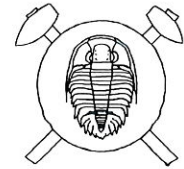


Lamniporichnus vulgaris igen. et isp. nov.: traces of insect larvae in stone fruits of hackberry (*Celtis*) from the Miocene and Pleistocene of the Czech Republic



Lamniporichnus vulgaris igen. et isp. nov.:
stopy hmyzích larev v peckách břestovce (*Celtis*)
z miocénu a pleistocénu České republiky (Czech summary)

(1 text-fig., 1 plate)

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Traces made probably by insect larvae in stone fruits of the Miocene hackberry, *Celtis lacunosa*, are described as *Lamniporichnus vulgaris* igen. et isp. nov. They were found in the opencast mine Merkur-North in the Most (North Bohemian) brown-coal basin. The newly proposed ichnogenus comprises borings in those wooden parts of fruits which contain a hollow filled with non-xylic digestible tissue (stones, nuts). The borings consist of a short cylindrical tunnel joining the stone (nut) surface and a natural hollow inside the xylic body. In comparison, the ichnogenus *Carporichnus* Genise, 1995 represents a longitudinal central cavity and a radial tunnel, both made by the tracemaker. Less favourably preserved material of *Celtis* sp. from the Pleistocene fill of karst cavities at Vitošov (Northern Moravia) provided also remains of presumably insect borings.

Key words: Insect borings, Miocene, Pleistocene, Most Basin, karst sediments, Czech Republic

Introduction

The attention paid to insect traces in xylic substrates during the last decade has demonstrated that these traces are common in the fossil record since the Cretaceous (Genise 1995). However, as they had been usually overlooked before, systematic ichnology of them remains fragmentary.

The aim of the present contribution is to describe traces made probably by insect larvae in stone fruits of *Celtis lacunosa* (Reuss, 1861) Kirchner, 1957, from the Miocene of the Most (North Bohemian) brown-coal basin. Regardless the traces of comparable to identical morphology are quite common in Recent and presumably also in the Cenozoic fossil record, no ichnotaxonomical name has been given to them so far. The material from the North Bohemian Miocene is described herein as *Lamniporichnus vulgaris* igen. et isp. nov. Similar, but much less favourably preserved material of insect-damaged *Celtis* stone fruits is reported from the cemented fill of the karst cave at Vitošov (Northern Moravia).

Geological settings

Merkur-North: Tertiary basins in Northwest Bohemia (Czech Republic) originated along the rift structure during the Eocene to Miocene. In the middle of the rift, the Most (North Bohemian) brown-coal basin is situated. In the Early Miocene, variable fluvial, limnic and swamp settings developed there. The past ecosystems are often well documented by the fossil flora, fish, insect, amphibian and reptile faunas (Kvaček – Fejfar 1993).

One of the rich fossil sites of the basin, which provided the fruit stones of *Celtis lacunosa* (Reuss) Kir-

chner bearing traces of insect larvae, is the opencast mine Merkur North of Chomutov. Here, the calcareous marls on the base of the so-called „Main Brown Coal Seam“ contain fossils of plants, terrestrial molluscs, insects and small mammals (Kvaček – Fejfar 1993). Stratigraphically, earlier part of the Early Miocene (Eggenburgian), lower Orleanium, mammal zone MN 3a is concerned. Reconstruction of the settings and vegetation (Kvaček – Fejfar 1993, Z. Kvaček *pers. comm.* 1998) show that shrubs to smaller trees of *Celtis lacunosa* were a part of forests that overgrew the brown coal swamps, together with *Acer tricuspidatum*, *Glyptostrobus europaeus*, *Alnus julianiformis*, with *Decodon* sp. in undergrowth, a.o.

