

UPPER JAW FRAGMENT OF THE *ANANCUS ARVERNENSIS* (CROIZET & JOBERT 1828) (MASTODONTIDAE, PROBOSCIDEA, MAMMALIA) FROM THE VILLAFRANCHIAN OF HAJNÁČKA, SLOVAKIA

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Abstract: Remains of a representative of the family Mastodontidae (Proboscidea, Mammalia) of the Villafranchian fauna were found in Hajnáčka, southern part of Central Slovakia. The upper jaw fragment of an *Anancus arvernensis* with preserved molars M^2 sin., M^2 dex., M^3 sin., M^3 dex. is described in this paper. *Anancus arvernensis* is a relatively common mastodontid in the European Plio-Pleistocene deposits. Only isolated teeth and bones of mastodontids are usually found on the territory of Slovakia and more complete fossil remains such as the presented specimen are very rare.

Key words: Villafranchian, Proboscidea, Mastodontidae, *Anancus arvernensis*.

Introduction

The deposits of the vertebrate locality Hajnáčka are of European importance. Since the year 1863, when was the locality discovered, fossiliferous horizons have provided very rich vertebrate fauna of the Villafranchian Age (Fejfar 1964). In the history of the research many geologists and paleontologists have been dealt with this locality (Kubinyi 1863; Szabó 1865; Paul 1866; Krenner 1867; Schafarzik 1899; Kormos 1915 In: Fejfar et al. 1990) and from recent years Fejfar (1964); Fejfar et al. (1985, 1990), etc.

The fossil remains of the locality originated from limnic basin-fillings with pyroclastic intercalations (tuffs, tuffite, lapilli, agglomerates) (Fejfar et al. 1990). The complete mammal fauna consists of ca. 30 species. Tooth and bone fragments of mastodonts and tapirs are most frequent. The complete list of mammalian species is available in Fejfar (1964) and Fejfar et al. (1990).

Systematic Paleontology

Class	Mammalia Linnaeus 1758
Order	Proboscidea Illiger 1811
Suborder	Mastodontoidea Osborn 1921
Family	Mastodontidae Girard 1852
Subfamily	Anancinae Hay 1922
Genus	<i>Anancus</i> Aymard 1855

Anancus arvernensis (Croizet & Jobert 1828)

Synonymy: *Mastodon arvernesis*, *Mastodon dissimilis*, *Dibunodon arvernensis*

Type (lectotype): M^1 sin., described and depicted by Croizet & Jobert 1828, p. 139–140, Pl. 13, Fig. 1.

Paratypes: Dozens of isolated molars with fragments of upper and lower mandibles described and depicted by Croizet

& Jobert 1828, p. 133–138, Pl. 1, Fig. 1, 4, Pl. 2, Fig. 7 and by Osborn 1936, p. 632–633, Fig. 596 (denoted as cotypes).

Type locality: Perrier, Auvergne, France

Type level: Lower Villafranchian, Upper Pliocene

Localities: Many sites in Europe and Asia

Material

A fragment of the upper jaw (ZIBA-2407/1986, Collections of Zoological Institute, Comenius University, Bratislava) with the molars M^2 dex., M^2 sin., M^3 dex., M^3 sin. (see Fig. 2). Only one molar (M^2 dex.) is completely preserved, the other teeth are incomplete. The fossil has a light-brown color with features after burning in the lava (blackish inner part), while the teeth are grey.

Locality

The locality of Hajnáčka is located 28 km east of the town of Lučenec, in the Cerová vrchovina Upland (see Fig. 1).



Fig. 1. Geographical location of the Lower Villafranchian locality Hajnáčka.

