



## A new fossil genus of net-winged beetles, with a brief review of amber Lycidae (Insecta: Coleoptera)

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### Abstract

A new fossil genus of net-winged beetles, *Protolopheros* **gen. n.**, and a new species, *Protolopheros hoffeinsorum* **sp. n.**, are described from the Baltic amber. The new taxon is placed in Erotini, next to *Lopheros* Leconte, 1881. The extant *Pseudaplapterus* (*Eropterus*) Green, 1951, **comb. n.** is lowered in rank and placed as a subgenus of the fossil *Pseudaplapterus* Kleine, 1940. The extant *Kolibaceum* (*Laterialis*) Kazantsev, 1990, **comb. n.** is lowered in rank and placed as a subgenus of the fossil *Kolibaceum* Winkler, 1987.

**Key words:** Coleoptera, Lycidae, new genus, new species, taxonomy, Baltic amber, palaeoentomology, Eocene

### Introduction

Although fossil specimens of net-winged beetles (of *Dictyoptera* sp.) were initially reported from the Baltic amber (Klebs, 1910), the first fossil lycid taxon was described from Florissant Fossil Beds (Upper Eocene/Lower Oligocene) in North America (Wickham, 1914). However, all consequent descriptions were based on amber inclusions, predominantly from the Baltic region. The first Baltic amber lycid taxon, *Pseudaplapterus* Kleine, 1940, was presented in the middle of the last century (Kleine, 1940; 1941); afterwards were added another three genera, *Hiekeolycus* Winkler, 1987, *Kolibaceum* Winkler, 1987 and *Pietrzeniukia* Winkler, 1987 (Winkler, 1987). Later on *Hiekeolycus* and *Pietrzeniukia* were demonstrated to be synonymous with the extant genera (Kazantsev, 1995; 1997; 2004), while a representative of *Kolibaceum* was found among the extant net-winged beetles of China (Kazantsev, 1997). Finally, another fossil genus, *Electropteron* Kazantsev, 2012, was discovered in the Dominican amber (Kazantsev, 2012b).

Comparison of *Pseudaplapterus* with the extant *Eropterus* Green, 1951, the latter taxon not compared originally with the former, revealed that the two are very closely allied and, at most, represent two subgenera of a single genus. Similarly, comparison of *Kolibaceum* with the extant *Laterialis* Kazantsev, 1990 showed that the two taxa also represent two subgenera of a single genus. On the other hand, a study of Baltic amber inclusions from the Hoffeins collection in Hamburg led to the discovery of a new taxon, apparently related to *Lopheros* Leconte, 1881. A description of the new taxon, as well as taxonomic notes that were deemed necessary are presented below.

