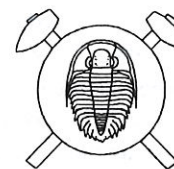


***Rafanoglossella* n. gen. and *Plectoglossa* Cooper (Glossellinae, Brachiopoda) in the Upper Ordovician of the Prague Basin**

***Rafanoglossella* n. gen. a *Plectoglossa* Cooper (Glossellinae, Brachiopoda) ve svrchním ordoviku pražské pánve (Czech Summary)**



(3 text-figs, 2 plates)

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The medium to large glossellinid brachiopods of the Upper Ordovician age have been assigned to two similar genera, namely to *Rafanoglossella* n. gen. and *Plectoglossa* Cooper, which differ from one another in the presence or absence of ventral pseudointerarea, and in the presence or absence of prominent circular pits on the inner surface of both valves. Other rather small glossellinid brachiopods have not been revised owing to insufficient material (e.g. „*Lingula*“ *incongruens* Barrande, „*L.*“ *ovum* Barrande).

Key words: Upper Ordovician, Prague Basin, Brachiopoda, Lingulata

Introduction

This paper deals with medium to large lingulate brachiopods from the Berounian and Kralodvorian Stages (Upper Ordovician). The specimens gathered by the present author, indicated by letters VH preceding the catalogue number, are deposited in the Museum at Rokycany, whereas the specimens from the Barrande's collection, indicated by the letter L, are deposited in the National Museum in Prague. The photos were made by R. Horný and V. Vokáč. Abbreviations used: L – length; W – width; bv – brachial valve; pv – pedicle valve.

Obolidae King, 1848

Glossellinae Cooper, 1956

***Rafanoglossella* n. gen.**

Type species: *Lingula leiskowiensis* Barrande, 1879.

Diagnosis: Shell of lingulid appearance, lenticular in longitudinal and transverse profiles, of variable size, with nearly straight to gently convex sides. Ventral beak orthocline, pseudointerarea absent; internal area (term used by Havlíček 1982, p. 13) not elevated above the inner valve surface; for this reason, its anterior margin is obscure. Pedicle groove shallow, gently narrowing posteriorly. Dorsal beak marginal, more convex than the ventral one. Dorsal pseudointerarea absent.

Ornamentation consists of fine concentric rugellae often underlain by swollen concentric bands, and even finer radiating capillae. Pedicle valve interior distinguished by a pair of weak to well-developed submedian, anteriorly gently diverging ridges. Interior of brachial valve bears a strong median ridge angular in cross-section, often with a fine groove on its crest. The dorsal ridge is strongest at its steeply sloping anterior face. Straight to gently arcuate vascula lateralia established only in *R. siliqua*. Elongate-oval central muscle scars have been observed also in *R. siliqua* at each side of the anterior end of the dorsal median ridge (Havlíček 1994).

Shell substance lamellar, dark grey, chitino-phosphatic; if partly exfoliated, the lamellae bear fine radial striation. **Comparison:** *Rafanoglossella* is the most probable descendant of the Arenigian–Dobrotivian genus *Rafanoglossa* Havlíček as indicated by the presence of a strong median ridge in their brachial valves. Whereas *Rafanoglossa* has a well-developed, moderately elevated ventral pseudointerarea anteriorly bounded with prominent transverse edges (Havlíček 1982, pl. IX, figs. 9, 11), the Berounian to Kosovian genus *Rafanoglossella* has lost totally the ventral pseudointerarea, which was substituted by an internal area neither raised above the valve floor nor being separated from the inner valve surface by a transverse edge.

The ventral internal area of *Rafanoglossella* is similar to that of the Upper Ordovician genus *Anx* Havlíček, which differs from the former genus in a total absence of the median ridge in the brachial valve.

