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 larv v peckách břestovce (Celtis) z miocénu a pleistocénu České republiky (Czech summary)

(1 text-fig., 1 plate)

RADEK MIKLÁŠ – ZDENĚK DVOŘÁK – HLJA PEK

1 Geologický ústav Akademie věd České republiky, Rozvojová 135, 165 00 Práha 6, Czech Republic
2 Severočeské doly, a.s., Doly Bílina, 418 29 Bílina, Czech Republic
3 Přírodovědecká fakulta Univerzity Palackého, Svobody 26, 771 46 Olomouc, Czech Republic

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-xylar digestible tissue (stones, nts). The borings consist of a short cylindrical tunnel joining the stone (nut) surface and a natural hollow inside the xyleic body. In comparison, the ichnogenus Carpichnus 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 xylar 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) Kirkheimer, 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 fluvialite, 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) Kirchheimer 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 Orléanum, 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 europeus, Alnus julianiformis, with Decodon sp. in undergrowth, a.o.

The hackberry Celtis lacunosa was described first from freshwater limestones and travertines at Tuchlovice (Reuss 1861). From the Most basin, few reports on its occurrence have been published so far. Holy in Čtyřoký et al. (1964) first determined the species from the Merkur-North locality. Finds of endocarps of C. lacunosa from the layers overlying 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 biogenetic 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 frumenta (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 Celsis 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**

**Lamnporichinus 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:** Lamnporichinus vulgaris n. isp.

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

**Lamnporichinus vulgaris n. isp.**

Pl. I, figs. 1–3; Text-fig. 1

**Holotype:** Specimen figured in Pl. I, fig. 1b, housed in the paleontological collection of the Doly Blina, 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 Vitoslov (?Early Pleistocene).

**Diagnosis:** Lamnporichinus 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 Celsis 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.

The stones of Celsis 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 nucem (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 Celsis have been found so far (J. Prokop, pers. comm. 1998).

**Acknowledgements.** Thanks are due to Dr. Z. Kvaček (Faculty of Sciences, Charles University, Prague) for his kind help with the botanical aspect of the problem and for the comments to the early draft. We thank also Dr. V. Ložek (Institute of Geology, Praha), Mgr. J. Prokop (Charles University, Prague), and Dr. Z. Gába (Regional Museum in Šumperk) for personal communications given to the topic. Dr. R. Morávek (Homeland Museum in Olomouc) kindly provided his finds from Vitošov for further study.

Submitted November 2, 1998
Translated by R. Mikuláš

**References**


La–f: Lanniporichnus vulgaris igen. et isp. nov. (round holes) in stone fruits of Celtis lacunosa (Reuss) Kirchh. 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. Lanniporichnus vulgaris igen. et isp. nov.). Pleistocene, fill of karst cave, Vitošov, x3.0.
Lamniorichinus vulgaris igen. et isp. nov.: stopy hmyzích larev v peckách břestovce (Celtis) z miocénu a pleistocénu České Republiky

Pecky spodnomicenčního břestovce Celtis faciculata, nalezené na lokalitě Měrkur sever v mostecké hnědouhelné pánvi, jsou často perforovány drobnými kruhovými otvory, které jsou morfologicky a velmi pravděpodobně i etologicky analoží např. recentním stopám larev nosatec na plodech lísky. Pro tento typ stopy byl navržen nový ichnotaxon Lamniorichinus vulgaris igen. et isp. nov. Od příbuzného ichnosporu Carpocrinus Genise, 1995 se liší tím, že původce stopy pouze prorazil stěnu plodu původně vyplněnou neslevnatým materiálem, zatímco Carpocrinus představuje vrtby do výhradně dřevnatých částí plodů palmy.

Pozoruhodný nález velkého množství pecek břestovce tvořených sintrem z lomu ve Vítošově (pleistocén) poskytl rovněž několik pecek s obdobnými perforacemi.