A SYSTEMATIC REVIEW OF FEATHER MITES OF THE PTERODECTES GENERIC COMPLEX (ACARI: PROCTOPHYLLODIDAE: PTERODECTINAE) WITH REDESCRIPTIONS OF SPECIES DESCRIBED BY VLADIMÍR ČERNÝ

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ABSTRACT: Five species of feather mites originally described in the genus Pterodectes by Vladimír Černý (1974) are redescribed: Pterodectes havlíkii, P. maculatus, P. reticulatus, P. storkani, P. thraupicola and P. troglodytis. The formerly unknown males of P. thraupica and P. reticulatus and the females of P. maculatus are described for the first time. A synopsis of known species of the Pterodectes generic complex is presented, and species content of the genus Pterodectes is revised. Fifteen species previously included in this genus are transferred to the new genera Amerodectes and Cotingodectes. These mites have torpedo-shaped bodies and extensive dorsal shields, with most dorsal setae reduced in size, presumably an adaptive response to the strong air-flow during flight. The formerly unknown males of Amerodectes havliki (Trouessart, 1885) and Cotingodectes thraupica (Trouessart, 1885) are redescribed:

KEY WORDS: Astigmata, feather mites, Analgoidea, Proctophyllodidae, Pterodectinae, Pterodectes complex, systematics

INTRODUCTION

Feather mites of the subfamily Pterodectinae (Proctophyllodidae) are adapted to living mostly on the large flight and tail feathers of their avian hosts and are mainly associated with passerines (Passeriformes) and hummingbirds (Apodiformes: Trochilidae). These mites have torpedo-shaped bodies and extensive dorsal shields, with most dorsal setae reduced in size, presumably an adaptive response to the strong air-flow during flight (Dabert and Mironov 1999). Mites of the genus Pterodectes Robin, 1877 (Pterodectinae) are usually found in narrow corridors between barbs on the ventral side of vanes of flight feathers (Fig. 1).

Until 1971, when Park and Atyeo defined the subfamily Pterodectinae, this genus was one of the largest feather mite genera, comprising a morphologically heterogenous assemblage of species (Trouessart 1885, 1899; Gaud 1953; Gaud and Mouchet 1957). Park and Atyeo (1971) organized the pterodectines previously referred to Pterodectes into several genera, and the nine species retained in Pterodectes were arranged in the rutilus and gracilis species groups. After that, 15 more Pterodectes species were described (Berla 1973; Černý 1974; O’Connor et al. 2005; Hernandes and Valim 2005, 2006; Valim and Hernandes 2008; Mironov et al. 2008a), and more recently, the three closely related genera were established: Tyranidectes Mironov, 2008, Metapterodectes Mironov, 2008, and Cotingodectes Valim et Hernandes, 2009.

In an attempt to bring into current concepts the species of Pterodectes with incomplete or unsatisfactory descriptions we redescribed in our previous papers (Valim and Hernandes 2006, 2008) four species of Pterodectes described by H.F. Berla in the end of 1950s, and six species described by the early naturalists, N. Banks, O. Stoll, E.L. Trouessart and C. Robin, in the end of 19th and the beginning of 20th centuries.

Among researchers who previously described species of Pterodectes, Vladimír Černý (1928–2002) was a prominent Czech acarologist, who worked on various parasitic mites, mostly those associated with birds. He described about 85 new taxa of mites and ticks (Daniel 2002), and most of them were feather mites (Astigmata: Analgoidea and Pterolichoidea). Černý (1974) described 11 species from Surinam, and six of them were referred to the genus Pterodectes. Despite the limited illustrations, his descriptions presented good diagnoses and an accurate acarological nomenclature for leg and idiosomal setae, which allows prompt recognition of his species.

The first goal of the present paper is to redescribe the six species of the genus Pterodectes de-
scribed by Černý (1974). Three of these species were originally described from only females (P. thraupicola and P. reticulatus) or males (P. maculatus), and the formerly unknown sexes of these species are herein described for the first time.

We also provide an overview of the genera and species of the Pterodectes generic complex (sensu Mironov 2009) from the New World with new data on hosts and geographical occurrence. An updated list of species referred to this complex with emendations to their taxonomic status is presented.

MATERIAL AND METHODS

Specimens used to describe previously unknown sexes were collected from live birds (e.g. males of P. reticulatus and P. thraupicola) or museum skins (e.g. females of P. maculatus). Additional material used in the description of female P. maculatus was collected from bird skins deposited at the Museum of Zoology of São Paulo State University, Brazil following the method described by Gaud and Atyeo (1996).

The redescriptions of the taxa follow the format used in recent papers for pterodectine feather mites (Hernandes and Valim 2005, 2006; Valim and Hernandes 2006, 2008; Mironov 2006, 2008; Mironov et al. 2008a, b). The chaetotaxy of the idiosoma and legs follow Griffiths et al. (1990) and Atyeo and Gaud (1966), respectively; the host taxonomy is updated according to Dickinson (2003). All measurements are in micrometers (µm); distance between setae was measured as a direct distance between their bases; distances between setae belonging to different pairs were taken on one side of the body. Measurements follow the descriptive method presented by Valim and Hernandes (2006, 2008): (I) idiosomal length, measured from the anterior margin of prodorsal shield to the lobar apices in males, and excluding the terminal appendages in females; (II) idiosomal width, measured at the level of setae cp; (III) prodorsal shield dimensions, length measured along the midline and width at the posterior margin; (IV) hysteronotal shield length (in males), measured from the anterior margin to lobar apices, and anterior hysteronotal shield length (in females), measured from the anterior to posterior margin (lobar shields excluded); (V) hysteronotal shield width (in both sexes), measured at the level of setae cp; (VI) lobar shield dimensions (in females), length measured from the anterior margin to the apices of lobes excluding appendages and width measured at the level of setae h2; (VII) distance between prodorsal and hysteronotal shields, measured along the midline; (VIII) distance between male
anal suckers, measured between their centers; (IX) length of terminal cleft (in both sexes), measured from its anterior end to the level of lobar apices and; (X) dimensions of setae, length taken from bases to visible ends, and width of setae c3 (in both sexes) and h2 (in females) at their greatest dimensions; (XI) length of tarsi IV (in males), measured excluding the pretarsus.

The specimens studied herein are deposited in the following institutions: National Museum of Natural History “Naturalis”, Leiden, Netherlands (RMNH); University of Hamburg, Zoological Institute and Zoological Museum, Hamburg, Germany (ZMUH); Institute of Parasitology of Academy of Sciences, České Budejovice, Czech Republic (IPCB); United States National Museum of Natural History at Beltsville, Maryland, USA (USNM); Museum of Zoology, University of Michigan, Ann Arbor, Michigan, USA (UMMZ); Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA (MCZ); Acalorological Collection of Instituto Oswaldo Cruz, Rio de Janeiro, Rio de Janeiro, Brazil (CAIOC); Collection of Acari of Departament Zoologia e Botânica of Universidade Estadual Paulista, São José do Rio Preto, São Paulo, Brazil (DZSJRP); Museum of Zoology of the São Paulo University, São Paulo, São Paulo, Brazil (MZSP); and Collection of National Museum of Rio de Janeiro, Rio de Janeiro, Brazil (MNRJ).

Despite the slides from IPCB were not provided with the mark “types”, they had the same collection data as those stated in the original publication (Černý 1974), including the host, localities, collector and date of collection; therefore, we treated them as holding type specimens.

Although many Pterodectes species of previous authors have been recently re-described as belonging to this genus sensu Park and Atyeo (1971), after re-examination of most of type specimens and new materials, a number of comments and corrections are made for them in the present publication. A diagnosis is presented for each species, although one should bear in mind a huge diversity of undescribed species to date. So it could appear in the future that some diagnoses have a limited value, i.e. they are applicable to samples from only a type host or, in contrary, they characterize several close species.

Asterisk (*) denotes a type host and a type locality for each mite species, and crosses (†) mark new or previously unpublished hosts and localities.

Family Proctophyllodidae
Trouessart et Méglin, 1884

Subfamily Pterodectinae Park et Atyeo, 1971

Pterodectes generic complex

The Pterodectinae comprises the tribes Rhamphocaulini and Pterodectini, which are distributed mostly on hummingbirds (Apodiformes) and passerines (Passeriformes), respectively. The former is subdivided into two generic groups (Rhamphocaulus and Trochilodectes groups), and the Pterodectini is subdivided into the Proterothrix and the Pterodectes generic groups. Finally, the genera within the Pterodectes group are subdivided in two complexes, the Montesauria and Pterodectes generic complexes. So, we intend to restrict our synopsis to those species, which are distributed through New World birds and taxonomically belong to the Pterodectes generic complex (Mironov 2009). For further information on other pterodectine generic groups see Park and Atyeo (1971), Mironov et al. (2008b), Mironov (2009) and Hernandes et al. (2010).

The Pterodectes generic complex currently comprises six genera which present the male genital papillae situated anterior to the genital arch: Amerodectes Valim et Hernandez gen. nov., Berladectes Valim et Hernandez, 2009, Cotingodectes Valim et Hernandez, 2008, Metapterodectes Mironov, 2008, Pterodectes Robin, 1877 and Tyrannidectes Mironov, 2008. Despite their superficial body resemblance, representatives of this complex bear important morphological characters that allow a prompt distinction of them as different genera (Table 1).

Genus Pterodectes Robin, 1877

Type species: Proctophyllodes (Pterodectes) rutillus Robin, 1877 by subsequent designation.

Description. Both sexes. Moderately elongated pterodectines. Maximal set of hysterosomal setae occurring in Proctophyllodidae present. Prodorsal shield covering most of prodorsum; scapular shields not developed dorsally; and humeral shields well developed and situated ventrally, not fused with epimerites III. Setae c2 situated distinctly on antero-lateral margin of hysteronotal shield. Setae c3 short, narrowly spine-like. Epimerites I fused into a Y, not connected with epimerites II. Setae wa on tarsi I and II anterior to setae la and ra. Solenidion al of genu I shorter than solenidion a3 of corresponding tarsus. Femora I and II lacking ventral crest, other segments

Systematic review of Pterodectes generic complex

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M.P. Valim and F.A. Hernandes

Table 1. Morphological characters in different genera of the *Pterodectes* generic complex.

