

Find of *Trionyx rostratus* Arth. in the Upper Badenian deposits of the Male Karpaty Mts., Western Carpathians

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Abstract. Find of the representative of freshwater to brackish turtle *Trionyx* is described in this paper. It was found in Upper Badenian shoreface deposits in the Sandberg Hill locality. The species suggests the presence of appropriate non-marine water biotop on the former Devínska Kobyla island. These turtles are typical by lacking of plastron part of the shell. The remains of the *Trionyx* are widespread worldwide from the Malm to the Recent. Our specimen represents the first occurrence of this genus in the Slovakia, on the other hand it has been already described from the austrian part of the Vienna Basin.

Key words: Badenian, Devínska Kobyla Hill, Sandberg, vertebrate fauna, turtles, *Trionyx*

Introduction

The area around the Devínska Kobyla Hill (514 m above the sea level) is well known by findings of the abundant invertebrate and vertebrate fauna. The locality is situated west of Bratislava, between Devínska Nová Ves and Devín, districts of the Bratislava city. This area is also significant from the botanical and zoological point of view. The vertebrate remains occur mainly on these localities: Štokeravská vápenka quarry – classic Zapfe's locality, Štokeravská vápenka quarry – locality „Bonanza“, Sandberg Hill and Weitov lom quarry. Abundant fish fauna proceeds from Devínska Nová Ves – brickyard and rare vertebrate remains have been found also in Devín – vineyards, Dúbravka – field and Glavica Hill.

Geological situation of the area around Devínska Kobyla Hill was described by Koutek & Zoubek (1936), Buday et al. (1962), Mišík (1976) and Baráth et al. (1994).

Many authors studied also fossil vertebrates from this area, the most important are Pia & Sickenberg (1934), Zapfe (1950, 1952, 1960, 1979), Thenius (1952), Wettstein & Westersheimb (1955), Herre (1955), Estes (1969), Holec (1985) and Špinar et al. (1993).

Description of locality

The relics of the Upper Badenian marine sediments occur all around the Devínska Kobyla Hill. It indicates, the Devínska Kobyla Hill formed an island probably with occasional connection with land (Male Karpaty Mts.). Estimated area of island is about 300 hectares (Milovsky, pers. com.).

Well-known Sandberg Hill locality is situated in the NW slope of Devínska Kobyla Hill, above the Devínska Nová Ves village. The Upper Badenian sediments related to a transgressive event on eastern margin of the Vienna Basin are exposed in the Sandberg quarry. The section represents the stratotype of these sediments, called the

Sandberg Member (Baráth et al., 1994). The sediments lie erosionally on the older carbonate sequences of the Devín Unit, Triassic to Lower Cretaceous in age. The same transgressive sediments are also revealed in Devín and Štokeravská vápenka quarry. The total thickness of the section in the quarry attains 90 m.

We present detail profile from upper terrace of quarry (Fig. 1), which is very interesting from the paleontological point of view. Many remains of large vertebrates have been collected mainly from this part. The studied part of section attains 32 m. The white to yellowish sand with cross bedding and bioturbation is typical for lower 4 metres (Fig. 1). Sand layers are intercalated by thin interlayers and lenses of fine gravel with abundant shark teeth and fragmentary molluscs. Middle part of the section consists predominantly of massive, solid yellow sand, locally with coarser gravel admixture, thin gravel intercalations and pebble-lines. The find of *Trionyx* carapace proceeds from this part (black point in profile). Upper part is characterised by sand–sandstone alternation. Grey to grey-yellowish sandstones are well-lithified with undulated bedding planes. Grey sand layers contain numerous marine molluscs (mainly *Pecten* and *Chlamys*).

Systematic part

Classis. *Reptilia*

Ordo. *Chelonia*

Subordo. *Cryptodira*

Familia. *Trionychidae*

Gen. *Trionyx*

Trionyx rostratus ARTH.

Description of carapace: The carapace (Fig. 2, 3) is almost flat, only moderately convex. The arching makes 20 mm (with free costal ribs) above the horizontal plane.