The hackberry *Celtis lacunosa* was described first from freshwater limestones and travertines at Tuchořice (Reuss 1861). From the Most basin, few reports on its occurrence have been published so far. Holý in Čtyrský et al. (1964) first determined the species from the Merkur-North locality. Finds of endocarps of *C. lacunosa* from the layers overlaid by the Main Coal Seam are mentioned in the manuscript by Kvaček and Bůžek (1983). The insects at the Merkur-North locality are represented mostly by diving-beetles (J. Prokop, *pers. comm.* 1998).

Vitošov: The quarry at Vitošov exploits weakly metamorphosed limestones of the Devonian age. The quarrying led in 1997 to a discovery of karst cavities filled with breccia composed of biogenic particles and cemented with sinter. About 98 % of the breccia clasts are spherical bodies representing probably unfavourably preserved fruit stones of *Celtis* sp. Terrestrial molluscs are represented by *Granaria frumentum* (Draparnaud), *Clausilia* cf. *dubia* Drapanaud and fragments of several other taxa

(V. Ložek *pers. comm.* 1998). Also bones, fragments of bones or rarely skulls of small Pleistocene mammals (*Martes* sp., *Rodentia* and *Microchiroptera* div. gen. et sp.) were found in the karst cavities in the upper part of the quarry (Z. Gába, *pers. comm.* 1998).

Fossils of *Celtis* sp. have been found in sediments of several interglacial periods of the Central European Pleistocene. The way of cementation of the breccia and the gastropod fauna point to the appurtenance of one of the older Quaternary interglacials (Ložek *pers. comm.* 1998).

Systematic ichnology

Lamniporichnus n. igen.

Diagnosis: Borings in those wooden parts of fruits which contain a hollow filled with non-xylic digestible tissue (nuts, stones). The borings consist of a short cylindrical tunnel joining the nut (stone) surface and a natural hollow inside the xylic body.

Type ichnospecies: *Lamniporichnus vulgaris* n. isp.

Comparisons: *Lamniporichnus* differs from a similar ichnogenus *Carporichnus* Genise, 1995 by the circumstance that the boring of the former ichnogenus only perforates a wall of the fruit particle. However, in *Carporichnus*, borings are composed of a longitudinal central cavity and a radial tunnel, both made by the tracemaker (Genise 1995). Similar to identical morphology as *Lamniporichnus* shows also the ichnogenus *Oichnus* Bromley, 1981, which, however, differs by its substrate (i.e. shells of marine shally fauna, esp. gastropods and lamellibranchs).

Lamniporichnus vulgaris n. isp.

Pl. I, figs. 1–3; Text-fig. 1

Holotype: Specimen figured in Pl. I, fig. 1b, housed in the palaeontological collection of the Doly Břlina, a.s. mining company.

Type horizon: Early Miocene, mammal zone MN 3a.

Type locality: Merkur-North opencast mine (the site called also after the former village Ahníkov).

Material: Twenty studied specimens from the Merkur-North site (Miocene). Three ill-preserved specimens from Vitošov (?Early Pleistocene).

Diagnosis: *Lamniporichnus* formed in small (up to several mm) fruit stones. The tunnel is very short, cylindrical, smooth.

Description: Rounded apertures connected with very short tunnels, 0.8–2.0 mm in diameter, on the wall of irregularly sculptured fruit stones of *Celtis lacunosa*. Length of the stones 4.0–6.0 mm. Larger apertures (1.0–2.0 mm) are often irregular, probably enlarged subsequently by a mechanic damage. Thickness of the bored wall is ca. 0.4 mm.

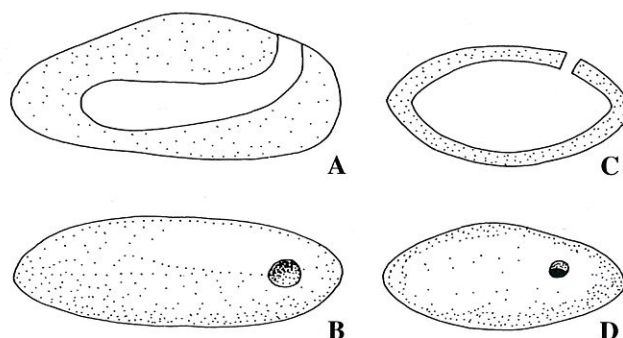


Fig. 1. A, B: *Carporichnus* isp. Schematic drawing, after Genise (1995); C, D: *Lamniporichnus* isp. Schematic drawing. Not to scale.

