

**A taxonomic review of the genus *Eorhipidius*
(Coleoptera: Ripiphoridae: Ripidiinae),
with descriptions of three new species from Asia**

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Abstract. The ripiphorid genus *Eorhipidius* Iablokoff-Khnzorian, 1986 is revised and four species are recognized: *E. januschevi* Iablokoff-Khnzorian, 1986 from Tajikistan, *E. jelineki* sp. nov. from Iran, *E. loebli* sp. nov. from Orissa (India) and *E. ruzickai* sp. nov. from Pakistan. All species are (re)described, their diagnostic characters are illustrated, and an identification key to all species is provided. The systematic positions of the Eorhipidiini and the Ripidiinae are thoroughly discussed.

Key words. Coleoptera, Ripiphoridae, Ripidiinae, Eorhipidiini, *Eorhipidius*, taxonomy, new species, Iran, India, Pakistan, Tajikistan, Palaearctic Region, Oriental Region

Introduction

The ripiphorid subfamily Ripidiinae currently comprises the tribes Ripidiini Gerstaecker, 1855 and Eorhipidiini Iablokoff-Khnzorian, 1986 (cf. BATELKA 2008). Species of the Eorhipidiini are unique within the Ripiphoridae by having filiform antennae in males. In addition, they differ from the Ripidiini by having fully developed mandibles and maxillae with tetramerous palpi, while the mouthparts are modified to form an impaired or bifurcate stylus in the Ripidiini (see KAUPP et al. (2001) for summary). The Eorhipidiini contain two described Palaearctic genera: *Eorhipidius* Iablokoff-Khnzorian, 1986 and *Pterydrias* Reitter, 1895, each with a single known species.

Because of its unusual morphology and some ‘non-ripiphorid’ external features (e.g. simple antennae) given in the original description (IABLOKOFF-KHNZORIAN 1986) and lack of other specimens at that time, ŠVÁCHA (1994) regarded *Eorhipidius januschevi* Iablokoff-

Khnzorian, 1986 as of uncertain subfamily or even family position. Subsequently, KAUPP et al. (2001) classified the Eorhipidiini as Ripiphoridae *incertae sedis*, based on a large number of ancestral morphological characters: only six visible sternites, elytra adjacent to each other behind scutellum, small eyes, filiform antennae, presence of tibial spurs [*sic!*, see Discussion], moveable mandibles, and fully developed maxillary palpi.

Moreover, the genus *Pterydrias* with the single species *P. debilis* Reitter, 1895 was described from southern Turkey, and subsequently recorded from Israel (Palestine) by PIC (1927). It was originally placed in the Drilidae (REITTER 1895), but was recently transferred to the Ripiphoridae (BATELKA 2007). Based on a picture of the single available specimen, BATELKA (2007) suggested that *Pterydrias* could be a senior synonym of *Eorhipidius*. Unfortunately, we were not able to recover Reitter's type specimen in the collection of the Hungarian Natural History Museum in Budapest (O. Merkl, pers. comm. 2006) where a major part of his collection is deposited. Although the specimen mentioned by BATELKA (2007) seems to be similar in external features with *Eorhipidius*, its identification remains doubtful without a detailed study (mouthparts, position of eyes, etc.), and we therefore cannot establish the synonymy of both genera.

Additional undescribed genera and species of the Eorhipidiini have been discovered in South Africa and Central and South America; see BATELKA (2007) for a summary.

The collections of *Eorhipidius* housed in the National Museum in Prague and Naturhistorisches Museum Basel contain three new species described below and enable us to improve the knowledge of the systematic position, taxonomy and distribution of the genus.

Materials and methods

The habitus of *Eorhipidius* is rather uniform. Therefore, we provide only diagnostic characters concerning the body size, lengths of maxillary palpomeres, pronotum and elytra, position of eyes and antennae, and shape of head and mandibles for each species.

