ISSN 0031-0301, Paleontological Journal, 2010, Vol. 44, No. 4, pp. 434–450. © Pleiades Publishing, Ltd., 2010
Original Russian Text © A.V. Gorochov, 2010, published in Paleontologicheskii Zhurnal, 2010, No. 4, pp. 70–87.

New and Little Known Orthopteroid Insects (Polyneoptera) from Fossil Resins: Communication 3

A. V. Gorochov

Zoological Institute, Russian Academy of Sciences, Universitetskaya nab. 1, St. Petersburg, Russia 199034
e-mail: orthopt@zin.ru

Received 29 January, 2009

Abstract—New taxa of Orthoptera Ensifera are described in the families Mogoplistidae [*Protomogoplistes asquamosus* gen. et sp. nov. (Upper Cretaceous) in the subfamily Protomogoplistinae subfam. nov. and *Archornebius balticus* gen. et sp. nov. (Eocene), *Pseudarachnocephalus* gen. nov., *P. dominicanus* sp. nov., and *P. latiusculus* sp. nov. (all Miocene) in Mogoplistinae] and Gryllidae [*Eopentacentrus borealis* gen. et sp. nov. (Eocene), *?Grossoxipha feminea* sp. nov. (Miocene), and *Apentacentrus copalicus* sp. nov. in the subfamily Pentacentrinae, *?Cyrtoxipha electrina* sp. nov. and *?Cyrtoxipha illegibilis* sp. nov. (both Miocene) in Trigonidiinae, and *Baltonemobius fossilis* gen. et sp. nov. (Eocene) in Nemobiinae]. The Miocene genera *Proanaxipha* Vickery et Poinar and *Grossoxipha* Vickery et Poinar are transferred from the subfamily Trigonidiinae to Pentacentrinae. *P. latoca* Vickery et Poinar and *Abanaxipha longispina* Vickery et Poinar are redescribed; the male of the latter species is described for the first time.

Key words: Orthoptera, Ensifera, Grylloidea, Mogoplistidae, Gryllidae, new taxa, Upper Cretaceous, Miocene, Eocene, amber, Burmite, copal.

DOI: 10.1134/S0031030110040106

This third contribution of the series deals with two families of the superfamily Grylloidea: scaly crickets (Mogoplistidae) and true crickets (Gryllidae). The preceding publications focused on representatives of the infraclass Polyneoptera with uncertain ordinal affinity and representatives of the order Dictyoptera (Gorochov, 2006, 2007). The orthopteran classification followed here is based on comparative morphological study of both recent and fossil forms (Gorochov, 1995a; 1995b; 2001). Results of the molecular phylogenetic study by Flook et al. (1999) lend support to the views of the current author, while being in substantial disagreement with molecular data of Jost and Naskrecki (2003). Some results of these studies, valuable for improving the classification, are discussed below.

MATERIAL

The material examined is preserved at the Natural History Museum (NHM) in London, National Museum of Natural History (NMNH) in Washington, and the Zoological Institute of the Russian Academy of Sciences (ZIN) in St. Petersburg.

SYSTEMATIC PALEONTOLOGY

Suborder Ensifera

Infraorder Gryllidea

Superfamily Grylloidea Laicharting, 1781

Family Mogoplistidae Brunner-Wattenwyl, 1873

Subfamily Protomogoplistinae Gorochov, subfam. nov.

Type genus. *Protomogoplistes* gen. nov.

Diagnosis (early-instar nymph, other stages unknown). Body without scales, covered with abundant hairs and small setae (Fig. 1a). Head with clypeus moderately swollen, forming most convex part of head between antennae (Fig. 1b). Legs more or less robust; hind tibiae shortened (significantly shorter than hind femora), with only moderately elongated apical spurs and small denticles on upper surface; hind basitarsi without conspicuous spurs or spines but with traces of small denticles on upper surface (Fig. 1a); second tarsomeres of all leg pairs narrow, without expanded pulvilli.

Composition. Type genus.

Comparison. The new subfamily can be readily differentiated from Mogoplistinae by the lack of a scale cover on the body (in all representatives of Mogoplistinae, including early instars, the entire body is densely covered with small scales, i.e., modified setae;

Fig. 1. Mogoplistidae: (a–b) *Protomogoplistes asquamosus* sp. nov., holotype, Burmite: (a) body in lateral view; (b) anterior part of body in dorsal view; (c) *Pseudomogoplistes byzantius* Gor., modern species from Crimea, fragment of scale cover; (d–j) *Archornebius balticus* sp. nov., holotype, Baltic amber: (d) body in dorsal view; (e) anterior body part in lateral view; (f) base of fore tibia, inner side; (g) fore tarsus in ventral view; (h) distal part of hind tarsus in lateral view; (i) hind tarsus in lateral view; (j) apex of abdomen in ventral view. The dotted lines indicate contours of the opaque froth covering some parts of the specimen. Scale bars, (a–b) 0.5 mm; (c) 0.1 mm; (d–j) 1 mm.

Fig. 1c). It differs from the subfamily Malgasiinae, which possibly should also be included in Mogoplistinae, in the position of the clypeus, which forms the most convex part of the head between the antennae (the clypeus of Malgasiinae is situated below the antennae and the most convex part of the head between the antennae is formed by the rostrum, i.e., the prominent part of the frons above the clypeus), and significantly more robust legs, with shortened hind tibiae (the legs of Malgasiinae are long and slender and their hind tibiae are not shortened).

Remarks. This subfamily is classified in the Mogoplistidae based on the structure of the head and the hind legs. In Protomogoplistinae and most of the less ancient Mogoplistidae the most convex part of the head between the antennae is the clypeus, while in other Upper Cretaceous and Cenozoic Grylloidea (Gryllidae, Myrmecophilidae, and Gryllotalpidae) the most convex part of the head between the antennae, which protects the antennal bases during jumping, is the area of the frons immediately above the clypeus. It is possible that in the Jurassic or Early Cretaceous common ancestors of Mogoplistidae, Myrmecophilidae, and Gryllidae, the hind tibiae had large spines (possibly facilitating swimming, as an adaptation to living near water, see Gorochov, 1995a), but sometimes, when the life style changed, the spines became replaced with numerous minute denticles. This took place in Mogoplistidae and various Gryllidae, including Pteroplistinae and some Cachoplistinae, Oecanthinae, and Gryllinae (*Sclerogryllus* Gor.). The morphology of the new subfamily suggests that in Mogoplistidae this change occurred no later than in the Late Cretaceous. Therefore, Protomogoplistinae can be considered as the ancestral group of Mogoplistinae, and the cover of scales as an autapomorphy of the latter subfamily rather than the entire family.

