

**A fossil ugyopine planthopper from Baltic amber (Hemiptera:  
Fulgoroidea: Delphacidae)**

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**ABSTRACT:** A new fossil genus and species *Serafinana perperunae* gen. et sp. n. from Eocene Baltic amber is described. It is the first fossil representative of the tribe Ugyopini of the planthopper family Delphacidae. The morphological characters and distribution of the subfamily Asiracinae are discussed.

**KEY WORDS:** *Serafinana perperunae* gen. et sp. n., Hemiptera, Fulgoroidea, Delphacidae, Asiracinae, Ugyopini, Eocene, Baltic amber, taxonomy.

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INTRODUCTION

Representatives of the planthopper family Delphacidae are not common in fossil record (METCALF & WADE 1966, KEILBACH 1982, SPAHR 1988). Fossils of delphacid planthoppers have been described from Tertiary sediments of North America and Europe (BECKER-MIGDISOVA 1964, METCALF & WADE 1966). From resins they have been reported by DALMAN (1825) and COCKERELL (1917) from Burmese amber and by POINAR & POINAR (1999) from Dominican amber.

*Serafinana perperunae* gen. et sp. n. is the first known fossil delphacid representative of the tribe Ugyopini of the subfamily Asiracinae. Recently, the tribe comprises 15 genera and 158 species, which consists about 8% of all Delphacidae planthoppers (ASCHE 1985, DONALDSON 1987, 1988). Their distribution is limited to the tropical ecosystems of the Australoasian and Neotropical regions. The insects are thought to have separated relatively recently and are regarded as a monophyletic group of the evolutionary old planthoppers (FENNAH 1979).

### Acknowledgements

We wish to thank Mr. Jacek Serafin, the collector and owner of a rich and interesting collection of Baltic amber inclusions, which we had privilege to study and Mrs. Krystyna Warchał for language improvement.

## DESCRIPTIONS

### *Serafinana* gen. n.

#### Diagnosis

Median carina of frons single, long, not bifurcated. External surface of the compound eye without incision. Second antennal segment club-like, not depressed, more than twice as long as cylindrical first segment, which is enclosed by circular collar. Mesonotum with five carinae. Tegmina with nodal line not very distinct, apex with 11 longitudinal veins. External margin of hind tibiae with 3 lateral spines.

#### Type-species

*Serafinana perperunae* sp. n., present designation.