Photographs of all specimens were taken with an Olympus Camedia C-5060 digital camera attached to Olympus SZX9 stereomicroscope. Differently focused images were combined using Helicon Focus 3.20.2.Pro software. Exact label data are cited for the type material; a forward slash (/) separates different lines of data; additional remarks are found in square brackets. Holotypes of the newly described species are provided with a red label with the following printed text: 'HOLOTYPE / EORHIPIDIUS / [name of the species] sp. nov. / J. Batelka & J. Hájek det. 2008'.

The specimens are deposited in the following collections:

- JBCP Jan Batelka collection, Praha, Czech Republic;
- NHMB Naturhistorisches Museum, Basel, Switzerland (Michel Brancucci);
- NMPC Národní muzeum, Praha, Czech Republic (Jiří Hájek);
- ZMAS Zoological Institute, Russian Academy of Science, Sankt Petersburg, Russia (Alexander G. Kirejtshuk).

Taxonomy

Eorhipidius Iablokoff-Khnzorian, 1986

Eorhipidius Iablokoff-Khnzorian, 1986: 89 (original description; gender masculine).

Type species. *Eorhipidius januschevi* Iablokoff-Khnzorian, 1986 (by monotypy).

Redescription. Body elongate, gracile, of anthicid-like form. Elytra shortened. Body colouration dark brown, maxillary palps yellowish, metathoracic wings hyaline with dark veins. Surface rugose, coarsely punctured, smooth between punctures, covered with short pale semierect setae.

Measurements: Body length (without mandibles) 2.2–3.2 mm, maximum width (at humeri) 0.6–0.9 mm.

Head prognathous, occiput slightly elevated above anterior margin of pronotum, sometimes bilobed; gula Y-shaped; compound eyes convex, oval, in some species shallowly emarginate posteriorly, occupying about two thirds of lateral side of head, each consisting of about 100–140 protuberant ommatidia; postocular ommatidia absent; antennal cavity reaching margin of eye or narrowly separated from it; antenna inserted dorso-anteriorly of eyes, consisting of 11 simple antennomeres; scape and pedicel short, club-shaped, antennomeres III–XI long, parallel-sided, antennomere XI acute apically; mouthparts reduced: labrum absent; mandible simple, sickle-shaped, truncate apically in some species, with single apical tooth; maxilla well developed, lacinia short and oval, galea long and slender with apex inflexed, bearing long setae ventrally, palpifer cylindrical, maxillary palp tetramerous, cylindrical, with palpomere IV longest, as long as or longer than combined lengths of palpomeres II and III; labium absent.

Thorax. Prothorax well developed; pronotum bell-shaped with prominent posterior angles; prothoracic coxal cavities widely separated. Mesothorax rather small; mesoscutellar shield well developed, convergent apically; elytra shortened, adjacent to each other subbasally, narrowed near midlength, slightly dehiscent apically and reaching midlength of abdomen, rounded apically. Metathorax large, metepisternum triangular, expanded posteriorly; metathoracic coxae large, protruding posteriorly; metathoracic wings hyaline, venation extremely reduced, generally identical with that of *Ripidius* Thunberg, 1806, veins only indistinctly shorter than as illustrated by BESUCHET (1956: Fig. 70); subcosta, well-sclerotized simple radius, media, cubitus and anal vein reaching close to edge of wing, pigmented pterostigma absent, replaced by weakly sclerotized, slightly darker area between anterior margin and apical part of radius. Legs long and slender, tarsal formula 5-5-4, tibial spurs absent; tibiae with several erect setae on apical edges, tarsomere I slightly shorter than tarsomeres II–IV combined, claws simple.

Abdomen tubular, narrow, bearing six visible ventrites (which we interpret as sternites III–VIII), last ventrite with deep apical emargination. Abdomen in mounted specimens sometimes deformed, e.g. into a knob-like shape as illustrated by IABLOKOFF-KHNZORIAN (1986: Fig. 6).

Male external genitalia with median lobe simple, tubular, parameres fused, apically slightly incised, their lateral sides twisted.

***Eorhipidius januschevi* Iablokoff-Khnzorian, 1986**

(Figs. 1, 5, 9)

Type locality. Tajikistan, N of Dushanbe, Kondara [ca. 38°48.7'N, 68°49.7'E], Hissarskiy Khrebet [Mts.], ca. 1500 m a.s.l.

