

Two new species of the feather mite genus *Dicrurobius* Mironov, 2001 (Acari: Astigmata: Pteronyssidae) from drongos (Passeriformes: Dicruridae) in Africa

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Abstract

Two new species of the feather mite genus *Dicrurobius* Mironov, 2001 are described from drongos (Passeriformes: Dicruridae) in Africa: *Dicrurobius alatus* **sp. n.** from *Dicrurus atripennis* Swainson, 1837 and *D. cameroonensis* **sp. n.** from *Dicrurus adsimilis* (Bechstein, 1794). New data on host associations and distribution of the sole formerly known species, *D. monacrotrichus* (Gaud, 1952), are given. A key to three *Dicrurobius* species known to date is presented.

Key words: Acari, Analgoidea, Pteronyssidae, *Dicrurobius*, new species, Dicruridae, Africa

Introduction

The feather mite genus *Dicrurobius* Mironov, 2001 (Analgoidea: Pteronyssidae) was established for a sole species, *Dicrurobius monacrotrichus* (Gaud, 1952), known from the crested drongo, *Dicrurus forficatus* Linnaeus, 1766 (Passeriformes: Dicruridae) in Madagascar (Gaud, 1952). Within the family Pteronyssidae, which currently includes over 130 species in 22 genera (Faccini & Atyeo, 1981; Gaud & Atyeo, 1996; Mironov, 2001), the genera *Dicrurobius*, *Micropteroherpus* Mironov, 2001, *Pteroherpus* Gaud, 1981, and *Vanginyssus* Mironov, 2001, make up the *Pteroherpus* generic group. This group is clearly characterized by the synapomorphy of dorsal palpal setae *dp*₂ having bifurcate form (Figs. 1a, 2f). In the context of the *Pteroherpus* group, the following combination of diagnostic features characterizes the genus *Dicrurobius*: in males, terminal membranes of opisthosomal lobes have a pair of acute protrusions, coxal fields III are open, and tarsi III have acute apices (Figs. 1a, b, 2d, g); in females, posterior angles of prodorsal shield are long and extend to bases of setae *c*₂, hysteronotal shield covers median area of

hysterosoma from sejugal zone to posterior end of the body, and hysteronotal gland openings are situated on striated integument (Figs. 3a, 6a, b). Acute protrusions of terminal membrane in males are a unique diagnostic feature of this genus.

In the present paper we describe two more species of the genus *Dicrurobius*, found on two African species of drongos in the course of our systematic study of feather mites associated with African passerines (Mironov & Wauthy, 2005a–c).

Materials and methods

The material used in the present study was borrowed in a loan from the Musée Royal de l’Afrique Centrale (Tervuren, Belgium) and some comparative materials were received from the University of Georgia (Athens, USA).

The general morphological terms and nomenclature of leg and idiosomal chaetotaxy follow Gaud and Atyeo (1996). The description is given according to standards used for pteronyssid species (Mironov, 1992, 2001). All measurements are in micrometres (μm). A full set of standard measurements is given only for the holotype (male) and one paratype (female); the range of idiosomal size (length, width) is displayed for other paratype specimens of the type series. The standard measurements implying the distance between different pairs of setae represent the shortest distance between the transverse levels formed by setae of respective pairs. Scientific names of birds follow “The Howard and Moore Complete Checklist” (Dickinson, 2003).

Specimen depositories and reference accession numbers in used materials: AMNH—American Museum of Natural History, New York, USA; MRAC—Musée Royal de l’Afrique Centrale, Tervuren, Belgium; UGA – University of Georgia, Athens, USA; USNM—National Museum of Natural History, Washington DC, USA; YSU—Youngstown State University, Youngstown, Ohio, USA. Where the collection number consists of two parts, the first refers to the collection number of the mite specimens; the second is the collection number of the respective host specimen. Location data are given using the original spelling.

Taxonomy

Pteronyssidae Oudemans, 1941

***Dicrurobius* Mironov, 2001**

***Dicrorobius alatus* Mironov et Wauthy sp. n. (Figs. 1a, b, 2a–h, 3a, b)**

Type material

Male holotype, 1 male and 2 female paratypes (MRAC 180 186) ex *Dicrurus atripennis* Swainson, 1837 (Dicruridae), south CAMEROON, September 1955, coll.

unknown; 9 male and 13 female paratypes, same data (MRAC 180 184, 180 185, 180 187–180 189, 5 slides). Holotype and all paratypes—MRAC.

Additional material

2 males and 2 females (UGA 1793 USNM 255 624) ex *Dicrurus atripennis*, GABON, N’Komi, Ogouma, 2 October 1918, C.R. Aschmeier.