The stones of *Celtis* from the karst breccia from Vitošov are somewhat larger (up to 8 mm) and the poorly preserved perforations are 1–3 mm in diameter.

Discussion: Traces of similar morphology are well-known from recent ecosystems. For example, nuts of a common hazel (*Corylus avellana* L.) are often attacked by larvae of the beetle *Balaninus nucum* (L.). Stones of various central European fruits (e.g., cherry) are also subjects of similar attacks.

Among the fossil insects known from the North Bohemian Miocene, no taxa which are supposed to be able to exploit the stones of *Celtis* have been found so far (J. Prokop, *pers. comm.* 1998).

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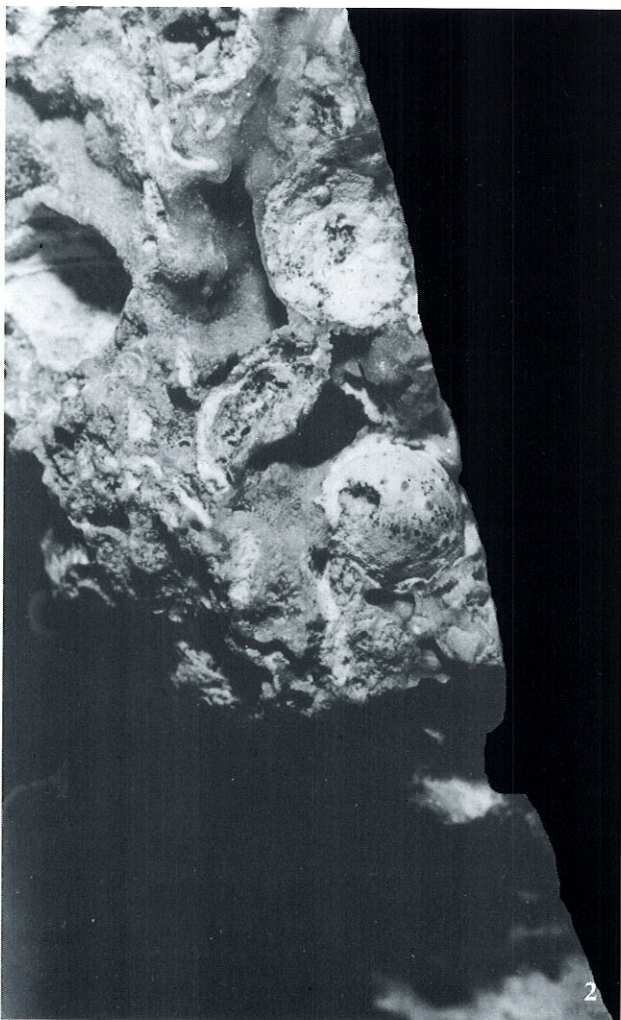
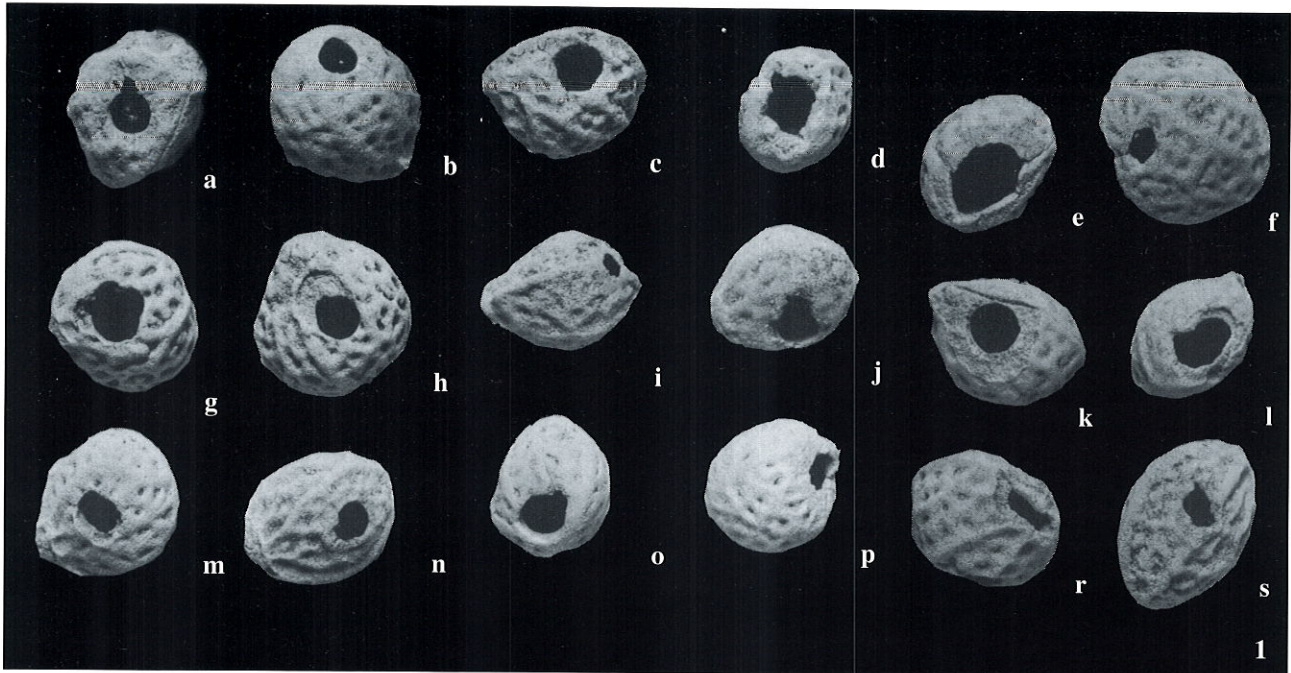
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R. Mikuláš - Z. Dvořák - I. Pek: *Lamniporichnus vulgaris* igen. et isp. nov.: traces of insect larvae in stone fruits of hackberry (*Celtis*) from the Miocene and Pleistocene of Czech Republic (Pl. I)