The discovery of Protomogoplistinae can also shed light on the taxonomic position of the enigmatic recent subfamily Malgasiinae, containing several wingless species lacking tympana (the genus *Malgasia* Uv., on Madagascar and adjacent islands). Like in Protomogoplistinae, the hind tibiae of these crickets are armed, in addition to the apical spurs, with only minute denticles. Malgasiinae may turn out descendants of Protomogoplistinae that became adapted to troglobitic or partially troglobitic environments. Because until now the presence of the scale cover was considered the main autapomorphy of Mogoplistidae, Malgasiinae could not be previously classified in that family based on morphological data. Moreover, Malgasiinae show some genitalic similarities with Myrmecophilidae rather than the most primitive of the previously known Mogoplistinae (Gorochov, 1984).

It should be noted that some of the recent molecular phylogenetic studies indicated that Malgasiinae were closer to Mogoplistidae than to Myrmecophilidae, while Mogoplistidae were closer to Gryllidae than to Myrmecophilidae (Jost and Naskrecki, 2003). Such data corroborate the current author's opinion (Gorochov 1984, 1995a, 1995b) that *Malgasia* has to be transferred from Phalangopsinae to a new subfamily of its own, which has to be excluded from Gryllidae, and that Mogoplistidae are close to Gryllidae rather than to Myrmecophilidae. At the same time, these data do not support his hypothesis that Malgasiinae belong to Myrmecophilidae and that the similarity in the hind tibial armament of Malgasiinae and Mogoplistinae is due to convergent evolution. Therefore, the family Mogoplistidae possibly includes three subfamilies (Protomogoplistinae, Mogoplistinae, and Malgasiinae) but, contrary to the opinion of Desutter (1987), is not closely related to Myrmecophilidae.

Genus *Protomogoplistes* Gorochov, gen. nov.

Etymology. From the generic name *Mogoplistes*.

Type species. *P. asquamosus* sp. nov.

Diagnosis (early-instar nymph). Head slightly flattened dorsoventrally (Fig. 1a), with relatively large eyes, situated very close to subgenae, and with distance between antennae large, approximately 2.5 times width of scape (Fig. 1b). Pronotum relatively short, conspicuously shorter than either fore or middle femora. Legs somewhat robust; fore and middle tibiae each with one or two relatively small lower spurs; hind tibiae each with 3 pairs of spurs, among which outer middle spur and both upper ones slightly shorter than inner middle spur, both lower spurs shorter yet; hind femora clearly of jumping type but not strongly thickened (Fig. 1a).

Composition. Type species.

Protomogoplistes asquamosus Gorochov, sp. nov

Etymology. From the Latin *squamosus* (scaly).

Holotype. NHM, In. 20188-1, an inclusion of a complete early-instar nymph; Burmite (Burmese amber); possibly Upper Cretaceous.

Description (Figs. 1a, 1b, 3a). The head and pronotum are relatively large (such proportions are typical of young instars of various cricket taxa). The coloration is uniform, light; the pubescence is better developed on the thoracic and abdominal tergites compared to the head and legs. The antennal flagella are slightly expanded not far from their bases; the maximum length of the eyes is slightly exceeding the width of the clypeus. The cerci are conspicuously longer than the hind femora.

Measurements (mm): body length, 2.0; pronotal length, 0.45; hind femoral length, 1.4; hind tibial length, 0.9; hind basitarsal length, 0.5.

Material. Holotype.

Subfamily Mogoplistinae Brunner-Wattenwyl, 1873

Tribe Arachnocephalini Gorochov, 1984

Genus *Archornebius* Gorochov, gen. nov.

Etymology. From the generic name *Ornebius*.

Type species. *A. balticus* sp. nov.

Diagnosis (female). Body covered with abundant small scales, particularly conspicuous along posterior margins of tergites (Fig. 1d). Head conspicuously flattened dorsoventrally, with rather large eyes, situated not very close to subgenae, with distance between antennae moderately large, approximately 2.5 times width of scape; clypeus not very strongly inflated (Figs. 1d, 1e).

Pronotum rather long, somewhat longer than either fore or middle femora. Legs notably robust; fore tibiae each with only inner tympanum, large and oval (Fig. 1f), structure of distal part these of tibial unknown; middle tibiae each with two small spurs; hind tibiae each with four or more spurs; hind femora strongly inflated, 1.3 times as long as hind tibiae; tarsi with second tarsomere strongly expanded, basitarsus relatively long, hind basitarsus clearly serrated dorsally and with pair of moderately long apical spurs (Figs. 1g–1i). Wings absent (in female). Genital plate apparently relatively wide; ovipositor more or less long and narrow (Fig. 1j).

Composition. Type species.

Comparison. The new genus is most similar to the recent genera *Ornebius* Guer.-Men., *Ectatoderus* Guer.-Men., and *Cycloptilum* Scud., differing from these in the less flattened head and conspicuously less inflated clypeus, as well as the large distance between the antennal bases and/or the significantly longer basitarsi. *Archornebius* differs from the other genera of the tribe in the following combination of characters: the body relatively short, the tympanum present (and possibly the male tegmina with a stridulatory apparatus developed), the second tarsomeres expanded, and the hind basitarsi distinctly serrated dorsally.

***Archornebius balticus* Gorochov, sp. nov.**

Etymology. From *Baltic amber*.

Holotype. ZIN, Balt. 1, an inclusion of a complete female; Baltic amber; Late Eocene.

Description (Figs. 1d–1j, 3b). The body areas where the coloration is preserved are more or less uniformly dark. In addition to scales, the pronotum, abdomen, and legs with sparse, long setae. The maxillary palpi with their apical segments moderately expanded. The pronotum with the posterior margin distinctly convex and the ventral margins of the lateral lobes almost straight. The genital plate is shallowly emarginate posteriorly; the ovipositor is conspicuously longer than the pronotum (its distal part is not preserved).

Measurements (mm): body length, 6; pronotal length, 1.7; hind femoral length, 3.8; hind tibial length, 2.9; hind basitarsal length, 1.0.

Material. Holotype.

Genus *Pseudarachnocephalus* Gorochov, gen. nov.

Etymology. From the generic name Arachnocephalus.

Type species. *P. dominicanus* sp. nov.

Diagnosis. Body covered with abundant small scales. Head strongly flattened dorsoventrally, with rather large eyes, situated relatively close to subgenae, with distance between antennal bases moderate, approximately 2 times width of scape; clypeus strongly inflated, dorsally with faint median groove (Fig. 2a). Pronotum slightly shorter than either fore or middle femora, with low lateral lobes (conspicuously lower than in *Archornebius*). Legs moderately robust, without tympana (Fig. 2b); fore and middle tibiae with only one spur, hind tibiae with six spurs; hind femora not strongly inflated, almost twice as long as hind tibiae; tarsi with second tarsomere moderately expanded, basitarsi long, hind basitarsus without clear serration on its upper surface and with one pair of short apical spurs (Fig. 2c). Wings missing in both sexes. Female genital plate not wide, distinctly narrowing apically (Figs. 2d, 2j); male genital plate rounded posteriorly (Figs. 2g, 2i); female ovipositor with only slightly expanded apical part (Fig. 2e); each male paraproct with rather long process (Figs. 2f, 2h).

Composition. *P. dominicanus* sp. nov., *P. latiusculus* sp. nov., and possibly *Ornebius ambericus* Vickery et Poinar, 1994 from Dominican amber.