Type material. HOLOTYPE: ♂ (ZMAS), 'Гиссарск. хр. у-ф. / Кондара. свет. / Янушев. 20.VI.1973 [handwritten] // Holotypus / *Eorhipidius* / *januschevi* Khnz. [red label, handwritten]'. PARATYPE: 1 ♂, same label data as holotype (ZMAS).

Additional material examined. TAJIKISTAN: Hissar Mts., Kondara, 7.–10.vii.1992, S. V. Kazantsev leg., 3 ♂♂ (JBCP, NHMB).

Diagnosis. Larger species, body length 3.0–3.2 mm. Head including mandibles 2.1× as long as high, occiput short, bilobed apically. Distance between posterior margin of compound eye and occipital edge in lateral view 1.3× as long as distance between anterior margin of eye and base of maxillary palpus. Antennal cavity narrowly separated from eye. Antennomere length ratios as follows: 1.1-1.0-1.2-1.4-1.9-1.7-1.8-1.7-1.9-1.8-2.8. Maxillary palpomere IV 0.9× as long as palpomeres II and III combined. Elytra 2.9–3.0× as long as pronotum.

Collection circumstances. The type specimens were collected at UV light.

Distribution. Known only from the type locality in the Hissarskiy Khrebet Mts., northwestern Tajikistan.

***Eorhipidius jelineki* sp. nov.**

(Figs. 2, 6, 10)

Eorhipidius januschevi: BATELKA (2007: 169) (misidentification).

Type locality. Iran, Lorestan province, Lenje Abad, 10 km SW of Dorud, ca. 33°27'N 49°01'E, 1710 m a.s.l.

Type material. HOLOTYPE: ♂ (NMPC), 'W Iran, Prov. Lorestán, Lenje Ábad, 10 km SW Dorúd, 33°27'N 49°01'E, 8.-10.x.1998, Chvojka lgt'.

Diagnosis. Small species, body length 2.3 mm. Head including mandibles 2.1× as long as high, occiput projecting over pronotum, rounded; distance between posterior margin of compound eye and occipital edge in lateral view 5.7× as long as distance between anterior margin of eye and base of maxillary palpus; antennal cavity narrowly separated from eye. Antennomere length ratios as follows: 1.2-1.0-1.2-1.6-2.3-2.2-2.2-2.2-2.2-3.2. Maxillary palpomere IV 1.6× as long as palpomeres II and III combined. Elytra 3.1× as long as pronotum.