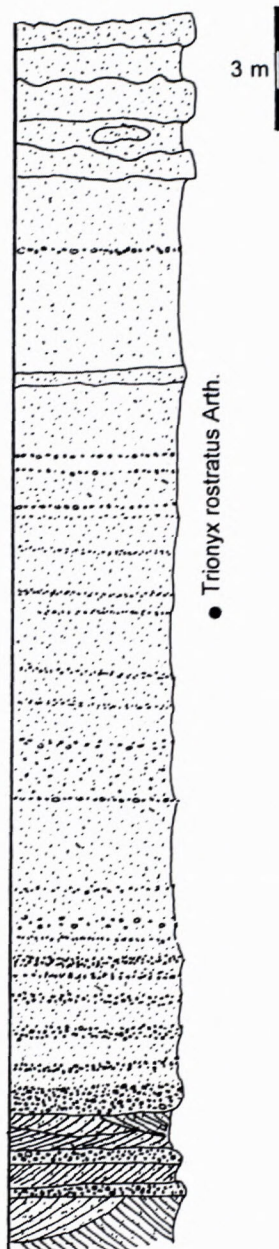


Fig. 1 Lithological profile of the upper part of the Sandberg quarry (see text for explanation)

Fig. 3 *Trionyx rostratus* ARTH., dorsal view of the carapace

The carapace is not complete. Nuchal plate (scuta nuchale) and two costal plates of the right side (scuta costalia 1 and 2) are lacking. The preserved remain consists of seven neural plates (scuta vertebralia, V 1 – 7), eight right costal plates (scuta costalia dext., C1 – 8 dext.) and six left costal plates (C3 – 8 sin.). Vertebrae have been partly damaged, only last 4 vertebrae have preserved also corpus vertebralia. Free ribs project from the middle of the lateral costal bone margins.

Neural plates (scuta vertebralia) are elongated by the median axis of the carapace (V1 – V7 from the cranial to caudal margin). V1 is the largest, approximately oblong in

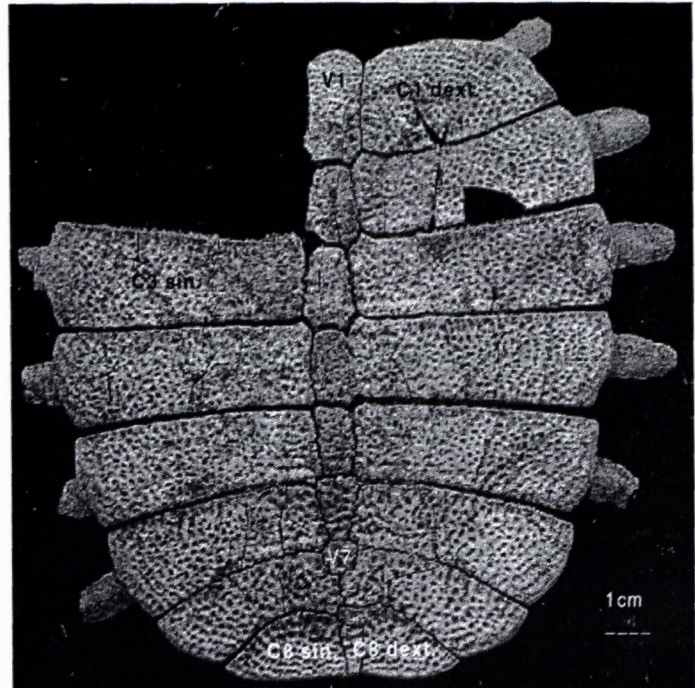
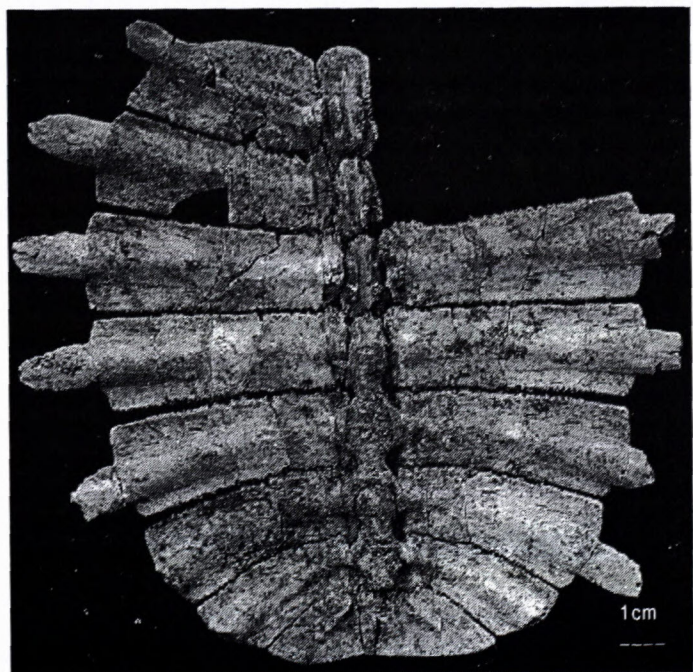


