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New cantacaderid lace bugs from Dominican amber (Heteroptera: Tingidae , Cantacaderinae)

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ABSTRACT

New fossil tingids, representatives of the small subfamily Cantacaderinae (Tingidae) from the Oligocene Dominican amber, are described and discussed. The fossil species *Eocader babyrussus* n. sp. belongs to the recent neotropical genus *Eocader* of the tribe Phatnomini.

Keywords: Heteroptera. Tingidae. Cantacaderinae. Phatnomini. *Eocader babyrussus* n.sp. Dominican amber.

INTRODUCTION

Fossil tingids are quite rare among other known fossil bugs, especially they are very few in Mesozoic heteropteran faunas (Popov, 1989; Golub and Popov, 1998a; Golub and Popov, 1999). Most fossil lace bugs described and mentioned in publications from Cenozoic Dominican and Baltic ambers mainly belong to the plesiomorphic subfamily Cantacaderinae (especially in the Baltic amber) and are represented almost exceptionally by the tribe Phatnomini (Golub and Popov, 1999). Some of them, e.g. *Sinalda baltica* (DRAKE), as well as species of the genus *Paleocader* GOLUB AND POPOV 1998, are quite common.

During the visit of one of the authors (Yu.P.) to the Smithsonian Institution (Washington) and the American Museum of Natural History (New York) in 1994 and also due to continuous efforts by Dr.W.Weitschat (Hamburg University) three very fine collections of the Dominican amber inclusions have been studied and the tingids from them were sorted for determination and description.

New fossil species of the peculiar cantacaderid lace bugs were preserved in amber from the Dominican Republic. This amber varies in age from Lower Miocene to Mid Oligocene, i.e. 23-30 million years old (Grimaldi, 1995). We support the conclusion made by Iturralde and MacPhee (1996) that the age of Dominican amber in the Dominican Republic is most probably of the late Early Miocene - early Middle Miocene (15 to 20 million years old). The present paper deals with the first tingid description from Dominican amber (all amberiferous sites are unfortunately unknown) based on 4 specimens (2 males and 2 females) while some other undescribed tingids from Dominican amber belong to the other subfamily Tinginae and to the recent American genus *Gargaphia* (Golub and Popov, 1999).

SYSTEMATICS

Order: Hemiptera
Suborder: Heteroptera
Infraorder: Cimicomorpha

Family: Tingidae LAPORTE, 1832
Subfamily: Cantacaderinae STAL, 1873
Tribe: Phatnomini DRAKE AND DADIS, 1960

GENUS ***Eocader*** DRAKE AND HAMBLETON 1934

Eocader babyrussus GOLUB AND POPOV n.sp.
Figure 1

Type species: Eocader vergrandis DRAKE AND HAMBLETON 1934; recent species.

Type material: Holotype male (submacropterous form); label "Amber: Dominican Republic, Oligo-Miocene, specific provenance unknown. Purched in Santo Domingo by D.Grimaldi, AMNH DR-8-383."; insect well preserved (Fig. 1.1) and deposited in the American Museum Natural History, New York.

Description: Holotype, male. Small, less than 2 mm long. Body oblong, bare and general colour brown (probably originally yellow-gray).

Head long, 1.7 times as long as wide (from clypeus tip to hind margin of eyes) and 1.34 times as long as wide (from clypeus top to anterior emarginate margin of pronotum). Surface of head fine punctate. Vertex between eyes and occiput depressed, considerably lower than convex frons; this depression runs obliquely outside in form of sulcus in front of each eye fusing backwards and Y-like. Eyes convex, rising above head surface, directed upwards and to the side. Head with 5 denticles: unpaired clypeal and paired frontal and jugal ones. All denticles located far from eyes, especially clypeal and jugal once; clypeal denticle conical with thick base, almost equal as wide as the base of clypeus, directed obliquely upwards and forwards and covering (overlain from above) almost 2/3 length of clypeus; frontal denticles conical with thick base and smoothed top, directed obliquely forwards, upwards and to sides; jugal denticles very short, rather thin and weakly curved, with sharp apex, located lower and in front of clypeal one, directly above upper edge of bucculae. Antennae long and thin; 1-2 joints very short, 2nd joint far from reaching clypeal top; 3rd joint thinnest and longest. Antenniferus tubercles very small and almost equal in length to 2nd joint. Bucculae anteriorly opened, hardly protruding forward beyond apex of clypeus; anterior half with 2 horizontal rows of cells, posterior one has 1 row of cells.