Interesting is the mode of life of *Rafanoglossa* and *Rafanoglossella*. According to Havlíček, Vaněk and Fatka (1993), the type species of *Rafanoglossa* (i.e. *Lingula impar* Barrande) was most probably attached to the fixed of floating algae of the genus *Krejciella* as it is shown by the presence of numerous specimens arranged in long rows and occurring in the same layer that has yielded the algal thalli (see Havlíček, Vaněk and Fatka 1993, pl. II, fig. 1). On the other hand, *Rafanoglossella* was an infaunal element; the specimens with conjoined valves have often been found in their original life position in burrows vertical to the bedding planes of clayey shales (e.g. *R. generosa*, *R. leiskowiensis*).

Another glossellinid brachiopod of medium to large size in the Upper Ordovician of the Prague Basin is *Plectoglossa* Cooper; the later genus, however, differs from *Rafanoglossella* in having well-developed orthocline ventral pseudointerarea, pedicle groove halved longitudinally by a low ridge, and in possessing chaotically dispersed circular pits on the inner surface of both valves. Further, the ornamentation of *Plectoglossa* differs from that

of *Rafanoglossella* in consisting of rather strong, erect rugellae separated by much wider concentric interspaces, whereas the ornamentation of *Rafanoglossella* is formed as densely crowded very fine rugellae of about the same size as the interspaces between them.

Species assigned to *Rafanoglossella* in the Prague Basin: *Lingula leiskowiensis* Barrande, 1879; Králův Dvůr Formation;

Rafanoglossa siliqua Havlíček, 1994; Kosov Formation; *Rafanoglossella generosa* n. sp.; Bohdalec Formation.

Species questionably assigned:

Lingula deleta Barrande, 1879; Letná Formation.

***Rafanoglossella generosa* n. sp.**

Pl I, figs. 9, 10, Pl. II, figs. 7–11; text-fig. 1

Holotype: Pedicle valve, pl. I, fig. 9; VH 13081.

Type horizon and locality: Bohdalec Formation, Polyteichus facies; Praha–Michle, between Slatiny and the power station.

Exterior and interior: Shell of lingulid appearance, strongly elongate with a low brachial cavity, ranging in length from 11.0 mm to 41.0 mm in specimens available. Maximum width of shell at or anterior to its mid-length; sides gently curved, anterior margin slightly arcuate in anterior direction. Postero–lateral sides rather long, moderately curved, enclosing 89–94° in pedicle valves, and 92–113° in brachial valves.

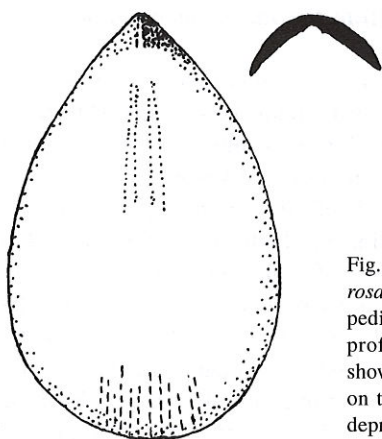


Fig. 1. *Rafanoglossella generosa* n. sp. Internal mould of pedicle valve and transverse profile of the ventral beak showing the pedicle groove on the bottom of an angular depression.

Ventral beak orthocline, pseudointerarea absent; in transverse profile, ventral beak rather strongly convex; consequently, the umbonal cavity deep, angular, never underlain by a shelf elevated above the inner valve surface, medianly bearing a narrow, anteriorly slightly expanding shallow pedicle groove occupying about 1/10 of the pedicle–valve length. Dorsal beak marginal, no pseudointerarea present. The youngest pedicle valve (11.9 mm long) is 138 % as long as its maximum width, the largest valve (41.0 mm long) is 178 % as long as wide.

Brachial valve slightly shorter than the pedicle valve, usually 140–150 % as long as its maximum width; an exceptional valve (due to deformation?) is 189 % as long as wide.

Ornamentation formed as fine rugellae not fully regularly disposed, sometimes bifurcating or two rugellae may fuse into one, always separated by narrow and deep grooves counting 20 or more per 1 mm, crossed by even finer radiating capillae (pl. II, fig. 11). In several specimens, the rugellae rest on low, concentric, gently swollen bands. If partly decorticated, fine radial striation appears.

