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SOLANDANGELLA, A PROBLEMATIC LOWER ORDOVICIAN MOLLUSC FROM THE MONTAGNE NOIRE, SOUTHERN FRANCE

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Abstract. A problematic mollusc, *Solandangella vizcainoi* gen. et sp. n., is described from the Lower Ordovician (Arenigian) of the Montagne Noire. The muscle scar pattern located in the centre of the subcircular shell and the early ontogenic growth of the shell resemble representatives of the tryblidiid tergomyans. An anterocentral apex and a subapical scar, anteriorly closing the muscle scars circle, however, are unusual features among the tryblidians. The genus, resembling also *Pseudometoptoma* and its allies, is provisorilly classified as Mollusca *incertae sedis.*

■ Mollusca *incertae sedis*, *Solandangella vizcainoi* gen. et sp. n., Tergomya, *Pseudometoptoma*, shell morphology, muscle scars, systematics, mode of life, Lower Ordovician, Montagne Noire, France

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While studying the Lower Ordovician gastropods and cyrtonellid tergomyans in the unique collection of Daniel Vizcaïno at Carcassonne, I came upon a single, subcircular shell labelled as *Archinacella* sp. Later observation of this internal mould brought evidence of distinct muscle scars, resembling the tryblidiacean muscle scar pattern. It is the first find of a shell possessing discrete paired muscle scars found in the Lower Ordovician (Tremadoc-Arenig) of the Montagne Noire.

The specimen was collected in 1985 by Daniel Vizcaïno at the locality RQ24, W of Escougoussou, SSE of Roquebrun, Hérault, in a small, cracked nodule without a counterpart found at the surface of freshly cultivated eluvial soil in a vineyard. The associated trilobite and bivalve fauna indicates the middle part of the Formation des grès du Foulon, faunal zone k, Arenigian. Originally housed in the Vizcaïno collection under a number VOMN 434, the specimen has now been deposited in the Muséum National d'histoire naturelle de Paris, Section B. As far as the palaeontology and geology of the Montagne Noire is concerned, I refer the reader mainly to Thoral 1935, Babin et al. 1982, and Courtessole et al. 1985.

Solandangella represents an interesting mollusc possessing partly a tryblidiid-like muscle scar pattern. This pattern is closed anteriorly, however, by a subapical scar which is connected with the large retractor scars of the first anterior pair. According to the written communication of L. Popov (Uppsala) to E. L. Yochelson, this mollusc, ostensibly univalve, is similar to the bivalved Lower Ordovician *Pseudometoptoma* HUENE, 1899 from the Kunda stage in Estonia and to the Siberian *Angarella* ASATKIN, 1932. According to Rowell (1965) and the mentioned communication of Popov (1995), these genera, previously assigned to craniid Brachiopoda, cannot be brachiopods but are probably molluscs of uncertain position. The shell structure in *Solandangella*, however, is unknown, its univalved or bivalved character cannot be demonstrated, and its tergomyan characters are not unequivocal. Although preferring its tergomyan appurtenance, I find it desirable to leave the genus provisorilly without suprageneric systematic assignment. As the shell morphology is more similar to that of the tryblidiid tergomyans, morphological terminology of these molluscs has been used in the

descriptions. If the systematic position within Tryblidiida is proved, it should be located within a new subfamily of the Family Tryblidiidae, characterized by almost circular shells with anterocentrally positioned apex, and with a pair of subapical scars, connected with the first pair of laterodorsal scars by a narrow linear strand.

Systematic palaeontology

Mollusca *incertae sedis*

Genus *SOLANDANGELLA* gen. n.

Type species. *Solandangella vizcainoi* sp. n.
Derivatio nominis. For Solange and Daniel Vizcaïno.

Diagnosis. Shell low, subcircular, widest posteriorly; apex directed forward, at the anterior margin at the juvenile stage, halfway between the centre of the shell and the anterior margin in adults; 6 pairs of discrete dorsal and dorsolateral retractor muscle scars in the central part of the shell; scars of the anterior pair largest and differentiated, connected with a single subapical scar by a narrow linear strand; the elongate scars of the second to the sixth pairs are radially arranged so that the scars of the sixth pair, which are longest, are positioned almost parallel to the antero-posterior shell axis.

