

Marian MŁYNARSKI

Chelydrosis muchisoni (Bell, 1832) (*Testudines, Chelydridae*) from the Miocene of Przeworno in Silesia (Poland)

[Pl. IX, 1 text-figure]

Chelydrosis muchisoni (Bell, 1832) (*Testudines, Chelydridae*) z miocenu Przeworna na Śląsku, Polska*

Abstract. The remains of *Chelydrosis muchisoni* (BELL, 1832) from the Upper Vindobonian fauna of Przeworno are described. This is the first find of a member of the *Chelydridae* (*Chelydropsinae*), belonging to the *muchisoni-sansaniensis* group characteristic of the European Miocene (F. DE BROIN, 1977; MŁYNARSKI, 1980), in the Polish Tertiary. A list of the amphibians and reptiles so far known from Przeworno is given and the significance of the occurrence of *Chelydrosis* to the ecological characterization of the Przeworno II locality is discussed in the general part.

I. INTRODUCTION

A well-preserved plastron was found during an excavation made by workers of the Vertebrate Laboratory (Institute of Systematic and Experimental Zoology, Polish Academy of Sciences) at Przeworno in 1978.** These remains belonged to a juvenile of the family *Chelydridae*. They permit us to determine their systematic position fairly accurately, although some parts and edges were damaged at the time of their extraction. Like most bony remains found at Przeworno, this plastron is very brittle and in this connection we did not venture upon its complete removal from the clayey sediment. Thus, we are concerned here with the inner surface of the plastron, but thanks to the extant impressions of some margins and missing parts it was possible to reconstruct the whole fragment of the armour under study (Fig. 1).

The fossil *Chelydridae*, till a short time ago traditionally counted in the genus *Chelydra* LINNAEUS, 1758, are relatively frequent and common in the Tertiary of Europe. These turtles are particularly frequent in the Miocene and for this reason they may even be regarded circumspectly as „indicator fossils”. They have not hitherto been found in Poland, although their remains have

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** After submitting the present paper for publication an almost complete skull of a big specimen *Chl. muchisoni*, together with a mandible, was found in Przeworno (1979). This find will be described in a separate publication.

been recorded from nearby and neighbouring countries (USSR, Czechoslovakia, Roumania, Austria and both German Republics) for a long time. The presence of a member of *Chelydrosis muchisoni* at Przeworno II permits us to add to the list of the herpetofauna of this locality and to its ecological characteristics.

The age and origin of Przeworno have been discussed in detail in works by GŁAZEK, OBERC & SULIMSKI (1971), GALEWSKI & GŁAZEK (1978), KOWALSKI & ZAPFE (1974), KUBIAK (1975), GŁAZEK et al. (1976), MŁYNARSKI (1976), GŁAZEK, GALEWSKI & WYSOCZYŃSKI-MINKOWICZ (1977) and MŁYNARSKI (1976b).

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II. SYSTEMATIC PART

Superfamily: *Chelydroidea* BAUER, 1893, emend. MŁYNARSKI, 1969

Family: *Chelydridae* SWAINSON, 1839, emend. GAFFNEY, 1975

Subfamily: *Chelydropsinae* MŁYNARSKI, 1980

Chelydrosis PETERS, 1868

(sensu CKHIKHVADZE, 1971; emend. F. DE BROIN, 1977, et MŁYNARSKI). 1980)

Chelydrosis muchisoni (BELL, 1832)

(Diagnosis: MŁYNARSKI, 1980)

Material: Plastron of a juvenile, well preserved „in situ”, from locality Przeworno II (No. Rf. 186/78 Inst. of Syst. and Exp. Zoology, Polish Academy of Sciences, Kraków).

Measurements

Plastron length	100 mm
Width between bridges after reconstruction of missing part	90 mm
Width of preserved section of bridge	40 mm
Length of entoplastron	1.9 mm

Description

The plastron under description was found together with some fragments of the carapace of the same individual. The photograph (Pl. IX) shows a number of peripheral plates, which form the bridge margin for the plastron-carapace contact. Since these plates are very fragile and of no major taxonomic importance, they have been left in the state in which they were discovered. For the same reason the other plates of the carapace embedded in a lump of clayey sediment, on the surface of which the plastron was uncovered, have not been extracted from it.

