

Hettangian (Early Jurassic) brachiopod fauna of the Bakony Mts. (Hungary)

by
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Abstract: Up to now only sporadic Hettangian brachiopods were known from the Bakony Mts. During a new collection, a surprisingly rich brachiopod fauna was found at 13 localities of the Bakony Mts. Fifteen Hettangian brachiopod taxa are described, belonging to 5 genera. Some of them are not determinable exactly owing to the bad preservation.

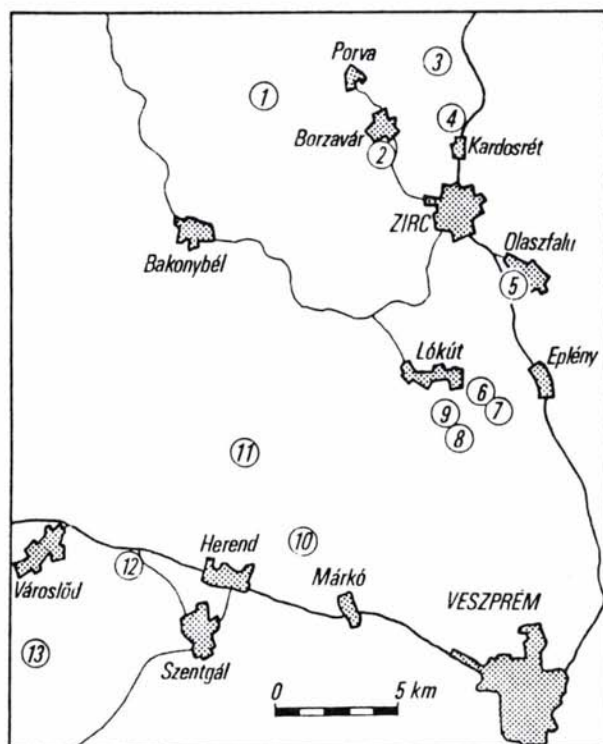
INTRODUCTION

The Hettangian Kardosrét Limestone Formation is widespread in the Bakony Mts. but it contains scarce and badly preserved megafauna. The crisis at the Triassic/Jurassic boundary resulted in extremely poor faunas in Hettangian formations (Michalík et al. 1991) and there are very few data about Hettangian fossils in the literature. Therefore the Hettangian brachiopods of the Bakony Mts. were poorly known.

Böckh (1874) described the characteristic Hettangian *Terebratula ovatissimaeformis* and *Terebratula (Waldheimia) Bakonica* n. sp. from Som-hegy and Tüz-köves-hegy. Koch (1875) mentioned the former species from Kőrös-hegy, Szépalmapusztá and Szesztra-hegy. Kovács (1931) listed some Late Triassic and Hettangian forms from Hamuházi-hegy (*Zeilleria elliptica*, *Terebratula gregaria*, *Terebratula ovatissimaeformis*). Noszky (1972) mentioned a great number of Hettangian brachiopod species from the Bakony but some of those were originated from Sinemurian rocks. Haas et al. (1984) listed a rich brachiopod fauna from the Városi-erdő near Sümeg but their material is predominantly Sinemurian in my opinion.

There are also very few data about Hettangian brachiopods in the other areas of the Mediterranean region. Gaetani (1970) described a rich silicified Hettangian material from Bergamo, in which there were four brachiopod species (*Calcirhynchia rectemarginata*, *Cuneirhynchia latesinuosa*, *Lobothyris ovatissimaeformis*, *Zeilleria perforata*). Michalík et al. (1991) examined the brachiopods of the Triassic/Jurassic boundary in the Tethys region. They mentioned Gaetani's four species and *Lobothyris ovatissimaeformis*, *Zeilleria perforata* from Bakony. They also referred to Hettangian brachiopods from the Western Carpathians, Outer Dinarides and Sicily but without mentioning names. Besides there are only sporadic references in some Sinemurian or Pliensbachian works.

Hettangian brachiopods were collected recently at 13 localities of the Bakony Mts. (Text-fig. 1). About 90% of the collected fauna consists of brachiopods (562 specimens) but two-thirds of the collected brachiopods are undeterminable. Among the determined brachiopods terebratulids are prevailing (96.3%), rhynchonellids are rare (3.1%) and spiriferids are insignificant (0.5%). The determined brachiopod fauna is dominated by *Lobothyris ovatissimaeformis* (67%).



Text-fig. 1: Locality map. 1-Kóris-hegy, Bakonybél; 2-Páskom, Borzavár; 3-Cuha-völgy, Kardosrét; 4-Szesztra-hegy, Kardosrét; 5-Eperkés-hegy, Olaszfalu; 6-Lókúti-domb; 7-Kávás-hegy, Eplény; 8-Kericser, Lókút; 9-Papod-alja, Lókút; 10-Som-hegy, Márkó; 11-Alsó-Hajag, Herend; 12-Tűzköves-hegy, Szentgál; 13-Csalános-völgy, Városlőd

On the basis of paleoecological examinations of brachiopod fauna, a somewhat differentiated paleoenvironment is suggested for the Hettangian time (Dulai 1993). The outlined paleogeography is strikingly similar to the pattern of sea-mounts and intervening basins postulated for the Pliensbachian (Vörös 1989). This probably indicates, that the tectonic collapse of the platform started already during the Hettangian (Dulai 1993).

The specimens and the acetate peels are deposited in the Geological and Paleontological Department of the Hungarian Natural History Museum in Budapest (inventory numbers: M.93.4.-M.93.18.).

SYSTEMATIC DESCRIPTIONS

Phylum BRACHIOPODA
Class ARTICULATA Huxley, 1869
Order RHYNCHONELLIDA Kuhn, 1949
Superfamily RHYNCHONELLACEA Gray, 1848
Family Wellerellidae Likharev, 1956
Subfamily *Cirpinae* Ager, 1965
Genus *Calcirhynchia* Buckman, 1918

Calcirhynchia ? *plicatissima* (Quenstedt, 1852)
(Plate I: Fig. 1; Text-fig. 2)

1992 *Calcirhynchia* ? *plicatissima* Quenstedt - Dulai: p. 44, pl. 1, fig. 3. (cum. syn.)



Text-fig. 2: Drawing
of *Calcirhynchia* ?
plicatissima,
Tüzköves-hegy

Material: Cuha-völgy (2), Lóküti-domb (3) and Tüzköves-hegy (1).

Dimensions (mm): Specimen M.93.4. (Text-fig. 2) length: 11.1, width: 12.2, thickness: 7.1.

Description - *External characters:* Small shell, subtriangular in outline. The sides of triangle are straight, the base of triangle is convex. The angle between the lateral margins is about 105°. The two corners are rounded at the anterior margin. The width is a little larger than the length, while the thickness is three-quarter of the length.

Biconvex form, the convexity of the pedicle and the brachial valves are equal. The maximum width is at the anterior third, while the maximum convexity is at the half of the length. The beak is small and suberect. There are no beak ridges and planareas.

The lateral commissures are straight, the anterior commissure is uniplicate. The plica is wide, slightly arched and low. All the surface of shell is costate, 16-18 costae run straight on each valve to the anterior end without bifurcation. The cross section of costae is triangular.

Internal characters: There were no adequate specimens available for serial sectioning due to the sparry calcite filling.

Remarks: Vecchia (1944) erected a new subspecies (*Rhynchonella plicatissima rectemarginata*) collected from Hettangian rocks. Later Gaetani (1970) raised it to species level. In my opinion the small differences in the external characters do not justify its separation from *C. ? plicatissima*. Neither the occurrence in Hettangian warrants the separation, as *C. ? plicatissima* first appears in the Late Hettangian (Almérás 1964). These specimens are wider and flatter than the Early Sinemurian *C. ? plicatissima* specimens from the Lóküti-domb (Dulai 1992), however the high variability of this species is well known from the literature. The specimens of *Rhynchonella hungarica* described by Böckh (1874) are very similar to my specimens. Already Di Stefano (1886), Rothpletz (1886) and Geyer (1889) synonymized *R. hungarica* Böckh, 1874 with *R. plicatissima*. In the original description Böckh also mentioned the similarity of the two species but noted that his specimens are wider. It is here regarded to be within the range of intraspecific variability of *C. ? plicatissima*.