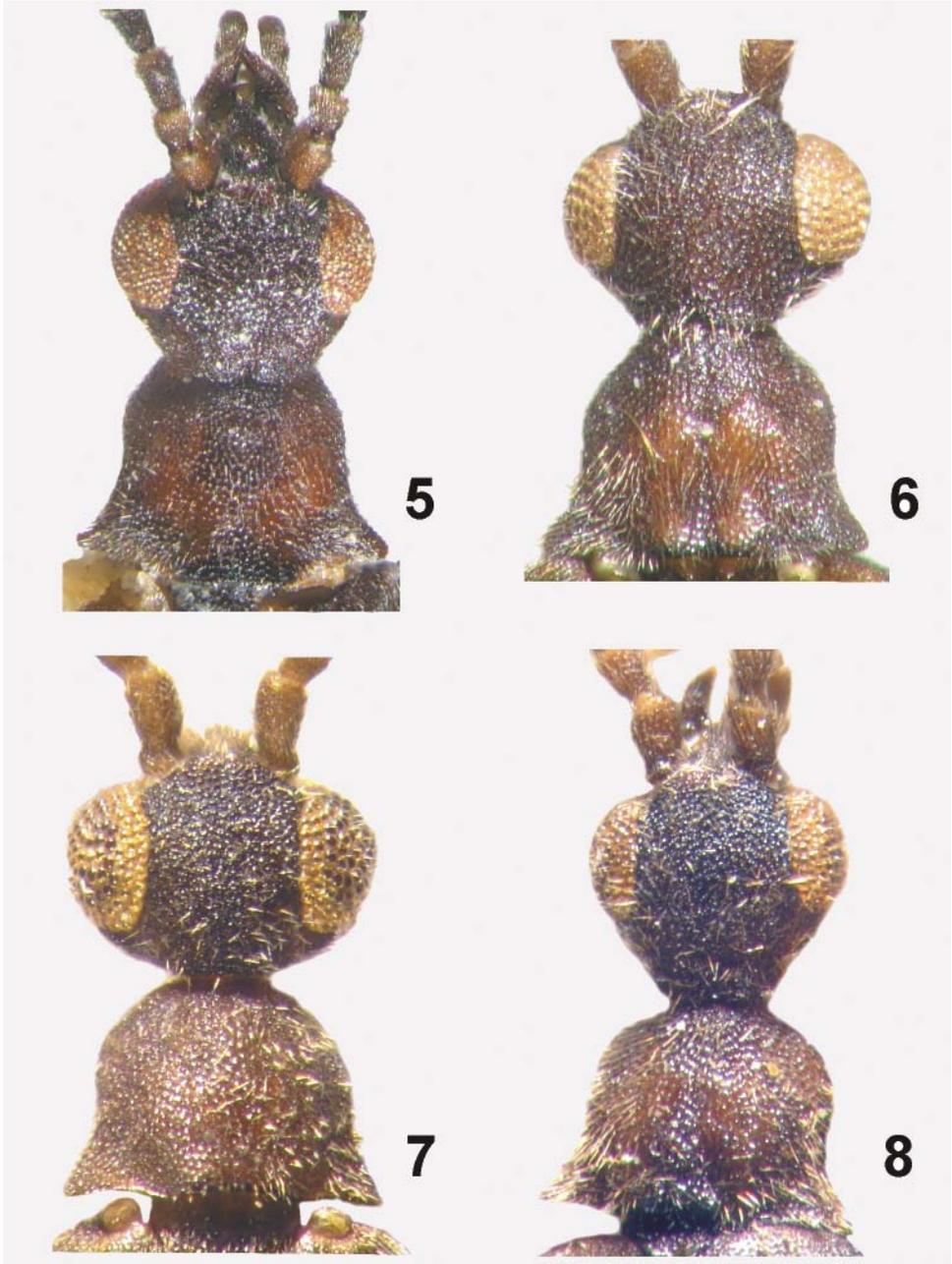
Collection circumstances. Swept from vegetation in a river valley with pastures and sparse oak wood. The type locality is situated in a karst area in the central Zagros Mts. (P. Chvojka, pers. comm. 2008).

Etymology. The new species is dedicated to Josef Jelínek (Prague, Czech Republic), our teacher, friend and specialist on the Cucujoidea.

Distribution. Known only from the type locality in the central Zagros Mts., Lorestan province, Iran.



Figs. 1–4. Habitus, dorsal view. 1 – *Eorhipidius januschevi* Iablokoff-Khnzorian, 1986; 2 – *E. jelineki* sp. nov.; 3 – *E. loebli* sp. nov.; 4 – *E. ruzickai* sp. nov.



Figs. 5–8. Head and pronotum, dorsal view. 5 – *Eorhipidius januschevi* Iablokoff-Khnzorian, 1986; 6 – *E. jelineki* sp. nov.; 7 – *E. loebli* sp. nov.; 8 – *E. ruzickai* sp. nov. Not to scale.



Figs. 9–12. Head, lateral view. 9 – *Eorhipidius januschevi* Iablokoff-Khnzorian, 1986; 10 – *E. jelineki* sp. nov.; 11 – *E. loebli* sp. nov.; 12 – *E. ruzickai* sp. nov. Not to scale.

***Eorhipidius loebli* sp. nov.**

(Figs. 3, 7, 11)

Type locality. India, Orissa state, Simlipal National Park, Lulung, ca. 21°56'N 86°32'E.

Type material. Holotype ♂, (NHMB): 'India: Orissa state, / Similipal N. P., Lulung / 21°56'N 86°32'E, / 25.v.-13.vi.1998 / Karel & Simon Majer leg.'

