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A new euomphalomorph gastropod genus in the faunula, listed by VADÁSZ (1915) from Alsórákos (Perşani Mts, Romania; ?Early Jurassic)

by
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Abstract — Five species are distinguishable from the available, most probably Early Jurassic material, consisting of a few poorly preserved inner casts and a specimen with shell. The latter one preserved also the original shell microstructure that was different from that of the comparable genera just like some of the megascopic characters. These gave a basis for establishment of *Valamidiscus persanyensis* n. gen. & n. sp. Short descriptions of the steinkerns are also given in the systematic part of the paper. Because *Valamidiscus* n. gen. cannot be fitted into the existing families without objection, its accommodation has been tentatively chosen (?Discohelicidae, ?Cirroidea).

Key words — Euomphalomorpha, ?Cirroidea, ?Discohelicidae, shell structure, Perşani Mts, ?Early Jurassic.

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Introduction

A few, most probably Early Liassic gastropod specimens provided the occasion to publish the information below. Recently their locality area has became highlighted because of a possible occurrence of fossil bearing, marine Triassic–Jurassic boundary sequence. Therefore a preliminary revision of the museum materials from this region has been started (PÁLFY 1999) and the rediscovery of the gastropods is a consequence of these studies.

PODEK, F. and JEKELIUS, E. collected the studied specimens in the initial years of the 20th century. The gastropods constitute only a minor part of the complete fauna (9 specimens among hundreds of other fossils, mainly cephalopods). Their preservation is rather poor; eight specimens are inner moulds and only a single one has shelly preservation. However, the shelly specimen seems to be an important document to the knowledge of the euomphalus-shaped gastropods. The material is now deposited in the Museum of the Hungarian Geological Institute. In the faunal list of VADÁSZ (1915, p. 237), two names refer to these gastropods:

Discohelix transsylvanicus n. sp.
Trochus epulus D'ORBIGNY.

Because VADÁSZ did not give systematical description and figure, the species name "*transsylvanicus*" remained "nomen nudum". The generic identification also needs a correction.

In an earlier publication, VADÁSZ (1908, p. 287, pl. VI: 8, 9) reported two additional Lower Liassic gastropod species from this area:

Pleurotomaria reticulata SOW.
Pleurotomaria cfr. *sulcata* SOW.

The specimens of the latter two species have not been studied in detail, however, the figures in VADÁSZ (1908) and the applied names suggest a need of a taxonomical revision. *Pleurotomaria reticulata* SOW. = *Trochus reticulatus* J. SOWERBY, 1821 = (the valid name:) *Bathrotomaria reticulata* (SOWERBY J., 1821) strongly differs both in its shape and age (Late Jurassic). The case with *Pleurotomaria* cfr. *sulcata* SOW. is similar: *Trochus sulcatus* SOWERBY J., 1818 = (the valid name.) *Leptomaria sulcata* (SOWERBY J., 1818) is an Aalenian species.

The poor preservation of the inner moulds does not permit a detailed systematic analysis, therefore the paper will concentrate to the single shelly specimen, representing a new genus and species that increases the number of the euomphalus-shaped genera. Formerly this group of Palaeozoic–Mesozoic gastropods has been regarded as belonging to a single family or superfamily, Euomphalidae or Euomphaloidea, respectively (see e.g. KNIGHT et al. 1960). However, recent studies have demonstrated their polyphyletic origin (MORRIS & CLEEVELY 1981; BANDEL 1988, BANDEL & GELDMACHER 1996, BANDEL & FRÝDA 1998, WAGNER 2002). The genera got into several families belonging sometimes to different subclasses. Because the Perşani Mts new form has preserved a curious shell microstructure that has not yet been reported and this character is usually regarded as having high classification value, the possibility to establish another new family must be also considered.

Locality

The Perşani Mts is a hilly region in SE Transylvania, the central part of Romania within the East Carpathian Arc, on the left side of the river Olt, NW from Braşov, the largest town in the neighbourhood of the locality. The fossiliferous outcrops were found in the valley of Tepei (= Tepe or Töpe) Creek, near the village Racoşul de Jos, called Alsórákos (Hungarian) in the early publications

Figure 1 — Sketch map of the locality. — Asterisk indicates the locality area.

