Acta zool. cracov. 35(3): 657-663, Kraków, 29 Jan. 1993

Miocene fauna of land snails in the region of Cracow

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Received: 10 March 1992
Accepted for publication: 15 May 1992

STWORZEWICZ E. 1993. Miocene fauna of land snails in the region of Cracow. Acta zool. cracov. 35(3): 657-663.

Abstract. This paper summarizes the recent records on the Miocene land snails known from the vicinity of Cracow. The hitherto recognized snail assemblage comprises: *Cochlostoma polonicum*, *Tudorella conica bielanensis*, *Trichia kleini kleini*, *Helicodonta involuta scabiosa*, cf. *Tropidomphalus extinctus*, *Klikia giengensis bielanensis* and *Cepaea silvana silvana*.

Key words: *Gastropoda*, *Prosobranchia*, *Pulmonata*, systematics, palaeontology, Miocene, Poland.

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I. INTRODUCTION

It is noteworthy that owing to the common ocurrence of land snails in freshwater limestones they where, paricularly in geological papers, erroneously termed "freshwater species". I whish to stress that in the present paper the terms " land " or " terrestrial" snails concern exclusively snails living outside water environments.

The presence of land snails in the Miocene deposits in the vicinity of Cracow was reported already at the end of 19th c.. In 1892 BIENIASZ found freshwater limestones in Witkowice and recognized a freshwater snail of the genus *Lymnaea*, and some land snails, preserved as internal moulds lacking any remnants of shells (after ZARĘCZNY 1894). Somewhat later, deposits of a similar age, but petrographically different, were found by NIEDŹWIEDZKI (1900) in the site Bielany. The deposits consisted of dark grey clays which comprised shell material preserved as whole shells or as destroyed debris retaining, however, the surface sculpture. The snail fauna of both the localities mentioned was described by ŁOMNICKI (1902). He listed five land snail species (*Cochlostoma polonicum*, *Tudorella conica bielanensis*, *Klikia giengensis bielanensis*, *Trichia kleini kleini* and *Cepaea silvana silvana*) and one species of freshwater bivalve – *Cyrena ulmensis* C. MAYER, but he did not mention the genus *Lymnaea* previously noted by BIENIASZ and ZARĘCZNY (op.cit.).

Working together with the team of the Academy of Mining and Metalurgy and the Geological Institute of the Jagiellonian University I have collected some shells of land snails from pre-Badenian sediments from two localities: Ruczaj Str. in Cracow and Szczyglice near Cracow. Geological description of the locality in Cracow was made by MICHALIK et al. (1984) and FELISIAK (1984) who mentioned single snail opercula found in the base of conglomerates. The opercula were more numerous, along with the snail shells, in black marls which filled the depressions at the surface of conglomerate sequence. All the shells are more or less damaged but most of them retained their surface sculpture. From the mentioned sites I have identified the following terrestrial species: *Tudorella conica bielanensis*, *Helicodonta involuta scabiosa* and *Trichia kleini kleini*.

In Szczyglice the fauna was found in limestones of caliche type developed on the Senonian marls covered by the Badenian marine silty clastics (FELISIAK pers. com.). Only the internal moulds (mostly badly deformed), were preserved there, with scarce remnants of shells. A major part of the moulds represents probably the species – *Tropidomphalus extinctus* of *Helicidae*, whereas a few other specimens were probably those of *Tudorella conica bielanensis*.

II. SYSTEMATIC PART

The following land snail species were hitherto recorded from Cracow and its closest vicinity:

Familia: *Cyclophoridae*

Genus: *Cochlostoma* JAN, 1830

***Cochlostoma polonicum* (ŁOMNICKI, 1902)**

Pomatias polonica ŁOMNICKI, 1902

Cochlostoma polonicum: WENZ 1923

Described from Bielany based on two specimens "badly damaged but with excellently preserved shell sculpture". It was not found at the remaining localities though the fauna-bearing deposits at Ruczaj, Szczyglice and Witkowice are of similar age and contain another common species.

