MILOŠ SIBLÍK*

# NEW SPECIES OF DOMERIAN RHYNCHONELLOIDS FROM SLOVAKIA

*(Text-figs. 1—12, Pl. IX—XII)*

Abstract: This paper contains descriptions of the new genus *Slovenirhynchia* gen. n. and the new species *Cirpa slovenica* sp. n., *Pseudogibbirhynchia globosa* sp. n., *Slovenirhynchia maninensis* sp. n. and *Slovenirhynchia slovenica* sp. n. A general section deals with previous research, character of preservation, description of the localities etc.

## Introduction

The Domerian rhynchonelloid brachiopods are a very characteristic element of the Slovakian brachiopod fauna and are usually better preserved than the rhynchonelloids from the Lower Lias.

The material used in the study comprises a personal collection made at Kostelec between 1962 and 1964, and now deposited in the Geological Institute of the Czechoslovak Academy of Sciences in Prague, in addition to the sole comprehensive collection of Slovakian Liassic brachiopods, housed in the Dionýz Štúr Geological Institute in Bratislava (GÚDŠ).

The whole work on the Domerian rhynchonelloids from Slovakia is divided into three parts. This paper is the first and deals only with new genus and species. In addition general sections are added concerning known species description of which will be published in the other two parts.

I am very obliged to Dr. D. V. Ager (Imperial College, London) for very valuable help and discussion during the work on this paper and to Dr. F. Westphal (Institut und Museum für Geologie und Paläontologie der Universität Tübingen) for giving me useful information. I am indebted also to my friend D. A. B. Pearson (Imperial College, London) for his help with the translation.

## Previous research

Liassic brachiopods were first recorded from Slovakia in the faunal lists of papers of a stratigraphic nature. They were not studied in the detail accorded to the accompanying ammonite fauna due to their lesser stratigraphical importance. Abundant brachiopod faunas were listed by F. von Andrian and K. M. Paul (1864) from the Malé Karpaty Mts., and by G. Stache (1865) and H. Vetters (1910) from the Lower Liassic locality „Pálený vrch" near the village of Rudno in the Žiar Mts. On the whole, however, mention of Liassic brachiopods in the literature was rare until the years following 1950 when the stratigraphical papers published by the Mesozoic group of the GÚDŠ in Bratislava began to contain lists of rich Liassic faunas in which brachiopods were prominent. Following the publication in 1931 by D. Andrusov of a very short description of some brachiopods from the Klippen Belt, the first major work containing determinations of Liassic brachiopods inclusive descriptions is a monograph by M. Maheľ „Geológia Stratenskej hornatiny" (1957). Papers, dealing particularly with Liassic brachiopods are those of J. Pevný (1964) and M. Siblík (1964, 1965, 1966), in which material from localities in the Malé Karpaty Mts., Strážovská hornatina Mts., and Veľká Fatra Mts. is considered.

* RNDr. M. Siblík CSc., Geological Institute of the Czechoslovak Academy of Sciences, Praha-Vršovice, Dvacátéhoosmého pluku 19.

## Techniques employed

In the preparation of the internal and external characters no methods were employed other than those described by S. S. Buckman (1918), M. H. Muir-Wood (1934) etc. and reviewed by D. V. Ager (1956).

The length of the shell is taken to be parallel to the posterior part of the lateral commissure (in the lateral view). Width and thickness are measured normal to this in the conventional manner.

The internal structure was investigated by means of serial grinding. A simple grinding apparatus allowing the constant orientation of the specimen, and with a working interval of 1/10 or 1/20 mm was used to prepare transverse serial surfaces; cellulose peels were taken of the more important sections, the remainder were only drawn.

The specimens in the text-figures (except for the text-figs. 6 and 7) are orientated in the way usual in the literature — the pedicle valve above and the brachial valve at the bottom. The conditions in the text-figs. 6 and 7 and in the plates are contrary. The numbers in each section indicate the distance from the posterior end of pedicle valve (if not stated otherwise).

The photographs were taken in the laboratory of the Geological Institute of the Czechoslovak Academy of Sciences by Mrs. L. Záporožcová. of specimens covered by ammonium chloride. The figured specimens are deposited in the Geological Institute of the Czechoslovak Academy of Sciences if not stated otherwise.

## Occurrence and character of preservation

Most of the material studied was found in more or less coarse grained limestones, deposited in a shallow sea or inlet. They very rich Domerian locality of Kostelec by Považská Teplá is formed of very coarse grained crumbling limestones, consisting almost entirely of crinoid debris. The brachiopods there are the most remarkable and numerous part of the fauna.

In the most cases the orientation of the shells in the sediment and other similar questions could not be observed. as the greater part of the material was gained from free boulders or broken rock. The majority of specimens are only casts; traces of the shell are preserved on a small number of individuals. Only complete specimens were used in making determinations, the separate valves or fragments of whole shells being suitable only exceptionally. Beak damage in a great number of specimens made the study of the delthyrial parts of shells difficult or impossible.

The type of preservation and suitability of specimens for serial grinding differs from place to place depending on the lithology of the various localities. Those shells of which the cavity is filled with crystalline calcite are unsuitable for the investigation of internal structure; the internal elements can be differentiated only with difficulty or have been totaly destroyed during recrystallisation.

The brachiopods from Pristodolok are rather poor in number but rich in variety of species. Individuals are secondarily deformed or in fragments only, but the preservation is suitable for successful grinding. At Kostelec the conditions are contrary: individuals are externally perfectly preserved but internally recrystallised and the determination of their internal details can only be made after grinding a great number of specimens.

The preservation of individuals from the other localities of the Domerian is generally good and permits the study of internal structures. However the scarcity of specimens of some species from these localities made the study of variability within the species

very difficult and also limited the number of sectioned specimens of certain species to 1 or 2 samples.

A spectrographic analysis of shells of the species *Slovenirhynchia maninensis* sp. n. from Kostelec has been made by L. Minařík, Geological Institute of the Czechoslovak Academy of Sciences. The composition of the shells as preserved differs only very little from the composition of the coarse grained limestone matrix. Single elements represented in an average sample are as follows (tab. 1):

The observation of the structure of the shell was possible only exceptionally [e. g. in the case of *Rhynchonelloidea lineata* (Young et Bird, 1828) from the Malé Karpaty Mts.].

In several specimens from Kostelec (5 of *Cirpa langi carpathica* and 7 of *Slovenirhynchia maninensis* sp. n.) there were traces of predation; in each case a small boring (1.1—1.3 mm) placed randomly in the shell with gastropods or boring sponges as the probable originators.

## The characterisation of the localities of Domerian Brachiopods

The greatest part of the rhynchonelloids described in this paper were found either at Pristodolok in the Malé Karpaty Mts., or at Kostelec near the village of Považská Teplá in the Strážovská hornatina Mts. The other localities yielded the remaining few specimens (text-fig. 1). Mentioned also are the localities where only indeterminable

Table 1

| | shells | limestone |
|---|---|---|
| more than 1 % | Ca, Mg, Si, P | Ca, Mg, Si |
| 1—0,1 % | Na, Sr, Fe | Fe, Na, P, K |
| 0,1—0,01 % | Al, Ba | Al, Ba, Mn |
| 0,01—0,001 % | B, Pb, Mn | Cu, Ni, Cr, V, Pb, B |


Text-fig. 1. Sketch map of eastern Czechoslovakia, showing occurrences of Domerian rhynchonelloids.

fragmentary brachiopods have been found, the age of which was fixed as Domerian on the basis of the accompanying fauna.

1. Locality Pristodolok — about 3 km ENE from the village of Kuchyňa in the Malé Karpaty Mts. The Domerian is represented by light, pink and greyish coarse-grained limestones here and there containing grey or reddish hornstones. The rich benthonic fauna consists dominantly of pelecypods and brachiopods. The following rhynchonelloids were recognised: *Prionorhynchia serrata* (Sowerby), *Prionorhynchia quinqueplicata* (Zieten), *Furcirhynchia melvillei* Ager, *Cirpa langi carpathica* Siblík, *Gibbirhynchia muirwoodae* Ager, *Rhynchonelloidea lineata* (Young et Bird), *Slovenirhynchia slovenica* sp. n., *Pseudogibbirhynchia globosa* sp. n. (?) and other undeterminable specimens, belonging undoubtly to the genera *Gibbirhynchia* [*G.* aff. *amalthei* (Quenst.)] and *Tetrarhynchia*.

2. Locality at the S part of the village of Bzince in the Nedzovské pohorie Mts. In the reddish or ochre-coloured Domerian limestones were found *Cuneirhynchia persinuata* (Rau), *Furcirhynchia* sp., *Zeilleria cornuta* (Sowerby), *Lobothyris punctata* (Sowerby), *Spiriferina angulata* Oppel and *Spiriferina* cf. *rostrata* (Schlotheim).

3. Locality of Valaská Belá — in the neighbourhood of this village in the Strážovská hornatina Mts. One specimen of *Prionorhynchia serrata* (Sowerby) was found in the grey medium-grained limestones laying freely about in the fields 300 m SE from the Čierna hora Mt.

4. Locality of Trenčianske Teplice in the Strážovská hornatina Mts. The greyish limestones with sandy admixture at NW margin of the spa contain Domerian pelecypods, and fragments of *Gibbirhynchia* sp. and *Furcirhynchia* sp.

5. Locality of Košecké Rovné in the Strážovská hornatina Mts. The exposure NW of the village, close to the road from Košecké Rovné to the village of Košecké Podhradie. The dark-greyish limestones yielded one specimen of *Tetrarhynchia tetraedra* (Sowerby).

6. Kostelec in the Strážovská hornatina Mts. The klippe E of the village Kostelec has a special development of Jurassic deposits. The geological origin and position of this klippe with shallow-water character is not yet quite clear. The first who dealt with the geology and stratigraphy of this locality was D. Andrusov (1931). The age of the entire locality was thought at that time as Lower Jurassic (Lower—Middle? Lias).