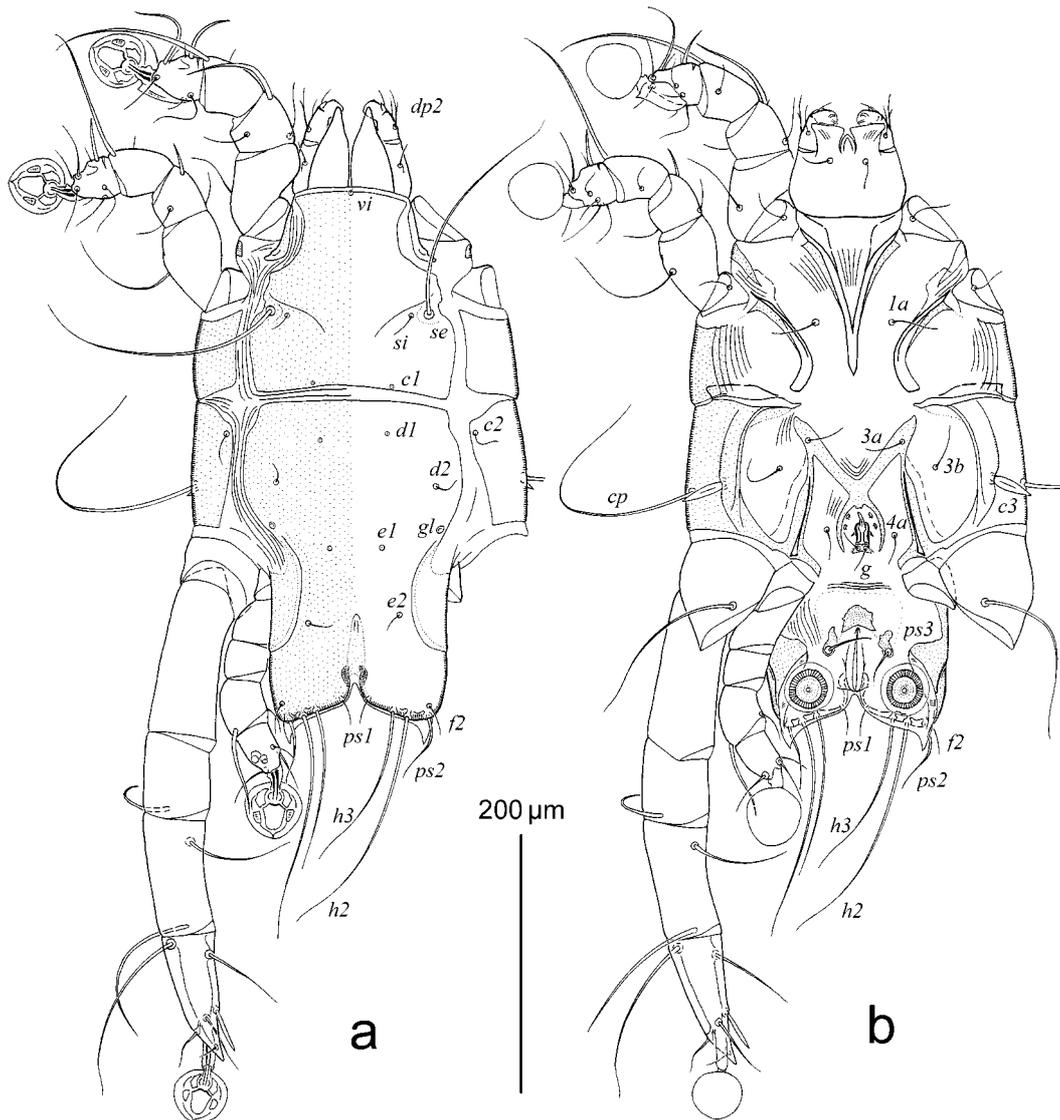


FIGURE 1. *Dicrurobium alatus* sp. n., male. a—dorsal view, b—ventral view.

Description

Male (holotype). Idiosoma length from anterior margin to base of setae *h2* 405, width at level of humeral shields 255 (idiosomal size in 10 paratypes 395–410 x 225–255). Length of hysterosoma 255. Prodorsal shield: posterior angles almost rectangular, lateral margins without incision, posterior margin straight, length along midline 148, width at posterior margin 150, setae *se* separated by 120 (Fig. 1a). Setae *c2* hair-like, short, situated on inner margin of humeral shields; setae *c3* lanceolate, 30 x 7. Hysteronotal shield entire, anterior margin straight, anterior angles blunt, length along midline 245, greatest width at level of humeral shields 168. Distance between prodorsal and hysteronotal shields about 10. Opisthosomal lobes truncated; posterior margin of these lobes with narrow terminal membrane, which forms acute claw-shaped protrusion near outer angle of each lobe; median incision in terminal membrane as an inverted U, extending anterior to the level of setae *ps1* by approximately 10. Supranal concavity extending to level of setae *e2*; distance from anterior end of the concavity to level of setae *ps1* 48. Setae *f2* dorsal, anterior to base of setae *ps2*. Dorsal measurements: *c2:d2* 42, *d2:e2* 100, *d2:gl* 34, *gl:e1* 12–13, *e2:h3* 76, *h2:h2* 79, *h3:h3* 58. Setae *ps1* about 30 long. Epimerites I fused as a Y, sternum about 1/3 of total length of epimerites. Transventral sclerite V-shaped, 20 along midline, 15 in width in narrowest part (Figs. 1b, 2h); tips of epiandrium extending to base of genital apparatus; genital arch 24 x 12; aedeagus thin, directed anteriorly. Adanal shield represented by unpaired sclerite at anterior end of anal slit and a pair of small lateral sclerites bearing setae *ps3* (Fig. 2g). Diameter of anal discs 28. Ventral measurements: *ps2:ps2* 107, *ps3:ps3* 46, *ps3:h3* 52. Ventral membrane of tarsus I as long as segment (Figs. 2a, b). Tarsus III 104 long, with narrow acute apex, seta *w* setiform, about 60 long; setae *s* narrowly lanceolate, 22 long, setae *r* slightly longer than segment (Fig. 2d). Tarsus IV subequal in length to tibia IV; modified seta *d* much larger than modified seta *e* (Fig. 2e).

