setae: II, 11–14 (plus anterior pair); III, 11–12; IV, 13–14; V, 13–15; VI, 11–13; VII, 12; VIII, 10; IX, 2; sternal

setae: II, 4–5; III, 5–7; IV, 8–10; V, 6–8; VI, 8–9; subgenital plate as in Fig. 20 with 4 long setae; vulva with 14 medium long and 5 short setae.

Dimensions (measurements of the lectotype of *P. trabecula* are in parentheses): FW, 0.21–0.22 (0.23); FHMW, 0.25 (0.26); HMI, 1.14–1.19 (1.13); PAW, 0.29–0.30 (0.33); TW, 0.42–0.43 (0.50); HL, 0.50–0.51 (0.51); PAL, 0.26–0.28 (0.28); LHCL, 0.09 (0.11); DAPL, 0.24–0.27 (0.28); DAPW, 0.12–0.13 (0.14); PW, 0.27 (0.31); MW, 0.38–0.39 (0.44); AWV, 0.53–0.54 (0.59); SGPW, 0.30 (0.32); TL, 1.36–1.41 (1.38).

Material examined. 1 female syntype of *P. trabecula* ex *Dicrurus remifer* (Piaget's Collection number 625) deposited in NHML and designated as the lectotype below; 1 male and 2 nymphs ex *Dicrurus remifer*, **THAILAND**: Chanthaburi, Khao Soi Dao Tai, 4800 m, 28.II.1966, S. King leg. (number MAPS 3913) deposited in KCEM; 2 females, from the same host species and locality, except 2500 m, 22.III.1966 (numbers MAPS 4638 and 4645) deposited in KCEM; 1 female syntype of *P. trabecula* ex *Artamella viridis* (Stadius Müller) (Piaget's Collection number 626) deposited in NHML.

Remarks. Piaget's (1880: 662) gave the following measurements: TW, 0.44; HL, 0.46; MW, 0.37; AWV, 0.46; TL, 1.19. We believe the discrepancies with our measurements are due to different measuring techniques.

The two female syntypes of *P. trabecula* belong to different species. The specimen from *Dicrurus remifer* has short dorsal submarginal setae (about 0.05), while the specimen from *Artamella viridis* has long dorsal submarginal setae (about 0.18). The determination of this latter specimen is also queried on the label (Thompson 1938: 611).

Therefore, to settle the identity of this species of *Philopterus*, we hereby designate the female from *Dicrurus remifer*, on Piaget Collection slide 625, as the lectotype of *Philopterus trabecula* (Fig. 33). The other female from *Artamella viridis*, on Piaget Collection slide 626, becomes a misidentified paralectotype. The two females from the KCEM are consistent with the lectotype, especially in the length of the dorsal submarginal seta.

Philopterus trabecula is readily distinguished by its short dorsal submarginal setae (only 0.04–0.05 long), and by the male genitalia having an endomeral plate simple with pointed posterior margin, and a mesomere with two rounded distal projections overlapping with the posterior margin of the endomeral plate (Figs. 6–7).

Philopterus kalkalichi Ansari, 1955

(Figs. 1–4, 11–14)

Philopterus kalkalichi Ansari, 1955: 58.