The greater part of the exposure is formed of light, greyish and pink limestones with layers of very coarse-grained crinoidal limestones, very prolific in fossils. The rich fauna of the crinoidal limestones belongs not only to the Lower Jurassic (Domerian) but also to the Middle Jurassic (M. Rakus 1965; M. Siblík 1966).

The Domerian brachiopods ascertained of Kostelec are as follows: *„Rhynchonella" lacuna* Quenstedt, *Tetrarhynchia tetraedra* (Sowerby), *Tetrarhynchia subconcinna* (Davidson), *Prionorhynchia quinqueplicata* (Zieten), *Cirpa langi carpathica* Siblík, *Cirpa slovenica* sp. n., *Cuneirhynchia persinuata* (Rau), *Cuneirhynchia* aff. *desori* (Haas), *Homoeorhynchia acuta* (Sowerby), *Pseudogibbirhynchia globosa* sp. n., *Slovenirhynchia maninensis* sp. n., *„Terebratula" beyrichi* Oppel, *Lobothyris punctata* (Sowerby), *Zeilleria darwini* (E.-Deslongchamps), *Zeilleria subnumismalis* (Davidson), *Zeilleria quadrifida* (Lamarck), *Zeilleria* aff. *mariae* (d'Orbigny), *Aulacothyris resupinata* (Sowerby), *Spiriferina alpina* Oppel, *Spiriferina angulata* Oppel, *Spiriferina slovenica* Siblík and *Spiriferina* ex gr. *muensteri* (Davidson).

7. Locality Belanská dolina (Belá Valley) in the Veľká Fatra Mts. more than 2 km

NNE from the Borišov Mt. The grey ochre-coloured coarse-grained limestones with belemnites and brachiopods are of Charmouthian and Domerian age. The exposure and brachiopods were studied not long ago by the author (M. Siblík 1964). The Domerian rhynchonelloids are represented at this locality by *Prionorhynchia serrata* (Sowerby) and *Cuneirhynchia persinuata* (Rau).

8. Locality in the saddle under Osnica Mt. in the Malá Fatra Mts. about 750 m SSE from the Osnica Mt. (approx. 4 km NW from the village of Párnica). The Domerian age of the grey and brownish limestones was based on ammonites. Only undeterminable fragments of rhynchonelloids were found there.

9. The small abandoned quarry in the valley of the brook Drienkyňa about 1500 m SE from the village of Slovenská Ľupča in the Zvolenská vrchovina-highlands. The Domerian age of the pink and reddish spotted limestones was determined on the basis of accompanying ammonites. Among brachiopods only *„Terebratula" adnethensis* Suess and undeterminable broken rhynchonelloids were found at this locality.

List of the rhynchonelloids of the Slovakian Middle Liassic—Domerian:

*Prionorhynchia serrata* (Sowerby, 1825)
*Prionorhynchia quinqueplicata* (Zieten, 1832)
*Cirpa langi carpathica* Siblík, 1965
*Cirpa slovenica* sp. n.
*Pseudogibbirhynchia globosa* sp. n.
*Tetrarhynchia tetraedra* (Sowerby, 1812)
*Tetrarhynchia subconcinna* (Davidson, 1852)
*Gibbirhynchia muirwoodae* Ager, 1954
*Furcirhynchia melvillei* Ager, 1958
*Furcirhynchia* sp.
*Homoeorhynchia acuta* (Sowerby, 1816)
*Rhynchonelloidea lineata* (Young et Bird, 1828)
*Slovenirhynchia maninensis* sp. n.
*Slovenirhynchia slovenica* sp. n.
*Cuneirhynchia persinuata* (Rau, 1905)
*Cuneirhynchia* aff. *desori* (Haas, 1884)
*„Rhynchonella" lacuna* Quenstedt, 1871.

This brachiopod fauna lies in the range of the „marginal group" of Liassic brachiopods of D. V. Ager (1960) and contains species occuring commonly in the Great Britain and Germany.

## Descriptions

### *Cirpa* di Gregorio, 1930

### *Cirpa slovenica* sp. n.

(Pl. IX, figs. 1—3, Text-fig. 2)

1966 *Cirpa langi* ssp. n. — M. Siblík: Ramenonožci kosteleckého bradla, p. 154.

Type-specimen: The holotype figured on plate IX, fig. 1 and deposited in the collection of the Geological Survey in Prague (MS-164).

Paratypes: The specimen figured on plate IX, fig. 2 is deposited with the

type-specimen, under the number MS-165. The other specimens are in the possession of the Geological Institute of the Czechoslovak Academy of Sciences.

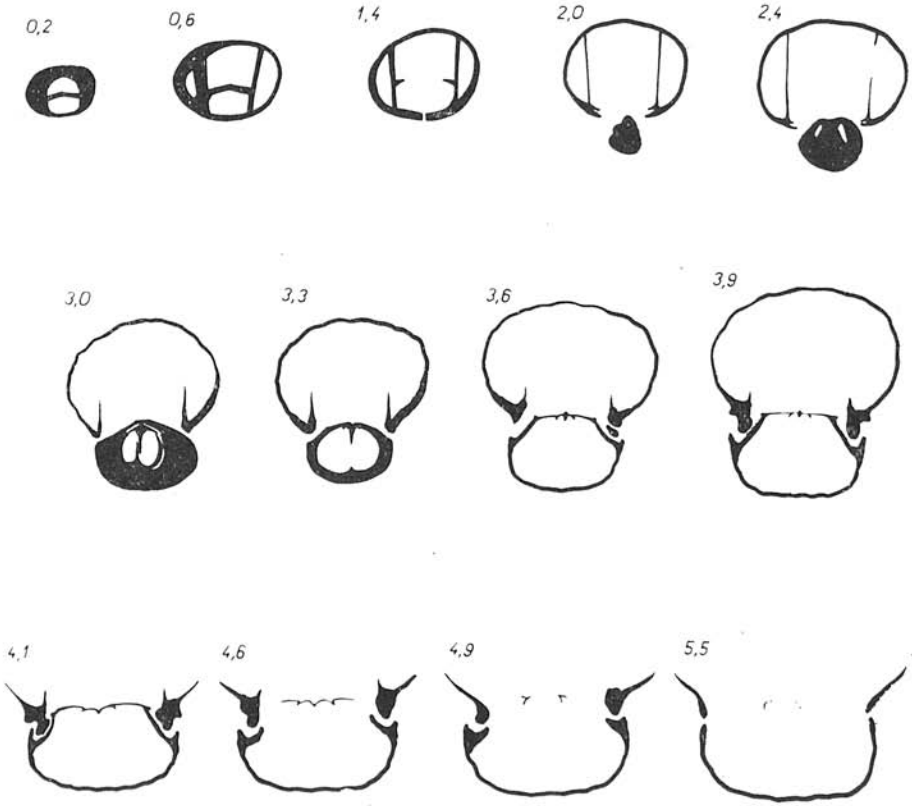
Stratum typicum et locus typicus: The uppermost layers of the Domerian; Kostelec near Považská Teplá.

Derivatio nominis: after the country of the locality — Slovakia.

Material: 32 specimens (casts with fragments of shell).

The dimensions:

| Length: | width: | thickness: | |
|---|---|---|---|
| 22,8 | 30,5 | 19,5 | |
| ca 22,5 | 31,1 | 17,5 | |
| 20,0 | 25,9 | 15,6 | plate IX, fig. 3 |
| 19,5 | 26,1 | 12,3 | |
| 18,6 | 23,4 | 15.2 | type-specimen, pl. IX, fig. 1 |
| ca 17,0 | 23,1 | 12,7 | plate IX, fig. 2 |
| 15,0 | 18,3 | 10,8 | |
| 10,3 | 12,9 | 6,8 | young specimen |




Text-fig. 2. *Cirpa slovenica* sp. n. Kostelec. A series of thirteen transverse sections through the posterior part of shell. The crura ended at 6,0 mm from the posterior end. Original length of specimen 18,9 mm. All x5 approx.

Description: External characters: The shells are of medium to large dimensions and subpentagonal outline. Their maximum width lies in the anterior third to half of the brachial valve. The brachial valve is more convex than the pedicle; the central parts of the valves are very little curved in the lateral view. There are very shallow but well-limited planareas or merely flattening on the lateral parts of shell. Subangular plication of the commissure is high and broad. The fold is fairly low and expressive in the anterior half of the valve. The beak is large and incurved with only barely distinct beak-ridges. The pedicle opening is small, submesothyridid. The apical angle fluctuates between 110—115°. The costae are strong and sharp covering the whole surface of the valves up to the umbos numbering 9—14 on each valve; 4—7, in one case 3, of them are confined to the fold.

Internal characters: The general character of the internal structure is analogous with that of other species of *Cirpa*, espec. with *Cirpa langi carpathica* Siblík, 1965. The species described here has, however, a very well-developed subangular pedicle collar and the doubling of the deltidial plates is always distinct. The dental lamellae are parallel or converge ventrally, their length varies. The flat hinge-plates are fused (text-fig. 2, section 3, 6—4, 6), the crural bases being visible on their dorsal side.

Remarks: The new species has a close resemblance to *Cirpa langi* Ager, 1958. When compared with it the following characteristics may be noticed in *Cirpa slovenica* sp. n.:

1. greater dimensions (*C. slovenica* sp. n. belongs among the largest forms of *Cirpa*),
2. relatively less thickness of the brachial valve which is semicircular in lateral view (being subtrigonal in *Cirpa langi*),
3. more strongly curved outline when anteriorly viewed,
4. absence of the flattening of the anterior margin of the adult shell [this flattening is, however, present in some young specimens that are thus practically indistinguishable from young specimens of *Cirpa fronto* (Quenstedt, 1871)],
5. longer fusion of the hinge-plates.