### Taxonomy

#### Subfamily Erotinae

#### Tribe Erotini

#### *Protolopheros* **gen. n.**

Type species: *Protolopheros hoffeinsorum* **sp. n.**

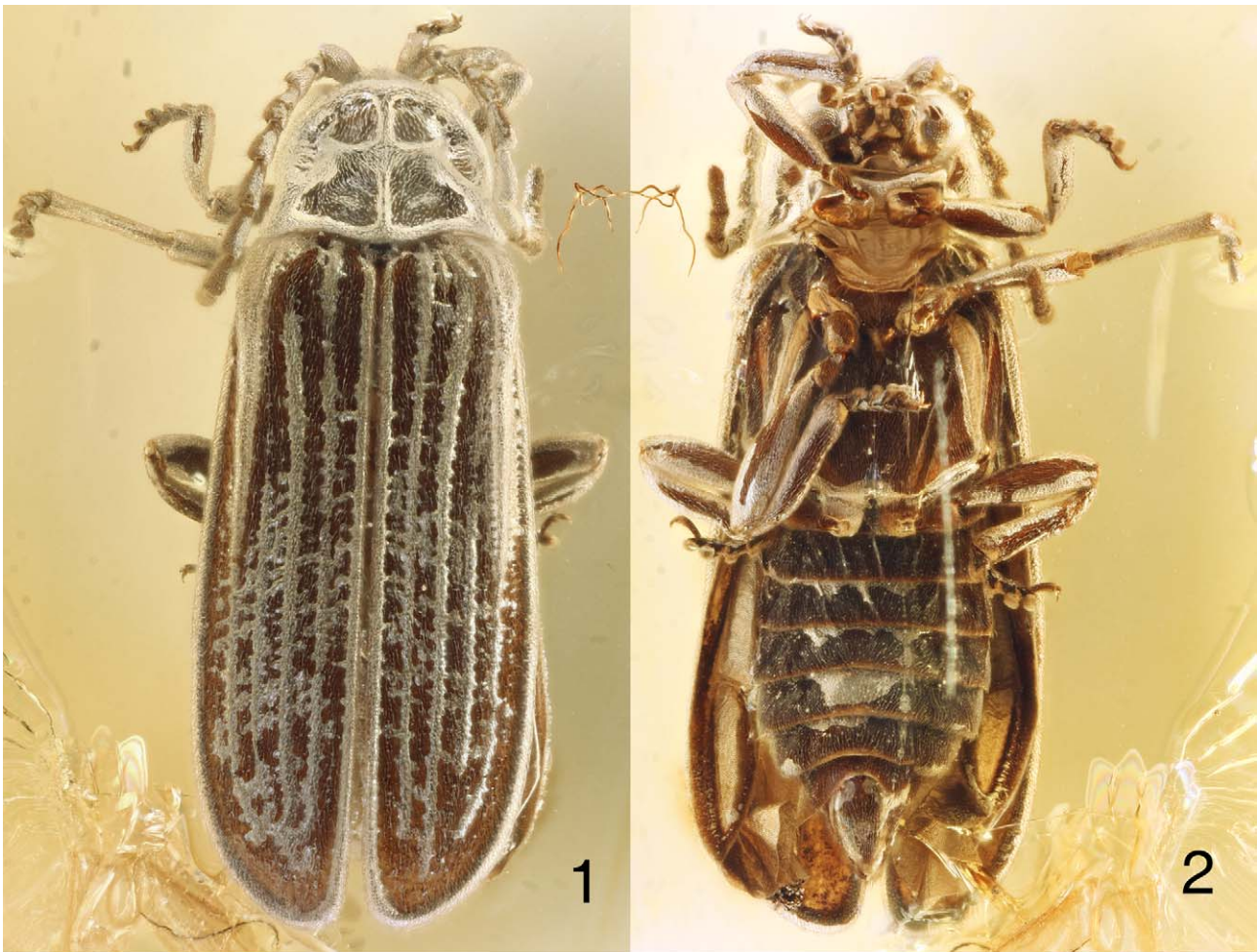
**Description.** Adult male. Alate, flattened, elongate (Fig. 1). Head transverse, slightly exposed. Eyes moderately large, spherical (Figs 2–3). Labrum short. Palps small, slender; ultimate palpomeres securiform. Labium with elongate undivided prementum and short annuliform mentum. Gula short, transverse (Fig. 2). Antennal sockets separated by ca. 2/3 their diameter. Antenna 11-segmented, relatively short, antennomeres cylindrical; pedicel (antennomere 2) about as long as wide, about twice as short as antennomere 3, antennomere 3 about twice as short as subsequent antennomeres; pubescence on antennomeres 3–11 short and suberect (Figs 1–3).

Pronotum transverse, rounded anteriorly, with complete median and lateral and short antero-lateral carinae; posterior angles acute (Fig. 1). Prosternum short, V-shaped (Fig. 2). Scutellum square, truncate at apex (Fig. 1). Mesoventrite undivided, with almost straight anterior margin, separated from mesopleuron by sterno-pleural segment. Discrimen almost complete, bifurcate near mesoventrite (Fig. 2). Elytra elongate, flattened, almost parallel-sided, with stout humeral elytral costa (costa 4) and almost obsolete proximally costa 3, with double rows of irregular weak cells in interstices; pubescence uniform, short and decumbent (Fig. 1). Epipleuron absent (Fig. 4). Metathoracic wings fully developed.

Legs relatively short and robust; hind coxae conspicuously separated; pro- and mesotrochantins subequal in size; trochanters short; femurs and tibiae straight, tibiae and femurs subequal in length, almost non-widened distally; tarsomeres 1–4 slightly widened, with plantar pads, plantar pad occupying ca. 1/2 of tarsomere 1 (Figs 2–4); claws simple.