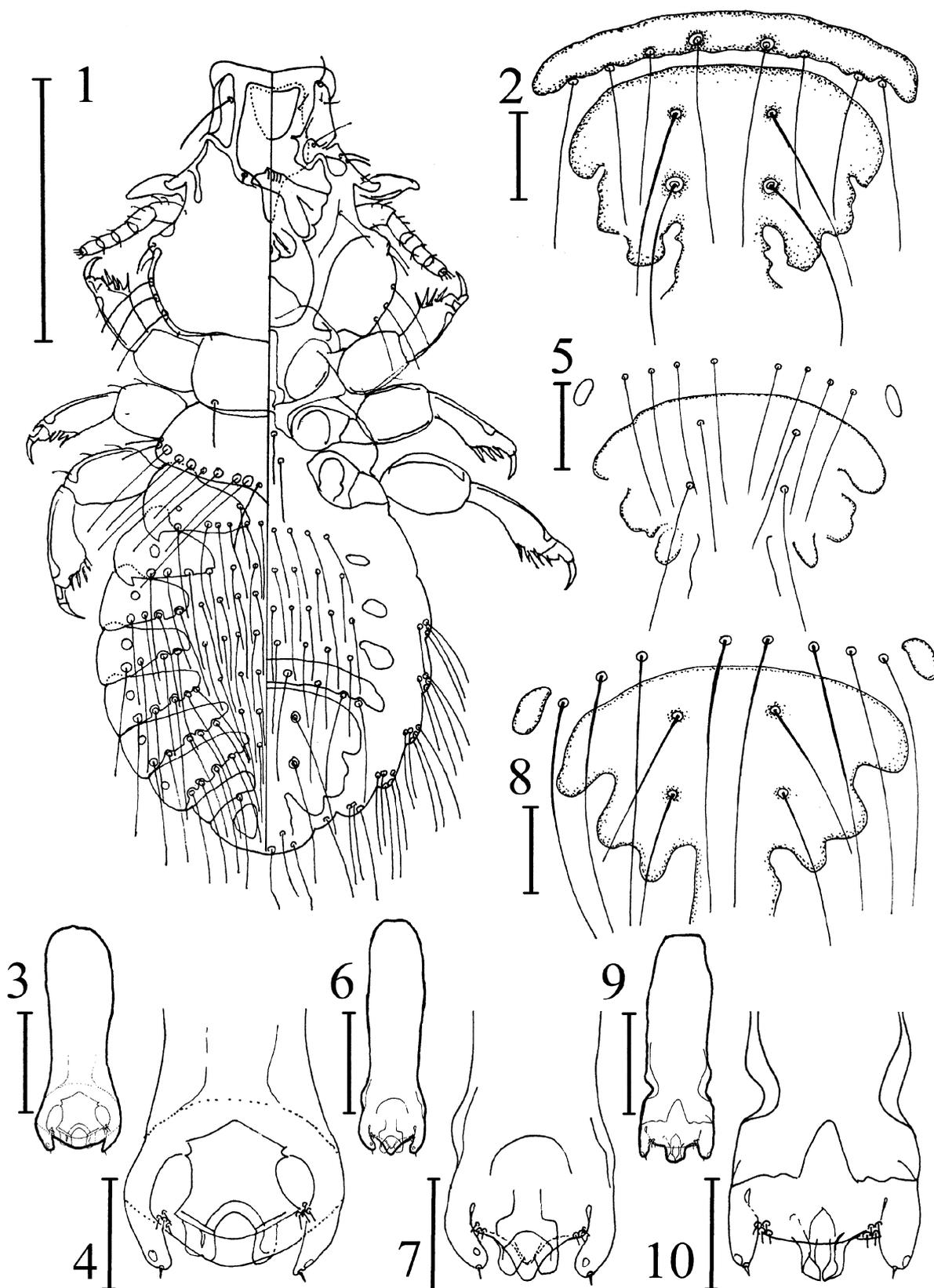
Philopterus kalkalichi Ansari, "sp. nov."; Ansari, 1956a: 396.

Philopterus kalkalichi Ansari, 1955; Ansari, 1956b: 17, figs. 30–32.

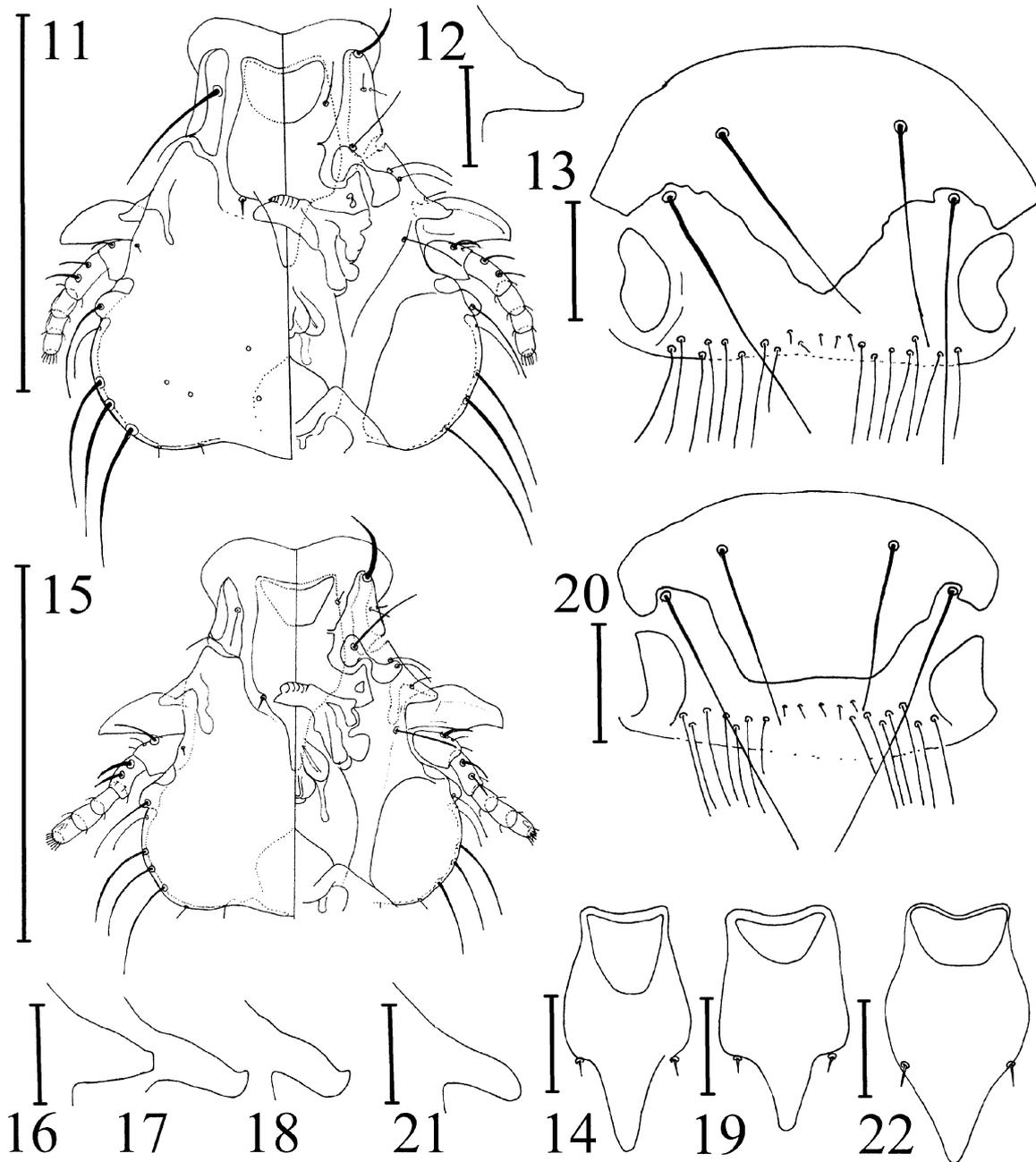
Philopterus kalkalichi Ansari, 1955; Palma & Price, 2006: 7.