<table>
<thead>
<tr>
<th>Characters</th>
<th>Amerodectes</th>
<th>Berladectes</th>
<th>Metapterodectes</th>
<th>Pterodectes</th>
<th>Tyrannidectes</th>
<th>Cotingodectes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position of seta c2 on hysteronotal shield</td>
<td>off</td>
<td>off</td>
<td>off</td>
<td>on</td>
<td>off</td>
<td>off</td>
</tr>
<tr>
<td>Setae c3 width</td>
<td>≥5µm</td>
<td>≥5µm</td>
<td>≥5µm</td>
<td>≤3µm</td>
<td>≥5µm</td>
<td>≥5µm</td>
</tr>
<tr>
<td>sRIII</td>
<td>present</td>
<td>present</td>
<td>absent</td>
<td>present</td>
<td>absent</td>
<td>present</td>
</tr>
<tr>
<td>Solenidion σ3</td>
<td>present</td>
<td>present</td>
<td>absent</td>
<td>present</td>
<td>present</td>
<td>present</td>
</tr>
<tr>
<td>Supranal concavity</td>
<td>distinct</td>
<td>distinct</td>
<td>distinct</td>
<td>indistinct</td>
<td>distinct</td>
<td>distinct</td>
</tr>
</tbody>
</table>

### Males

<table>
<thead>
<tr>
<th>Epimerites I</th>
<th>inverted π, V-shaped</th>
<th>inverted π</th>
<th>U-shaped</th>
<th>Y-shaped</th>
<th>U-shaped</th>
<th>inverted π</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setae h3 length</td>
<td>long/median/short1</td>
<td>median</td>
<td>short</td>
<td>short</td>
<td>short</td>
<td>median</td>
</tr>
<tr>
<td>Setae h3 shape</td>
<td>setiform/spiculiform</td>
<td>setiform</td>
<td>spiculiform</td>
<td>spiculiform</td>
<td>spiculiform</td>
<td>foliform</td>
</tr>
<tr>
<td>Ratio of genital arch length/aedeagus</td>
<td>&gt;1/3</td>
<td>&gt;1/3</td>
<td>&gt;1/3</td>
<td>≤1/3</td>
<td>&gt;1/3</td>
<td>&gt;1/3</td>
</tr>
<tr>
<td>Opisthoventral shield</td>
<td>variable</td>
<td>entire lobes</td>
<td>lateral</td>
<td>lateral</td>
<td>variable</td>
<td>entire lobes</td>
</tr>
</tbody>
</table>

### Females

<table>
<thead>
<tr>
<th>Epimerites I</th>
<th>V-shaped</th>
<th>U-shaped</th>
<th>U-shaped</th>
<th>Y-shaped</th>
<th>U-shaped</th>
<th>U-shaped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lobar region</td>
<td>developed</td>
<td>developed</td>
<td>developed</td>
<td>atrophic</td>
<td>developed</td>
<td>developed</td>
</tr>
<tr>
<td>Seta h2 shape</td>
<td>dagger-like</td>
<td>dagger-like</td>
<td>dagger-like</td>
<td>setiform</td>
<td>dagger-like</td>
<td>dagger-like</td>
</tr>
<tr>
<td>Terminal filament on seta h2</td>
<td>present/absent</td>
<td>absent</td>
<td>present</td>
<td>present</td>
<td>present</td>
<td>absent</td>
</tr>
<tr>
<td>Crest on gen IV</td>
<td>present</td>
<td>absent</td>
<td>present</td>
<td>absent</td>
<td>present</td>
<td>present</td>
</tr>
</tbody>
</table>

1long — subequal to the width of idiosoma or longer; medial — longer than the width of opisthosomal lobes but lesser than the width of idiosoma; short — less than the width of opisthosomal lobes.

without processes and other modifications. Setae sR of trochanters III and solenidion σ1 of genu III present. Supranal concavity indistinct.

**Male.** Coxal fields II–IV open; epimerites I–IV with extensive sclerotized areas. Setae h3 medium-sized, spiculiform, situated on lobar apices. Setae h1 situated anterior to bases of opisthosomal lobes. Setae ps1 setiform and minute, situated on margins of terminal cleft. Genital arch large and with well-developed branches, situated between trochanters IV; aedeagus ensiform, at most 3 times longer than genital arch. Genital papillae situated anterior to genital arch. Pregenital apodeme, paragenital apodemes, and genital shield absent. Opisthoventral shields present and restricted to lateral borders of opisthosomal lobes, with large roughly rectangular projections bearing setae ps3. Corolla of anal suckers dentate. Adanal shields absent. Setae ps3 located antero-lateral to anal suckers. Setae g and ps3 in trapezoid arrangement. Legs I–IV subequal in size. Solenidia φ of tibiae IV slightly longer than on legs III. Tarsus IV without apical claw-like process, setae d and e button-like.

**Female.** Lobar region of opisthosoma clearly separated from remaining part of opisthosoma; opisthosomal lobes relatively short, with well-developed terminal appendages. Hysteronotal shield split dorsally into anterior and lobar shields. Terminal cleft V-shaped. Setae h2 long and entirely setiform. Epigynum horseshoe-shaped. Translobar apodemes present. Genu IV dorsally slightly inflated, without pronounced dorsal crest. Solenidion φ of tibiae IV much shorter than corresponding tarsus and slightly shorter than that on tibiae III.

**Remarks.** Based on the present review, the genus *Pterodectes* is considered to be monotypic; its sole species is associated exclusively with passerines of the family Hirundinidae (swallows). These are intercontinental migratory birds, which explains the worldwide distribution of *P. rutilus*.

**Pterodectes rutilus** (Robin, 1877)


**Material examined.** 5 males and 5 females from *Hirundo rustica*, Chokpak, Djambul Province, Kazakhstan, 06.09.1984, coll. S.V. Mironov, deposited at DZSJRP. 2 males and 4 females from *Hirundo rustica eurythromaster* (skin MZSP 56152, 10.04.1962, coll. O. Pinto and E. Dente); Upper Muçai River, Roraima, Brazil, 20.08.2008, coll. M.P. Valim, deposited at CAIOC and MZSP. 3 males and 3 females from *Stelgyodopteryx ruficollis* (ISCM 2442), no data for locality, 10.06.1910, coll. H.E. Ewing, deposited at USNM.

**Remark.** The only record if this mite (Vitzthum 1929: 101) on a bird host other than *Hirun-

**Distribution.** Brazil (Roraima), Cameroon (no other data); Cuba (no other data), Europe* (no other data), Mozambique and Zimbabwe, Kazakhstan (Djambul Province), Suriname (Weg naar Zee).


**Material examined.** 5 males and 5 females from *Hirundo rustica*, Chokpak, Djambul Province, Kazakhstan, 06.09.1984, coll. S.V. Mironov, deposited at DZSJRP. 2 males and 4 females from *Hirundo rustica eurythromaster* (skin MZSP 56152, 10.04.1962, coll. O. Pinto and E. Dente); Upper Muçai River, Roraima, Brazil, 20.08.2008, coll. M.P. Valim, deposited at CAIOC and MZSP. 3 males and 3 females from *Stelgyodopteryx ruficollis* (ISCM 2442), no data for locality, 10.06.1910, coll. H.E. Ewing, deposited at USNM.

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**Genus Amerodectes**
Valim et Hernandes gen. nov.

Type species: *Proctophyllodes (Pterodectes) gracilis* Trouessart, 1885.

**Both sexes.** Moderately elongated pteodectines. Maximal set of hysterosomal setae found in Proctophyllodidae present. Prodorsal shield covering most of prodorsum; scapular shields not developed dorsally; humeral shields moderately developed and situated latero-dorsally, free or fused with epimerites III. Setae c2 situated dorso-laterally on strialed tegument. Setae c3 well developed and dagger-like. Setae w on tarsi I and II situated anterior to setae la and ra. Solenidion σ of genu I shorter than solenidion ω3 of corresponding tarsus. Setae sR on trochanter III and solenidion σ on genu III present. Supranal concavity usually distinct.

**Male.** Epimerites I fused in different forms: as an U or V, with or without posterior projections or as a narrow inverted π with their posterior extensions connected to epimerites II. Coxal fields II–IV open; epimerites I–IV usually with narrow sclerotized areas. Setae h3 long, setiform, lanceolate or spiculiform, situated on lobar apices. Setae h1 situated anterior to bases of opisthosomal lobes. Setae ps1 setiform and minute. Genital arch with moderately developed branches, situated between trochanters IV; adeagus ensiform, at least 5 times longer than genital arch. Genital papillae anterior to genital arch. Premaxilla papillae, paragential apodem, and genital shield absent. Opisthoventral shields occupy distal half or all surface of opisthosomal lobes, bearing setae ps3. Corolla of anal suckers edentate. Anal shield usually absent (present only in *A. thraupicola*). Setae ps3 located antero-lateral to anal suckers. Setae g and ps3 in trapezoid arrangement. Legs I–IV subequal in size. Solenidion ϕ of legs IV slightly longer than on legs III. Tarsus IV without apical claw-like process, setae d and e button-like.

**Female.** Lobar region of opisthosoma clearly separated from remaining part of opisthosoma; opisthosomal lobes well developed, with long terminal appendages. Hysteronal shield split dorsally into anterior and lobal shields. Setae h2 always dagger-like, with or without terminal filament. Epigynum horseshoe-shaped. Translobar apodem present. Genu IV dorsally inflated, with longitudinal dorsal crest. Solenidion ϕ of tibiae IV slightly shorter than on tibiae III.

**Diagnosis.** In general appearance and most diagnostic features the new genus *Amerodectes* gen. n. is similar to the genera *Pterodectes*, *Metapterodectes* and *Tyrannidectes*. It differs from *Pterodectes* by the position of dorsal setae c2 off the hysteronal shield and the shape of epimerites I never forming a sternum in both sexes, by the smooth corolla of anal suckers in males, and by the dagger-shaped setae h2 in females. *Amerodectes* can be easily distinguished from both *Metapterodectes* and *Tyrannidectes* by the simultaneous presence of setae sR and solenidion σ of legs III. In *Pterodectes*, setae c2 are set on the hysteronal shield, epimerites I are fused into a Y, corolla of anal suckers is dentate, and macrosetae h2 are simple whip-like (Park and Atyeo 1971; Valim and Hernandes 2008). In *Metapterodectes*, setae sR and solenidion σ of legs III are absent, and in *Tyrannidectes*, seta sR on trochanter III is absent and solenidion σ on genu III is present (Mironov et al. 2008a).

**Remarks.** The new genus *Amerodectes* (including most species previously referred to *Pterodec-
tes* currently includes 15 species, associated with Neotropical oscine and suboscine passerines of the families Cardinalidae, Emberizidae, Fur-
Amerodectes atyeoi (O'Connor, Foufopoulos et Lipton, 2005) comb. nov.


**Distribution.** Ecuador (Galapagos Islands*).

**Type material examined.** Holotype male and female paratype from Geospiza fuliginosa; Estación Científica Charles Darwin, Isla Santa Cruz, Galápagos Province, Ecuador, 14.10.2002, at Vale de Dois Rios, Ilha Grande, Rio de Janeiro, Brazil, 29.09.2001, coll. A. Storni, at CAIOC and DZSJRP. 4 males and 4 females from T. sayaca, Belém, Pará, Brazil, 2000, no other data, at CAIOC.

**Diagnosis.** In both sexes: setae cG on genu I–II dagger-like. In males, epimerites I as an inverted π, their posterior ends connected with epimerites II by narrow transverse sclerotized bands; longitudinal median groove reaching the anterior margin of hysteronotal shield.

**Remarks.** This species was originally described from Caryothraustes canadensis (Cardinalidae) (Berla 1958; Valim and Hernandes 2006) and herein is reported on two species of tanager (Thraupidae) in synoxenism with *A. thraupicola* (see below). Further investigation is required to clarify whether birds of the family Cardinalidae are indeed the hosts for this species, or it was originally described from contaminated samples.

Amerodectes geothlypis (Berla, 1973) comb. nov.

**Pterodectes geothlypis** Berla 1973: 21, figs. 1–4; Valim and Hernandes 2006: 51, figs. 10–12.

**Hosts.** Geothlypis aequinoctialis (Gmelin, 1789)* (Passeriformes, Parulidae).

**Distribution.** Brazil (Rio de Janeiro*).

**Type material examined.** Male holotype (44907) from G. aequinoctialis, Manguinhos, Rio de Janeiro, Brazil, 17.08.1970. coll. H.F. Berla, at MNRJ; 1 male and 4 female paratypes (44907–44909), same data as holotype, at MNRJ.

**Diagnosis.** See redescription of this species (Valim and Hernandes 2006) and diagnosis and comments for *A. havliki* below.

Amerodectes gracilis (Trouessart, 1885) comb. nov.