Diagnosis. Small species, body length 2.2 mm. Head including mandibles 1.7× as long as high, occiput short, temples almost absent; distance between posterior margin of compound eye and occipital edge in lateral view 4.0× as long as distance between anterior margin of eye and base of maxillary palpus. Antennal cavity touching eye margin. Antennomere length ratios as follows (only antennomeres I–VII preserved): 1.3-1.0-1.2-1.4-1.8-2.0-1.8. Maxil-

lary palpomere IV 1.2× as long as palpomeres II and III combined. Elytra 2.3× as long as pronotum.

Etymology. The new species is dedicated to Ivan Löbl (Geneva, Switzerland), our friend and specialist on the Staphylinidae.

Distribution. Known only from the type locality in the Simlipal National Park, Orissa State, India.

***Eorhipidius ruzickai* sp. nov.**

(Figs. 4, 8, 12)

Type locality. Pakistan, North-West Frontier Province, Swat.

Type material. HOLOTYPE: ♂, (NMPC): 'Swat, 1971'.

Diagnosis. Larger species, body length 3.0 mm. Head including mandible 2.4× as long as high, occiput projecting over pronotum, rounded. Distance between posterior margin of compound eye and occipital edge in lateral view 2.6× as long as distance between anterior margin of eye and base of maxillary palpus. Antennal cavity very narrowly separated from eye. Antennomere length ratios as follows: 1.1-1.0-1.5-1.5-1.9-2.0-2.2-2.0-1.8-1.6-2.3. Maxillary palpomere IV 1.2× as long as palpomeres II and III combined. Elytra 3.3× as long as pronotum.

Etymology. The new species is dedicated to Jan Růžička (Prague, Czech Republic), our friend and specialist on the Leiodidae and the Silphidae.

Distribution. Known only from the Swat valley in North-West Frontier Province, Pakistan.

A key to *Eorhipidius* species

1. Smaller species, less than 2.5 mm long; head in lateral view with compound eye situated anteriorly; distance between anterior ocular margin and base of maxillary palpus in lateral view at most equal to two central ommatidia diameters. 2
 - Larger species, ca. 3 mm long; head in lateral view with compound eye situated centrally or posteriorly; distance between anterior eye margin and base of maxillary palpus in lateral view as long as or larger than three central ommatidia diameters. 3
2. Head elongate posteriorly, distance between posterior eye margin and occipital edge in lateral view 5.7× as long as distance between anterior eye margin and base of maxillary palpus; temples well developed; apical maxillary palpomere 1.6× as long as preceding two combined (Fig. 10). Iran. ***E. jelineki* sp. nov.**
 - Head short, distinctly transverse, distance between posterior eye margin and occipital edge in lateral view 4.0× as long as distance between anterior eye margin and base of maxillary palpus; temples almost absent; apical maxillary palpomere subequal to preceding two combined (Fig. 11). India: Orissa. ***E. loebli* sp. nov.**
3. Head only slightly elongate posteriorly, eye thus situated rather posteriorly in lateral view; distance between posterior eye margin and occipital edge in lateral view 1.3× as long as distance between anterior eye margin and base of maxillary palpus; head including man-

- dible 2.1× as long as high, occiput short (Fig. 9); maxillary palpomere IV shorter than palpomeres II and III combined. Tajikistan. ... *E. januschevi* Iablokoff-Khnzorian, 1986
- Head distinctly elongate posteriorly, eye thus situated almost centrally in lateral view distance between posterior eye margin and occipital edge in lateral view 2.6× as long as distance between anterior eye margin and base of maxillary palpus; head including mandible 2.4× as long as high, occiput long (Fig. 12); maxillary palpomere IV slightly longer than palpomeres II and III combined. Pakistan. *E. ruzickai* sp. nov.