Inner surface of pedicle valve bears a pair of submedian ridges gently diverging anteriorly, occupying about a third of the valve length. Each ridge of the submedian pair is longitudinally halved by a faint groove.

Brachial valve interior is distinguished by a median angular ridge originating near the beak and usually extending beyond the mid-length of the valve. Maximum size of the mid-ridge is located at its anterior end; its abrupt anterior face bears a shallow pit. No muscle scars and main pallial markings have been found neither in the pedicle nor in the brachial valve. Shell lamellar, chitino–phosphatic.

Comparison: The Upper Berounian *R. generosa* slightly differs from its descendant *R. leiskowiensis* (Barrande) (Kralodvorian) in being slightly larger and having moderately curved lateral margins of its shell. In contrast to the new species, the sides of *R. leiskowiensis* are nearly straight and usually slightly diverge anteriorly. These differences, however, are not reliable enough to warrant separation of the two species. The main distinguishing character concerns the umbonal region of the pedicle valve, which in *R. generosa* is internally deep, V-shaped, whereas the umbonal part of *R. leiskowiensis* is gently concave and never angular. This difference between the two species seems to be so constant to warrant erection of two separate species.

By its gently convex sides, the shell of *R. generosa* resembles that of *R. siliqua* Havlíček (Kosov Formation), but the latter differs from the new species in having much shorter brachial valve which is 102 % (in the holotype) to 120 % as long as its maximum width, and in having an acute ventral apical angle (about 72°; Havlíček 1994). Occurrence: Bohdalec Formation, mainly Polyteichus facies, Prague territory. Localities: Butovice, south of the subway station Nové Butovice (greywacke); Michle, railway cutting east of the power station (greywacke with carbonate cement); Bohdalec, northern foot (greywackes and calcareous shales with phosphatic nodules); Krč, V Podzámčí Street (greywacke with carbonate cement); Hloubětín, former brickyard „Pod bažantnicí“ (sandy carbonate with pyrite, fragments of shale and phosphatic nodules); Libeň, railway cutting south of Invalidovna (sandy carbonate with phosphatic nodules, fragments of dark shale, and chaotically disposed fossils); Vršovská hora, railway cutting (lense of a dark carbonate with pyrite, phosphatic nodules, and chaotically disposed brachiopods).

Same formation, *Svobodaina* Community. Michle, Vyškočilova Street near Brumlovka building (calcerous shale); Michle, railway cutting north of the former farm Dolní Roztyly (dark shale with rare phosphatic nodules); Záběhlce, sewerage tunnel below the highway bridge (dark grey shale with numerous *Svobodaina ellipsoides*).

***Rafanoglossella leiskowiensis* (Barrande, 1879)**

Pl. I, figs. 1–8; text-fig. 2

1879 *Lingula Leiskowiensis* Barr.; Barrande, pl. 103, case I, figs. 1–8, case II, figs. 1–5, 7, 9.

Lectotype (SD herein): Shell with both valves, disarticulated, figured by Barrande 1879, pl. 103, case I, figs. 7, 8.; L 25420.

Type horizon and locality: Králův Dvůr Formation, Lejškov near Chodouň.

Exterior and interior: Externally similar to its precursor *R. generosa* but somewhat smaller (the largest valve is 15.4 mm long), having straight to nearly straight lateral margins subparallel to gently diverging anteriorly; maximum width of shell is usually anterior to its mid-length. Dimensions of pedicle valves: pvL: 5.2–14.3 mm; pvL/W: 118–156 %; ventral apical angle: about 97°. Dimensions of brachial valves: bvL: 4.0–15.4 mm; bwL/W: 118–160 %; dorsal apical angle: 122–132° (posterior margin usually evenly curved).