Discussion. A low shell with a subcircular outline, anterocentral apex and anteriorly subapically closed muscle scar circle of otherwise tryblidiid pattern distinguishes the genus from all so far described Palaeozoic representatives of the Class Tergomya. A few other Ordovician genera with a subcircular aperture differ in general configuration of the shell, position of the apex and the muscle scar pattern. *Archaeophiala* PERNER, 1903 possesses a much higher shell with an apex touching or slightly overhanging the anterior apertural margin, and a quite different, anteriorly open, muscle scar pattern. *Moyerocania* ROZOV, 1970 has a low conical shell with anterocentral apex but

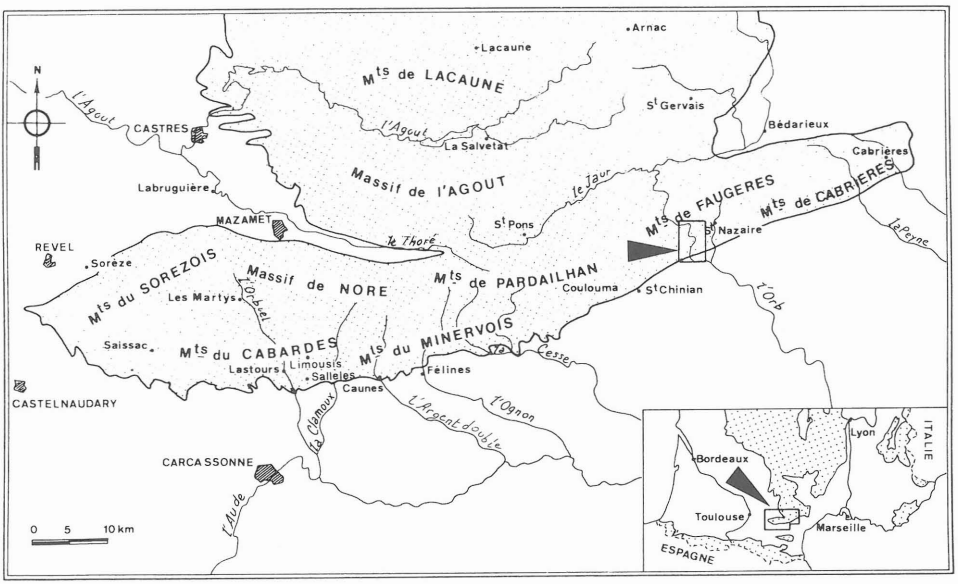
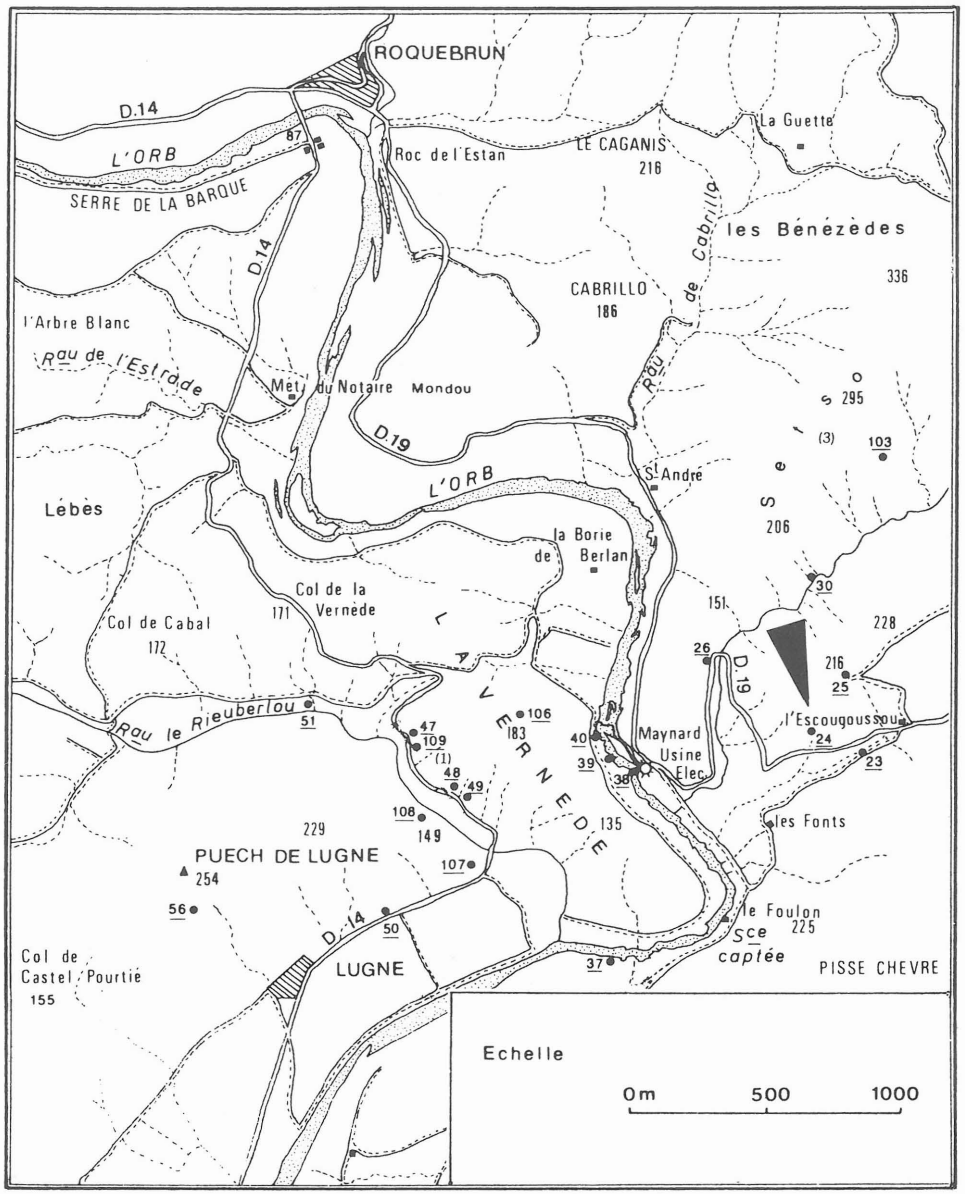