Distribution: According to Alméras (1964) *C. ? plicatissima* is Late Hettangian to Sinemurian in age. Vörös (1983) found it ranging up to the Davoei Zone of the Early Pliensbachian in the Bakony Mts. The species was reported from Germany, Switzerland, the Eastern Alps, the Southern Alps, Sicily and the Transdanubian Central Range.

Genus *Salgirella* Moisseev, 1936

Salgirella cf. *albertii* (Oppel, 1861)
(Plate I: Fig. 2; Text-fig. 3)

- 1861 *Rhynchonella Albertii* n. sp. - Oppel: p. 546, pl. 13, fig. 4.
1879 *Rhynchonella Albertii* Oppel - Uhlig: p. 32, pl. 4, fig. 1.
1889 *Rhynchonella Alberti* Oppel - Geyer: p. 43, pl. 5, figs. 14-17.
1889 *Rhynchonella Alberti* Oppel var. ? *lobata* n. var. - Geyer: p. 45, pl. 5, fig. 18.
1895 *Rhynchonella Alberti* Oppel - Fucini: p. 172, pl. 7, fig. 1.
?1900 *Rhynchonella* sp. aff. *Alberti* Oppel - Böse & Schlosser: p. 193, pl. 18, fig. 1.
?1910 *Rhynchonella Alberti* Oppel - Principi: p. 79, pl. 3, fig. 8.
?1920 *Rhynchonella Albertii* Oppel-Dareste de la Chavanne: p. 18, pl. 1, fig. 5.
1949 *Rhynchonella Alberti* Oppel var. *tenuis* n. var. - Nucubidze: p. 49, pl. 1, fig. 5.
non 1879 *Rhynchonella Albertii* Oppel - Uhlig: p. 32, pl. 4, fig. 2.

Material: 1 fragmentary pedicle valve from Lókúti-domb (leg.: A. Vörös).

Dimensions (mm): Specimen M.93.5. (Text-fig. 3) length: 13.3, width: 13.0 (incomplete).

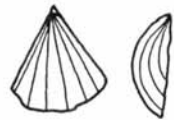
Description - External characters: Medium-sized shell, rounded triangular in outline. The sides of triangle are straight or slightly concave, the base of triangle is very convex. The angle between the lateral margins is about 90°. The two corners are slightly angular at the anterior margin. The length is nearly equal to the width, but this is an incomplete specimen, so the total width is greater than the length.

The pedicle valve is convex. The maximum width is situated at the anterior third, while the maximum convexity is probably at the half of the length. There are no beak ridges and planareas at the pedicle valve. The lateral commissures are probably straight, the anterior commissure is uniplicate.

All the surface of the shell is costate, 9 very sharp costae run straight to the anterior end without bifurcation. Three of them are on the fold and 3-3 on its sides. The cross section of costae is triangular.

Internal characters: There were no adequate specimens available for serial sectioning due to the paucity of the material.

Remarks: Only a fragmentary pedicle valve was found, nevertheless, the specimen can be well identified with *S. albertii*. The fold of our specimen is not so well defined. Geyer (1889) separated *R. Alberti* var. *lobata*, which is probably not distinguishable from typical *S. alberti*. Fucini (1895) mentioned some surprisingly large specimens (larger than 3 cm). Böse & Schlosser's (1900) specimen is very flat and it has got more costae on the fold than it is typical. On the basis of Principi's (1910) and Dareste de la Chavanne's (1920) figures their specimens have got fewer costae and the costae are less sharp than it is at *S. albertii* in general. The



Text-fig. 3: Drawing of *Salgirella* cf. *albertii*, Lókúti-domb

preservation of Nucubidze's (1949) specimen is not very good and it is also large-sized. The specimen of Uhlig's (1879) second figure (pl. 4., fig. 2.) is probably not *S. albertii*, because of the well-defined planareas.

Distribution: According to Alméras (1964) *Salgirella albertii* is Sinemurian in age. Its occurrence in the Pliensbachian is uncertain. The specimen of the Bakony Mts. is of Hettangian age, thus extends the global range of this species, (N.B. Alméras treated *S. albertii* var. *lobata* separately, which is Hettangian to Sinemurian in age). The species was reported from the Eastern Alps, the Southern Alps, the Northern Appennines, Algeria, the Caucasus and the Transdanubian Central Range.

Rhynchonellida sp. 1.
(Plate I: Fig. 3; Text-fig. 4)

Material: 1 brachial valve from Szesztra-hegy.

Dimensions (mm): Specimen M.93.6. (Text-fig. 4) length: 12.6, width: 15.0 (incomplete).



Text-fig. 4: Drawing of Rhynchonellida sp. 1, Szesztra-hegy

Description - External characters: Medium-sized shell, subtriangular in outline. The sides of triangle are straight, the base of triangle is probably convex. The angle between the lateral margins is about 100°. The two corners are rounded at the anterior margin. The width is larger than the length.

The brachial valve is slightly convex, but the convexity is very low. The maximum width is situated at the anterior third.

The surface of the brachial valve is costate, 14 rounded, flat costae run straight to the anterior end.

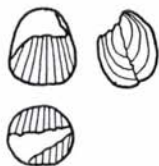
Internal characters: The internal characters were not studied due to the paucity of the material.

Remarks: Only a brachial valve was found but it characteristically differs from the other rhynchonellids. *C. ? plicatissima* has got more and sharper costae and its valve is more convex. *S. cf. albertii* is much more convex and it has got few and very sharp costae. Rhynchonellida sp. 2. is very different in shape. The incomplete preservation render a more precise identification impossible.

Rhynchonellida sp. 2.
(Text-fig. 5)

Material: 1 incomplete specimen from Szesztra-hegy.

Dimensions (mm): Specimen M.93.7. (Text-fig. 5) length: 10.7, width: 8.9, thickness: 8.5.



Text-fig. 5: Drawing of Rhynchonellida sp. 2, Szesztra-hegy

Description - External characters: Small shell, rounded triangular in outline. The sides of triangle are very convex, the base of triangle is less convex. The angle between the lateral margins is about 85°. The two corners are rounded at the anterior margin. The length is larger than the width, while the thickness is slightly smaller than the width.

Biconvex form, the convexity of the pedicle valve is larger than the brachial one. The maximum width is situated at the

anterior third, while the maximum convexity is at the half of the length. There are no beak ridges and planareas.

The surface of the shell is costate, 8-10 weak costae can be seen on the valves. The cross section of costae is rounded triangular.

Internal characters: The internal characters were not studied due to the paucity of the material.

Remarks: Only an incomplete specimen was found, which is infilled by coarse-grained sparry calcite, so the identification is impossible. However its characters are very different from the features of the other rhynchonellids.

Order SPIRIFERIDA Waagen, 1883
Suborder SPIRIFERIDINA Waagen, 1883
Superfamily *SPIRIFERINACEA* Davidson, 1884
Family *Spiriferididae* Davidson, 1884
Genus *Liospiriferina* Rousselle, 1977

Liospiriferina pichleri (Neumayr, 1879)
(Plate I: Fig. 4; Text-fig. 6)

1879 *Spiriferina Pichleri* n. sp. - Neumayr: p. 10, pl. 1, fig. 6.

1881 *Spiriferina* cfr. *Pichleri* Neumayr - Canavari: p. 179, pl. 9, fig. 5.

1932 *Spiriferina Pichleri* Neumayr (mut.) - Renz: p. 15, pl. 1, fig. 8.

1993 *Spiriferina pichleri* Neumayr - Manceñido: p. 87.

Material: 1 incomplete specimen from Kávás-hegy.

Dimensions (mm): Specimen M.93.8. (Text-fig. 6)
length: -, width: 17.0, thickness: 11.0 (incomplete).

