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New parasitic wasps from Baltic amber (Insecta: Hymenoptera: Dryinidae)

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With 56 Figures

Summary

Four new species of the parasitic wasp family Dryinidae, *Dryinus reifi* n. sp., *Dryinus muenchi* n. sp., *Dryinus wunderlichi* n. sp., and *Palaeodryinus groehni* n. gen. n. sp., are described from Baltic amber. These new species belong to the widespread and diverse subfamily Dryininae. A neotype is designated for *Harpactosphecion gracile* (Brues, 1933b) comb. nov. which was originally described in the extant genus *Thaumatodryinus* and is here transferred to the fossil genus *Harpactosphecion* within Dryininae, just like *Harpactosphecion*? *deletum* (Brues, 1933b) comb. nov. The spelling of the names of the species here attributed to the genus *Harpactosphecion* is changed to *gracile*, *deletum*, *filicorne*, and *sucinum* in accordance with Art. 30 IRZN. New specimens of *Dryinus bruesi* (Olmi, 1984), *Dryinus janzeni* Olmi, 1999b, *Harpactosphecion filicorne* (Brues, 1923), and *Palaeoanteon janzeni* Olmi, 1999b are figured, and a new subfamily Palaeoantoninae n. subf. is established because of the new evidence. The fossil subfamily Laberitinae Olmi, 1989 is regarded as unavailable taxon since the type genus *Laberites* Ponomarenko, 1988 is not available either. Updated keys to the subfamilies of Dryinidae, the genera of Dryininae, and all dryinid species from Baltic amber are provided, as well as an annotated catalogue of all fossil Dryinidae.

Zusammenfassung

Vier neue Arten der parasitischen Wespenfamilie Dryinidae, *Dryinus reifi* n. sp., *Dryinus muenchi* n. sp., *Dryinus wunderlichi* n. sp. und *Palaeodryinus groehni* n. gen. n. sp., werden aus dem Baltischen Bernstein beschrieben. Diese neuen Arten gehören zu der weitverbreiteten und diversen Unterfamilie Dryininae. Ein Neotypus wird für *Harpactosphecion gracile* (Brues, 1933b) comb. nov. festgelegt, die ursprünglich in der rezenten Gattung *Thaumatodryinus* beschrieben wurde und hier zu der fossilen Gattung *Harpactosphecion* innerhalb der Dryininae gestellt wird, genauso wie *Harpactosphecion*? *deletum* (Brues, 1933b) comb. nov. Entsprechend Art. 30 IRZN wird die Schreibweise der Namen der hier zur Gattung *Harpactosphecion* gestellten Arten in *gracile*, *deletum*, *filicorne* und *sucinum* geändert. Neue Exemplare von *Dryinus bruesi* (Olmi, 1984), *Dryinus janzeni* Olmi, 1999b, *Harpactosphecion filicorne* (Brues, 1923) und *Palaeoanteon janzeni* Olmi, 1999b werden abgebildet, und eine neue Unterfamilie Palaeoantoninae n. subf. wird aufgrund der neuen Erkenntnisse errichtet. Die fossile Unterfamilie Laberitinae Olmi, 1989 wird als nicht verfügbares Taxon erkannt, da die Typusgattung *Laberites* Ponomarenko, 1988 ihrerseits nicht verfügbar ist. Aktualisierte Bestimmungsschlüssel zu den Unterfamilien der Dryinidae, den Gattungen der Dryininae und

allen Dryinidenarten im Baltischen Bernstein werden vorgestellt; desgleichen ein kommentierter Katalog aller fossilen Dryinidae.

1. Introduction

Dryinidae is a highly specialized family of chrysidoid Hymenoptera (the sistergroup is Embolemidae), with world-wide distribution, including about 36 genera and 1401 species in 10–11 subfamilies (OLMI, 1999a). The larvae of these small wasps are parasitoids of immature and adult planthoppers (Auchenorrhyncha; mainly Cicadellidae, Delphacidae, Flatidae, Membracidae, and Issidae). These hosts are grasped by the female wasp with its highly modified fore tarsi that each bear a curious chela formed by a lateral outgrowth of the fifth tarsomere and one enlarged claw (such a chela is plesiomorphically absent only in the most basal subfamily Aphelopinae).

All known fossil representatives of Dryinidae are preserved in amber (KEILBACH, 1982; SPAHR, 1987; DARLING & SHARKEY, 1990; CARPENTER, 1992; OLMI, 1984, 1994, 1999b), with the possible exceptions of *Baissobius* sp. from the Lower Cretaceous of Transbaikalia and Mongolia (RASNITSYN 1975, 1980; POMOMARENKO 1981a,b) and a fossil wasp from the Lower Cretaceous Crato Formation of Brazil that was preliminarily classified as Sphecidae – Ampulicinae by DARLING & SHARKEY (1990) who briefly discussed the alternative possibility of its dryinid affinities. Recently, *Baissobius* was regarded as an Embolemidae by RASNITSYN (1996).

Indisputable Mesozoic Dryinidae are known from one species from Lower Cretaceous Lebanese amber (OLMI, 1999b), one species from Upper Cretaceous amber of Medicine Hat/Canada (PONOMARENKO, 1981a, 1981b), and two species from Upper Cretaceous amber of Taymyr/Siberia (PONOMARENKO, 1975c, 1981a, 1981b; ZHERIKHIN, 1978: 83).

Tertiary Dryinidae are known from an undescribed species from French amber (ZHERIKHIN 1978: 72), one species from Mexican amber (HURD, SMITH & DURHAM 1962: 110; OLMI, 1995: 260–262), eleven species from Dominican amber (CURRADO & OLMI, 1983; POINAR 1992, 1999; OLMI, 1987, 1989, 1995, 1998a, 1998b), and thirteen species from Baltic amber (BRUES 1933a: 397; BRUES 1933b: 146, 169; ANDER 1942: 27; HAUPT 1944: 90–94; BACHOFEN-ECHT 1949: 132; PONOMARENKO 1975a: 126, 1975b: 124, 1988a: 108, 1988b: 106; LARSSON 1978: 136, 187; OLMI 1984, 1994, 1999b; ROHDENDORF 1991: 520; POINAR 1992: 201; WEITSCHAT & WICHARD 1998: 178, 186). Finally, there was a subfossil specimen reported from copal (HANDLIRSCH 1925: 252). POINAR (1992: fig. 140; 1999: fig. 140) and OLMI (1995: fig. V; 1999b: fig. 17) featured three pieces of Dominican amber and one piece of Baltic amber that each contain a small planthopper (Auchenorryncha: Fulgoroidea, Flatidae, and Cicadellidae) that is parasitized by a dryinid larva.

In this work we describe four new species of the dryinid subfamily Dryininae from adult female specimens in Baltic amber. The subfamily Dryininae was previously recorded from Baltic, Dominican, Canadian, and Siberian amber with 24 fossil species and 2 exclusively fossil genera (*Cretodryinus* and *Harpactosphecion*), and today is widespread with 5 extant genera with 265 extant species. Their larvae are parasitoids of a variety of fulgoromorph cicadas, which are also known from Baltic amber.

We also figure and briefly describe several new female specimens of already known species, and provide updated determination keys as well as a taxonomical catalogue of all described fossil Dryinidae in amber (see Appendix).

Methods

All drawings were made with camera lucida on a Wild M5 binocular microscope, and the photos have been made with a Canon 35 mm SLR camera on a Wild M5 binocular microscope with photo tube. The anatomical terminology is based on OLMI (1984–1999).

2. Systematic Palaeontology

Class Insecta LINNAEUS, 1758 (= Hexapoda LATREILLE, 1825)
Pterygota BRAUER, 1885
Order Hymenoptera LINNAEUS, 1758
Superfamily Chrysidoidea LATREILLE, 1802
Family Dryinidae HALIDAY, 1833
Subfamily Dryininae? HALIDAY, 1833

Genus *Dryinus* LATREILLE, 1804

Dryinus muenchi n. sp.
Figs 1–2

Holotype: Female specimen no. SMNS BB-2372 in the amber collection of the Staatliches Museum für Naturkunde Stuttgart, Germany.
Type locality: Baltic.
Type horizon: Eocene (40–50 mybp), Baltic amber (Succinite).
Derivation of name: Named after Mr RAINER MÜNCH (biologist and pedagogue) who acquired specimen no. SMNS 2369 of *Harpactosphecion filicorne* (described below) for the Dept. "Museumspädagogik" at SMNS and donated this interesting fossil to the amber collection of the palaeontological department of this museum.
Male: unknown.
Hosts: unknown.

Diagnosis (female). – This species is distinguished by the following combination of characters in the female sex: Complete notauli; pronotum not humped, without a disc, with a transverse impression; antennae more than three times as long as head; antennal segment 3 less than twice as long as segment 4; antennal segment 1 slightly longer than segment 2; segment 5 of fore tarsus slightly longer than segment 1.

Description. – Fully winged; length 5 mm; colour apparently black, with legs, palps, antennae and gaster brown-testaceous; antennae 10-segmented, long and slender, apparently covered with dense short hairs, slightly thickened distally; antennal rhinaria visible only in 9th and 10th segment, because the previous segments are not distinctly visible; in 10th segment two rhinaria are visible, whereas one rhinarium is present in 9th segment; antennal segments in the following proportions: 8:6:23:16:14:9:10:8:8:11; antennae shorter than body, more than three times as long as head (length of head dorsally measured from occipital carina behind the ocelli to distal apex of mandibles): approximately 116:36 = 3.22; head ventrally and dorsally visible, but the ventral side is completely covered with mould; frons apparently granulated, whereas the sculpture of the other region of head is not visible; clypeus visible,

Fig. 1. *Dryinus muenchi* n. sp., ♀ holotype SMNS BB-2372, dorsal view. Without scale.

Fig. 2. *Dryinus muenchi* n. sp., ♀ holotype SMNS BB-2372, ventral view. Without scale.

but it is not possible to see if the anterior margin of the clypeus is rounded or emarginated, because this region is covered with mould; mandibles not visible because covered with mould; occipital carina probably complete, but visible only on dorsal side of head, laterally do not reaching the eyes; occiput excavated; eyes normally bulging; ocellar triangle distinctly visible; POL = 4; OL = 3; OOL = 10; TL = 3; posterior ocelli touching the occipital carina; frontal line complete; pronotum crossed by an anterior strong transverse impression between anterior collar and disc; disc slightly humped; posterior collar very short; pronotum apparently shiny, hairy, strongly punctate, shorter than head (20:35); pronotal tubercles apparently reaching the tegulae; scutum apparently dull, hairy, granulated and strongly punctate, as long as pronotum (20:20); notauli complete, posteriorly separated; minimum distance between the notauli slightly shorter than antennal segment 2 (7:9); scutellum shorter than scutum (12:20), apparently strongly punctured; metanotum and propodeum not visible, because they are hidden under the wings; shape of pronotum, scutum and scutellum usual for Dryininae; forewing apparently completely darkened, with the usual venation of Dryininae; pterostigma narrow, much longer than broad (30:7); marginal cell open; distal part of stigmal vein longer than proximal part (25:17); stigmal vein slightly S-shaped, apparently forming an angle between proximal and distal parts; forewing with the usual three basal cells clearly enclosed by pigmented veins (costal, median and submedian cells); hindwing apparently hyaline, not darkened; hindwing shape usual for Dryininae; front leg segments in the following proportions: 24 (coxa): 19 (trochanter): 40 (femur): 30 (tibia): 23 (tarsal segment 1): 3 (tarsal segment 2): 5 (tarsal segment 3): tarsal segment 4 not visible: 26 (tarsal segment 5); enlarged claw slightly shorter than tarsal segment 5 (24:26); fore trochanters slender and long, very curved, with a long proximal stalk; the distal broadened region usually present in Dryininae is not visible; segments 2 and 3 of fore tarsus produced into hooks; rudimentary claw present; arolium much shorter than enlarged claw (5:24); inner side of the enlarged claw not visible, so that it is not possible to see if there are teeth, lamellae or bristles; distal apex of enlarged claw not spatulate; inner side of segment 5 of fore tarsus not visible, so that it is not possible to see the lamellae; distal apex of segment 5 with a group of numerous lamellae (at least 10); mid leg segments in the following proportions: 12 (coxa): 9 (trochanter): 33 (femur): 26(tibia): 23 (tarsal segment 1): 10 (tarsal segment 2): 7 (tarsal segment 3): 4 (tarsal segment 4): 5 (tarsal segment 5); hind leg segments in the following proportions: coxa not visible: 9 (trochanter): 45 (femur): 50 (tibia): 24 (tarsal segment 1): 12 (tarsal segment 2): 9 (tarsal segment 3): 5 (tarsal segment 4): 7 (tarsal segment 5); petiole not visible; maxillary palps apparently with 6 segments; labial palps not visible; length and breadth of wings usual for Dryininae; shape and morphology of the body usual for Dryininae; tibial spur formula 1, 1, 2.

Systematic position. – The distal apex of the enlarged claw is not distinctly visible, so that it is impossible to include this species in one of the two species groups, *collaris* and *gryps*. Nevertheless, this species is different from the other known species of *Dryinus* from Baltic amber.

In the *gryps* group there are 3 fossil species: *janzeni* Olmi, *bruesi* (Olmi) and *balticus* (Olmi). This specimen cannot be *D. janzeni* because that species has incomplete notauli, whereas in this specimen the notauli are complete. For the shape of the pronotum this specimen resembles *D. bruesi* (the pronotum is humped, with a distinct disc and two transverse impressions; the anterior and posterior collar are dis-

tinct; the posterior collar is very short (Fig. 664 B in OLMI, 1984)). In *D. balticus* the pronotum is different: It is not humped, without disc, only with a transverse impression between the anterior and posterior collar (Fig. 665 A in OLMI, 1984). However, this specimen is not a *D. bruesi*, because the antennae are longer (in *D. bruesi* the antennae are less than three times as long as head: 122:50; in this specimen the antennae are more than three times as long as head: 116:36). In conclusion, in the *gryps* group this specimen should be a new species.

In the *collaris* group 3 fossil species are known: *D. vetus* (BRUES), *D. mortuorum* (BRUES) and *D. reifi* n. sp. However, *D. vetus* is different, because in that species the antennal segment 3 is approximately twice as long as segment 4, whereas in this specimen the antennal segment 3 is less than twice as long as segment 4 (1.43). For this character, this specimen resembles *D. mortuorum* and *D. reifi*. In this specimen it is impossible to observe the character used to separate *D. mortuorum* and *D. reifi* (subapical tooth of the enlarged claw more distant from the distal apex in *D. mortuorum*; subapical tooth of the enlarged claw nearer the distal apex in *D. reifi*), because the distal apex of the enlarged claw is not visible. For this reason it is necessary to look at other characters. The antennal segment 1 is approximately twice as long as segment 2 in *D. reifi* (15:7), whereas in *D. mortuorum* it is slightly longer (9:6), as in this specimen (8:6). In addition, the fifth segment of fore tarsi is almost twice as long as segment 1 in *D. reifi* (43:23), whereas in *D. mortuorum* it is slightly shorter (26:28) and in this specimen is slightly longer (26:23). This specimen should be very different from *D. reifi* and similar to *D. mortuorum*. There are no significant differences in the antennal length of *D. mortuorum* and this specimen: The antennae / head ratio is 120:40 = 3 in *D. mortuorum* and 116:36 = 3.22 in this specimen, thus very similar. Apparently the best difference is in the fore tarsi, in spite of the impossibility to see distinctly all segments; however the first and fifth segment are distinct.

Dryinus reifi n. sp.

Figs 3–7

Holotype: Female specimen no. SMNS BB-2370 in the amber collection of the Staatliches Museum für Naturkunde Stuttgart, Germany. The specimen was purchased 1998 by Prof. Dr H.-U. PFRETZSCHNER (Tübingen) from a Polish trader at a flea market in Kaiserslautern, and then kindly donated to SMNS.

Type locality: Baltic (Gdansk, Poland?). It is unknown, whether this piece of amber was originally found in Poland (Bay of Gdansk) or in Russia (Palmnicken). However, the colour, the presence of so-called "white cloudy matter" around the inclusion, and the presence of stellate hairs from oak trees, clearly indicates that this piece is genuine Baltic amber.

Type horizon: Eocene (40–50 mybp), Baltic amber (Succinite).

Derivation of name: Named in honour of the palaeontologist Prof. Dr WOLF-ERNST REIF (Tübingen), the thesis-supervisor of the second author.

Male: unknown.

Hosts: unknown.

Diagnosis (female). – This species is distinguished by the following combination of characters in the female sex: Antennal segment 3 less than twice as long as segment 4 and with the only subapical tooth of the enlarged claw situated very near the distal apex.

Description. – Fully winged; length 7.50 mm; colour apparently brown; antennae 10-segmented, long and slender, apparently covered with very short and dense hairs, slightly thickened distally; antennal rhinaria apparently present on segments

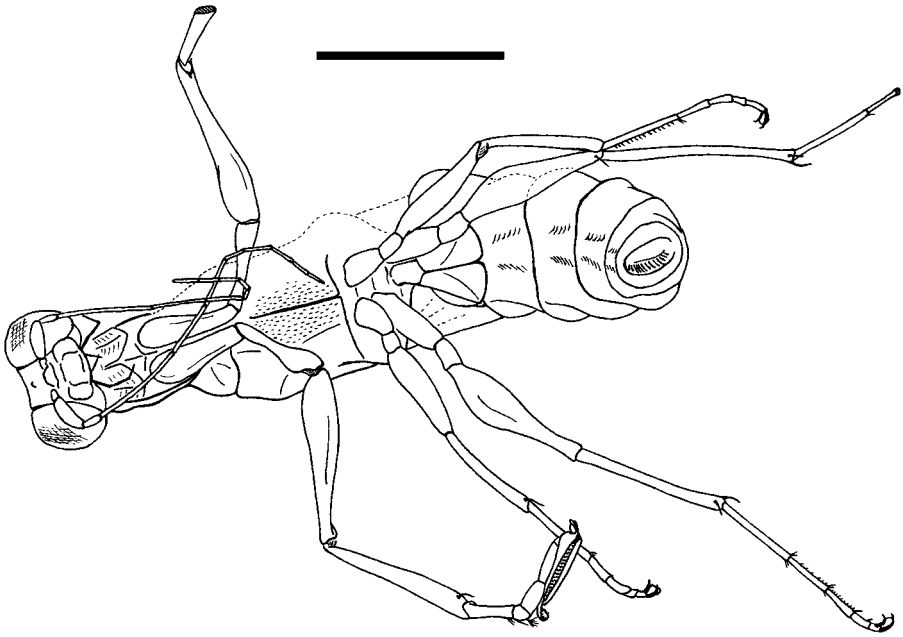

Fig. 3. *Dryinus reifi* n. sp., ♀ holotype SMNS BB-2370. Scale 2 mm.