The species is extinct but other representatives of the genus still live in the Mediterranean countries.

Familia: *Pomatiasidae*

Genus: *Tudorella* P. FISCHER, 1885

***Tudorella conica bielanensis* (ŁOMNICKI, 1902)**

Tudora bielanensis ŁOMNICKI, 1902

Tudorella conica bielanensis: WENZ 1923

Known from Bielany and Witkowice. Several damaged shells and fragments were found at the locality Ruczaj, a few interior moulds (probably of juvenile specimens) in Szczyglice. The microsculpture of the specimens from Ruczaj is relatively well preserved (Fig. 1) and shows differences in ribbing of particular whorls described by ŁOMNICKI (1902) as characteristic of the species (subspecies ?). The moulds from Szczyglice bear no traces of microsculpture but their shape in spite of some deformation seems to be similar (convex whorls separated by a deep suture) and the opercula are in both cases identical.

The living representatives of *Tudorella* occur in the Mediterranean countries.

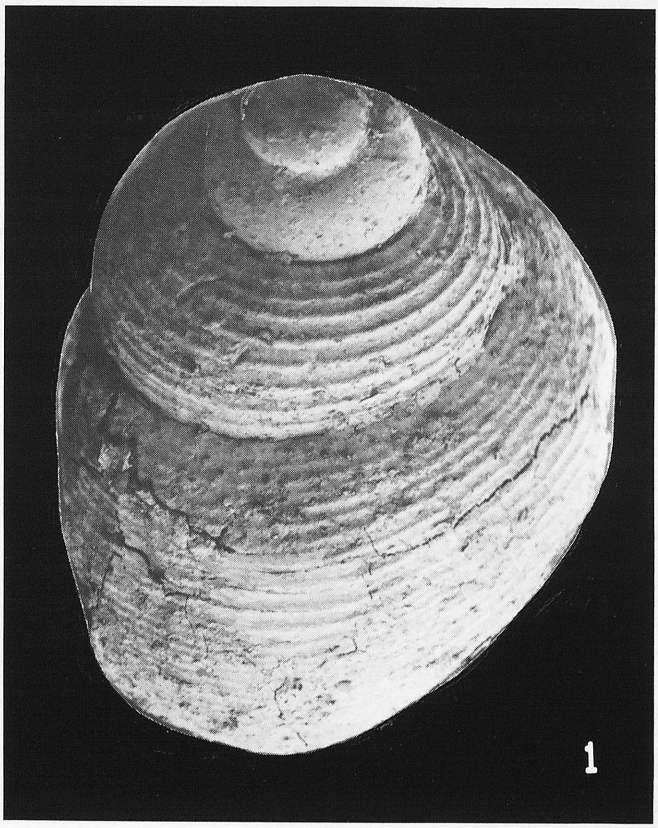

Fig. 1 – *Tudorella conica bielanensis* (ŁOMNICKI), Ruczaj site – height 7mm.

Familia: *Helicidae*

Genus: *Trichia* HARTMANN, 1841

***Trichia kleini kleini* (KLEIN, 1864)**

Helix (Zenobia) carinulata: ŁOMNICKI 1902

Trichia kleini kleini: WENZ 1923

A few juvenile, damaged shells were found at the locality Ruczaj. The shell surface has its microsculpture preserved in shape of striation and small papillae visible at higher magnification (Fig. 2).

The snail is known from Bielany, and WOŹNY (1976) recorded it from the borehole Czarny Dunajec. In European Miocene it was very common at many localities in Germany and Switzerland. ŁOMNICKI (1886) mentioned its occurence from localities in Podole – Wyczółki and Folwarki – at present outside Poland.

The genus *Trichia* is represented in recent fauna of Poland by species inhabiting mostly woodland and scrub habitats, sometimes also limestone rocks and meadows.