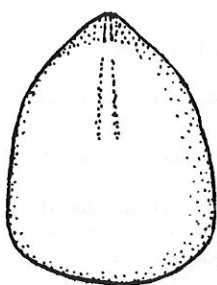


Fig. 2. *Rafanoglossella leiskowiensis* (Barrande). Internal mould of pedicle valve and transverse profile of the ventral beak showing a shallow groove on the bottom of a gently concave depression.

Concentric rugellae counting more than 20 per 1 mm as in *R. generosa*, but usually underlain by strong, rounded, concentric rugae. Radial capillae, if preserved, are clearly stronger than those of *R. generosa* (see pl. I, fig. 1).

Ventral internal area not elevated above the floor of the valve, gently concave in cross-section, never angular. Pedicle groove very shallow with flattened bottom. Submedian ridges in pedicle valve weak, gently divergent.

Dorsal beak marginal; median ridge not extending beyond the mid-length of the brachial valve, in specimens from Lejškov slightly more than 30 % of the brachial valve length.

Occurrence: Králův Dvůr Formation, Lejškov near Chodouň, Králův Dvůr, and Tobolka (boring); further Prague territory: sewerage tunnel between the Botič Brook and Vltava River, about 20 m below the surface at Pankrác.

***Rafanoglossella? deleta* (Barrande, 1879)**

Pl. I, figs. 11–13; text-fig. 3

1879 *Lingula deleta* Barr.; Barrande, pl. 102, case II.

Holotype (by monotypy): Brachial valve figured by Barrande in 1879 (poor illustration); L 16290.

Type horizon and locality: Letná Formation (sandstone); Drabov near Beroun.

Remarks: In addition to the holotype, there are only 7 valves available coming from the topmost part of the Letná Formation, all more or less exfoliated to show the lamellar structure of the shell but no surficial ornamentation. Shape and size of *R. deleta* are similar to those of the upper Berounian *R. generosa*, but umbonal regions are ill-preserved.

The pedicle valve VH-13426 has a gently thickened internal area medianly with a shallow pedicle groove. Pedicle-valve interior is distinguished by a very low, axially grooved median ridge that bifurcates about a third of the valve length. Dorsal beak marginal, dorsal median ridge seen only in a young, partly exfoliated specimen VH-13451.

Shell substance chitinophosphatic, lamellar, radially striated, usually lacking shallow pits except for specimens VH-3098 and VH-13426 which bear dark spots scarcely disposed on few lamellae and producing on them small, circular pits. Owing to paucity of lingulids in the Letná Formation, this species is assigned preliminary to *Rafanoglossella*. It differs from the later *R. generosa* (Bohdalec Formation) in having shallow pits at least in some chitinophosphatic lamellae and in the nature of the vent-

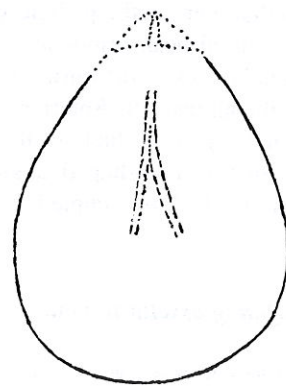


Fig. 3. *Rafanoglossella deleta* (Barrande). Internal mould of pedicle valve (based on specimens of the uppermost Letná Formation).

ral submedian ridges which unite into one stem in the posterior third of the valve in *R. ? deleta*.

Occurrence: Letná Formation, medium part, monomictic sandstone, Drabov near Beroun (only the holotype collected in the past century). The same formation, uppermost part, greywacke with dominant *Bicuspina multicostellata* and *Aegiromena praecursor*, Chrastice, foot of the Blýskava (near the former iron ore mine).

***Plectoglossa* Cooper, 1956**

Type species: *Plectoglossa oklahomensis* Cooper, 1956.

***Plectoglossa davidsoni* (Barrande, 1879)**

Pl. II, figs. 1–6

1879 *Lingula Davidsoni* Barr.; Barrande, pl. 104, case VIII, figs. 1–4.

Lectotype (SD herein): Pedicle valve figured by Barrande in 1879, pl. 104, case VIII, fig. 2; L 25971.