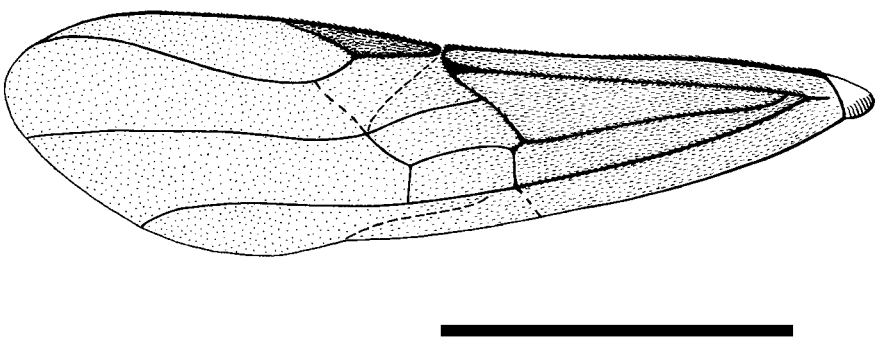

Fig. 4. *Dryinus reifi* n. sp., ♀ holotype SMNS BB-2370, left forewing. Scale 2 mm.

6–10 (2 rhinaria on segment 10; 1 rhinarium on each of the segments 6–9); however, the antennal segment 5 is not completely distinct; antennal segments in the following proportions: 15:7:46:29:15:8:7:9:9:11; antennae much shorter than body, almost four times as long as head (length of head dorsally measured from occipital carina behind the ocelli to distal apex of mandibles): 156:41; head slightly convex; the sculpture of the head is not visible, because the head is covered with the so-called "white cloudy matter" (in German "Phlom"), which is probably mould; because of the presence of this mould the shape of the clypeus and mandibles is not visible and it is not possible to see the occipital carina and the occiput; eyes normally bulging; ocelli not visible among the mould, so that it is not possible to measure POL, OL, OOL,

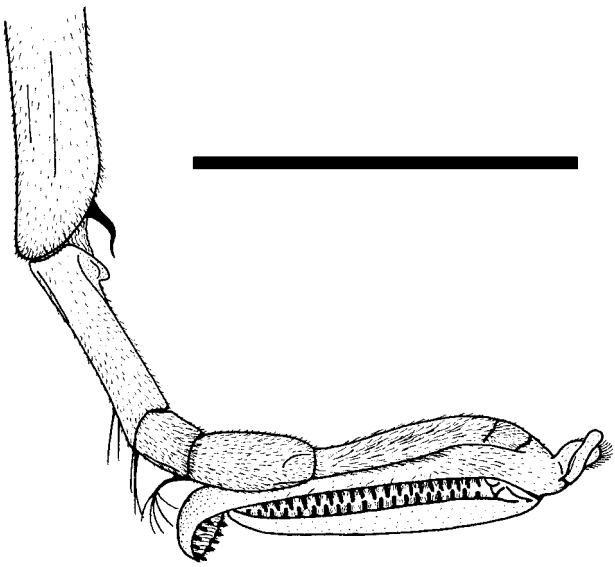

Fig. 5. *Dryinus reifi* n. sp., ♀ holotype SMNS BB-2370, right fore tarsal chela. Scale 1 mm.

OPL and TL; frontal line not visible among the mould; pronotum completely covered with the mould; however, it is possible to see that it is crossed by an anterior strong transverse impression between anterior collar and disc; disc slightly humped; posterior collar very short; the sculpture of the pronotum is not visible because of the mould; pronotum apparently slightly longer than head (44:41); pronotal tubercles not reaching the tegulae; the sculpture of the scutum is not visible because the scutum is completely covered with the mould; scutum much shorter than pronotum (28:44); notauli not visible among the mould; scutellum and metanotum not visible, because they are completely covered with mould; propodeum not visible, because it is hidden behind the darkened wings; shape of pronotum and scutum usual for Dryininae; forewing completely darkened, with the usual venation of Dryininae; pterostigma narrow, much longer than broad (40:6); marginal cell apparently open, but almost closed; distal part of stigmal vein much longer than proximal part (50:11); stigmal vein not S-shaped, forming an angle between proximal and distal parts; forewing with the usual three basal cells clearly enclosed by pigmented veins (costal, median and submedian cells); fading veins are visible in the remaining distal region of the forewing; hindwing not visible, because hidden under the forewing; forewing shape usual for Dryininae; front leg segments in the following proportions: 46 (coxa): 40 (trochanter): 80 (femur): 70 (tibia): 23 (tarsal segment 1): 5 (tarsal segment 2): 13 (tarsal segment 3): 22 (tarsal segment 4): 43 (tarsal segment 5); enlarged claw slightly shorter than tarsal segment 5 (37:43); fore trochanters slender and long, curved, with a long proximal stalk, broadened more distally than the half-way; fore trochanters approximately four times as long as broad (40:10) (maximum breadth measured on the distal club); segments 2 and 3 of fore tarsus produced into hooks; rudimentary claw present; arolium much shorter than enlarged claw (5:37); enlarged claw with 1 subapical tooth and with a row of 15 lamellae; subapical tooth of en-

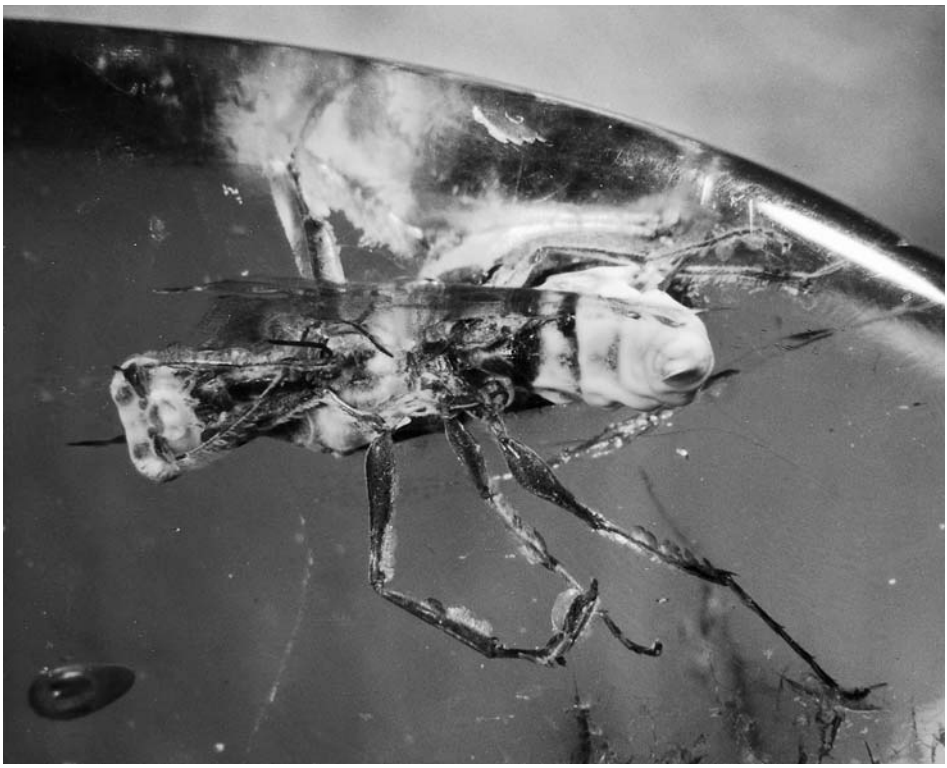

Fig. 6. *Dryinus reifi* n. sp., ♀ holotype SMNS BB-2370, ventral view. Without scale.

larged claw large, long and pointed, situated very near the distal apex of the enlarged claw; distal apex of enlarged claw not spatulate; segment 5 of fore tarsus with two rows of lamellae (it is not possible to count the number of lamellae; however, they are at least 17, distributed on all length); distal apex of segment 5 with a group of lamellae (it is not possible to count the number); mid leg segments in the following proportions: 16 (coxa): 12 (trochanter): 45 (femur): 48 (tibia): 36 (tarsal segment 1): 14 (tarsal segment 2): 10 (tarsal segment 3): 6 (tarsal segment 4): 8 (tarsal segment 5); hind leg segments in the following proportions: 28 (coxa): 13 (trochanter): 65 (femur): 70 (tibia): 39 (tarsal segment 1): 23 (tarsal segment 2): 16 (tarsal segment 3): 8 (tarsal segment 4): 8 (tarsal segment 5); petiole shape and length usual for Dryininae; maxillary palps with 6 segments; labial palps with 3 segments; length and breadth of wings usual for Dryininae; shape and morphology of the body usual for Dryininae; tibial spur formula 1, 1, 2.

Systematic position. – The palp formula is 6/3: In the holotype the palps are only partly visible; however the right maxillary palp clearly shows 4 segments and in all *Dryinidae* the maxillary palps are geniculated after the first 2 segments and the first 2 segments are very small; for this reason, always the distal part of the palps is visible after the geniculation; if 4 segments are visible, one has to add the first 2 segments to calculate the total number of segments. A similar situation is present also in labial palps which always have a geniculation after the first segment; after this genic-

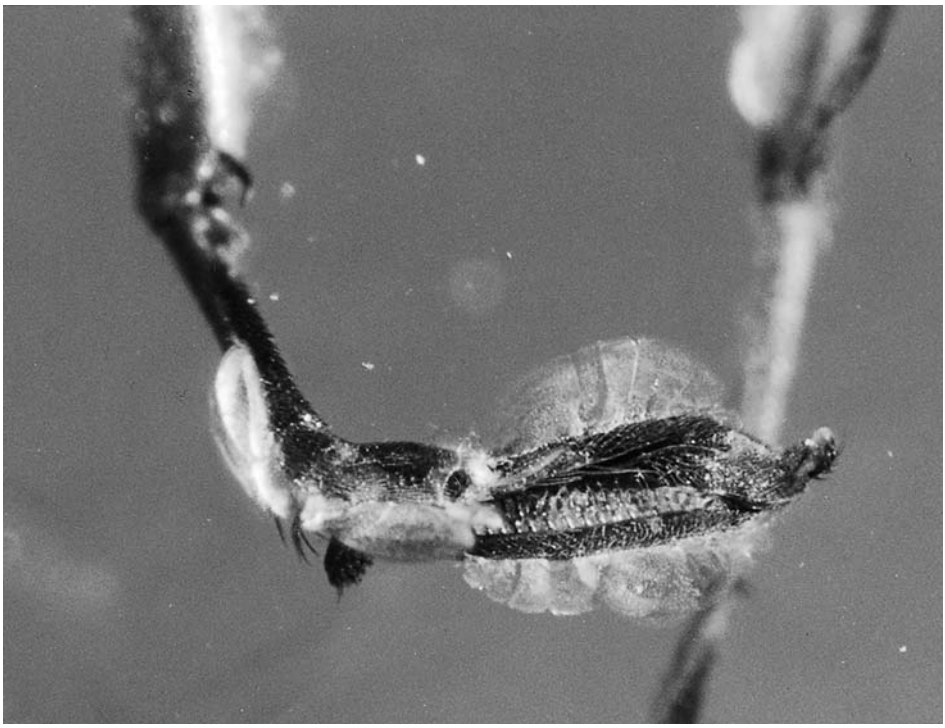

Fig. 7. *Dryinus reifi* n. sp., ♀ holotype SMNS BB-2370, fore tarsal chela. Without scale.

ulation there can be 1 or 2 distal segments; in the holotype of *D. reifi* only one long segment is visible; when a labial segment is so long and so protruding, the distal part of the labial palps is generally composed of 2 segments and the labial palps have totally 3 segments. In the key to the genera of the females of Dryininae, there are two only genera with palpal formula 6/3, viz *Dryinus* and *Megadryinus*. However, *Megadryinus* has the enlarged claw much longer than fore tibia, so that the holotype of *D. reifi* cannot be a *Megadryinus*, while it fits perfectly into the genus *Dryinus*.

After the key of BRUES (1933), *D. vetus* (which we have not seen) must be a different species because the third antennal segment is approximately twice as long as segment 4, whereas in *D. reifi* the third segment is 1.58 times as long as segment 4. This ratio is similar to that of *D. mortuorum*. However, in *D. mortuorum* the subapical tooth is more distant from the distal apex, while in *D. reifi* this tooth is very near the distal apex.

The other Baltic amber species of *Dryinus*, *D. bruesi* (OLMI) and *D. balticus* (OLMI), belong to a different group of species, the *gryps* group, whereas *D. reifi* clearly belongs to the *collaris* group, because of the presence of 1 only subapical tooth in the enlarged claw and the absence of a broad distal lamella. *D. bruesi* has no subapical teeth and *D. balticus* has a row of 5 subapical teeth. Because of these characters *D. bruesi* and *D. balticus* belong to the *gryps* group.

Dryinus wunderlichi n. sp.
Figs 8–10

Holotype: Female specimen no. SMNS BB-2373 in the amber collection of the Staatliches Museum für Naturkunde Stuttgart, Germany.
Type locality: Baltic.
Type horizon: Eocene (40–50 mybp), Baltic amber (Succinite).
Derivation of name: Named after Mr JÖRG WUNDERLICH (Straubenhardt) who donated the type specimen to SMNS.
Male: unknown.
Hosts: unknown.

Diagnosis (female). – This species is distinguished by the following combination of characters in the female sex: Scutum sculptured by numerous oblique longitudinal keels, with antennal segment 3 approximately twice as long as segment 4 and with antennal segment 5 about nine times as long as thick.

Systematic position. – Because of the notauli and the presence of a subapical tooth in the enlarged claw, *Dryinus wunderlichi* belongs to the *collaris* group. In this group other three fossil species are known: *D. vetus* (BRUES), *D. mortuorum* (BRUES) and *D. reifi* n. sp. However, *D. wunderlichi* is similar to *D. vetus*, because the antennal segment 3 is approximately twice as long as segment 4 (in *D. reifi* and *D. mortuorum* the antennal segment 3 is less than twice as long as segment 4). From *D. vetus* the new species may be distinguished for the scutum sculptured by numerous oblique and longitudinal keels (the scutum is smooth in *D. vetus*) and for the length of the antennal segment 5 (it is about nine times as long as thick, whereas in *D. vetus* it is about three times as long as thick).

Description. – Fully winged; length 6.68 mm; colour apparently black, with antennae, mandibles and legs brown; antennae 10-segmented, long and slender, apparently covered with very short and dense hairs, slightly thickened distally; antennal rhinaria apparently present on segments 6–10 (2 rhinaria on segment 10; 1 rhinarium on each of the segments 6–9); however, the antennal segment 5 is not completely distinct; antennal segments in the following proportions: 12:6:43:21.5:16:10:9:9:8:9; antennae much shorter than body, approximately 3.5 times as long as head (length of head dorsally measured from occipital carina behind the ocelli to distal apex of mandibles): 143.5:41; head slightly excavated; the sculpture of the head is not completely distinct; however a few longitudinal and irregular keels are visible on the sides of the ocellar triangle and along the frontal line; apparently the head is granulated and rugose near the antennal toruli; eyes normally bulging; posterior ocelli not visible, because the posterior region of the head is hidden under a large air bubble, so that it is not possible to measure POL, OL, OOL, OPL and TL; only the anterior ocellus is distinctly visible; frontal line present in front of the anterior ocellus; however, it is not possible to see if the frontal line is complete or incomplete, because it is partly hidden under the antennae; clypeus anteriorly not emarginated; mandibles not completely visible, so that the number of teeth is not visible; occipital carina visible only in the ventral side of the head, not visible in the dorsal side, because of the air bubble covering the posterior region of the head; for this reason it is not possible to see if the occipital carina is complete or incomplete; pronotum crossed by an anterior and a posterior strong transverse impression, between disc and respectively anterior and posterior collar; disc slightly humped; posterior collar very short; pronotum apparently smooth, punctate and without sculpture among the punctures; pronotum shorter than head (31:41); pronotal tubercles reaching the tegulae; scutum

Fig. 8. *Dryinus wunderlichi* n. sp., ♀ holotype SMNS BB-2373, dorsal view. Without scale.

Fig. 9. *Dryinus wunderlichi* n. sp., ♀ holotype SMNS BB-2373, ventral view. Without scale.

shiny, sculptured by numerous longitudinal and oblique keels; scutum much shorter than pronotum (20:31); notauli composed of many punctures, incomplete, reaching approximately 0.80 length of scutum; scutellum shorter than scutum (13:20); scutellum shiny, rugose; metanotum shorter than scutellum (7:13); the sculpture of the metanotum is not visible, because the metanotum is hidden under an antenna and air bubbles; propodeum shorter than head (37:41), reticulate rugose; the posterior surface of the propodeum is not visible because it is hidden by the wings; shape of pronotum and scutum usual for Dryininae; forewing apparently partly darkened, with the usual venation of Dryininae; pterostigma narrow, much longer than broad (40:6); marginal cell apparently open, but almost closed; distal part of stigmal vein much longer than proximal part (41:8); stigmal vein not S-shaped, forming an angle between proximal and distal parts; forewing with the usual three basal cells clearly enclosed by pigmented veins (costal, median and submedian cells); fading veins are visible in the remaining distal region of the forewing; hindwing partly visible, because hidden under the forewing; forewing shape usual for Dryininae; front leg segments in the following proportions: 40 (coxa): 33 (trochanter): 48 (femur): 48 (tibia): 23 (tarsal segment 1):21 (tarsal segment 4): 36 (tarsal segment 5); front tarsal segments 2 and 3 not distinctly visible; enlarged claw slightly shorter than tarsal segment 5 (30:36); fore trochanters slender and long, curved, with a long proximal stalk, broadened more distally than the half-way; fore trochanters approximately 4.5 times as long as broad (33:7) (maximum breadth measured on the distal club); rudimentary claw present; arolium much shorter than enlarged claw (6:30); enlarged claw with a large subapical tooth and a row of 10 lamellae; distal apex of enlarged claw not spatulate; segment 5 of fore tarsus with two rows of lamellae (it is not possible to count the number of lamellae; however, they are numerous and distributed on all

Fig. 10. *Dryinus wunderlichi* n. sp., ♀ holotype SMNS BB-2373, fore tarsal chela. Without scale.

length); distal apex of segment 5 with a group of lamellae (it is not possible to count the number); mid leg segments in the following proportions: 18 (coxa): 8 (trochanter): 38 (femur): 44 (tibia): 27 (tarsal segment 1): 12 (tarsal segment 2): 7 (tarsal segment 3): 4 (tarsal segment 4): 7 (tarsal segment 5); hind leg segments in the following proportions: 24 (coxa): 10 (trochanter): 50 (femur): 65 (tibia): 21 (tarsal segment 1): 16 (tarsal segment 2): 12 (tarsal segment 3): 5.5 (tarsal segment 4): 9 (tarsal segment 5); petiole shape and length usual for Dryininae; maxillary palps with 6 segments; labial palps with 3 segments; length and breadth of wings usual for Dryininae; shape and morphology of the body usual for Dryininae; tibial spur formula 1, 1, 2.