### *Serafinana perperunae* sp. n.

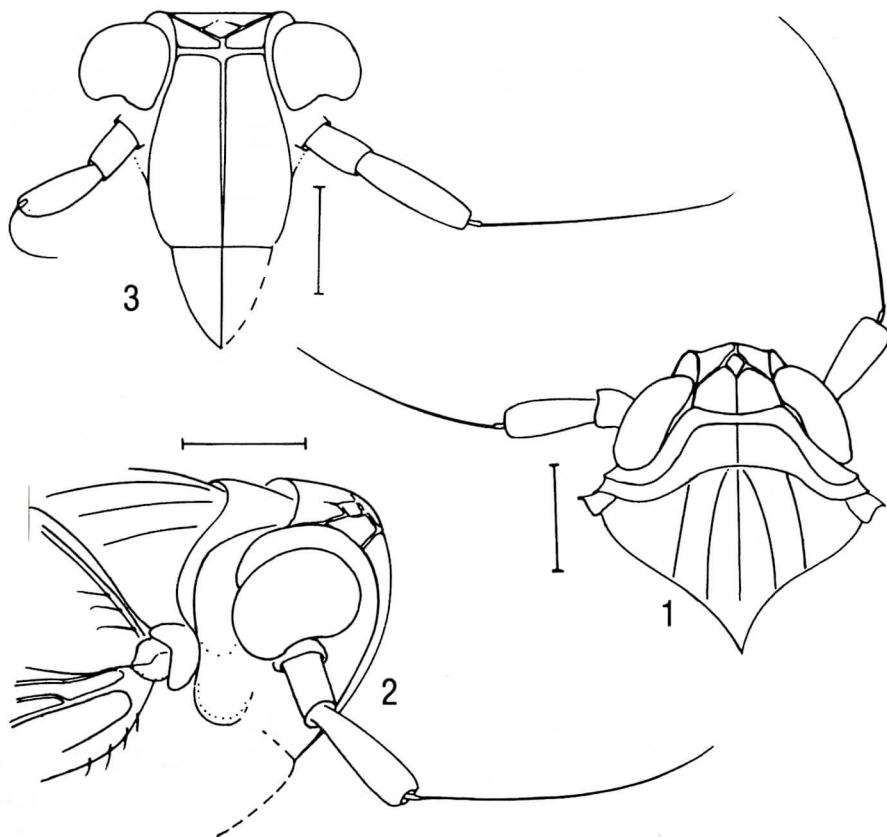
#### Description

Total length of body (measured in the middle line of the back): 2.97 mm, with tegmina about 4 mm. Head with compound eyes 0.95 mm wide. Vertex subquadrate, 0.23 mm long, 0.33 mm wide at posterior margin. Width of vertex smaller than length of compound eye (in dorsal view), its posterior margin straight, reaching  $\frac{1}{3}$  the length of compound eyes (Figs. 1, 7). Lateral margins of head subparallel and elevated, connected with carinae of vertex near the anterior angle of compound eye. Median part of vertex slightly concave, with indistinct carinae. Anterior margin of head (fronto-vertical margin) low, weakly distinguished, subapical margin more distinguishable, with lateral carinae of vertex passing arcuately onto external carinae of frons. Head apex slightly convex and blunt at the end. Compound eyes elongated, slightly depressed laterally, somewhat narrowed above the base of antennae (in lateral view). Frons 1 mm high, 0.47 mm wide, discoidal, widest a little above transclypeal suture (Fig. 3). Lateral carinae of frons strongly elevated, curved laterally and slightly widened. Median ocellus lacking. Base of antenna placed in middle of lower margin of compound eye. Antenna 3-segmented, flagellum 1.5 times longer than the basal part. Basal segment (about 0.2 mm long) cylindrical, partly encircled by a circular collar, shorter than first antennal segment. Second segment club-like and not depressed, about twice as long as the first, covered with placoidal sensillae, particularly in its subapical

part. Third segment forming callosity in the base of flagellum. Flagellum 0.86 mm long (Figs. 2, 3). Clypeus triangular, slightly longer than wide at base, with visible lateral and median carinae. Transclypeal suture only slightly curved (Fig. 3). Rostrum stout, strongly sclerotized, reaching hind leg coxae.

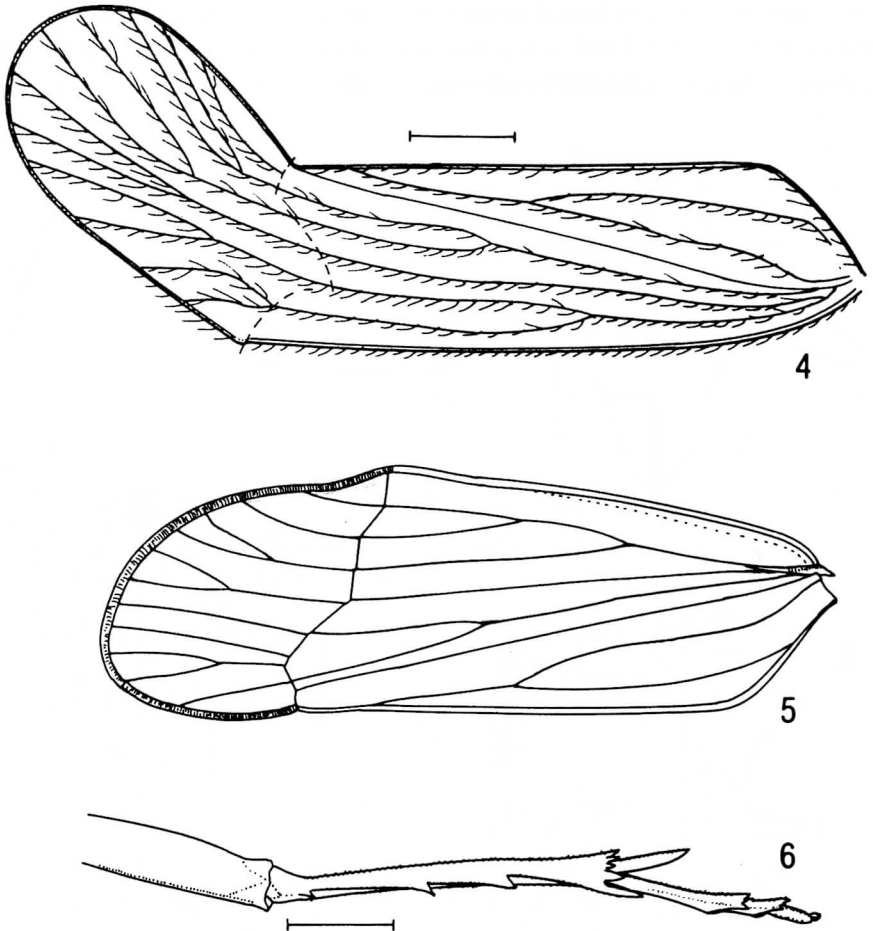
Pronotum (1.02 mm) slightly wider than head. Pronotum measured in median line (0.18 mm) slightly shorter than vertex, the posterior margin distinctly incised. Mesonotum 0.68 mm long, 0.95 mm wide, slightly longer than combined length of head and pronotum. Mesonotal disc slightly convex, wide, weakly flattened in the middle.