Comparison. The new genus is most similar to the modern genus *Arachnocephalus* Costa, differing from it in the distinctly larger eyes, distinctly shorter hind tibiae, and the longer hind basitarsi, as well as the ovipositor being slightly expanded apically and lacking any serration. From the other genera of the tribe, the new genus differs, in addition to above characters, in the tympana and tegmina missing in both sexes and the hind tibiae being approximately half as long as the hind femora.

***Pseudarachnocephalus dominicanus* Gorochov, sp. nov.**

Etymology. From Dominican amber.

Holotype. NMNH no. 504396, Acc. 371428, Woodruff (collection reg.) 8842, Brodzinsky/Lopez-Peña (Penha) Collection, an inclusion of a complete female; Dominican amber; Miocene.

Description (Figs. 2a–2i, 3c–3e). The body is relatively narrow, the width of the pronotum in its posterior half is approximately 0.3 times the length of the hind femur. The coloration is light, with the following dark markings: antennal flagella are more or less dark-

Fig. 2. Mogoplistidae: (a-i) *Pseudarachnocephalus dominicanus* sp. nov., holotype (a–e) and paratypes (f–i), Dominican amber: (a) head and pronotum in dorsal view, (b) inner side of fore leg, (c) outer side of hind leg, (d) genital plate and ovipositor in ventral view, (e) distal part of ovipositor in lateral view, (f) apex of male abdomen in posterodorsal view (stippled areas indicate places where the missing parts of the cerci and genitalia were attached), (g) male genital plate in ventral view, (h) apex of abdomen (possibly late-instar male nymph) in dorsal view, (i) same specimen, genital plate; (j) *P. latiusculus* sp. nov., holotype, Dominican amber, genital plate and base of ovipositor in ventral view. Scale bars (a–j), 0.5 mm.

ened, the head and pronotum with distinct dark markings (Fig. 2a), although the dark area in the center of the pronotal disc can be poorly developed, the fore femora with a large dark marking or a group of markings in their distal halves (Fig. 2b), the middle femora with two or three relatively large markings; the hind femora with distinct or indistinct markings on their upper and distal parts (Fig. 2c), the tibiae of all leg pairs with two bands (Figs. 2b, 2c), the abdominal tergites with a transverse light band anteriorly of the abdomen midlength, elsewhere with rather numerous dark spots merging together near margins of the light band, and the cerci are darkened, except their bases. The pronotum is almost square in dorsal view. The female genital plate apically with a small yet conspicuous emargination (Fig. 2d); the male genital plate is as in Figs. 2g and 2i; the ovipositor is straight, the structure of its apex is as in Fig. 2e; the male paraprocts with processes as in Figs. 2f and 2h.

M e a s u r e m e n t s (mm): female body length, 7.0; same of male, 6.0–7.0; female pronotal length, 1.3; same of male, 1.2–1.3; female hind femoral length, 4.0; same of male, 3.5–3.7; female hind tibial length, 2.0; same of male, 1.6–1.7; female hind basitarsal length, 1.1; same of male, 0.8–0.9; ovipositor length, 2.8.

M a t e r i a l. Holotype and two paratypes: NMNH no. 504366, Acc. 371428, Woodruff (collection reg.) 8812, an inclusion of a male with the upper part of its head and partially its legs and abdomen tip damaged, and NMNH no. 504387, Acc. 371428, Woodruff (collection reg.) 8833, an inclusion of a complete male (possibly a last-instar nymph, with the dark pattern poorly developed); Brodzinsky/Lopez-Penha Collection; Dominican amber; Miocene.

C o m p a r i s o n. The new species differs from the insufficiently described *?P. ambericus* (Vick. et Poin.) from Dominican amber in its body proportions. According to Vickery and Poinar (1994), the pronotum of *?P. ambericus* is significantly longer than wide and the ovipositor is less than half as long as the hind femur. It is possible, however, that the measurements reported by these authors are not fully accurate: on their photograph of the *?P. ambericus* holotype, the general body shape (including the shape of the thorax)

Fig. 3. Mogoplistidae, photographs of inclusions: (a) *Protomogoplistes asquamosus* sp. nov., holotype, Burmite, lateral view; (b) *Archornebius balticus* sp. nov., holotype, Baltic amber, dorsal view; (c–e) *Pseudarachnocephalus dominicanus* sp. nov., holotype, Dominican amber, dorsal views: (c) holotype; (d) paratype NMNH no. 504366; (e) paratype NMNH no. 504387; (f) *P. latiusculus* sp. nov., holotype, Dominican amber, dorsal view.

appears similar to that of the new species, and the ovipositor appears longer than one-half of the hind femur (Vickery and Poinar, 1994: Fig. 7). If that is true, the new species may turn out to be a mere synonym of *?P. ambericus*.

***Pseudarachnocephalus latiusculus* Gorochov, sp. nov.**

Etymology. From the Latin *latiusculus* (rather wide).

Holotype. NMNH no. 502773, Acc. 371428, Woodruff (collection reg.) 5548, Brodzinsky/Lopez-

Penha Collection, an inclusion of a female missing the head and the anterior part of the thorax; Dominican amber; Miocene.

Description (Figs. 2j, 3f). The body is somewhat wide, the width of the pronotum in its posterior half is approximately 0.4 times the length of the hind femur. The coloration is uniformly light or not preserved (the latter is unlikely because the same piece of amber contains inclusions of other small insects with well-preserved dark pattern). The hind tarsus is approximately as long as the hind tibia. The female genital plate with a very small, inconspicuous apical emargination (Fig. 2j); the ovipositor is similar to that of *P. dominicanus*, but its relative length with respect to the hind femur is slightly greater.

Measurements (mm): hind femoral length, 3.6; hind tibial length, 1.8; hind basitarsal length, 1.2; ovipositor length, 2.7.

Material. Holotype.

Comparison. The new species differs from *P. dominicanus* in its less narrow body, somewhat longer hind tarsi (in *P. dominicanus* these are slightly shorter than the hind tibiae), and the female genital plate having a very small apical emargination. From *?P. ambericus* it differs in the wider pronotum and the long ovipositor. It is, however, possible that the new species can turn out to be a synonym of *?P. ambericus* (see the comparative note on *P. dominicanus* for details).

Family Gryllidae Laicharting, 1781

Subfamily Pentacentrinae Saussure, 1878

Genus *Eopentacentrus* Gorochov, gen. nov.

Etymology. From the genus *Pentacentrus*.

Type species. *E. borealis* sp. nov.