Female (paratype). Idiosoma length x width 525 x 255 (idiosomal size in all 15 paratypes 490–535 x 235–260). Length of hysterosoma 350. Prodorsal shield: posterior angles elongated, extending almost to setae *c2*; lateral margins without incision; posterior margin deeply concave; length of the shield along midline 148, greatest length 172, width of posterior part 180, setae *se* separated by 130. Setae *c2* hair-like, short; setae *c3* lanceolate, 36 x 8. Hysteronotal shield entire, pygidial fragment demarked by short lateral incisions but not completely split from the main body; anterior part of the shield between levels of trochanters III and IV with pair of large lateral extensions; median part of the shield with cell-like pattern (Fig. 3a); total length of the shield 345, width at anterior margin 105, width at level of lateral extensions 184. Setae *d2* mesal to lateral margins of hysteronotal shield. Setae *ps1* anterior to level of setae *h2*. Dorsal measurements: *c2:d2* 105, *d2:e2* 146, *d2:gl* 65–68, *gl:e1* 12–22, *e2:h3* 89, *h2:h2* 92, *h3:h3* 76. Epimerites I fused as a Y, sternum short, less than 1/5 of epimerite length. Epigynium with short lateral extensions and slightly divergent posterior ends, 64 x 102 (Fig. 3b).