Discussion

Systematic position of the Eorhipidiini

Although a phylogenetic analysis of the family Ripiphoridae and the subfamily Ripidiinae is not available, an unusual combination of putatively plesiomorphic characters in the Eorhipidiini was pointed out by KAUPP et al. (2001: 166) and FALIN (2002: 437). The systematic placement of the Eorhipidiini has been questioned several times: ŠVÁCHA (1994) regarded *Eorhipidius* as of uncertain subfamily or even family position, and KAUPP et al. (2001) classified the Eorhipidiini as Ripiphoridae *incertae sedis*. FALIN (2002: 437) was the first who suggested the Eorhipidiini as a possible basal group of the Ripidiinae. We agree with him and, following BATELKA (2007, 2008), place the Eorhipidiini in the Ripidiinae. The potential synapomorphies of males of both the Eorhipidiini and the Ripidiini¹⁾ (females of the former group are unknown) are as follows:

1. Compound eyes convex with protruding, enlarged ommatidia.
2. Tendency to a reduction of mouthparts. The absence of the labrum and labium in the Eorhipidiini and a complete reduction of the mouthparts in the Ripidiini, who possess either dimerous maxillary palps or only an unpaired, non-segmented stylus.
3. Coriaceous and reduced elytra, which are always shorter than the abdomen. Although the elytra are also reduced in *Ripiphorus* Bosc, 1791 (subfamily Ripiphorinae) and in Hemirhipidiinae, the shape and structure of the elytra in the latter genus and subfamily are different and we assume that the reduction evolved independently in all groups (cf. SELANDER 1957: 92).
4. Metathoracic wing venation strongly reduced. A similarly strong reduction of wing venation to a simple subcosta, radius, media, cubitus and anal vein is apparent in most ripidiine genera. IABLOKOFF-KHNZORIAN (1986) considered the wing venation in *Eorhipidius* identical

¹⁾ The monotypic Brazilian ripidiine genus *Aporrhapis* Pascoe, 1887 (with the species *A. flexilis* Pascoe, 1887) is not included in the study. According to the original description, it possesses some morphological features different from all other members of the subfamily Ripidiinae: antennomeres with long processes which are modified into spirals of various directions; elytra long with three slender raised lines; abdomen five-segmented; tarsal segments figured as expanded. *Aporrhapis* is compared with the genus *Ripidius* by PASCOE (1887) and it is currently considered as a member of the tribe Ripidiini by KAUPP et al. (2001). We did not study the type specimen, however according to M. V. L. Barclay (pers. comm., 2009), curator of the entomological collections in the Natural History Museum, London, where the type is deposited, the genus *Aporrhapis* is not a member of Ripiphoridae, but belongs rather to superfamily Elateroidea, family Lycidae.

with that of *Ripidius* (see BESUCHET 1956: 119), and ZARAGOZA CABALLERO (1991: 490) gave an almost identical wing venation also for the genera *Quasirhipidius* Zaragoza Caballero, 1991 and *Quasipirhidius* Zaragoza Caballero, 1991. PETERSEN'S (1967: 331) illustration of the metathoracic wings of the two known species of *Falsorhipidius* Pic, 1947 shows a similar arrangement: the radius and cubitus are well developed but shortly reunited basally, while the media seems to be absent in *F. arcuaticornis* Pic, 1947 and present in a reduced form shortly before the apical margin of the wing in *F. lemkaminiensis* Petersen, 1967. Slightly more complex venation is seen in some Australian genera of the Ripidiini, i.e., *Neonephrites* Riek, 1955, *Rhipidioides* Riek, 1955 and *Riekella* Selander, 1957 (RIEK 1955: Plate 1). As with elytral reduction, we assume that the reduction of wing venation in other Ripiphoridae (e.g., *Ripiphorus*) evolved independently; see, for example, KUKALOVÁ-PECK & LAWRENCE (1993: Fig. 66).

5. Legs slender, elongate, subcylindrical, without carinae, tubercles, spines or lobes. An enlarged, elongate trochanter was already mentioned as an apomorphy by KAUPP et al. (2001) and FALIN (2002).

6. Increased number of abdominal ventrites. Six ventrites are visible in the Eorhipidiini and seven in the Ripidiini in contrast to five in all other Ripiphoridae. SELANDER (1957: 100) speculated that the higher number of ventrites in the Ripidiinae could be explained by resclerotization of some abdominal segments during the evolution of flightless females like in some Meloidae. In fact, a phylogenetic analysis of the Meloidae (BOLOGNA & PINTO 2001) revealed that an abdomen with six visible sternites (apomorphy) is characteristic for both sexes in all meloid genera except of those in the most basal subfamily Eleticinae.