Type horizon and locality: Zahořany Formation, Loděnice.

Exterior and interior: Shell lenticular in longitudinal profile, lingulid in appearance, with a low brachial cavity; widest anterior to its mid-length, rarely up to in three quarters of its length from the beak. Size variable; length ranges from 15 to 18 mm in specimens from the Zahořany Formation, whereas the specimens from the overlying Bohdalec Formation seem to be smaller (5.5–10.0 mm long in shells available). Postero-lateral sides of pedicle valve nearly straight enclosing a slightly greater angle than 90°. Lateral and anterior margins of both valves rounded. Brachial valve somewhat shorter than the pedicle one, but much more convex unbonally. Dorsal beak marginal, no pseudointerarea present.

Ornamentation rarely well-preserved (e.g. in specimen VH-13095).

Concentric rugellae narrow, high, separated by flat to gently concave, moderately broader interspaces, in contrast to *P. oklahomensis* Cooper devoid of fine concentric fila. The rugellae are usually regular, less commonly some of them bifurcate, counting 4–6 per 1 mm in the median part of the pedicle valve.

Ventral beak orthocline, but its tip is so thin that it is usually broken off during redeposition or during the life of the animal (?). Anterior to the tip of the beak, the umbonal region is thick-walled with massive propareas separated by a V-shaped, angular, deep depression, the bottom of which is occupied by a deep, posteriorly narrowing

pedicle groove. If the inner surface of the beak is excellently preserved (e.g. in the valve figured by Barrande, 1879, case VIII, fig. 4; unfortunately, not available for photographing), the pedicle groove bears a low, longitudinal ridge that resembles a similar feature in *P. oklahomensis* (see Cooper 1956, pl. 6, fig. 13). The propareas are clearly elevated above the pedicle-valve inner surface, and clearly striated parallel to their anterior margins. On the other hand, some pedicle valves are devoid of the axial ridge in their pedicle grooves, the striations and the angular edges bounding anteriorly the propareas are more or less obscure (e.g. pl. II, fig. 1.). Shell substance chitino-phosphatic, lamellar, grey-blue in color with dark circular spots which form large, irregularly disposed pits on the inner surface in the posterior parts of both valves, or they are rather small and tend to form discontinuous concentric rows in anterior parts of both the valves. Function of these dark spots and corresponding shallow pits is not clear. Muscle fields and pallial markings not observed.

Occurrence: Zahořany Formation; Loděnice; Vráž (only old material);

Prague territory: Libeň–Palmovka (fairly common); Vysočany, “U vysočanského pivovaru” Street; Karlín, subway tunnel between Florenc and the Vltava River.

Bohdalec Formation, Polyteichus facies, Prague territory: Michle, railway cutting east of the “V Zápolf” Street (rare); and Krč, “V podzámčí” Street (rare).

Submitted February 4, 1997

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***Rafanoglossella* n. gen. a *Plectoglossa* Cooper (Glossellinae, Brachiopoda) ve svrchním ordoviku pražské pánve**

Středně velcí až velcí glossellinidní brachiopodi svrchoordovického stáří jsou řazeni ke dvěma blízkým rodům, a to *Rafanoglossella* n. gen. a *Plectoglossa* Cooper. Tyto rody se od sebe liší přítomností, nebo nepřítomností pseudointerarey v břišní misce a přítomností nebo nepřítomností chaoticky uspořádaných okrouhlých jamek na vnitřním povrchu obou misek. Ostatní, zpravidla malí glossellinidní brachiopodi, nebyli revidováni pro nedostatek dobře zachovalých jedinců (kupř. „*Lingula*“ *inconguens* Barrande, „*Lingula*“ *ovum* Barrande).