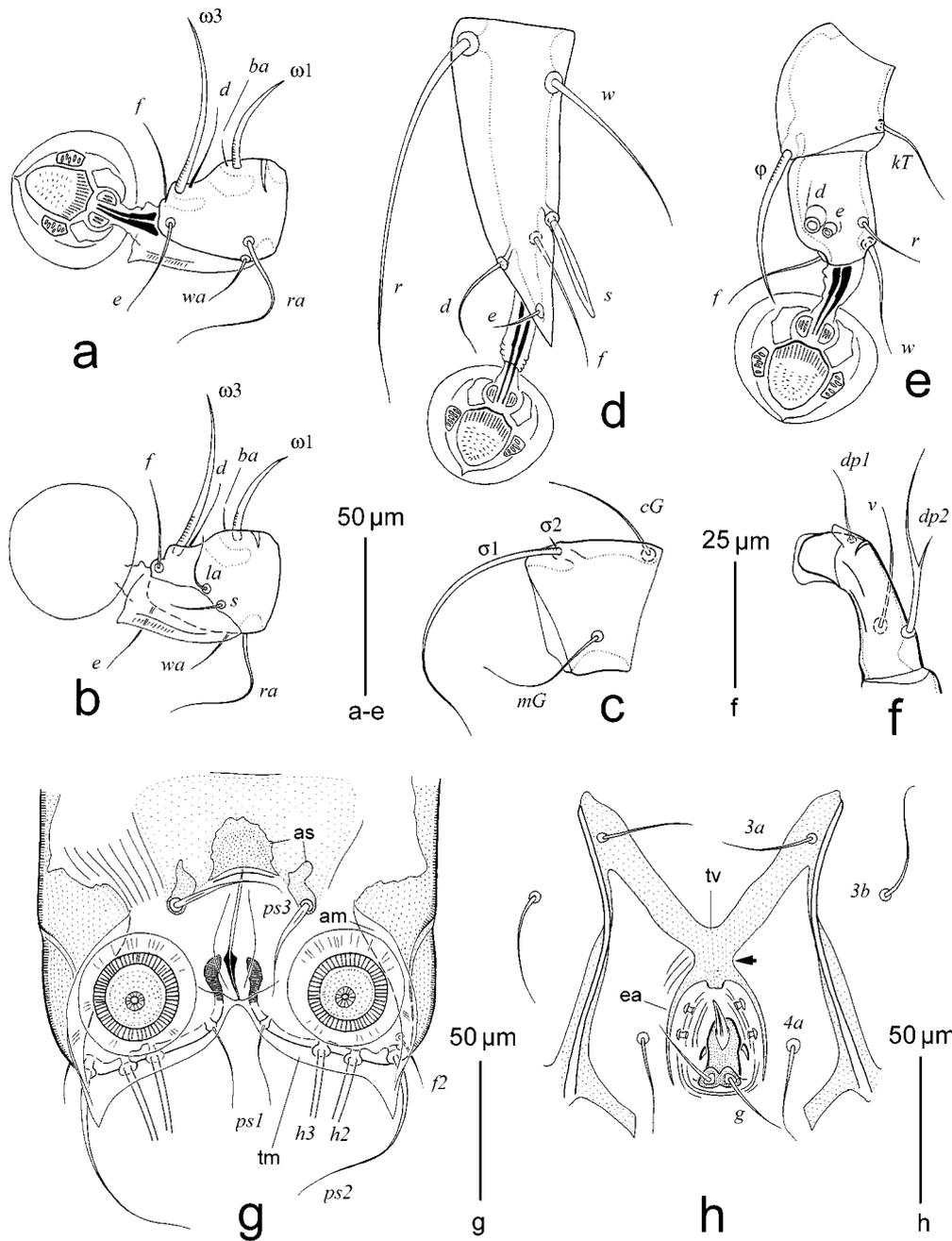


FIGURE 2. *Dicrurobius alatus* sp. n., details of male. a—tarsus I, dorsal view, b—same, ventral view, c—genu I, dorsal view, d—tarsus III, dorsal view, e—tarsus and tibia IV, dorsal view, f—palp, dorsal view, g – opisthosoma, ventral view, h—genital apparatus. am—adanal membrane, as—fragments of adanal shield, ea—epiandrium, tm—terminal membrane, tv—transventral sclerite; arrow points where the width of transventral sclerite should be measured.

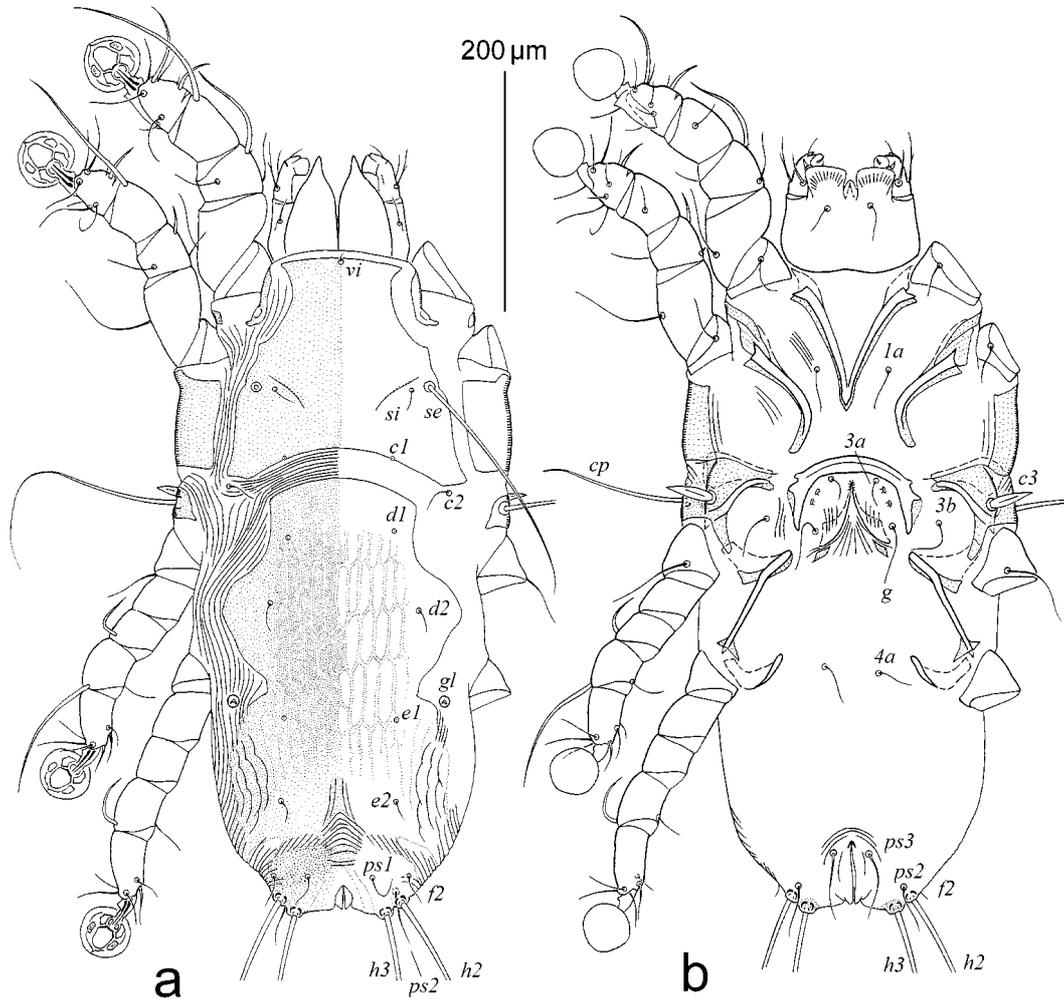


FIGURE 3. *Dicrurobium alatus* sp. n., females. a—dorsal view, b—ventral view.