Fig 1. Location of the find of *Solandangella vizcainoi.* 1a – territory of the Montagne Noire; 1b – the western part of the Saint-Chinianais oriental. The underlined numbers indicate the fossiliferous localities; the number 24 W of l'Escougoussou, SSE of Roquebrun indicates the locality of *S. vizcainoi.* After Courtessole et al. 1985



a different, opened muscle scar pattern. *Lenaella* BJALYJ, 1973 and *Romaniella* DOGUZHAEVA, 1972, with narrower conical shells, also have an almost central apex but with a different muscle scar pattern. The Upper Cambrian *Kirengella* ROZOV, 1968 possesses a conical shell with a subcentral apex, slightly shifted posteriorly (according to Starobogatov 1970, Wingstrand 1985, Yochelson, Flower, and Webers 1973) or anteriorly (according to Rozov 1968; 1970 in litt.; see Yochelson, Flower, and Webers, p. 285). For a critical discussion see Peel 1988, p. 157.

In general shape and apertural outline, *Solandangella* also resembles several species com-

monly assigned to *Archinacella* ULRICH et SCOFIELD, 1897 with an anterocentral (posterocentral?) apex, like e. g. *Archinacella norwegica* (PERNER in KOKEN, 1925) from the Middle Ordovician of Norway (Yochelson 1963, Pl. 1, figs 19, 20), but a similar shell shape is seen even in the Lower Devonian representatives of *Palaeoscurria* PERNER, 1903 (see Horný 1963a, Pl. 12, figs 8-10). It somewhat resembles even the shell of the Late Cambrian mollusc *Chipewaella* GUNDERSON, 1993 but it lacks the dorsal crest and sinus and the prominently arched posterior apertural margin (Gunderson 1993). Another genus, slightly resembling *Solandangella*, is the Lower Devonian *Platypilina* HORNÝ, 1961 (see Horný 1963a) with a flat, nearly circular shell and an apex located between the centre of the shell

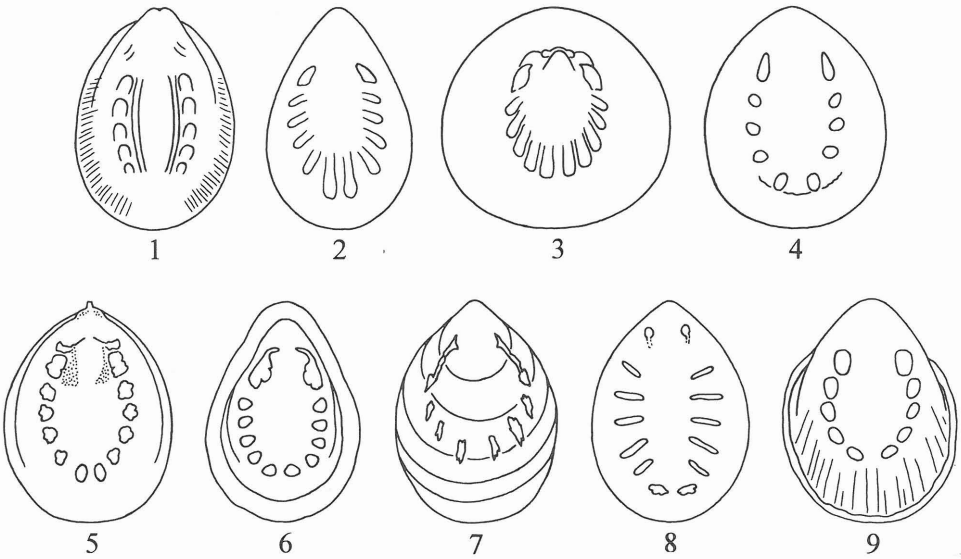


Fig. 2. Muscle scar patterns in different Palaeozoic trybidiacean genera (internal moulds), including the problematic genus *Solandangella*. 1 – *Bipulvina* YOCHELSON, 1958, Lower Ordovician; 2 – unidentified genus, determined as *Proplina* in Knight et Yochelson 1958, Lower Ordovician; 3 – *Solandangella* gen. n., Lower Ordovician; 4 – *Pentalina* HORNÝ, 1961, Lower Ordovician; 5 – *Pilina* KOKEN, 1925, Upper Ordovician – Silurian; 6 – *Tryblidium* LINDSTRÖM, 1880, Silurian; 7 – *Retipilina* HORNÝ, 1961, Silurian; 8 – *Drahomira* PERNER, 1903, Silurian; 9 – *Kotysium* HORNÝ, 1961, Lower Devonian. 1, 2, 5, and 6 after Knight and Yochelson 1960

and the margin, based on a single fragmentary specimen of *P. tardissima* (PERNER, 1903). It differs by a flatter shell with the apertural margin in a plane, more regularly circular outline of aperture, and a thin shell. Systematic position of this genus, muscle scars of which are unknown, is rather problematic. - Most of these examples of similarity based on external shape of the simple univalve shell, with no traces of the muscle scar pattern, are better interpreted as resulting from similar living conditions than as indicating fundamentally different systematic taxa.