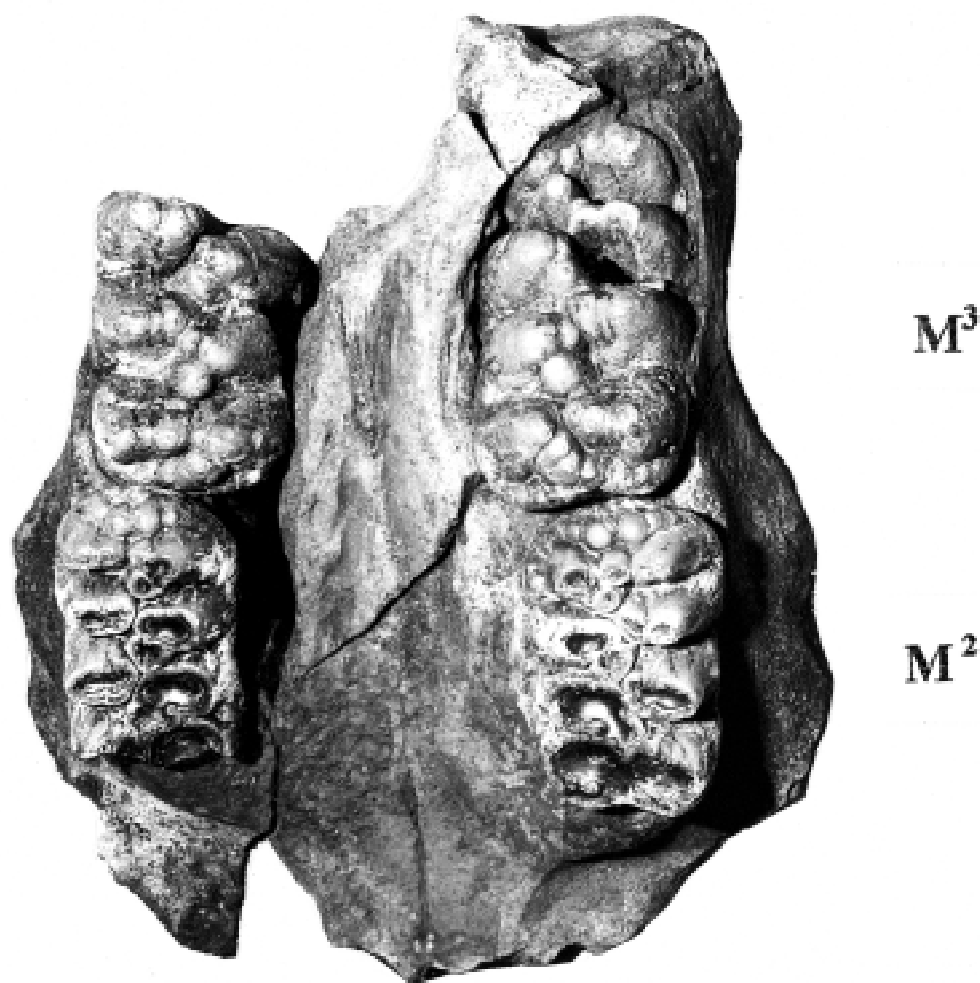


Fig. 2. Upper jaw fragment of the *Anancus arvernensis* (Croizet & Jobert 1828) ZIBA-2407/1986 with preserved molars and part of maxilla (photo P. Lupták).

More detailed descriptions of the fossiliferous horizons, chronostratigraphy and other geological aspects are available in Fejfar (1964), Fejfar & Heinrich (1985) and Fejfar et al. (1990). The described fragment of the upper jaw with preserved molars was discovered in the locality — Hajnáčka I (area called Močiar (Swamp)), 600 m from the village Hajnáčka southwest of the poplar alley. The fossil find originated from the fine sandy tuffites with abundant pyroclastic agglomerates near Gortva stream gorge.

Description

The fragment of the upper jaw consists of four well preserved molars (M^2 dex., M^2 sin., M^3 dex., M^3 sin.) and the particularly well preserved maxilla (see Fig. 2). Originally, the jaw was desintegrated and composed of five major parts. The size of the maxilla and teeth indicate a juvenile specimen of *Anancus arvernensis*. The number of the molar ridges is lower than in the adult specimens. Total length of the fragment is 400 mm and width is 320 mm. The palate bone tends to narrow towards the front. The middle part of this bone has

a remarkable medial suture. Inner structure of the bone is very cavernous and partly destroyed by burning.