Diagnosis (female). Body relatively large (compared to other representatives of this subfamily). Pronotum rather long, approximately 1.5 times as wide as long, conspicuously narrowing anteriorly, with high lateral lobes (Figs. 5a–5c). Legs moderately robust; each fore tibia with pair of moderately large oval tympana; fore and middle tibiae each with two spurs; each hind tibia with four pairs of small upper spines in its distal half, several small denticles above, and six apical spurs; fore and middle tarsi with moderately shortened basitarsus; hind basitarsus conspicuously long, with pair of spurs of moderate size and several small denticles on upper surface (Fig. 5a). Tegmina not quite reaching apex of abdomen, with almost parallel longitudinal veins in dorsal field and not parallel in lateral field (branches of Sc more or less oblique and curved) (Figs. 5a, 5c); hindwings extending well beyond apices of hind femora but not reaching apices of hind tibiae. Ovipositor long and narrow, with distal part narrow and smooth, gradually narrowing towards pointed apex (Figs. 5a, 5d).

Compostion. Type species.

Comparison. The genus *Eopentacentrus* differs from the few extant genera of the subfamily in the following combination of characters: the relatively large size, the rather long pronotum with high lateral lobes, each fore tibia with two tympana of moderate size, the hind tibiae with four pairs of spines, the hind tarsi relatively short, the venation in the lateral fields of the tegmina not parallel, and the ovipositor long and with its apical part narrow. From the genus *Proanaxipha* Vick. et Poin., described from Dominican amber and included in the same subfamily, the new genus differs in some of the above characters: the large size, long pronotum, four (instead of three) pairs of spines on the hind tibiae, short tarsi, and venation in the lateral fields of the tegmina not parallel. It probably differs from *Grossoxipha* Vick. et Poin. (another possible representative of the Pentacentrinae from Dominican amber) in the presence of two tympana on each fore tibia and by venation in the lateral fields of the tegmina being not parallel.

Eopentacentrus borealis Gorochov, sp. nov.

Etymology. From the Latin adjective *borealis* (northern), coming from a Greek root.

Holotype. ZIN, Balt. 2, an inclusion of a female missing most of the head; Baltic amber; Late Eocene.

Description (Figs. 4a, 5a–5d). The coloration is light, with the following dark markings: most of the disc and most of the lateral lobes of the pronotum are dark (only bands along the midline and along the anterior and lateral margins of the disc remain light; the light areas on the lower parts of the lateral lobes are possibly artifacts)(Figs. 5a–5c); the fore and middle femora are slightly darkened in their distal parts (the conspicuously dark area on one of the middle femora is possibly an artifact); the hind femora with numerous slightly darkened oblique stripes on the outer surface and dark apices; the tibiae and tarsi of all leg pairs are slightly darkened, with the upper surfaces of the fore tibiae, the bases of the middle tibiae, and the distal parts of the hind tibiae somewhat darker (Fig. 5a); the tegmina with slightly darkened dorsal and lateral parts, separated by a light longitudinal streak, and with dark longitudinal veins (Figs. 5a, 5c); the abdominal tergites and the visible upper parts of the hindwings are slightly darkened; the thorax laterally and the coxae with small dark spots (Fig. 5a); the apical parts of the cerci, the apex of the genital plate, and the apical part of the ovipositor are darkened. The tegminal venation is as in Figs. 5a and 5c. The genital plate is small and round, its apex is somewhat truncate; the distal part of the ovipositor is as in Fig. 5d.

Measurements (mm): length of body excluding head, 10.3; length of body excluding head but including wings, 13.8; pronotual length, 1.6; tegmen length, 8.0; hind femoral length, 5.8; hind tibial length, 4.7; hind basitarsal length, 1.7; ovipositor length, 5.7.

Material. Holotype.

Fig. 4. Gryllidae, photographs of inclusions: (a) *Eopentacentrus borealis* sp. nov., holotype, Baltic amber, lateral view; (b) *Apentacentrus copalicus* sp. nov., holotype, African copal, lateral view; (c) *Proanaxipha ?latoca* Vick. et Poin., male NMNH no. 502986, Dominican amber, dorsal view; (d) *?Grossoxipha feminea* sp. nov., holotype, Dominican amber, dorsal view; (e, f) *Abanaxipha longispina* Vick. et Poin., male NMNH no. 504374, Dominican amber: (e) dorsal view, (f) inner side of hind leg; (g) *?Cyrtoxipha electrina* sp. nov., holotype, Dominican amber, dorsal view; (h) *Baltonemobius fossilis* sp. nov., holotype, Baltic amber, dorsal view.

Fig. 5. Gryllidae: (a–d) *Eopentacentrus borealis* sp. nov., holotype, Baltic amber: (a) whole inclusion in lateral view, (b) pronotum in lateral view, (c) posterior part of head, pronotum, and right tegmen of a female in dorsal view, (d) distal part of ovipositor in lateral view; (e–i) *?Grossoxipha feminea* sp. nov., holotype (e, f) and paratype NMNH no. 502992 (g–i), Dominican amber: (e) head, pronotum, and left tegmen of a male in dorsal view, (f) apex of male abdomen in ventral view, (g) head and pronotum in dorsal view, (h) base of fore tibia, inner side, (i) male genitalia in posterior view (remnant of anal plate, bases of cerci, with paraprocts in-between and, below paraprocts, genitalia lying inside cuplike cavity of bent-out genital plate, including transverse lamelliform epiphallus with large upper process and membranous valves surrounding dark round ampulla of spermatophore). Scale bars (a–i), 1 mm.

Genus *Proanaxipha* Vickery et Poinar, 1994

Until now this genus included two species from Dominican amber: *P. latoca* Vick. et Poin. (type species) and *P. bicolorata* Vick. et Poin. (Vickery and Poinar, 1994). The authors of the genus placed it in the subfamily Trigonidiinae, but the material described here indicates that the genus actually belongs to Pentacentrinae and it is close to modern Neotropical representatives of that subfamily. In particular, the recently described modern *Nemobiopsis eugethes* Otte from Costa Rica appears belonging to *Proanaxipha* rather than to *Nemobiopsis*. *Proanaxipha* differs from all other genera of the Pentacentrinae in the presence of tympana on both sides of the fore tibiae, the hind basitarsus long and straight (short and distinctly arched in *Nemobiopsis* Bol.), the male stridulatory apparatus only partially reduced, the venation of the lateral parts of tegmina parallel in both sexes, and the male genitalia short. The second species originally included in *Proanaxipha*, *P. bicolorata*, most probably belongs neither to this genus, nor to this subfamily. Judging from the photograph of its holotype (Vickery and Poinar, 1994: text-fig. 4), it may be a nymph of Nemobiinae or Eneopterinae.

Proanaxipha ?latoca Vickery et Poinar, 1994

Material. NMNH no. 502986, Acc. 371428, Woodruff (collection reg.) 7421, male; NMNH no. 504436, Acc. 371428, Woodruff (collection reg.) 8882, male; NMNH no. 504373, Acc. 371428, Woodruff (collection reg.) 8819, male; NMNH no. 503257, Acc. 371428, Woodruff (collection reg.) 7697, male; NMNH no. 504456, Acc. 371428, Woodruff (collection reg.) 8902, female; NMNH no. 504397, Acc. 371428, Woodruff (collection reg.) 8843, male; NMNH no. 503253, Acc. 371428, Woodruff (collection reg.) 7693, female; Brodzinsky/Lopez-Penha Collection; inclusions of 7 complete or nearly complete individuals; Dominican amber; Miocene.