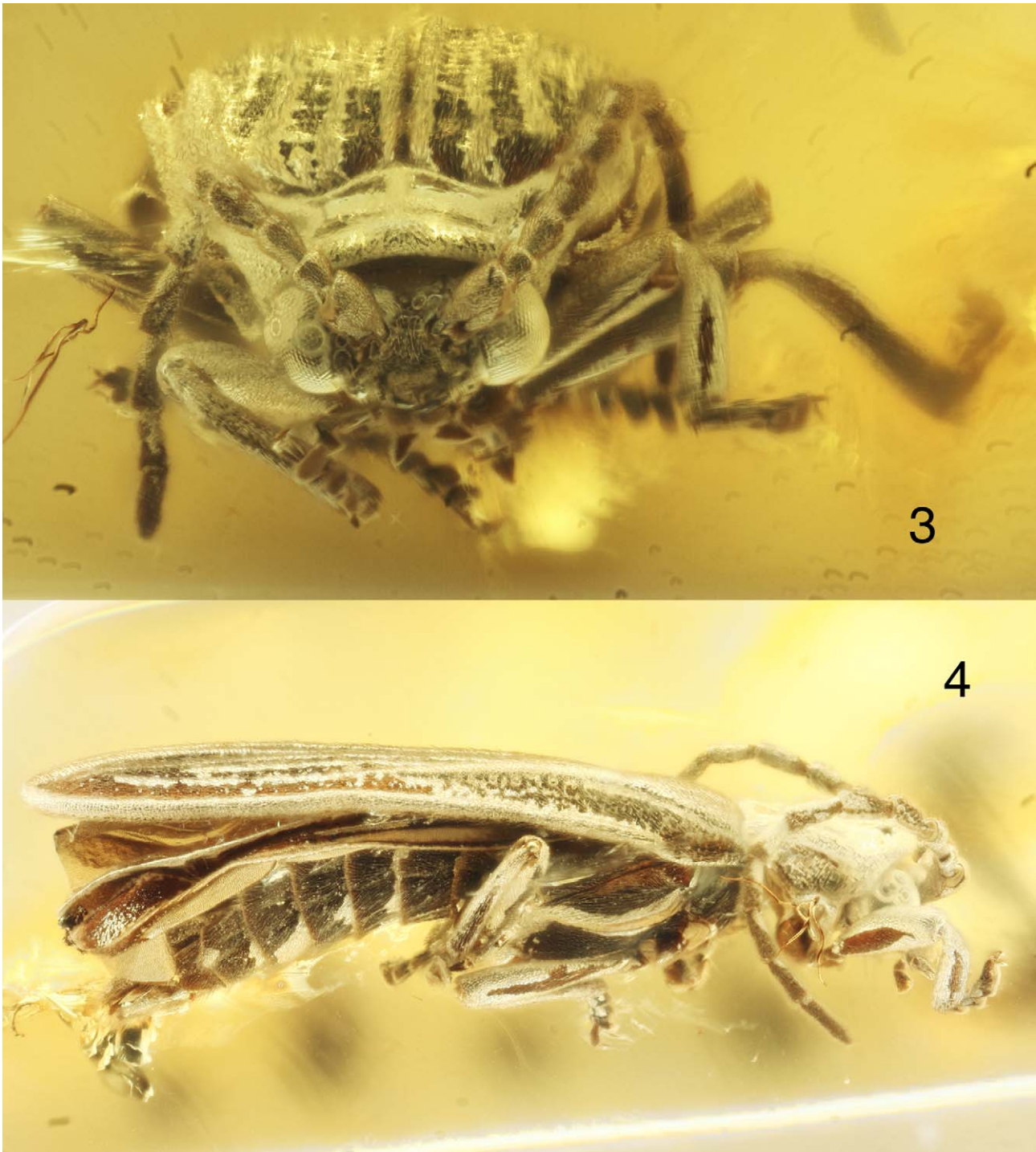
Abdomen with eight ventrites; penultimate ventrite with wide semicircular incision, exposed portion of ultimate ventrite elongate, elliptical; ventrites without photic organs (Fig. 2).

Female. Unknown.



**FIGURES 1–2.** General view of *Protolopheros hoffeinsorum* gen. n., sp. n., holotype male. 1—dorsally; 2—same, ventrally.





FIGURES 3–4. General view of *Protolopheros hoffeinsorum* gen. n., sp. n., holotype male. 3—anteriorly; 4—same, laterally.

**Diagnosis.** *Protolopheros* gen. n. may be unmistakably referred to the erotine complex of net-winged beetles due to a combination of characters, above all the antennal structure, the very characteristic pronotal pattern and strong elytral costae with evident reticulation (Fig. 1). Based on the erotine key (Kazantsev, 2004), the new fossil genus would key to *Lopheros* Leconte, 1881, at the same time easily distinguishable from *Lopheros* and related genera (*Aplatopterus* Reitter, 1911, *Eulopheros* Kazantsev, 1995) by the short, but conspicuous antero-lateral pronotal carinae (Fig. 1), stout humeral elytral costa (costa 4) and almost obsolete proximally elytral costa 3, combined with irregular elytral reticulation (Fig. 1). *Aplatopterus* was not included in the 2004 key as not valid at that time, but was consequently validated (Kazantsev, 2012a) on the basis of a cladistic analysis (Kazantsev, 2010).