Diagnosis

Differs from other species by the following combination of features: in males, the prodorsal shield with almost straight posterior margin, the distance between prodorsal and hysteronotal shields along midline is 10–15, transventral sclerite slightly longer than wide, and the incision in terminal membrane extends beyond the level of setae *ps1*, length of setae *ps1* about 1/3–1/2 of opisthosoma width (Figs. 1a, b, 2g, h); in females, hysteronotal shield entire (not separated into main body and pygidial fragment), anterior part of this shield with wide lateral extensions, median part of the shield with cell-like pattern (Fig. 3a).

Etymology

From *ala* (wing, Latin) to point out to wing-like lateral extensions of the hysteronotal shield in females.

2. *Dicrurobium cameroonensis* Mironov et Wauthy sp. n. (Figs. 4a, 5a, b, 6a)*Type material*

Male holotype, 1 male and 2 female paratypes (MRAC 180 180) ex *Dicrurus adsimilis* (Bechstein, 1794), CAMEROON, Yaoundé, February 1956, coll. unknown; 6 male and 7 female paratypes (MRAC 180 177 – 180 179), same data. Holotype and all paratypes – MRAC.

Description

Male (holotype). Idiosoma length from anterior margin to base of setae *h2* 430, width at level of humeral shields 270 (idiosomal size in 7 paratypes 410–420 x 245–265). Length of hysterosoma 258. Prodorsal shield: posterior angles almost rectangular, lateral margins without incision, posterior margin slightly concave, length along midline 152, width at posterior margin 170, setae *se* separated by 134 (Fig. 4a). Setae *c2* hair-like, short, situated on antero-median angle of humeral shield; setae *c3* lanceolate, 30 x 6.5. Hysteronotal shield entire, anterior margin slightly concave, anterior angles blunt, length 260, greatest width at level of humeral shields 174. Distance between prodorsal and hysteronotal shields along midline about 15. Opisthosomal lobes truncated; posterior margin of these lobes with narrow terminal membrane, which forms acute claw-shaped protrusion near outer angle of each lobe; median incision in terminal membrane poorly expressed, not extending to the level of setae *ps1* (Fig. 5a). Supranal concavity extending beyond the level of setae *e2*; distance from anterior end of the concavity to level of setae *ps1* 85. Setae *f2* dorsal, anterior to base of setae *ps2*. Dorsal measurements: *c2:d2* 58, *d2:e2* 116, *d2:gl* 36, *gl:e1* 10–12, *e2:h3* 67, *h2:h2* 90, *h3:h3* 68. Setae *ps1* about 62 long. Epimerites I fused as a Y, sternum about 1/3 of total length of epimerites. Transventral sclerite V-shaped, 18 along midline, 22 in width in narrowest part; tips of epiandrium extending beyond the base of genital apparatus; genital arch 25 x 15; aedeagus thin, directed anteriorly (Fig. 5b). Adanal shield represented by unpaired sclerite at anterior end of anal slit and a pair of small lateral sclerites bearing setae *ps3*. Diameter of anal discs 23. Ventral measurements: *ps2:ps2* 128, *ps3:ps3* 48, *ps3:h3* 50. Ventral membrane of tarsus I as long as segment. Tarsus III 96 long, with acute apex, seta *w* setiform, about 65 long; setae *s* narrowly lanceolate, 25 long, setae *r* longer than segment. Tarsus IV subequal in length to tibia IV; modified seta *d* larger than modified seta *e*.

Female (paratype). Idiosoma length x width 540 x 265 (idiosomal size in all 9 paratypes 525–558 x 250–270). Length of hysterosoma 375. Prodorsal shield: posterior angles elongated, extending to bases of setae *c2*; lateral margins without incision; posterior

margin deeply concave; length of the shield along midline 157, greatest length 172, width of posterior part 190, setae *se* separated by 136. Setae *c2* hair-like, short; setae *c3* lanceolate, 36 x 8. Hysteronotal shield split into a large anterior part (main body of the shield) and pygidial sclerite by transverse obliquely striated band of soft tegument; anterior part of hysteronotal shield between levels of trochanters III and IV with pair of blunt-angular lateral extensions, posterior margin of anterior piece with narrow median incision about 65 long; surface of this sclerite monotonously punctured (in some paratypes cell-like pattern poorly distinct); total length of the hysteronotal shield from anterior margin to bases of setae *h3* 360, width at anterior margin 120, width at level of lateral extensions 190 (Fig. 6a). Setae *d2* mesal to lateral margins of hysteronotal shield. Setae *ps1* anterior to level of setae *h2*. Dorsal measurements: *c2:d2* 108, *d2:e2* 162, *d2:gl* 70, *gl:e1* 18–22, *e2:h3* 100, *h2:h2* 97, *h3:h3* 78. Epimerites I fused as a Y, sternum short, less than $\frac{1}{4}$ of epimerite length. Epigynum with short lateral extensions and slightly divergent posterior ends, 48 x 92.