**Hosts.** Psarocolius decumanus (Pallas, 1769)*, P. viridis (Müller, 1776), Cacicus haemorrhous (Linnaeus, 1766)*, C. cela (Linnaeus, 1758)* (Passeriformes, Icteridae).
**Distribution.** Brazil* (without exact locality for type material, Acre†, Amazonas†, Pará†, Rio de Janeiro, Roraima†, and São Paulo†).


**Diagnosis.** In males, epimerites I as an in verte d π, their posterior ends connected with epimerites II by narrow transverse sclerotized bands; aedea gus long, reaching body terminus; bending of aedeagus backward approximately at level of tro chan ters III; female with conspicuous narrowing (“waist”) in anterior part of lobar region.

**Amerodectes havliki** (Černý, 1974) **comb. nov.**

Figs. 2–3


**Hosts.** Philydor pyrrhodes (Cabanis, 1848)* (Passeriformes, Furnariidae), *Tachyphonous cristas tus* (Linnaeus, 1766), *T. rufus* (Boddart, 1783)*, *Ramphocelus carbo* (Passeriformes, Thraupidae), *Atticora melanoleuca* (Passeriformes, Hirundinidae).

**Distribution.** Surinam (Tawajariweg and Weg naar Zee).

**Type material examined.** Holotype male (P 1592) and paratype (allotype) female (P 1591) from *Philydor pyrrhodes*; Tawajariweg, Surinam, 09.09.1971, coll. F. Lukoschus and N.J.J. Kok, at RMNH; 1 male paratype (A18/77), same data as holotype; 1 female and 1 nymph paratypes (A56/81) from *Tachyphonous rufus*; Weg naar Zee, Surinam, 10.09.1971, coll. F. Lukoschus and N.J.J. Kok, at ZMUH; 1 male and 1 female paratypes, same data as holotype, at USNM.

**Additional material examined.** 1 male and 4 females from *Philydor pyrrhodes*; Tawajariweg, Surinam, 09.09.1971, coll. Lukoschus and Kok, at IPCB; 2 males and 4 females from *Tachyphonous cristatus*; Weg naar Zee, Surinam, 10.09.1971, coll. F. Lukoschus and N.J.J. Kok, at IPCB.

**Remarks.** It is important to stress that Černý (1974) cited only *Philydor pyrrhodes* as a host for this species. Later on, Černý and Lukoschus (1975) reported this mite from the two species of tana gers, *Tachyphonous cristatus* and *Ramphocelus carbo*, collected at localities and dates close to that of the type material. In addition, we examined slides from ZMUH and USNM collected from *T. rufus* and also labeled as paratypes. The record (Černý and Lukoschus 1975) of one female of this species on *Atticora melanoleuca* is probably the result of contamination.

**Diagnosis.** *Amerodectes havliki* is morphologically very similar to *A. geothlypis*. In males of these species, epimerites I are fused in a V, with short posterior extensions; sclerites rEpIIa are present; the opisthoventral shields are covering the entire ventral surface of the lobes; the aedeagus is reaching the anterior margin of the anal suckers. In females, epimerites I are fused in a V; the supranal concavity is well developed; at least three large lacunae are present around setae h1; the alveoli of setae ps2 are visibly thicker than those of ps3; the primary spermat duct is without enlargement near the head of spermatheca.

In males of *A. havliki*, the level of setae h1 is equidistant from the levels of e2 and f2; the aedeagus is extending to the midlevel of anal suckers (Fig. 2A, B); in females, numerous pit-like lacu nae are present on the anterior hysterontal shield; the lobar shield with narrow median furrow; setae h1 are piliform (Fig 3A). In males of *A. geothlypis*, setae h1 are closer to the level of f2 than to the level of e2; the aedeagus is extending to the anterior margin of anal suckers; in females, lacunae are absent on the anterior hysterontal shield; the median furrow on lobar shield is absent; setae h1 are slightly thickened.

As mentioned above, these species are remarkably similar and could only be separated by slight differences in their morphology, and more conservative taxonomists could reasonably consider
them as synonyms. Despite minor variations in hystoronotal lacunae of these species (pit-like lacunae present in both sexes of *P. haviliki* and absent in females of *P. geothlypis*), it was found that in one paratype male of *P. geothlypis*, collected from the same bird specimen as the holotype, such dorsal lacunae were also absent (Valim and Hernandes 2006: 51). The features used by Valim and Hernandes (2006: 53) to separate both species, mainly body measurements, were taken from the original description (Černý 1974: 354). Nevertheless, after examining and measuring the types of both species, it is possible to conclude these ranges of measurements overlap. However, we prudently regard them as separate species until more specimens are collected and examined, and more data are accumulated on host associations of these species.

Fig. 2. *Amerodectes haviliki* (Černý, 1974), male holotype. A — dorsal view, B — ventral view.
**Description. Male** (Figs. 2A–B) (holotype, measurements for 1 paratype from type host in parentheses). Length of idiosoma 372 (352), width 150 (143). Prodorsal shield 111 (109) in length, 113 (109) in width, surface with sparsely disposed lacunae of circular shape. Setae ve present. External scapular setae se 119 (109) in length, their bases separated by 61 (60); bases of si separated by 47 (44). Humeral shields absent. Setae c2 and cp on striated tegument, setae c1 on hysteronotal shield. Setae c3 lanceolate, 29 (27) in length and 10 (8) in width. Distance between prodorsal and hysteronotal shields 18 (8). Hysteronotal shield 242 (228) in length, 117 (109) in width, surface with numerous circular lacunae uniformly distributed on this shield, and with two pairs of pale-sclerotized areas.

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Fig. 3. *Amerodectes haviliki* (Černý, 1974), female paratype. A — dorsal view, B — ventral view, C — spermatheca and spermatoducts.
well outlined. Terminal cleft U-shaped, 30 (27) in length, with distinct supranal concavity. Setae h3 separated by 12 (38). Length of setae: ps1 7 (10), h3 46, h2 161 (174), ps2 82 (90), f2 9 (14), ps3 35 (33). Distance between dorsal setae: si–ci 62 (53), c1–c2 37, (30) ci–d1 61 (53), dl–d2 33 (35), dl–e1 91 (92), d2–e1 58 (60), e1–e2 30, e1–h1 41, e2–h1 13 (22), h1–f2 23 (24).

Epimerites I contiguous, their posterior tips fused by its internal surface fields, roughly V-shaped, with small postero-lateral extensions; epimerites II bent, with surface fields projecting toward posterior tips of epimerites I. Sclerites rEpIIa present. Epimerites IVa weakly expressed. Aedeagus extending to anterior margin of anal suckers, 97 (92) in length; genital arch 15 (11) in length and 45 (41) in width. Distance between ventral setae: 3a–4a 37, 4a–g 41, g–ps3 64 (63), ps3–ps3 69 (65). Anal suckers edentate, 17 (15) in diameter and separated by 24 (29). Opisthoventral shields occupying lateral margin of opisthosoma and entire lobes, bearing setae ps3 on their inner margins approximately at midlevel of anal suckers.

Setae cG on genua I and II spine-like. Tarsus IV 33 (35) in length, modified setae d and e button-like (Fig. 2A).


Epimerites I contiguous, their posterior tips fused by its internal surface fields, roughly V-shaped, without postero-lateral extensions; epimerites II bent, surrounded by narrow surface fields. Coxal fields I–III open. Distance between ventral setae: 1a–3a 72–79, 3a–g 21–23, 4a–ps3 92–98, g–4a 121–128, ps2–ps3 25–34, ps2–ps2 42–44, ps3–ps3 23. Setae ps2 setiform with large alveolus, setae ps3 setiform, bases of setae ps2, ps3 in nearly rectangular arrangement. Spermatheca and spermatoducts as in Fig. 3C. Legs I and II as in the male; setae cG on genua I and II spine-like. Legs IV extending by ambulacral disc at maximum to level of setae h2.

**Amerodectes maculatus**

(Černý, 1974) comb. nov.

Figs. 4–5


**Host.** *Chrysomus icterocephalus* (Linnaeus, 1766)* (Passeriformes, Icteridae).

**Distribution.** Brazil (Pará†), Surinam (Welgedacht†).

**Type material examined.** Holotype male (P 1590) from *Chrysomus (=Agelaius) icterocephalus*, Welgedacht, Surinam, 22.08.1971, coll. F. Lukoschus and N.J.J. Kok, at RMNH.

**Additional material examined.** 6 males and 6 females from *C. icterocephalus* (skin MZSP 70911, 31.10.1968, coll. A.M. Olalla), Tapará River, Sta Maria do Arapenam, Pará, Brazil, 19.08.2008, coll. M.P. Valim, deposited at CAIOC, DZSJRP and MZSP. 6 males and 6 females from *C. icterocephalus* (skin MZSP 70915, 12.11.1968, coll. A.M. Olalla), Tapará River, Santa Maria do Arapenam, Pará, Brazil, 19.08.2008, coll. M.P. Valim, deposited in CAIOC, DZSJRP and MZSP.

**Diagnosis.** In both sexes, dorsal shields almost entirely covered by large lacunae; in males, epimerites I fused as a V with short postero-lateral extensions; sclerites rEpIIa absent; aedeagus reaching the anterior margin of the anal suckers. In females, epimerites I fused in a V; supranal concavity well developed; at least three large lacunae around setae h1.
Male (Figs. 4A–C) (holotype, range for 5 additionally collected males in parentheses). Length of idiosoma 360 (333–350), width 165 (140–148). Prodorsal shield: 115 (105–117) in length, 114 (90–115) in width, surface with well-distributed circular lacunae. Setae ve present. Scapular setae si and se arranged in transverse line. External scapular setae se missed in holotype (89–102), their bases separated by 64 (50–66); bases of si separated by 48 (40–52). Humeral shields present, fused to epimerites III. Setae cp surrounded by small sclerotized base, in some specimens these sclerotized areas connected to corresponding hynmeral shield. Setae c2 on striated tegument, setae c1 set on hysteronotal shield. Setae c3 lanceolate, 24 (20–22) in length and 9 (7–8) in width. Distance between prodorsal and hysteronotal shields 19 (5–9). Hysteronotal shield: 230 (217–229) in length, 109 (85–110) in width; surface with numerous circular lacunae uniformly distributed on...
Fig. 5. *Amerodectes maculatus* (Černý, 1974), female. A — dorsal view, B — ventral view, C — spermatheca and spermatheca ducts.

this shield, and with some pale-sclerotized areas weakly expressed on lateral margins of this shield. Terminal cleft U-shaped, 10 (18–22) in length with distinct supranal concavity. Setae h3 long and setiform, separated by 35 (32–36). Length of setae: ps1 6 (5–7), h3 65 (52–79), h2 115 (137–175), ps2 50 (62–88), f2 7 (7–9), ps3 27 (28–36). Distance between dorsal setae: si–c1 61 (47–59), c1–c2 38 (30–39), c1–d1 51 (53–64), d1–d2 53 (35–44), d1–e1 64 (86–101), d2–e1 27 (51–58),
Epimerites I fused as a V, without short postero-lateral extensions in holotype (with short postero-lateral extensions in some additional males, Fig. 4C); epimerites II bent, with little surface projections pointed to epimerites I. Sclerites rEpIIa absent. Epimerites IVA weakly expressed. Aedeagus extending to anterior margin of anal suckers, 84 (79–103) in length; genital arch 13 (9–11) in length and 43 (38–42) in width. Distance between ventral setae: 3a–4a 42 (35–43), 4a–g 44 (34–37), g–ps3 58 (52–62), ps3–ps3 66 (55–63). Anal suckers 14 (12–15) in diameter and separated by 24 (23–30). Opisthoventral shields occupying lateral margin of opisthosoma and posterior edge of lobes, bearing setae ps3 on their lateral margins.