Pronotum 1.54 times as wide as long; pronotal disc convex, with 3 longitudinal low carinae lateral ones of them weakly protruding; median carina in its middle part with 1-2 finest cells; median carina stretching from posterior margin of calloused convex area to posterior margin of pronotum. Pronotal disc densely punctuate (except calloused small area); anterior margin distinctly emarginate, elevated in form of rudimental vesicula with 1 transversal row of small cells. Paranotum in anterior part considerably widened, with 3 row of cells (3rd intermediate row represented by a single cell only) narrowing backward and with 1 row of rather small cells along most part of their length; external edges in anterior third emarginate; posterior margin of pronotum almost straight and slightly waved, without triangular projection. Scutellum completely exposed, trapezoidal form.

Submacropterous form. Hemelytra surpassing far beyond top of abdomen, sharply narrowed at base. Costal area rather wide, practically along whole length with 2 rows of moderately large cells, mainly quadrangular-pentagonal form. Subcostal area inclined (this area of right hemelytron of holotype slightly flattened), with 4 rows of cells along most length and with 4 transversal veins elevating more than other veins. Discoidal area in broadest place with 4 rows of rounded, irregular form cells, and with 2-3 transversal strongly elevated veins. Sutural area at the very base of hemelytra with one row of cells at the level of anterior angle of discoidal area, slightly broadening and at this place with a single cell of 2nd row; further backwards along discoidal area with 1 row of cells and near by apex of widened sutural area 5 rows of cells; tips of sutural areas (membranae) of both hemelytra almost fully overlapping in repose. Clavus distinctly separated by sutura from corium, in the broadest place with 4 oblique rows of cells; exterior row is separated at the level of vein from others. Hypocostal plate (lamina) with one row of cells.

Scent gland openings located by apex of anterior-exterior angle of metapleurit, slightly elevated and broadened at this place. Rostrum long, surpassing backwards anterior margin of fifth abdominal sternite.

Dimensions (in mm): Body length to the tip of hemelytra 1.86, width 0.87; length of pronotum 0.37, width 0.57; length of head from clypeal tip to hind margin of eyes 0.34, to anterior margin of vesicula (along middle line) 0.39, width 0.29; width of vertex 0.11; ratio of antennomeres I-IV as 0.05:0.045:0.64:0.16.

Variability: Judging by the preservation to different degrees of body parts of paratypes (1 male and 2 females) clypeal denticle may be shorter and overlap one third - one half of the length of clypeus (Fig. 1.2), broadened front parts of paranota can be only with two rows of cells,