Type host: *Dicrurus macrocercus* Vieillot—Black drongo.

Male (n = 5). As in Fig. 1. *Head* longer than wide, preantennal region with slightly concave lateral margin. Hyaline margin wide, expanded laterally (HMI > 1) and with a median emargination. Marginal carina interrupted medially and laterally. Coni short (about 0.05) and well pigmented (Fig. 12). Dorsal anterior head plate (= clypeal signature of Ansari 1956b) pale, uniformly pigmented and as in Fig. 14; ventral anterior head plate with widely rounded posterior margin. Anterior seta 3 stout and relatively long. Anterior seta 1 (preconal seta of Price & Helenthal 1998) short: 0.03–0.04 in length (Fig. 11). Postconal seta very short not > 0.01. Dorsal submarginal seta 0.17–0.21 long. Eyes well developed, ocular seta long. Temporal carina distinct, marginal temporal carina with 3 very long setae. *Thorax*: Prothorax with one long seta on each postero-lateral corners. Pterothorax sharply angulated posteriorly with 19–21 posterior setae (including those on pteropleural margin). *Abdomen*: tergites uniformly pigmented, except for light areas associated with spiracles. Abdominal chaetotaxy: tergal setae: II, 11–13 (plus anterior pair); III, 11–14; IV, 15–17; V and VI, 15–16; VII, 11–13; VIII, 9–10; IX, 2; sternal setae: II, 7–8; III, 8–9; IV, 8–11; V, 9–10; VI, 8; subgenital plate as in Fig. 2 with 4 long setae; pleural (paratergal) setae: II–III, 0; IV–V, 4; VI–VII, 5; VIII, 3; IX, 1. Lateral sternites on III–V 0.05–0.07 wide; with prominent median sternite on VI (Fig. 2). *Genitalia* (Figs. 3–4) with short and stout parameres fused with the basal plate; endomeral plate simple with widely rounded posterior margin, mesomere with rounded projection posteriorly not overlapping posterior margin of endomeral plate, ventral plate as in Fig. 4, with a group of four very short setae near the latero-posterior corner; basal plate long.



FIGURES 1–10. 1–4: *Philopterus kalkalichi*: 1—male, dorso-ventral view; 2—male sternite VI and subgenital plate; 3—male genitalia; 4—detail of distal male genitalia. 5–7: *Philopterus trabecula*: 5—male sternite VI and subgenital plate; 6—male genitalia; 7—detail of distal male genitalia. 8–10: *Philopterus crassipes*: 8—male sternite VI and subgenital plate; 9—male genitalia; 10—detail of distal male genitalia. Scales 0.50 mm (Fig. 1), 0.10 mm (Figs. 2–3, 5–6, 8–9), 0.05 mm (Figs. 4, 7, 10).



FIGURES 11–22. 11–14: *Philopterus kalkalichi*: 11—female head, dorso-ventral view; 12—conus; 13—female subgenital plate; 14—dorsal anterior head plate. 15–20: *Philopterus trabecula*: 15—female head, dorso-ventral view; 16—conus (female, slide 4638); 17—conus (male, slide 3913); 18—conus (female, slide 4645); 19—dorsal anterior head plate; 20—female subgenital plate. 21–22: *Philopterus crassipes*: 21—conus; 22—dorsal anterior head plate. Scales 0.50 mm (Fig. 11, 15), 0.10 mm (Figs. 13–14, 19–20, 22), 0.05 mm (Figs. 12, 16–18, 21).

Dimensions: FW, 0.20–0.22; FHMW, 0.22–0.25; HMI, 1.10–1.14; PAW, 0.28–0.32; TW, 0.43–0.45; HL, 0.47–0.51; PAL, 0.22–0.27; LHCL, 0.10–0.11; DAPL, 0.23–0.26; DAPW, 0.13–0.14; PW, 0.27–0.30; MW, 0.38–0.42; AWV, 0.50–0.62; TL, 1.35–1.47; GL, 0.26–0.28; GW, 0.09–0.10.