1a–s: *Lamniporichnus vulgaris* igen. et isp. nov. (round holes) in stone fruits of *Celtis lacunosa* (Reuss) Kirchl. Early Miocene, mammal zone MN 3a, Merkur-North locality, x4.5. 1b = holotype.

2–3: Sinter-cemented breccia of stone fruits of *Celtis* sp. with perforations (cf. *Lamniporichnus vulgaris* igen. et isp. nov.). Pleistocene, fill of karst cave, Vitošov, x3.0.

Lamniporichnus vulgaris igen. et isp. nov.: stopy hmyzích larev v peckách břestovce (*Celtis*) z miocénu a pleistocénu České Republiky

Pecky spodnomiocenního břestovce *Celtis lacunosa*, nalezené na lokalitě Merkur-sever v mostecké hnědouhelné pánvi, jsou často perforovány drobnými kruhovými otvory, které jsou morfologickou a velmi pravděpodobně i etologickou analogií např. recentním stopám larev nosatců na plodech lísky. Pro tento typ stopy byl navržen nový ichnotaxon *Lamniporichnus vulgaris* igen. et isp. nov. Od příbuzného ichnorodu *Carporichnus* Genise, 1995 se liší tím, že původce stopy pouze prorazil stěnu plodu původně vyplněného nedřevnatým materiálem, zatímco *Carporichnus* představuje vrtby do výhradně dřevnatých částí plodů palmy.

Pozoruhodný nález velkého množství pecek břestovce tmelených sintroem z lomu ve Vitošově (pleistocén) poskytl rovněž několik pecek s obdobnými perforacemi.