7. Simple male external genitalia. In all other Ripiphoridae the genitalia are more complex (cf. SELANDER 1957: 100).

In addition to the apomorphies listed above, males of the Ripidiinae may be recognised also by the following, presumably plesiomorphic characters:

1. Body surface including antennae covered with short, semi-erected, dense setae.
2. Claws simple²⁾. All other ripiphorids possess serrate, pectinate or bidentate claws.

Finally, the somewhat confusing issue of the presence/absence of tibial spurs in the Ripidiinae should be clarified. Tibial spurs are absent in all known species of the Ripidiini. KAUPP et al. (2001: 172) mentioned that they are present in *Eorhipidius*, although IABLOKOFF-KHNZORIAN (1986: 90) wrote in the original description that tibial spurs are absent. We were not able to find any tibial spurs in *Eorhipidius*, although there is a ring of coarse setae at the apical edge of the tibia. Nevertheless, in some undescribed Neotropical representatives tentatively attributed to Eorhipidiini, hind tibia bear two distinct spurs (J. Batelka, unpublished data). We consider the absence of tibial spurs as an apomorphy, but leave it out from the list until the Neotropical taxa are formally described.

²⁾ Serrate claws are mentioned for male of the Australian genus *Riekella* Selander, 1957 (*Nephrites* sensu RIEK 1955). Careful examination of the *Riekella* members in this respect is desirable.

Relationships of the Eorhipidiini and the Ripidiini

Although the tribes Eorhipidiini and Ripidiini differ in a number of characters, the definition of the Eorhipidiini is problematic. We were not able to find any presumably apomorphic characters in the Eorhipidiini (see below). Despite that, we prefer to keep the tribe for practical reasons. Males of both tribes differ as follows:

1. Compound eyes not expanded but hemispherical in the Eorhipidiini (plesiomorphy) [expanded, almost holoptic in the Ripidiini (apomorphy)].
2. Antennae filiform in the Eorhipidiini (plesiomorphy) [uniflabellate or biflabellate in the Ripidiini (apomorphy)].
3. Mandibles and maxillae present and functional in the Eorhipidiini (plesiomorphy) [completely modified in the Ripidiini (apomorphy)].
4. Mesoscutellar shield not modified, tapering posteriorly; elytra adjacent to each other sub-basally in the Eorhipidiini (plesiomorphy) [mesoscutellar shield expanded, transverse and trapezoidal in the Ripidiini, elytra thus widely dehiscent basally (apomorphy)].
5. Six visible abdominal ventrites in the Eorhipidiini (plesiomorphy) [seven or more in the Ripidiini (apomorphy)].

Systematic placement of the Ripidiinae

The Ripidiinae are traditionally included in the Ripiphoridae, based primarily on their flabellate antennae and parasitoid way of life. They were also usually considered as the most derived group of ripiphorids (cf. SELANDER 1957: 101). FALIN (2002: 437) mentioned for the first time that the discovery of *Eorhipidius* with its numerous ancestral characters could require a more basal position of the Ripidiinae within the Ripiphoridae. Based on the characters mentioned above, it is even possible that the Ripidiinae represent a sister group to all other Ripiphoridae or do not even form a monophyletic clade with other Ripiphoridae. The only apomorphy for the Ripiphoridae including the Ripidiinae is the parasitoid life history. However, known Ripidiinae are parasitoids of hemimetabolous insects (Blattodea), whereas other Ripiphoridae are parasitoids of the Endopterygota (Coleoptera, Hymenoptera). Therefore we speculate that even the parasitoid life history could have evolved independently in both groups. On the other hand, the Ripiphoridae excluding the Ripidiinae could be defined by at least three apomorphies:

1. Endoparasitic, inflated first instar larvae (P. Švácha, pers. comm. 2009);
2. Absence of functional clawed legs in last instar larvae (P. Švácha, pers. comm. 2009);
3. Modified tarsal claws in adults.