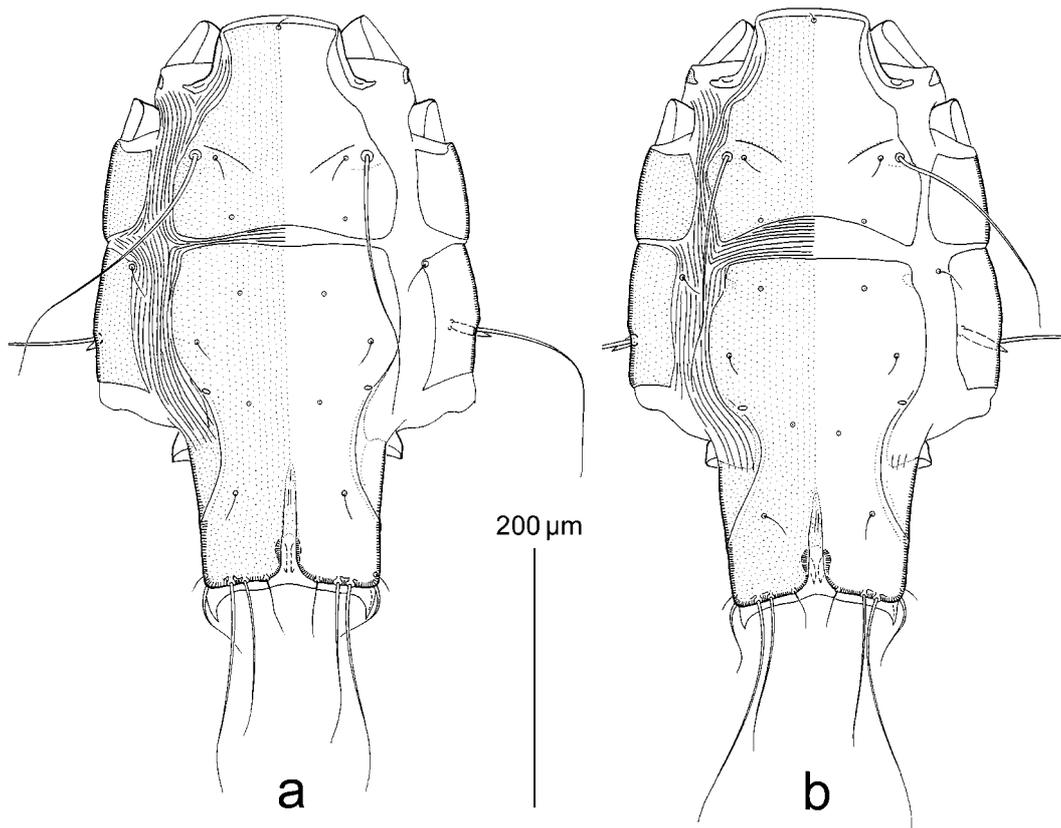


FIGURE 4. *Dicrurobius* males, dorsal view of idiosoma. a—*Dicrurobius cameroonensis* sp. n., b—*D. monacrotrichus*.

