



## New omethid and lampyrid taxa from the Baltic Amber (Insecta: Coleoptera)

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### Abstract

Two new fossil genera, *Electromethes* **gen. n.** (Omethidae) and *Electotreta* **gen. n.** (Lampyridae), and two new species, *Electromethes alleni* **sp. n.** and *Electotreta rasnitsyni* **sp. n.**, are described from the Baltic amber. The new taxa appear to be related to the extant omethids (*Electromethes*) and ototretines (*Electotreta*) from the East Asia.

**Key words:** Coleoptera, Omethidae, Lampyridae, new genera, new species, Baltic Amber, palaeoentomology, Eocene.

### Introduction

A possibility to study Baltic Amber inclusions allowed discovering two well preserved and relatively well observable male specimens, representing two new, apparently "Cantharoid", genera. While the pronotal shape, the non-flabellate antennomere 3 and laterally exposed outside sternite 9 parameres of the first specimen quite closely match those of (at least some) Omethidae (e.g., Ramsdale, 2010), the second amber specimen has rather much in common with recent ototretines, one of the hypothetically more primitive (and not light-emitting) lampyrid subfamilies, at the same time possessing certain traits linking it with other extant lampyrids: the pronotal contour (with conspicuous posterolateral angles) as in Ototretinae (e.g., *Drilaster* Kiesenwetter, 1879) or Cyphonocerinae, and the prominent humeral elytral costa and large punctuation more reminiscent of certain extant Luciolinae, such as, e.g., *Curtos* Motschulsky, 1845 (McDermott, 1964). For this reason, the two new genera are tentatively attributed, the former, to the family Omethidae, the latter, to the lampyrid subfamily Ototretinae. In neither of the groups fossil taxa have so far been known.

### Taxonomy

#### *Electromethes* **gen. n.**

Type species: *Electromethes alleni* **sp. n.**

Description. Adult male. Alate, flattened, elongate (Fig. 1). Head transverse, exposed. Eyes moderately large, spherical. Labrum conspicuous, sclerotised, located anteriorly of clypeus. Palps small, slender; ultimate palpomeres securiform. Gula transverse (Fig. 3). Antennal sockets separated by ca. their diameter. Antenna 11-segmented, moderately long, antennomeres 4–10 flabellate; pedicel (antennomere 2) short, subequal in length and width to antennomere 3 and considerably shorter than subsequent antennomeres; pubescence on antennomeres 3–11 short and decumbent (Fig. 2).

Pronotum transverse, narrowed and rounded anteriorly, with punctate convex disk, explanate sides and almost straight posterior angles (Figs 1–2). Prosternum triangular (Fig. 3). Scutellum elongate, rounded at apex (Fig. 1). Discrimen complete, bifurcate near mesoventrite. Elytra elongate, flattened, slightly broadening posteriorly, densely punctate, with inconspicuous longitudinal costae, pubescence short and decumbent (Fig. 1). Epipleuron absent. Metathoracic wings fully developed.



**FIGURES 1–3.** General view of *Electromethes alleni* **gen. n., sp. n.**, holotype male. 1—dorsally; 2—same, latero-dorsally; 3— same, ventrally.

Legs relatively short and robust; hind coxae contiguous; trochanters short; femurs and tibiae straight, tibiae noticeably longer than femurs, almost non-widened distally; tarsomeres 1–4 slightly widened, with plantar pads; claws simple, shortly appendiculate at base.

Abdomen with eight ventrites; exposed portion of ultimate ventrite small, transverse, rounded at apex; ventrites without photic organs. Aedeagus with laterally exposed outside sternite 9 parameres (Fig. 3).

Female. Unknown.

Diagnosis. *Electromethes* **gen. n.** is easily distinguishable from other omethids by a combination of the following characters: more prominent and more sclerotised labrum, securiform ultimate palpomeres, non-flabellate antennomere 3, location of the bases of flabellae of antennomeres 4–10 at the apices of antennomeres (Fig. 1), triangular prosternum (Fig. 3), absent elytral epipleuron, present plantar pads on tarsomeres 1–2 (Fig. 3), etc.

Etymology. The name of the new genus is derived from "electron", the Greek for "amber", and the genus name "Omethes". Gender masculine.

### *Electromethes alleni* **sp. n.**

(Figs 1–3)

Description. Male. Dark brown; elytral margins testaceous.

Eyes bulging, interocular dorsal distance over 3 times greater than eye radius. Maxillary and labial palps slender; ultimate maxillary palpomere elongate, ca. 3 times longer than wide, ultimate labial palpomere about 1.5 times longer than wide. Antennae flabellate, attaining to elytral middle, with antennomeres 2 and 3 combined about 2 times shorter than antennomere 4; flabellae of antennomeres 4–10 noticeably longer than antennomeres (Figs 1–2).

Pronotum transverse, ca. 1.5 times as wide as long, convex at disk, with noticeable anterior angles. Scutellum elongate, almost parallel-sided, rounded at apex (Fig. 1).

Elytra long, 3.4 times as long as wide at humeri (Fig. 1).

Tibiae ca. 1.2 times longer than femurs; tarsomere 1 almost as long as tarsomeres 2–4 combined (Fig. 3).

Length (from anterior head margin to end of elytra): 6.4 mm. Width (humeraly): 1.7 mm.