Redescription (Figs. 4c, 6a–6j). The coloration of most specimens is light, except the following dark areas: the face and the rostrum, the antennal flagella, one pair of spots of variable size between the eyes

Fig. 6. *Proanaxipha ?latoca* Vick. et Poin. (Gryllidae), Dominican amber: (a–c) male NMNH no. 502986: (a) head in dorsal view, (b) pronotum in dorsal view, (c) dorsal field of tegmen; (d–g) male NMNH no. 504436: (d) head in dorsal view, (e) dorsal field of tegmen, (f) outer side of fore leg, (g) outer side of hind leg; (h) male NMNH no. 504397, head in dorsal (slightly anterodorsal) view; (i) male NMNH no. 504373, apex of abdomen in ventral (slightly lateroventral) view (genitalia visible behind genital plate: pair of lateral lobe-shaped ectoparameres and single large epiphallus with apical process directed upwards); (j) female NMNH no. 504456, ovipositor in lateral view (slightly dorsolateral). Scale bars (a–e, h, i), 1 mm; (f, g, j), 0.5 mm.

(Figs. 6a, 6d), the lateral lobes of the pronotum, lateral fields of tegmina, characteristic spots in the dorsal fields of the male tegmina (Figs. 6c, 6e) and streaks along the longitudinal veins of the female tegmina, one band on each front and middle femur, three spots on each hind femur, and two spots on each front and middle tibia of the male (in the females these tibiae are completely dark), the visible parts of the hindwings and the abdominal tergites (both darkened to a variable degree), and the base of the male genital plate. In the male NMNH no. 504397 the color pattern is similar, but an unpaired small marking is present behind the eyes (Fig. 6h) instead of a pair of markings between the eyes, the entire pronotum is dark, and the apical field of the tegmina is darkened. The female NMNH no. 503253 is almost completely discolored, but with traces of dark coloration on the pronotal disc. The body is small and slender. The head is almost as wide as the pronotum, the rostrum between the eyes is approximately 1.5 times the width of the scape. The pronotum is short, approximately 1.7 times as wide as long, distinctly narrowing anteriorly. The fore tibiae each with two not very large, oval tympana; the hind tibiae each with three pairs of spines, five spurs (the lower inner one is missing) and small denticles on the upper surface; the fore and middle tarsi with moderately shortened basitarsi; the hind basitarsi are quite long, each with small denticles on the upper surface and one pair of not very large spurs (Figs. 6f, 6g).

The tegmina are slightly longer in the male than in the female, extending approximately to the tip of the abdomen, with parallel venation in their lateral fields; the dorsal field of the tegmen with a partly reduced stridulatory apparatus in the male (Figs. 6c, 6e) and with five simple, parallel longitudinal veins in the female; the hindwings are long, slightly extending beyond apices of the stretched out hind tibiae. The male genital plate is relatively short, with a shallow posterior emargination; the male genitalia apparently with relatively elongated lobe-shaped ectoparameres and a triangular epiphallus, the apex of which is extended into a fingerlike process curved upwards

(Fig. 6i); the female genital plate is small, nearly triangular; the ovipositor is slightly bent upwards, with a narrow, pointed apex (Fig. 6j).

Measurements (mm): male body length, 5.0–6.2, same of female, 6.5–8.0; male body length including wings, 7.3–8.0, same of female, 9.0–10.0; male pronotal length, 0.8–0.9, same of female, 1.0–1.2; male tegminal length, 3.8–4.1, same of female, 2.7–3.1; male hind femoral length, 3.5–3.7, same of female, 3.8–4.4; male hind tibial length, 2.5–2.7, same of female, 2.7–3.0; male hind basitarsal length, 1.1–1.2, same of female, 1.3–1.5; ovipositor length, 2.5–2.6.

Remarks. The original description of this species (Vickery and Poinar, 1994) is not sufficient for reliable identification because it does not mention or illustrate many important structures, the size and coloration are described in such a way that allows too much variation, and the drawing of the ovipositor is apparently mixed up and illustrates a Trigonidiinae morphology. Probably the authors dealt with more than a single species, but they did not specifically describe or illustrate the coloration of the holotype, although their photographs of the paratypes show clear differences in the coloration of the pronotum, identical to the variation mentioned in the description above. It must be also noted that the female with the dark pronotal disc (NMNH no. 503253) has a shorter ovipositor, approximately 0.59 times the length of the hind femur (compared to 0.67 times in the female with the light pronotal disc). Therefore, it is possible that this series of specimens (as well as the type series of *P. latoca*) actually includes representatives of two species. *P. ?latoca* differs from the modern Costa Rican species (see details on the genus *Proanaxipha* above) in the more contrasting color pattern, shorter male tegminal part behind the diagonal vein, and probably smaller ectoparameres.

The genus *Grossoxipha* Vickery et Poinar, 1994

Until now the genus included a single species, *G. yaque* Vick. et Poin., described for a single female from Dominican amber (Vickery and Poinar, 1994). Like the preceding genus, it was originally placed in the subfamily Trigonidiinae. However, it is most likely that the genus also belongs to the Pentacentrinae, because its hind tibia and tarsus are closer to those of *Proanaxipha* than any Trigonidiinae (Vickery and Poinar, 1994: text-fig. 6). The original description does not include any main characters differentiating this genus from the preceding genera, except the body size and the head width. Even the number of tympana and the structure of the lateral field of the tegmen remain unknown. Because of this, the new species described below is only tentatively placed in *Grossoxipha*. If the placement is correct, the genus can be distinguished from the other genera of the subfamily by the following set of characters: only the inner tympanum is present, the hind basitarsus is straight and relatively long, the male tegmina are completely lacking a stridulatory apparatus, venation of the lateral parts of the tegmina in both sexes is parallel, and the male genitalia are rather short.

?Grossoxipha feminea Gorochov, sp. nov.

Etymology. From the Latin *feminea* (feminine).

Holotype. NMNH no. 504395, Acc. 371428, Woodruff (collection reg.) 8841, Brodzinsky/Lopez-Penha Collection, an inclusion of a complete male; Dominican amber; Miocene.