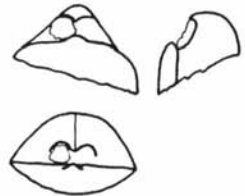
Description - *External characters:* Medium-sized shell. The angle between the lateral margins is about 90°. Biconvex form, the pedicle valve is more convex than the brachial one. The maximum width and the maximum convexity is situated at the anterior third.

The umbo of brachial valve is small and not prominent. The beak is medium sized and strongly curved. The preservation of the region of the lateral interarea is not very good, so the interpretation is difficult. The anterior part of the specimen is missing but a prominent uniplication has already developed near the beak.

Internal characters: There were no adequate specimens available for serial sectioning due to the paucity of the material.

Remarks: The only specimen is rather fragmentary, but it can well be identified with Neumayr's species. The uniplication has already developed near the beak. Manceñido (1993) did not figure *L. pichleri* but he revised Renz's (1932) material, therefore his record was accepted in the synonymy. Manceñido (1993) mentioned some similar forms: *Spiriferina alpina* Oppel, 1861 and *Spiriferina inventa* De Gregorio, 1930. However *L. pichleri* has got a prominent sulcus and its beak is very narrow.

Distribution: According to Alméras (1964), *L. pichleri* is Hettangian to Early Sinemurian in age. The species was reported from the Northern Limestone Alps, Western Greece, the Central Appennines and the Transdanubian Central Range.



Text-fig. 6: Drawing
of *Liospiriferina pichleri*,
Kávás-hegy

Order TEREBRATULIDA Waagen, 1883
Suborder TEREBRATULIDINA Waagen, 1883
Superfamily TEREBRATULACEA Gray, 1840
Family Terebratulidae Tschorszhevsky, 1972
Subfamily *Lobothyridinae* Makridin, 1964
Genus *Lobothyris* Buckman, 1918

Lobothyris ovatissimaeformis (Böckh, 1874)
(Plate I: Fig. 6; Text-fig. 7-8)

1874 *Terebratula ovatissimaeformis* n. sp. - Böckh: p. 123, pl. 1, figs. 11-14.
1903 *Terebratula ovatissimaeformis* Böckh - De Alessandri: p. 243, fig. 1.
1970 *Lobothyris ovatissimaeformis* Böckh - Gaetani: p. 348, pl. 30, figs. 2-6.

Material: Kőris-hegy (20 specimens), Páskom (10), Cuha-völgy (12), Szesztra-hegy (27), Eperkés-hegy (4), Lókúti-domb (5), Kávás-hegy (11), Som-hegy (13), Alsó-Hajag (8), Tüzköves-hegy (14), Csalános-völgy (3) and Sümeg (1).

Dimensions (mm): Specimen M.93.9. (Text-fig. 7) length: 21.6, width: 14.4, thickness: 10.3.

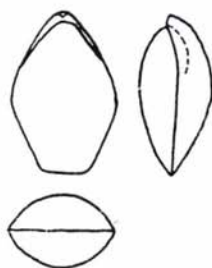
Description - *External characters:* Medium to large sized shell, elliptical in outline but slightly angular at the anterior margin. The anterior margin is straight. The length is much larger than the width, while the thickness is three-quarter of the length. The angle between the lateral margins is about 80°.

Biconvex form, the convexity of valves is equal. The maximum width and the maximum convexity are situated at the half of the length. The beak is small and erect. There are two weak beak ridges on the pedicle valve running to the third of the length. The lateral commissures and the anterior commissure are straight. The shell surface is smooth.

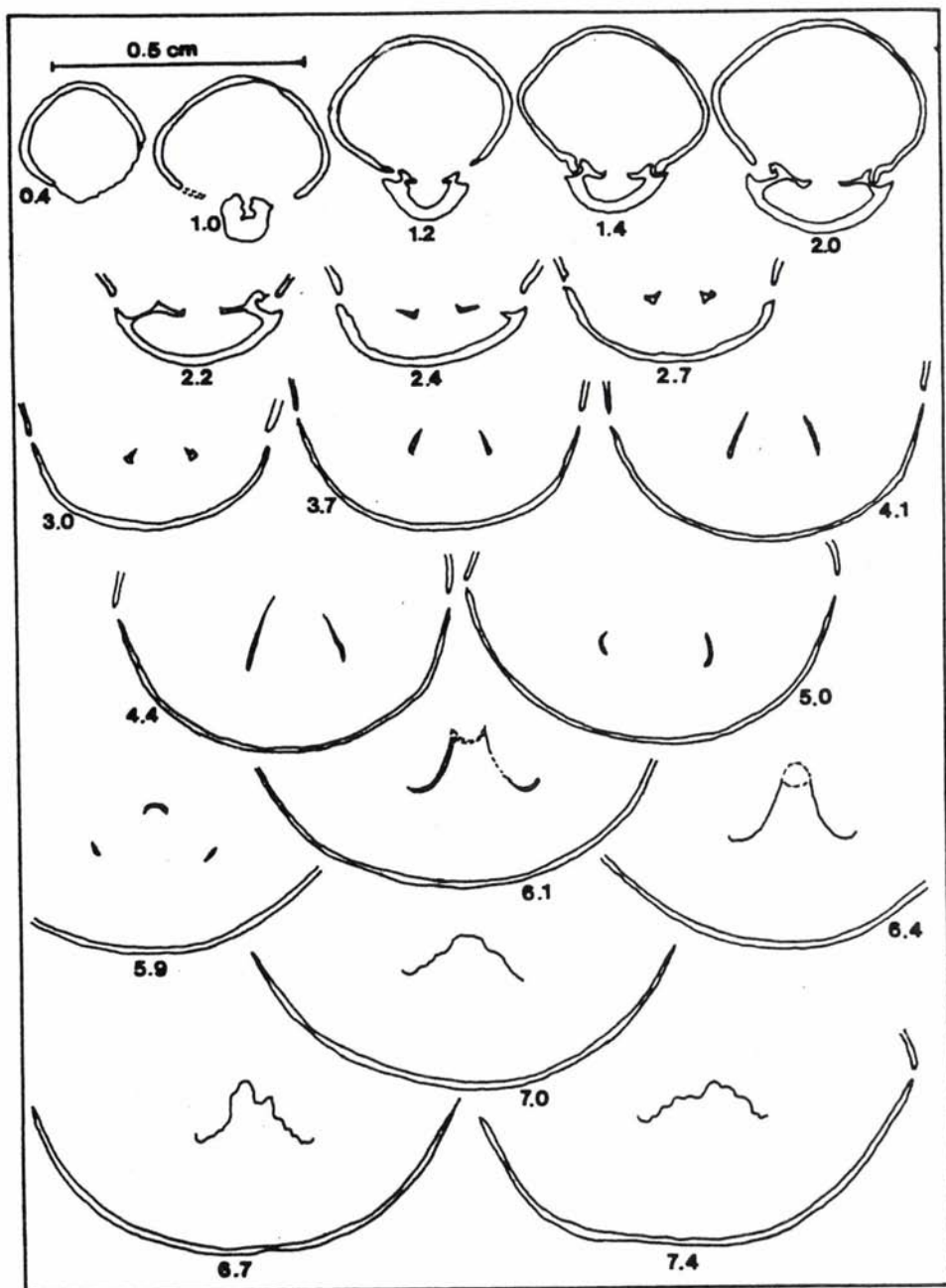
Internal characters (Text-fig. 8): The pedicle collar is missing but it is present at some other specimens. There are no dental plates. The delthyrial cavity is circular in cross section. The hinge-teeth are small and not crenulated. No median septum has been observed. The sockets are narrow and deep at the beginning but wider and shallower after that. The inner hinge plates are straight at the beginning and slightly arched after that. The crural processes are high but not too wide. The transverse band is high and narrow. There is a frilly secondary callus at the end of transverse band.