Female (n = 7). Most features as in male. Abdominal chaetotaxy: tergal setae: II, 14–15 (plus anterior pair); III, 16–18; IV, 15–22; V, 18–24; VI, 17–22; VII, 14–18; VIII, 10–11; IX, 2–3; sternal setae: II, 6–8; III, 9–10; IV, 9–14; V, 10–11; VI, 8; subgenital plate as in Fig. 13 with 4 long setae; vulva with 14–16 medium long and 4–6 short setae.

Dimensions: FW, 0.21–0.25; FHMW, 0.25–0.26; HMI, 1.04–1.10; PAW, 0.32–0.35; TW, 0.50–0.53; HL, 0.52–0.57; PAL, 0.25–0.29; LHCL, 0.11–0.12; DAPL, 0.27–0.28; DAPW, 0.14–0.16; PW, 0.30–0.32; MW, 0.42–0.46; AWV, 0.72–0.77; SGPW, 0.33–0.41; TL, 1.69–1.82.

Material examined. 3 males, 3 females ex *Dicrurus macrocercus harterti* Baker, **TAIWAN:** Puli Nantou hsien, XI–XII.1963 and I.1964, T.C. Maa leg.; 2 nymphs, ex the same host species, **TAIWAN:** Taipei, 19.X.1964, C.T. Lin leg., deposited in PIPEr and UMSP (numbers TMT 239, 49, 95, 11–12 and 2152); 3 males, 6 females and 4 nymphs ex *Dicrurus caerulescens* (Linnaeus), **INDIA:** Rampur (Uttar Pradesh), 15.VI.2008, A. Ahmad leg., deposited at the department of Zoology, Govt. Raza PG College, Rampur, U.P., India; 1 male and 1 female with the same data are deposited at Zoological Survey of India, Calcutta, India.

Remarks. Although we have not examined the type specimens of *P. kalkalichi*, and the original description of this species by Ansari (1955) is incomplete, our specimens are consistent with some important points in Ansari's redescription (1956b), especially the shape of the head, the dorsal anterior head plate, and the male genitalia. Although, there are discrepancies between Ansari's (1955) measurements and ours, they may be due to different mounting and/or measuring techniques.

Philopterus petrescuae Adam, sp. nov.

(Figs. 23–31, 34)

Type host: *Dicrurus hottentottus* (Linnaeus)—Hair-crested drongo.

Male (n = 2). As in Fig. 34. *Head:* Coni short (0.054–0.056) and curved upwards (Figs. 27–28). Dorsal anterior head plate as in Fig. 30; ventral anterior head plate with narrow posterior margin. Anterior seta 3 (see Clay 1951) stout and relatively long (0.094–0.102). Anterior seta 1 (preconal seta of Price & Hellenthal 1998) short (0.017–0.019 in length). Postconal seta short (0.017–0.019 long). Dorsal submarginal seta very short, only 0.010–0.015 long (Fig. 24). *Thorax:* Pterothorax with 18–20 posterior setae. *Abdomen:* Abdominal chaetotaxy: tergal setae: II, 10 (plus anterior pair); III, 10–11; IV, 9–12; V, 11–12; VI, 12; VII, 11; VIII, 11; IX, 2; sternal setae: II, 7–9; III–V, 9; VI, 8; subgenital plate as in Fig. 25 with 4 long setae (paratype male has two additional shorter setae; we consider this an abnormality); pleural (paratergal) setae: II–III, 0; IV–V, 3; VI–VII, 4; VIII, 3; IX, 1. Lateral sternites on III–VI 0.026–0.046 wide (Figs. 23, 25). Genitalia (Fig. 29) with short and stout parameres fused with the basal plate; endomerale plate simple with pointed posterior margin, mesomere with two rounded distal projections not overlapping the posterior margin of the endomerale plate.