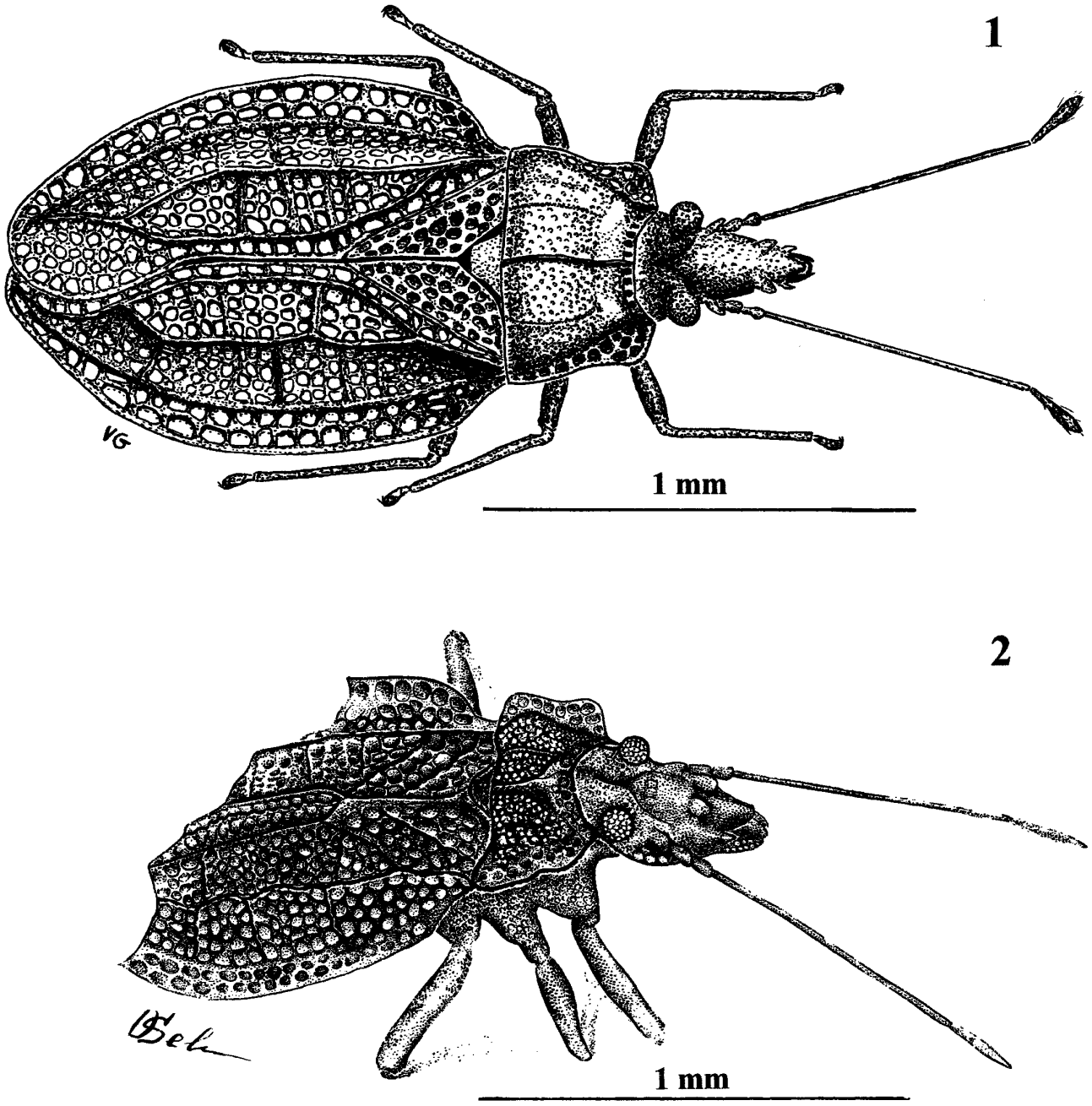

Figure 1. 1.- Habitus of *Eocader babyrussus* n. sp.; 2.- Drawing of the holotype, AMNH DR-8-383.

at least females can be brachypterous (female paratype) with fusing but not overlapping sutural areas of hemelytra along the whole of their length, and subcostal and discoidal areas of hemelytra in their broadest part can be with five rows of cells (at least in females). The length of the third and fourth antennal joints in paratype of male ranges correspondingly 0.65 and 0.14 mm. In female paratype with preserved antennae the length of the third and fourth joints are correspondingly 0.53 and 0.16 mm; a significant difference in the length of the third joint of antennae in males and females of the same species is a regular phenomenon in family Tingidae. Besides the above, frontal denticles of head can be more rounded and flat on the top as it is shown in figure 1.2.