Setae cG on genua I and II setiform, 10 (8–10) and 11 (10–13) in length, respectively. Tarsus IV 29 (26–33) in length, modified setae d and e button-like.

**Female** (Figs. 5A–C) (range of measurements for 5 additional specimens). Length of idiosoma 469–495, width 155–169. Prodorsal shield: 118–134 in length and 102–127 in width, surface as in male. Setae ve present. Scapular setae si and se arranged in transverse line. Setae se 89–104 in length, their bases separated by 62–95; pair si separated by 46–55. Humeral shields represented by small plates surrounding setae cp and separated from epimerites III. Setae c2 on striated tegument, setae c1 set on anterior hysteronotal shield. Setae c3 lanceolate, 22–25 in length and 7–8 in width. Distance between prodorsal and anterior hysteronotal shields 7–14. Anterior hysteronotal shield: 253–269 in length and 97–122 in width; surface as described for male. Anterior hysteronotal and lobar shields separated by thin band of soft cuticle. Lobar region 74–92 in length and 76–84 in width. Terminal cleft V-shaped, 43–63 in length, reaching level of setae f2. Supranal concavity distinct. Setae h2 dagger-like, without terminal filament, 41–45 in length and 8–10 in width. Setae h3 13–23 in length and their bases separated by 27–43. Setae h1 surrounded by at least three conspicuous lacunae and inserted at middle level of supranal concavity opening; their bases forming trapezoidal arrangement with those of setae f2. Setae ps1 set closer to h3 than to h2, near to inner margin of lobar cleft (Fig. 5A). Distance between dorsal setae: si–c1 61–71, c1–c2 28–44, c1–d1 70–82, d1–d2 40–57, d1–e1 117–131, d2–e1 72–81, e1–e2 42–49, e1–h1 67–74, e2–h1 29–39, h1–f2 17–21, f2–h2 17–18.

Epimerites I fused as a V, without small postero-lateral extensions. Distance between ventral setae: 1a–3a 69–80, 3a–g 14–23, 4a–ps3 84–105, g–4a 111–119, ps2–ps3 21–30, ps2–ps2 41–46, ps3–ps3 16–21. Setae ps2 and ps3 setiform, set in trapezoidal arrangement. Spermatheca and spermatoducts as in Fig. 5C. Setae cG on genua I and II setiform, 9–12 and 11–14 in length, respectively. Legs IV extending by ambulacral disc at maximum to level of setae f2.

**Amerodectes molothrus** (Mironov, 2008)
**comb. nov.**

*Pterodectes molothrus* Mironov (in Mironov et al. 2008a: 13, figs. 7–9).

**Hosts.** Molothrus bonariensis (Gmelin, 1789*)*, M. rufoaxilaris* Cassin, 1866† (Passeriformes, Icteridae).

**Distribution.** Argentina (Buenos Aires†), Brazil (Mato Grosso do Sul*).

**Type material examined.** 1 male paratype from *M. bonariensis*, Fazenda Monte Alegre, Pantanal, Mato Grosso do Sul, Brazil, 20.06.2006, colls. I. Literak and M. Čapek, donated to MZSP.

**Additional material examined.** 8 males and 8 females from *Molothrus rufoaxilaris*, Albufera Mar Chiquitita, BA, Argentina, 15.10.2006, coll. M.P. Valim, donated at CAIOC and DZSJRP.

**Diagnosis.** In males, epimerites I fused as a V with short and acute posterior extensions; sclerites rEpIIa absent; aedeagus reaching the anterior margin of the anal suckers. In females, epimerites I fused as an U, with small triangular plate on its end; supranal concavity well developed; lacunae around setae h1 absent.

**Amerodectes nordestensis** (Berla, 1958)
**comb. nov.**

*Pterodectes nordestensis* Berla 1958: 4–6, figs. 5–6; Park and Atyeo, 1971: 56; Valim and Hernandes, 2006: 46, figs. 4–6.

**Host.** Caryothraustes canadensis (Linnaeus, 1766)* (Passeriformes, Cardinalidae).

**Distribution.** Brazil* (no other data).

**Type material examined.** Male holotype (44888) from *C. canadensis*, no data from host locality, Brazil, 23.01.1958, coll. H.F. Berla, at MNRJ; 2 male and 2 female paratypes (44885–44887 and 44889), same data as holotype, at MNRJ.

**Diagnosis.** In both sexes, dorsal shields covered by small lacunae; in males, epimerites I U-shaped with small plate; sclerites rEpIIa absent; aedeagus reaching the posterior margin of anal

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*e1–e2 25 (22–31), e1–h1 77 (35–41), e2–h1 43 (19–25), h1–f2 18 (14–25).*
suckers. In females, epimerites I fused as a V; supranal concavity well developed; single large circular lacuna situated anterior to each seta \( h1 \).

**Amerodectes paroariae**

(Mironov, 2008) comb. nov.

*Pterodectes paroariae* Mironov (in Mironov et al. 2008a: 5, figs. 1–3).

**Host.** *Paroaria capitata* (Orbigny et lafresnaye, 1837)* (Passeriformes, Emberizidae).

**Distribution.** Brazil (Mato Grosso do Sul*).

**Type material examined.** 1 male paratype from *P. capitata*, Fazenda Belcanto near Ivinhema River, Mato Grosso do Sul, Brazil, 12.08.2006, colls. I. Literak and M. Čapek, donated to MZSP.

**Diagnosis.** In both sexes, prodorsal shield covered by large circular lacunae, epimerites I fused as a V, without posterior extensions. In males, sclerites rEpIIa absent; opisthoventral shields covering the middle-level of surface of opisthosomal lobes; aerodeagus reaching the posterior margin of the anal suckers; setae \( h3 \) long setiform. In females, epimerites I fused as a V; supranal concavity well developed; lacking lacunae around setae \( h1 \).

**Amerodectes pitangi**

(Mironov, 2008) comb. nov.

*Pterodectes pitangi* Mironov (in Mironov et al. 2008a: 17, figs. 10–12).

**Host.** *Pitangus sulphuratus* (Linnaeus, 1766)* (Passeriformes, Tyrannidae).

**Distribution.** Brazil (Mato Grosso do Sul* and Rio de Janeiro†).

**Type material examined.** 1 male and 1 female paratypes from *P. sulphuratus*, Nova Andrade, Mato Grosso do Sul, Brazil, 12.08.2006, colls. I. Literak and M. Čapek, donated to MZSP.

**Additional material examined.** 23 males, 2 females and 17 nymphs from *P. sulphuratus*, 23.08.2003, Rio de Janeiro, RJ, Brazil, coll. M.P. Valim, deposited at CAIOC and DZSRP.

**Diagnosis.** In both sexes, prodorsal shield with narrow lateral incisions around or posterior to scapular setae \( se \) and \( st \), epimerites I often free. In males, solenidion \( \phi \) on tibia IV at least 2.5 times longer than that on tibia IV.

**Amerodectes sialiarum**

(Stoll, 1893) comb. nov.

*Proctophyllodes sialiarum* Stoll 1893: 42, pl. 21, figs. 3–4.

*Pterodectes sialiarum*: Atyeo and Braasch 1966: 317; Park and Atyeo 1971: 56; Reeves et al. 2007: 56; Valim and Hernandes 2008: 142, figs. 8–9.

**Host.** *Sialia sialis* (Linnaeus, 1758)* (Passeriformes, Turdidae).

**Distribution.** Guatemala (Retalhuleu*), USA (Georgia and North Carolina).

**Additional material examined.** 4 males and 3 females from *S. sialis*; Georgia, USA, 19.06.2004, coll. R. Carleton, deposited at DZSRP.

**Diagnosis.** In males, epimerites I fused as a V with short postero-lateral extensions; sclerites rEpIIa absent; opisthoventral shields covering the middle-level of surface of opisthosomal lobes; aerodeagus reaching the posterior margin of the anal suckers; setae \( h3 \) long setiform. In females, epimerites I fused as a V; supranal concavity well developed; lacking lacunae around setae \( h1 \).

**Amerodectes storkani**

(Černý, 1974) comb. nov.

Figs. 6–8


**Hosts.** *Ramphocelus carbo* (Pallas, 1764)*, *R. bresilius* (Linnaeus, 1766)*† (Passeriformes, Thraupidae).

**Distribution.** Brazil (Rio de Janeiro†), Surinam (Tawajariweg*).

**Type material examined.** Holotype male (P 1612) and allotype female (P 1614) from *Ramphocelus carbo*; Tawajariweg, Surinam, 07.09.1971, coll. F. Lukoschus and N.J.J. Kok, at RMNH; 1 female paratype (A56/81), same host data, at ZMUH.

**Additional material examined.** 10 males and 6 females from *R. carbo*; Tawajariweg, Surinam, 07.09.1971, coll. F. Lukoschus and N.J.J. Kok, at IPCB; 11 males and 7 females from *R. bresilius*; Vale de Dois Rios, Ilha Grande, Rio de Janeiro, Brazil, 25.11.2001, coll. A. Storni, deposited at CAIOC and DZSRP.

**Diagnosis.** *Amerodectes storkani* is very similar to *A. bilineatus* (Berla, 1958) (see above) by having setae \( cG \) on genua I and II modified in a strong dagger in both sexes, and the hysteronotal shield with a deep median groove in males. It can be distinguished from *A. bilineatus* by having the aforementioned leg setae relatively longer (males: \( cGI \) 65 vs 27 and \( cGII \) 60 vs 41; females: \( cGI \) 65 vs 44 and \( cGII \) 65 vs 60), and by the median longitudinal groove not reaching the anterior margin of male hysteronotal shield (in *A. bilineatus*, this groove extending to the anterior margin of this shield).

**Male** (Figs. 6A–B, 7A–B) (holotype). Length of idiosoma 382, width 163. Prodorsal shield: 129 in length, 129 in width, surface with numerous lacunae of circular shape disposed on its posterior
third. Setae are present. Scapular setae $si$ and $se$ are arranged in transverse line. External scapular setae $se$ are 91 in length, their bases separated by 75; bases of $si$ separated by 52. Humeral shields present, fused to epimerites III; setae $cp$ on humeral shields. Setae $c2$ on striated tegument near humeral shields; setae $cl$ on hysteronal shield. Setae $c3$ lanceolate, 32 in length and 12 in width. Distance between prodorsal and hysteronal shields 6. Hysteronal shield: 252 in length, 120 in width; surface with numerous small circular lacunae distributed through both sides of this shield. A long and wide median groove running from terminal cleft to the area between setae $cl$ and $dl$ on hysteronal shield and not reaching anterior margin of this shield (Fig. 6A). Terminal cleft U-shaped, 25 in length with distinct supranal concavity. Setae $h3$ long and setiform, separated by 42. Length of setae: $ps1$ minute, $h3$ 75, $h2$ 181, $ps2$ 87, $f2$ 10, $ps3$ 45. Distance between dorsal setae: $si$–$cl$ 67, $cl$–$c2$ 45, $cl$–$dl$ 55, $dl$–$d1$ 39, $d1$–$e1$ 78, $d2$–$e1$ 52, $e1$–$e2$ 49, $e1$–$h1$ 59, $e2$–$h1$ 25, $h1$–$f2$ 33.