Longitudinal carinae of mesonotum well visible. The narrowest, median carina, not reaching apex of scutellum; lateral carinae connected with median carina at the margin of pronotum, arcuately parted and — together with external carinae — reaching the posterior margin of mesonotum. Fields delimited by carinae subequal in width (Figs. 1, 7).



**Figs. 1-3.** *Serafinana perperunae* gen. et sp. n. 1 - anterior part of body in dorsal view, 2 - anterior part of body in latero-dorsal view, 3 - head in frontal view. Scale bar 0.5 mm.

Tegulae big and wide. Tegmina dark, narrow, elongated, with evenly rounded apices, extending end of abdomen, 3.81 mm long, about 0.9 mm wide; hairs relatively long, placed on longitudinal veins and on costal margin, not visible on apical margin. Pterostigma or callosity of Sc+R veins absent. Nodal line formed by the transverse veinlets, concentrated subapicad in  $\frac{2}{3}$  of tegmen length. Costal field narrow. Veins RA and RP with two branches, M bifurcated once, CuA with 5 branches. In the apical part of the tegmen, beyond nodal line transverse veinlets not present (Figs. 4, 7, 8). Wings weakly preserved, hyaline, probably well developed and wide.



**Figs. 4-6.** 4 – right tegmen of *Serafinana perperunae* gen. et sp. n., 5 - left tegmen of *Punana brunnea*, redrawn after ASCHE (1985), 6 - right hind leg of *Serafinana perperunae* gen. et sp. n. Scale bar: 0.5 mm.



Legs relatively slender. Fore femur as long as tibia (0.7 mm), mid tibia longer (0.88 mm) than femur. First tarsomere of fore and mid legs shorter, second and third tarsomeres equal in length (0.16 mm). Hind femur longer (0.84 mm) than fore and mid femora. Hind tibia 1.37 mm long. External margin of the hind tibia with 3 lateral spines placed below knee, in the middle and  $\frac{1}{4}$  of the tibia length (Fig. 6). Tibial spur thin, about 0.35 mm long, slightly curved and strongly acute, angular, with a row of very short setae. Plantar surface of tarsus with short setae. Basal tarsomere almost twice as long as combined length of remaining tarsomeres (0.51 : 0.26 : 0.26 mm). Apices of tibia and tarsomeres with strong lateral spines.

Abdomen relatively wide and short.

#### Material examined

Holotype, sex not recognized, Eocene Baltic amber, coll. Jacek Serafin, Kasparus, Poland, AUF 05JS. The holotype will be deposited in the collection of the Natural History Museum, Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Cracow, Poland.

#### Etymology

The generic name is a combination of the name Serafin, the owner of the holotype and *Punana* – a genus of ugyopine planthopper. The species name includes Old Slavonic goddess — Perperuna. Gender: feminine.

### DISCUSSION

Regarding the structures of vertex and facial part of the head, mesonotum and the tegmina venation *Serafinana perperunae* gen. et sp. n. is closely related to the Oriental genus *Punana* MUIR (Fig. 5). The latter genus comprises 4 species recorded in South-Eastern Asia. The main difference between these genera is the structure of the antenna. In the genus described above antennae are not depressed laterally, which is typical of representatives of *Punana* (DLABOLA 1965). Regarding the shape of head and the placement of carinae on vertex the new genus is also similar to representatives of some other Pacific genera (*Ugyopana*, *Melanesia*, *Melanugyops*, *Livatiella*). It differs from *Ugyopana* FENNAH, whose vertex is distinctly longer, and which has transverse veinlets on tegmina apical of nodal line. It is also different from *Melanesia* KIRKALDY — which lacks median carina on vertex and whose nodal line is bent at almost straight angle. *Melanugyops* FENNAH has characteristic massive carinae on vertex and three visible carinae on the mesonotal disc, while *Livatiella* FENNAH has 12 longitudinal subapical veins on the tegmen. Some less distinct similarities can also be observed between *Serafinana perperunae* gen. et sp. n. and the Oriental genera *Ostama* WALKER and *Eodelphax* MELICHAR.