According to the above considerations the following new key to the females of the fossil species of Palaearctic *Dryinus* can be proposed (excl. *Dryinus muenchi* n. sp. which cannot be assigned to one of the following two groups):

1 Enlarged claw with 1 subapical tooth, never with a broad distal lamella (Fig. 486 in OLMI, 1984) ..... *collaris* (L.) group
2 Enlarged claw without subapical tooth (Fig. 685 in OLMI, 1984), or with at least 2 subapical teeth (Fig. 676 in OLMI, 1984); rarely with only 1 subapical tooth, but in this case with a very broad distal lamella (Fig. 674 in OLMI, 1984) ..... *gryps* (REINHARD) group

collaris group (females)

1 Antennal segment 3 approximately twice as long as segment 4 2
– Antennal segment 3 less than twice as long as segment 4 3
2 Scutum smooth, except at anterior corners where it is punctate and reticulate rugose; antennal segment 5 about three times as long as thick ..... *vetus* (BRUES)
– Scutum sculptured by numerous oblique longitudinal keels; antennal segment 5 about nine times as long as thick ..... *wunderlichi*
3 Subapical tooth of the enlarged claw more distant from the distal apex ..... *mortuorum* (BRUES)
– Subapical tooth of the enlarged claw nearer the distal apex ..... *reifi* n. sp.

gryps group (females)

1 Notauli incomplete reaching approximately 0.66 length of scutum ..... *janzeni* OLMI
– Notauli complete, posteriorly separated 2
2 Pronotum humped, with a distinct disc and two transverse impressions (Fig. 664 B in OLMI, 1984); anterior and posterior collar distinct; posterior collar very short ..... *bruesi* (OLMI)
– Pronotum not humped, without disc, only with a transverse impression between anterior and posterior collar (Fig. 665 A in OLMI, 1984) ..... *balticus* (OLMI)

Genus *Palaeodryinus* n. gen.

Type species: *Palaeodryinus groehni* n. sp., by present designation.
Derivation of name: After "palaeo" and the genus *Dryinus*.

Diagnosis (female). – See type species, since monotypic.

Palaeodryinus groehni n. sp.

Figs 11–14

Holotype: Female specimen no. 4302 (old no. 1228 in coll. GRÖHN) in the amber collection of the Geologisches und Paläontologisches Institut der Universität Hamburg, Germany.
Type locality: Baltic.
Type horizon: Eocene (40–50 mybp), Baltic amber (Succinite).
Derivation of name: Named after the collector Mr CARSTEN GRÖHN (Glinde) who declared in will that this specimen of his collection will be inherited to the GPI in Hamburg.
Male: unknown.

Fig. 11. *Palaeodryinus groehni* n. gen. n. sp., ♀ holotype GPI 4302. Without scale.

Fig. 12. *Palaeodryinus groehni* n. gen. n. sp., ♀ holotype GPI 4302, head. Without scale.

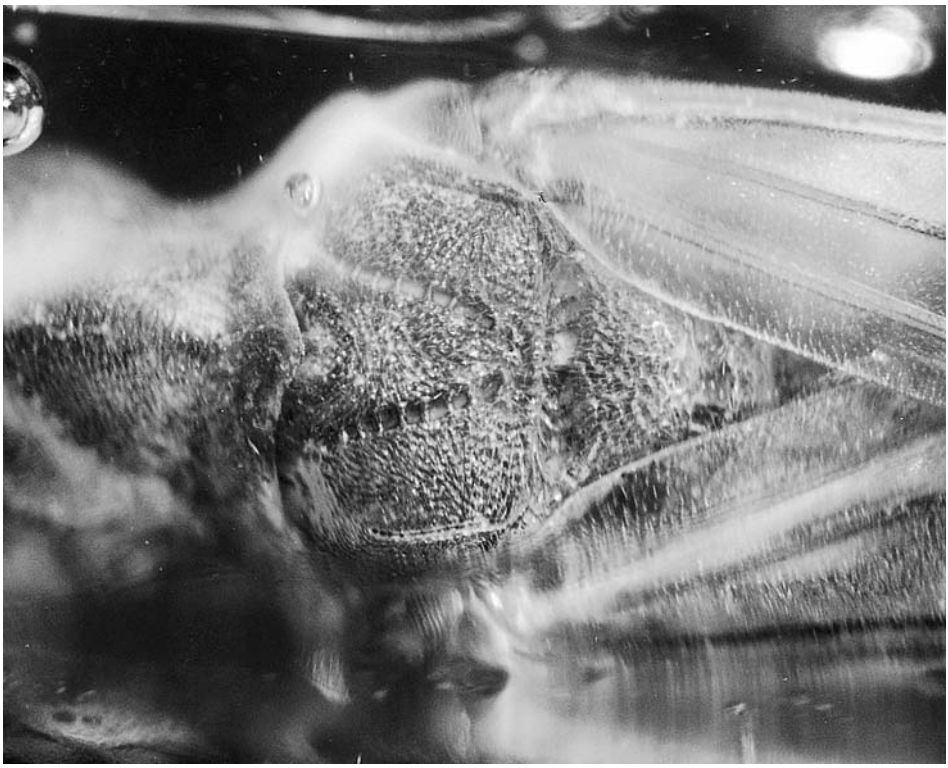

Fig. 13. *Palaeodryinus groehni* n. gen. n. sp., ♀ holotype GPI 4302, dorsal view of thorax. Without scale.

Hosts: unknown.

Diagnosis (female). – Fully winged; large (body length nearly 10 mm); forewing with costal, median and submedian cells distinctly enclosed by pigmented veins and with distal part of stigmal vein much longer than proximal part; antennae without tufts of long hairs on segments 5–10; ocelli present; occipital carina complete; pronotum with a distinct anterior collar and a posterior disc separated by a transverse impression; disc of pronotum swollen; fore trochanters long and slender; epicnemium visible; fore tarsus chelate; enlarged claw not spatulate; segment 5 of fore tarsus more than 6 times as broad as enlarged claw; median leg with a tibial spur.

Description. – Fully winged; length 9.81 mm; colour apparently testaceous, with antennae darkened, except for bright segments 9–10; antennae 10-segmented, short and slender, covered with dense and short hairs, slightly thickened distally; antennal rhinaria not visible, because only the proximal half of the antennae is distinctly visible; antennal segments in the following proportions: 10:4:24:11:7:6:5:4:4:6; antennae much shorter than body, approximately 4.5 times as long as head (length of head dorsally measured from occipital carina behind the ocelli to distal apex of mandibles): 81:18; head flat, dull, hairy, and apparently granulated; clypeus hairy, with anterior margin rounded, not bidentate; mandibles with 4 teeth successively larger from anterior to posterior tooth; occipital carina complete, laterally not reaching the eyes; occiput excavated; eyes normally bulging; POL = 3; OL = 5; OOL = 17; OPL = 2.5; TL

= 2; frontal line absent; in place of the frontal line there is a longitudinal median slender furrow; on the sides of this furrow there are two oblique longitudinal keels forming a V; the two branches of the V begin on the sides of the anterior ocellus and meet in the centre of the frons; distal of this junction they continue forming a single keel almost reaching the clypeus; vertex behind the ocelli with two short keels connecting the posterior ocelli with the occipital carina; propleura prominent and dorsally visible between the head and pronotum; pronotum long, crossed by an anterior strong transverse impression, with a posterior disc, a posterior little transverse impression, and a short posterior collar; pronotum hairy, dull, apparently with anterior collar granulated and disc sculptured by numerous transverse keels, slightly longer than head (22:18); disc of pronotum swollen, longer than anterior collar (12:3.5); pronotal tubercles reaching the tegulae; scutum dull, hairy, completely reticulate rugose, much shorter than pronotum (13:22); notauli incomplete, reaching approximately 0.9 length of scutum; scutellum dull, hairy, reticulate rugose, and much shorter than scutum (6:13); metanotum dull, rugose, shorter than scutellum (3:6); propodeum slightly longer than scutum (16:13), with dorsal surface shorter than posterior surface (10:18); dorsal surface of propodeum sculptured by numerous large areolae; posterior surface of propodeum with two complete longitudinal keels; lateral areas sculptured by numerous large areolae; the median area is not distinctly visible, but it appears to be smooth; mesopleura and metapleura dull, rugose; epicnemium visible; shape of head, scutum, scutellum, metanotum and propodeum usual for Dryininae; forewing with two dark transverse bands, with the usual venation of Dryininae; pterostigma long and narrow, much longer than broad (15:3); shape of pterostigma usual for Dryininae; marginal cell open; stigmal vein slightly S-shaped; distal part of stigmal vein much longer than proximal part (18:6); stigmal vein rounded, not forming an angle between proximal and distal parts; forewing with the usual three basal cells clearly enclosed by pigmented veins (costal, median and submedian cells); hindwing not visible; fore leg segments in the following proportions: 18 (coxa): 18 (trochanter): 35 (femur): (tibia not visible): (tarsal segment 1 not visible): 2 (tarsal segment 2): 3 (tarsal segment 3): 9 (tarsal segment 4): 13 (tarsal segment 5); enlarged claw slightly shorter than tarsal segment 5 (10:13); fore trochanters long and slender, slightly curved, with a long proximal stalk, more than five times as long as broad (18:3); shape of trochanters usual for Dryininae; segment 3 of fore tarsus produced into a hook; rudimentary claw and arolium not visible because the arolium area is hidden; enlarged claw not spatulate, slightly curved; inner side of the enlarged claw showing numerous hairs, apparently without lamellae; the chela is closed so that it is not possible to see if there is a subapical tooth; however, apparently the subapical tooth is absent; distal apex of enlarged claw pointed; segment 5 of fore tarsus very broad, "sole-shaped", with tens of lamellae beginning in the proximal third and present without interruption until the distal apex; mid leg segments in the following proportions: 7(coxa): 5 (trochanter): 22 (femur): 27 (tibia): 15 (tarsal segment 1): 6 (tarsal segment 2): 3 (tarsal segment 3): 2 (tarsal segment 4): 5 (tarsal segment 5); hind leg segments in the following proportions: 15 (coxa): 5 (trochanter): 30 (femur): 31 (tibia); tarsal segments not visible; petiole shape and length usual for Dryininae; maxillary palps with 6 segments; labial palps not visible; shape, length and breadth of wings usual for Dryininae; shape and morphology of the body usual for Dryininae; tibial spurs 1, 1, 1 (however, the distal apex of hind tibiae is not distinctly visible so that it is not possible to exclude that there are two tibial spurs).

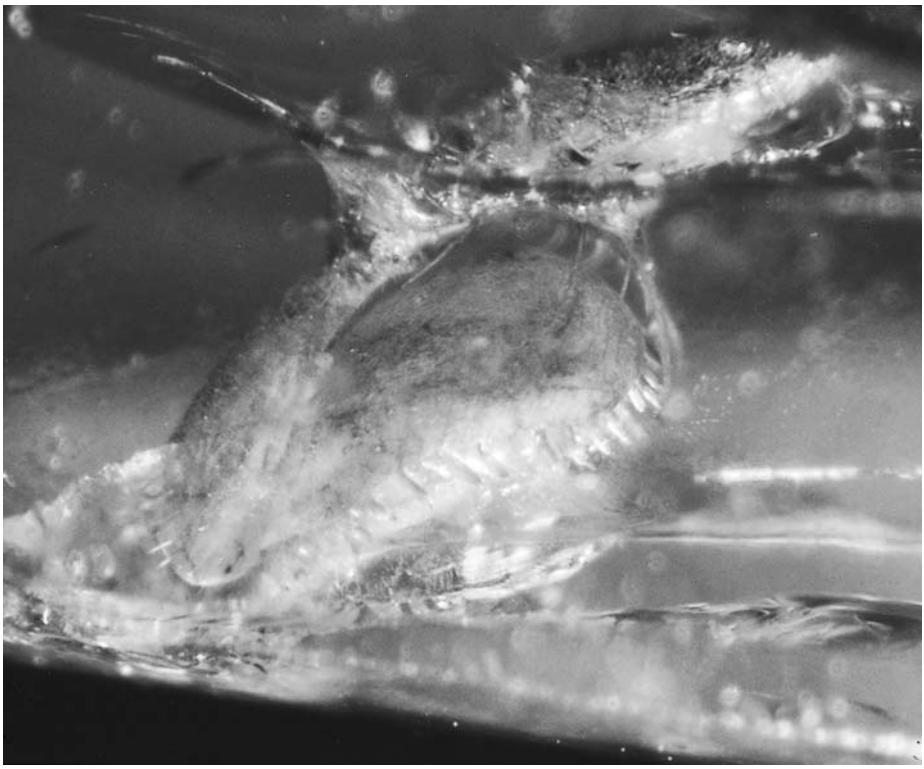

Fig. 14. *Palaeodryinus groehni* n. gen. n. sp., ♀ holotype GPI 4302, fore tarsal chela. Without scale.

Systematic position. – In the only known specimen of this species it is not possible to see if the rudimentary claw is present or absent, so that it is difficult to include this species in the key to the subfamilies of Dryinidae. However, the presence of a distinct epicnemium, very slender and long fore trochanters, very long pterostigma, swollen disc of pronotum and three basal cells of forewing distinctly enclosed by pigmented veins suggest that this species belongs to Dryininae subfamily. Of course only the finding of a further specimen with visible rudimentary claw may confirm this attribution.

In the key to Dryininae genera the palpal formula is very important. However, in the only known specimen of this species, only the maxillary palps are visible and distinctly composed of 6 segments; on the other hand, the labial palps are not visible, so that it is very difficult to attribute this species to a known genus of Dryininae. However, the absence of tufts of long hairs in the antennal segments 5–10 permit to exclude that this species is a *Thaumatodryinus*.

The main diagnostic morphological character of this species is the very large segment 5 of fore tarsus. It is indeed very extraordinary, being more than six times as broad as the enlarged claw. Furthermore, segment 5 of fore tarsus is approximately twice as thick as segment 4. At last the inner side of segment 5 of fore tarsus shows several dozens of lamellae that cover completely the surface. A similar "sole-shaped" segment 5 of fore tarsus is unknown from any other dryinids. Because of this unique

autapomorphic character this species may be attributed to a new genus within Dryininae.

Genus *Harpactosphecion* HAUPT, 1944

Revised diagnosis. – This genus is distinguished from all other fossil and extant genera by the following combination of characters (female): Female fully winged, with chelate fore tarsi and raptorial habitus; forewing with 3 basal cells clearly enclosed by pigmented veins; maxillary palps with 5–6 segments; labial palps with 2–3 segments; fore legs with trochanters more than twice as long as broad; chela with rudimentary claw; antennae long and slender, without tufts of long hairs, with segment 3 more than five times as long as segment 2; notauli complete; scutum never sculptured by numerous and parallel longitudinal keels; enlarged claw with two subapical teeth.

Taxonomical note. – The spelling of the names of the species here attributed to the genus *Harpactosphecion* (viz *gracilis*, *deletus*, *filicornis*, and *sucinus*) is changed to *gracile*, *deletum*, *filicorne*, and *sucinum* in accordance with Art. 30 IRZN, because sphecion is a Greek word with neuter gender.

New updated key to the genera of Dryininae (females):

1 Antennae with tufts of long hairs on segments 5–10 (Fig. 19 in OLMI, 1984) . . . . . *Thaumatodryinus* PERKINS
– Antennae without tufts of long hairs (Fig. 529 in OLMI, 1984) 2
2 Segment 5 of fore tarsus more than 6 times as broad as enlarged claw (Fig. 14) . . . . . *Palaeodryinus* n. gen.
– Segment 5 of fore tarsus less than twice as broad as enlarged claw (Figs 529, 660 in OLMI, 1984) 3
3 Palp formula 6/3 4
– Palp formula different 6
4 Enlarged claw much longer than fore tibia (Fig. 660 in OLMI, 1984) . . . . . *Megadryinus* RICHARDS
– Enlarged claw as long as, or shorter than fore tibia (Fig. 529 in OLMI, 1984) 5
5 Antennae very long and slender, with segment 3 more than five times as long as segment 2; notauli complete; scutum never sculptured by numerous and parallel longitudinal keels . . . . . *Harpactosphecion* HAUPT
– Antennae shorter and less slender, with segment 3 not more than five times as long as segment 2; occasionally antennal segment 3 more than five times as long as segment 2; in this case the notauli may be complete, but then the scutum is completely sculptured by numerous and parallel longitudinal keels . . . . . *Dryinus* LATREILLE
6 Enlarged claw without subapical teeth (Fig. 47 D in OLMI, 1989) . . . . *Gonadryinus* OLMI
– Enlarged claw with 1–2 subapical teeth (Fig. 70 E in OLMI, 1989; Fig. 10 in OLMI, 1999b) 7
7 Enlarged claw with 1 subapical tooth (Fig. 70 E in OLMI, 1989). . . . *Pseudodryinus* OLMI
– Enlarged claw with 2 subapical teeth (Fig. 10 in OLMI, 1999b) . *Harpactosphecion* HAUPT

The above key does not include the fossil genus *Cretodryinus* PONOMARENKO, because the only known specimen is not sufficiently preserved to see the distinguishing generic characters.

Harpactosphecion gracile (BRUES, 1933)

Figs 15–22

Neotype (Figs 15–20): Female specimen no. 1138–2 in the amber collection of Mr HANS WERNER HOFFEINS (Hamburg, Germany), who has declared in will that this specimen will be

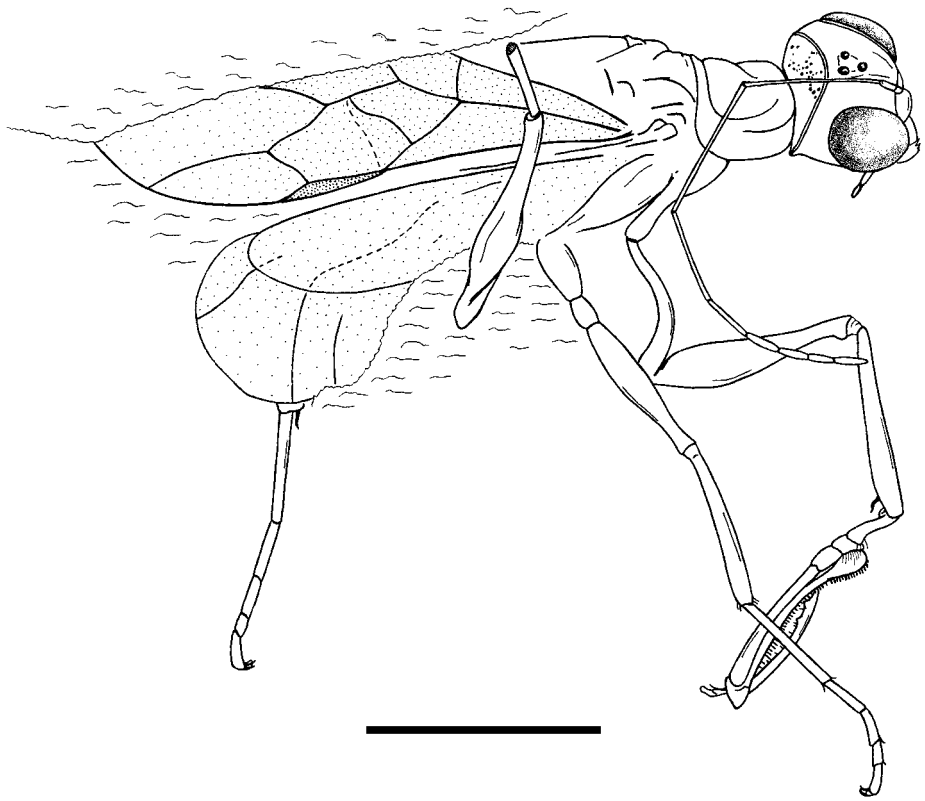

Fig. 15. *Harpactosphecion gracile* (BRUES, 1933), ♀ neotype no. 1138–2, coll. HOFFEINS. Scale 2 mm.