(VADÁSZ 1908, 1915)]. In these papers, the fossils were said to be collected from Lower Liassic (Lias □ = Sinemurian) "Adnet" type, marly, nodular and stratigraphically condensed limestone.

The "Adnet" limestone (≅ "Rosso Ammonitico" limestone) occurs in this region in olistoliths of different size, embedded in Barremian to Aptian wildflysch. Genetically, the olistoliths are regarded as fragments of the "Olt Nappe" (POPA & PATRULIUS 1996). The composition of the ammonite fauna suggests origin from the Tethyan Mediterranean Faunal Province and indicates a Hettangian to Sinemurian age (PÁLFY 1999). However, it is important to note that Upper Triassic (Norian) Hallstatt-type limestone and younger Liassic (up to Toarcian) marls have also been found amongst the olistoliths in the locality area (POPA & PATRULIUS 1996). The Adnet and Hallstatt limestones are closely related genetically and their megascopic characteristics are the same in many respects. Therefore the Hettangian to Sinemurian age of the gastropod specimens cannot be regarded certain because there is a small chance of mixing of the collected material. Unfortunately, there is no matrix attached to the specimen available to prepare thin section to find micropalaeontological and/or microfacies evidence of the age. Regardless of its exact age, the only specimen, which preserved the shell microstructure and the outer morphology, appears to represent new taxa therefore warrants a detailed study.

Systematics

The nine specimens belong to four different superfamilies and five species. Except one case, their preservation permits identification only with use of the open nomenclature. There will be also some uncertainties indicated on the higher levels of the taxonomical categories. These have arisen mainly from the recent changes, being done or needed in the gastropod classification. Some of the new arrangements are incompletely developed, others seem not supported by important data or new taxa are needed to reflect the phylogenetic relations more exactly. Attached question marks will indicate doubts either about the rank of a taxon or the taxon itself, respectively. However, discussion of the problems in details is out of the scope of this paper.

Abbreviations to measurements: **H** = total height; **HL** = height of last whorl; **HP** = height of peristome; **D** = diameter of last whorl; **WP** = width of peristome; **AA** = apical angle; **AL** = coiling angle of last whorl (if different from apical angle); **AUA** = umbilical angle in the earliest whorls; **AUL** = umbilical angle in the last whorl (if different from that of earliest whorls); * = measured on damaged or apparent peristome.

Class Gastropoda CUVIER, 1797
Subclass? Archaeogastropoda THIELE, 1925
Order ?Vetigastropoda SALVINI-PLAWEN, 1980
Superfamily Pleurotomarioidea SWAINSON, 1840
Family ?Pleurotomariidae SWAINSON, 1840

Bathrotomaria? sp.

Material — Single, strongly fragmentary specimen of inner cast preservation.

Measurements	H	HL	HP	D	WP	AA	AL	AUA	AUL
	-	*17.5	*11	*31	*15	-	*81°	-	-

Remarks — The specimen consists of two badly damaged whorls of a broadly phaneromphalous species. The whorls bear a rounded spiral angulation at midwhorl position. Two obscure spiral incisions, at the angulation, indicate presence

and position of a selenizone. These characters suggest that the specimen most probably belongs to the genus *Bathrotomaria* COX, 1956. However, the poor state of preservation permits to apply this name in doubtful form.

Superfamily Trochoidea RAFINESQUE, 1815
Family Trochidae RAFINESQUE, 1815
Subfamily? Proconulinae COX, 1960

?*Proconulus scherinus* (G. G. GEMMELLARO, 1874)
(Plate I: 8)

1915: *Trochus epulus* ORB. — VADÁSZ, p. 237.

Material — Two fragmentary steinkerns.