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**Fig. 6.** *Amerodectes storkani* (Černý, 1974), male holotype. A — dorsal view, B — ventral view.
Epimerites I fused as a narrow inverted π, pos-tero-lateral extensions connected with central part of epimerites II by thin transverse bands. Sclerites rEpIIa present. Epimerites IVa weakly expressed. Aedeagus extending beyond anal discs, its tip approximately at midlevel of terminal cleft, 136 in length; genital arch 15 in length and 44 in width. Distance between ventral setae: 3a–4a 37, 4a–g 47, g–ps3 64, ps3–ps3 72. Anal suckers 19 in diameter and separated by 38. Opisthoventral shields occupying at least lateral third of opisthosomal lobes, with discrete inner projection, situated slightly anterior to level of anal suckers, bearing setae ps3.

Setae cG of genua I (65), II (60), thick dagger-like in shape, on genu II this setae inserted apically (Figs. 7A–B). Tarsus IV 38 in length, modified setae d and e button-like (Fig. 6A).

Female (Figs. 7C–F, 8A–B) (range of measurements for 2 paratypes). Length of idiosoma 495–515, width 176–204. Prodorsal shield: 141–148 in length and 136–147 in width; surface without lacunae; setae ve, scapular setae si and se as described for male. Setae se 75–95 in length, their bases separated by 80–81; pair si separated by 51–54. Humeral shields present, fused with epimerites III. Setae cp set on humeral shields. Setae c1 on anterior hysteronal shield, setae c2 on striated tegument. Setae c3 lanceolate, 31 in length and 8–9 in width. Distance between prodorsal and anterior hysteronal shields 8–9. Anterior hysteronal shield: 237–245 in length and 133–148 in width; surface as described for the male. Anterior hysteronal and lobar shields separated by thin band of soft cuticle. Lobar region: 106–118 in length and 87–114 in width. Terminal cleft U-shaped, 52–62 in length, reaching level of setae h2. Supranal concavity distinct. Setae h2 dagger-like, without terminal filament, 43–46 in length and 10–11 in width. Setae h3 30 in length and their bases separated by 27–43. Setae h1 inserted on anterior third of lobar shield, posterior to supranal concavity opening and surrounded by several small lacunae; its bases of setae h1 and f2 in trapezoidal arrangement. Setae ps1 closer to h3 than to h2,
situated on lateral margins of terminal cleft (Fig. 8A). Distance between dorsal setae: si–c1 71–78, c1–c2 49–64, c1–d1 69–73, d1–d2 45–46, d1–e1 95–96, d2–e1 61–65, e1–e2 46–55, e1–h1 87–89, e2–h1 54–56, h1–f2 30–38, f2–h2 19–20.

Epimerites I contiguous, posterior tips fused by their surrounding surface fields into a V with small postero-lateral extensions; epimerites II bent, surrounded by narrow surface fields. Distance between ventral setae: 1a–3a 75–90, 3a–g 16–21, 4a–ps3 82–89, g–4a 114–117, ps2–ps3 28–30, ps2–ps2 65–75, ps3–ps3 27–34. Setae ps2 and ps3 setiform, their bases in trapezoidal arrangement. Spermatheca and spermaducts as in

Fig. 8. *Amerodectes storkani* (Černý, 1974), female paratype. A — dorsal view, B — ventral view.
Fig. 7C. Legs I and II as in male; setae $cG$ of genua I (61–65), II (59–65) thick dagger-like. Pronounced rounded dorso-basal crests on genua IV (Figs. 7F, 8A). Legs IV extending by ambulacral disc at maximum to level of setae $f2$.

**Amerodectes tangarae** (Mironov, 2008) comb. nov.

_Pterodectes tangarae_ Mironov (in Mironov et al. 2008a: 9, figs. 4–6).

**Host.** _Tangara cayana_ (Linnaeus, 1766)* (Passeriformes, Thraupidae).

**Distribution.** Brazil (Brasilia† and Mato Grosso do Sul*).

**Type material examined.** 1 male and 1 female paratypes from _T. cayana_, Água Limpa farm (15°57′S, 47°56′W), Brasilia, DF, Brazil, 18.07.2002, colls. M.F. Kanegae, deposited at CAIOC and DZSJRP; 3 males and 6 females from _T. cyanoptera_, Vale de Dois Rios, Ilha Grande, Rio de Janeiro, Brazil, 29.09.2001, coll. A. Storni, deposited at CAIOC and DZSJRP; 3 males and 4 females from _T. sayaca_, Vale de Dois Rios, Ilha Grande, Rio de Janeiro, Brazil, 29.09.2001, coll. A. Storni, deposited at CAIOC and DZSJRP.

**Diagnosis.** This species can be easily distinguished from all species included in the new genus _Amerodectes_ by the presence of the distinct transverse row of lacunae on posterior margin of the prodorsal shield in both sexes; the adanal shields are present in males; the primary spermatoduct of female is extremely long, somewhat resembling a long string of spaghetti (Fig. 10C).

**Remarks.** In some examined males, it was difficult to visualize some structures like prodorsal setae $ve$ and trochanteral setae $sr$ on legs III. The rudimentary epimeral sclerites $rEpIIa$ and the adanal shield can also vary in the shape and intensity.

Epimerites I as a narrow inverted π with pos-
tero-lateral extensions not connected to epimerites II. Sclerites rEpIIa present. Epimerites IVa weakly
expressed. Aedeagus extending to posterior mar-
gin of anal suckers, 103–117 in length; genital
arch 8–11 in length and 38–44 in width. Distance
between ventral setae: 3a–4a 27–35, 4a–g 44–49,
g–ps3 57–71, ps3–ps3 63–71. Adanal shields pres-
ent, situated anterior to anal suckers. Anal suckers
14 in diameter and separated by 18 (distance be-
tween centers of discs 34). Opisthoventral shields
occupying only lateral margin of opisthosoma,
bearing setae ps3. Setae cG on genua I and II
spine-like. Tarsus IV 35–41 in length, modified set-
ae d and e button-like.

Female (Figs. 10A–C) (holotype, measurements for 1 paratype in parentheses). Length of idiosoma 458 (440), width 177 (165). Prodorsal
shield: 136 (125) in length and 143 (133) in width;
surface, setae ve, scapular setae si and se as in
male. Setae se 98 (114) in length, their bases sepa-
rated by 91 (87); pair si separated by 58. Humeral
shields present, fused with epimerites III; setae cp
set on humeral shield. Setae cI set on anterior hys-

Fig. 9. Amerodectes thraupicola (Černý, 1974), male. A — dorsal view, B — ventral view.
teronotal shield, setae c2 on striated tegument. Setae c3 lanceolate, 30 (27) in length and 9 (7) in width.

Distance between prodorsal and anterior hysteronotal shields 2 (5). Anterior hysteronotal shield 235 (226) in length and 142 (136) in width. Surface without lacunae but with three pairs of fusiform pale sclerotized areas on lateral margins of this shield. Anterior hysteronotal and lobar shields separated by thin band of soft cuticle. Lobar region 84 (76) in length and 82 (76) in width. Lobar cleft as a narrow inverted U, inner margins of lobes slightly convex and touching each other at level of setae h2 (Fig. 10A), 52 (44) in length, reaching level of setae f2. Supranal concavity distinct. Setae h2 dagger-like, without terminal filament, 53 (46) in

Fig. 10. *Amerodectes thraupicola* (Černý, 1974), female holotype. A — dorsal view, B — ventral view, C — spermatheca and spermaducts.
length and 11 (10) in width. Setae h3 23 (24) in length and their bases separated by 23 (27). Setae h1 inserted near anterior margin of lobar shield, slightly posterior to supranal concavity; bases of setae h1 and f2 in trapezoidal arrangement. Setae ps1 inserted roughly at same transverse level as setae h2, at inner margin of lobar cleft (Fig. 10A). Distance between dorsal setae: si–e1 60 (54), c1–c2 42 (46), c1–d1 62 (63), d1–d2 51 (46), d1–e1 110 (109), d2–e1 68, e1–e2 37 (38), e1–h1 75 (68), e2–h1 43 (42), h1–f2 16 (22), f2–h2 13 (24).

Epimerites I fused as a V, without posterolateral extensions; epimerites II bent, with small projections pointed to epimerites I. Distance between ventral setae: l1–3a 64 (65), 3a–g 19 (24), 4a–ps3 90 (79), g–4a 96 (90), ps2–ps3 31 (27), ps2–ps2 62 (57), ps3–ps3 25 (24). Setae ps2 and ps3 setiform set in trapezoidal arrangement. Spermatheca and spermaducts as in Fig. 10C, primary spermaduct very long, often coiled within female body due to its long length. Setae cG on genua I and II spine-like. Legs IV extending by ambulacral disc at maximum to level of setae h2.

*Amerodectes troglodytis* (Černý, 1974) comb. nov.

Figs. 11–12


**Host.** _Troglydotes aedon_ Vieillot, 1809* (Passeriformes, Troglydidae).

**Distribution.** Surinam (Paramaribo*).

**Type material examined.** Holotype male and paratype (allotype) female (both in slide, P 1593) from _Troglydotes aedon_; Paramaribo, Surinam, 18.07.1971, coll. F. Lukoschus and N.J.J. Kok, at RMNH.

**Additional material examined.** 1 male, 1 female and 1 tritonymph from _T. aedon_; Paramaribo, Surinam, 18.07.1971, coll. F. Lukoschus and N.J.J. Kok, at IPCB.

**Diagnosis.** _Amerodectes troglodytis_ resembles _A. pitangi_ (Mironov, 2008) (see above) by having the prodorsal shield with deep lateral incisions at the level of setae se in both sexes. It can be distinguished from that species by the following characters in males: epimerites I are fused in a V with postero-lateral extensions; solenidion φ on tibia IV is at most 1.5 times longer than this segment; setae h3 are about one fifth the length of ps2, and the aedeagus reaches the anterior margin of the anal suckers. In males of _A. pitangi_, setae the h3 and ps2 are subequal, and the aedeagus reaches the midlevel between setae g and anterior margin of the anal opening. The females have epimerites I fused as a V without postero-lateral extensions, rather than into an U with short and acute postero-lateral extensions as in _A. pitangi_.

**Male** (Figs. 11A–B) (holotype, measurements for 1 additional specimen in parentheses). Length of idiosoma 350 (319), width 162 (143). Prodorsal shield: 111 (106) in length, 105 (98) in width, surface without lacunae, its lateral margins with incisions surrounding bases of setae se. Setae ve absent. Scapular setae si and se arranged in transverse line. External scapular setae se 120 (125) in length, their bases separated by 60 (54); bases of setae si separated by 44 (38). Humeral shields absent, setae cp and c2 on soft tegument. Setae cl on hysteronotal shield. Setae c3 lanceolate, 26 (23) in length and 8 (7) in width. Distance between prodorsal and hysteronotal shields 18 (14). Hysteronotal shield: 228 (204) in length, 98 (95) in width; surface without lacunae. Terminal cleft as a wide and shallow U, 17 (16) in length, 33 in width, with a distinct supranal concavity. Setae h3 short and spine-like, separated by 49. Length of setae: ps1 5, h3 17 (15), h2 137 (196), ps2 58 (76), f2 5 (8), ps3 20 (22). Distance between dorsal setae: si–c1 67 (65), c1–c2 33 (37), c1–d1 54 (49), d1–d2 27 (34), d1–e1 82 (79), d2–e1 58 (49), e1–e2 24 (22), e1–h1 36, e2–h1 28, h1–f2 34.

Epimerites I fused as a narrow V, with small postero-lateral extensions. Scelrites rEpIa present, weakly expressed. Epimerites IVa absent. Aedeagus extending to anterior margin of anal suckers, 86 (79) in length; genital arch 7 in length and 43 (38) in width. Distance between ventral setae: 3a–4a 37, 4a–g 42 (37), g–ps3 49 (34), ps3–ps3 58 (54). Anal suckers edentate, 11 in diameter and separated by 30. Opisthovenital shields occupying postero-lateral margins of opisthosoma, bearing setae ps3. Setae cG on genua I and II very short and spine-like. Femur II with ventral crest, other segments of legs I, II without processes. Tarsus IV 26–30 in length.