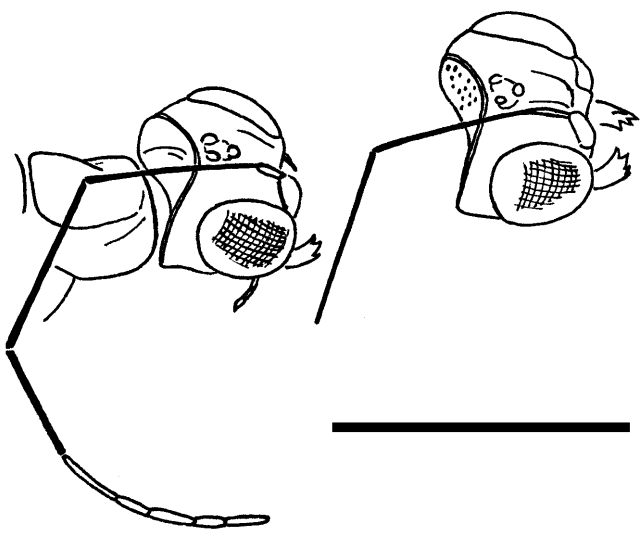

Fig. 16. *Harpactosphecion gracile* (BRUES, 1933), ♀ neotype no. 1138–2, coll. HOFFEINS, head. Scale 2 mm.

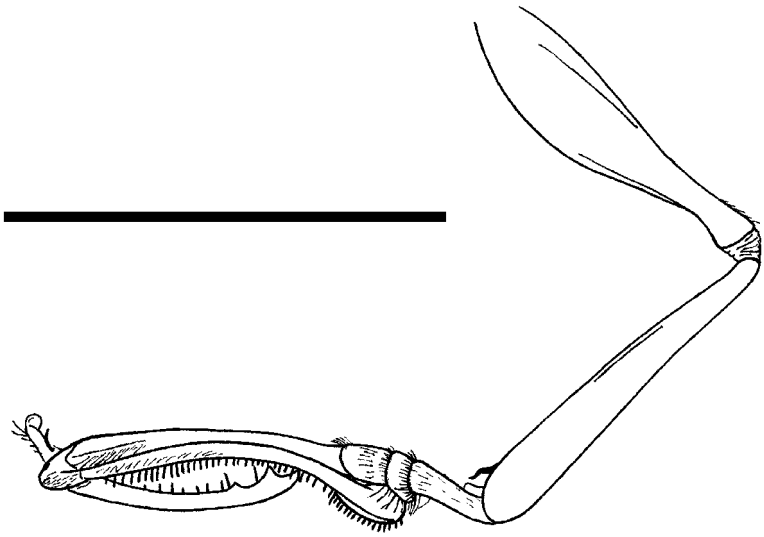

Fig. 17. *Harpactosphecion gracile* (BRUES, 1933), ♀ neotype no. 1138–2, coll. HOFFEINS, fore tarsal chela. Scale 2 mm.

Fig. 18. *Harpactosphecion gracile* (BRUES, 1933), ♀ neotype no. 1138–2, coll. HOFFEINS. Without scale.

Fig. 19. *Harpactosphecion gracile* (BRUES, 1933), ♀ neotype no. 1138–2, coll. HOFFEINS, head and thorax. Without scale.

donated to the Entomological Institute in Eberswalde (Germany). The holotype was in the Königsberg amber collection, but has to be regarded as lost (see Appendix).

Type locality: Baltic.

Type horizon: Eocene (40–50 mybp), Baltic amber (Succinite).

Male: unknown.

Hosts: unknown.

Revised diagnosis (female). – This species is distinguished from the other species of the genus *Harpactosphecion* by the following combination of characters in the female sex: Antennal segment 4 approximately as long as segment 3 and with antennal segments 8 and 9 approximately same length.

Redescription (neotype). – Fully winged; length 6.37 mm; colour apparently black, with chela brown; antennae 10-segmented, long and slender, covered with dense and short hairs, slightly thickened distally; antennal rhinaria present on segments 5–10 (2 rhinaria on segment 10; 1 rhinarium on each of the segments 5–9); antennal segments in the following proportions: 10:6:49:51:32:18:13:10:8:12; antennae slightly shorter than body, approximately five times as long as head (length of head dorsally measured from occipital carina behind the ocelli to distal apex of mandibles): 210:42; head slightly convex, dull and punctate, covered with dense and short hairs; clypeus not distinctly visible, because covered with mould; mandibles with only two teeth visible, the others being hidden under mould; occipital carina

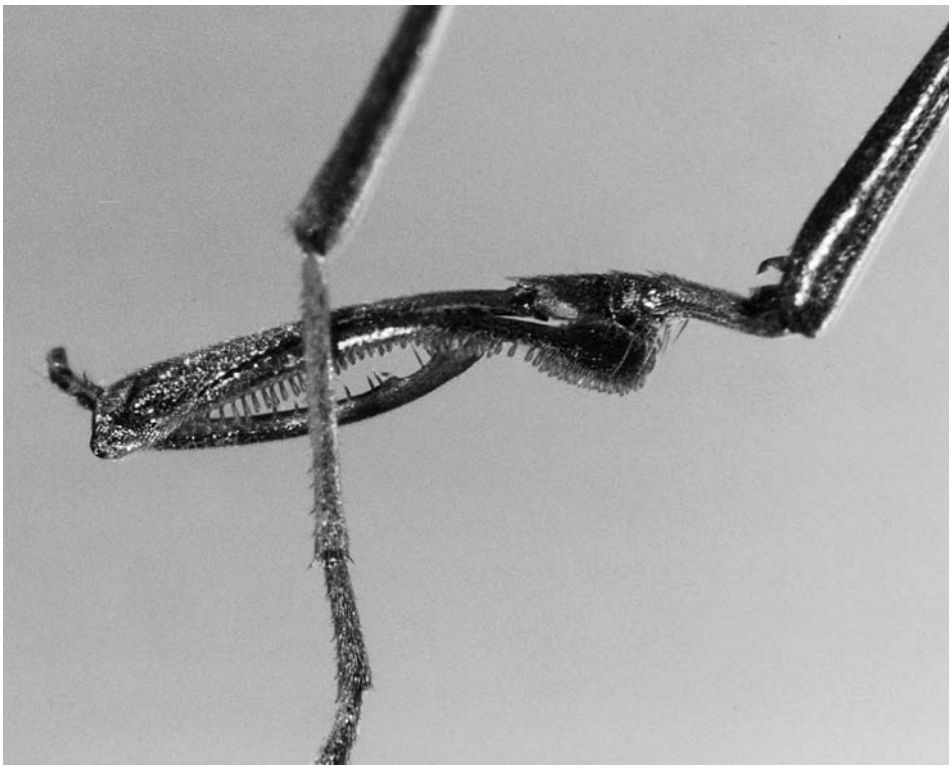

Fig. 20. *Harpactosphecion gracile* (BRUES, 1933), ♀ neotype no. 1138–2, coll. HOFFEINS, fore tarsal chela. Without scale.

complete, laterally not reaching the eyes; occiput excavated; eyes normally bulging; POL = 2; OL = 2.5; OOL = 13; OPL = 2; TL = 8; frontal line complete; pronotum crossed by an anterior strong transverse impression between anterior collar and disc; disc slightly humped; posterior collar very short; pronotum apparently shiny, punctate, without sculpture among punctures, apparently shorter than head (35:42); pronotal tubercles reaching the tegulae; scutum apparently shiny, punctate, without sculpture among punctures, covered with short hairs, much shorter than pronotum (25:35); notauli complete, posteriorly separated; minimum distance between the notauli slightly longer than antennal segment 2 (7:6); scutellum shorter than scutum (15:25), punctate, apparently without sculpture among the punctures; metanotum shorter than scutellum (11:15), not distinctly visible, because hidden by the wings; propodeum not visible, because hidden by the wings; shape of pronotum, scutum, scutellum and metanotum usual for Dryininae; forewing apparently completely darkened, with the usual venation of Dryininae; pterostima narrow, much longer than broad (37:6); marginal cell not completely visible, so that it is not possible to see if it is open or closed; distal part of stigmal vein longer than proximal part (the length of the distal part is not distinctly valuable, because it is not completely visible; however, the distal part is much longer than proximal part (40:18); stigmal vein not S-shaped, forming an angle between proximal and distal parts; forewing with the usual three basal cells clearly enclosed by pigmented veins (costal, median and submedi-

Fig. 21. *Harpactosphecion gracile* (BRUES, 1933), ♀ specimen no. 3011, coll. GRÖHN. Without scale.

Fig. 22. *Harpactosphecion gracile* (BRUES, 1933), ♀ specimen no. 3011, coll. GRÖHN, fore tarsal chela. Without scale.

an cells); hindwing apparently darkened as the forewing; hindwing shape usual for Dryininae; front leg segments in the following proportions: 46 (coxa): 47 (trochanter): 75 (femur): 62 (tibia): 16 (tarsal segment 1): 5 (tarsal segment 2): 12 (tarsal segment 3): 48 (tarsal segment 4): 70 (tarsal segment 5); enlarged claw shorter than tarsal segment 5 (70:55); fore trochanters slender and long, very curved, with a long proximal stalk, broadened more distally than the half-way; fore trochanters approximately 6,2 times as long as broad (47:7,5)(maximum breadth measured on the distal club); segments 2 and 3 of fore tarsus produced into hooks; rudimentary claw present; arolium much shorter than enlarged claw (10:55); enlarged claw with 2 subapical teeth and with a row of 11 lamellae; subapical teeth of enlarged claw large, long and pointed; distal apex of enlarged claw not spatulate; segment 5 of fore tarsus with two rows of lamellae (8 proximal + approximately 31 distributed on all length); distal apex of segment 5 with a group of approximately 98 lamellae; mid leg segments in the following proportions: 18 (coxa): 14 (trochanter): 60 (femur): 51 (tibia): 36 (tarsal segment 1): 16 (tarsal segment 2): 10 (tarsal segment 3): 7 (tarsal segment 4): 10 (tarsal segment 5); hind leg segments in the following proportions (coxa and trochanter not visible): 65 (femur): 91 (tibia): 34 (tarsal segment 1): 19 (tarsal segment 2): 13 (tarsal segment 3): 8 (tarsal segment 4): 11 (tarsal segment 5); petiole shape and length usual for Dryininae; maxillary palps 5-segmented; labial palps not visible; shape, length and breadth of wings usual for Dryininae; shape and morphology of the body usual for Dryininae; fore and mid tibiae with 1 distal spur; distal spurs of hind tibiae not visible, because the distal extremity of the hind tibiae is hidden by dirt.

Systematic position. – The female holotype of this species is probably lost; however, the present new specimen completely agrees with the original description of BRUES (1933) and therefore it is here designated as neotype. Because of the general habitus, the shape of the antennae, the presence of two subapical teeth on the enlarged claw and the complete occipital carina this species can be attributed to the genus *Harpactosphecion*.

Harpactosphecion filicorne (BRUES,1923) emend.

Figs 23–35

New specimens: Female specimens no. SMNS BB-2369 (Figs 23–26) and SMNS BB-2374 (Fig. 27) in the amber collection of the Staatliches Museum für Naturkunde Stuttgart, Germany; female specimen without number (Figs 28) in coll. JENS-WILHELM JANZEN, Seevetal, Germany; female specimen without number (Figs 29–35) in coll. JÖRG WUNDERLICH, Straubenhardt, Germany.

Locality: Baltic.

Horizon: Eocene (40–50 mybp), Baltic amber (Succinite).

Male: unknown.

Hosts: unknown.

Revised diagnosis (female). – This species is distinguished from the other species of the genus *Harpactosphecion* by the following combination of characters in the female sex: Antennal segment 4 approximately 1.3 times as long as segment 3, and with antennal segment 8 being 1.1–1.2 times as long as segment 9.

Redescription (female). – See OLMI (1999b).

Remarks. – We examined the neotype and believe that specimen SMNS BB-2369 is also belonging to *H. filicorne*, in spite of the following differences to the original description that could be observed:

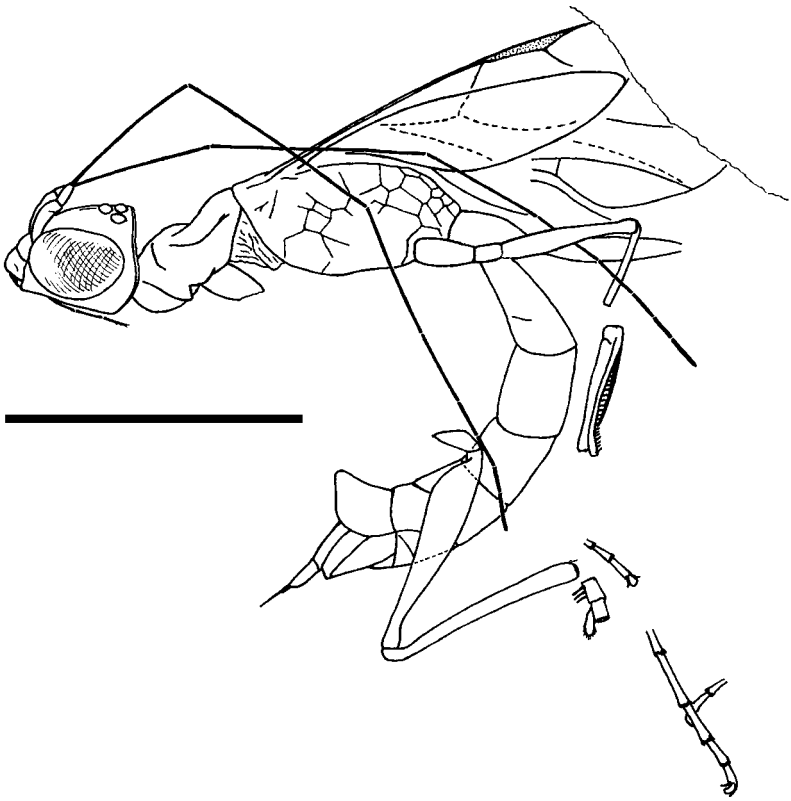

Fig. 23. *Harpactosphecion filicorne* (BRUES, 1923), ♀ specimen no. SMNS BB-2369. Scale 2 mm.

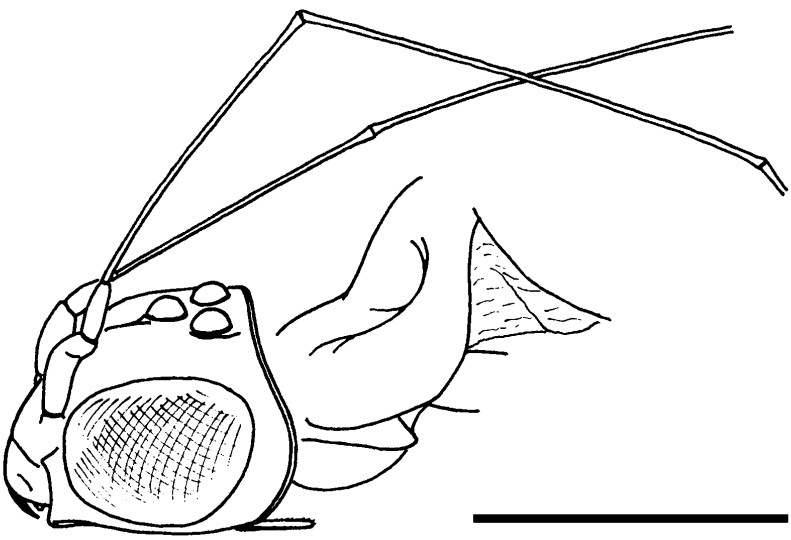

Fig. 24. *Harpactosphecion filicorne* (BRUES, 1923), ♀ specimen no. SMNS BB-2369, head. Scale 1 mm.

Fig. 25. *Harpactosphecion filicorne* (BRUES, 1923), ♀ specimen no. SMNS BB-2369, fore tarsal chela. Scale 1 mm.

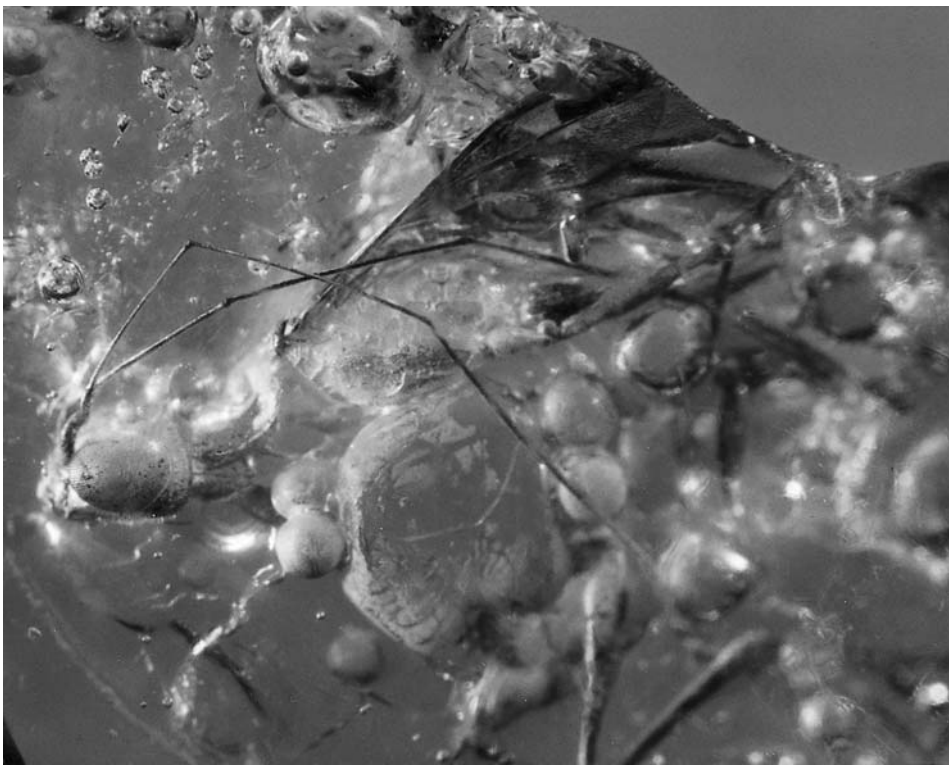

Fig. 26. *Harpactosphecion filicorne* (BRUES, 1923), ♀ specimen no. SMNS BB-2369. Without scale.

1. The frons is slightly convex (instead of slightly concave); however, the frons is also slightly convex in the *H. filicorne* specimens in coll. JANZEN and coll. LAGING.

2. The gaster appears to be more slender and longer, so that the antenna seems not to exceed the body in length; however, the gaster of this specimen is broken and incomplete, so that this character state is dubious; we measured the head : antenna ratio, and in the other specimens of *H. filicorne* the antenna is approximately 7 times as long as head, while in this specimen the antenna is approximately 7.33 times as long as head; we believe that this difference is too small to be important.

Fig. 27. *Harpactosphecion filicorne* (BRUES, 1923), ♀ specimen no. SMNS BB-2374. Without scale.

3. The enlarged claw has only five short lamellae (= teeth), but two subapical teeth, as in the other specimens of *H. filicorne*; the number of lamellae of the enlarged claw is 7–8 in the other specimens of *H. filicorne*; however, this difference is not important in Dryinidae, because this number may vary.