Measurements	H	HL	HP	D	WP	AA	AL	AUA	AUL
Plate I: 8	-	*6.5	*3.5	10	-	*48°	26°	-	-

Remarks — The specimens have slightly cyrtoconical outline therefore they resemble to "*Trochus*" *actaeon* D'ORBIGNY, 1853 but differ in having narrower spiral angles, higher, and consequently, fewer whorls. *Trochus epulus* D'ORBIGNY, 1853 has a simple conical shell therefore VADÁSZ's identification is erroneous. Though some authors unify the two species but in this case the applicable name is *actaeon* (see FISCHER & WEBER 1997).

The specimens lack the apical part and the shell that are needed to reliable genus and species identification. The earliest whorls indicate normal conical or acute juvenile shell like in the Middle Liassic *Proconulus scherinus* (G. G. GEMMELLARO, 1874) that is a species most resembling in its shape and dimensions.

Superfamily Eucycloidea KOKEN, 1897
Family Eucyclidae KOKEN, 1897

Eucyclus? sp.
(Plate I: 7)

? 1908: *Pleurotomaria reticulata* SOW. — 1908, p. 287, pl. VI: 8.
? 1908: *Pleurotomaria* cfr. *sulcata* SOW. — 1908, p. 287, pl. VI: 9.

Material — Single fragmentary steinken.

Measurements	H	HL	HP	D	WP	AA	AL	AUA	AUL
Plate I: 7	-	-	-	*21.5	-	*63°	63°	-	-

Remarks — The specimen is an inner cast with a turbiniform shape, characteristic to the anomphalous shells of *Eucyclus* J. A. EUDES-DESLONGCHAMPS, 1860. There are two angulations on the whorls; the upper one corresponds to the periphery, the lower one is followed by the suture. No trace of other spiral ornamental elements is observable that is unusual in *Eucyclus* and in the other members of Eucyclidae. Commonly there are also other cords and carinae that are reflected on the inner casts (see e.g. *Riselloidea* below). In lack of these morphological characters, there is no reliable tool to distinguish the inner mould from that of some extreme species of *Bathrotomaria*, *Pleurotomaria* DEFRANCE, 1826 and *Worthenia* DEKONINCK, 1883, which may possess an upper angulation, that have become the periphery. From these possibilities, the name *Eucyclus* has been selected because earlier investigations confirmed that this genus is characteristic in the depositional environment of the Rosso Ammonitico limestones (SZABÓ, 1995).

The specimen is probably conspecific with those ones that have been named by VADÁSZ (1908) as *Pleurotomaria reticulata* SOW. and *Pleurotomaria* cfr. *sulcata* SOW. All these specimens seem to belong to a single species that is rather variable in its spiral angle and the related dimensions. Because no resembling species has been found they may represent a new one. However, the steinkern preservation does not provide satisfactory conditions to establish new species.

Riselloidea aff. *noszkyi* SZABÓ, 1995
(Plate I: 9)

Material — Four fragmentary inner casts.

Measurements	H	HL	HP	D	WP	AA	AL	AUA	AUL
Plate I: 9	-	*12	*7	*18	-	75°	75°	-	-

Remarks — The specimens are conical inner moulds of a species, having four equally spaced carinae on the whorls and six marked cords on the base between the periphery and the edge of an axial basal depression that probably indicates a narrow umbilicus. The Perşani specimens are similar to *Riselloidea noszkyi* SZABÓ, 1995, found in the Bakony Mts Sinemurian (Hungary). However, this latter species have also collabral riblets that are also reflected on the inner mould. Another comparable species is the Late Sinemurian to Pliensbachian *Riselloidea multistriata* (BÖCKH, 1874) but it differs in having much smaller spiral angle, higher volutions and weaker spiral cords of the whorls that are inequally spaced. Specimens of better preservation are needed to a more accurate identification.

Subclass Euomphalomorpha BANDEL & FRÝDA, 1998
Superfamily ?Cirroidea COSSMANN, 1916
Family ?Discohelicidae SCHRÖDER, 1995

Genus *Valamidiscus* n. gen.