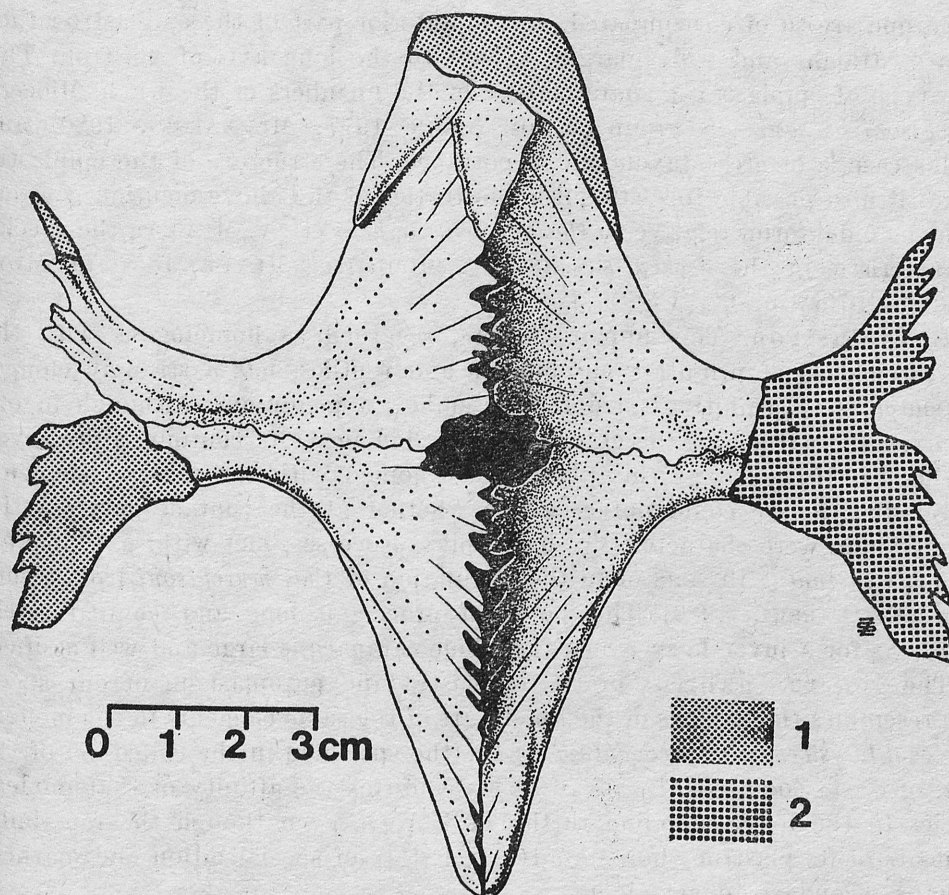


Fig. 1. 1) A reconstruction on the basis of the impression, 2) Missing parts

The plastron of *Chelydropsis* from Przeworno is preserved „in situ”, as has already been mentioned in the introduction, and only its inner side can be seen. The sculpture of the inner surface of the plastral plates and the sutures which join these elements together are very well preserved. The damaged margins and fragments of the plastron are partly preserved as impressions in the surface of the strongly hardened clayey sediment, brown-yellowish in colour. The plastron of the turtle being described has a cruciform shape, typical of the *Chelydridae* („*Cruciplastra*”, CKHIKHVADZE, 1973). Its state of preservation made it also possible to describe particular elements more accurately and, in consequence, to determine the systematic position.

Epiplastra. Our material contains a fragment of the lateral part of the right epiplastra, joined to the right hyoplastra. The shape of the lacking part of this plate has easily been reconstructed on the basis of its fairly distinct impression, which, in turn, allowed the reconstruction of both epiplastra (Fig. 1). These plates are broad, massive, much better developed than in the modern snapping turtle (*Chelydra serpentina* (LINNAEUS)), with which fossil chelydrids

of Europe are so often compared. In the anterior part of the epiplastron they form a straight and wide margin, square to the long axis of plastron. This very type of epiplastra is characteristic of the members of the whole Miocene *murchisoni-sansaniensis* group (F. DE BROIN, 1977; MLYNARSKI, 1980) and in this case is of great taxonomic importance. The structure of the epiplastra makes it also possible to distinguish the turtles of the above-mentioned group from the older forms relative to *Chelydropsis decheni* (H. V. MEYER), the species characteristic of the *decheni-sanctihenrici* group (see MEYER, 1852 in MLYNARSKI, 1976a, p. 67, Fig. 67).

Entoplastron. This unpaired plate, regarded as homologous with the interclavicular of primitive amphibians and reptiles, has a strongly elongated shape. Its „primitive” structure resembles a pendulum. Although in our specimen the surface of the entoplastron is damaged, its contour is preserved excellently. However, as this plate is fast joined with the plastral elements surrounding it, we could not ascertain whether at the contact points of its margin there were characteristic sharp spiky processes, met with, e. g. in *Chelydropsis carinatus* PETERS or in the population of *Chl. murchisoni* from Steinheim (MLYNARSKI, 1980). The posterior process is long and comparatively broad. As for a juvenile specimen the whole carapace is large and well ossified.