Remarks: This species is the most common in Kardosrét Limestone Formation. The external characters are quite variable. Already in Böckh's (1874) original description several different forms were figured. Böckh's original type specimens are missing from the type material of the Hungarian Geological Institute. The internal characters refer to the genus *Lobothyris*, just as in the case of Gaetani's (1970) specimens from Bergamo.

Distribution: According to Alméras (1964), *L. ovatissimaeformis* is Hettangian to Early Sinemurian in age. Gaetani (1970) described it from Hettangian rocks. The species was reported from the Southern Alps and the Transdanubian Central Range.



Text-fig. 7: Drawing
of *Lobothyris*
ovatissimaeformis,
Kőris-hegy



Text-fig. 8: Transverse serial sections of *Lobothis ovatissimaeformis*, Páskom, Borzavár.
Original length of specimen about 18 mm

Lobothyris ? subgregaria (Dal Piaz, 1909)
(Plate I: Fig. 7; Text-figs. 9-10)

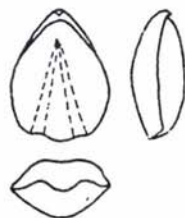
?1889 *Terebratula gregaria* Suess - Geyer: p. 15, pl.2, figs. 20-24.

?1895 *Terebratula gregaria* Suess - Fucini: p. 191, pl.7, fig. 15.

1909 *Terebratula subgregaria* n.sp. - Dal Piaz: p. 6, pl. 1, fig. 3.

Material: Szesztra-hegy (2) and Lókúti-domb (6).

Dimensions (mm): Specimen M.93.10. (Text-fig. 9) length: 17.5, width: 13.5, thickness: 8.0.



Text-fig. 9: Drawing of
Lobothyris ? subgregaria,
Szesztra-hegy

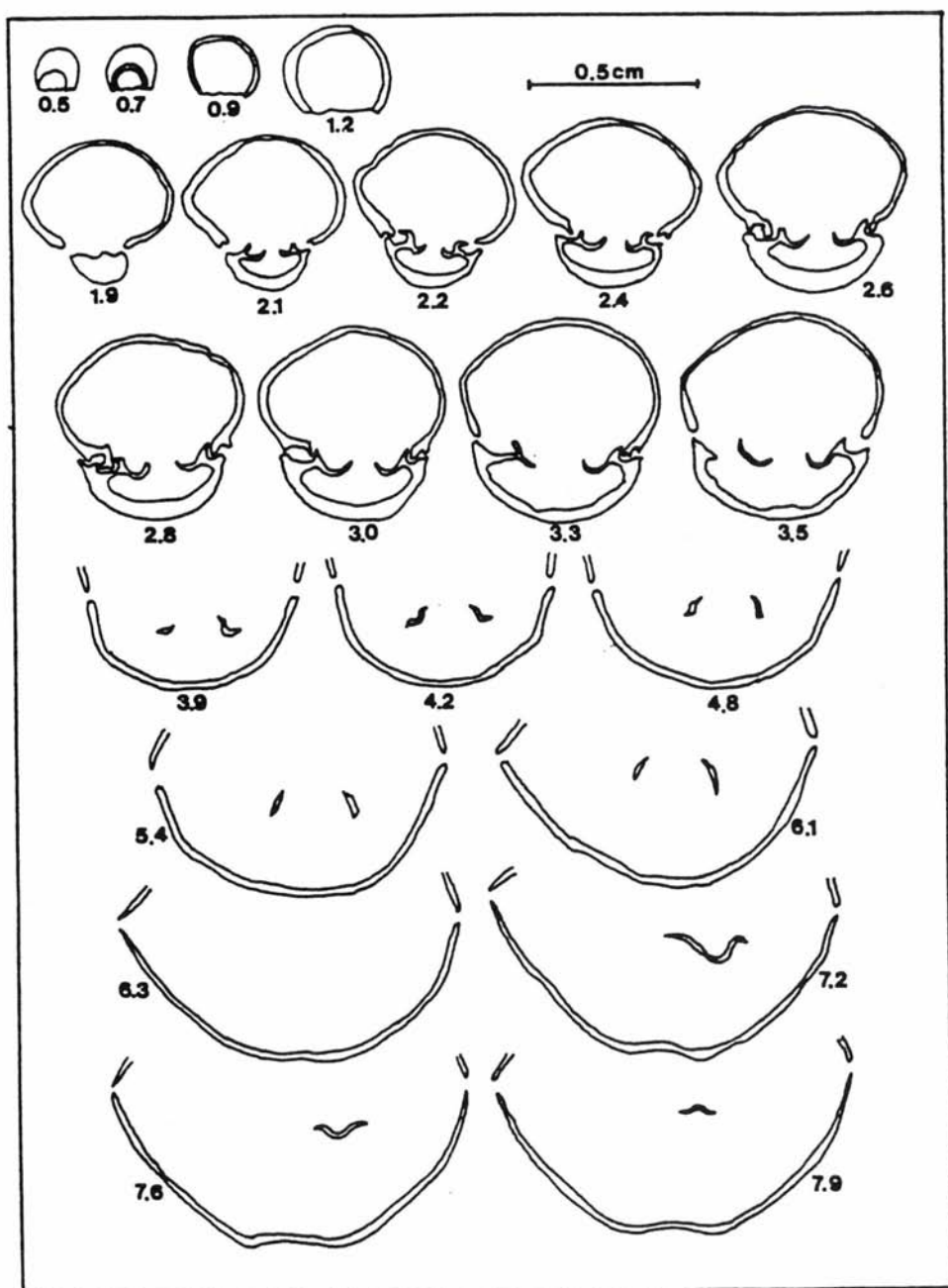
Description - *External characters:* Small to medium-sized shell, elliptical in outline. The length is larger than the width, while the thickness is about half of the length. The angle between the lateral margins is about 80°.

Biconvex form, the pedicle valve is more convex than the brachial one. The maximum width and the maximum convexity are situated at the half of the length. The beak is small and erect. The lateral commissures are straight, the anterior commissure is biplicate. The furrows run to the two-third of the length. The depth of the furrows are 2-3 mm. The width of biplication is two-third of the total width. The width of the plica is smaller than the width of the furrow. Both valves are smooth.

Internal characters (Text-fig. 10): A small pedicle collar has been observed. There are no dental plates, so the delthyrial cavity is circular in cross section. The hinge-teeth are long and narrow. There are two well-defined denticula. The socket is wide and not too deep. There is no median septum. The inner hinge plates are U-shaped in cross section. The crural processes are not well-developed. The transverse band has broken but it can be observed in a little shifted and tilted position: it seems to be low and not too wide.

Remarks: On the basis of external characters the specimens are just like *Rhaetina gregaria*. However the internal characters refer to the genus *Lobothyris*. Dal Piaz (1909) described a Sinemurian biplicate species (*T. subgregaria*), which may be the same as the specimens of Bakony Mts. According to Dal Piaz (1909) his new species is very similar to Geyer's (1889) and Fucini's (1895) specimens described as *Terebratula gregaria*. There is also a biplicate form in the Pliensbachian ("*Terebratula schlosseri*") described by Böse (1898). Besides these heterochronous homoeomorphs, *Rhaetina gregaria* has got a homoeochronous homoeomorph: *Triadithyris gregariaeformis* (Zugmayer) (Pearson 1977). Răileanu & Jordan (1964) figured a biplicate terebratulid ("*Lobothyris gregaria*") without systematic description or transverse serial sections (p. 17, pl. 6, fig. 33.).

Distribution: According to Almérás (1964), *L. ? subgregaria* is Sinemurian in age. The specimens from the Bakony Mts. are Hettangian in age, thus extending the global range of this species. The species was reported from the Southern Alps and the Transdanubian Central Range. The occurrences in the Eastern Alps and the Northern Appennines are uncertain.