Explanation of plates

Plate I

1–8. *Rafanoglossella leiskowiensis* (Barrande); Králův Dvůr Formation. ⇒

1 – Pedicle valve, L 25968, x5.0 (= orig. Barrande 1879, pl. 103, case II); Lejškov. 2 – Pedicle valve showing pedicle groove, L 25952, x3.2 (= orig. Barrande 1879, pl. 103, case II, fig. 9), Lejškov. 3 – Pedicle valve, internal mould showing weak submedian ridges, VH 13379, x6.6; Velká Chuchle. 4 – Pedicle valve showing pedicle groove, VH 13486, x6.3; Lejškov. 5 – Brachial valve, internal mould, VH 13461, x3.8; Králův Dvůr. 6 – Brachial and pedicle valves, internal moulds, L 25420, x3.6 (= orig. Barrande 1879, pl. 103, case I, figs. 7, 8); Lejškov. 7 – Pedicle valve, VH 13462b, x2.8; sewerage tunnel between Michle and Pankrác. 8 – Brachial valve, internal mould, VH 13487, x6.6; Michle.

9, 10 – *Rafanoglossella generosa* n. sp.; Bohdalec Formation.

9 – Pedicle valve showing pedicle groove, VH 13081, x3.5; Michle, railway cutting east of the power station. 10 – Incomplete pedicle valve, VH 13097, x2.4; Michle, railway cutting (phosphorite nodule).

11–13. *Rafanoglossella ?deleta* (Barrande); Letná Formation, Chrštenice, Blýskava. 11 – Interior of pedicle valve showing submedian ridges, apical part damaged; VH 3098, x3.2. 12 – Pedicle valve, internal mould, VH 13426, x3.3. 13 – Pedicle valve, VH 13416, x3.1.

Plate II

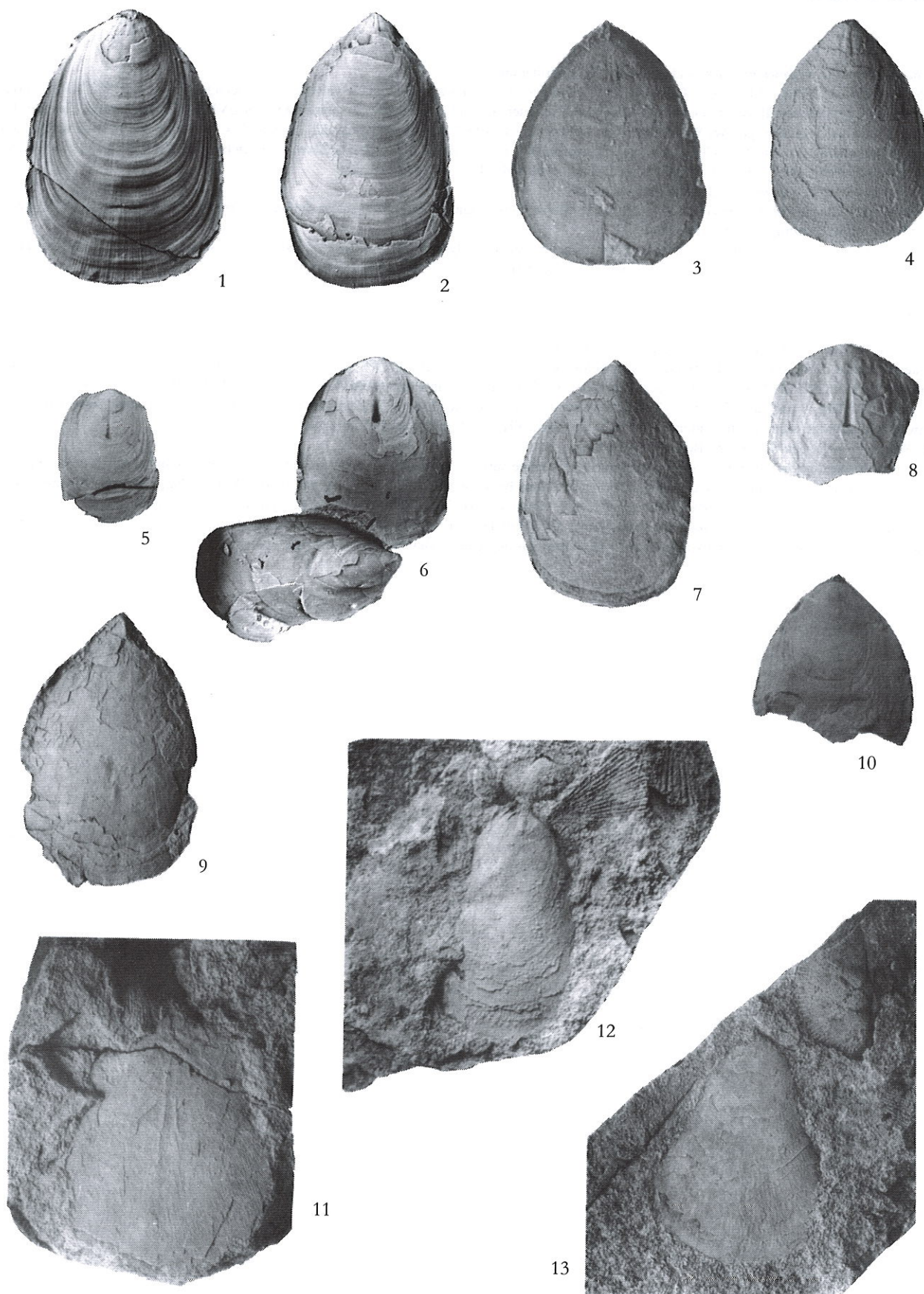
1–6. *Plectoglossa davidsoni* (Barrande); Zahorany Formation (figs. 1–3, 6) and Bohdalec Formation (figs. 4, 5). ⇒⇒