Type material: Paratype ? male; amber Dominican Republic; insect strongly damaged (Fig. 1.2) and deposited in the collection G. Herrling (NW Germany), Inv.Nr.DB W2. Paratype female; label "12533 - amber Dominican Republic, C. Drake collection"; insect significently damaged and deposited in the National Museum of Natural History, Smithsonian Institution. Paratype female; label "125445 - amber Dominican Republic, C. Drake collection"; insect strongly damaged and deposited in the National Museum of Natural History, Smithsonian Institution.

Etymology: The name of the species reflects a curious similarity in the form of head with the quite famous Oriental pig *Babyrussa babyrussa*.

DISCUSSION

The absence of stenocostal area of hemelytra and the presence of median clypeal protrusion are the features of Phatnomini. The depression of vertex between eyes with its continuation in the form of two oblique grooves in front of eyes (Y-shaped form) and hemelytron sharply narrowing at the base - all these are the characteristic features of the small Neotropical recent genus *Eocader* (Drake and Hambleton, 1934). Judging by the diagnosis of genera in the excellent work of Richard C. Froeschner (1996), these specific features of *Eocader* are unique among Phatnomini. The broadened front parts of paranotum and their emarginated exterior edges are the features that bring together the fossil *Eocader babyrussus* n.sp. with the type species of the genus *E. vergrandis* DRAKE AND HAMBLETON found in Brazil.

The main difference between the Miocene species and the modern *E. vergrandis* is the absence in the latter of jugal denticles. Besides, the frontal and clypeal denticles in *E. babyrussus* n.sp. are located closer to the top of head as compared to *E. vergrandis.* In addition to well expressed medial carina, the holotype and paratypes of the species described here have extremely low lateral carinae on pronotum. In brachypterous specimens of *E. vergrandis*, pronotum has one carina and emarginate hind margin, in the macropterous ones - with three carinae and emarginate hind margin (Froeschner, 1996). In the submacropterous holotype *E. babyrussus* n.sp. pronotum has a well expressed, although very low, medial carina and slightly rising lateral carinae, while the hind margin of pronotum is practically straight. At least one of the paratypes of the described species is a brachypterous female. Its pronotum has also three carinae (lateral ones are very low) and a straight hind margin. The differences in the structure of pronotum of *E. vergrandis* and *E. babyrussus* n.sp. are only of a special character. In the same way, the presence or absence of any pair of head denticles cannot serve as a sufficient ground for distinguishing this new species as an independent genus. In the composition of the modern genera of Tingidae there are often species both with carinae and without them, e.g. in *Galeatus inermis* the head's carinae are absent altogether, while in other species of this genus there are five long carinae.

Oligo-Miocene *E. babyrussus* n.sp. is very close to the Eocene genus *Intercader* GOLUB AND POPOV 1998b, from Baltic amber. The only species of this genus *I. weitschati* similar to *E. babyrussus* n.sp. has a depressed vertex between eyes and five head denticles including the jugal one. The main differences between species *I.weitschati* are the presence of five pronotal carinae and the absence of a sharp narrowing of hemelytra at their base. The paired short lateral carinae closely positioned on each side of pronotum in *Intercader* can be looked upon as a result of the break of initial carina and divergence of its fragments in the process of evolution. In any case the difference in the number of pronotal lateral carinae is far from being always considered in systematics of Tingidae as generic difference, for instance in genus *Derephysia.* The differences in the form of hemelytra base are probably more significant because of the uniqueness of this feature in Miocene and modern species of genus *Eocader*. However the depression of the vertex in *Eocader* and *Intercader* is also a rare feature among Tingidae, whose independent appearance in phylogenetic groups seems to be less possible in comparison with related groups. The discovery of the modern genus *Eocader* in Dominican amber and the closest fossil genus *Intercader* in Baltic amber, on the one hand, points to it *(Eocader)* being rather old (beginning with Early Cenozoic period) and, on the other hand, it can be compared to the recent species of this genus. In the Tertiary period there existed significantly closer zoogeographical links between the faunas of Eurasia and South America, as compared to the present time (Golub and Popov, 1998 a).

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