Considering *Solandangella* a tryblidiid tergomyan (a possibility hardly acceptable for E. L. Yochelson, pers. comm.), then the subapical scar, located just below the apex, would be connected with the cephalic musculature and probably homologous to the „zonal" scar of *Romaniella*, originally interpreted as posterior (Doguzhayeva 1981), and to the fused anterior pair of scars in *Nyuella* ROZOV, 1975. Similarly located muscles (musculus preoralis and musculus oralis anterior) were figured by Wingstrand (1985, fig. 7) in *Vema* CLARKE et MENZIES, 1959, and the X and Y insertion areas of *Neopilina* LEMCHE, 1957 (Lemche and Wingstrand, figs 130, 131) were homologized with the scars lying within the apex of

Pilina KOKEN, 1925 (*ibidem*, fig. 133). Presuming that the musculature of *Solandangella* is homologous with that of the extant *Neopilina*, the subapical scar could then represent the insertion areas X and Y *sensu* Lemche and Wingstrand 1959 (figs 130, 132, and 133). Even the two anterior tubercles, figured by Horný 1963b in *Drahomira* PERNER, 1903 (Text-figs 4, 6, and 9) could be homologous.

The largest, probably composite, scars of the first anterior pair of *Solandangella* could indicate similar muscle condition to those developed in many tryblidiid genera, e. g. *Tryblidium* LINDSTRÖM, 1880 or *Pilina*, probably consisting of attachments of the anterior pedal retractors and a posterior oral muscle. The narrow, band-like strands projecting anteriorly from these scars and connecting the subapical scar somewhat resemble the „diaphragm scars" in *Pilina unguis* (LINDSTRÖM, 1880) (Lemche and Wingstrand 1959, p. 44). The function of the responsible muscles, however, remains unclear. On account of their anterolateral position, the muscles can hardly be connected with a diaphragm structure but can belong to the pallial musculature. Quite unusual is an unclear concentric structure, probably consisting of several fused scars, joining the scars of the second pair across the dorsum. This „internal muscle scar ring" can probably represent an abandoned juvenile muscle scar pattern, not observed in Tryblidiida as yet but described in Cyrtonellida (e. g., Horný 1991).

The axially elongate scars of the last, posterior pair show some similarity to those of the

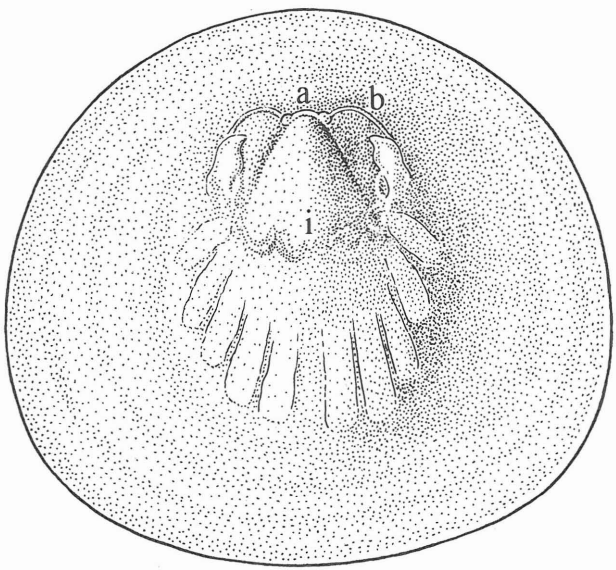


Fig. 3. Muscle scar pattern of *Solandangella vizcainoi*. a – anterior subapical scar, b – connecting strand, i – „internal muscle scar ring". Orig.

last pair of a taxon represented by a specimen figured by Yochelson 1958 and Knight and Yochelson 1960 as *Proplina cornutaformis* (WALCOTT, 1879) (for an explanation see Webers, Pojeta, and Yochelson 1992, p. 193). The axially elongate scars of the last posterior pair are also present in *Moyerccania miagkovae* ROZOV, 1970. Similarly arranged scars of the two posterior pairs have been described by Horný 1963b (Text-fig. 8) in the Silurian *Drahomira perlonga* HORNÝ, 1963 which, however, has a narrow, spoon-shaped shell with anteriorly positioned apex and a different muscle scar pattern.