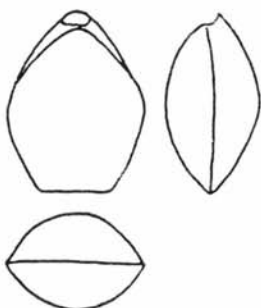
Text-fig. 10: Transverse serial sections of *Lobothisys ? subgregaria*, Lókúti-domb.
Original length of specimen about 17 mm

Lobothyris andleri (Oppel, 1861)
(Plate II: Fig. 4; Text-figs. 11-12)

- 1861 *Terebratula Andleri* n. sp. - Oppel: p. 536, pl. 10, fig. 4.
?1880 *Terebratula* cfr. *Andleri* Oppel - Parona: p. 194, pl. 1, fig. 4.
1889 *Terebratula punctata* var. *Andleri* Oppel - Geyer: p. 3, pl. 1, figs. 3-8., 11., 13., 15., 16.
1920 *Terebratula Andleri* Oppel - Dareste de la Chavanne: p. 35, pl.2, fig. 7.
?1964 *Lobothyris punctata andleri* Oppel - Răileanu & Iordan: p. 14, pl. 4, fig. 21.
1971 *Serbiothyris andleri* Oppel - Sučić-Protić: p. 27, pl. 10, figs. 1-5, pl. 29, fig. 1, pl. 39, fig. 2.
non 1910 *Terebratula punctata* var. *Andleri* Oppel - Vinassa de Regny: p. 184, pl. 7, fig. 14.

Material: Kőrös-hegy (1), Páskom (1), Cuha-völgy (1), Szesztra-hegy (1), Alsó-Hajag (1), Tűzköves-hegy (4).

Dimensions (mm): Specimen M.93.11. (Text-fig. 11) length: 24.0, width: 19.0, thickness: 12.8.



Text-fig. 11: Drawing of *Lobothyris andleri*, Kőrös-hegy

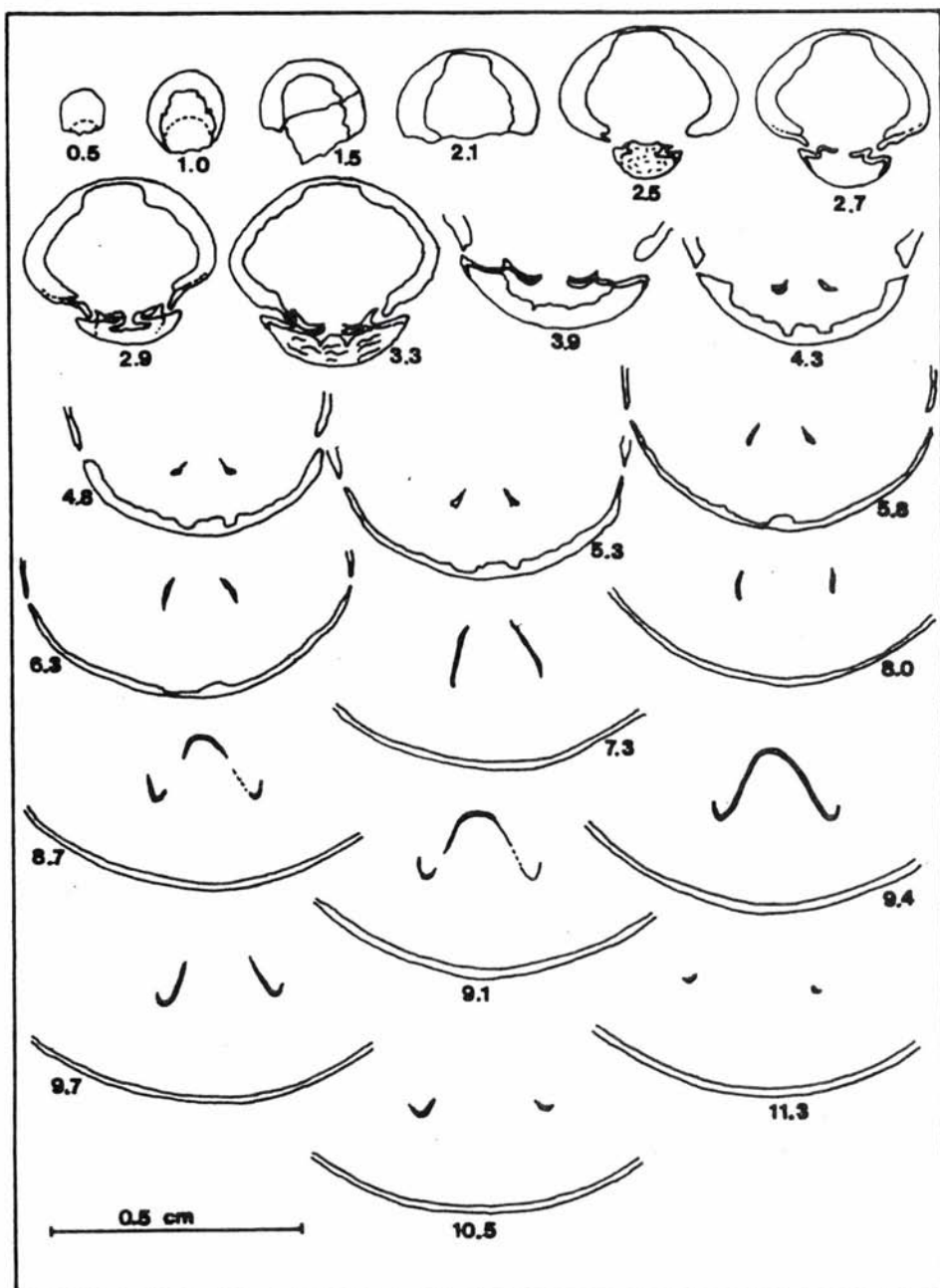
Description - External characters: Medium to large-sized shell, elliptical in outline. The anterior margin is straight. The length is much greater than the width, while the thickness is about half of the length. The angle between the lateral margins is about 85°.

Biconvex form, the valves are equally convex. The maximum width and the maximum convexity are situated at half of the length. The beak is relatively large and erect. There are two weak beak ridges on the pedicle valve, running to the third of the length. The lateral commissures and the anterior commissure are straight. Both valves are smooth.

Internal characters (Text-fig. 12): A weak pedicle collar has been observed. Very thick fibrous secondary layers are on the internal surface of both valves. There are no dental plates. The hinge-teeth are long and narrow, the sockets are deep and narrow. No median septum has been observed. The inner hinge plates are slightly arched in cross section. The crural processes are high and not too wide. The transverse band is high and quite wide. Two relatively long spines developed at the base of the transverse band.

Remarks: "*Terebratula andleri*" was first described by Oppel (1861). Parona's (1880) specimen is shorter and the outline is slightly differs from Oppel's specimens. Geyer (1889) considered this form as a subspecies of "*Terebratula punctata*". Raileanu & Iordan's (1964) figured specimen has got narrower beak than it is typical at *L. andleri*. Vinassa de Regny's (1910) specimen is short, pentagonal form and the valves are less convex.

Distribution: According to Alméras (1964) *L. andleri* is Hettangian to Sinemurian in age. The species was reported from the Eastern Alps, the Southern Alps, the Transdanubian Central Range and the Southern Carpathians (?).

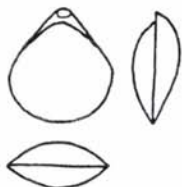


Text-fig. 12: Transverse serial sections of *Lobothyris andleri*, Tűzköves-hegy, Szentgál.
Original length of specimen about 24 mm

Lobothyris ? complanata (Böckh, 1874)
(Plate I: Fig. 8; Text-figs. 13-14)

1874 *Terebratula* (*Waldheimia*) *Bakonica* n. sp. var. *complanata* - Böckh: p. 130, pl. 3, fig. 1.

Material: Kőrös-hegy (1), Páskom (3), Szesztra-hegy (10), Eperkés-hegy (1), Tűzköves-hegy (8).



Text-fig. 13: Drawing of
Lobothyris ? complanata,
Tűzköves-hegy

Dimensions (mm): Specimen M.93.12. (Text-fig. 13)
length: 15.0, width: 13.8, thickness: 6.6.