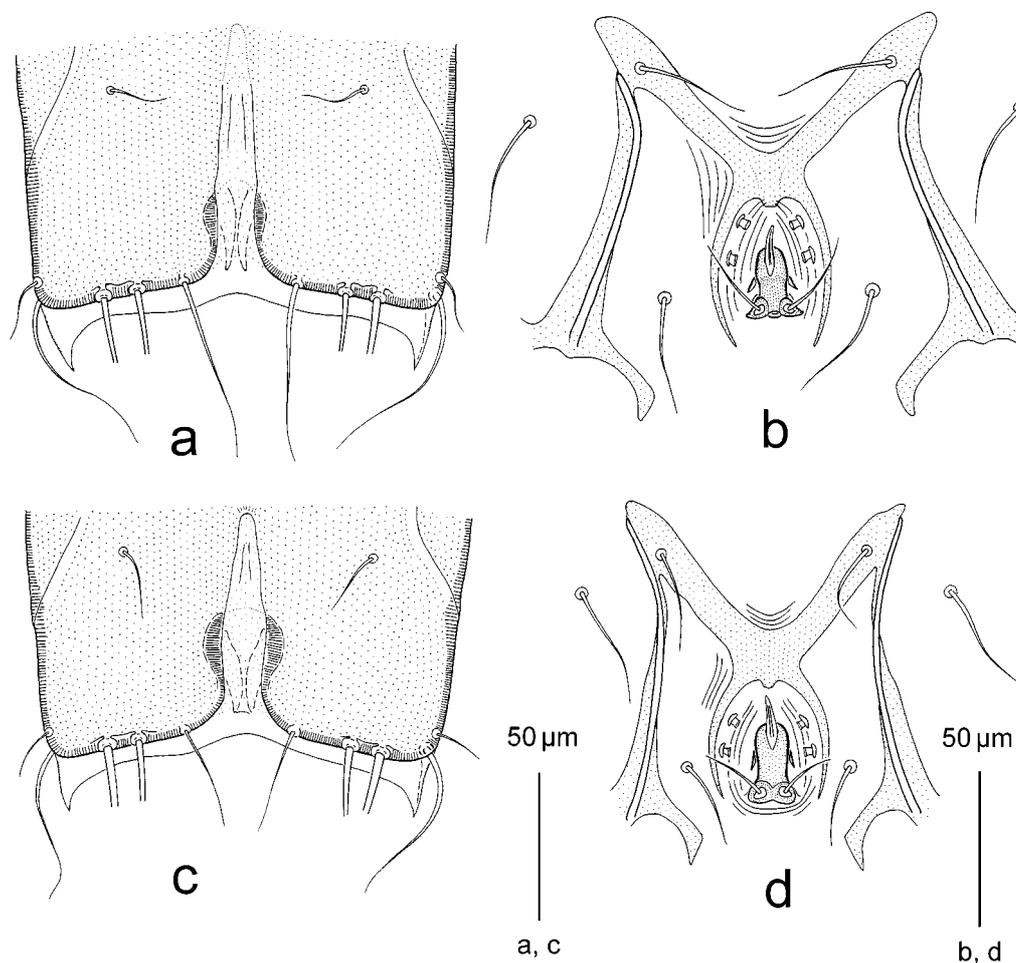


FIGURE 5. *Dicrurobium* males. a—*Dicrurobium cameroonensis* sp. n., dorsal view of opisthosoma b—same, genital apparatus, c—*D. monacrotrichus*, dorsal view of opisthosoma, d—same, genital apparatus.

Diagnosis

Differs from other species by the following combination of features: in males, the prodorsal shield with slightly concave posterior margin (Fig. 4a), the distance between prodorsal and hysteronotal shields is 10–15, and transventral sclerite slightly wider than long, and incision in terminal membrane is poorly expressed and not extends to the level of setae *ps1*; length of setae *ps1* approximately equal to width of opisthosomal lobe (Figs. 5a, b); in females, the hysteronotal shield is split into anterior piece (main body of the shield) and posterior piece (pygidial sclerite) by narrow transverse band of soft striated tegument, and main body of hysteronotal shield has blunt-angular lateral extensions in anterior part (Fig. 6a).

Etymology

Specific epithet derives from the type locality.

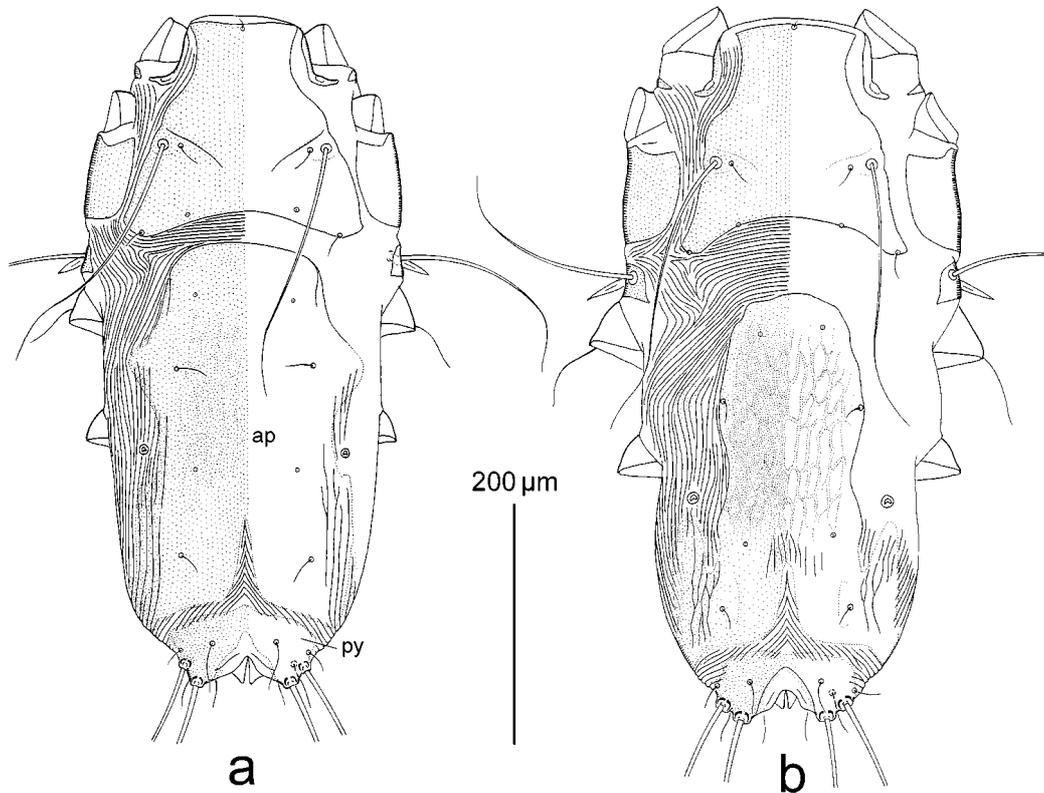


FIGURE 6. *Dicrurobius* females, dorsal view of idiosoma. a—*Dicrurobius alatus* sp. n., b—*D. monacrotrichus*. ap—anterior piece (main body) of hysteronotal shield, py—pygidial sclerite.

3. *Dicrurobius monacrotrichus* (Gaud, 1952) (Figs. 4b, 5c, d, 6b)

Pteronyssus monacrotrichus Gaud, 1952: 101, Fig. 8; Gaud & Mouchet, 1959: 523; Gaud & Till, 1961: 278.