Type species — *Valamidiscus persanyensis* n. gen. & n. sp. (see below).
Name — *valami* (Hungarian) = (in composed words) some; *discus* (Greek in Latinised form) = disc.
Diagnosis — False sinistral, discoidal shell with deeply concave spire and shallow, almost plane umbilicus. Protoconch slightly raised in deeper excavation, this way indicating spire. Whorls rather loosely coiled, therefore sutures deeply grooved. Shell moderately, but not evenly thick-walled; outer (back) side more thickened. Whorls have two spiral angulations, both bearing one carina. Third spiral carina on strongly arched outer side slightly above periphery. Adapical suture runs just along middle spiral carina, lower (umbilical) suture follows periphery of preceding whorl. Inner space of whorls rounded at apparent peristome. Growth lines marked on juvenile, delicate on last whorl. Their orientation nearly orthocline between spire suture and adapical angulation, feebly opisthocyrt between pairs of carinae, and feebly prosocyrt between lowermost carina and umbilical suture.

Valamidiscus persanyensis n. gen. & n. sp.

nom. nud. 1915: *Discohelix transsylvanicus* n. sp. — VADÁSZ, p. 237.

Holotype — Plate I: 1-6, 10
Type locality — Tepe Valley (Töpe-patak), Racoşul de Jos (Alsórákos), Perşani Mts (Persányi-hegység), Romania.
Type strata — Most probably "Adnet" type red, nodular, marly limestone; slight possibility of coming from "Hallstatt" type limestone, which has similar megascopic characters.
Type level — Most probably Sinemurian; slight possibility of belonging to the Upper Triassic.
Name — Refers to the Perşani Mts but the spelling follows the Hungarian name as used in the early publications.
Diagnosis — See that of *Valamidiscus* above.
Material — A single, slightly damaged, shelly specimen with micritic infilling.

Measurements	H	HL	HP	D	WP	AA	AL	AUA	AUL
Plate I: 1-6, 10	*6.6	*6.6	*6.6	*19.3	*6	* ~ 170	247	-	210°

Description — In the available specimen, the protoconch is poorly preserved. Its shape is slightly trochospiral and dextral, there is a hole in the central part but it is impossible to see whether the first whorl was open coiled or the initial chamber lacking owing to damage.

No peristome part preserved.

On naturally etched parts of the shell, two layers with oriented structural elements are observable. This fact suggests that both shell layers must have been originally made of calcite because in the red, nodular limestones of deep water origin, the original aragonitic shells always dissolved, substituted or recrystallyzed into irregular mosaic structure.

The outer shell layer consists of fine fibres of calcite normal to the growth-lines. The fibres of the subsequent growth phases on the spire and umbilical whorl sides join to each other in a pattern of spiral arms, starting at the adaxial suture and tending to the abaxial suture. Some of the "spiral arms" are elevated like a thread, suggesting that the periostracum of the shell might have