The general habitus of the epiplastra and entoplastron of our specimen resembles the habitus of the inner part of the same elements in the modern species *Platysternon megacephalum* GRAY (the specimen in the collection of the Inst. of Syst. Zool., No. R 257/76). This confirms the affinity of that modern species to the fossil snapping turtles of Europe, even though the remaining elements of its plastron show an advanced state of specialization and marked, perhaps secondary, development.

Hyo- and hypoplastra. These plates are grown closely together, but the suture between them is very well seen. A transversely situated fontanelle is visible in the place where this suture reaches the long axis of the plastron, i. e. the medial suture. It indicates the juvenile age of our specimen, in which the ossification processes were not yet completed. This is also evidenced by the relatively small size of the plastron. Thus, in our specimen the central fontanelle is not a taxonomic character as it is in adults of *Chelydropsis decheni*. The longitudinal fontanelle also occurs as a meandering zigzag fissure. This very fontanelle is typical of the members of the *murchisoni-sansaniensis* group and, as a rule, does not disappear, even in very old individuals. As regards the form from Przeworno, this fontanelle must have undergone a considerable reduction in old animals, which indicates that the degree of ossification of the plastron was much higher than, e. g. in the members of the population from Steinheim.

The lateral fontanelles in the bridge part of the plastron, also characteristic of *Chelydropsis murchisoni*, are preserved rather poorly. Their presumable shape is reconstructed in the figure on the basis of the impressions and so is the length of some digital processes. These are relatively short, developed

similarly to the processes in specimens of the population from Oehningen (locus typicus, cf. the holotype in BELL, 1832, Pl. 24) or in *Chelydropsis sansaniensis* (BERGOUNIAUX) from the French Miocene (F. DE BROIN, 1977, p. 285, Fig. 44). The width of the plastron-carapace contact („bridge”) in our specimen is considerable, extending for nearly a half of the overall plastron length.

Xiphiplastra. Both these plates are preserved whole and after the cleaning of their edges the shape and sculpture are seen perfectly well. The xiphiplastra form the narrow and pointed end of the plastron, characteristic of the whole group. In our specimen, as in those from Oehningen, these two plates are joined with each other more closely than in the specimens from Steinheim. Although we are concerned with a juvenile specimen, the fissure between the xiphiplastra is very narrow, which suggests that it became grown over in adult specimens.

Particular parts of the plastron, e. g. its bridge parts, are slightly though fairly distinctly bent. This feature is typical of the *Chelydridae*, in which the strongly reduced, cruciform plastron surrounds the fat well-muscled ventral part of the body in a bandlike manner.

Discussion

On the basis of the foregoing morphological analysis of the plastron I place the remains of the turtle under discussion in the species *Chelydropsis munchisoni* (BELL, 1832). However, as no other elements of the carapace or skeleton are preserved, this identification is not decisive and may be confirmed or altered when more material has been found. The fact, emphasized repeatedly, that our specimen is juvenile, with its ossification processes not completed yet, must be taken into consideration.

As I emphasized in the descriptive part, *Chelydropsis munchisoni* from Przeworno most resembles the specimens of the population of Oehningen, whose illustrations are known from studies by BELL (1832), H. v. MEYER (1845, 1852) and WINKLER (1869). Our snapping turtle differs markedly from the members of the Steinheim population and from *Chl. sansaniensis* (BERGOUNIAUX) in the structure of its plastron.

Chelydropsis munchisoni is undoubtedly a typical turtle of the European Miocene. Its presence at Przeworno, together with *Ptychogaster* (MŁYNARSKI, 1978), to a certain degree supports the dating of this locality carried out on the basis of the mammalian remains, but does not permit us to date it more precisely.

III. REMARKS ON THE MIOCENE HERPETOFAUNA OF PRZEWORNO

A new species, no doubt important to the bioecological characterization of the locality, has now been added to its amphibian and reptilian fauna, which already includes 7 forms. Its nature and quantities are presented in the following table.

Herpetofauna of Przeworno acc. to the state in 1978

Genera and species	Przeworno II „Upper”	Przeworno I „Lower”
1. <i>Latonia</i> cf. <i>sayfriedi</i> (= <i>Discoglossus giganteus</i>)	****	**
2. <i>Ophisaurus fraasi</i>		**
3. <i>Coluber</i> sp.	*	
4. <i>Ptychogaster buchelbergense</i>	***	
5. <i>Geoemyda</i> aff. <i>eureia</i> ?	**	
6. <i>Testudo</i> sp.		***
7. <i>Chelydropsis muchisoni</i>	**	

**** — frequent, *** — fairly frequent, ** — rare, * — very rare = single specimen.

Bibliography: 1 — MŁYNARSKI (1976b), SANCHÍZ & MŁYNARSKI (1979); 2 — BACHMAYER & MŁYNARSKI (1977); 3 — MŁYNARSKI (1978); 4—6 — MŁYNARSKI (1978).