M^2 dex. is the only molar entirely preserved. The trigon and talon are same width. The root part is not observable. On the chewing surface of the molar are 4 regular ridges and one posterior semiridge. The first two ridges are particularly abraded. The dentin is largely exposed only on the first ridge. On the inner palatinal side the first and second ridge have half of the height on the external buccal side. The course of the median sulcus can be traced on the second and third ridges. On the first ridge it is impossible because of intense abrasion. The second ridge has one longitudinal groove. The third and fourth ridges are typical with two longitudinal grooves. Every halfridge of the third and fourth ridges has two cusps. On the second ridge it is possible to see the continual fusion of both occlusal surfaces. The first ridge presents complete junction of the half-ridges into one surface. The last fifth ridge consists of four major cusps and one semicusp in the center of the ridge. The half-ridges of entoloph are shifted more distally than half-ridges of ectoloph. The cement coat is preserved on the bottoms of the synclines. The cingular thickening is preserved around the whole crown

base. Enamel on walls and crown base show tiny irregular knolls, pits and grooves. The enamel has a rough pattern at the end of the synclines. The thickness of the tooth enamel was measured on the broken parts (M^2 sin., M^3 sin., M^2 dex.) and ranges from 5.2 to 6.1 mm. The adult specimens may have 9 mm thickness (Fejfar 1964). Measurement results see in the table (Table 1). The first ridge of the M^2 sin. has broken enamel on the mesial margin. The root is well preserved. The length of the M^2 sin. root (fourth ridge) is 89 mm.

M^3 dex. is nearly complete, only the fourth ridge has lost half of the buccal cusp. The crown surface has a different pattern to the third molars. Generally, the second molars are much longer in relation to their width, and in this juvenile specimen without any abrasion. The structure of the bunodont ridges is typical with strongly developed half-ridges. The half-ridges get an alternant position and the synclines get closed. The fourth and fifth ridge of the M^3 dex. are in the bone, mainly the fifth. The crown base is elongated in outline. Ectoloph and entoloph of the first ridge are composed from several (4–5) secondary (adaxial) conelets. The conelets (3) are also present in the second, third, fourth and probably fifth ridge of the crown. Half of the fourth and the whole fifth ridges are absent from M^3 sin.

Table 1: Dental measurements of the molars M^2 sin., M^2 dex., M^3 sin., M^3 dex. (*Anancus arvernensis* ZIBA-2407/1986, HEC — height of ectoloph, HEN — height of entoloph, scale in mm).

RIDGE No.	1	2	3	4	5
M^2 sin. width	63.1	61.2	64.0	66.1	43.8
M^2 sin. HEC	30.5	35.3	43.0	44.1	28.6
M^2 sin. HEN	18.3	21.4	38.7	36.7	25.4
M^2 dex. width	61.6	59.2	63.6	64.7	38.2
M^2 dex. HEC	29.9	34.6	42.3	44.4	38.4
M^2 dex. HEN	29.1	12.5	27.8	44.3	32.5
M^3 sin. width	70.1	69.2	65.2	-	-
M^3 sin. HEC	62.2	56.4	-	-	-
M^3 sin. HEN	47.6	49.0	40.4	38.6	-
M^3 dex. width	68.0	68.3	73.8	-	-
M^3 dex. HEC	55.5	54.4	57.1	-	-
M^3 dex. HEN	43.6	-	61.8	-	-

Conclusions

Anancus arvernensis belongs to the progressive line of the subfamily Anancinae. The progressiveness is derived from the presence of more than four ridges on the third molars. It is bunodont tetralophodont dibelodont brevirostrinuous mastodon form (Holec 1985). Pentalophodonty is also presented in this group of proboscids — *Anancus* from the Sagantole Formation, Ethiopia (Kalb & Mebrate 1993). The process of the alternation of half-ridges, typical for the third molars of this mastodontid, is also present on the crown surface of the second molars. The description of molars of the

Proboscidea has always presented special problems to paleontologists. This difficulty is due to the unique manner in which these teeth are worn during mastication, and the resultant variation in morphology these molars display throughout their height and length (Froehlich & Kalb 1995). The alternation of half-ridges is explained by Lehman (1950) by the tendency of molars to elongate their crown without enlargement of jaws where the process took place. The specimen from Hajnáčka is placed in wear stage 1 (WS I, after Froehlich & Kalb terminology (1995)) when on the anterior end of the second molars extending just to the first ridge.

The upper jaw fragment with preserved four molars is the next contribution to the Villafranchian fauna of Hajnáčka. There are only two other localities in Slovakia where this species is presented. From Lower Pleistocene of southern Slovakia — Strekov (Holec 1985), and few undescribed findings are known from nearby located place — Nová Vieska.

The fossil was discovered approximately thirty years after the last intensive research on the locality. The complexity of the jaw fragment and its state of preservation indicates the possibility of important finds from this well known paleontological locality in future.

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