*Cirpa slovenica* sp. n. differs externally from *Cirpa langi carpathica* Siblík, 1965 especially in greater dimensions and in having more costae. The distinction concerning the inner structure have already been mentioned.

Distribution: *Cirpa slovenica* sp. n. was found near the top of the Domerian of the Kostelec-locality.

## *Pseudogibbirhynchia* Ager, 1962

### *Pseudogibbirhynchia globosa* sp. n.

(Pl. X, fig. 5, Pl. XII, fig. 1, Text-fig. 3)

1962 *Pseudogibbirhynchia moorei* (Davidson) — D. V. Ager: A Monograph of the British Lias. Rhynch., p. 110, pl. 9, fig. 6 (non figs. 2—5), text-fig. 67.
1966 *Pseudogibbirhynchia* aff. *moorei* (Davidson) — M. Siblík: Ramenonožci kostelecké bradla, p. 153.

Type-specimen: The holotype figured on plate XII, fig. 1 and deposited in the collection of the Geological Survey in Prague (MS-166).

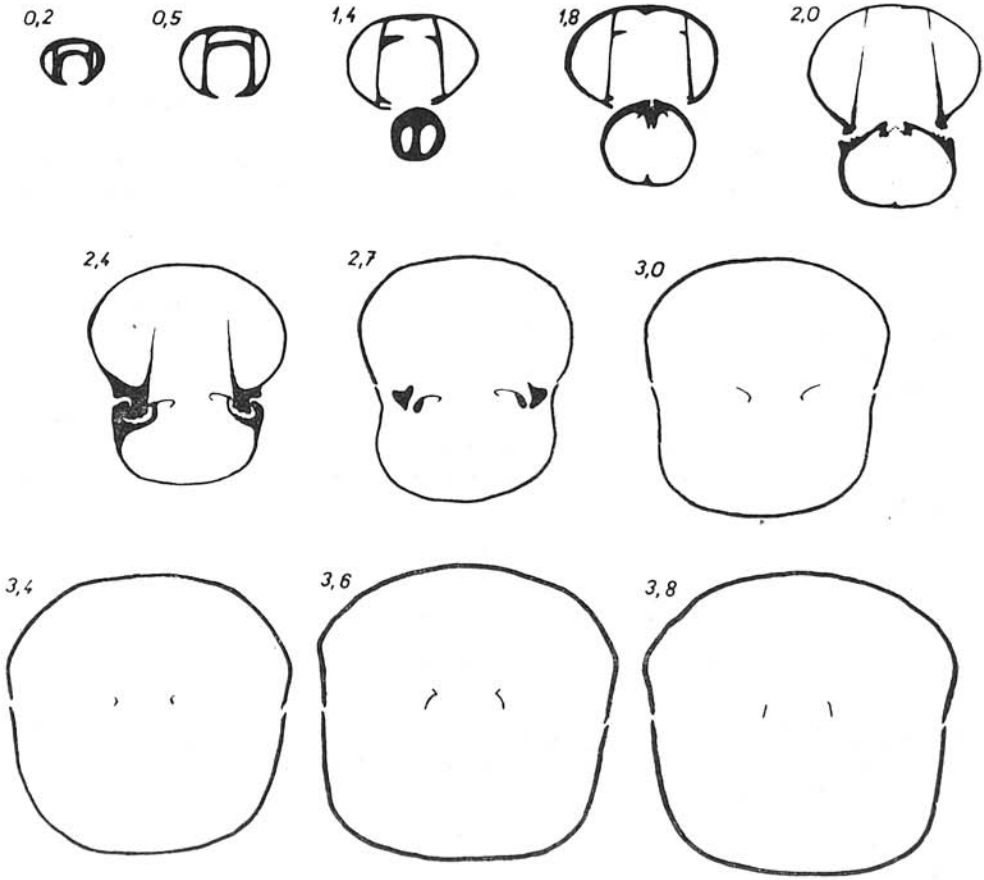
Derivatio nominis: Latin „globosus" i. e. globular, globose.

Stratum typicum et locus typicus: Domerian; the Kostelec-Klippe near the village of Považská Teplá.

Material: 12 specimens with remains of the shell. The dimensions of the best-preserved of them are as follows:

| Length: | width: | thickness: | |
|---|---|---|---|
| 15,5 | 17,9 | 14,1 | |
| 14,1 | 14,9 | 11,3 | |
| 13,7 | 18,1 | 13,3 | type-specimen; plate XII, fig. 1 |
| 13,5 | 15,9 | 12,0 | |
| 13,5 | 15,0 | 11,2 | |
| ca 8,0 | 8,5 | 5,6 | young specimen; plate X, fig. 5 |

Description: External characters: The shells are of medium size, having a subelliptic outline and relatively great thickness; some specimens are nearly globular. The brachial valve is in most cases much more convex than the pedicle. The plication is broad and high, regularly curved. The fold is very low and to be seen only near




Text-fig. 3. *Pseudogibbirhynchia globosa* sp. n. Kostelec. A series of eleven transverse sections through the posterior part of shell. The crura disappeared at 3,9 mm from the posterior end. Original length of specimen 14,9 mm. All x3,5 approx.

to the anterior margin, not rising very much from the general level of the valve. The beak is very large, low and incurved with short beak-ridges. The apical angle is close to 90° in young specimens, and reaches 110—120° in the adults. The foramen is submesothyridid and circular. There are 14—22 rather blunt costae in each valve (5—7 of them being confined to the fold); they rapidly lose their expression toward the posterior part of the valves; those parts very close to the beak are nearly smooth in several specimens.

Internal characters: The delthyrial cavity is relatively high, the lateral umbonal cavities are semicircular. The dental lamellae are short and convergent ventrally, they disappear before the hinge-teeth are fully developed. The strong pedicle collar is ventral in position. The double deltidial plates are well-developed. The hinge-teeth are straight and relatively low; denticula are developed. A very slight median ridge is sometimes present (text-fig. 3, sections 1,4—1,8).

The slender hinge-plates are horizontal in position. The large sockets are notable for the development of the outer socket-ridges, the inner socket-ridges are only slightly developed. The median septum is very short and a septalium is not formed. The crura developing at the innermost parts of the hinge-plates are of the prefalcifer type. They are at first hook-shaped in the section (section 3, 4 in the text-fig. 3), proximally they extend and straighten up.

Remarks: *Pseudogibbirhynchia globosa* sp. n., especially the young specimens. have a close resemblance to the Upper Liassic species *Pseudogibbirhynchia moorei* (Davidson, 1852). The new species differs from Davidson's species which is always dorsoventrally depressed, by its great size, nearly globular form and expressive high plication; the flatteness of the posterior part of the brachial valve is missing [its existence is according to D. V. Ager (1962, p. 110) characteristic for *Pseudogibbirhynchia moorei]*. The globular specimen, figured by D. V. Ager (1962, pl. 9, fig. 6) as *Pseudogibbirhynchia moorei*, and coming from the uppermost layers of the Domerian does not practically differ from the new species described here [the globular specimen under consideration had been previously recorded by D. V. Ager (1957) as „*Rhynchonella*" aff. *moorei*]. The Domerian species *Pseudogibbirhynchia globosa* sp. n. can probably be considered as the ancestor of *Pseudogibbirhynchia moorei* (Dav.) from the Toarcian.

Distribution: The individuals of the species *Pseudogibbirhynchia globosa* sp. n. were found in the Domerian of Kostelec near Považská Teplá. Two individuals exteriorly corresponding to the described species, but with an unknown internal structure, were found in the locality Pristodolok in the Malé Karpaty Mts.

## *Slovenirhynchia* gen. n.

Type-species: *Slovenirhynchia maninensis* sp. n.; Domerian, Slovakia.

Diagnosis: Medium to large-sized rhynchonelloids with very different convexity of valves. The pedicle valve is nearly flat, and the brachial high and remarkably convex, subcynocephalous. The anterior commissure is strongly uniplicate, but the fold is to be seen only in the anterior half of the shell. The beak is strong, erect or slightly incurved with beak-ridges of varying length. The pedicle opening is submesothyridid in position. The costae are strong and sharp, but remarkable only in the anterior parts of the valves, the valves being smooth posteriorly.

Dental lamellae are subparallel, the hinge-teeth straight and strong. The denticula are only slightly developed. The deltidial plates are either double or remarkably

thickened with trigonal profil in sections. Septalium is well-developed with the septalial plates differentiated from the narrow horizontal hinge-plates. The dorsal septum is exceptionally long. The crura are of radulifer type, triangular in cross-section, and somewhat expanded distally.

Remarks: The new genus is very closed to S. S. Buckman's genus *Rhynchonelloidea* but differs from it in the character of the deltidial plates, in having a well-developed septalium and a very long dorsal septum. The beak is lower on average in *Slovenirhynchia* gen. n. when compared with that of *Rhynchonelloidea;* it is normally erect, but sometimes slightly incurved (specimen shown in plate XI, fig. 1). The specimens with the incurved beak are externally similar to those of another closely similar genus *Homoeorhynchia* Buckman, 1914, but they may be distinguished from it by their only subcynocephalous character.