Description - External characters: Small shell, circular in outline. The anterior margin is straight at some species. The length is greater than the width, while the thickness is one-third of the length. The angle between the lateral margins is about 82°.

Biconvex form, the valves are equally convex. The maximum width is situated at half of the length, while the maximum convexity is at the posterior third. The beak is small and erect. There are two weak and short beak ridges on the pedicle valve. The lateral commissures and the anterior commissure are straight and sharp. Both valves are smooth.

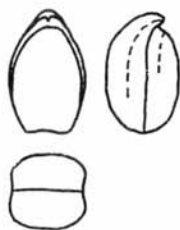
Internal characters (Text-fig. 14): No pedicle collar has been observed. There are no dental plates. The delthyrial cavity is circular in cross section. The hinge teeth and the sockets cannot be observed exactly. There is no median septum. The inner hinge plates are subhorizontal in cross section. The crural processes are not high and slightly arched. The transverse band is low and narrow.

Remarks: *L. ? complanata* was first described as the subspecies of "*Terebratula* (*Waldheimia*)" *Bakonica* Böckh, 1874. The internal characters of my specimens refer to the genus *Lobothyris* but the subhorizontal hinge plates make the classification uncertain. Böckh's original type specimens are missing from the type material of Hungarian Geological Institute.

Distribution: According to Alméras (1964), "*Waldheimia*" *bakonica* is Sineurian in age, however the specimens from the Bakony Mts. are probably Hettangian in age. The species was reported only from the Transdanubian Central Range.

Lobothyris ? sospirolensis (Uhlig, 1879)
(Plate II: Fig. 2; Text-figs. 15-16)

1879 *Waldheimia sospirolensis* n. sp. - Uhlig: p. 28, pl. 3, figs. 1-6.



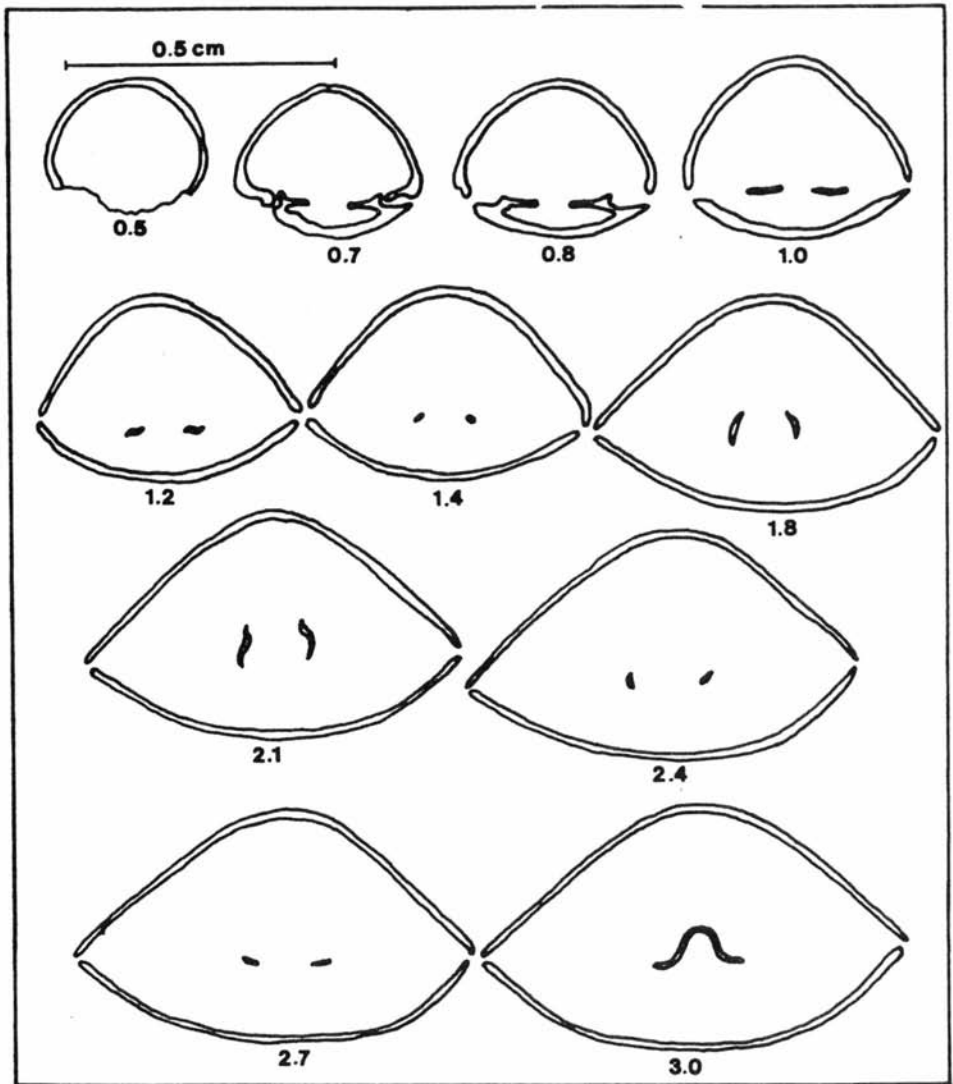
Text-fig. 15: Drawing of
Lobothyris ? sospirolensis,
Kávás-hegy

Material: Kőrös-hegy (1), Kávás-hegy (4).

Dimensions (mm): Specimen M.93.18. (Text-fig. 15)
length: 16.3, width: 10.0, thickness: 10.0.

Description - External characters: Small to medium sized shell, elliptical in outline but straight at the anterior margin. The angle between the lateral margins is about 55°. The length is much larger than the width, while the thickness and the width are equal.

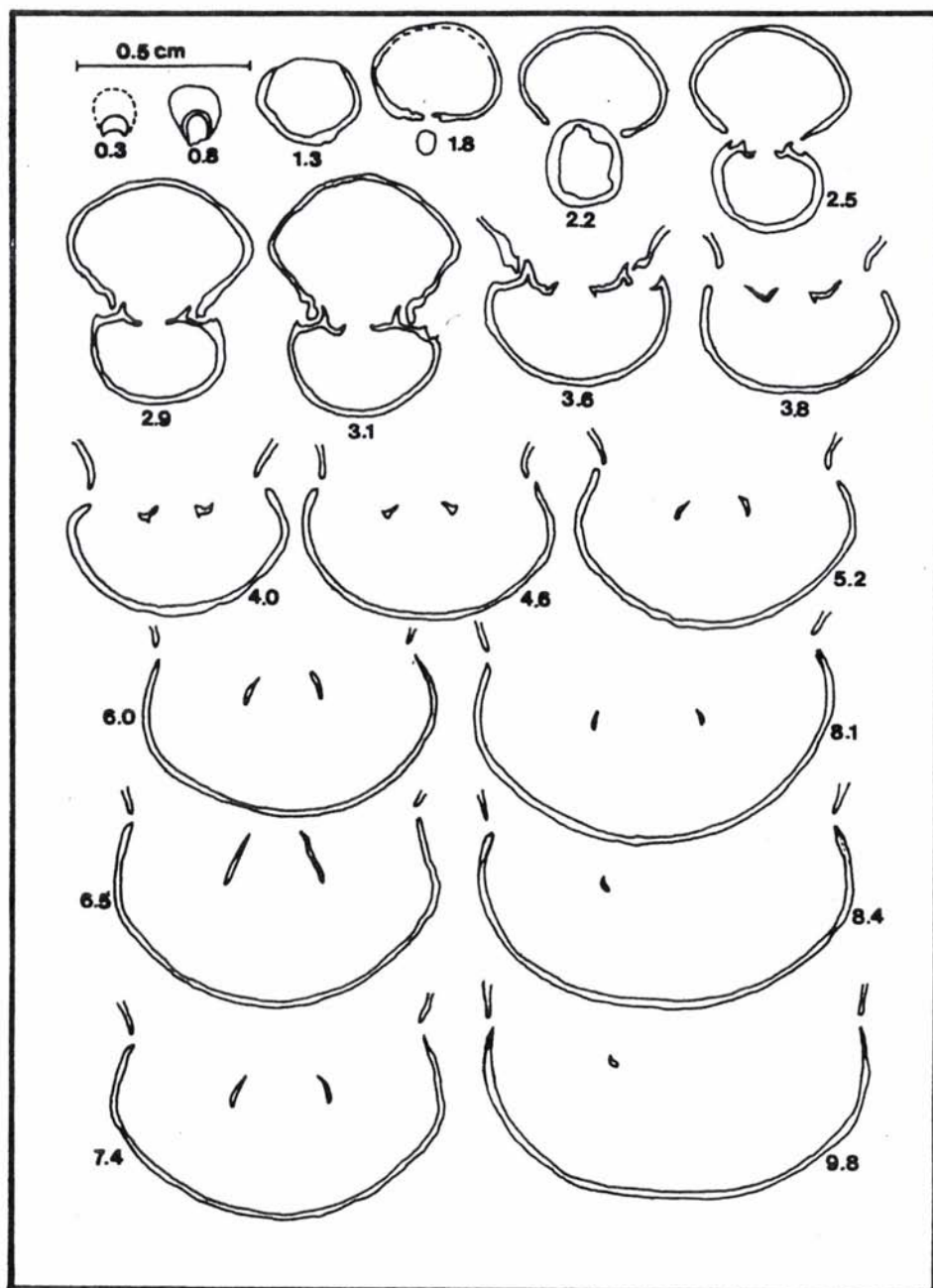
Biconvex form, the convexity of valves are equal. The maximum width is situated at the anterior third, the maxi-