**Female** (Figs. 12A–C) (paratype, measurements for 1 additional specimen in parentheses). Length of idiosoma 492 (495), width 171 (182). Prodorsal shield: 123 (128) in length and 133 (125) in width; surface, setae ve, scapular setae si and se as described for male, except for two small incisions on its postero-lateral margins. Setae se 133 (139) in length, their bases separated by 73; pair si separated by 50. Humeral shields absent, setae cp and c2 on soft tegument. Setae cl set on
anterior hysteronotal shield. Setae c3 lanceolate, 30 (27) in length and 9 (8) in width.

Distance between prodorsal and anterior hysteronotal shields 15 (24). Anterior hysteronotal shield: 256 (245) in length and 130 (122) in width. Surface with small pit-like lacunae restricted to region between setae e1 and e2 and with pair of weakly expressed pale sclerotized areas on postero-lateral angles of this shield. Anterior hysteronotal and lobar shields separated by thin band of soft cuticle. Lobar region, 98 (95) in length, 95 (80) in width, completely separated by median dorsal split. Terminal cleft as a narrow inverted V, 68 (60) in length, 41 in width, reaching level of setae h2. Supranal concavity distinct. Setae h2 dagger-like, without terminal filament, 50 (49) in length and 10 (8) in width. Setae h3 11 in length and their bases separated by 63. Setae h1 inserted on anterior margin of lobar shield, at same level as supranal concavity opening; its bases forming trapezoidal arrangement with setae f2. Setae ps1 set at midlevel of setae h2 and h3, at inner margin of lobar cleft (Fig. 12A). Distance between dorsal setae: si–c1 78 (79), c1–c2 44, c1–d1 78 (76), d1–d2 41 (44), d1–e1 118 (106), d2–e1 77 (68), e1–e2 33 (35), e1–h1 65 (68), e2–h1 39 (44), h1–f2 28 (35), f2–h2 17 (16).

Epimerites I fused as a V. Distance between ventral setae: 1a–3a 75 (68), 3a–g 18 (26), 4a–ps3 87 (90), g–4a 114 (109), ps2–ps3 35 (33), ps2–ps2 52 (64), ps3–ps3 23 (30). Setae ps2 and ps3 setiform, set in trapezoidal arrangement. Spermatheca and spermaducts as in Fig. 12C. Legs I and II as in the male; setae cG on genua I and II short and

Fig. 11. *Amerodectes troglodytis* (Černý, 1974), male. A — dorsal view, B — ventral view.
spine-like. Legs IV extending by ambulacral disc at maximum to the level of setae $f2$.

**Amerodectes turdinus** (Berla, 1959) **comb. nov.**


**Distribution.** Brazil (Rio de Janeiro*), Suriname (Tawajariweg and Welgedacht).

**Type material examined.** Male holotype (44906) from *Turdus rufiventris*, Fazenda Rubião, Mangaratiba, Rio de Janeiro, Brazil, 05.06.1958, coll. H.F. Berla, at MNRJ; 6 male and 3 female paratypes (44895–44900), same data as holotype, at MNRJ.

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**Fig. 12. Amerodectes troglodytis** (Černý, 1974), female. A — dorsal view, B — ventral view, C — spermatheca and spermducts.
Diagnosis. In both sexes, dorsal shields are entirely covered by large lacunae. In male, epimerites I are fused into an inverted π and connected by postero-lateral extensions to epimerites II, sclerites rEpIIa present. In female, setae h2 with terminal filament.

Remarks. As noted by Černý and Lukoschus (1975), a single male of this species was found on *Thraupis episcopus* (Thraupidae), and it is obviously the result of contamination.

*Metapterodectes* Mironov, 2008

Type species: *Metapterodectes furnarius* Mironov, 2008, by original designation.

Remarks. The genus *Metapterodectes* currently comprises two species associated with Neotropical passerines of the families Emberizidae and Furnariidae. This genus differs from other genera of the *Pterodectes* complex by lacking solenidion σ1 and seta sR on legs III.

*Metapterodectes furnarius* Mironov, 2008


Host. *Furnarius rufus* (Gmelin, 1789)* (Passeriformes, Furnariidae).

Distribution. Brazil (Mato Grosso do Sul* and Minas Gerais†).

Type material examined. 1 male and 1 female paratypes from *F. rufus*, Fazenda Monte Alegre, Pantanal, Brazil, 20.07.2006, colls. I. Lišlerakov and M. Čapek, donated to MZSP.

Additional material examined. 10 males and 10 females from *F. rufus*, Belo Horizonte, Minas Gerais, Brazil, 26.05.2007, coll. A.J. Andrade, distributed at CAIOC and DZSJRP.

Diagnosis. In males, epimerites I fused as an U with short posterolateral extensions; sclerites rEpIIa absent; opisthoventral shields covering only the bases of ps3; aedeagus reaching the posterior margin of the anal suckers; setae h3 spiculiform. In females, epimerites I fused as a V with short posterolateral extensions; supranal concavity weakly developed; lacunae around setae h1 absent.

*Metapterodectes muticus* (Banks, 1909) comb. nov.

*Pterodectes muticus* Banks 1909: 141, pl. 10, fig. 4 (part); Park and Attyeo 1971: 56 (part); Valim and Hernandes 2008: 145, figs. 10–11.

Host. *Pooecetes gramineus* (Gmelin, 1789)* (Passeriformes, Emberizidae).

Distribution. Canada* (no other data), USA (Texas).

Type material examined. Several syntypes in poor condition (75521) from Vesper Sparrow (= *P. gramineus*), Canada, 19.04.1907, coll. Unknown, deposited at MCZ.

Diagnosis. In males, epimerites I fused as an U; sclerites rEpIIa absent; opisthoventral shields covering only the bases of ps3; aedeagus reaching the anterior margin of the anal suckers; setae h3 short and spine-like. In females, epimerites I fused as a V with short posterolateral extensions; supranal concavity weakly developed; at least four small lacunae set anterior to setae h1.

Remarks. As pointed by Valim and Hernandes (2008), the absence of setae sR and solenidion σ1 on legs III are characteristic in this species, therefore *Pterodectes muticus* is transferred to the genus *Metapterodectes*.

*Tyrannidectes* Mironov, 2008

Type species: *Tyrannidectes berlai* Mironov, 2008, by original designation.

Remarks. The genus *Tyrannidectes* currently comprises six species associated with Neotropical passerines of the families Corvidae, Turdidae and Tyrannidae. This genus is characterized by lacking setae sR on trochanters III.

*Tyrannidectes amaurochalinus* (Hernandes et Valim, 2006) comb. nov.

*Pterodectes amaurochalinus* Hernandes and Valim 2006: 50, figs. 1–7.

Host. *Turdus amaurochalinus* Cabanis, 1850* (Passeriformes, Turdidae).

Distribution. Brazil (Minas Gerais†).

Diagnosis. In both sexes, dorsal shields with small circular lacunae, without median longitudinal groove; epimerites I fused as an U. In males, sclerites rEpIIa present. In females, setae ps2 and ps3 button-like; setae h2 with terminal filament.

Type material examined. Male holotype, 6 male and 8 female paratypes from *T. amaurochalinus*, Belo Horizonte, Minas Gerias, Brazil; 13.10.2005, coll. M.P. Valim, at DZSJRP and CAIOC.

Remarks. The absence of setae sR on legs III is distinctive for the genus *Tyrannidectes* Mironov (in: Mironov et al. 2008a); and these setae were erroneously depicted by Hernandes and Valim (2006) in the original description of this species.

*Tyrannidectes banksi* (Valim et Hernandes, 2008) comb. nov.

Host. *Sayornis phoebe* (Latham, 1790)* (Passeriformes, Tyrannidae).

**Distribution.** USA (Texas*).

**Type material examined.** Male holotype (NU 1178A) from *S. phoebe*, 20 mi. S. Dallas, Texas, USA, 01.10.1938, coll. unknown, at UMMZ; 2 female paratypes (1178C and 1178D), same data as holotype, at UMMZ.

**Diagnosis.** In both sexes, setae *cl* set off hysteronotal shield on striated tegument. In female, setae *ps2*–*ps3* setiform.

**Remarks.** As noted by Valim and Hernandes (2008), the absence of setae *sR* on legs III is distinctive for *Pterodectes banksi*; therefore this species is transferred herein to the genus *Tyrannidectes.*

**Tyrannidectes berlai** Mironov, 2008


**Hosts.** *Myiarchus tyrannulus* (Muller, 1776)*, *M. ferox* (Gmelin, 1789) (Passeriformes, Tyrannidae).

**Distribution.** Brazil (Mato Grosso do Sul*†*). Male holotype, 2 male and 2 female paratypes, from *M. tyrannulus*, Fazenda Monte Alegre, Pantanal, Brazil, 20.07.2006, colls. I. Literak and M. Čapek, donated to MZSP.

**Additional material examined.** 10 males and 10 females from *M. tyrannulus*, Bataguassú, Mato Grosso do Sul, Brazil, _._11.2007, coll. F. Lukoschus and N.J.J. Kok, at IPCK.

**Diagnosis.** In both sexes, epimerites I fused as an U with short posterolateral extensions. In male, setae *h3* spiculiform. In female, setae *ps2* and *ps3* setiform; distinct pattern of reticulation forming oblique lines in lateral margins of anterior part of hysteronotal shield.

**Tyrannidectes crassus** (Trouessart, 1885) comb. nov.


**Host.** *Cyanocorax chrysops* (Veillot, 1818)* (Passeriformes, Corvidae).

**Distribution.** Colombia* (no other data), Paraguay (San Pedro).

**Additional material examined.** 5 males and 5 females from *C. chrysops*, Rio Paraguay, E. bank, 10km W Rosario, San Pedro, Paraguay, 13.09.1988, coll. S.M. Goodman, at UMMZ.

**Diagnosis.** In both sexes, epimerites I fused as an U; prodorsal setae *si* posterior to the level of *se*; prodorsal shields with a pair of conspicuous incisions in posterior margin. In female, setae *ps2* and *ps3* button-like.

**Remarks.** *Pterodectes crassus* should be included in the genus *Tyrannidectes* based on the absence of trochanteral setae *sR*III (see Valim and Hernandes 2008).

**Tyrannidectes fissuratus** (Hernandes et Valim, 2005) comb. nov.

*Pterodectes fissuratus* Hernandes and Valim 2005: 62, figs. 1–12.

**Hosts.** *Turdus leucomelas* Veillot, 1818*, T. nudigenis* Lafresnaye, 1848† (Passeriformes, Turdidae), *Ramphocelus carbo* (Passeriformes, Thraupidae)†.

**Type material examined.** Male holotype, 2 male and 2 female paratypes, from *T. leucomelas*, Parque Estadual Vila Rica do Espirito Santo, Fe-nix, Paraná, Brazil, 30.03.2003, coll. A. Bispo, at DZSJRP.

**Distribution.** Brazil (Paraná*†*), Surinam (Tawajariweg†).

**Additional material examined.** 1 male on *Ramphocelus carbo*, Tawajariweg, Surinam, 7.09.1971, coll. F. Lukoschus and N.J.J. Kok, at IPCK.