Although *Protolopheros* gen. n. is distinguished from the related genera by the stout humeral elytral costa, just

as the amber subgenera of *Kolibaceum* or *Pseudaplatopterus*, it also differs by the pronotal and certain other details of the elytral structure, and apparently deserves the genus rank.

**Etymology.** The name of the new genus is derived from the Latin for “ancestor”, and the genus name “Lopheros”. Gender masculine.

***Protolopheros hoffeinsorum* sp. n.**

(Figs 1–4)

**Description.** Male. Dark brown.

Eyes bulging, interocular dorsal distance ca. 2 times greater than eye radius. Ultimate maxillary and labial palpomeres considerably larger than preceding palpomeres, ca. 1.5 times longer than wide. Antennae filiform, attaining to elytral two fifths, with antennomeres 2 and 3 combined subequal in length to antennomere 4 (Figs 1–3).

Pronotum transverse, ca. 1.4 times as wide as long, with rounded anterior and small acute posterior angles. Scutellum almost quadrate, truncate at apex (Fig. 1).

Elytra flattened, long, 3.6 times as long as wide at humeri (Fig. 1).

Tarsomere 1 only slightly shorter than tarsomeres 2–4 combined (Fig. 2).

Length (from anterior head margin to end of elytra): 6.0 mm. Width (humeraly): 2.0 mm.

Syninclusions. None.

Female. Unknown.

**Type material:** Holotype, ♂, specimen No. 1424-1, Baltic amber, Eocene (Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany).

**Diagnosis.** *Protolopheros hoffeinsorum* sp. n., the only known representative of the genus, is easily distinguishable from other erotines by the generic characters.

**Etymology.** The new species is named after Christel Hoffeins and Hans Werner Hoffeins (Hamburg) who enabled me to study this remarkable Baltic amber beetle specimen.

***Pseudaplatopterus* Kleine, 1940**

Type species: *Pseudaplatopterus ascheelei* **Kleine, 1940**

*Pseudaplatopterus* Kleine, 1940: 179

**Remarks.** Comparison of *Pseudaplatopterus* with *Eropterus*, which originally had not been done by the author of the latter taxon (Green, 1951), reveals that the two taxa have no morphological differences, except the stoutness of the humeral elytral costa in *Pseudaplatopterus*. As this character is also the only one that distinguishes the fossil *Kolibaceum*, from the Baltic amber as well, from its extant subgenera, it seems appropriate, until further clues are found, to consider *Pseudaplatopterus* and *Eropterus* subgenera of a single genus. In one of the recent papers on Erotini (Kazantsev, 2004) I already mentioned that *Eropterus* is likely synonymous with *Pseudaplatopterus*, but was unwilling to suggest any taxonomic changes until a re-examination of the holotype of *Pseudaplatopterus ascheelei*. Now, with the new data available on the *Kolibaceum-Laterialis* lineage which seems to be a parallel case with *Pseudaplatopterus-Eropterus* and which is hereby treated as a single genus, as well as on the *Lopheros-Protolopheros* gen. n. lineage, moving *Pseudaplatopterus* and *Eropterus* closer together and regarding them as subgenera of a single genus appears more substantiated.

**Distribution.** One fossil species known from the Baltic amber. Extant taxa belonging in *Pseudaplatopterus* (*Eropterus*) occur in Eastern Palaearctic and Nearctic.

***Pseudaplatopterus* (*Pseudaplatopterus*) Kleine, 1940**

Type species: *Pseudaplatopterus ascheelei* **Kleine, 1940**

*Pseudaplatopterus* Kleine, 1940: 179

***Pseudaplatopterus (Pseudaplatopterus) ascheelei* Kleine, 1940**

*Pseudaplatopterus A. Scheelei* Kleine, 1940: 179

*Pseudaplatopterus scheelei* Kleine: Spahr, 1981

**Remarks.** In accordance with Art. 32.5.2 of the ICZN the incorrect original spelling of the species name «A.Scheelei» should be corrected to «ascheelei». All consequent changes and «synonymizations» (e.g., Spahr, 1981; Winkler, 1987) are invalid.

**Distribution.** Baltic amber.

***Pseudaplatopterus (Eropterus) Green, 1951, comb. n.***

Type species: *Eropterus trilineatus* Green, 1951

*Eropterus* Green, 1951: 14

**Distribution.** All species extant, Eastern Palaearctic and Nearctic.

**Tribe Dictyopterini*****Helcophorus* Fairmaire, 1891**

type species: *Helcophorus miniatus* Fairmaire, 1891

*Helcophorus* Fairmaire, 1891: 129

= *Xylobanoides* Kleine, 1928: 237 type species: *Xylobanus unicolor* Gorham, 1903

= *Hiekeolycus* Winkler, 1987: 66 type species: *Hiekeolycus berendti* Winkler, 1987

**Distribution.** One fossil species known from the Baltic amber. Extant taxa in Eastern Palaearctic (Himalayas, Central China, Northern Vietnam).