Text-fig. 14: Transverse serial sections of *Lobothyris ? complanata*, Szesztra-hegy, Kardosrét.
Original length of specimen about 11 mm

mum convexity is at half of the length. The beak is large, erect and "hood-like". There are two strong beak ridges running to the two-third of the length on the pedicle valve. There are two less well-developed beak ridges on the brachial valve, too. The planareas are long and deep. The lateral margins are straight and run in the middle of the planareas. The anterior commissure is straight. The specimens are "box-like" in appearance.

Internal characters (Text-fig. 16): A weak pedicle collar has been observed. There are no dental plates. The hinge-teeth are not too long and narrow. The sockets are wide and shallow. There is no median septum. The inner hinge plates



Text-fig. 16: Transverse serial sections of *Lobothyris ? sopsirolensis*, Kávás-hegy, Eplény.
 Original length of specimen about 16 mm but a big part of the specimen is missing

are arched at beginning and slightly angular after that in cross section. The crural processes are not too high. The transverse band has broken. The loop is probably quite long.

Remarks: The species was first described as "*Waldheimia*" *sospirolensis* by Uhlig (1879). My specimens are very similar to Uhlig's specimens in external characters, but the internal characters refer to the genus *Lobothyris*. The only difference is that the loop is much longer than it is typical at *Lobothyris*. Some of Uhlig's figures show a weak median septum from outside view, others not. Unfortunately the internal characters of his specimens is unknown. A considerable part of the loop is missing, so the exact determination is impossible, because this was the only specimen from the Bakony Mts. suitable for serial sectioning.

Distribution: According to Alm eras (1964), *L. ? sospirolensis* is Sinemurian in age. The species was reported from the Southern Alps and the Transdanubian Central Range.

Lobothyris ? sp.
(Plate II: Fig. 1; Text-fig. 17)

Material: 2 fragmentary specimen from Szesztra-hegy.

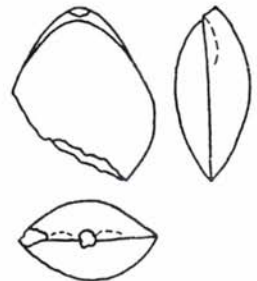
Dimensions (mm): Specimen M.93.13. (Text-fig. 17) length: 23.0, width: 19.1, thickness: 10.5.

Description - External characters: Medium-sized to large shell, elliptical in outline. The width is smaller than the length, while the thickness is smaller than half of the length. The angle between the lateral margins is about 88°.

Biconvex form, the convexity of pedicle valve is greater than the the convexity of brachial one. The maximum width is situated at half of the length, the maximum convexity is at the posterior third. The beak is medium-sized. The lateral commissures and the anterior commissure are straight. Both valves are smooth.

Internal characters: There were no adequate specimens available for serial sectioning due to the paucity of the material.

Remarks: Only two fragmentary specimens were found and the internal characters are unknown. No median septum has been observed from outside, therefore specimens were classified to the genus *Lobothyris* with question mark. The specimens characteristically differ from the other *Lobothyris* species: they are not biplicate than *L. ? subgregaria*, flatter than *L. andleri*, much wider and more angular than *L. ovatissimaeformis*, bigger and more irregular in outline than *L. ? complanata*.



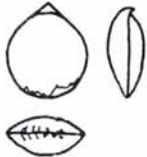
Text-fig. 17: Drawing of
Lobothyris ? sp.,
Szesztra-hegy

Family **Cancellothyrididae** Thomson, 1926
Genus *Phymatothyris* Cooper and Muir-Wood, 1951

Phymatothyris sp.
(Plate I: Fig. 5; Text-fig. 18)

Material: Szesztra-hegy (1), Alsó-Hajag (1).

Dimensions (mm): Specimen M.93.14. (Text-fig. 18) length: 12.4, width: 10.8, thickness: 8.5.



Text-fig. 18: Drawing
of *Phymatothyris* sp.,
Szesztra-hegy

Description - External characters: Small shell, circular in outline. The width is slightly smaller than the length, while the thickness is smaller than half of the length. The angle between the lateral margins is about 100°.

Biconvex form, the pedicle valve is significantly more convex than the brachial one. The maximum width and the maximum convexity are situated at half of the length. The beak is small and suberect. The lateral margins are straight, the anterior margin is badly preserved. Both valves are smooth.

Internal characters: The internal characters remain unknown, because only one complete specimen of this species was found, so there was no possibility for serial sectioning.

Remarks: The small specimen number and the small size render a more precise identification impossible. The external characters of *L. ? complanata* are slightly similar to this species, however the beak of *L. ? complanata* is much larger.

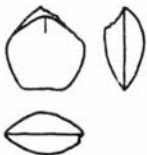
Suborder TEREBRATELLIDINA Muir-Wood, 1955
Superfamily ZEILLERACEA Allan, 1940
Family **Zeilleriidae** Allan, 1940
Genus *Zeilleria* Bayle, 1878

Zeilleria mutabilis (Oppel, 1861)
(Plate II: Fig. 3; Text-fig. 19)

1992 *Zeilleria mutabilis* Oppel - Dulai: p. 69, pl. 4, fig. 6, pl. 5, fig. 1. (cum. syn.)

Material: Páskom (1), Kávás-hegy (1).

Dimensions (mm): Specimen M.93.15. (Text-fig. 19) length: 11.2, width: 10.5, thickness: 6.0.



Text-fig. 19: Drawing
of *Zeilleria mutabilis*,
Páskom

Description - External characters: Small shell, sub-pentagonal in outline. The two corners are quite rounded at the lateral margins, while the other two are less rounded at the anterior margin. The anterior margin is straight. The width is nearly equal to the length, while the thickness is half of the length. The angle between the lateral margins is about 80°.

Biconvex form, the convexity of the valves is equal. The maximum width and the maximum convexity are situated at half of the length. The beak is absent. The lateral commissures and the anterior commissure are straight. Both valves are smooth.

Internal characters: The internal characters were not studied due to the paucity of the material.

Remarks: The specimens are slightly fragmentary, nevertheless they can be well identified with *Zeilleria mutabilis*. The Hettangian specimens are smaller than the average size of *Z. mutabilis* in Early Sinemurian of Lókúti-domb (Dulai 1992).