Table 2

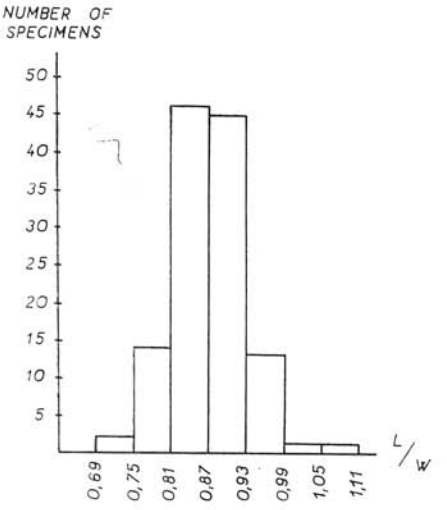
| Length in mm | Number of specimens |
|---|---|
| 9,5—11,4 | 8 |
| 11,5—13,4 | 11 |
| 13,5—15,4 | 4 |
| 15,5—17,4 | 15 |
| 17,5—19,4 | 19 |
| 19,5—21,4 | 38 |
| 21,5—23,4 | 30 |
| 23,5—25,4 | 13 |
| 25,5—27,4 | 1 |

Table 3

| Width in mm | Number of specimens |
|---|---|
| 10,5—12,4 | 5 |
| 12,5—14,4 | 10 |
| 14,5—16,4 | 3 |
| 16,5—18,4 | 10 |
| 18,5—20,4 | 10 |
| 20,5—22,4 | 20 |
| 22,5—24,4 | 29 |
| 24,5—26,4 | 26 |
| 26,5—28,4 | 16 |
| 28,5—30,4 | 5 |

Table 4

| Thickness in mm | Number of specimens |
|---|---|
| 6,0—7,9 | 3 |
| 8,0—9,9 | 10 |
| 10,0—11,9 | 13 |
| 12,0—13,9 | 12 |
| 14,0—15,9 | 18 |
| 16,0—17,9 | 28 |
| 18,0—19,9 | 33 |
| 20,0—21,9 | 16 |
| 22,0—23,9 | 4 |
| 24,0—25,9 | 1 |
| 26,0—27,9 | 2 |




Text-fig. 4. *Slovenirhynchia maninensis* sp. n. Kostelec.

Species — *Slovenirhynchia maninensis* sp. n.
*Slovenirhynchia slovenica* sp. n.
*?Rhynchonella cynica* Buckman, 1895; Upper Lias (referred to *Rhynchonelloidea* later by S. S. Buckman, 1918 and D. V. Ager, 1956)

Distribution: Domerian.

*Slovenirhynchia maninensis* sp. n.

(Pl. X, figs. 1—4, Pl. XI, figs. 1—3, Text-figs. 4—9)

1966 *Rhynchonelloidea?* sp. n. — M. Siblík: Ramenonožci kosteleckého bradla, p. 152.

Type-specimen: The holotype figured on plate XI, fig. 2 and deposited in the collection of the Geological Survey in Prague (MS-167).

Paratypes: The specimen figured on plate XI, fig. 1 is deposited in the collection of the Geological Survey in Prague (MS-168). Other figured specimens are in the possession of the Geological Institute of the Czechoslovak Academy of Sciences in Prague.

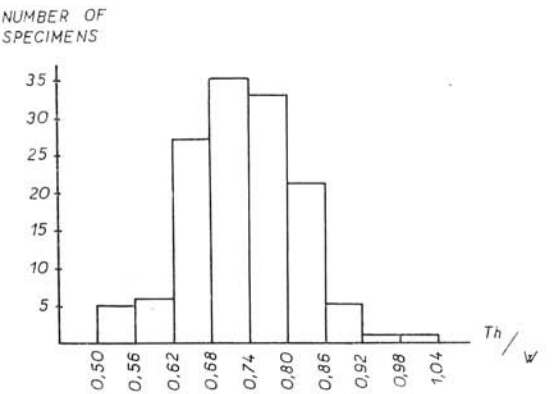
Derivatio nominis: „maninensis" — after the mountain „Manín" near the type locality of Kostelec.

Stratum typicum et locus typicus: Domerian; Kostelec-Klippe near the village of Považská Teplá.

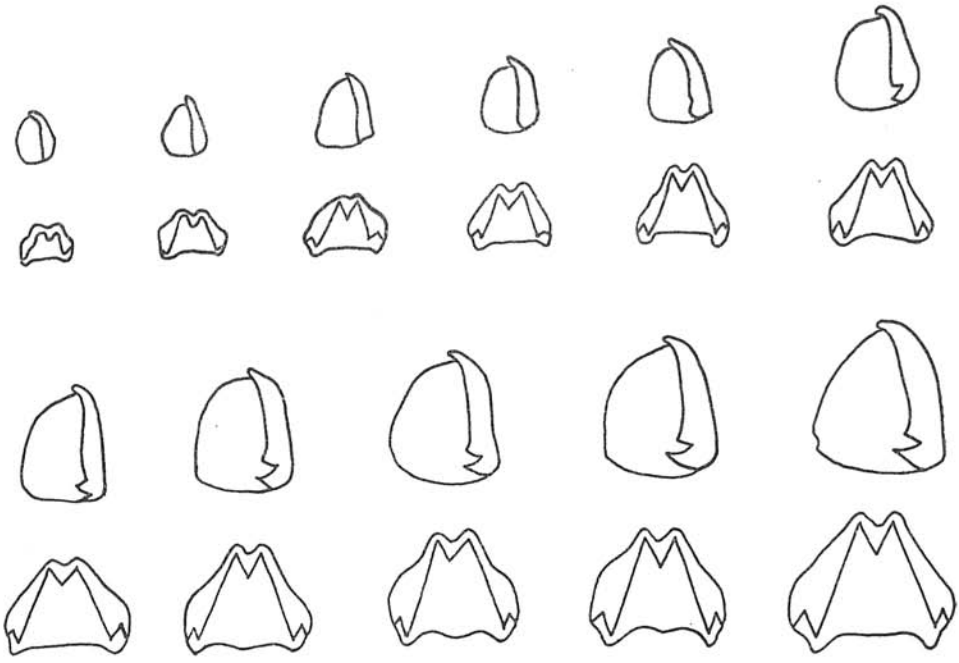
Material: 280 specimens. The figured specimens are of the following dimensions:

| Length: | width: | thickness: | |
|---|---|---|---|
| 21,3 | 26,2 | 21,3 | pl. XI. fig. 1 |
| 20,0 | 22,4 | 18,3 | type-specimen; pl. XI, fig. 2 |
| 19,1 | 21,8 | 12,9 | pl. X. fig. 3 |
| 16,5 | 22,9 | 13,2 | pl. X, fig. 4 |
| 15,8 | 18,0 | 11,0 | pl. X. fig. 1 |
| 14,8 | 17,8 | 8,4 | pl. XI, fig. 3 |

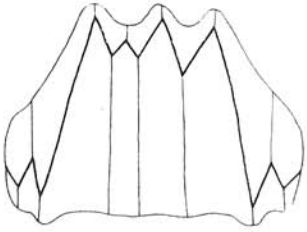
The size variability of all measurable specimens is put down in the following tables 2—4 and text-figs. 4—5.




Text-fig. 5. *Slovenirhynchia maninensis* sp. n. Kostelec.

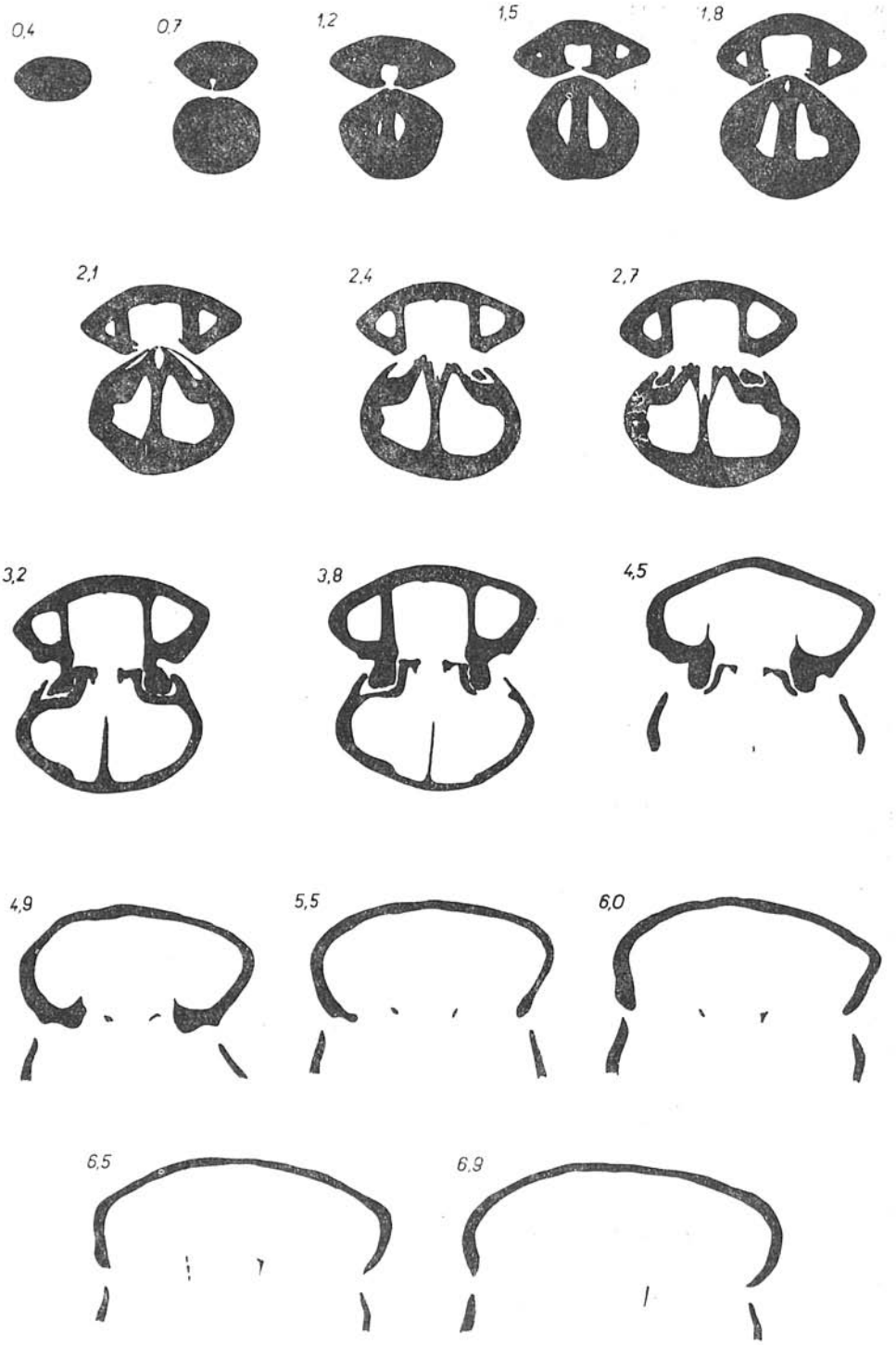


Text-fig. 6. *Slovenirhynchia maninensis* sp. n. Kostelec. Growth series of specimens. All x1 approx.