Fig. 2 – *Trichia kleini kleini* (KLEIN), Ruczaj site – breadth 6.8 mm.

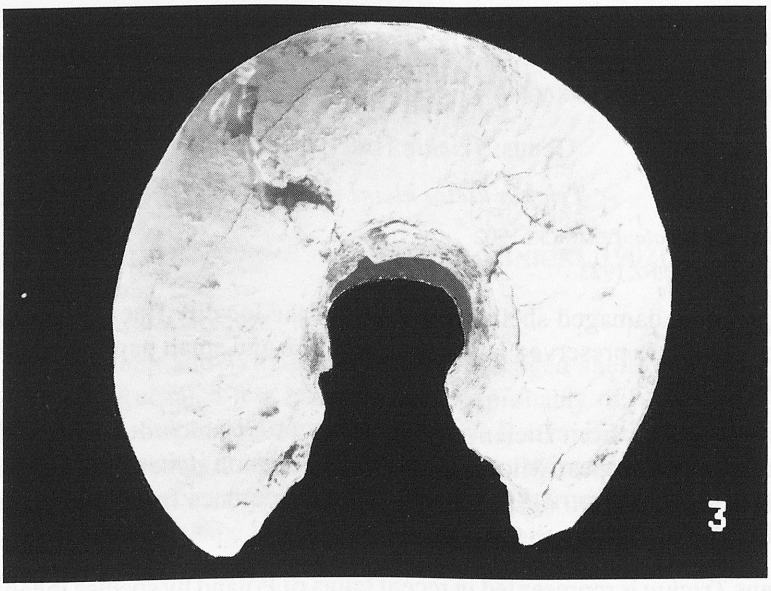

Fig. 3 – *Helicodonta involuta scabiosa* (SANDBERGER), Ruczaj site – breadth 5.9 mm.

Genus: *Helicodonta* FERUSSAC, 1819

***Helicodonta involuta scabiosa* (SANDBERGER, 1874)**

Helix (Drepanostoma) involuta KLEIN, 1853 nec *H. involuta* THOMAE, 1845
Helix scabiosa SANDBERGER, 1874: 377 (nom. nud.)
Helix (Trigonostoma) involuta THOMAE var. *scabiosa* SANDBERGER, 1874: 584
Helicodonta (Helicodonta) involuta scabiosa: WENZ 1923
Trissexodon involutus scabiosus: SCHLICKUM 1976

A single damaged shell, though with well visible characters of the species was found at the locality Ruczaj (Fig. 3). The snail is known in Poland from a Miocene locality in Opole (ANDREAE 1902-04). It was also recorded from the above mentioned localities in Podole and Tortonian deposits in Zwiefaltendorf (Germany) (SCHLICKUM 1976) and it is regarded as a characteristic form of that period.

SCHLICKUM (1975, 1976) transfered this species to the genus *Trissexodon* – in my opinion without sufficient grounds. The shell, both of my specimen and known from literature (including presented by Schlickum) is flat, concave above and convex below and slightly keeled around the umbilicus. The surface is covered with fine striae and longitudinal papillae like in the recent *H. obvoluta* when periostracal hairs become rubbed off. There are no papillae on the surface of snails belonging to *Trissexodon.*

Extant representatives of *Helicodonta* live in Central and South Europe, including one in Poland (Sudety Mt. only).

Genus: *Tropidomphalus* PILSBRY, 1895

cf. *Tropidomphalus extinctus* (RAMBUR, 1862)

Helix extincta RAMBUR, 1862
Tropidomphalus (Pseudochloritis) extinctus: WENZ 1923

Several interior moulds belonging probably to this species were found in Szczyglice (Fig. 4). One specimen has a very well visible strongly reflexed aperture margin, and another – a trace of ribbing on the preserved fragment of shell. Almost all of them show a narrow deep umbilicus (Fig. 5).