Furthermore, the ratio between the antennal segments 4 and 3 is 62:46; this means that the fourth antennal segment is 1.34 times as long as segment 3; in his key to the fossil species of *Thaumatodryinus* (= *Harpactosphecion*), BRUES (1933) wrote that in *H. filicorne* the fourth antennal segment is almost one half longer than third, whereas in *H. deletum* and *H. gracile* the fourth antennal segment is as long as third. This also suggests that this specimen, with its 1.34 ratio, indeed is a *H. filicorne*. The few minor differences do not justify the description of a new species for this specimen.

Fig. 28. *Harpactosphecion filicorne* (BRUES, 1923), ♀ specimen without number, coll. JANZEN (not the neotype!). Without scale.

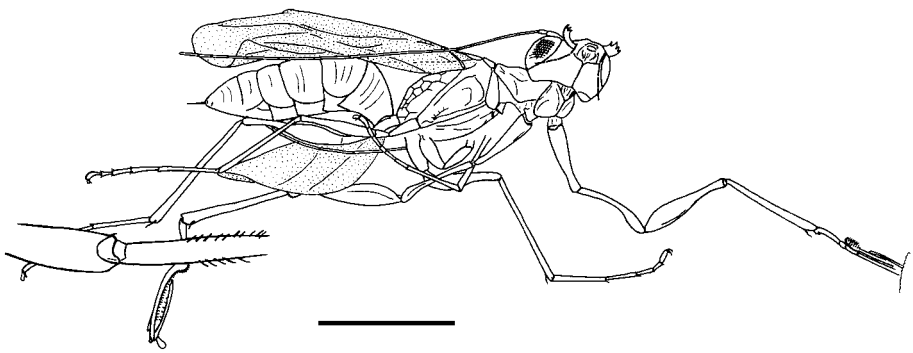

Fig. 29. *Harpactosphecion filicorne* (BRUES, 1923), ♀ specimen without number, coll. WUNDERLICH. Scale 2 mm.

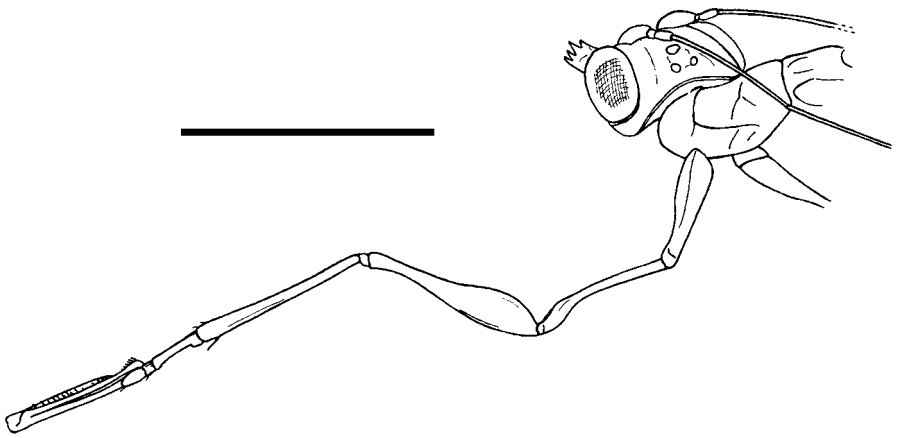

Fig. 30. *Harpactosphecion filicorne* (BRUES, 1923), ♀ specimen without number, coll. WUNDERLICH, anterior part of body (dorsal view). Scale 2 mm.

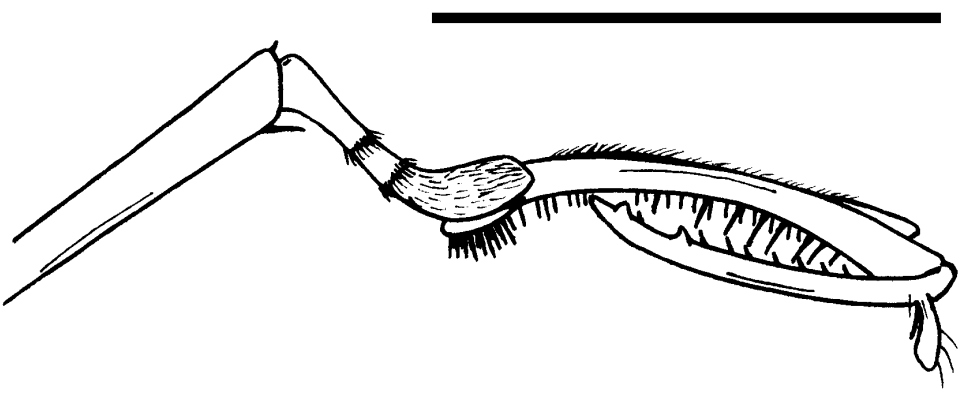

Fig. 31. *Harpactosphecion filicorne* (BRUES, 1923), ♀ specimen without number, coll. WUNDERLICH, fore tarsal chela. Scale 1 mm.

Fig. 32. *Harpactosphecion filicorne* (BRUES, 1923), ♀ specimen without number, coll. WUNDERLICH. Without scale.

Fig. 33. *Harpactosphecion filicorne* (BRUES, 1923), ♀ specimen without number, coll. WUNDERLICH, head and thorax in dorsal view. Without scale.

Fig. 34. *Harpactosphecion filicorne* (BRUES, 1923), ♀ specimen without number, coll. WUNDERLICH, head and thorax in ventral view. Without scale.

Fig. 35. *Harpactosphecion filicorne* (BRUES, 1923), ♀ specimen without number, coll. WUNDERLICH, fore tarsal chela. Without scale.

Subfamily Palaeoanteoninae n. subf.

Type genus: *Palaeoanteon* Olmi, 1999 [1999b], by present designation. The type species of the type genus is the only known species of this new subfamily.

Diagnosis (female). – Epicnemium absent; fore tarsus chelate; ocelli present; chela without a rudimentary claw; occipital carina complete; tibial spur formula 1, 1, 2; enlarged claw spatulate; fore trochanters long and slender; disc of pronotum swollen.

Systematic position. – The chelate fore tarsus, presence of ocelli, absence of a rudimentary claw, median leg without tibial spurs, occipital carina complete, are all characters of Anteoninae. However, the spatulate enlarged claw is very common among Dryininae and unknown in Anteoninae, so that the genus *Palaeoanteon* can be considered a very interesting transition taxon between these two subfamilies. Furthermore, such long fore trochanters and pterostigmata are present in Dryininae, but not in Anteoninae.

The absence of the epicnemium is a very important plesiomorphic character (the epicnemium is absent in all the most primitive dryinids, including Aphelopinae, Anteoninae and Bocchinae). This character state is present both in females and males. The more evolved dryinids (Dryininae and Gonatopodinae) have a distinct epicnemium in both sexes. This is the most important reason (together with the general aspect of *Palaeoanteon*) for previously attributing *Palaeoanteon* to Anteoninae. Other characters are present only in females and they have to be regarded as apomorphies (enlarged claw spatulate; fore trochanters long and slender; disc of pronotum swollen; absence of the rudimentary claw). The shape of the pterostigma of both sexes is variable in Anteoninae (pterostigma from short and broad, as in *Anteon*, to long and narrow, as in *Deinodryinus*) and constant in Dryininae (pterostigma long and narrow), so that the interpretation of pterostigma of *Palaeoanteon* is difficult. In the here described new specimen of *Palaeoanteon* we also observed that the tibial spur formula is 1, 1, 2, which is very interesting since the hind leg tibial spurs were not distinctly visible in the holotype.

The mosaic character distribution is summarized in the following table (characters of *Palaeoanteon* printed bold):

ANTEONINAE	*DRYININAE*
males and females	
Epicnemium absent	Epicnemium present
Pterostigma short and broad or **long and narrow**	Pterostigma **long and narrow**
only females	
Rudimentary claw absent	Rudimentary claw present
Enlarged claw not spatulate	Enlarged claw **spatulate** or not
Fore trochanters short and broad	**Fore trochanters long and slender**
Disc of pronotum flat	Disc of pronotum **swollen** or excavated
Tibial spur formula 1, 1, 2	Tibial spur formula 1, 1, 1, or **1, 1, 2**

New key to the subfamilies of Dryinidae (females):

1 Fore tarsus not chelate ..... Aphelopinae
– Fore tarsus chelate 2
2 Ocelli absent 3
– Ocelli present 4
3 Prothorax fused with the mesothorax, except for the mobile propectus ... Apodryininae
– Prothorax not fused with the mesothorax ..... Plesiodryininae
4 Chela without a rudimentary claw 5
– Chela with a rudimentary claw 7
5 Tibial spur formula 1, 0, 1; occipital carina absent ..... Transdryininae
– Tibial spur formula 1, 1, 2; occipital carina complete 6
6 Fore trochanters long and slender; disc of pronotum swollen ..... Palaeoanteoninae
– Fore trochanters short and broad; disc of pronotum flat ..... Anteoninae
7 Tibial spur formula 1, 0, 1 or 1, 0, 2 ..... Gonatopodinae
– Tibial spur formula 1, 1, 1 or 1, 1, 2 8
8 Fore wing with costal and median cells enclosed by pigmented veins ... Conganteoninae
– Forewing with costal, median and submedian cells enclosed by pigmented veins 9
9 Epicnemium absent ..... Bocchinae
– Epicnemium present ..... Dryininae

Genus *Palaeoanteon* Olmi, 1999 [1999b]

Palaeoanteon janzeni Olmi, 1999 [1999b]

Fig. 36–39

New specimen: Female specimen no. SMNS 2375 in the amber collection of the Staatliches Museum für Naturkunde Stuttgart, Germany (ex coll. Andrey Krylov).

Type locality: Baltic.

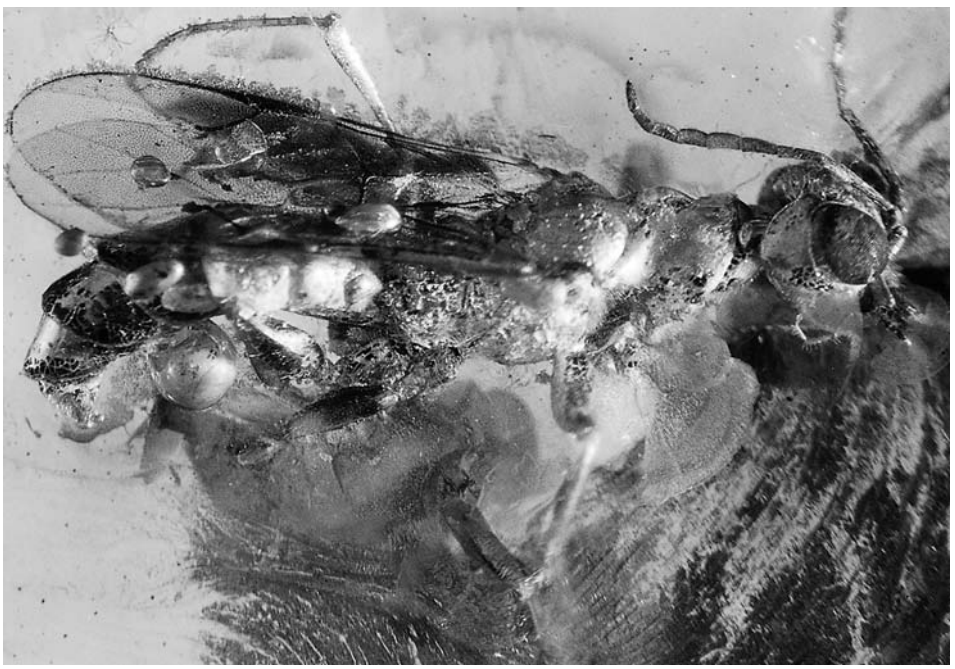

Fig. 36. *Palaeoanteon janzeni* Olmi, 1999, ♀ specimen no. SMNS 2375. Without scale.

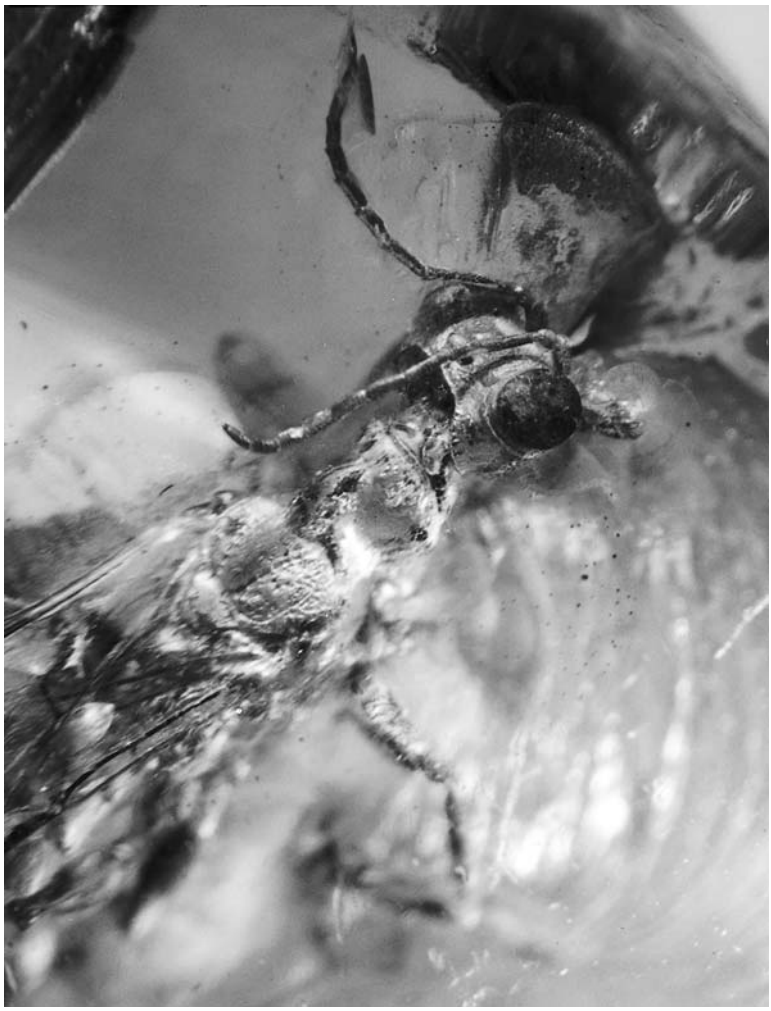

Fig. 37. *Palaeoanteon janzeni* OLMI, 1999, ♀ specimen no. SMNS 2375, head and thorax. Without scale.

Type horizon: Eocene (40–50 mybp), Baltic amber (Succinite).
Male: unknown.
Hosts: unknown.

Diagnosis (female). – Fully winged; forewing with distal part of stigmal vein much shorter than proximal part; occipital carina complete; enlarged claw spatulate; disc of pronotum swollen; pronotum with a distinct anterior collar and a posterior disc separated by a transverse impression; fore trochanters long and slender. The new specimen also showed that the epicnemium is absent. This important diagnostic character was not visible in the holotype.

Redescription. – Fully winged; length 4.62–6.06 mm (holotype 4.62 mm); colour apparently black, with antennae and legs brown; antennae 10-segmented, short and slender, covered with dense and short hairs, slightly thickened distally;

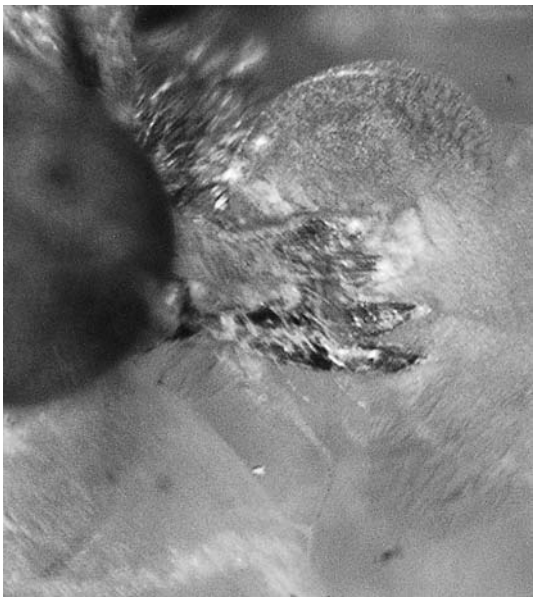

Fig. 38. *Palaeoanteon janzeni* OLMI, 1999, ♀ specimen no. SMNS 2375, right mandible. Without scale.

antennal rhinaria absent; antennal segments in the following proportions: 8:7:19:10:10:9:7:7:6:8; antennae much shorter than body, approximately three times as long as head (length of head dorsally measured from occipital carina behind the ocelli to distal apex of mandibles): 91:30; head slightly convex, shiny and reticulate rugose, apparently hairless; shape of the clypeus not visible; mandibles with 4 teeth progressing larger from anterior one to posterior (this character is distinctly visible in the present new specimen of this species, whereas in the holotype the mandible is not distinctly visible; for this reason in the original description the mandibles seem to have apparently only 3 teeth); occipital carina complete, laterally not reaching the eyes; occiput excavated; eyes normally bulging; POL = 3; OL = 2; OOL = 11; OPL = 2; TL = 2; in the present new larger specimen the temples are much longer than OPL (OPL = 4; TL = 7); frontal line complete; pronotum long, crossed by an anterior strong transverse impression, with a posterior disc, without a posterior collar; pronotum apparently almost glabrous, shiny, punctate, without sculpture among punctures, slightly shorter than head (27:30); posterior disc of pronotum longer than anterior collar (17:10); pronotal tubercles reaching the tegulae; scutum of the holotype dull, apparently glabrous, punctate, without sculpture among punctures, much shorter than pronotum (20:27); in the present new specimen numerous areolae are present near the anterior margin and partly also near the lateral margins; notauli complete, posteriorly separated; minimum distance between the notauli approximately as long as antennal segment 2; scutellum much shorter than scutum (9:20), apparently glabrous, smooth, punctate; metanotum shorter than scutellum (7:9), with sculpture not distinctly visible; propodeum approximately as long as scutum; in the holotype the sculpture of the dorsal and posterior surfaces of the propodeum are not visible, whereas laterally the surface is distinctly rugose; in the present new spec-

Fig. 39. *Palaeoanteon janzeni* Olmi, 1999, ♀ specimen no. SMNS 2375, fore tarsal chela. Without scale.

imen all the propodeum is distinctly visible, so that it is possible to see that the propodeum is completely reticulate rugose; however, it is not possible to see if in the posterior surface of the propodeum there are longitudinal keels; mesopleura and metapleura dull, rugose; shape of head, scutum, scutellum, metanotum and propodeum similar to Anteoninae; epicnemium absent; forewing apparently completely slightly darkened, and its venation is similar to that of Anteoninae; pterostigma long and narrow, much longer than broad (32:6); shape of pterostigma similar to that of Dryininae; marginal cell open; stigmal vein slightly S-shaped; distal part of stigmal vein much shorter than proximal part (3:11); stigmal vein forming an angle between proximal and distal parts; forewing with the usual three basal cells clearly enclosed by pigmented veins (costal, median and submedian cells); hindwing apparently slightly darkened; hindwing shape similar to Anteoninae; front leg segments in the following proportions: 15 (coxa): 13 (trochanter): 30 (femur): 29 (tibia): 9 (tarsal segment 1): 3 (tarsal segment 2): 7 (tarsal segment 3): 13 (tarsal segment 4): 30 (tarsal segment 5); enlarged claw slightly shorter than tarsal segment 5 (27:30); fore trochanters long and slender, slightly curved, with a long proximal stalk, more than

three times as long as broad (13:4); shape of trochanters similar to that of Dryininae; segment 2 and 3 of fore tarsus produced into a hook; rudimentary claw absent; arolium much shorter than enlarged claw (8:27); enlarged claw very spatulate, slightly curved, with inner side partly visible; the chela is closed so that it is not possible to see if there are subapical teeth; however it is possible to see 4 subdistal lamellae; the distal lamellae are not visible; distal apex of enlarged claw not pointed, but broadly spatulate; segment 5 of fore tarsus with numerous lamellae beginning in the proximal third and present without interruption until the distal apex; it is impossible to see if there are one or two rows of lamellae, but the lamellae are at least 6, excluding the distal group; distal apex of segment 5 with a group of numerous lamellae (at least 10); mid leg segments in the following proportions: 9 (coxa): 8 (trochanter): 29 (femur): 27 (tibia): 17 (tarsal segment 1): 7 (tarsal segment 2): 5 (tarsal segment 3): 4,5 (tarsal segment 4): 7 (tarsal segment 5); hind leg segments in the following proportions: 15 (coxa): 6 (trochanter): 40 (femur): 44 (tibia): 21 (tarsal segment 1): 10 (tarsal segment 2): 8,5 (tarsal segment 3): 5 (tarsal segment 4): 10 (tarsal segment 5); petiole shape and length similar to Anteoninae; maxillary palps with 6 segments; labial palps with 3 segments; shape, length and breadth of wings similar to Anteoninae; shape and morphology of the body similar to Anteoninae; tibial spur formula 1, 1, 2.