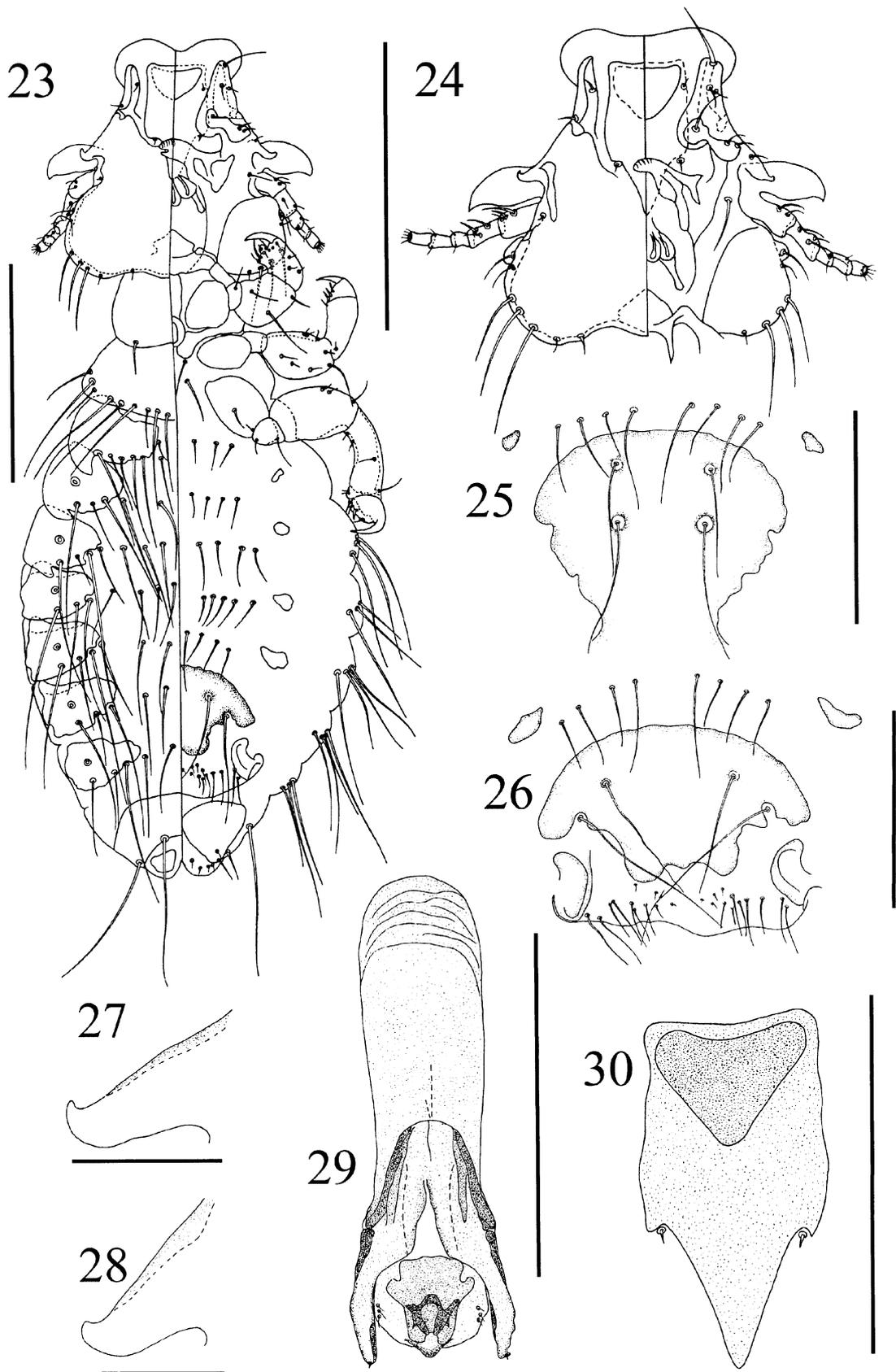
Dimensions: FW, 0.24–0.25; FHMW, 0.29–0.30; HMI, 1.20–1.21; PAW, 0.35–0.36; TW, 0.48–0.50; HL, 0.54–0.56; PAL, 0.31; LHCL, 0.11; DAPL, 0.28; DAPW, 0.14–0.15; PW, 0.30; MW, 0.41–0.42; AWV, 0.64–0.68; SGPW, 0.35; TL, 1.55–1.66; GL, 0.29; GW, 0.10.

Female (n = 2). Most features as in male. Pterothorax with 15–17 posterior setae. Abdominal chaetotaxy (Fig. 23): tergal setae: II, 11 (plus anterior pair); III, 12–14; IV, 13–15; V, 15–17; VI, 13–15; VII, 12–14; VIII, 10; IX, 4; sternal setae: II, 7; III–IV, 8–9; V, 9–10; VI, 8–11; subgenital plate as in Fig. 26 with 4 long setae (one paratype female has one additional seta; we consider this an abnormality); vulva with 14–16 medium long and 6–9 short setae (Fig. 26).