1 – Internal mould of pedicle valve, L 25971, x5.0 (= lectotype, orig. Barrande 1879, pl. 104, case VIII, fig. 2), Loděnice. 2 – Brachial valve, surficial ornamentation worn off; VH 13377b, x3.0; Libeň, Palmovka. 3 – Brachial valve, internal mould; VH 13377a, x2.3; Libeň, Palmovka. 4 – Pedicle valve, VH 13095, x3.4; Krč, V podzámčí Street. 5 – The same valve strongly magnified to show fine ornamentation, x7.0. 6 – Pedicle valve, partly exfoliated to show a median ridge occupying the bottom of the pedicle groove; VH 13381, x2.5 Libeň, Palmovka.

7–11. *Rafanoglossella generosa* n. sp.; Bohdalec Formation.

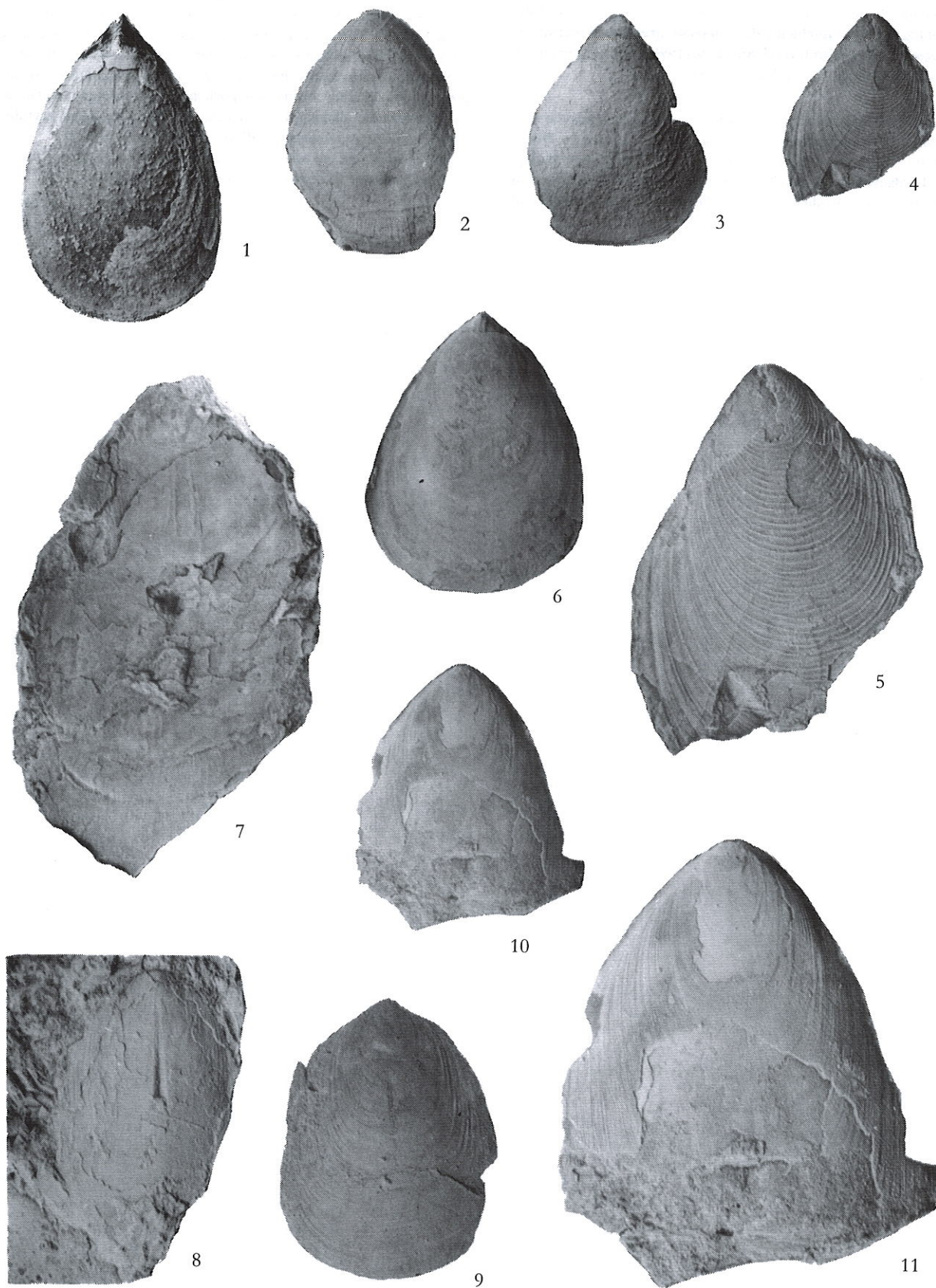
7 – The largest specimen in the author's collection; interior of pedicle valve with well-developed submedian ridges, but its apical part is damaged; VH 13091, x2.0; Libeň, railway cutting south of Invalidovna (limestone bank). 8 – Brachial valve, internal mould; VH 13079c, x3.0; Michle, east of the power station (lens of carbonate in the dark shale sequence). 9 – Pedicle valve; VH 13099, x4.9; Michle, Vyskočilova Street, near Brumlovka building, in association with numerous *Svobodaina ellipsoides* (Barr.). 10 – Pedicle valve; VH 13401, x3.2; temporary outcrop between Záběhlce and Spořilov (siltstone). 11 – The same valve strongly magnified to show fine concentric and radial rugellae on its right side; x5.2.

V. Havlíček: *Rafanoglossella* n. gen. and *Plectoglossa* Cooper (Glossellinae, Brachiopoda) in the Upper Ordovician of the Prague Basin (Pl. I)



For explanation see p. 165

V. Havlíček: *Rafanoglossella* n. gen. and *Plectoglossa* Cooper (Glossellinae, Brachiopoda) in the Upper Ordovician of the Prague Basin (Pl. II)



RECENZE

K. Goth – W. Haas – D. Mai (eds.): **150 Jahre Palaeontographica. Geschichte der Palaeontographica, Portraits der Herausgeber und Gesamtverzeichnis 1846–1996.** – Schweitzerbart'sche Verlagsbuchhandlung, 124 str. Stuttgart 1997.

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Jiří Pešek