***Helcophorus berendti* (Winkler, 1987)**

*Hiekeolycus berendti* Winkler, 1987: 67

**Material studied:** ♂, specimen No. 1151-2, Baltic amber, Eocene (Hoffeins Collection, Hamburg).

**Distribution.** Baltic amber.

***Kolibaceum* Winkler, 1987**

type species: *Kolibaceum balticum* Winkler, 1987

*Kolibaceum* Winkler, 1987: 62

**Distribution.** One fossil species known from the Baltic amber. Extant taxa in Eastern Palaearctic.

***Kolibaceum (Kolibaceum) Winkler, 1987***

type species: *Kolibaceum balticum* Winkler, 1987

*Kolibaceum* Winkler, 1987: 62

= *Pietrzeniukia* Winkler, 1987: 68 type species: *P. kunowi* Winkler, 1987

***Kolibaceum balticum* Winkler, 1987**

*Kolibaceum balticum* Winkler, 1987: 63  
= *Pietrzeniukia kunowi* Winkler, 1987: 70

**Distribution.** Baltic amber.

***Kolibaceum (Laterialis)* Kazantsev, 1990, comb. n.**

*Dictyoptera (Laterialis)* Kazantsev, 1990: 14  
type species: *Eros oculatus* Gorham, 1886

**Remarks.** Comparison of *Kolibaceum* with *Laterialis* revealed that the two taxa are fairly identical, except, as in the case of the pair *Pseudaplatopterus* - *Eropterus*, the stoutness of the humeral elytral costa in the fossil *Kolibaceum*. It seems appropriate, until further clues are found, to consider *Kolibaceum* and *Laterialis* subgenera of a single genus.

**Distribution.** Japan.

***Kolibaceum (Tricostaeptera)* Kazantsev, 1997**

*Kolibaceum (Tricostaeptera)* Kazantsev, 1997: 160  
type species: *Kolibaceum (Tricostaeptera) sanguinea* Kazantsev, 1997

**Remarks.** *Tricostaeptera* was initially described as subgenus of *Kolibaceum* (Kazantsev, 1997). Later on it was transferred to *Laterialis* as a subgenus (Kazantsev, 2004). Here *Laterialis* is suppressed in rank to the subgeneric level within the genus *Kolibaceum*; hence, *Tricostaeptera* returns to its initial place in the genus *Kolibaceum*.

**Distribution.** Central China (Hubei), Northern Vietnam, Taiwan.

**Subfamily Leptolycinae****Tribe Leptolycini*****Electropteron* Kazantsev, 2012**

type species: *Electropteron avus* Kazantsev, 2012  
*Electropteron* Kazantsev, 2012: 1

**Distribution.** One fossil species known from the Dominican amber. Extant taxa on Hispaniola (Kazantsev, paper in preparation).

***Electropteron avus* Kazantsev, 2012**

*Electropteron avus* Kazantsev, 2012: 2

**Distribution.** Dominican amber.

**Discussion**

While *Electropteron*, the only known Dominican amber lycid, is from the subfamily Leptolycinae, all lycids



described from the Baltic amber belong in two tribes, Erotini and Dictyopterini, of the subfamily Erotinae. Three of the four Baltic amber lycid genera (*Pseudaplatopterus*, *Helcophorus* and *Kolibaceum*) have one feature in common: they all have extant members, and these members occur only in Eastern Palaearctic and Nearctic (*Pseudaplatopterus*) or only in Eastern Palaearctic (*Helcophorus* and *Kolibaceum*). The fourth genus, *Protolopheros* **gen. n.**, although not having extant members, has close relatives (*Lopheros*, *Aplatopterus* and *Eulopheros*), also in Eastern Palaearctic and Nearctic (Kazantsev, 2004). The fact that the Baltic amber Lycidae are closely allied to Recent net-winged beetles testifies to a probable quite long history of these insects before the Eocene resins started capturing them for future science.

Another peculiarity of the Baltic amber lycid taxa is the morphology of their elytra: they all have prominent humeral costa, considerably surpassing in stoutness other elytral costae, whereas the modern Lycidae in general, and Erotinae, where all Baltic amber lycids belong, in particular, quite rarely have it in this condition. It may indicate that the stout humeral costa is the ancestral character state, and not only among the erotines, but in other lineages of net-winged beetles as well.

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