**Diagnosis.** In both sexes, epimerites I fused as an U; longitudinal median groove on entire hysteronotal shield and posterior half of prodorsal shield; dorsal shields with large and irregular lacunae. In female, setae *ps2* and *ps3* button-like; setae *h2* with terminal filament.

**Remarks.** *Pterodectes fissuratus* is transferred herein to the genus *Tyrannidectes* based on the absence of setae *sR* on trochanters III (Mironov et al. 2008a); these setae were mistakenly depicted in the original description of this species (Hernandes and Valim 2005). A single male specimen collected from *Ramphocelus carbo* and regarded as ‘*Pterodectes* sp.’ by Černý and Lukoschus (1975: 197) is, in fact, a *T. fissuratus*. This latter host is likely resulted from the accidental contamination, and chances are that the actual host for this specimen is *Turdus nudigenis*, which was the only species of thrushes collected at the same date and locality as the aforementioned host.

**Tyrannidectes reticulatus** (Černý, 1974) comb. nov.

Figs. 13–14

*Pterodectes reticulatus* Černý 1974: 357, figs. 5E, 6E; Černý and Lukoschus 1975: 196.
Hosts. *Elaenia flavogaster* (Thunberg, 1822)*, *E. chiriquensis* Lawrence, 1865† (Passeriformes, Tyrannidae).

Distribution. Brazil (Brasília†), Surinam (Weg naar Zee*).

Type material examined. Holotype female (*Elaenia flavogaster*; Weg naar Zee, Surinam, 10.09.1971, coll. F. Lukoschus and N.J.J. Kok, at RMNH; 1 nymph paratype (A56/81), same data as holotype, at ZMUH.

Additional material examined. 2 males and 4 females from *E. flavogaster*, Água Limpa farm (15°57'S, 47°56'W), Brasília, Brazil, 07.08.2002; 22 males and 26 females from *E. chiriquensis* Lawrence, 1865, Água Limpa farm (15°57'S, 47°56'W), Brasilia, Brazil, 13.02.2002, coll. M. Kanegae, deposited at CAIOC and DZSJRP.

Diagnosis. This species is very similar to *Tyrannidectes berlai* Mironov, 2008 by the presence of the following characters: in male, setae h3 are short and spiculiform, the aedeagus reaches the level of anterior margin of anal suckers; in both sexes, dorsal shields are with distinct ornamentation (most clearly expressed in females). They are promptly distinguished by the shape of anterior margin of hysteronotal shield, which is straight in *T. reticulatus* and concave in *T. berlai*. The females can be separated by the pattern of hysteronotol ornamentation, which is reticulate in *T. reticulatus* and represented by transverse lines in *T. berlai*.

Fig. 13. *Tyrannidectes reticulatus* (Černý, 1974), male. A — dorsal view, B — ventral view.

M.P. Valim and F.A. Hernandes
**Remarks.** The absence of setae \( sR \) on trochanters III is a distinctive character that places *Pterodectes reticulatus* in the genus *Tyrannidectes*.

**Male** (Figs. 13A–B) (measurements of 2 specimens from *E. flavogaster*). Length of idiosoma 341–396, width 165. Prodorsal shield 122–128 in length and 112–117 in width, surface without lacunae or pale sclerotized areas. Setae \( ve \) present.

Scapular setae \( si \) and \( se \) arranged in transverse line. External scapular setae \( se \) 150–158 in length, their bases separated by 64–65; bases of \( si \) separated by 42–46. Setae \( c1 \) set on hysteronotal shield, and \( c3 \) lanceolate, 24–30 in length and 6–8 in width. Humeral shields absent, setae \( cp \) set on soft tegument. Distance between prodorsal and hysteronotal shields 22–27. Hysteronotal shield: 245–250

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Fig. 14. *Tyrannidectes reticulatus* (Černý, 1974), female holotype. A — dorsal view, B — ventral view, C — spermatheca and spermaducts.
in length, 109 in width; surface without lacunae but with small points forming reticulated pattern, in some specimens those reticulations faint. Terminal cleft as a wide U, 22–27 in length and 33–35 in width, with distinct supranal concavity. Setae minal cleft as a wide U, 22–27 in length and 33–35 in some specimens those reticulations faint. Ter but with small points forming reticulated pattern, in length, 109 in width; surface without lacunae

49–52, 82–84 in length; genital arch 8 in length and 38–49 extending to anterior margin of anal suckers, set. Epimerites IVa weakly expressed. Aedeagus postero-lateral projections. Sclerites rEpIIa ab

f2 wards anal sucker between

terior margin of anal suckers; acute projection in of opisthosoma, extending from setae

Opisthoventral shields occupying lateral margins Anal suckers 11 in diameter and separated by 30.

lar setae

length and 128 in width; surface, setae

idiosoma 520, width 201. Prodorsal shield 125 in

modified setae


Setae cG on genua I and II stick-like. Ventral crest present on femur I. Tarsus IV 38 in length, modified setae d and e button-like.

Female (Figs. 14A–C) (holotype). Length of idiosoma 520, width 201. Prodorsal shield 125 in length and 128 in width; surface, setae ve, scapular setae si and se as in male. Setae se 94 in length, their bases separated by 75; setae si separated by 50. Humeral shields absent, setae cp on soft tegument. Setae el set on anterior hysteronotal shield; setae e3 lanceolate, 29 in length and 9 in width.

Distance between prodorsal and anterior hysteronotal shields 40. Anterior hysteronotal shield 264 in length and 123 in width. Surface without lacunae but with small points forming reticulated pattern, with pair of pale sclerotized areas on latero-posterior angles of this shield. Anterior hysteronotal and lobar shields separated by thin band of soft cuticle. Lobar region 95 in length and 100 in width. Terminal cleft as a narrow V, 62 in length, reaching the level of setae h2. Supranal concavity distinct. Setae h2 dagger-like, without terminal filament, 50 in length and 10 in width. Setae h3 48 in length and their bases separated by 46. Setae h1 inserted on anterior third of lobar shield, set at middle level of supranal concavity opening; its bases forming linear arrangement with setae f2. Setae ps1 set at midlevel of setae h2 and h3, distant from inner margin of lobar cleft (Fig. 14A). Distance between dorsal setae: i–c1 85, c1–c2 56, c1–dl 82, dl–d2 51, d1–el 114, d2–el 69, el–e2 41, el–h1 84, e2–h1 46; h1–f2 and f2–h2 were not measured due the poor condition of the material.

Epimerites I fused in a narrow U, with small posterolateral projections. Coxal fields I–II open. Distance between ventral setae: 1a–3a 81, 3a–g 23, 4a–ps3 83, g–4a 127, ps2–ps3 47, ps2–ps2 45, ps3–ps3 25. Setae ps2 and ps3 setiform set in nearly rectangular arrangement. Spermatheca and spermaducts as in Fig. 14C. Setae cG on genua I and II spine-like. Legs IV extending by ambulacral disc at maximum to level of setae f2.

Cotingodectes Valim et Hernandes, 2008

Type species: Pterodectes interifolia Trouessart, 1899, by original designation.

Remarks. The genus Cotingodectes currently comprises two species associated with Neotropical passerines of the family Cotingidae (Valim and Hernandes 2008, 2009). This genus is characterized by the following characters in male: the opisthosomal lobes are dissected into two lobules, the terminal cleft is large and with additional incisions on inner margins of lobes; all ventral surface of lobes is covered by sclerotization, setae h3 are foliform; long paragenital apodemes are present, extend from the midlevel of coxal fields IV to the level of anal suckers and encircle the large genital field; the pre-genital sclerite is present between coxal fields IV.

Cotingodectes breviphallus

Valim et Hernandes, 2009

Cotingodectes breviphallus Valim and Hernandes 2009: 266, figs. 1–8.

Host. Rupicola rupicola (Linnaeus, 1766)* (Passeriformes, Cotingidae).

Distribution. Brazil (Roraima*).

Type material examined. Male holotype, 5 male and 3 female paratypes from R. rupicola, Serra do Tepequém, Vila do Cabo Sobral, Ama jari, Roraima, Brazil, 20.08.2008, coll. M.P. Valim, at MZSP, DZSJRP and CAIOC.

Diagnosis. Aedeagus reaching the anterior margin of anal opening.

Cotingodectes interifolius (Trouessart, 1899)

Pterodectes interifolia Trouessart 1899: 61; Park and Atyeo 1971: 56.

Cotingodectes interifolius: Valim and Hernandes 2008: 152, figs. 14–16.

Host. Rupicola peruviana (Latham, 1790)* (Passeriformes, Cotingidae).
**Distribution.** Peru (Cuzco*).

**Additional material examined.** 4 males (BMOC 01–0102–140) and 4 females (BMOC 01–0102–140) from *Rupicola peruviana*, Suecia, Paucartambo, Cuzco, Peru, 27.09.1999, coll. D.F. Stotz, at UMMZ.

**Diagnosis.** Aedeagus reaching level of bases of setae $h_3$.

**Berladectes Valim et Hernandes, 2009**

Type species: *Dolichodectes neotropicus* Hernandes et Valim, 2006, by original designation.

**Remarks.** The genus *Berladectes* is currently monotypic and associated with New Word passerines of the family Tyrannidae (Valim and Hernandes 2009). This genus is characterized by having the male opisthosomal lobes long, rounded apically and entire; only lateral surface of lobes covered by ventral sclerotization; setae $h_3$ are setiform; long paragenital and pregenital apodemes encircle the large genital field; coxal field III are closed.

**Berladectes neotropicus** *(Hernandes et Valim, 2006)*

*Dolichodectes neotropicus* Hernandes and Valim 2006: 55, figs. 8–17.

*Berladectes neotropicus*: Valim and Hernandes 2009: 270, fig. 10.

**Host.** *Elaenia chiriquensis* (Passeriformes, Tyrannidae).

**Distribution.** Brazil (Brasilia*).

**Type material examined.** Male holotype, 5 male and 13 female paratypes from *E. chiriquensis*, Fazenda Água Limpa, Brasilia, D.F., Brazil; 07.08.2002, coll. M.F. Kanegae, at CAIOC and DZSJRP.

**DISCUSSION**

As noted by Park and Atyeo (1971), the genus *Pterodectes*, as defined then, still had many undescribed species. We only began to scratch the surface of this vastly underexplored diversity and up to this date, a still inexpressive number of known species withstands a clearer framework of the evolution and host-association of their species.

The distribution of members of the *Pterodectes* generic complex seems to be much more in agreement with the occurrence on passerines from the New World, than with the phylogenetic relationships of passerine birds living in this area (Table 2). These mites have colonized several hosts from families of the three major lineages of Passeriformes (*sensu* Barker et al. 2002, 2004) — Passerida, Corvida, and Tyrannida. The Passerida host mites of the genera *Amerodectes, Metapterodectes* and *Pterodectes*; the Corvida exhibit so far an association with a sole species, *Tyrannidectes crassus*; finally, the Tyrannida harbour pterodectines of the genera *Amerodectes, Tyrannidectes, Metapterodectes, Berladectes* and *Cotingodectes*. Current data suggest that species of the genera *Amerodectes, Tyrannidectes* and *Metapterodectes*, being morphologically very close to each other, are distributed rather erratically among the three major groups of passerines. It could reasonably be hypothesized that this pattern of distribution was caused by many cases of horizontal transferring between these phylogenetically distant groups of birds (Mironov 2009). On the other hand, species of the genera *Berladectes* and *Cotingodectes*, which are morphologically quite distinct from other genera of the *Pterodectes* complex, were recorded only on South American tyrannids (Tyrannidae and Cotingidae, respectively). It is likely that these genera were formed and evolved in the frame of their respective host families.