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Appendix
Catalogue of fossil Dryinidae in amber

Subfamily Aphelopinae

Aphelopus? *palaeophoenicius* OLMI, 1999
* 1999b *Aphelopus palaeophoenicius* OLMI, pp. 49–52, figs. 1, 4.
Holotype: Female specimen no. OR 194–21 in coll. GEORGE POINAR Jr. (ex Milki collection), Corvallis, Oregon, USA (maintained at Oregon State University).
Locality and age: Lower Cretaceous amber from Lebanon (120–136 mybp).
Comment: It is interesting that this oldest known fossil dryinid also belongs to the most "primitive" subfamily. It was tentatively placed in the extant genus *Aphelopus* by OLMI (1999b).

Aphelopus poinari OLMI, 1998
* 1998a *Aphelopus poinari* OLMI, pp. 153–154, fig. 1.
1999b *Aphelopus poinari*. – OLMI, p. 66.
Holotype: Female specimen no. H-10–122 coll. GEORGE POINAR Jr., Corvallis, Oregon, USA (maintained at Oregon State University).
Locality and age: Oligocene/Miocene? amber from the Dominican Republic (15–40 mybp), "La Toca" or "Palo Alto" mine.

Subfamily Anteoninae

Deinodryinus areolatus (PONOMARENKO, 1975)
* 1975a *Electrodryinus areolatus* PONOMARENKO, pp. 126–128, figs 1–2.
1975b *Electrodryinus areolatus*. – PONOMARENKO, pp. 124–127, figs 1–2.
1984 *Deinodryinus areolatus*. – OLMI, pp. 119, 121–123, 1830, fig. 71.
1987 *Electrodryinus areolatus*. – SPAHR, p. 38.
1992 *Electrodryinus areolatus*. – CARPENTER, p. 488.
1995 *Deinodryinus areolatus*. – OLMI, p. 268.
1999b *Deinodryinus areolatus*. – OLMI, p. 65.
Holotype: Female specimen no. PIN 964/60 at Palaeontological Institute, Moscow, Russia.
Locality and age: Eocene Baltic amber (40–45 mybp).
Comment: This species was transferred to the extant genus *Deinodryinus* by OLMI (1984) who's re-examination of the holotype showed several errors and imprecisions in the original description, e.g. a rudimentary claw is absent, contrary to the figure by PONOMARENKO (1975). It is the only record of *Deinodryinus* for the Palaearctic region.

Janzenia baltica OLMI, 1999
* 1999b *Janzenia baltica* OLMI, pp. 52–54, figs 2–3.
Holotype: Female specimen without number (but the specimen is labelled as the concerning holotype) in coll. JENS-WILHELM JANZEN, Seevetal, Germany (also figured on the world wide web at http://home.t-online.de/home/jjanzen/sdryi.htm).
Locality and age: Eocene Baltic amber (40–45 mybp).

Subfamily Bocchinae

Bocchus vetustus OLMI, 1989
* 1989 *Bocchus vetustus* OLMI, pp. 243–244, figs 31 D, 31 E.
1995 *Bocchus vetustus*. – OLMI, p. 268.
1999b *Bocchus vetustus*. – OLMI, p. 65.
Holoype: Female specimen no. CAS 16718 at the California Academy of Sciences, San Francisco, USA.
Locality and age: Oligocene/Miocene? amber from the Dominican Republic (15–40 mybp), "El Valle" amber mine.

Subfamily Palaeoanteoninae n. subf.

Palaeoanteon janzeni OLMI, 1999
* 1999b *Palaeoanteon janzeni* OLMI, pp. 54–56, figs 5–8, 18.
Holotype: Female specimen without number (but the specimen is labelled as the con-

cerning holotype) in coll. JENS-WILHELM JANZEN, Seevetal, Germany (also figured on the world wide web at http://home.t-online.de/home/jjanzen/sdryi.htm).
Further material: A single female specimen (described above) no. SMNS 2375 in the amber collection of the Staatliches Museum für Naturkunde Stuttgart, Germany (ex coll. ANDREY KRYLOV).
Locality and age: Eocene Baltic amber (40–45 mybp).
Comment: This taxon is attributed to a new separate subfamily in the present publication, because it has retained plesiomorphic similarities with Anteoninae, but also shows distinct apomorphic similarities with Dryininae. Its "intermediate" status was already mentioned by OLMI (1999b).

Subfamily Gonatopodinae

Neodryinus? *somniatus* BRUES, 1933 nomen dubium

* 1933b *Neodryinus*? *somniatus* BRUES, pp. 152, 170.
1944 *Neodryinus somniatus*. – HAUPT, p. 93.
1953 *Neodryinus somniatus*. – RICHARDS, p. 69.
1975a *Neodryinus somniatus*. – PONOMARENKO, p. 126.
1975b *Neodryinus somniatus*. – PONOMARENKO, p. 124.
1982 *Neodryinus somniatus*. – KEILBACH, p. 271.
1984 *Neodryinus somniatus*. – OLMI, pp. 1825, 1830 (as nomen dubium).
1987 *Neodryinus somniatus*. – SPAHR, p. 39.
1995 *Neodryinus somniatus*. – OLMI, p. 268.
1999b *Neodryinus somniatus*. – OLMI, p. 65.

Holotype: The female holotype specimen without number was in the amber collection of the Albertus University in Königsberg and has to be regarded as lost according to OLMI (1984).
Locality and age: Eocene Baltic amber (40–45 mybp).
Comment: According to RICHARDS (1953) the structure of the prothorax does not permit an attribution of this species to the extant genus *Neodryinus*, and even the attribution to Gonatopodinae is very doubtful as well. Since the type is lost and the original description is insufficient, this species was considered a nomen dubium by OLMI (1984).

Subfamily Dryininae (incl. Thaumatodryininae)

Cretodryinus zherichini PONOMARENKO, 1975

* 1975c *Cretodryinus zherichini* PONOMARENKO, pp. 104–105, fig. 120.
1978 *Cretodryinus zherichini*. – BURNHAM, p. 95.
1978 *Cretodryinus zherichini*. – KÖNIGSMANN, p. 373, figs 4/t1 and 13/t1.
1978 *Cretodryinus zherichini*. – SCHLÜTER, p. 129.
1978 *Cretodryinus zherichini*. – ZHERICHIN, p. 86.
1982 *Cretodryinus zherichini*. – KEILBACH, p. 271.
1984 *Cretodryinus zherichini*. – OLMI, pp. 1046–1047, 1830.
1987 *Cretodryinus zherichini*. – SPAHR, p. 38.
1992 *Cretodryinus zherichini*. – CARPENTER, p. 488.
1992 *Cretodryinus zherichini*. – POINAR, p. 201.
1995 *Cretodryinus zherichini*. – OLMI, p. 267.
1999b *Cretodryinus zherichini*. – OLMI, p. 65.

Holotype: Female specimen no. PIN 3130/112 at Palaeontological Institute, Moscow, Russia.
Locality and age: Upper Cretaceous amber from Taymyr in Siberia (78–115 mybp, probably about 80 mybp).

Dryinus balticus (OLMI, 1984)

* 1984 *Alphadryinus balticus* OLMI, pp. 978–980, 1830, fig. 665.
1995 *Dryinus balticus*. – OLMI, p. 268.
1999b *Dryinus balticus*. – OLMI, p. 65.

Holotype: Female specimen without number (but the specimen is labelled as the concerning holotype) at Museum of Zoology of the University, Copenhagen, Denmark.
Locality and age: Eocene Baltic amber (40–45 mybp), apparently from the German coast, since indicated as "German amber".

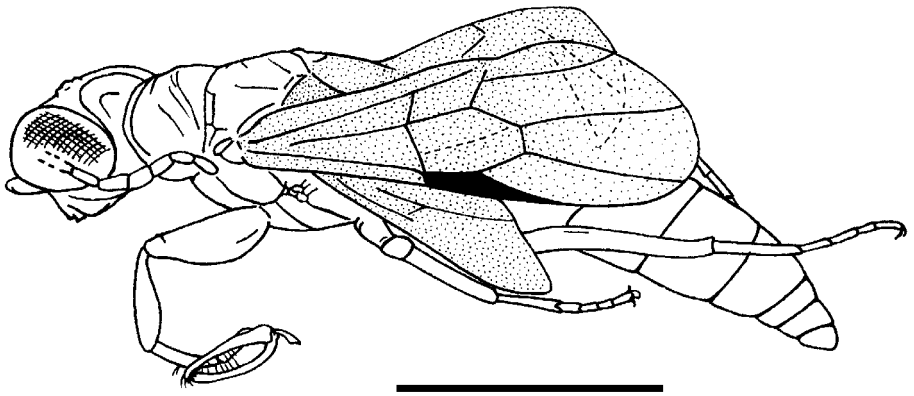

Fig. 40. *Dryinus bruesi* (OLMI, 1984), ♀ specimen no. SMNS BB-2371. Scale 2 mm.

Fig. 41. *Dryinus bruesi* (OLMI, 1984), ♀ specimen no. SMNS BB-2371. Without scale.

Dryinus bruesi (OLMI, 1984)

* 1984 *Alphadryinus bruesi* OLMI, pp. 975–978, 1830, fig. 664.
1995 *Dryinus bruesi*. – OLMI, p. 268.
1999b *Dryinus bruesi*. – OLMI, p. 65.

Holotype: Female specimen without number (but the specimen is labelled as the concerning holotype) at Museum of Zoology of the University, Copenhagen, Denmark.
Further material: Female specimen no. SMNS BB-2371 at the Staatliches Museum für Naturkunde Stuttgart, Germany (see Figs 40–42).
Locality and age: Eocene Baltic amber (40–45 mybp), apparently from the German coast, since indicated as "German amber".
Comment: After a comparison of the new specimen at SMNS with the holotype of *Dryinus bruesi*, we came to the conclusion that it belongs to the same species.

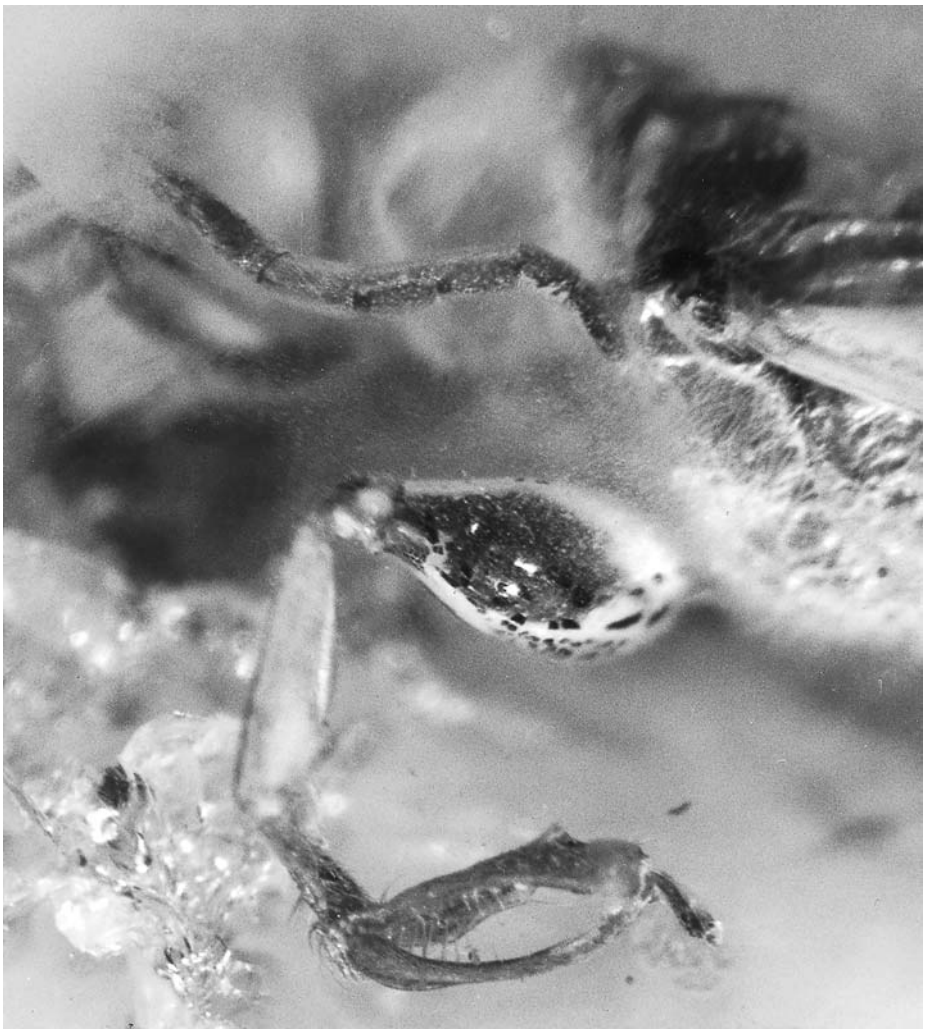

Fig. 42. *Dryinus bruesi* (Olmi, 1984), ♀ specimen no. SMNS BB-2371, fore tarsal chela. Without scale.

Dryinus canadensis (Ponomarenko, 1981)

* 1981a *Avodryinus canadensis* Ponomarenko, p. 143.
1981b *Avodryinus canadensis*. – Ponomarenko, p. 119, fig. 2.
1984 *Richardsidryinus canadensis*. – Olmi, pp. 907, 930–931, 1830.
1987 *Avodryinus canadensis*. – Spahr, p. 38.
1992 *Avodryinus canadensis*. – Carpenter, p. 488.
1992 *Avodryinus canadensis*. – Poinar, p. 201.
1995 *Dryinus canadensis*. – Olmi, p. 268.
1999b *Dryinus canadensis*. – Olmi, p. 65.

Holotype: Female specimen no. 1130 in the Canadian National Collection at Ottawa, Canada.

Locality and age: Upper Cretaceous (Campanian) amber (retinite) from Medicine Hat, Alberta, Canada (70–75 mybp).

Comment: OLMI (1984) redescribed the holotype and synonymized the fossil genus *Avodryinus* with the extant genus *Richardsidryinus*.

Dryinus grimaldii OLMI, 1995

* 1995 *Dryinus grimaldii* OLMI, pp. 254–255, fig. I-1.

1999b *Dryinus grimaldii*. – OLMI, p. 65.

Holotype: Female specimen no. DR-10–1426 at American Museum of Natural History, New York, USA.

Paratype: Female specimen no. DR-10–1423 at American Museum of Natural History, New York, USA.

Further material: The female specimen figured by POINAR (1999: fig. 139) also belongs to this species. It has no. H-10–100 in coll. GEORGE POINAR Jr., Corvallis, Oregon, USA (maintained at Oregon State University).

Locality and age: Oligocene/Miocene? amber from the Dominican Republic (15–40 mybp).

Dryinus hymenaeaphilus OLMI, 1995

* 1995 *Dryinus hymenaeaphilus* OLMI, pp. 255–258, fig. I-2.

1999b *Dryinus hymenaeaphilus*. – OLMI, p. 65.

Holotype: Female specimen no. DR-10–1425 at American Museum of Natural History, New York, USA.

Locality and age: Oligocene/Miocene? amber from the Dominican Republic (15–40 mybp).

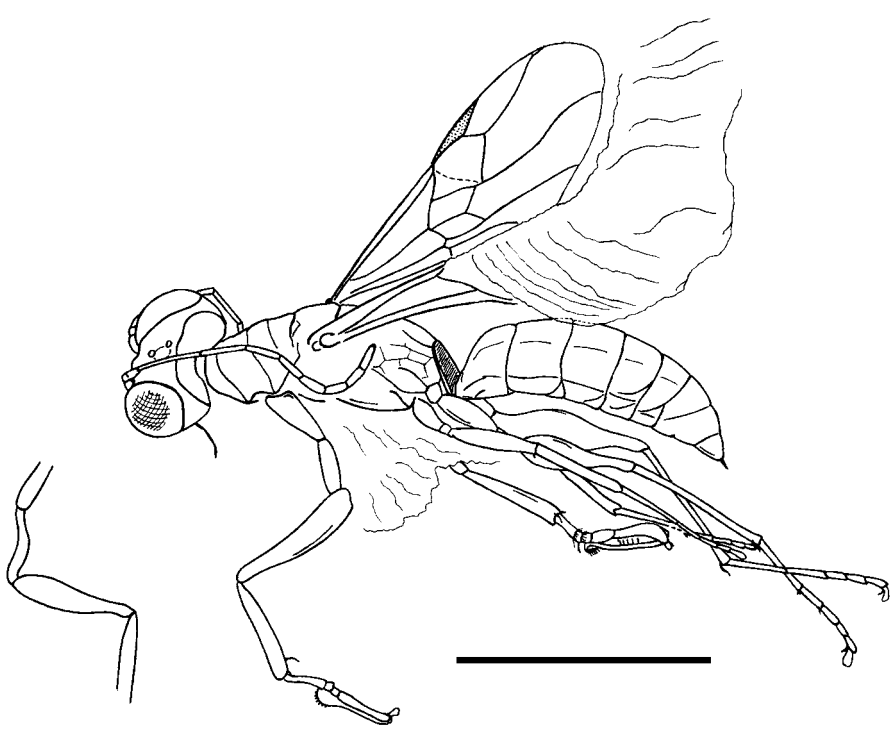

Fig. 43. *Dryinus janzeni* OLMI, 1999, ♀ specimen no. 1138–1, coll. HOFFEINS, the left fore leg is also shown in interior aspect because it is optically distorted from the outer side. Scale 2 mm.