Fig. 2 *Trionyx rostratus* Arth., ventral view of the carapace



form. Its cranial margin is regularly convex. The lateral margins are moderately concave and they are obliquely bevelled to the median axis near the caudal margin. This feature is also visible on V2, V3, V4. V2 and V3 are similar in form. Their cranial margin is narrower than caudal margin. V4 is almost regularly oblong, but its lateral margins are slightly convex (in difference of V1). V5 and V6 have cranial margins straight and wider than caudal margins. Especially, the caudal margin of V6 is obviously narrowed. Almost circular V7 is the smallest neural plate. Costal plates (scuta costalia) are laterally elongated. Cranial and caudal margins of C2 – C7 dext. and C3 – C7

Tab. 1 Measurements of individual bones (C - costal bones, V - neural bones)

No.	dext.	C1	C2	C3	C4	C5	C6	C7	C8
	sin.	C1	C2	C3	C4	C5	C6	C7	C8
total length [mm]		37.2	51.5	56.7	55.3	50.4	45.0	36.8	24.2
		----	----	55.7	55.0	51.0	44.8	37.1	24.5
median margin		18.7	17.2	17.7	16.8	16.2	14.7	12.2	14.9
		----	----	18.5	17.6	15.8	14.4	13.6	13.5
cranial margin		31.1	45.8	49.7	53.2	51.8	45.4	37.5	26.5
		----	----	51.6	53.6	49.6	44.7	37.8	25.0
caudal margin		42.7	50.0	53.0	50.4	47.0	34.2	26.7	23.0
		----	----	52.3	51.0	46.0	38.7	25.0	24.7
lateral margin		13.2	20.2	21.4	19.9	20.2	18.9	17.0	23.0
		----	----	22.8	19.8	19.7	20.0	16.1	24.7
length of free rib		10.4	17.7	17.2	17.0	12.0	----	----	
		----	----	8.0	8.1	7.2	13.1	----	
No.		V1	V2	V3	V4	V5	V6	V7	
max. width		12.0	11.4	10.6	9.5	7.9	9.1	7.8	
max. length		24.3	17.5	17.7	17.3	15.3	13.9	7.6	
cranial marg.		12.0	7.7	7.7	7.0	7.9	9.1	----	
caudal marg.		11.7	11.4	10.6	7.9	6.2	4.6	----	

sin. are almost parallel, however the costal plates become moderately wider toward the lateral margin. The shape of C1 is different others. Cranial margin is slightly convexly rounded, it passes gradually into the lateral margin. Free rib projects from the boundary of cranial and lateral margins. C1 dext. is connected to right lateral margin of V1 by its median margin. Caudolateral margin of V1 is connected to C2 dext. This feature is also visible on C3, C4 and C5. However, caudal mediolateral margin of C5 is connected to the craniolateral margin of V6. It is interesting that C5 sin. is not in contact with V4 due to its asymmetry. Free ribs of C2, C3, C4 dext. and C3, C4 sin. are situated more cranially on their lateral margins. On the other hand, free ribs of C5 dext. and C5, C6 sin. are situated more caudally. Free ribs of C6 dext., C7 dext. et sin. are not preserved. The costal plates C3 dext. et sin. are the longest, C4 is only a little smaller. Median margin of C3 is caudolaterally directed (C6, C7 – slightly mediocaudally directed). C6 dext. et sin. are distinctly curved laterocaudally. Mediocranial margins are joined with caudal margin of V6 only. Mediocaudal margins are joined to craniolateral margin of V7. Craniomedian parts of C7 dext. et sin. are connected to V7 but their remaining median parts are joined directly each other. Two last costal bones (C8 dext. et sin.) are also knitted by suture each other and they are not connected to neural bone. C8 dext. et sin. have three margins only, the common median margin, cranial margins, which communicate with caudal margins of C7 dext. et sin. and free caudal margins. C8 dext. is wider than C8 sin. due to asymmetry. C8 dext. is almost completely joined with C8 sin. but in craniomedian corner it also communicates with C7.

The total length of preserved carapace is 134.0 mm, maximal width (without free ribs) attains 118.2 mm (measurement through the C4 dext. et sin.). The thickness of costal plates varies among 3.3 – 4.6 mm.

Discussion: Our specimen from the Sandberg locality is well-comparable in shape and size with Müller's specimen (Müller, 1968) from the Middle Miocen of the Vienna Basin.

Conclusion

The genus *Trionyx* is presented from the Slovakia for the first time. Its occurrence is of peculiar interest. The carapace was found in the shoreface deposits. Well preservation of the almost complete carapace indicates short-term transport from the adjacent area.