The second group of invertebrates, in gross morphology and size similar to *Solandangella*, form the imperfectly known and yet not adequately described bivalved shells, previously assigned to the craniid brachiopods - *Pseudometoptoma* and *Angarella*. Species of both genera occur in early Ordovician Llanvirnian strata of the Baltic area (Estonia) and Asia

(Siberia, Urals, Kazahkstan). Their calcareous, impunctate, 2-layered shells consist of conical „brachial" and flat to gently convex „pedicle" valves. As given by Rowell 1965, the „brachial" valve shows a suggestion of 4 or 5 pairs of submarginally placed and bilaterally symmetrical muscle scars, unknown in any brachiopod superfamily, but similar to to that of some monoplacophorans. Finally, Rowell (1965, p. *H*291) stated, that „Since the animals have been described as having 2 valves, however, a close relationship with the monoplacophorans is unlikely; much more must be known of the morphology of the 2 valves and their relationship to each other before the systematic position of these genera can be regarded as reasonably well established." Thanks to L. Popov, who, through E. L. Yochelson, kindly draw my attention to this enigmatic group of fossils, I have obtained several photographs of the Huenes specimens of *Pseudometoptoma siluricum* (EICHWALD, 1842), deposited in the collections of CNIGR in St. Petersburg. Most interesting is the specimen 35/10953, Huene 1899, Pl. 3, figs 3, 4, showing a thick shell and irregularly limited scars in the posterocentral region, but the anterior area seems to be without details and the apical part of the mould bears irregular structures, better resembling those of *Floripatella* YOCHELSON, 1988 (Yochelson 1988, Fig. 1). The profile of the shell, well visible on the specimen 33/10953 (Huene Pl. 3, fig. 2), shows a convex anterior slope and a blunt apex, not narrow and slightly overhanging as in *Solandangella.* The type species of *Angarella, A. jaworowskii* ASATKIN, 1932, figured by Rowell 1965, p. *H*290 shows radially arranged scar-like structures, but the shell has a different, antero-posteriorly elongate outline. If related to this group, *Solandangella* differs from the existing genera by narrow, anteriorly directed apical part and distinct, horseshoe muscle scar pattern. It is probably also the oldest, lower Arenigian representative. In Popov's opinion (in litt.), this group may represent an exinct group of molluscs or a related, not yet formally established stock.

Occurrence. Lower Ordovician, France.

Species included. *Solandangella vizcainoi* sp. n.

Solandangella vizcainoi sp. n.

Pls 1 - 4

Material. Specimen IPM-B 49929, holotype and only known specimen, deposited in the collections of the Muséum National d'histoire naturelle de Paris, Section B.

Stratum typicum. Formation des grès du Foulon, faunal zone k; Ordovician, Arenig.

Locus typicus. Locality RQ24, W of l'Escougoussou, SSE of Roquebrun, Hérault; Montagne Noire, France.

Derivatio nominis. For Daniel Vizcaïno, an outstanding specialist of the Early Ordovician faunas of the Montagne Noire, who collected the described specimen.

Description. Shell low, subcircular, widest in posterior part, 15.8mm long, 16.6mm wide, and 5.0mm high; apex is directed anteriorly but located halfway between the centre of the shell and the anterior margin; maximum shell convexity lies in its central part approximately delimited by the muscle scars circle; towards the apertural margin, the shell becomes less convex, seemingly with a slightly flaring apertural margin; small patches of the shell wall and small cavities near the apertural margin after its dissolution indicate its relatively thickness, reaching at maximum 0.6mm. Outer shell surface is not observable. Apertural margin with a very low arching in the anterior and posterior regions. Six pairs of densely located discrete muscle scars are positioned around the centre of the shell, and one scar lies just below the apex. This anterior subapical muscle scar is deep, transversally elongate, probably consisting of two fused insertions, and lies directly below the apex indicating a rather limited migration during the ontogeny. It is connected with the scars of the first anterior scar by a narrow, curved, thin band-like strand, not observable on the left, imperfectly preserved side of the shell. The scars of the first anterior pair, positioned posterolaterally to the apex, are largest, probably consisting of two or three insertions and addorsally connected with the scars of the second pair; the elongate scars of the second to the sixth pairs are radially arranged so that the scars of the sixth pair, which are longest, are positioned almost parallel to the antero-posterior shell axis. An unclear concentric structure, probably consisting of several fused scars, joins the scars of the second pair across the dorsum. Irregular concentric structures are present between the muscle scars circle and the apertural margin, either reflecting the shell growth or connected with the pallial structures.