Text-fig. 7. *Slovenirhynchia maninensis* sp. n. Kostelec. Variant with additive costa in the fold. x2 approx.

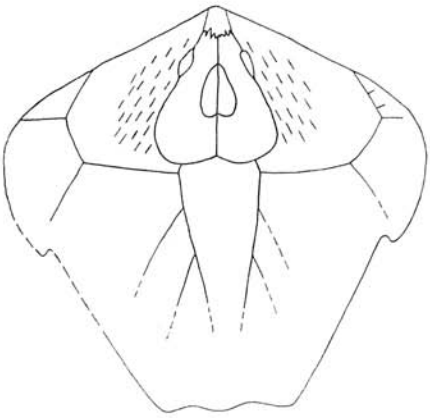
Description: External characters: The shells attain medium to large dimensions and have subpentagonal to subtrigonal outline. The greatest width is in the anterior half of the shell, the greatest thickness near the anterior margin. The pedicle valve is relatively flat, and the brachial strongly elevated und subtrigonal in lateral view, subcynocephalous. The lateral commissure is nearly straight but curves on tre anterior margin into a relatively narrow, high plication. The fold is prominent in the anterior half of the brachial valve. The posterior parts of the valves are sometimes slightly swollen (esp. the brachial). The beak is straight or slightly incurved with sharpened beak ridges of varying length. The interarea is broad and low. The foramen is small, circular and submesothyridid in position. There are 5—9 very strong and sharp costae well developed on the anterior part of each valve. Two or three of them are confined to the fold (there are 251 specimens in our material with 2 costae and 29 specimens




Text-fig. 8. *Slovenirhynchia maninensis* sp. n. Kostelec. A series of sixteen transverse sections through the posterior end of shell. One crus disappeared at 7,4 mm, the dorsal septum at 8,2 mm from the posterior end. Original length of suesimen 22,0 mm. All ×4

with 3 costae in the fold). The posterior parts of the valves are smooth. The growth-lines are sometimes visible near the margin of the valves, rarely in the posterior parts of the valves (text-fig. 6, 7).

Internal characters: The delthyrial cavity of quadrate cross-section is separated by



Text-fig. 9. *Slovenirhynchia maninensis* sp. n. Kostelec. Drawing of the pedicle valve showing the muscle-scars and pallial sinuses. x2 approx.

strong and almost parallel dental lamellae from the subtrigonal lateral umbonal cavities. These are filled by secondary shell matter in the majority of specimens. The pedicle collar is poorly developed and can only rarely be distinguished. The deltidial plates consist of double lamellae (plate X, fig. 2). The strong and straight hinge-teeth are expanded dorsally and sometimes crenulated. The squat and low denticula are developed laterally. A very slight ridge is sometimes to be seen in the median axis of the pedicle valve. The muscle-scars are of largely trigonal shape in the pedicle valve (but sometimes the general shape is relatively narrow); the oval adductor muscles are surrounded by large subtrigonal diductor muscles (text-fig. 9).

The strong development of the inner elements of the brachial valve is also characteristic. The strong and relatively narrow hinge-plates are of horizontal orientation. There are large sockets with a nearly horizontal base and strongly developed, high outer socket-ridges. No accessory sockets are present. The deep and narrow septalium is V- or narrow U-shaped. It is evident even if the sections are made with different orientations of the specimen. The septalial plates are separated distinctly from the hinge-plates. A very long dorsal septum penetrates in some specimens into the body of the septalium (text-fig. 8, sections 2,4—2,7). The muscle scars of the brachial valve appear as well-developed depressions in the section. The crura of radulifer character terminate with a dorsiventral elongation.

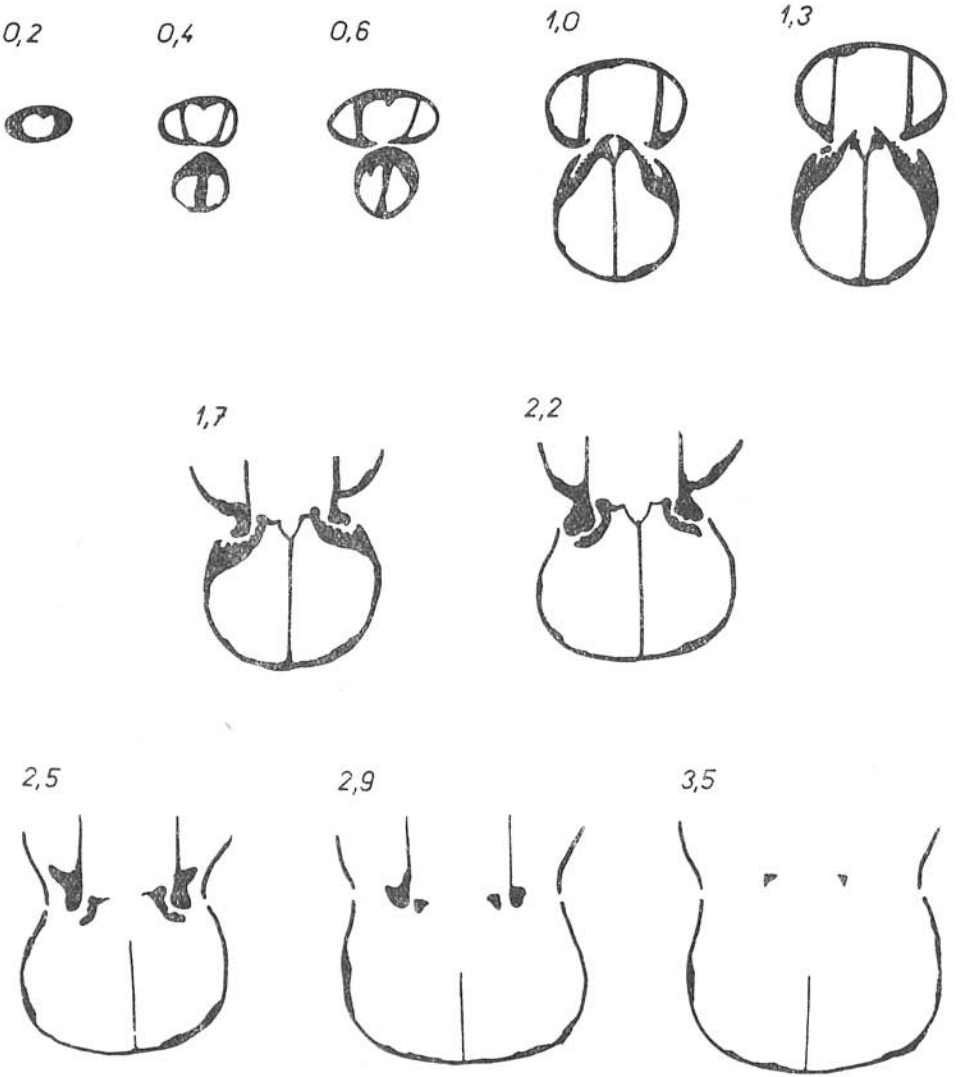
Remarks: Some specimens of the species described here are very close externally to *Homoeorhynchia meridionalis* (Eudes-Deslongchamps, 1862) which occurs in France and Spain. E.-Deslongchamps' species is, however, prominently cynocephalous and has a quite different internal structure [the sections of the specimen of this species from the locality near Toulon in France were kindly sent to me by D. V. Ager (London) and show the true *Homoeorhynchia* characters].

Distribution: *Slovenirhynchia maninensis* sp. n. was found in the Domerian of the Kostelec-Klippe near the village of Považská Teplá.

*Slovenirhynchia slovenica* sp. n.

(Pl. XII, figs. 2—4, Text-figs. 10—12)

Type-specimen: The holotype figured on plate XII, fig. 4 and deposited in the Dionýz Štúr Geological Institute in Bratislava.




Text-fig. 10. *Slovenirhynchia slovenica* sp. n. Pristodolok. A series of ten transverse sections through the posterior part of shell. The dorsal septum disappeared at 5,8 mm from the posterior end. Original length of specimen 14,5 mm. All x5 approx.

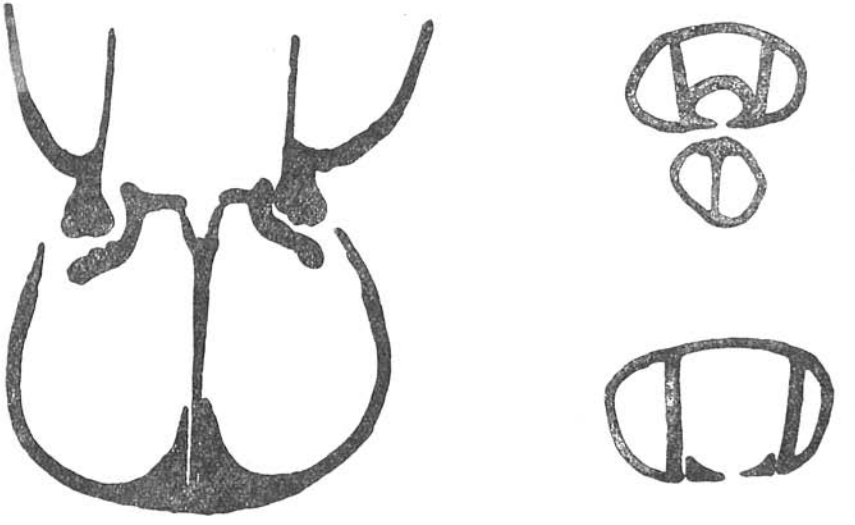
Paratypes: The specimens figured on plate XII, fig. 2—3 and deposited with the holotype.