The species is probably known also from the borehole Czarny Dunajec since WOŹNY mentioned *Helix* cf. *extincta* in the cited paper and from the Badenian deposits in Gündlkofen (Germany) (GALL 1980).

The genus *Tropidomphalus* is totally extinct.

Genus: *Klikia* PILSBRY, 1896

***Klikia giengensis bielanensis* (ŁOMNICKI, 1902)**

Helix (Gonostoma) osculum var. *bielanensis* ŁOMNICKI, 1902
Klikia (Klikia) giengensis bielanensis: WENZ 1923

The subspecies was described from Bielany on the basis of a single damaged shell. Its separate systematic position is doubtful in my opinion. The author compares it with two species: Lower Miocene *Klikia osculum* (THOMAE) and a younger one – *Klikia giengensis* (KLEIN) and states that it is twice smaller (it has width of 6.5 mm) than both mentioned. According to WENZ (1911) the range of width for *K. osculum* is 6.6 - 11.6 mm, and for

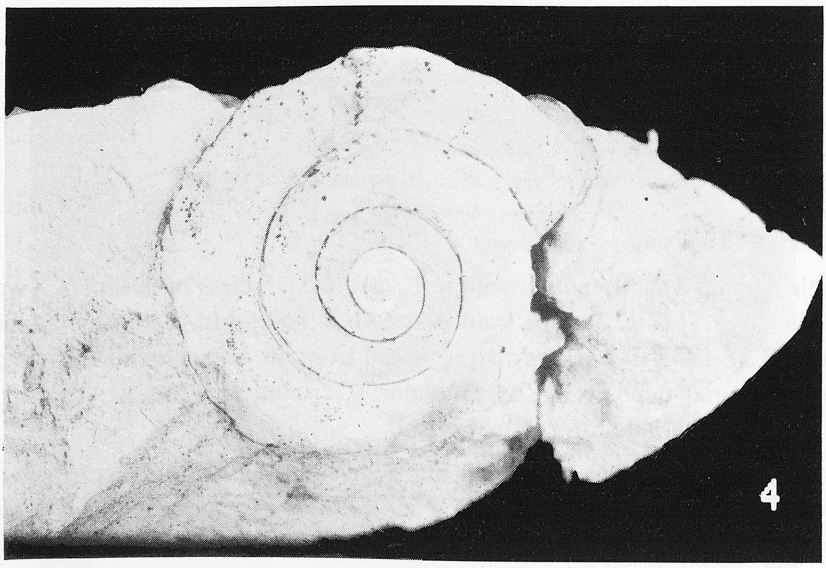

Fig. 4 – cf. *Tropidomphalus extinctus* (RAMBUR), Szczyglice site – breadth 30 mm.

Fig. 5 – cf. *Tropidomphalus extinctus* (RAMBUR), Szczyglice site – breadth 20 and 22 mm.

K. giengensis is 6.4 - 9.9 mm. The sculpture of the surface was another difference considered by ŁOMNICKI. The subspecies *bielanensis* is characterized by thin papillae in contradistinction to almost all the remaining species of *Klikia*. The only *Klikia* with similar surface sculpture is described by KLIKA (1891) from Tuchořice as *Helix osculum* var. *ornata*, considered by WENZ (1923) as *Klikia osculum osculum*.

The genus *Klikia* is totally extinct.

Genus: *Cepaea* HELD, 1837

***Cepaea silvana silvana* (KLEIN, 1853)**

Helix silvana KLEIN, 1853

Cepaea silvana silvana: WENZ 1923

The species is known from Bielany and Witkowice. It is one of the most common snails of Upper Miocene deposits in Central Europe.

Cepaea silvana silvana is known only from the Neogene deposits but three species of *Cepaea* occur in Poland recently.

ACKNOWLEDGEMENT

I am grateful to Mrs. Bogumiła DZIURDZIK, M. Sc. for preparation of the scanning electron microscope photographs.

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