Description (Figs. 4d, 5e–5i). Approximately as large as *E. borealis* and conspicuously larger than *P. ?latoca*. The coloration is light, except the face and genae darkened, the antennal flagella dark with rare light ringlets, the rostrum with small dark markings on its upper surface, a large dark macula between the lateral ocelli and three darkened longitudinal stripes on the vertex posteriorly of that macula, the pronotum with two pairs of variably distinct dark markings on the disc (Figs. 5e, 5g) and dark lateral lobes (each with a relatively large light macula in the lower anterior corner, reaching the middle part of the lower margin), the legs with darkened spots almost as in *P. ?latoca* (the coloration of the hind legs is poorly preserved), the tegmina with darkened stripes along the longitudinal veins and bands and spots along the transverse veins (Fig. 5e), the abdomen with the tergites and anal plate darkened (the latter basally with a small light median spot) and the sternites, male paraprocts, and the apex of the male genital plate less strongly darkened. The head is only slightly wider than the pronotum, the rostrum between the antennal bases is slightly wider than the scape. The pronotum is relatively long, approximately 1.5 times as wide as long, with the lateral margins of the disc weakly converging anteriorly or nearly parallel (Figs. 5e, 5g). The legs are as in *P. ?latoca*, except each fore tibia bearing only the inner tympanum, relatively small and oval (Fig. 5h), and the hind legs somewhat more robust, with slightly larger denticles on the tibiae and basitarsi. The tegmina are possibly identical in both sexes (the male lacks a stridulatory apparatus, apparently due to feminization of the tegmina; Fig. 5e), with parallel venation in their dorsal and lateral parts; the hindwings are extending beyond apices of the hind femora and probably reaching apices of the hind tibiae. The male anal plate is almost truncate posteriorly; the male paraprocts are small and rounded; the male genital plate is relatively short, with a rather narrow notch apically (Fig. 5f); the epiphallus has the form of a plate, divided at its apex, with a large process narrowing upwards and possibly with short ectoparameres laterally (under the epiphallus), and also with valves, situated lower yet and surrounding the large, dark ampulla of the spermatophore (Fig. 5i). The terminal part of the abdomen of the possible female is not preserved.

Measurements (mm): male body length, 8.0–8.5, same of ?female, 12.0; male body length including wings, 11.5, same of ?female 14.5; male pronotal length, 1.5–1.6, same of ?female, 1.8; male tegminal length, 6.5, same of ?female, 8.0; male hind femoral length, 5.7, same of ?female, 7.5; male hind tibial length, 3.5, same of ?female, 4.6; male hind basitarsal length, 1.7, same of ?female, 2.4.

Comparison. If the measurements reported in the description of *G. yaque* (Vickery and Poinar, 1994) are accurate, the new species differs from it in the significantly shorter hind tibia (approximately 0.63 times the length of the hind femur, compared to 0.91 times in *G. yaque*) and the longer hind basitarsus (0.30–0.31 times the length of the hind femur, compared to 0.22 times in *G. yaque*).

Material. Holotype and two paratypes, NMNH no. 502992, Acc. 371428, Woodruff (collection reg.) 7427, an inclusion of an almost complete male; NMNH no. 505727, Acc. 371428, Woodruff (collection reg.) 10174, an inclusion of a possible female, with the terminal part of its abdomen missing; Brodzinsky/Lopez-Penha Collection; Dominican amber; Miocene.

Genus *Apentacentrus* Chopard, 1934

Until now this genus included only three modern species from the tropical Africa. It is characterized by the presence of tympana on both sides of the fore tibia, the hind basitarsus straight and long, the male tegmina completely lacking a stridulatory apparatus, the lateral fields of the tegmina in both sexes with parallel venation, and the male genitalia relatively long. The genus is close to the monotypic genus *Pentacentrodes* Bol., also distributed in the tropical Africa and differing from *Apentacentrus* only in the presence of a slightly reduced stridulatory apparatus in the male. The similarity of the male genitalia in these genera together with the fact that the new species described below displays a more or less intermediate degree of reduction of the stridulatory apparatus suggest that *Apentacentrus* and *Pentacentrodes* may be synonyms.

Apentacentrus copalicus Gorochov, sp. nov.

Etymology. From *copal* (the Pliocene to Holocene amber).

Holotype. ZIN no. Afr. 3, an inclusion of an adult male without right hind leg; African copal; possibly Pleistocene.

Description (Figs. 4b, 7a–7f). Only slightly smaller than *?G. feminea*. The coloration is uniform, slightly darkened (the pattern, if there was one, is not preserved). The head is approximately as in *P. ?latoca*, not wider than the pronotum, but with the rostrum between the antennae almost as in *?G. feminea* or possibly even slightly narrower (unlikely to be wider than the scape); the terminal segment of the maxillary palpi is strongly expanded (Fig. 7e). The pronotum is short, 1.8 times as wide as long, distinctly narrowing anteriorly (Fig. 7a). The legs are as in *P. ?latoca*, except the fore tibia with relatively small tympana on its both sides (Fig. 7d), the hind tibia with slightly longer spines and spurs, and the hind basitarsus is slightly shorter (Fig. 7c). The tegmina are reaching the tip of the abdomen, with parallel venation on their dorsal and lateral field (Fig. 7b), except in the base of the dorsal field, where the veins are not entirely parallel (faint traces of a stridulatory apparatus are retained; Fig. 7a); the hindwings are extending beyond the apex of the hind femur, but not reaching the apex of the hind tibia (Fig. 7b). The structures of the anal plate and the paraprocts are unclear; the genital plate is not long, its apex is almost truncate; the genitalia with the epiphallus elongated, on its apex with pointed processes directed upwards, and with characteristic lower projections (ectoparameres) near the apex of the genitalia (Fig. 7f); the ampulla of the spermatophore, visible posteriorly of the genital plate, is round and light (Fig. 7f).

Measurements (mm): body length, 8.0–9.0; body length including wings, 11.0–12.0; pronotal length, 1.1–1.2; tegminal length, 6.8–7.0; hind femoral length, 5.2–5.5; hind tibial length, 4.0–4.2; hind basitarsal length, 1.2–1.3.

Comparison. The new species differs from all the other species of the genus (in which the males are known) in the faint traces of the stridulatory apparatus retained in the base of the dorsal part of the male tegmina and in the upper processes of the male epiphallus and/or the ectoparameres being not as narrow. It differs from *A. nigripennis* Chop., of which no males are known, in the larger number of longitudinal veins in the lateral field of the tegmen.

Remarks. The subfamily Pentacentrinae predominantly includes species occurring in tropical forest canopies and remains very poorly studied. It is therefore possible that the new species can be discovered among the modern African fauna.

Material. Holotype and paratype, ZIN, no. Afr. 4, an inclusion of an almost complete male, its structure is obscured by numerous cracks in the fossil resin; African copal; possibly Pleistocene.

Subfamily Trigonidiinae Brunner-Wattenwyl, 1873

Genus *Abanaxipha* Vickery et Poinar, 1994

This genus has been erected to include two species from Dominican amber, *A. longispina* Vick. et Poin. (type species) and *A. incongrua* Vick. et Poin. Each has been described for a single female (Vickery and Poinar, 1994). The first species differs from all the other representatives of the subfamily in the very long spines and spurs on its hind tibiae, as well as the rather long and almost straight ovipositor, illustrated by Vickery and Poinar (1994) as completely dissimilar from ovi-

Fig. 7. *Apentacentrus copalicus* sp. nov. (Gryllidae), holotype, African copal: (a) head, pronotum and base of right tegmen in dorsal view, (b) whole inclusion in lateral view, (c) hind leg in lateral view, (d) fore leg in lateral view, (e) maxillary palpus in lateral view; (f) apex of abdomen in lateral view. Scale bars (a–d), 1 mm; (e, f), 0.5 mm.

positors of Trigonidiinae. The new material for this species suggests that the above characters are diagnostic of *Abanaxipha*, along with two additional characters: the fore tibia with relatively small tympana (Fig. 8c) on both sides and the male tegmina with a partially reduced stridulatory apparatus (Fig. 8b). Additionally, it turned out that the ovipositor of *Abanaxipha*, although strongly different from ovipositors of all other genera of the subfamily, still has certain characteristics typical of Trigonidiinae, such as the weak and gradual expansion between its midlength and preapical part and the very poor serration on its apical part (Fig. 8g). The species *A. incongrua*, described incompletely based on highly incomplete remains, clearly does not belong to this genus because the armament of its hind tibiae is much shorter and, judging from the photograph of the holotype in the paper by Vickery and Poinar (1994), it is unlikely to belong in Trigonidiinae; its taxonomic position is obscure.