Pteroherpus monacrotrichus: Faccini & Atyeo, 1981: 49.

Dicrurobius monacrotrichus: Mironov, 2001: 7, Fig. 2, 3.

Material examined

Lectotype male, 3 male and 4 female paratypes (MRAC 180 171) ex *Dicrurus forficatus* Linnaeus, 1766, Madagascar, Tamatave province, Mahanoro, October 1951, J. Gaud; 4 male and 3 female paratypes (MRAC 180 172), same data; 2 males and 2 females (MRAC 180 173), same host, Madagascar, Fenerive, August 1962, coll. unknown; 1 male and 1 female (UGA 9276 AMNH 413 712), same host, Madagascar, Majunga province,

Mt. d'Ambre, 22 October 1930, A.L. Rand and R. Archbold; 2 males (UGA 9283 AMNH 671 789), ex *Dicrurus forficatus potior* (Bangs et Penard, 1922), Comoro Islands, Island Anjouan, 19 September 1906, P.N.K. Naidoo. 6 males and 3 females (MRAC 180 181, 180 182, 2 slides) ex *Dicrurus adsimilis*, SOUTH AFRICA, Zululand, St. Lucia, October 1965, F. Zumpt; 1 male and 4 females (MRAC 180 183), same host, SOUTH AFRICA, Cape province, East London, 30 October 1966, coll. unknown; 2 males (YSU 2157 AMNH 671 622) ex *Dicrurus a. adsimilis*, [TANZANIA], Tanganyika, Kilimanjaro Dist., Moshi, 6 July 1920, coll. unknown; 3 males and 5 females (YSU 2162 AMNH 671 690) ex *Dicrurus a. divaricatus* (Lichtenstein, 1823), ETHIOPIA, Detschambassa in Bunescho, 22 April 1901, O. Neumann; 1 female (UGA 1904 USNM 128 722) ex *Dicrurus aldabranus* (Ridgway, 1893), North of Madagascar, Aldabra Island, 2 October 1892, W.L. Abbot.

Diagnosis

Differs from other known species by following combination of features: in males, posterior margin of prodorsal shield is noticeably concave (Fig. 4b), the distance between this and hysteronotal shield along midline is 30–40, transventral sclerite is 1.5–2 times wider than long, and incision in terminal membrane is poorly expressed and does not extend to level of setae *ps1* (Fig. 5c, d); in females, hysteronotal shield is split into main body and pygidial sclerite by narrow transverse band of soft striated tegument, anterior part of the main body of hysteronotal shield without lateral extensions (Fig. 6b).

Remarks

Dicrurobius monacrotrichus was originally described from the crested drongo *Dicrurus forficatus*, distributed in Madagascar (Gaud, 1952); subsequently it was reported from the shining drongo, *Dicrurus atripennis*, and the fork-tailed drongo, *Dicrurus adsimilis*, in Cameroon (Gaud & Mouchet, 1959; Gaud & Till, 1961). Re-examination of the materials studied by these authors showed that the specimens from Cameroon actually represent two new mite species, which we described above, *D. alatus* and *D. cameroonensis*, respectively. Nevertheless, we have found that *D. monacrotrichus* does occur on *Dicrurus adsimilis*, but in another part of its range in continental Africa (Ethiopia, Tanzania and South Africa). In relation to that, it is interestingly to point out that two vicariate *Dicrurobius* species are associated with the fork-tailed drongo in Africa: *D. monacrotrichus* is recorded from north-eastern, eastern and southern parts of its range in Africa, while *D. cameroonensis* is apparently restricted to populations in western part of Central Africa (Cameroon).

Key to *Dicrurobius* species

1. In males, transventral sclerite longer than wide; incision in terminal membrane

- extends beyond the level of setae *ps1* (Figs. 1a, b, 2g, h). In females, hysteronotal shield entire, pygidial fragment is not split from the main body of this shield (Fig. 3a) *D. alatus* sp. n.
- In males, transventral sclerite wider than long, incision in terminal membrane very shallow and does not extend to the level of setae *ps1* (Figs. 5a–d). In females, hysteronotal shield split into central and pygidial sclerites by transverse band of obliquely striated soft tegument (Figs. 6a, b) 2.
 - 2. In males, posterior margin of prodorsal shield strongly concave, distance between prodorsal and hysteronotal shields along median line 30–40 (Fig. 4b). In females, anterior part of the main body of hysteronotal shield without lateral extension, setae *d2* situated on lateral margins of this shield; surface of the shield with clear cell-like pattern (Fig. 6b) *D. monacrotrichus* (Gaud, 1952)
 - In males, posterior margin of prodorsal shield slightly concave, distance between prodorsal and hysteronotal shields along median line 10–15 (Fig. 4a). In females, anterior part of the main body of hysteronotal shield with a pair of blunt-angular lateral extensions, setae *d2* situated mesal to lateral margins of this shield; surface of the shield monotonously punctured or with poorly expressed cell-like pattern (Fig. 6a) *D. cameroonensis* sp. n.

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