Female. Unknown.

Type material: Holotype, ♂, specimen No. L-052011, Baltic amber, Upper Eocene (Insect Centre collection, Moscow).

Diagnosis. *Electromethes alleni* **sp. n.**, the only known representative of the genus, is easily distinguishable from other omethids by the generic characters.

Etymology. The new species is named after Mr. Albert Allen (Boise, Idaho) who enabled me to study this remarkable Baltic Amber beetle specimen and donated the inclusion to the collection of the Insect Centre, Moscow.

### *Electotreta* **gen. n.**

Type species: *Electotreta rasnitsyni* **sp. n.**

Description. Adult male. Alate, flattened, elongate (Fig. 4). Head transverse, almost completely covered by pronotum. Eyes relatively large, spherical. Ultimate palpomeres distally pointed. Antennal sockets broadly separated. Antenna 11-segmented, moderately long, filiform; pedicel (antennomeres 2) subequal in length to antennomere 3 and subsequent antennomeres; pubescence on antennomeres 3–11 short and sub-erect (Figs 4–5).

Pronotum small, ca. 6 times shorter than elytra, transverse, narrowed and rounded anteriorly, with smooth convex disk and prominent acute posterior angles (Fig. 4). Scutellum triangular, with minute emarginate at apex (Fig. 4). Elytra elongate, flattened, parallel-sided, with prominent humeral costa, noticeable in proximal three fourths, and ten rows of even round impressions, six rows in discal part and four rows in lateral part, apices independently rounded; pubescence sub-erect and short (Fig. 4). Epipleuron short, noticeable near humerus (Fig. 5). Metathoracic wings fully developed.

Legs slender; trochanters elongate; femurs and tibiae narrow, tibiae straight, slightly widened distally; tarsomeres 2–4 slightly widened, with plantar pads; claws simple, with a small broad tooth at base.

Abdomen with six ventrites, strongly narrowed distally; ultimate ventrite elongate, almost parallel-sided; penultimate equally narrow, short. Ventrites without photic organs.

Female. Unknown.

Diagnosis. *Electotreta* **gen. n.** is easily distinguishable from other ototretines by the dorsally smooth head, transverse pronotum with prominent acute posterior angles and ten rows of round impressions on each elytron (Fig. 4).

Etymology. The name of the new genus is derived from "electron", the Greek for "amber", and the genus name "Ototreta". Gender feminine.



Remarks. Ototretines (*Drilaster*, *Stenocladius* Fairmaire, 1878 and allied genera), initially treated as drilids (e.g., Wittmer, 1944), were afterwards included in Lampyridae (McDermott, 1964; Crowson, 1972), and recently transferred to Cantharidae (Bouchard et al., 2011). However, the latter transfer was made without argumentation, and this lineage perhaps should be retained in Lampyridae, pending further study, as apparently not fitting in Cantharidae, due to, for instance, the free labrum of its representatives, as opposed to the fused labrum in the cantharids. Obviously, these East-Asian beetles need to be comprehensively studied to be properly classified.

Most of the head and thoracic structures of the inclusion are obscured below by air bulbs and detritus particles.

***Electotreta rasnitsyni* sp. n.**

(Figs 4–5)

Description. Male. Testaceous; elytra dark brown.

Eyes bulging, interocular dorsal distance ca. 3 times greater than eye radius. Maxillary and labial palps slender; ultimate maxillary palpomere elongate, ultimate labial palpomere roundish. Antennae filiform, attaining to elytral two fifths, with antennomere 3 subequal in length to pedicel (antennomere 2) and only slightly shorter than scape (Fig. 4).

Pronotum strongly transverse, ca. 2.4 times as wide as long, strongly narrowed anteriorly, margined throughout, with prominent acute posterior angles; disk sparsely punctate. Scutellum transverse, triangular, slightly emarginate at apex (Fig. 4).

Elytra elongate, 2.6 times as long as wide at humeri (Fig. 1); with ten rows of round impressions in the middle transforming into six rows at apices.

Terminal abdominal ventrite elongate, almost parallel-sided, with rounded apex, ca. 2 times longer than wide and longer than two preceding ventrites together (Fig. 5).

Length (from anterior head margin to end of elytra): 2.3 mm. Width (humeral): 0.8 mm.

Female. Unknown.



**FIGURES** 4–5. General view of *Electotreta rasnitsyni* gen. n., sp. n., holotype male. 4—dorsally; 5—same, ventrally.

Type material: Holotype, ♂, specimen No. L-042011, Palanga, Lithuania, Baltic amber, Upper Eocene (Insect Centre collection, Moscow).

Diagnosis. *Electotreta rasnitsyni* **sp. n.**, the only known representative of the genus, is easily distinguishable from other ototretines by the generic characters.

Etymology. The new species is named after a prominent palaeoentomologist Dr. A.P. Rasnitsyn (Moscow).

## Discussion

Both Omethidae and Ototretinae are rather poorly known and insufficiently studied (e.g., Ramsdale, 2010; Branham, 2010). For this reason it does not appear possible, prior to a thorough study of the extant representatives of the two groups, to adequately delineate the synapomorphies of the two lineages complementing them with the new fossil data. However, the discovery of the above new fossil amber taxa seems to be contributive to this end, and in the long run, to our understanding of the evolution of the "Cantharoidea" in general.

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