Abanaxipha longispina **Vickery et Poinar, 1994**

M a t e r i a l. NMNH no. 504374, Acc. 371428, Woodruff (collection reg.) 8820, an inclusion of a male with its left hind leg detached and preserved next to the rest of the specimen; NMNH no. 502562, Acc. 371428, Woodruff (collection reg.) 5329, an inclusion of the posterior part of a female body missing the very tip of the ovipositor and with only a single leg (right hind) preserved, which has the proximal part of its femur missing; Brodzinsky/Lopez-Penha Collection; Dominican amber; Miocene.

R e d e s c r i p t i o n (with description of the previously unknown male) (Figs. 4e, 4f, 8a–8g). The body is slender. The coloration is light, except a dark transverse band below the antennal pits, medially contiguous with a darkened spot on the upper part of the clypeus (Fig. 8a), the inner surfaces of the scapes slightly darkened, the lateral lobes of the pronotum dark except a wide light band in the lower portion of

Fig. 8. Gryllidae: (a–g) *Abanaxipha longispina* Vick. et Poin., Dominican amber: (a–e) male NMNH no. 504374: (a) head in anterior view, (b) head, pronotum, and right tegmen in dorsal view, (c) inner side of fore leg, (d) inner side of hind leg, (e) apex of abdomen in ventral view; (f, g) female NMNH no. 502562: (f) inner sides of hind tibia and tarsus, (g) ovipositor in lateral view; (h–j) *?Cyrtoxipha electrina* sp. nov., holotype, Dominican amber: (h) inner side of fore leg, (i) ovipositor in lateral view, (j) hind tibia and tarsus in dorsal view; (k, l) *C. illegibilis* sp. nov., holotype, Dominican amber: (k) genital plate in ventral view; (l) apex of abdomen in dorsal view; (m, n) *Baltonemobius fossilis* sp. nov., holotype, Baltic amber: (m) inner side of hind leg, (n) anterior half of body without legs, in dorsal view. Scale bars (a–n), 1 mm.

each lobe, four small dark markings on the pronotal disc, the tegmina with darkened lateral fields (with light veins standing out) and barely darkened areas in the dorsal fields (Fig. 8b), the visible parts of the hindwings darkened (but with light venation), slightly darkened spots on the fore and middle legs (approximately as in *P. ?latoca*), the hind femora with darkened apices, a slightly darkened spot in the middle of their inner surfaces, and numerous oblique stripes in the basal and middle portions of their outer surfaces,

and the abdominal tergites darkened. The head is typical of the subfamily, distinctly triangular anteriorly, with the antennae separated by a distance approximately equal to the scape width, the maxillary palpus with the 4th segment somewhat shorter than the rather long 3rd and 5th segments, the 5th segment conspicuously expanded distally. The pronotum is as wide as the head, distinctly narrows anteriorly (Fig. 8b). The legs are rather long and thin, but the hind femora are clearly of the jumping type; both tympana (the outer and the inner) are present, small, oval (Fig. 8c); the hind tibiae with three inner and four outer long spines (the inner spines are very long, the largest of them is 1.7 mm long in the male and 2.2 mm in the female) as well as two inner and three outer spurs (the outer spurs and one of the inner ones are not very long, and the upper is longest, 1.8 mm in male and 2.4 mm in female); the hind basitarsi without spines, their inner spur is rather long, approximately twice as long as the outer spur (Figs. 8d, 8f). The tegmina are reaching the tip of the abdomen, their lateral fields with parallel longitudinal veins (the transverse veins in these fields are very few), venation of the dorsal field of the male tegmen as in Fig. 8b; the hindwings are extending well beyond apices of the hind femora. The male genital plate is narrowing posteriorly, with the apical margin roundly truncate (Fig. 8e); the female ovipositor is rather narrow, barely curved, very slightly expanding towards its apex, which is finely serrated, at least along its upper margin (Fig. 8g).

Measurements (mm): male body length, 8.2; male body length including wings, 12.5; male pronotal length, 1.2; male tegminal length, 6.0; male hind femoral length, 6.1; male hind tibial length, 5.9, same of female, 6.8; male hind basitarsal length, 1.5, same of female, 1.8; length of the preserved part of ovipositor, 3.5 (estimated length of complete ovipositor, 3.7–3.8).

Genus *Cyrtoxipha* Brunner-Wattenwyl, 1873

Saussure (1878), who described both the type species of this genus, *C. gundlachi* Sauss., and the genus *Anaxipha* Sauss., differentiated these two modern Neotropical genera from one another by the presence in *Cyrtoxipha* of two tympana on each fore tibia (according to him, the fore tibia of *Anaxipha* bears only a single tympanum). Nevertheless, many subsequent authors included species with paired tympana into *Anaxipha* without providing an adequate, if any, justification of their actions. In most of these species male genitalia have not been studied or have been studied superficially. Unfortunately, for the classification of the modern Trigonidiinae genera this case is not an exception: most of it is badly convoluted and needs to be revised based on study of the male genitalia. The tentative placement of the two species described below in *Cyrtoxipha* is based on the presence or the likely presence of paired tympana on each of their front tibiae and the similarity of their general habitus to that of representatives of the above genera (slender, thin crickets with rather long legs and slightly swollen front tibiae). Additionally, the first species differs from *Abanaxipha* in most of its hind tibial spines and the upper inner hind tibial spur being significantly shorter (Fig. 8j), and the second species (for which these portions of legs are not preserved) differs from *Abanaxipha* in its shorter hind femora.

?Cyrtoxipha electrina Gorochov, sp. nov.

Etymology. From the Latinized Greek *electrinos* (pertaining to amber).

Holotype. NMNH no. 504374, Acc. 371428, Woodruff (collection reg.) 8820, Brodzinsky/Lopez-Penha Collection, an inclusion of a complete female; Dominican amber; Miocene.