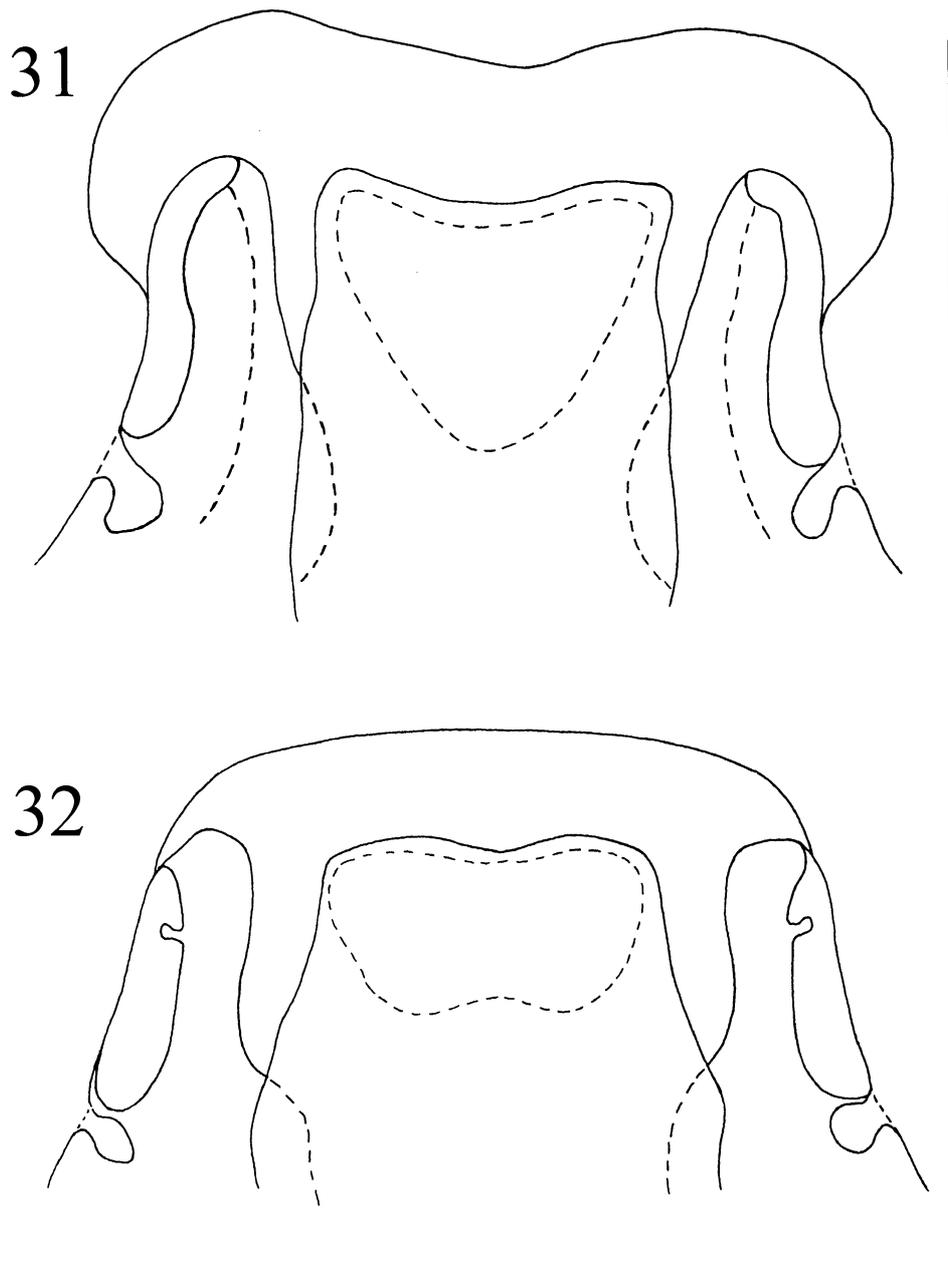
Dimensions: FW, 0.25; FHMW, 0.30–0.31; HMI, 1.20–1.24; PAW, 0.37; TW, 0.53–0.56; HL, 0.57–0.62; PAL, 0.32; LHCL, 0.11–0.12; DAPL, 0.30–0.31; DAPW, 0.15–0.16; PW, 0.33; MW, 0.45–0.46; AWV, 0.72–0.81; SGPW, 0.38–0.40; TL, 1.90–1.99.

Type material. Holotype male ex *Dicrurus hottentottus* (Linnaeus), **INDONESIA:** Bunaken Island (NE Sulawesi), 15.IV.1991, A. Petrescu & C. Adam coll. Deposited in “Grigore Antipa” National Museum of Natural History (slide ISC 258). Paratypes: 1 male and 2 females with same data as holotype. Deposited in “Grigore Antipa” National Museum of Natural History (slides ISC 258 and ISC 259).

Remarks. Both sexes of *P. petrescuae* sp. nov. can be distinguished from *P. trabecula* and *P. kalkalichi* by a unique combination of characters, as follows: (1) dorsal submarginal seta very short, under 0.02 long (Fig. 24); (2) female with great number of tergal setae on segments III, V and VI; (3) female with great number of sternal setae on segments II, III and V; (4) three pleural setae on segments IV–V and four on segments VI–VII; (5) small lateral sternites on abdominal segment VI (Fig. 23); (6) male genitalia shape, especially the mesomere (Fig. 29); (7) shape of male subgenital plate (Fig. 25); (8) greater dimensions overall.



FIGURES 23–30. *Philopterus petrescuai*: **23**—female, dorso-ventral view; **24**—male head, dorso-ventral view; **25**—male sternites VI and subgenital plate; **26**—female sternites VI and subgenital plate; **27**—male conus (slide ISC 258); **28**—female conus (slide ISC 258); **29**—male genitalia; **30**—dorsal anterior head plate. Scales: 0.5 mm (Figs. 23–24), 0.3 mm (Figs. 25–26, 29), 0.2 mm (Fig. 30), 0.05 mm (Figs. 27–28).



FIGURES 31–32. Male, dorso-anterior part of head (including hyaline margin): **31**—*Philopterus petrescuae*; **32**—*Philopterus crassipes*. Scales 0.2 mm.

Seven nymphs were also collected from the bird which harboured the holotype and paratypes, but they are not included in the type series. The presence of nymphs shows that *P. petrescuae* has bred on the host.

Etymology. This species is named after Dr Angela Petrescu (“Grigore Antipa” National Museum of Natural History, Bucharest, Romania) for her contribution in collecting the type series.