Stratum typicum and locus typicus: Domerian; locality Pristodolok in the Malé Karpaty Mts.

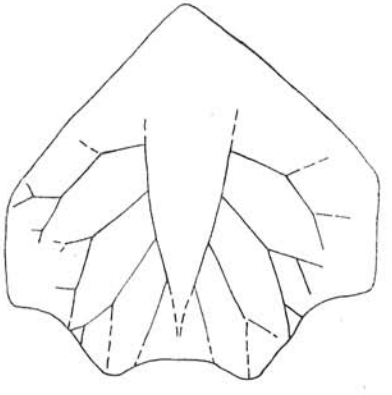
Derivatio nominis: slovenica — after the country of the locality — Slovakia.

Material: 48 specimens. The dimensions of the best:

| Length: | width: | thickness: | |
|---|---|---|---|
| 16.5 | 19.8 | ? | |
| 14.3 | 16.6 | 11,8 | pl. XII, fig. 3 |
| 14,2 | 21.5 | 12.4 | type-specimen: pl. XII, fig. 4 |



Text-fig. 11. *Slovenirhynchia slovenica* sp. n. Pristodolok. Three transverse sections showing the pedicle collar, the thick deltidial plates and the form of the dorsal septum. Magnified.



Text-fig. 12. *Slovenirhynchia slovenica* sp. n. Pristodolok. Drawing of the pedicle valve showing the pallial sinuses. x3 approx.

| | | | |
|---|---|---|---|
| 13,0 | 19.0 | 12.5 | |
| 11,0 | 15,7 | 7.4 | pl. XII, fig. 2 |
| 10,9 | 14,0 | 7,2 | |

Description: External characters: The shells are medium-sized (ca 15 mm) and are of subtrigonal or more rarely subpentagonal outline. the maximum-width being near the anterior margin in the subtrigonal shells or near the middle of the valves in the subpentagonal shells. Neither valve is very much convex, but the thickness of the brachial valve is much more remarkable than that of the pedicle. The lateral commissure is only slightly curved, the anterior commissure having a strong uniplication with rapidly convergent sides. The fold is low and developed only in the anterior half of the shell. The posterior parts of the brachial valve are sometimes swollen. Postero-lateral parts of the valves are a little concave or depressed. The beak is erect and mostly low, with blunt beak-ridges of varying length. The foramen is submesothyridid in position. There are 5—7 strong costae on each valve, either sharp or sometimes a little blunt, developed near the anterior margin, two (in five specimens three) of them being confined to the fold. The posterior parts of the valves are smooth. Young specimens have only a low plication in addition to blunt costae.

Internal characters: The delthyrial cavity is relatively narrow, the lateral umbonal cavities are semicircular. The long dental lamellae are parallel except for the part close to the beak. The hinge-teeth are straight, denticula are not developed. The deltidial plates are remarkably thickened and trigonal in sections; their doubling was not ascertained. The pedicle collar is sometimes visible (text-fig. 11). A small ridge in the posterior part of the pedicle valve is shown in the text-fig. 10, sections 0,2—0,6.

The horizontal hinge-plates are narrow and well-limited from the septalial plates as well as from the inner socket-ridges. The inner socket-ridges are more strongly developed than the outer ones. The crura are of the radulifer type and are trigonal in section.

Remarks: *Slovenirhynchia slovenica* sp. n. differs from *Slovenirhynchia maninensis* sp. n. in having smaller dimensions, lower plication and less expressive costae. The maximum-thickness is farther to the middle of the shell in the majority of the specimens of *Slovenirhynchia slovenica* sp. n. The difference in the inner structure consists in the character of the deltidial plates.

Distribution: *Slovenirhynchia slovenica* sp. n. was collected in the Domerian of the locality Pristodolok in the Malé Karpaty Mts.

## REFERENCES

Ager D. V., 1954: The genus Gibbirhynchia in the British Domerian. Proc. geol. Ass. 65, London. — Ager D. V., 1956, 1958, 1962: A Monograph of the British Liassic Rhynchonellidae. Palaeontogr. Soc. 1, 2, 3, London. — Ager D. V., 1957: The geographical distribution of Brachiopods in the British Middle Lias. Quart. J. geol. Soc. 112, London. — Ager D. V., 1959: Lower Jurassic Brachiopods from Turkey. J. Paleont. 33, 6, Menasha. — Ager D. V., 1960: Brachiopod distribution in the European Mesozoic. Rep. intern. geol. Congress 22, Copenhagen. — Andrian F. von, Paul K. M., 1864: Die geologischen Verhältnisse der Kleinen Karpathen und der angrenzenden Landgebiete im N. W. Ungarn. Jahrb. k. k. geol. Reichsanst. 14, Wien. — Andrusov D., 1931: Étude géologique de la zone des Klippes internes des Carpathes occidentales. Rozpravy St. geol. úst. 6, Praha. — Böse E., 1897: Die mittelliasische Brachiopodenfauna der östlichen Nordalpen. Palaeontographica 44, Stuttgart. — Böse E., Schlosser M., 1900: Ueber die mittelliasische Brachiopodenfauna von Südtyrol. Palaeontographica 46, Stuttgart. — Buckman S. S., 1914: Genera of some jurassic Brachiopoda. London. — Buckman S. S., 1918: The Brachiopoda of the Namyau Beds, Northern Shan States, Burma. Palaeont. indica (N. S.) 3, 3, Calcutta. — Buch L. von, 1835: Ueber Terebrateln. Abh. königl. Akad. Wiss., Berlin. — Buch L. von, 1838:

Essai d'une Classification et d'une Description des Térébratules. Mém. Soc. géol. Fr. (1), 3, Paris. — Canavari M., 1883: Contribuzione III alla conoscenza dei Brachiopodi degli strati a Terebratula aspasia Mgh. nell'Appennino centrale. Atti Soc. tosc. Sc. natur. Mém. 6, Pisa. — Davidson Th., 1851—1852: A Monograph of the British fossil Brachiopods. 3. The Oolitic and Liassic Brachiopoda. London. — Davidson Th., 1876—1878: A Monograph of the British fossil Brachiopoda. 4. Supplement to the British Jurassic and Triassic Brachiopoda, London.

Di-Stefano G., 1891: Il Lias medio del M. San Giuliano (Erice) presso Trapani. Atti Accad. Gioen. Sc. nat. 4, 3, Catania. — Dumortier E., 1864—1874: Études paléontologiques sur les dépôts jurassiques du basin du Rhone 3, 4. Paris. — Gemmellaro G. G., 1874: Sopra i fossili della zona con Terebratula aspasia Menegh. della provincia di Palermo e di Trapani. Giorn. Soc. scienz. nat. econ. Palermo 10, Palermo. — Geyer G., 1889: Über die liasische Brachiopoden des Hierlatz bei Hallstatt. Abh. geol. Reichsanst. 15, Wien. — Gregorio A. de, 1930: Monografia dei fossili liassici di Monte San Giuliana. Ann. Géol. Paléont. 53, Palermo. — Haas H., 1884: Beiträge zur Kenntniss der liasischen Brachiopodenfauna von Südtyrol und Venetien. Kiel. — Haas H., Petri C., 1882: Die Brachiopoden der Juraformation von Elsass-Lothringen. Abh. geol. Spezialk. Els.-Lothr. 2, 2, Strassburg. — Lanquine A., 1929: Le Lias et le Jurassique des châines Provençales. 1. Le Lias et le Jurassique inférieur. Bull. Carte géol. Fr. 32, 173, Paris et Liége. — Maheľ M., 1957: Geológia Stratenskej hornatiny. Geol. práce 48a, Bratislava. — Oppel A., 1853: Der mittlere Lias Schwabens. Stuttgart. — Oppel A., 1861: Ueber die Brachiopoden des unteren Lias. Z. deutsch. geol. Ges. 13, Berlin. — Parona C. F., 1880: Il calcare liasico di Gozzano e i suoi fossili. Atti r. Accad. Lincei (Mém. 3), 8, Pisa. — Parona C. F., 1885: I Brachiopodi liassici di Saltrio e Arzo nelle Prealpi lombarde. Mem. r. Inst. lomb. Sc. Lett. (3), 15, Milano. — Parona C. F., 1893: Revisione della fauna liasica di Gozzano in Piemonte. Mem. r. Accad. Sc. Torino (2), 43, Torino. — Pevný J., 1964: Brachiopódy severnej časti Malých Karpát. Geol. práce, Zprávy 33, Bratislava. — Quenstedt F. A., 1852: Handbuch der Petrefaktenkunde. Tübingen. — Quenstedt F. A., 1868—1871: Petrefactenkunde Deutschlands. Abt. 1, Bd. 2. Die Brachiopoden. Leipzig.