Preservation. The holotype is preserved as an internal mould in a dark grey to black siliceous nodule, originally probably calcareous but decalcified by late diagenetic or postdiagenetic processes. With the exception of four small patches, the shell itself has been mostly dissolved and the rough surface of the internal mould is locally covered with a hard residuum of the dissolved shell and with other mineral substances.

Occurrence. The specimen was found by Daniel Vizcaïno at the locality RQ24, W of l'Escougoussou, SSE of Roquebrun, Hérault, Montagne Noire, France, in the Formation des grès du Foulon, faunal zone k; Ordovician, Arenigian.

Mode of life

Speculations about mode of life depend on whether we are concerned with univalved limpet-like shells or with some kind of bivalved animals.

Most extant tergomyans live in quiet oceanic depths but there are rare exceptions (McLean 1979). Not all Lower Palaeozoic tryblidians lived in high energy environments, although not in too deep waters (Horný 1963a). Some of them inhabited shallow waters, like *Retipilina*, and the well known *Tryblidium* or *Pilina* with rather thick shells (Peel 1984). *Drahomira* probably lived on dead shells of nautiloids browsing on algal mats (Horný 1963b).

Solandangella inhabited a shallow sea, temporarily influenced by the import of sandy material from weathered crystalline rocks (Courtessole et al. 1985). Its low shell with a circular aperture and a relatively thick shell wall (0.5mm in a shell of about 15 mm diameter) suggests either a life on a hard silty bottom or perhaps even on blocks or boulders. As it is extremely rare, it might have been imported from the nearby shore and deposited together with typical shelf fauna with predominant fragmentary trilobites (*Taihungshania shui landeyranensis* (THORAL, 1935), *Neseuretus arenosus* DEAN, 1966, *Asaphellus lugneensis* COURTESSOLE, PILLET et VIZCAINO, 1985), and bivalves (*Coxiconcha giraudi* (THORAL, 1935), *Ekaterodonta courtessolei* BABIN, 1982, *Redonia michelae* BABIN, 1982). It was a slow epifaunal animal, probably an algal rasper, adapted for high energy habitat.

If *Solandangella* were a representative of bivalved molluscs, it may have lived attached by cementation of one valve to the substratum, or free (both possibilities have been inferred in *Angarella* and *Pseudometoptoma)*, perhaps as a ciliary feeder. The thick shell may indicate that it inhabited similar environment as when interpreted as a tergomyan. Our present knowledge of the functional morphology of this, yet not established, group is, however, too limited to warrant a more detailed image.

Discussion and comments

Solandangella (if being a tergomyan) would be, together with *Ozarkplina* STINCHCOMB, 1986 and *Bipulvina*, the oldest known representative of the Family Tryblidiidae. *Bipulvina*, like all other tryblidians, had a typical elongate shell with an apex only slightly overhanging the anterior margin. In *Solandangella*, however, only the juvenile shell had this shape. During the later growth, the apertural margin increased regularly around the whole aperture to form a subcircular outline in maturity. This kind of growth, connected with a flattening of the shell, was probably connected with an adaptation to an almost sessile, limpet-like mode of life in high energy conditions on a hard sea bottom. Some similarity in the concentric growth leading to a subcircular shell outline at maturity is known among some thin-shelled bellerophontaceans such as *Ptomatis* CLARKE, 1899, *Aspidotheca* TEICHERT, 1935, *Pedasiola* SPRIESTERSBACH, 1919, *Patellostium* WAAGEN, 1880, or *Bellerophacmaea* HORNÝ, 1989, adapted for the life on a soft muddy sea bottom (see Peel 1974, 1975, 1985, Horný 1989). Ontogenic changes of the shell parameters in *Solandangella* seemingly slightly influenced the position of the pedal retractor scars. Characteristic is the position of the largest, anterior, paired muscle scars which are located posterolaterally to the apex, not posteriorly as in other tryblidians. In fact, the scars partly lie below the apex, indicating a tendency to close the muscle scars circle anteriorly. A connecting strand even emphasizes this trend.