The representatives of the family *Trionychidae* are ranged to freshwater and brackish turtles. The rivers, as well as large brackish river deltas, river creeks, brooks and also backwater (lakes and big puddles) with sandy to muddy bottom are typical environment where recent species are living. This fact indicates that an appropriate non-marine water biotope had to exist on the former island of the Devínska Kobyla in the area smaller than 300 hectares. Moreover, some other taxa, entirely or seasonally depending on such environment have been found there (e. g. remains of the fossil toads *Bufo* sp. and *Bufo priscus* Spinar, Klembara & Mezsáros from Štokeravská vápenka – locality "Bonanza").

References

- Baráth I., Nagy A. & Kováč M., 1994: Sandberg Member - Late Badenian Marginal Sediments on the eastern margin of the Vienna Basin. *Geologické práce*, Spr. 99 (Bratislava), 59 -66.
- Buday T., Cambel B. & Mahel M., 1962: Explanations to general geological map of the ČSSR, 1 : 200 000, Wien - Bratislava, Bratislava.
- Estes R., 1969: Die fauna der miozän Spaltenfüllung von Nneudorf an der March (ČSSR). *Reptilia (Lacertilia)*. Sitz.-ber. Osterr. Akad. Wiss., Math.-Naturwiss. Klasse, I, 178, 1 - 4, 77 - 82.

- Herre W., 1955: Die fauna der miozän Spaltenfüllung von Neudorf an der March (ČSR). Sitz.-ber. Osterr. Akad. Wiss., Math.-Naturwiss. Klasse, Abh. I, Wien, 164, 783 - 803.
- Holec P., 1985: Finds of Mastodon (Proboscidea, Mammalia) Relics in Neogene ad Quaternary Sediments of Slovakia (ČSSR). Západ. Karpaty, Sér. Paleot., 10, 13 - 53.
- Koutek, J. & Zoubek, V., 1936: Explanations to geological map, 1 : 75 000, Bratislava 4758. Knihovna státního geologického ústavu Československé republiky, svazek 18, 150 p. Praha.
- Mišík, M., 1976: Geological excursions in Slovakia. SPN, Bratislava, 1-359.
- Müller A. H., 1968: Lehrbuch der Paläozoologie, Vertebraten, Band III, Teil 2, Reptilien und Vögel. VEB Gustav Fischer Verlag, Jena, 657 p.
- Pia, J., Sickenberg, O., 1934: Katalog der in den Österreichischen Sammlungen befindlichen Säugetierreste des Jungtertiäre Österreichs und der Randgebiete. Denkschriften des Naturhistorischen Museums in Wien, Band 4, Geologisch-Palaeontologische Reihe (Leipzig).
- Špinar, Z., Klembara, J., Mészáros, Š., 1993: A new toad from the Miocene at Devínska Nová Ves (Slovakia). Zb. Západné Karpaty, séria Paleontológia 17, GÚDŠ, Bratislava, 135-160.
- Thenius, E., 1952: Die Säugetierfauna aus dem Torton von Neudorf an der March (ČSR). Neues Jb. Geol. u. Paläontol. Abh. 96, 1, (Stuttgart), S. 3.
- Wettstein - Westersheimb, O., 1955: Die Fauna der Miozän Spaltenfüllung von Neudorf a.d. March (ČSR), Amphibia (Anura) et Reptilia. Sitzungsberichte Österreichische Akademie der Wissenschaften. Mathem. - Naturwiss. Klasse, Abt. I, 164, Wien, S. 804-815.
- Zapfe, H., 1950: Die Fauna der miozänen Spaltenfüllung von Neudorf a.d. March (ČSR), Chiroptera, Carnivora. Sitzungsber. Österr. Akad. Wiss. Klasse, 159, (Wien), S. 51-64, 109-141.
- Zapfe, H., 1952: Die Pliopithecus Funde aus der Spaltenfüllung von Neudorf a. d. March. Sonderheft C, S. 126-130.
- Zapfe, H., 1960: Die Primatenfunde aus der miozän Spaltenfüllung von Neudorf an der March, Tschechoslowakei. Schweizerische palaeontologische Abhandlungen, 78, S. 1-293.
- Zapfe, H., 1979: Chalicotherium grande (Blainv.) aus der miozänen Spaltenfüllung von Neudorf an der March (Devínská Nová Ves), Tschechoslowakei. Neue Denkschriften des Naturhist. Mus. in Wien, 282 S. Wien.