Radovanović S., 1889: Beiträge zur Geologie und Palaeontologie Ost-Serbiens. 1. Die Liasablagerungen von Rgotina. Ann. géol. Pénins. balk. 1, Beograd. — Răileanu Gr., Iordan M., 1964: Studiul brachiopodelor liasice din zona Sviniţa. Stud. cercet. Geogr. Geof., Geol. 1, 9, Bucuresti. — Rakús M., 1965: Biostratigrafia jury kosteleckého bradla. Geol. práce, Zprávy 37, Bratislava. — Rau K., 1905: Die Brachiopoden des mittleren Lias Schwabens. Geol.-paleont. Abh. 10 (N. F. 6), 5, Jena. — Rollier L., 1917: Synopsis des Spirobranches (Brachiopodes) purassiques celto-soundes. 2. Rhynchonellidés. Mém. Soc. paléont. Suisse 42, Genève. — Rothpletz A., 1886: Geologisch-palaeontologische Monographie der Vilser Alpen. Palaeontographica 33, Stuttgart. — Siblík M., 1964: K nálezu liasových brachiopodů v horní části Belanské doliny. Geol. práce, Zprávy 31, Bratislava. — Siblík M., 1965: Some New Liassic Brachiopods. Geol. sborn. Slov. akad. vied 16, 1, Bratislava. — Siblík M., 1966: Ramenonožci kosteleckého bradla. Geol. práce, Zprávy 38, Bratislava. — Sowerby J., Sowerby J. de C., 1812—1845: The Mineral Conchology of Great Britain. 1—7, London. — Stache G., 1865: Bericht über die geologischen Aufnahmen im Gebiete des oberen Neutra-Flusses und der königlichen Bergstadt Kremnitz im Sommer 1864. Jahrb. geol. Reichsanst. 15, Wien. — Tate R., Blake J. F., 1876: The Yorkshire Lias. London. — Trauth Fr., 1909: Die Grestener Schichten der österreichischen Voralpen und ihre Fauna. Beitr. Paläont. Geol. Österr.-Ung. 22, Wien, Leipzig. — Vetters H., 1910: Beiträge zur Geologie des Zjargebirges und des angrenzenden Teiles der Malá Magura in Ober-Ungarn. Denkschr. Akad. Wiss. 85, Wien. — Young G., Bird J., 1828: A geological Survey of the Yorkshire Coast. 2 edit., Whitby. — Zieten C. H., 1830—1833: Les pétrifications de Wurtemberg. Stuttgart. — Zittel K. A., 1869: Geologische Beobachtungen aus den Central-Apenninen. Beneckes geogn. papäont. Beith. 2, München.

Review by V. Havlíček.

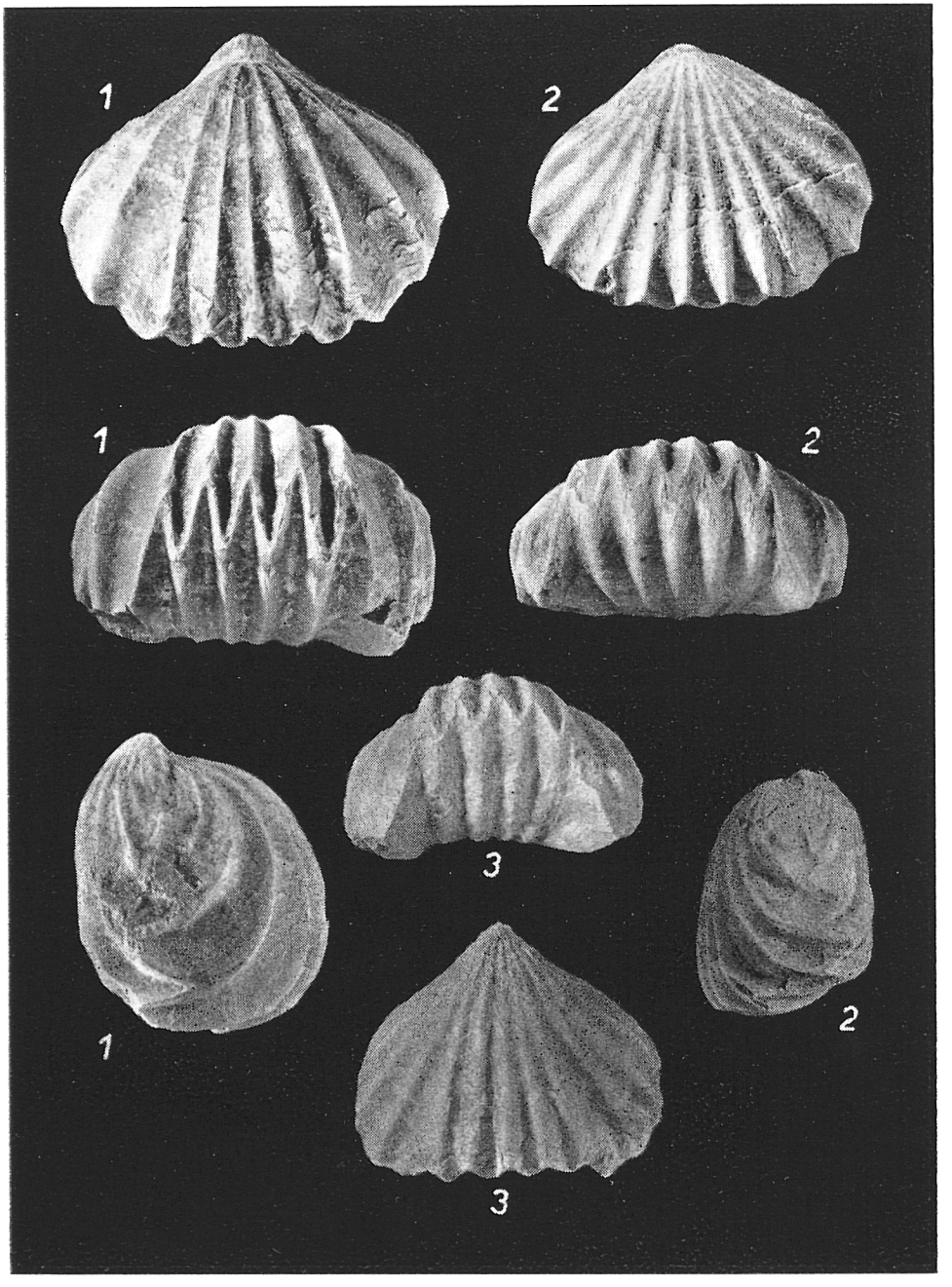



Fig. 1. *Cirpa slovenica* sp. n. Holotype. Kostelec near the village of Považská Teplá. ÚÚG-MS 164, x2,1. — Fig. 2. *Cirpa slovenica* sp. n. Same locality. ÚÚG-MS 165, x2. — Fig. 3. *Cirpa slovenica* sp. n. Same locality, x1,5.

ÚÚG-collections of the Ústřední ústav geologický (Geological Survey), Prague. GÚDŠ-collections of the Geologický ústav D. Štúra, Bratislava.

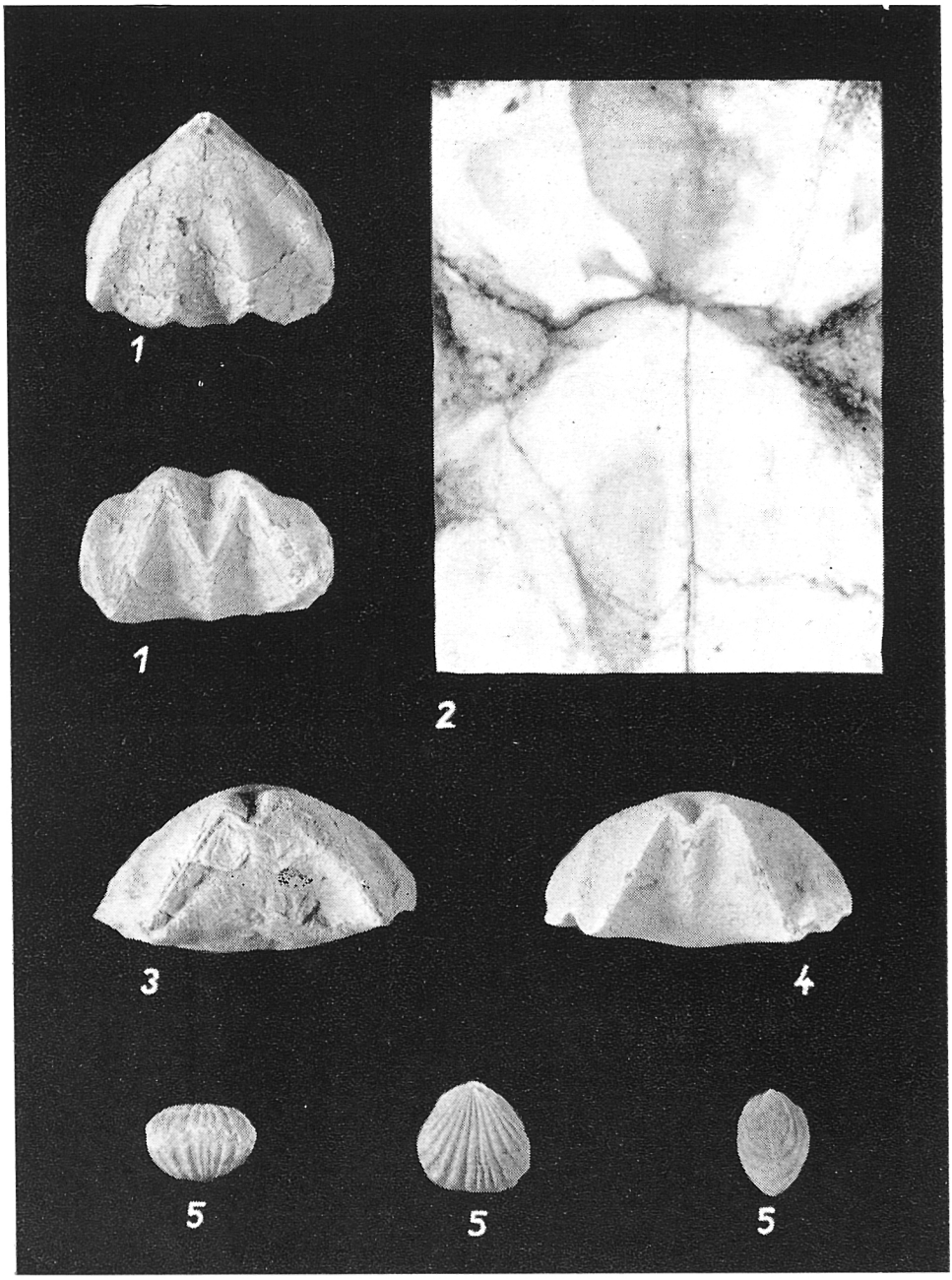



Fig. 1. *Slovenirhynchia maninensis* sp. n. Kostelec. x1.8. — Fig. 2. *Slovenirhynchia maninensis* sp. n. Same locality. Transverse section showing the form of the double deltidial plates. x15. — Fig. 3. *Slovenirhynchia maninensis* sp. n. Same locality. x2. — Fig. 4. *Slovenirhynchia maninensis* sp. n. Same locality. x1.8. — Fig. 5. *Pseudogibbirhynchia globosa* sp. n. Same locality. Young specimen, x2.