Description (Figs. 4g, 8h–8j). The body is slender. The coloration is light, except for the darkened ovipositor, distal parts of the tarsi, and hind tibial spines. The head is wider than the pronotum, the distance between the antennae is approximately equal to the width of the scape, with the maxillary palpi only slightly longer than in *A. longispina*. The pronotum is slightly narrowing anteriorly. The fore tibiae are weakly inflated in the tympanal area; the outer and the inner tympana are rather large, oval (Fig. 8h); the hind tibiae each with three pairs of spines and five spurs, none of these being particularly long (the longest spine is the outer proximal one and the longest spur is the inner upper one, both approximately 1 mm long; Fig. 8j). The tegmina are narrow, with the longitudinal venation parallel in the dorsal and lateral fields (the dorsal field with five longitudinal veins, of which three central ones are slightly curved towards median in the distal half of the tegmen and are merging into the medial submarginal longitudinal vein); the lateral fields with few crossveins between longitudinal veins; the hindwings are extending well beyond apices of the hind femora. The ovipositor as in Fig. 8i (the genital plate was not observable).

Measurements (mm): body length, 7.5; body length including wings, 11.5; pronotal length, 1.0; tegminal length, 6.0; hind femoral length, 6.0; hind tibial length, 5.5; hind basitarsal length, 1.3; ovipositor length, 2.3.

Comparison. In the structure of the ovipositor (its upper contour with a pair of low, broadly convex prominences in the distal half, and its lower contour with a more or less bumplike prominence closer to the midlength of the ovipositor) the new species most closely resembles *C. tolteca* Sauss., but differs from it in the ovipositor being slender and by the abovementioned prominences being somewhat shifted into its distal part (Fig. 8i). Another enigmatic species of Trigonidiinae has been described from Dominican amber as *Anaxipha dominica* Vick. et Poin. It has been described without details on the structure of the tympana and with numerous errors. In particular, accord-

ing to the description, the length of the hind femur is 3.3 mm, that of the hind tibia, 2.6 mm, the basitarsus (apparently of the hind leg), 1.2 mm, and the ovipositor, 3.6 mm. Yet, it is clearly seen on the photograph of its holotype that the hind basitarsus length is approximately one-quarter of the hind tibia length and the ovipositor is much shorter than the hind femur (Vickery and Poinar, 1994: text-fig. 1). The new species differs from *A. dominica* in its nearly uniform light coloration and, if one trusts the measurements in the description of the latter species, by its significantly larger size (it must also be noted that the ovipositor of *?A. dominica* drawn by Vickery and Poinar does not match the photograph of that species in the same publication and does not resemble ovipositors of Trigonidiinae).

Material. Holotype.

?Cyrtoxipha illegibilis Gorochov, sp. nov.

Etymology. From the Latin *illegibilis* (not legible, obscure).

Holotype. NMNH no. 506712, Acc. D, Woodruff (collection reg.) 11585, Brodzinsky/Lopez-Penha Collection, an inclusion of a male missing its upper body surface, wings (only small remnants of the lateral fields of the tegmina are preserved), and distal halves of its hind legs; Dominican amber; Miocene.

Description (Figs. 8k, 8l). The shape of the body and its parts is similar to that of *?C. electrina* (the coloration is not preserved), but the body size is conspicuously smaller and the fore tibiae are slightly more swollen in their tympanal areas (the tympana are not visible, but the aforementioned swelling indicates their presence in this species). The genital plate (Fig. 8k) is not long, almost as long as wide, narrowing posteriorly, its apex is almost truncate; the shape of the anal plate is obscure; the genitalia with the epiphallus divided posteriorly by a deep and narrow median notch into two lobes with their posteromedial margins smooth and strongly convex, posterolateral angles narrow and drawn out posteriorly, and the lateral margins nearly straight (Fig. 8l).

Measurements (mm): body length, 5.3; hind femoral length, 4.5.

Comparison. The new species differs from *?C. electrina* in its significantly smaller size and slightly more inflated fore tibiae, from other similar species in its hind femora being not very long and/or in the unique shape of the male epiphallus (Fig. 8l), and from *?A. dominica* from Dominican amber in its hind femora being distinctly less shorter (additionally see comparative notes on the preceding species).

Material. Holotype.

Subfamily Nemobiinae Saussure, 1877

Genus *Baltonemobius* Gorochov, gen. nov.

Etymology. From *Baltic amber* and the generic name *Nemobius*.

Diagnosis (late-instar nymph). Eyes large; antennae separated by distance approximately equal to scape width; maxillary palpi typical of subfamily, with their terminal segment moderately expanding towards apex. Pronotum with disc weakly transverse, posterior margin of disc nearly straight (Fig. 8n); lateral lobes moderately high, with their lower margins more or less straight and slightly oblique. Legs rather robust, not long; hind femora clearly of jumping type, conspicuously longer than hind tibiae; hind tibiae each with three pairs of rather strong, but not long, spines and with five spurs (upper inner spur significantly longer than spines, yet not nearly reaching apex of basitarsus; middle inner spur only hardly than longest spine; outer spurs shorter than most spines, with middle outer spur being longest and almost as long as shortest of spines, and lower outer spur being shortest); hind basitarsus rather long, without denticles (Fig. 8m), with pair of apical spurs (inner one much shorter than outer one). Tegminal pads almost reaching posterior margin of metanotum; hindwing pads much longer, almost reaching posterior margin of first abdominal tergite (Fig. 8n), suggesting presence of long wings and ability to fly in adults. Abdomen relatively short (Fig. 4h).

Composition. Type species.

Comparison. The absence of the lower inner spur on the hind tibia and the relatively small length of the hind tibial spines put the new genus close to the tribes Burcini and Marinemobiini. At the same time, it differs from representatives of these tribes in the presence of tegmina and long hindwings possibly in both sexes. Although the two latter characters are unlikely to be diagnostic at the generic level, they preclude placement of this cricket into any of the known genera of these tribes. Moreover, the above tribes are diagnosed almost exclusively by the structure of the male genitalia. This is yet another reason why the tribal affinity of *Baltonemobius* remains obscure.

Baltonemobius fossilis Gorochov, sp. nov.

Etymology. From the Latin *fossilis* (fossil).

Holotype. ZIN no. Balt. 3, an inclusion of a late-instar female nymph missing its right hind tarsus; Baltic amber; Late Eocene.

Description (Figs. 4h, 8m, 8n). The coloration is rather light, with slightly darkened upper surfaces of the head and pronotum, dark markings on the tergites of the pterothorax and the abdomen, and slightly darkened lateral lobes of the pronotum; the coloration of legs is not preserved.

Measurements (mm): body length, 4.5; pronotal length, 0.8; hind femoral length, 2.5; hind

tibial length, 2.0; hind basitarsal length, 1.0; length of nymphal ovipositor, 0.7.

M a t e r i a l. Holotype.

ACKNOWLEDGMENTS

The author thanks curators of fossil insect collections, Dr. A. Ross (NHM) and Dr. C. Labandeira (NMNH), and the private collector A. Krylov (Kaliningrad, Russia) for making the material available for study.

This work was supported by grants from the Program of the Presidium of the Russian Academy of Sciences "Origin and Evolution of the Biosphere," the Russian Foundation for Basic Research (project no. 07-04-00540a), and a short-term visitor grant from the Smithsonian Institution (2005).

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