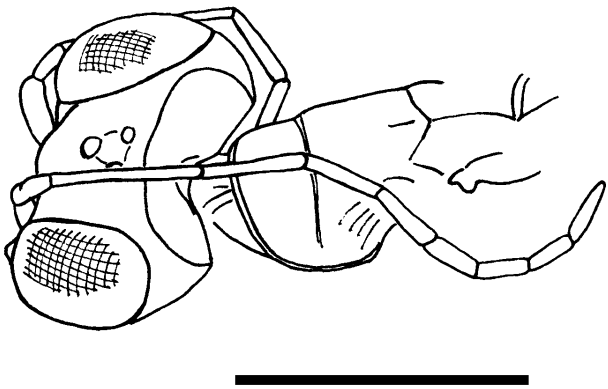

Fig. 44. *Dryinus janzeni* OLMI, 1999, ♀ specimen no. 1138–1, coll. HOFFEINS, head. Scale 1 mm.

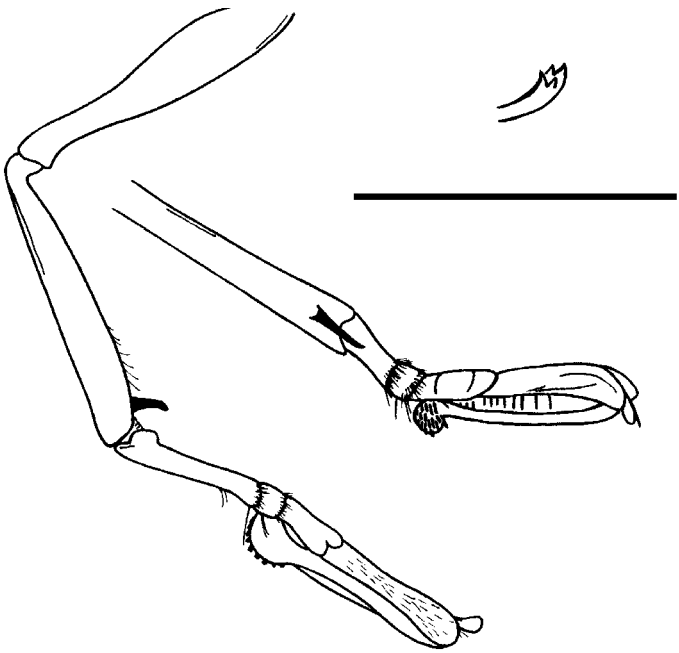

Fig. 45. *Dryinus janzeni* OLMI, 1999, ♀ specimen no. 1138–1, coll. HOFFEINS, fore tarsal chela (inner and outer side) and mandible. Scale 1 mm.

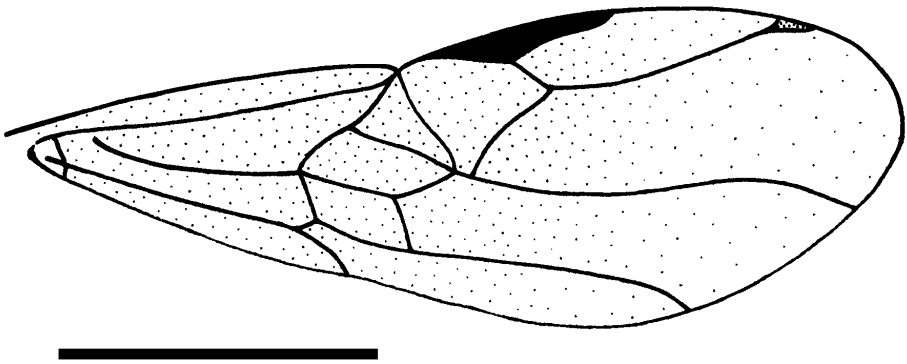

Fig. 46. *Dryinus janzeni* OLMI, 1999, ♀ specimen no. 1138–1, coll. HOFFEINS, right forewing. Scale 1 mm.

Fig. 47. *Dryinus janzeni* OLMI, 1999, ♀ specimen no. 1138–1, coll. HOFFEINS. Without scale.

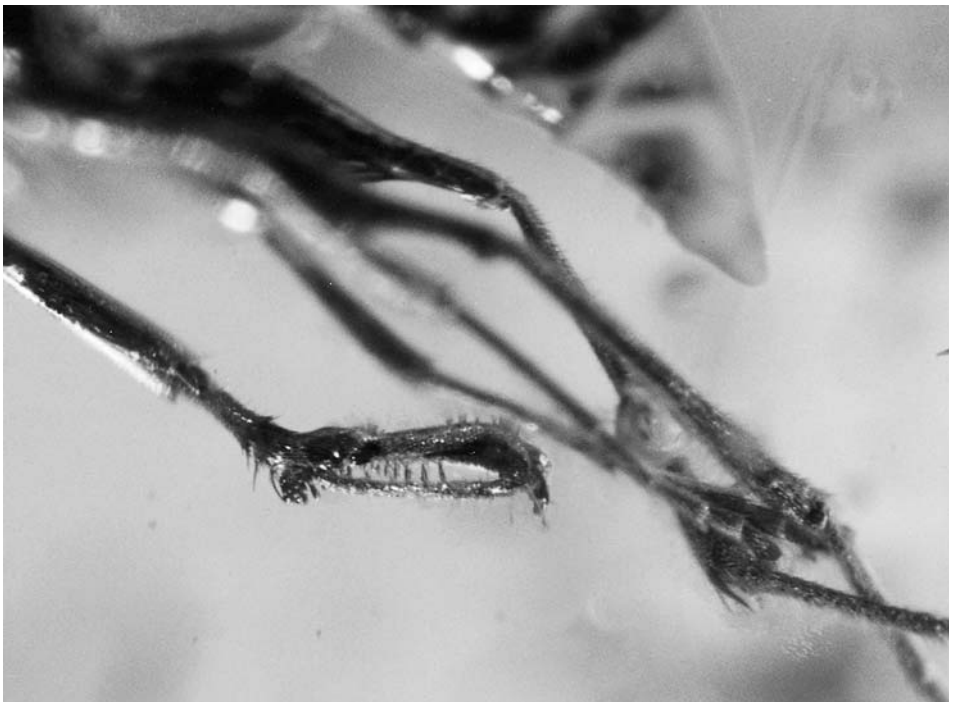

Fig. 48. *Dryinus janzeni* OLMI, 1999, ♀ specimen no. 1138–1, coll. HOFFEINS, fore tarsal chela. Without scale.

Fig. 49. *Dryinus janzeni* OLMI, 1999, ♀ specimen no. 3010, coll. GRÖHN. Without scale.

Fig. 50. *Dryinus janzeni* OLMI, 1999, ♀ specimen no. 3010, coll. GRÖHN, fore tarsal chela. Without scale.

Dryinus janzeni OLMI, 1999

* 1999b *Dryinus janzeni* OLMI, pp. 59–61, figs 11, 13–14.

Holotype: Female specimen in coll. JENS-WILHELM JANZEN, Seevetal, Germany (also figured on the world wide web at http://home.t-online.de/home/jjanzen/sdryi.htm).

Further material: Female specimen no. 1138–1 (see Figs 43–48) in coll. HANS WERNER HOFFEINS, Hamburg, Germany (declared in will to be donated to the Entomological Institute in Eberswalde, Germany); female specimen no. 3010 in coll. CARSTEN GRÖHN, Glinde, Germany (Figs 49–50).

Locality and age: Eocene Baltic amber (40–45 mybp).

Dryinus mortuorum (BRUES, 1933)

* 1933b *Lestodryinus mortuorum* BRUES, pp. 149–150, 170, pl. 13, fig. 80.
1944 *Lestodryinus mortuorum*. – HAUPT, p. 93.
1982 *Lestodryinus mortuorum*. – KEILBACH, p. 271.
1984 *Lestodryinus mortuorum*. – OLMI, pp. 1817, 1830 (as nomen dubium).
1987 *Lestodryinus mortuorum*. – SPAHR, p. 39.
1991 *Lestodryinus mortuorum*. – ROHDENDORF, pp. 519–520, fig. 1141.
1995 *Dryinus mortuorum*. – OLMI, p. 268.
1999b *Dryinus mortuorum*. – OLMI, pp. 61–65, figs 15–16.

Neotype: The neotype designated by OLMI (1999b) is a female specimen without number (but the specimen is labelled as the concerning neotype) in coll. PETER LAGING, Scharnebeck, Germany. The two original female type specimens without number were in the amber collection of the Albertus University in Königsberg and have to be regarded as lost according to OLMI (1984).

Locality and age: Eocene Baltic amber (40–45 mybp).

Comment: This species was incorrectly attributed to the extant genus *Lestodryinus* according to HAUPT (1944) and PONOMARENKO (1974a, 1974b). Subsequently it was considered a nomen dubium by OLMI (1984), because the type is lost and the original description is insufficient. Later it has been transferred to the extant genus *Dryinus* by

OLMI (1995), because of the similar shape of the body and because the drawing of BRUES is probably wrong in case of the alleged absence of a mesotibial spur.

Dryinus muenchi n. sp.

Holotype: Female specimen no. SMNS BB-2372 at the Staatliches Museum für Naturkunde, Stuttgart, Germany, which is described above.

Locality and age: Eocene Baltic amber (40–45 mybp).

Dryinus palaeodominicanus CURRADO & OLMI, 1983

* 1983 *Dryinus palaeodominicanus* CURRADO & OLMI, p. 330, figs 1–2.
1984 *Dryinus palaeodominicanus*. – OLMI, pp. 866–868, 1830, figs 584–586.
1987 *Dryinus palaeodominicanus*. – SPAHR, pp. 38, 100.
1992 *Dryinus palaeodominicanus*. – POINAR, p. 201.
1999b *Dryinus palaeodominicanus*. – OLMI, p. 65.

Holotype: Female specimen without number (but the specimen is labelled as the concerning holotype) at the Regional Museum of Natural Sciences of Torino, Italy.

Further material: Female specimen without number from the "Bayaguana" mine (OLMI, 1995) at the American Museum of Natural History, New York, USA (ex coll. MASSIMO OLMI).

Locality and age: Oligocene/Miocene? amber from the Dominican Republic (15–40 mybp).

Dryinus palaeomexicanus OLMI, 1995

* 1995 *Dryinus palaeomexicanus* OLMI, pp. 260–262, figs II-2 and IV.

Holotype: Female specimen no. N.J.35 at American Museum of Natural History, New York, USA.

Locality and age: Oligocene/Miocene? amber from Chiapas in Mexico (22–26 mybp).

Comment: The holotype of this species is the first and only Dryinidae found in Mexican amber.

Dryinus poinari OLMI, 1998

* 1998a *Dryinus poinari* OLMI, pp. 161–163, fig. 9.
1999b *Dryinus poinari*. – OLMI, p. 65.

Holotype: Female specimen no. H-10–23-F in coll. GEORGE POINAR Jr., Corvallis, Oregon, USA (maintained at Oregon State University).

Locality and age: Oligocene/Miocene? amber from the Dominican Republic (15–40 mybp), "La Toca" or "Palo Alto" mine.

Dryinus priscus OLMI, 1998

* 1998b *Dryinus priscus* OLMI, pp. 77–79, fig. 55.
1999b *Dryinus priscus*. – OLMI, p. 66.

Holotype: Female specimen no. DR-14–341 at American Museum of Natural History, New York, USA.

Locality and age: Oligocene/Miocene? amber from the Dominican Republic (15–40 mybp).

Dryinus pristinus OLMI, 1998

* 1998b *Dryinus pristinus* OLMI, pp. 79–81, fig. 56.
1999b *Dryinus pristinus*. – OLMI, p. 66.

Holotype: Female specimen no. DR-14–1139 at American Museum of Natural History, New York, USA.

Locality and age: Oligocene/Miocene? amber from the Dominican Republic (15–40 mybp).

Dryinus reifi n. sp.

Holotype: Female specimen no. SMNS BB-2370 at the Staatliches Museum für Naturkunde, Stuttgart, Germany, which is described above.

Locality and age: Eocene Baltic amber (40–45 mybp).

Dryinus vetus (BRUES, 1933) nomen dubium

* 1933b *Lestodryinus*? *vetus* BRUES, pp. 150–152, 170, pl. 13, fig. 81.
1982 *Lestodryinus vetus*. – KEILBACH, p. 271.
1984 *Lestodryinus vetus*. – OLMI, pp. 1829–1830.
1987 *Lestodryinus vetus*. – SPAHR, p. 39.
1995 *Dryinus vetus*. – OLMI, p. 268.
1999b *Dryinus vetus*. – OLMI, p. 65.

Fig. 51. *Dryinus* sp., ♀ specimen without number, coll. JANZEN. Without scale.

Type specimens: The three original female type specimens without number were in the amber collection of the Albertus University in Königsberg and have to be regarded as lost according to OLMI (1984).
Locality and age: Eocene Baltic amber (40–45 mybp).
Comment: This species was incorrectly attributed to the extant genus *Lestodryinus* according to HAUPT (1944) and PONOMARENKO (1974a, 1974b). Since the holotype is lost, no other specimens are known, and the original description is insufficient, this taxon has to be regarded as a nomen dubium according to OLMI (1984).

Dryinus vetustus OLMI, 1995
* 1995 *Dryinus vetustus* OLMI, pp. 258–260, figs II-1 and III.
1999b *Dryinus vetustus*. – OLMI, p. 66.
Holotype: Female specimen no. DR-10–1424 at American Museum of Natural History, New York, USA.
Locality and age: Oligocene/Miocene? amber from the Dominican Republic (15–40 mybp).

Dryinus wunderlichi n. sp.
Holotype: Female specimen no. SMNS BB-2373 at the Staatliches Museum für Naturkunde, Stuttgart, Germany, which is described above.
Locality and age: Eocene Baltic amber (40–45 mybp).

Dryinus sp. (undetermined)
Material: Female specimen no. H-10–173B in coll. GEORGE POINAR Jr., Corvallis, Oregon, USA (maintained at Oregon State University). Female specimen without number (but the specimen is labelled as the concerning holotype) in coll. JENS-WILHELM JANZEN, Seevetal, Germany (see Fig. 51).
Locality and age: Specimen no. H-10–173B in coll. POINAR: Oligocene/Miocene? amber from the Dominican Republic (15–40 mybp). Specimen in coll. JANZEN: Eocene Baltic amber (40–45 mybp).

Harpactosphecion? *deletum* (BRUES, 1933) comb. nov.
* 1933b *Thaumatodryinus deletus* BRUES, pp. 147–148, 169, pl. 13, fig. 79.
1975a *Thaumatodryinus deletus*. – PONOMARENKO, p. 126.
1975b *Thaumatodryinus deletus*. – PONOMARENKO, p. 124.
1982 *Thaumatodryinus deletus*. – KEILBACH, p. 271.

1984 *Thaumatodryinus deletus*. – OLMI, pp. 683, 1804, 1830 (as nomen dubium).
1987 *Thaumatodryinus deletus*. – SPAHR, p. 39.
1995 *Thaumatodryinus deletus*. – OLMI, p. 268.
1999b *Thaumatodryinus deletus*. – OLMI, p. 65.

Holotype: The female type specimen without number was in the amber collection of the Albertus University in Königsberg and has to be regarded as lost according to OLMI (1984).

Locality and age: Eocene Baltic amber (40–45 mybp).

Comment: This species was originally described in the extant genus *Thaumatodryinus*, but is here tentatively transferred to *Harpactosphecion*, as already suggested by OLMI (1984) who considered this taxon a nomen dubium, because the type is lost and the original description is insufficient. This species lacks the tufts of long hairs on the antennal flagellomeres 3–8 that are characteristic and autapomorphic for *Thaumatodryinus*. The elongate protrochanter described by BRUES (1933b: 148 "Front coxae, trochanters and femora all of about equal length") strongly suggests an attribution to Dryininae (or Gonatopodinae). Because of the erroneous attribution to *Thaumatodryinus*, and because of the similar habitus (including the elongated antennae), we here preliminarily transfer this species to the fossil genus *Harpactosphecion*.

Harpactosphecion filicorne (BRUES, 1923) emend.

* 1923 *Dryinus filicornis* BRUES, pp. 343–344.
1933b *Thaumatodryinus filicornis*. – BRUES, pp. 147, 169.
1944 *Harpactosphecion filicornis*. – HAUPT, pp. 90–94, 1 figure without number.
1975a *Thaumatodryinus filicornis*. – PONOMARENKO, p. 126.
1975b *Thaumatodryinus filicornis*. – PONOMARENKO, p. 124.
1982 *Thaumatodryinus filicornis*. – KEILBACH, p. 271.
1984 *Thaumatodryinus filicornis*. – OLMI, pp. 683, 1807, 1830 (as nomen dubium).
1987 *Harpactosphecion filicornis*. – SPAHR, pp. 38, 39.
1995 *Thaumatodryinus filicornis*. – OLMI, p. 268.
1999b *Harpactosphecion filicornis*. – OLMI, pp. 56–58, 65, figs 9–12.

Neotype: The neotype is a female specimen without number (but the specimen is labelled as the concerning neotype) in coll. JENS-WILHELM JANZEN, Seevetal, Germany (also figured by WEITSCHAT & WICHARD, 1998: 178, Plate 69, figure c, and figured on the world wide web at http://home.t-online.de/home/jjanzen/sdryi.htm). The female holotype specimen no. XXB 1547 was in the amber collection of the Albertus University in Königsberg and has to be regarded as lost according to OLMI (1984).

Further material: There was a female specimen (HAUPT, 1944) no. 233 in the amber collection of the Zool. Museum in Berlin (Germany), but it is not known to us if this specimen still exists. There is a second female specimen (OLMI, 1999b; also see Fig. 28) in coll. JANZEN, and a third one (OLMI, 1999b) in coll. PETER LAGING, Scharnebeck, Germany. A fourth female specimen (see Figs 29–35) without number in coll. JÖRG WUNDERLICH (Straubenhardt) is preserved together with a large carabid beetle. Finally, there is a fifth female specimen no. SMNS BB-2369 at the Staatliches Museum für Naturkunde, Stuttgart, Germany (see Figs 23–26), and a sixth female specimen no. SMNS BB-2374 was recently donated by Mr J. v. HOLT to the same museum (see Fig. 27).

Locality and age: Eocene Baltic amber (40–45 mybp).

Comment: This species was transferred from *Thaumatodryinus* to a new separate genus by HAUPT (1944). PONOMARENKO (1975a, 1975b) maintained that HAUPT (1944, cited by KROMBEIN, 1952) shall have considered that *H. filicorne* does not belong to Dryinidae at all, which is clearly incorrect, since indeed HAUPT redescribed this species with the dryinid subfamily Dryininae (sensu HAUPT). OLMI (1999b) provided a redescription and designated and figured a neotype, but did not specify which of the three mentioned specimens (2 in coll. JANZEN and 1 in coll. LAGING) represents this neotype. Therefore it is here clarified, that the figured neotype is a specimen without number in coll. JANZEN which is properly labelled as neotype. With totally eight known specimens this species obviously was the most abundant dryinid in the Baltic amber forest.

Harpactosphecion gracile (BRUES, 1933) comb. nov.

* 1933b *Thaumatodryinus gracilis* BRUES, pp. 148–149, 169.
1975a *Thaumatodryinus gracilis*. – PONOMARENKO, p. 126.