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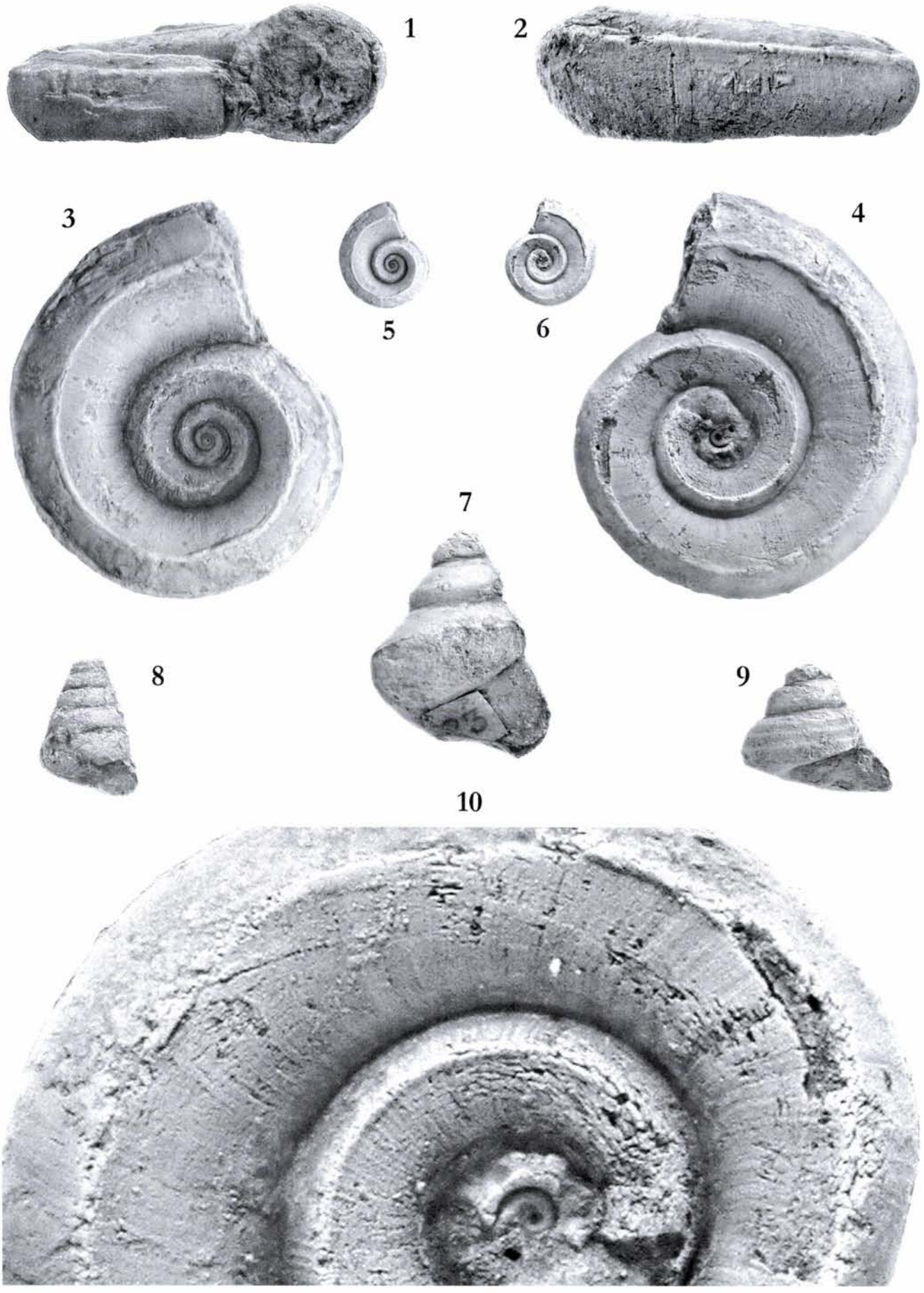
Explanation to Plate I

1–6 *Valamidiscus persanyensis* n. gen. & n. sp., holotype. — **1–4**: ×4; **5–6**: natural size
7 *Eucyclus* sp. — ×1.5.
8 *?Proconulus scherinus* (G.G. GEMMELLARO, 1874). — ×1.5.
9 *Riselloidea* aff. *noszkyi* SZABÓ, 1995. — ×2.
10 *Valamidiscus persanyensis* n. gen. & n. sp., holotype. — Strongly (×12) magnified part of the shell surface on the umbilical side to show the "spiral arm" arrangement of the outer calcite fibres.

Plate I



been also partly mineralised (see Plate I: 10). On the outer (back) side, where the growth-lines are opisthocyrt, the axes of the fibres are oriented towards the periphery and resemble to being "focused" by a concave mirror to the outermost shell line.

The lower layer, exposed on the umbilical side near the apparent peristome, show a French-floor pattern in section parallel to the shell surface (horizontally) but prismatic vertically. The prisms slope forward/towards the peristome, and the measurable angles suggest they are asymmetrical (columnar) first order calcite rhomboedres in mineralogical sense.

Remarks — The interspace between the adapical pair of carinae resembles to the sinus belt ("selenizone") of some euomphalid and ophiletid genera.

The discoidal species of similar age, that mainly belong to *Discohelix*, are easily distinguishable by the genus characters.