Most of the Neotropical families and species of birds were not thoroughly investigated concerning their feather mite fauna (Valim et al. 2010, in press); therefore we expect many more new taxa to be discovered on these birds. Further findings and taxonomic efforts could certainly provide a deeper understanding of the recent associations of these ectosymbionts with their hosts.

A specific case in the *Pterodectes* complex deserves a further look: *Pterodectes rutilus*, regarded herein as a sole species of the genus *Pterodectes*, is associated exclusively with the bird family Hirundinidae, which contains species occurring both in the New and Old Worlds (e.g. *Hirundo rustica*) (Stotz et al. 1996). Owing to associations of *P. rutilus* with such species, this representative of the *Pterodectes* complex is distributed outside the Americas. Besides, it is necessary to keep in mind that this mite species could potentially constitute a complex of cryptic species (Gaud and Till 1961; Park and Atyeo 1971), since it was recorded to this date from swallows of phylogenetically distanthirundinid genera, such as *Atticora Boie, Delichon Horsfield et Moore, Hirundo Linnaeus*, and *Riparia Forster* (Sheldon et al. 2005). Among these, *Hirundo rustica* seems to be the most common host of *P. rutilus*, whilst its presence on hosts of other Hirundinidae genera is rather rare (S.V. Mironov, pers. com.). Given the geographical distribution of species of the *Pterodectes* generic complex is almost exclusively in
### Table 2. Host associations and distribution of species of the *Pterodectes* generic complex.

<table>
<thead>
<tr>
<th>Mite genus and species</th>
<th>Host species</th>
<th>Host Suborder</th>
<th>Host family</th>
<th>Locality</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amerodectes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>A. bilineatus</em></td>
<td>Caryothraustes canadensis, Thraupis episcopus, T. sayaca</td>
<td>Passerida</td>
<td>Cardinalidae, Thraupidae</td>
<td>Pará, Rio de Janeiro (Brazil)</td>
<td>Berla (1958); PS</td>
</tr>
<tr>
<td><em>A. geothlypis</em></td>
<td>Geothlypis aequinoctialis</td>
<td>Passerida</td>
<td>Parulidae</td>
<td>Rio de Janeiro (Brazil)</td>
<td>Berla (1973)</td>
</tr>
<tr>
<td><em>A. haviliki</em></td>
<td>Philydor pyrhodes, Tachyphonus cristatus, T. rufus, Ramphocelus carbo</td>
<td>Tyrannida, Passerida</td>
<td>Furnariidae, Thraupidae</td>
<td>Tawajariweg, Weg naar Zee (Surinam)</td>
<td>Černý (1974); Černý and Lukoschus (1975); PS</td>
</tr>
<tr>
<td><em>A. gracilis</em></td>
<td>Cacicus cela, C. haemorrhous, Psarocolius decumanus, P. viridis</td>
<td>Passerida</td>
<td>Icteridae</td>
<td>Acre, Amazonas, Pará, Rio de Janeiro, Roraima, São Paulo (Brazil)</td>
<td>Trouessart (1885); Berla (1959); PS</td>
</tr>
<tr>
<td><em>A. maculatus</em></td>
<td>Chrysomus icterocephalus</td>
<td>Passerida</td>
<td>Icteridae</td>
<td>Bueno Aires (Argentina), Mato Grosso do Sul (Brazil)</td>
<td>Mironov et al. (2008a); PS</td>
</tr>
<tr>
<td><em>A. molothrus</em></td>
<td>Molothrus bonariensis, M. rufoaxilaris</td>
<td>Passerida</td>
<td>Icteridae</td>
<td>Brasilia, Mato Grosso do Sul (Brazil)</td>
<td>Mironov et al. (2008a); PS</td>
</tr>
<tr>
<td><em>A. nordestensis</em></td>
<td>Caryothraustes canadensis</td>
<td>Passerida</td>
<td>Cardinalidae</td>
<td>Brazil</td>
<td>Berla (1958)</td>
</tr>
<tr>
<td><em>A. paroariae</em></td>
<td>Paroaria capitata</td>
<td>Passerida</td>
<td>Emberizidae</td>
<td>Mato Grosso do Sul (Brazil)</td>
<td>Mironov et al. (2008a)</td>
</tr>
<tr>
<td><em>A. pitangi</em></td>
<td>Pitangus sulphuratus</td>
<td>Tyrannida</td>
<td>Tyrannidae</td>
<td>Mato Grosso do Sul, Rio de Janeiro (Brazil)</td>
<td>Mironov et al. (2008a); PS</td>
</tr>
<tr>
<td><em>A. tangarae</em></td>
<td>Tangara cayana</td>
<td>Passerida</td>
<td>Thraupidae</td>
<td>Brasilia, Mato Grosso do Sul (Brazil)</td>
<td>Mironov et al. (2008a); PS</td>
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<td><em>A. turdinus</em></td>
<td>Turdus albigollis, T. leucomelas, T. nudigenis, T. rufiventris</td>
<td>Passerida</td>
<td>Turdidae</td>
<td>Rio de Janeiro (Brazil), Tawajariweg, Welgedacht (Surinam)</td>
<td>Berla (1959); Černý and Lukoschus (1975); Storni et al. (2005)</td>
</tr>
<tr>
<td><em>A. sialisum</em></td>
<td>Sialia sialis</td>
<td>Passerida</td>
<td>Turdidae</td>
<td>Georgia, North Carolina (USA), Retalhuleu (Guatemala)</td>
<td>Stoll (1893); Reeves et al. (2007); Valim and Hernandes (2008)</td>
</tr>
<tr>
<td><em>A. storkani</em></td>
<td>Ramphocelus bresilius, R. carbo</td>
<td>Passerida</td>
<td>Thraupidae</td>
<td>Rio de Janeiro (Brazil), Tawajariweg (Surinam)</td>
<td>Černý (1974); PS</td>
</tr>
<tr>
<td><em>A. thraupicola</em></td>
<td>Thraupis cyanoptera, T. episcopus, T. palmarm, T. sayaca</td>
<td>Passerida</td>
<td>Thraupidae</td>
<td>Pará, Rio de Janeiro (Brazil), Tawajariweg (Surinam)</td>
<td>Černý (1974); PS</td>
</tr>
<tr>
<td><em>A. troglodytis</em></td>
<td>Trogodytes aedon</td>
<td>Passerida</td>
<td>Trogodytidae</td>
<td>Paramaribo (Surinam)</td>
<td>Černý (1974)</td>
</tr>
<tr>
<td><strong>Berladectes</strong></td>
<td></td>
<td></td>
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<tr>
<td><em>B. neotropicus</em></td>
<td>Elaenia chiriquensis</td>
<td>Tyrannida</td>
<td>Tyrannidae</td>
<td>Brasilia (Brazil)</td>
<td>Hernandes and Valim (2006)</td>
</tr>
</tbody>
</table>
the Americas, in addition to the fact that no other pterodectines exhibit associations with the Hirundinidae, two tentative scenarios can be conjectured to explain the current distribution of *P. rutilus*. According to the first hypothesis, some ancestor of the genus *Hirundo* had acquired *P. rutilus* by the horizontal transfer from some passerines during their dispersion in the New World, and further this mite species had dispersed worldwide by hirundinids. Another suggestion, which needs further evidence, is that the genus *Pterodectes* originated earlier, still on some passerines in the Old World, and via “*Hirundo*-stock” birds has widely dispersed around the World (including Americas) and also has colonized swallows of other genera.

**ACKNOWLEDGEMENTS**

We are greatly indebted to many researchers who helped in the course of this work: to Caroline Pepermans (National Museum of Natural History “Naturalis”, Leiden, Netherlands) for loaning type specimens from Vladimir Černý collection; to Oldřich Sychra (University of Veterinary and Pharmaceutical Sci-

### Table 2. Continued.

<table>
<thead>
<tr>
<th>Cotingodectes</th>
<th>Rupicola rupicola</th>
<th>Tyrannida</th>
<th>Cotingidae</th>
<th>Roraima (Brazil)</th>
<th>Valim and Hernandes (2009)</th>
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<tbody>
<tr>
<td><em>C. breviphallus</em></td>
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<tr>
<td><em>C. interfolius</em></td>
<td>Rupicola peruviana</td>
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<td>Cotingidae</td>
<td>Cuzco (Peru)</td>
<td>Trouessart (1899); Valim and Hernandes (2008)</td>
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<td>Metapterodectes</td>
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<td></td>
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<td><em>M. furnarius</em></td>
<td>Furnarius rufus</td>
<td></td>
<td>Furnariidae</td>
<td>Mato Grosso do Sul, Minas Gerais (Brazili</td>
<td>Mironov et al. (2008a); PS</td>
</tr>
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<td><em>M. muticus</em></td>
<td>Poocetes gramineus</td>
<td></td>
<td>Emberizidae</td>
<td>Canada, Texas (USA)</td>
<td>Banks (1909); Valim and Hernandes (2008)</td>
</tr>
<tr>
<td><em>Pterodectes</em></td>
<td></td>
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<td><em>P. rutilus</em></td>
<td>Atticora melanoleuca, Delichon urbicum, Hirundo rustica, H. nigrita, Riparia riparia, R. paludicola, Stelgidopteryx ruficollis</td>
<td>Passerida</td>
<td>Hirundinidae</td>
<td>Cameroon, Mozambique, Zimbabwe, Cuba, Europe, Djambul (Kazakhstan), Roraima (Brazil), Weg naar Zee (Surinam)</td>
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<td><em>T. amaurochalinus</em></td>
<td>Turdus amaurochalinus</td>
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<td>Turdidae</td>
<td>Minas Gerais (Brazil)</td>
<td>Hernandes and Valim (2006)</td>
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<td><em>T. banksi</em></td>
<td>Sayornis phoebe</td>
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<td>Texas (USA)</td>
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<td><em>T. berlai</em></td>
<td>Myiarchus ferox, M. tyrannulus</td>
<td>Tyrannida</td>
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<td><em>T. crassus</em></td>
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<td>Corvida</td>
<td>Corvidae</td>
<td>Colombia, Paraguay (San Pedro)</td>
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<td><em>T. fissuratus</em></td>
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<td>Turdidae</td>
<td>Paraná (Brazil), Tawajariweg (Surinam)</td>
<td>Hernandes and Valim (2005); PS</td>
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<td><em>T. reticulatus</em></td>
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<td>Tyrannidae</td>
<td>Brasilia (Brazil), Weg naar Zee (Surinam)</td>
<td>Černý (1974); PS</td>
</tr>
</tbody>
</table>

**PS** — Present study
ences, Brno, Czech Republic) for making available type specimens from IPCB; to Renata Pardini (Instituto de Biologia da Universidade de São Paulo, Brazil) and Thomas Puettker (Leibniz Institute for Zoo and Wildlife Research, Berlin, Germany), for handling type specimens from Germany; to Barry O’Connor (University of Michigan, Ann Arbor, USA) for donating paratypes of A. atyeoi to DZ-SJRP; to Armando C. Cicchino (Universidade Nacional de Mar del Plata, Mar del Plata, Argentina), Aline Storni (Foco Ambiental Consultoria, Parauapebas, Pará, Brazil), Andrey J. Andrade (UFMG, Belo Horizonte, Brazil), and Mieko F. Kanegae (Universidade Federal do Rio de Janeiro, Brazil) for collecting and donating mite specimens; and to Luís Fabio Silveira (Museu de Zoologia da Universidade de São Paulo, Brazil) for authorizing examination of the Chrysomus icterocephalus skin at the ornithological collection of MZSP. We also thank both reviewers of Acarina for their constructive notes throught the manuscript.

REFERENCES