1975b *Thaumatodryinus gracilis*. – PONOMARENKO, p. 124.
1982 *Thaumatodryinus gracilis*. – KEILBACH, p. 271.
1984 *Thaumatodryinus gracilis*. – OLMI, pp. 683, 1807, 1830 (as nomen dubium).
1987 *Thaumatodryinus gracilis*. – SPAHR, p. 39.
1995 *Thaumatodryinus gracilis*. – OLMI, p. 268.
1999b *Thaumatodryinus gracilis*. – OLMI, p. 65.

Neotype: Female specimen no. 1138–2 in coll. HANS WERNER HOFFEINS, Hamburg, Germany (declared in will to be donated to the Entomological Institute in Eberswalde, Germany) has been designated as neotype in the present publication. The female holotype specimen no. 9017 IV 260 was in the amber collection of the Albertus University in Königsberg and has to be regarded as lost according to OLMI (1984).
Further material: Female specimen no. 3011 in coll. CARSTEN GRÖHN, Glinde, Germany (Figs 21–22).
Locality and age: Eocene Baltic amber (40–45 mybp).
Comment: This species was originally described in the extant genus *Thaumatodryinus*, but is here transferred to *Harpactosphecion*, as already suggested by OLMI (1984) who still considered this taxon a nomen dubium, because the type was lost, no other material was known then, and the original description was insufficient.

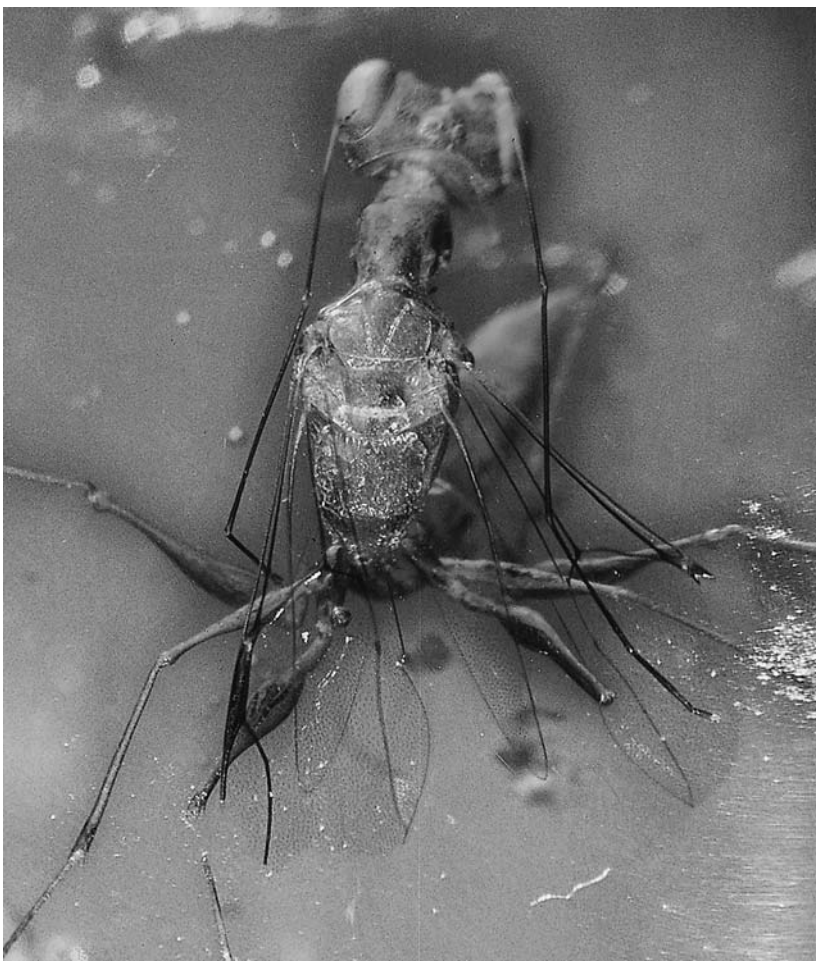

Fig. 52. *Harpactosphecion sucinum* OLMI, 1987, ♀ specimen no. SMNS Do-4494-M. Without scale.

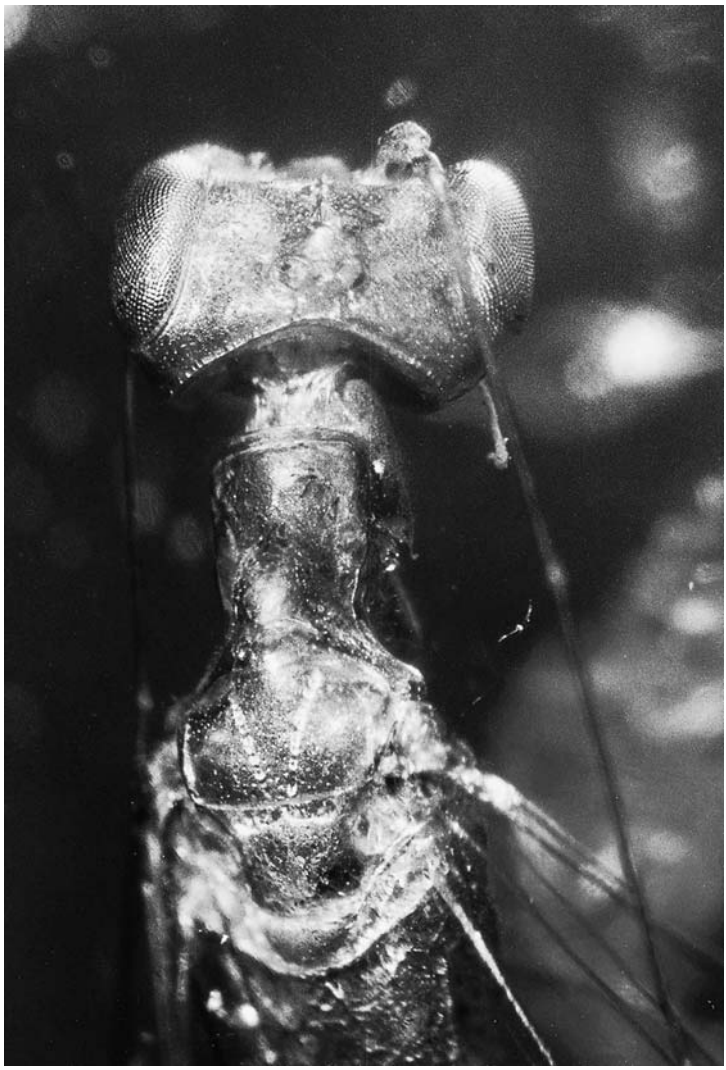

Fig. 53. *Harpactosphecion sucinum* OLMI, 1987, ♀ specimen no. SMNS Do-4494-M, head and thorax. Without scale.

Harpactosphecion sucinum OLMI, 1987 emend.

* 1987 *Alphadryinus sucinus* OLMI, pp. 220–222, fig. 2-A.
1995 *Dryinus sucinus*. – OLMI, p. 268.
1998a *Pseudodryinus sucinus*. – OLMI, p. 160.
1999b *Harpactosphecion sucinus*. – OLMI, p. 66.

Holotype: Female specimen without number (but the specimen is labelled as the concerning holotype) at Museo Regionale di Scienze Naturali, Torino, Italy.

Further material: Two female specimens (OLMI, 1998a) with nos DR-14–1032 and DR-14–1033 at American Museum of Natural History, New York, USA, and another female specimen with no. H-10–100B in coll. GEORGE POINAR Jr., Corvallis, Oregon, USA (maintained at Oregon State University). Finally, there is a very nice female spec-

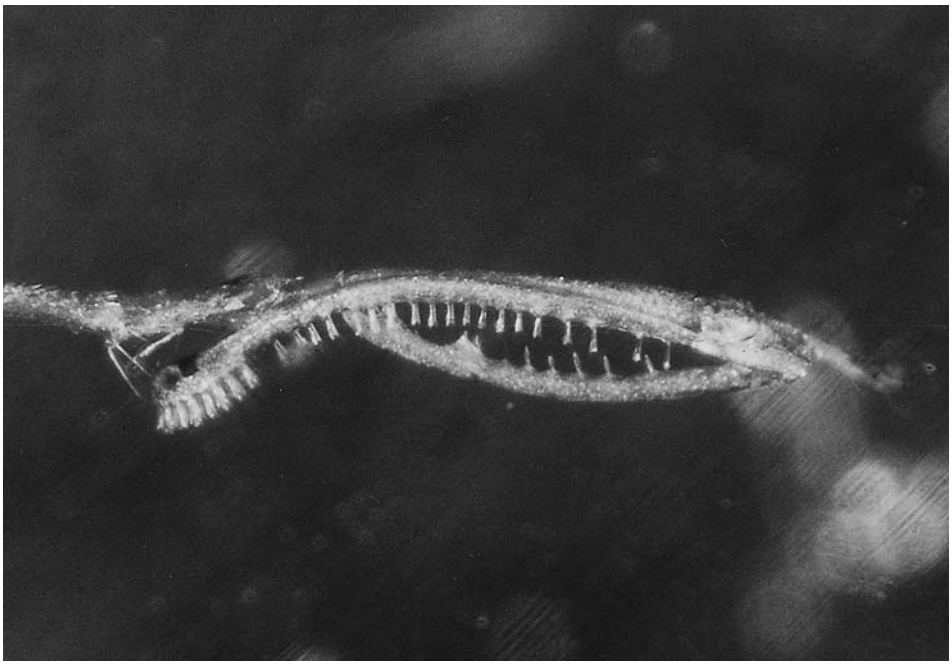

Fig. 54. *Harpactosphecion sucinum* OLMI, 1987, ♀ specimen no. SMNS Do-4494-M, fore tarsal chela. Without scale.

imen with no. SMNS Do-4494-M at the Staatliches Museum für Naturkunde, Stuttgart, Germany (Figs 52–54).

Locality and age: Oligocene/Miocene? amber from the Dominican Republic (15–40 mybp).

Palaeodryinus groehni n. gen. n. sp.

Holotype: Female specimen no. 4302 (old no. 1228 in coll. GRÖHN) in the amber collection of the Geologisches und Paläontologisches Institut der Universität Hamburg, Germany, which is described above (Figs 11–14).

Locality and age: Eocene Baltic amber (40–45 mybp).

Thaumatodryinus miocenicus OLMI, 1995

* 1995 *Thaumatodryinus miocenicus* OLMI, pp. 263–266, figs VI-1–2.

1999b *Thaumatodryinus miocenicus*. – OLMI, p. 66.

Holotype: Female specimen without number (but the specimen is labelled as the concerning holotype) at American Museum of Natural History, New York, USA (ex coll. MASSIMO OLMI).

Paratypes: Two female specimens without number (but the specimens are labelled as the concerning paratypes) American Museum of Natural History, New York, USA (ex coll. MASSIMO OLMI).

Further material: The female specimen figured by POINAR (1992: fig. 102) also belongs to this species. It has no. H-10–100A in coll. GEORGE POINAR Jr., Corvallis, Oregon, USA (maintained at Oregon State University). A further very nice female specimen with no. SMNS Do-4066-M at the Staatliches Museum für Naturkunde, Stuttgart, Germany (Figs 55–56).

Locality and age: Oligocene/Miocene? amber from the Dominican Republic (15–40 mybp), "El Valle" amber mines.

Fig. 55. *Thaumatodryinus miocenicus* OLMI, 1995, ♀ specimen no. SMNS Do-4066-M, head and thorax. Without scale.

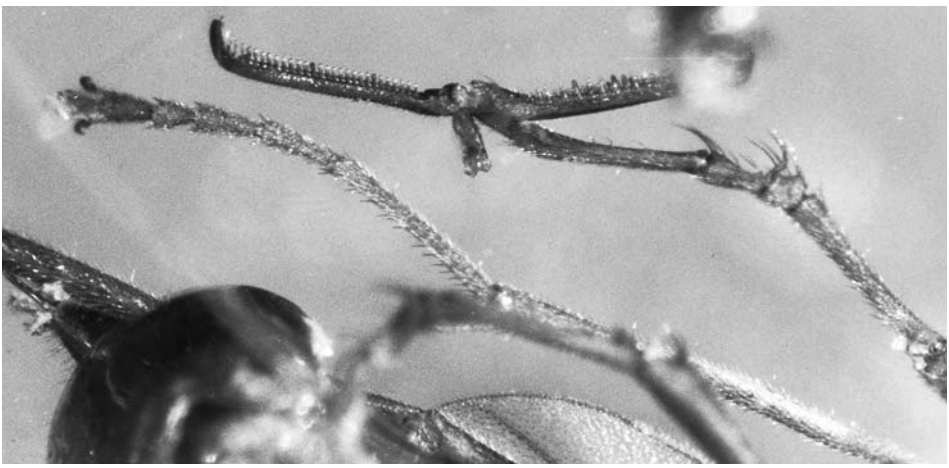

Fig. 56. *Thaumatodryinus miocenicus* OLMI, 1995, ♀ specimen no. SMNS Do-4066-M, fore tarsal chela. Without scale.

Dryinidae in subfamila incertae sedis

Dryinus? *antiquus* (PONOMARENKO, 1981)

* 1981a *Laberius antiquus* PONOMARENKO, p. 139.
1981b *Laberius antiquus*. – PONOMARENKO, pp. 116, 118–119, fig. 1.
1984 *Dryinus antiquus*. – OLMI, pp. 751, 1830.
1987 *Laberius antiquus*. – SPAHR, p. 38.
1995 *Dryinus antiquus*. – OLMI, p. 268.
1988 *Laberites antiquus*. – PONOMARENKO, pp. 105–106.
1999b *Dryinus antiquus*. – OLMI, p. 65.

Holotype: Male specimen no. PIN 3426/221 at Palaeontological Institute, Moscow, Russia.

Locality and age: Upper Cretaceous (Upper Cenomanian) amber from Western Taymyr, Nizhnyaya Agapa River, Siberia (78–115 mybp, probably about 100 mybp).

Comment: This specimen was first mentioned by ZHERIKHIN (1978: 83) and described by PONOMARENKO (1981a) in the genus *Laberius* KIEFFER, 1914 which the latter author regarded as formal genus for male Dryinidae incertae sedis. OLMI (1984) provisionally transferred this species to the extant genus *Dryinus*, since *Laberius* indeed has to be considered a synonym of the extant dryinid genus *Dicondylus* according to RICHARDS (1937). For this reason CARPENTER (1992: 488) incorrectly attributed this species to the extant genus *Dicondylus*. However, OLMI (1984: 751) mentioned that the only known specimen is in too bad condition to permit the definite attribution to any genus of Dryinidae. Therefore, PONOMARENKO (1988) disputed the placement within the extant genus *Dryinus* and transferred this species to a new formal genus *Laberites*. Unfortunately, the latter genus is not available according to Art. 13.3 IRZN (4th ed.), since there was no type species designated in the original publication, and a subsequent designation is not possible for genera created after 1930.

[*Laberites*] *polonicus* (PONOMARENKO, 1988)

* 1988a *Laberites polonicus* PONOMARENKO, p. 108, fig. 1.
1988b *Laberites polonicus*. – PONOMARENKO, p. 106, fig. 1.
1989 *Laberites polonicus*. – OLMI, p. 393 (in a new separate subfamily Laberitinae).
1995 *Laberites polonicus*. – OLMI, p. 268 (in the separate subfamily Laberitinae).
1999b *Laberites polonicus*. – OLMI, p. 65.

Holotype: Male specimen no. 8736 in Museum of the Earth of Polish Acad. Sci., Warsaw, Poland.

Locality and age: Eocene Baltic amber (40–45 mybp).

Comment: Since the genus *Laberites* PONOMARENKO, 1988 is not available (see above), because there was no type species designated in the original publication, the original author should establish a valid new genus for this species which does not fit into any of the known fossil and extant dryinid genera. Therefore, even a separate subfamily Laberitinae was suggested by OLMI (1989), but this taxon is unfortunately unavailable as well, because its type genus is unavailable according to Art. 11.7.1.1 IRZN (4th ed.). We contacted Dr. PONOMARENKO to solve this issue.

Dryinidae larvae indet.

Dryinid larva parasitizing in a planthopper larva (Flatidae?)

1992 POINAR, p. 201, 252, fig. 140.
1995 OLMI, p. 163.
1999b OLMI, pp. 64–65.

Material: Specimen (number unknown) in coll. GEORGE POINAR Jr., Corvallis, Oregon, USA (maintained at Oregon State University).

Locality and age: Oligocene/Miocene? amber from the Dominican Republic (15–40 mybp).

Dryinid larva parasitizing in a planthopper larva (Flatidae)

1995 OLMI, p. 163, fig. V.
1999b OLMI, p. 65.

Material: Specimen no. DR-10–546 at American Museum of Natural History, New York, USA.

Locality and age: Oligocene/Miocene? amber from the Dominican Republic (15–40 mybp); "El Valle" mine.

Dryinid larva parasitizing in a planthopper larva (Fulgoroidea)

1999 POINAR, p. 136, fig. 140.

Material: Specimen no. HO-4–38 in coll. GEORGE POINAR Jr., Corvallis, Oregon, USA (maintained at Oregon State University).

Locality and age: Oligocene/Miocene? amber from the Dominican Republic (15–40 mybp).

Comment: This fossil specimen is quite extraordinary, since the parasite is just emerging from its host.

Dryinid larva parasitizing in a female adult planthopper (Cicadellidae)

1999b OLMI, p. 65., fig. 17.

Material: Specimen without number in coll. PETER LAGING, Scharnebeck, Germany.

Locality and age: Eocene Baltic amber (40–45 mybp).

Comment: This is the only published record of a dryinid larva from Baltic amber.

Dryinid larva parasitizing in a planthopper larva (Cicadellidae)

2001 GRÖHN, pers. comm.

Material: Specimen no. 5001 in coll. CARSTEN GRÖHN, Glinde, Germany (determination by Dr JACEK SZEWDO, Poland).

Locality and age: Eocene Baltic amber (40–45 mybp).

Comment: This specimen is the second dryinid larva from Baltic amber.

A further adult female Dryinidae from Baltic amber, which was not examined by us, is present in the private collection of Mr J.-W. JANZEN (Seevetal). Several further adult female Dryinidae from Dominican amber shall be present in the collection of the Museo de Ambar in Santo Domingo which is now closed, and the complete collection is offered for sale by the owner Mr H. HOERSCH.

Concerning the whereabouts of BRUES' type material of Baltic dryinids, OLMI (1984, 1999b) correctly supposed that it has to be regarded as lost (viz destroyed in the 2nd world war), since it is neither present among the remains of the Königsberg amber collection at the University of Göttingen, nor at MCZ in Cambridge where BRUES studied the loaned material. Literal citation from a letter (in the archives of SMNS), dated 29.04.1968, by Prof. Dr W. HENNIG (Staatl. Mus. Naturk. Stuttgart) to Prof. Dr O. H. WALLISER (Geol.-Pal. Inst. Univ. Göttingen): „*Die parasitischen Hymenopteren sind – im wesentlichen nach Königsberger Material – kurz vor dem Kriege von Brues bearbeitet worden. Das betreffende Material mit den Typen ist leider verschollen. Ich habe auch im Museum of Comparative Zoology in Cambridge (Massachusetts), der früheren Wirkungsstätte von Bues* [sic]*, im August des vorigen Jahres keine Spur davon entdecken können.*" (end of citation).

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