Comparisons and conclusion

Similar gastropods to *Valamidiscus* n. gen. can be found mainly amongst the Early Palaeozoic representatives of the Macluritina [sensu KNIGHT et al. (1960)] or Euomphalina DE KONINCK, 1881 [as WAGNER (2002) calls practically the same group of lower level taxa]. False sinistral shells with concave spire, loose coiling mode, transformations of trapezoidal whorl cross-section and (nearly) flat base are characteristic to the members of the Macluritidae (e.g. *Maclurina* ULRICH & SCOFIELD, 1897) and Ophiletidae (e.g. *Lecanospira* BUTTS, 1926 or *Lesueurilla* KOKEN, 1898). The spiral belt between the closely spaced adapical carinae in *Valamidiscus* n. gen., resembling to a sinus belt ("selenizone"), increases the similarity to the ophiletids. However, none of the compared forms have opisthocyrt growth-lines on the outer face. On the contrary, they have prosocyrt growth-lines.

Further genera with concave spire and two angulations on the whorls are known also in the Euomphalidae, sensu BANDEL & FRÝDA (1998) who suggested subclass status for *Euomphalus* SOWERBY, 1814 and other closely related genera on the basis of their peculiar protoconch morphology. They have a bulb-shaped initial chamber and at least half a whorl is open coiled. Though the remnants of the protoconch in the available specimen of *Valamidiscus* n. gen. are comparable, the poorly preserved earliest whorls do not permit a reliable decision if it has belonged to the Euomphalidae of this latter definition or not. The structure of the shell is different from that observed by BANDEL & FRÝDA (1998) in *Euomphalus*.

The third carina and the asymmetry in the growth-lines of the spire and umbilical sides in *Valamidiscus* n. gen. distinguish it from *Discohelix* DUNKER, 1848, the most common, contemporaneous discoidal genus. The unique shell structure may mean a further tool to the distinction. because MORRIS & CLEEVELY (1981) and SCHRÖDER (1995) found *Discohelix* to have prismatic nacreous inner shell layer. However, the figured gastropod of the latter author is so different from the type species of *Discohelix (D. calculiformis)*, that a confirmation is needed from study of a species, being morphologically closer. MORRIS & CLEEVELY (1981) did not give either a figure or species name of their *Discohelix* species.

The nacreous shell microstructure and BANDEL (1988) suggestion, induced by the "archaeogastropod type" protoconch, lead to establishing of Discohelicidae SCHRÖDER, 1995. The new systematical place would be the Trochoidea, however, this is a foreign morphological environment. Later BANDEL & GELDMACHER (1996) thought the cirroidean origin also possible.

In Cirroidea, discoidal forms have been also accommodated and ultradextral (false left-handed) forms are common. Therefore this superfamily seems also a systematical place for *Valamidiscus* n. gen. to be considered.

In spite of the doubts, Discohelicidae seems the best tentative systematical position on the family level for *Valamidiscus* n. gen., because a peculiar morphological element, namely the "spiral arm" pattern, has been observed in a *Discohelix* species (*D. acarinata* SZABÓ, 1979). This character may indicate close relation.

Outer calcite shell layer in the compared gastropod genera and family level taxa is common but inner, originally calcite layer has not yet been reported. This magnitude of difference in the shell structure is frequently applied to distinguish families or even higher taxa.

Unfortunately, the number of existing data is insufficient to understand how the mineralogy and microstructure of the shells has changed and how it correlates with phylogeny/evolution. Estimation of the real value of this character is especially hard in the euomphalus-shaped gastropods that are known mainly from the early (Palaeozoic–Mesozoic) history of Gastropoda and belonging to extinct groups. Therefore the single occurrence of *Valamidiscus* n. gen. suggests treating of this case cautiously.

In most of the existing gastropod classifications, the lower rank taxa in a subclass are different in their shell structure and in the protoconch morphology. These reflect a widely accepted opinion that the evolution in these character groups "has not stopped at the taxonomical boundaries". In fact, establishment of Subclass Euomphalomorpha BANDEL & FRÝDA, 1998 provides a new theoretical ground to unify again those morphologically related genera that have got into uncertain systematical relations recently. This is why the Discohelicidae, tentatively selected to accommodate *Valamidiscus* n. gen., is regarded here as a possible component in Subclass Euomphalomorpha.

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