The group of similar and probably related genera can also encompass some other Neotropical genera with the following set of characters: nodal line distinctly visible and apical part of tegmen separated. These are members of the tribe Asiracini: *Tetrasteira* MUIR, *Equasystatus* ASCHE and *Platysystatus* MUIR.

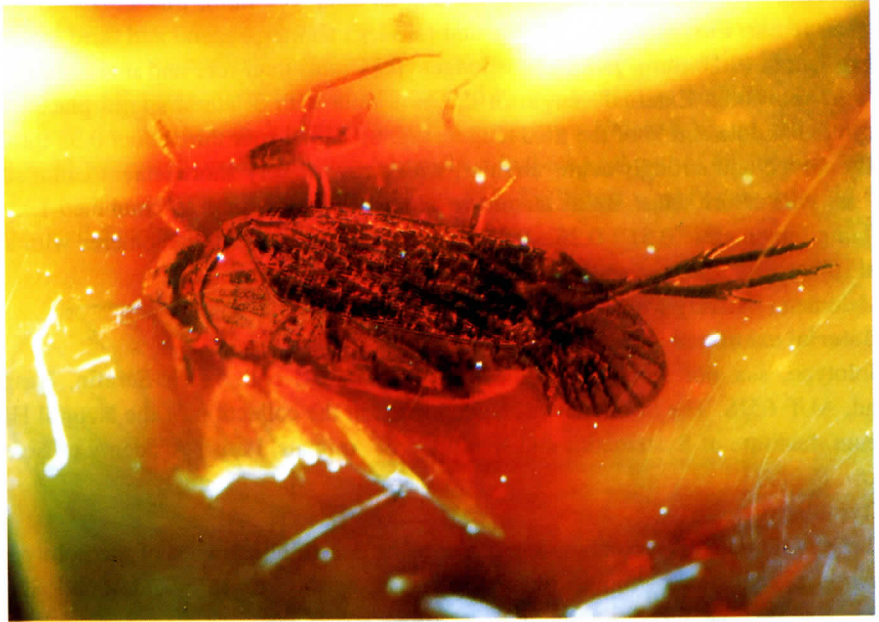


Fig. 7. *Serafinana perperunae* gen. et sp. n. in dorsal view.

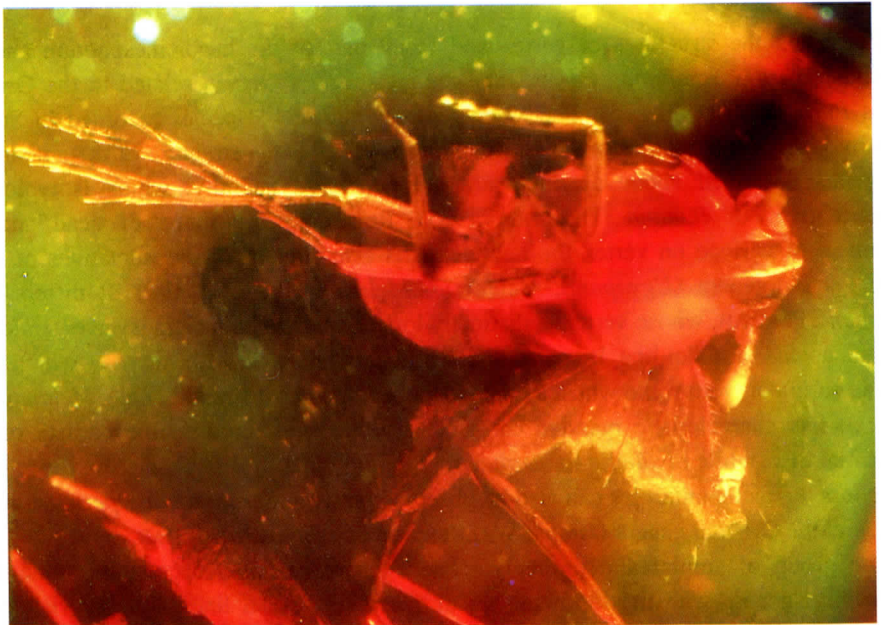


Fig. 8. *Serafinana perperunae* gen. et sp. n. in ventral view.

Fossil *Serafinana* gen. n. described herein from Tertiary of Europe indicates that planthoppers of the tribe Ugyopini were more widely distributed in the past than now.

Recent distribution of Ugyopini in the Australasian and Neotropical regions, together with pattern of recent distribution of all Asiracinae (ASCHE 1985, 1987) would also suggest their Laurasian origin.

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