Evidence from the fossil record

From the fossil record, the oldest known ripiphorids belong to two lineages. A highly derived representative of the Ripidiini, *Paleoripiphorus deploegi* Perrichot, Nel & Néraudeau, 2004 from the French Cretaceous (Uppermost Albian) amber, bears biflabellate antennae and abdomen with 'eight segments and apex of ninth segment visible' (PERRICHOT et al. 2004). *Myodites burmiticus* Cockerell, 1917 described from the Burmese Cretaceous (Albian) amber

(for aging see PERRICHOT et al. 2004: 581) was associated with the genus *Ripiphorus* Bosc, 1791 (Ripiphorinae) by KAUPP et al. (2001) and PERRICHOT et al. (2004). However, KAUPP et al. (2001) reprinted the picture of the type specimen and speculated that it could be a ripidiine given the general habitus, globular head, simple slender legs and reduced venation of the meta-thoracic wings typical for the Ripidiinae. We support the opinion of Kaupp and co-workers; in addition to the character mentioned in their paper, the species also has at least six visible abdominal ventrites. As the specimen has flabellate antennae (like the Ripidiini) and possibly six abdominal ventrites (like the Eorhipidiini) it could represent an undescribed genus.

On the other hand, the oldest known fossil of the subfamily Ripiphorinae, *Macrosiagon ebboi* Perrichot, Nel & Néraudeau, 2004, was described from French Cretaceous (probably Cenomanian) amber. However, its placement within the tribe Macrosiagonini is doubtful because the tarsal claws are described as 'long, serrate, without lobiform appendages' (PERRICHOT et al. 2004), whereas they are smooth and only apically bidentate in the genera *Macrosiagon* Hentz, 1830 and *Metoecus* Dejean, 1834 (both Macrosiagonini). A speculative record of an intermediate form between a 'Mordellid and Rhipiphorid' from Canadian Upper Cretaceous amber was listed by KAUPP et al. (2001: 186) and a putatively ripiphorid first instar '*triungulin*' larva was described from Burmese amber by GRIMALDI et al. (2005).

In addition to the Mesozoic records listed above, several Cenozoic ripiphorids (mostly Ripidiinae) are known from Baltic, Dominican and French amber and from the shale deposits in Germany (Rott) and the U.S.A. (Florissant). The oldest reliably identified representative of Ripiphorinae is *Macrosiagon deuvei* Batelka, Collomb & Nel, 2006 from French Eocene amber. Additionally, several Ripidiinae inclusions from subfossil copal are also known (KAUPP et al. 2001).

Given the highly derived features of *Paleoripiphorus deploegi*, it is plausible to consider the Ripidiinae as a rather old group with possibly great diversification already in the beginning of the Cretaceous period, while other ripiphorid subfamilies are available in credible fossil records only from the Cenozoic. Nevertheless, without a comprehensive phylogenetic analysis of all these groups and other potential relatives within the Tenebrionoidea, the Ripidiinae should be retained within the family Ripiphoridae.

Distribution and life history of the Eorhipidiini

Members of *Eorhipidius* are currently known to occur in rather large, predominantly mountainous areas of the southern Palaearctic and northern Oriental Regions. Including other undescribed taxa associated with Eorhipidiini, the tribe seems to be scarcely distributed in subtropical and tropical areas of all major zoogeographical regions excluding Australia.

Nothing is known about the bionomics of the Eorhipidiini and so far only males have been collected. FALIN (2002) presumed a largely nocturnal life because of the coarsely faceted eyes. The uniformly coloured body and the fact that specimens of *E. januschevi* have been collected at light may support this hypothesis. The adults are most probably short-lived and possibly do not feed at all. Like the Ripidiini, they might parasitize other insects, most probably from the Hemimetabola. Judging from their overall similarity to termitophilous Karumiinae (Dascilloidea: Dascillidae) (cf. LAWRENCE 2005), developed mandibles, possible nocturnal

activity of males and distribution in warm and temperate regions, they might be parasitoids of termites (which are closely related to cockroaches, hosts of the Ripidiini).

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