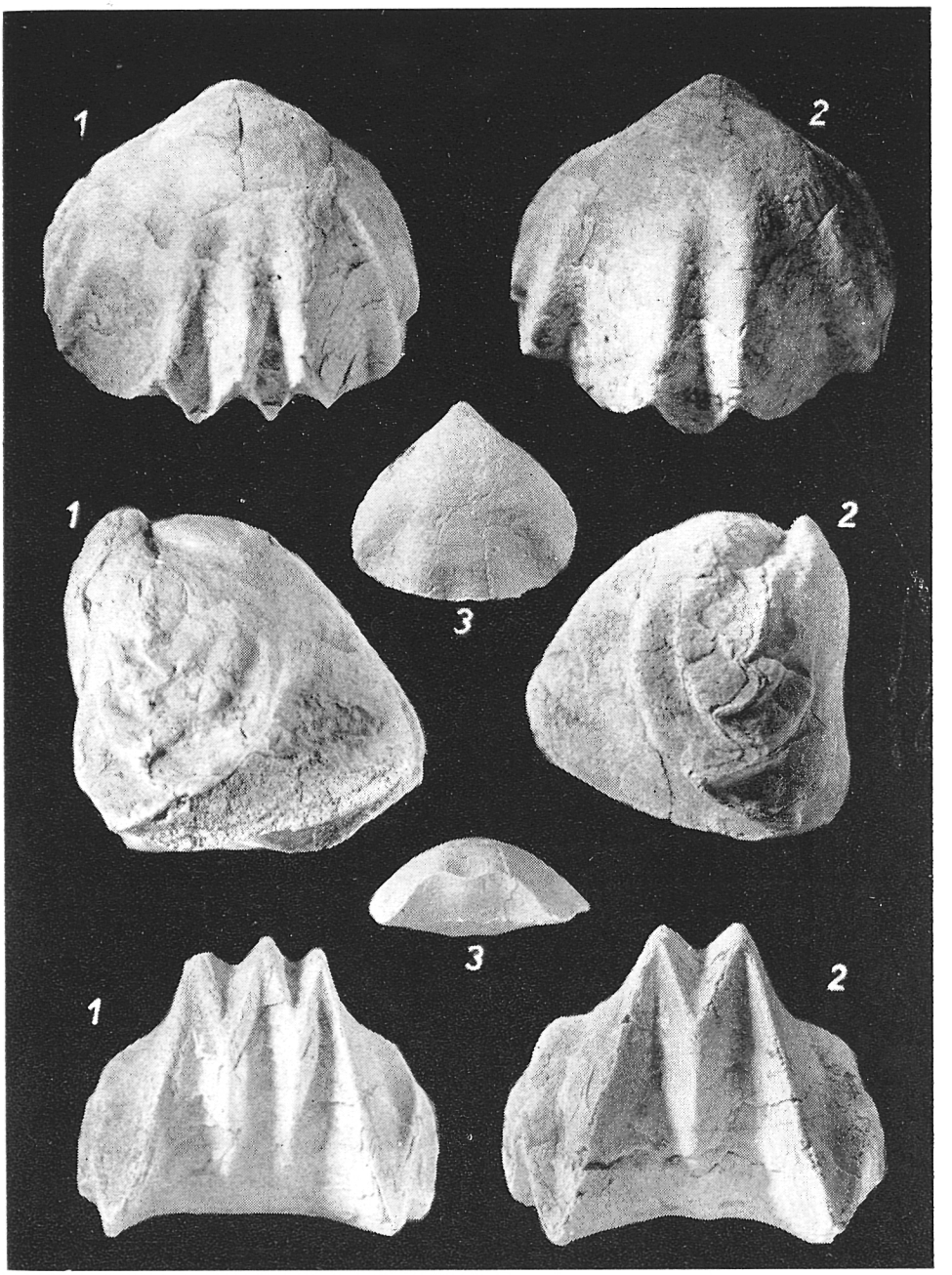



Fig. 1. *Slovenirhynchia maninesis* sp. n. Kostelec. ÚÚG-MS 168; variant with tricostate fold. x1,9. — Fig. 2. *Slovenirhynchia maninensis* sp. n. Holotype, same locality. ÚÚG-MS 167, x2,2. — Fig. 3. *Slovenirhynchia maninensis* sp. n. Same locality. Young specimen, x1,7.

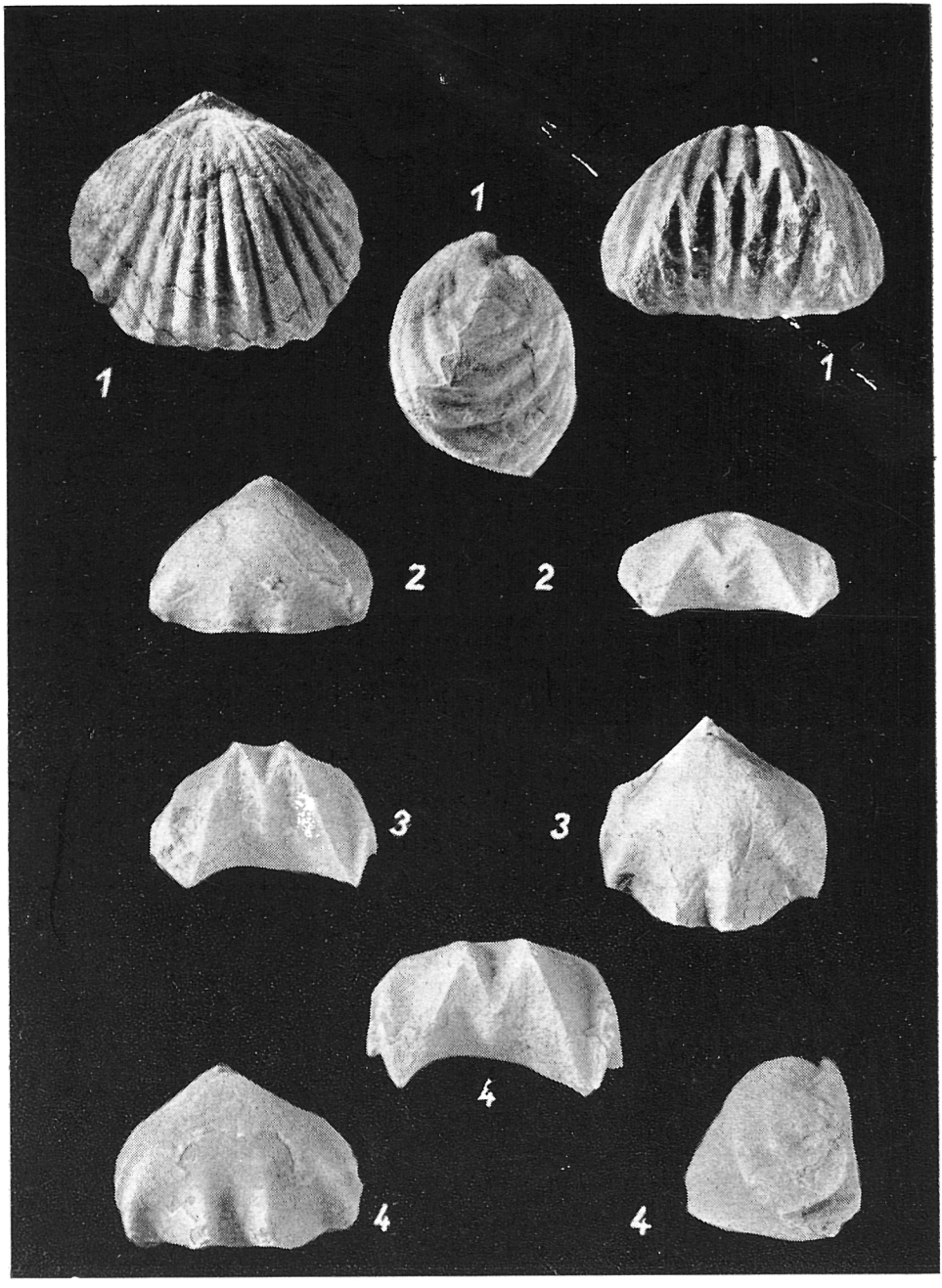



Fig. 1. *Pseudogibbirhynchia globosa* sp. n. Holotype, Kostelec. UUG-MS 166, x2. — Fig. 2. *Slovenirhynchia slovenica* sp. n. Pristodolok in the Malé Karpaty Mts. GÚDŠ, x2. — Fig. 3. *Slovenirhynchia slovenica* sp. n. Same locality. GÚDŠ, x1,8. — Fig. 4. *Slovenirhynchia slovenica* sp. n. Holotype, same locality. GÚDŠ, x1,5.