***Philopterus crassipes* (Burmeister, 1838)**

(Figs. 8–10, 21–22, 32)

Docophorus crassipes Burmeister, 1838: 425.

Philopterus crassipes (Burmeister, 1838); Hopkins & Clay, 1952: 282.

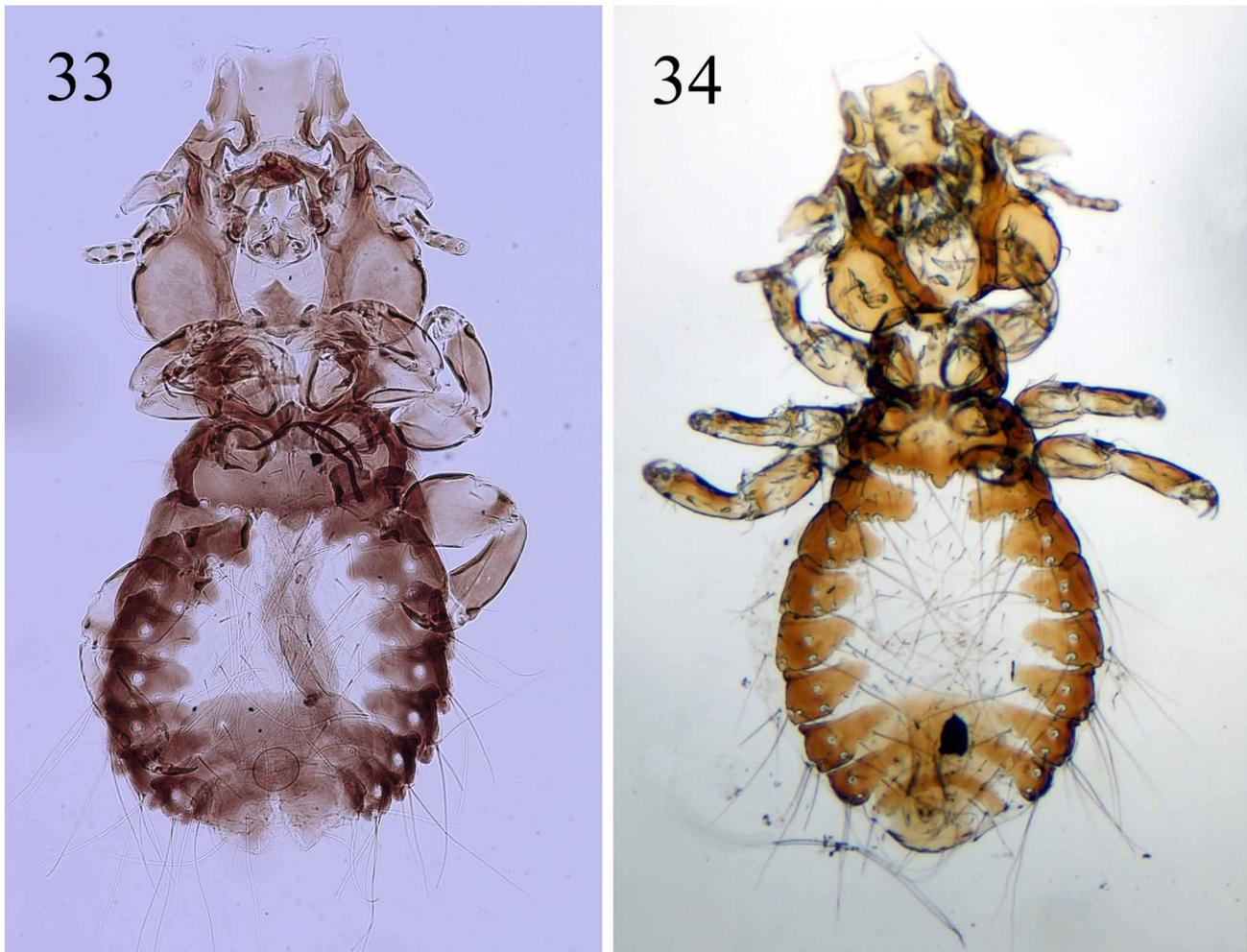
Type host: *Nucifraga caryocatactes* (Linnaeus)

Material examined. 3 males ex *Dicrurus remifer*, **THAILAND:** Chanthaburi, Khao Soi Dao Tai, 4800 m, 4III.1966 (number MAPS 4089) deposited in KCEM.

Remarks. Our identification of these specimens as *P. crassipes* is based on the redescription given by Price & Hellenthal (1998: 796). Although they agree in most of the key features, these males have fewer tergal setae, as follows [tergal setae counts given by Price & Hellenthal (1998) are in parenthesis]: II, 14–15 (18–24); III, 15–16 (19–32); IV, 15–17 (19–32); V, 16–17 (19–32); VI, 14–16 (19–32); VII, 13–15 (17–26); VIII, 8–10 (10–18). Furthermore, the genitalia of the specimens examined have lateral emarginations in the distal end of the basal apodeme (Figs. 9–10).