Distribution: According to Alméras (1964), *Z. mutabilis* is Sinemurian to Pliensbachian in age. According to (Vörös 1982) this species occurs in the Late Sinemurian and the Pliensbachian of the Bakony Mts. The species was reported from the Eastern Alps, the Southern Alps, the Northern Appennines, the West Carpathians and the Transdanubian Central Range.

Zeilleria sp. 1.

(Plate II: Fig. 5; Text-fig. 20)

Material: Kóris-hegy (1).

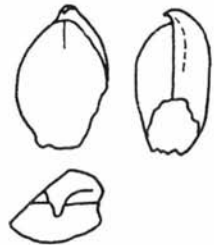
Dimensions (mm): Specimen M.93.16. (Text-fig. 20) length: 19.5, width: 13.0, thickness: 10.0.

Description - External characters: Medium-sized shell, probably elliptical in outline. The length is much larger than the width and the thickness but the specimen is not complete. The angle between the lateral margins is about 75°.

Biconvex form, the convexity of valves are equal. The maximum width and the maximum convexity are probably situated at half of the length. The beak is small, narrow and erect. There are two weak beak ridges on the pedicle valve running to one-third of the length. The lateral commissures are straight. Both valves are smooth.

Internal characters: There were no adequate specimens available for serial sectioning due to the paucity of the material.

Remarks: The only fragmentary specimen renders a more precise identification impossible. However it significantly differs from the other two *Zeilleria* in the outline and in the shape and size of beak.



Text-fig. 20: Drawing of *Zeilleria* sp. 1, Kóris-hegy

Zeilleria ? sp. 2.

(Plate II: Fig. 6; Text-fig. 21)

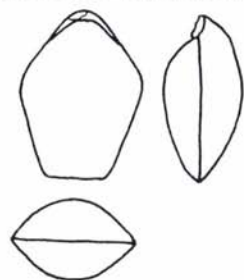
Material: Som-hegy (1).

Dimensions (mm): Specimen M.93.17. (Text-fig. 21) length: 22.5, width: 16.6, thickness: 11.0.

Description - External characters: Medium-sized shell, elongated pentagonal in outline. The two corners are quite rounded at the lateral margins, while the other two are slightly rounded at the anterior margin. The sides of pentagon are slightly convex. The length is greater than the width, while the thickness is half of the length. The angle between the lateral margins is about 80°.

Biconvex form, the convexity of valves are equal. The maximum width and the maximum convexity are situated at half of the length. The beak is very small

and badly preserved. There are no beak ridges and planareas. The lateral commissures and the anterior commissure are straight. Both valves are smooth.



Text-fig. 21: Drawing of *Zeilleria* ? sp. 2, Som-hegy

Internal characters: There were no adequate specimens available for serial sectioning due to the paucity of the material.

Remarks: The preservation of the only specimen is not very good. The median septum cannot be seen, therefore the classification to *Zeilleria* is questionable. However the external characters are nearer to *Zeilleria* than *Lobothyris* (the outline, the shape and size of beak, etc.). There are some similar zeilleriid forms in the European Pliensbachian: *Z. indentata*, *Z. quiaioensis* (Delance 1974).

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EXPLANATION OF PLATES

PLATE I.

- 1a-c: *Calcirhynchia* ? *plicatissima*, Tűzköves-hegy
2: *Salgirella* cf. *albertii*, Lókúti-domb
3: Rhynchonellida sp. 1., Szesztra-hegy
4a-c: *Liospiriferina pichleri*, Kávás-hegy
5a-c: *Phymatothyris* sp., Szesztra-hegy
6a-c: *Lobothyris ovatissimaeformis*, Kőrös-hegy
7a-c: *Lobothyris* ? *subgregaria*, Szesztra-hegy
8a-c: *Lobothyris* ? *complanata*, Tűzköves-hegy

PLATE II.

- 1a-c: *Lobothyris* sp., Szesztra-hegy
2a-c: *Lobothyris* ? *sospirolensis*, Kávás-hegy
3a-c: *Zeilleria mutabilis*, Páskom
4a-c: *Lobothyris andleri*, Kőrös-hegy
5a-c: *Zeilleria* sp. 1., Kőrös-hegy
6a-c: *Zeilleria* ? sp. 2., Som-hegy

PLATE I.

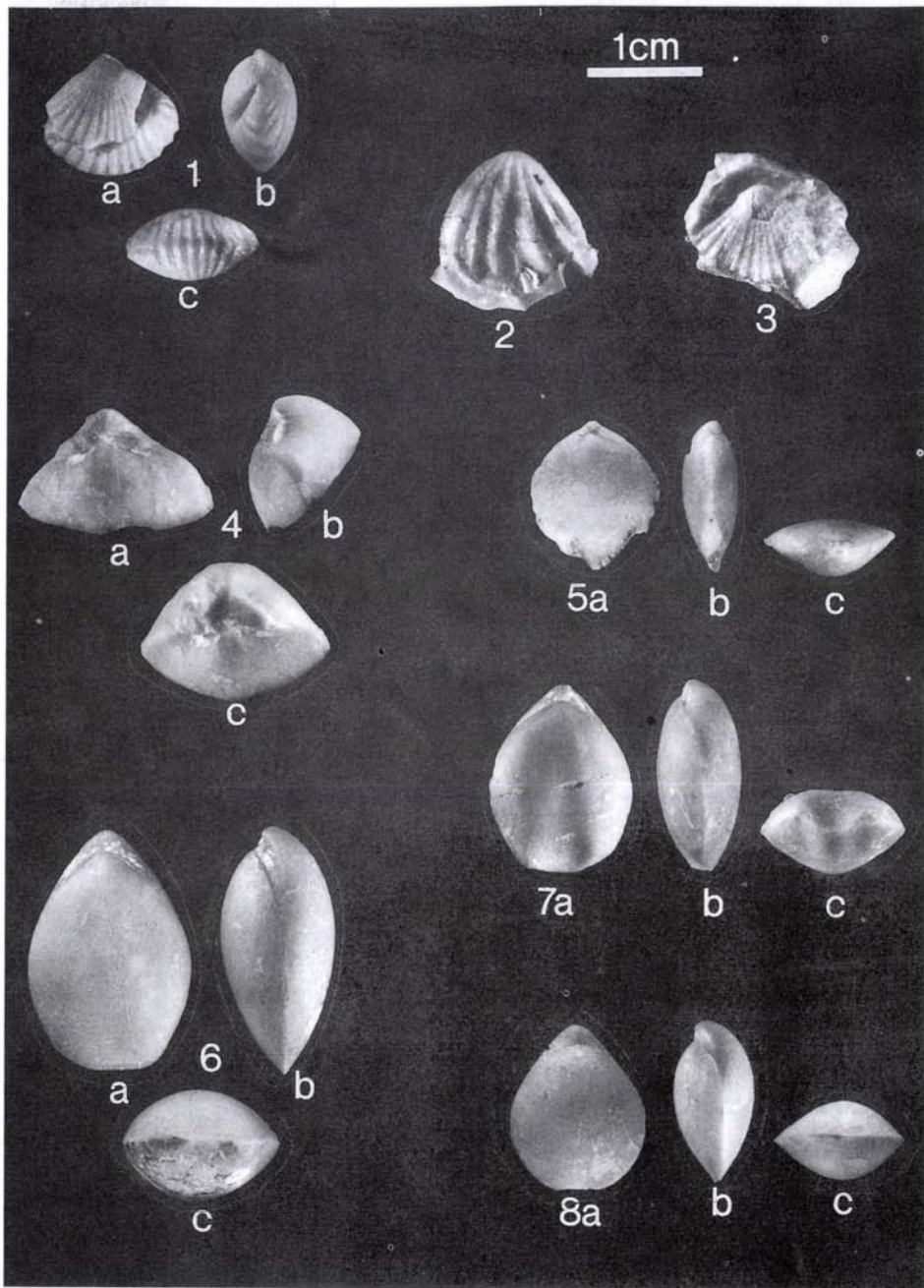


PLATE II.