Amphibians and reptiles form a high percentage of the total Przeworno fauna, but like the members of the other groups they do not occur in large numbers. Anyway, this fauna is characterized by its great diversity and the presence of forms typical of various kinds of environment.

The big Miocene frog *Latonia sayfriedi* H. v. MEYER of the family *Discoglossidae* is undoubtedly a dominant and, allowing for the existing conditions, common form. Its remains are encountered both in the damp-forest conditions of Przeworno II („upper”) and, although far less numerous, in the dry land environment of Przeworno I („lower”). Remains of about 30 individuals have been gathered here in the course of excavation carried out fairly regularly every year since 1971. However, despite earlier suppositions no other amphibians have been found till now.

Reptiles were most numerous represented by remains of turtle-shells, which were mostly found „in situ”. *Ptychogaster* or both *Ptychogaster* and *Geoemyda* together are probably dominant in this group. Unfortunately, in the preceding years many specimens of shells, found almost complete, were destroyed while being extracted. These forms occur exclusively at Przeworno II, whereas relatively numerous shell fragments of land tortoises of the genus *Testudo* have been preserved at Przeworno I. Unluckily, this locality has provided only detached plates, whose small number does not permit a more accurate determination of species. Scanty remains of *Ophisaurus fraasi* (HILGENDORF), the species described from the Steinheim Miocene, occur in the same xerothermic land environment. However, its systematic position is not quite clear and calls for examination of the remains from many European localities.

Only once a vertebra of a snake of the family *Colubridae* (group *Colubroidea*), a form resembling *Coluber* or *Elaphe*, has been found at Przeworno II. Unfor-

tunately, we cannot state anything else in this respect now, although we hope that further remains of these reptiles will be found.

Chelydropsis murchisoni, described in this paper, adds to the list of our herpetofauna. Unlike the turtles found at Przeworno before, this animal is considerably more closely associated with water environment. The contemporary snapping turtles of America always live in water, mostly near the banks of fairly large reservoirs or rivers, although they often leave it and are able to move very well and even to feed on land. The members of the genus *Chelydropsis* were also associated with water. In large numbers their remains occur only in river or even more often lacustrine sediments, e. g. at Steinheim, Oehningen, Hajnáčka or Irimești (MŁYNARSKI, 1969). The presence of this genus at Przeworno II indicates that in face of the earlier suppositions there was a fairly large water reservoir here; judging by the sediments, it may have been a bend of a river flowing through various land environments: a wet forest and open areas. Amphibians found convenient living conditions in the widely overflowing river, whereas the Eurasian snapping turtles (*Chelydropsis*) gathered near the banks. This river probably flowed at a certain distance from the locality Przeworno II and our *Chelydropsis* may have come here from its territory in search of food, perhaps snails and slugs.

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by Jerzy ZAWADZKI

Institute of Systematic and Experimental Zoology
Polish Academy of Sciences
Ślawkowska 17
31-016 Kraków, Poland

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STRESZCZENIE

W czasie prac wykopaliskowych w Przewornie w roku 1978 znaleziono dobrze zachowany plastron młodego osobnika z rodziny *Chelydridae*, której przedstawiciele byli dotychczas nieznani z terenu Polski. Na podstawie wyraźnych cech morfologicznych udało się oznaczyć stanowisko systematyczne (*Chelydropsis murchisoni* (BELL, 1932)). *Chelydropsis* (podrodzina *Chelydropsinae*) jest rodzajem charakterystycznym dla wielu europejskich stanowisk miocenów, przede wszystkim zaś stanowiska Steinheim w Wirtembergii (MLYNARSKI 1980). W dalszej części opracowania przedstawiono wykaz dotychczas stwierdzonych w Przewornie płazów i gadów. Raz jeszcze omówiono też środowisko ekologiczne stanowisk Przeworno I („dolne”) i Przeworno II („górne”).

W czasie prac wykopaliskowych w roku 1979, po oddaniu do druku niniejszej notatki, znaleziono prawie kompletną czaszkę przedstawiciela tego samego gatunku. Ten niezmiernie cenny materiał zostanie opracowany w osobnej publikacji.

Redaktor pracy: doc. dr Z. Bocheński

Plate IX

Chelydropsis murchisoni (BELL) from the Miocene of Przeworno

Phot. K. JAKUBEK