The three males examined have lateral sternites on VI as in *P. trabecula*. However, they differ from the latter species by a number of key characters, such as (1) long dorsal submarginal setae (about 0.17); (2) conis short (about 0.05) and curved downwards (Fig. 21); (3) dorsal anterior head plate as in Fig. 22; (3) male genitalia (compare Fig. 10 with Fig. 7); and (4) larger dimensions (especially TW and HL).

Considering that most hosts are parasitised by only one species of *Philoaterus* (Price *et al.* 2003: 336), and that *Dicrurus remifer* is a regular and natural host for *Philoaterus trabecula*, we believe that these males are stragglers or contaminants from one of the several hosts of *P. crassipes* (Price *et al.* 2003: 213). One of those hosts, *Dendrocitta vagabunda* (Latham), occupies a large geographical range covering all of mainland India up to the Himalayas, and a broad south-eastern band into Burma (Myanmar), Laos, and Thailand (del Hoyo *et al.* 2009). Therefore, it is possible that a *D. remifer* from Thailand may have acquired these *P. crassipes* from a specimen of *D. vagabunda*, where these two host species overlap in their distribution.



FIGURES 33–34. 33—female lectotype of *Philoaterus trabecula*; 34—male holotype of *Philoaterus petrescuae*.

Discussion

The genus *Philopterus* is one of the largest genus of the ischnoceran family Philopteridae and there is no revision of the entire genus. [Mey \(2004\)](#) revised the *Philopterus*-complex and divided members of the *Philopterus sensu lato* into 11 genera. [Price & Hellenthal \(1998\)](#) revised the species of *Philopterus* from the passerine family Corvidae. Since the family Dicruridae belongs into the Corvoidea clade (Tree of Life Web Project 2006), we compared our *Philopterus* material from drongos with the descriptions of *Philopterus* species from this clade (Table 1), especially with those of Corvidae in [Price & Hellenthal \(1998\)](#). Species of *Philopterus* from drongos are morphologically close to those from corvid species, but can be readily distinguished from them by the presence of a wide hyaline margin in the head, with latero-anterior expansions, and a HMI greater than 1 (Figs. 1, 11, 15, 23–24, 31).

TABLE 1. Distribution of genera and some species of chewing lice belonging to the *Philopterus*-complex on bird families of the Corvoidea clade. Bird families as in [Clements et al. \(2010\)](#).

Bird family	Genus/species of chewing lice
Neosittidae	-
Campephagidae	<i>Tritabeculus</i> (2 spp.) ¹
Pachycephalidae	<i>Philopteroides</i> (undetermined spp.) ¹
Paramythiidae	-
Cinclosomatidae	<i>Cinclosomicola</i> (1 sp.) ¹
Vireonidae	<i>Philopterus</i> (undetermined spp.) ¹
Oriolidae	<i>Philopterus ornatus</i> (Nitzsch, 1866) ²
Cracticidae	<i>Australophilopterus</i> (2 spp.) ¹
Artamidae	-
Aegithinidae	-
Malaconotidae	<i>Philopterus depressus</i> (Piaget, 1871) ²
Platysteiridae	<i>Tyranniphilopterus</i> (1 sp.) ¹
Vangidae	<i>Philopterus nigellatus</i> Mey, 2004 ¹
Prionopidae	-
Dicruridae	<i>Philopterus</i> (3 spp. mentioned in this paper)
Rhipiduridae	-
Laniidae	<i>Philopterus bijae</i> Ansari, 1955 ² <i>Philopterus coarctatus</i> (Scopoli, 1763) ² <i>Philopterus trigonophorus</i> (Giebel, 1874) ² <i>Philopterus vittati</i> Ansari, 1955 ²
Corvidae	<i>Philopterus</i> (26 spp.) ^{2,3}
Paradisaeidae	<i>Philopterus</i> (undetermined spp.) ¹ <i>Philopteroides</i> (undetermined spp.) ¹
Corcoracidae	<i>Corcorides</i> (2 spp.) ¹ <i>Paraphilopterus</i> (1 sp.) ¹
Monarchidae	<i>Philopteroides</i> (1 sp. ⁴ + undetermined spp.) ¹

¹according to [Mey \(2004\)](#); ²according to [Price et al. \(2003\)](#); ³reviewed by [Price and Hellenthal \(1998\)](#); ⁴[Najer et al.](#), in press.

Key to species of *Philopterus* from Dicruridae

1. Head hyaline margin not expanded (HMI ≤ 1) (Fig. 32) *Philopterus* from other host families within the Corvoidea clade (Table 1)
- Head hyaline margin with expanded latero-anterior angles (HMI > 1) (Fig. 31); *Philopterus* from Dicruridae 2

2. With a conspicuous sternite on abdominal segment VI (Figs 1–2) *P. kalkalichi* Ansari
 - Without a median sternite on abdominal segment VI [only small lateral sternites] (Figs. 5, 8, 23, 25–26) 3
3. Pleurites IV–V with 4 setae and pleurites VI–VII with 5 setae *P. trabecula* (Piaget)
 - Pleurites IV–V with 3 setae and pleurites VI–VII with 4 setae *P. petrescuae* Adam, **sp. nov.**

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