Speculations about the possible systematic location of *Solandangella* in the Family Tryblidiidae are mainly based on the shape of the pedal retractor muscle scar pattern and the

position of the apex in the juvenile stages, when it touches the anterior margin. The presence of the subapical scar, anteriorly closing the muscle scar circle, and recognized also in the genera *Nyuella* and *Romaniella*, cannot be too important systematically as all tergomyans have had muscle insertions in the cephalic region of the shell. Rather, the question is whether or not they are preserved and observable on the internal shell surface.

The discovery of *Solandangella*, possessing tryblidiid features of musculature, helps to better interpret the otherwise similar *Romaniella* as figured by Doguzhayeva (1981, text-figs 1b,c). The correct explanation of the biological orientation of the shell also confirms the conclusions made by Peel 1991a, concerning the key differences between the Classes Helcionelloida and Tergomya (see also Peel, 1991b, p. 19 and 31). It is suggested that the „anal sinus" of *Romaniella* and *Nyuella* represent, in fact, a cephalic sinus, developed even in some tryblidians (*Pilina*; *Retipilina* HORNÝ, 1961; *Undicornu* HORNÝ, 1971).

The closed muscle scar pattern with densely arranged scars of *Solandangella* resembles, to some extent, the musculature of the patellids and even of the archinacellids. The patellid horseshoe muscle scar pattern, also seen in the Lower Palaeozoic genera (*Floripatella* YOCHELSON, 1988, *Damilina* HORNÝ, 1961), represents a well tested system enabling effective clamping and thus safe protection of the animal in a simple, shallow, univalved shell (Yochelson 1988). This comparison is presented, however, only as an example of a result of adaptation of two similar, although unrelated, representatives of different molluscan classes.

A different situation concerns the archinacellids. Knight et Yochelson (1960) classified them as untorted monoplacophorans, as did Horný (1965), using them as a model for his Subclass Cyclomya, and later Salvini-Plawen (1980) and Runnegar and Jell (1986). Starobogatov (1970) and Golikov and Starobogatov (1975) reinterpreted them as gastropods, and this opinion was followed by Harper and Rollins (1982), Yochelson (1988), and Peel (1990, 1991b). Nevertheless, Horný (1991) again compared *Archinacella patelliformis* (HALL, 1847) with *Sinuitopsis neglecta* PERNER, 1903 (regrettably comparing his Text-fig. 17a, d with *Kirengella* (b) and *Lenaella* (c) in reversed positions) and Webers, Pojeta, and Yochelson (1992) assigned them, even if questionably, again to the Class Monoplacophora (= Tergomya). It is suggested that none of these authors has brought together sufficient evidence to support their points of view, and that the archinacelloids still await stable systematic assignment. *Solandangella* with its clearly developed and fused anterior (cephalic) muscle scar can serve as a model for the correct orientation of *Archinacella*. Whilst *Archinacella* seems to have a continuous muscle scar band, *Archinacellina* HORNÝ, 1961 possesses two pairs of partly fused posterodorsal scars and *Archinacellopsis**) has one pair of clearly separated posterodorsal scars (Knight and Yochelson 1958, Pl. 5, fig. 4; see Peel 1990, Webers, Pojeta and Yochelson 1992).

The presence of a muscle circle closed below the anteriorly directed apex in *Solandangella*, perhaps even homologous to the continuous muscle scar of *Archinacella* and its allies, supports the abandonment of the Subclasses Tergomya and Cyclomya made by Peel 1991b. On the other hand, it helps to better understand the non-torted, tergomyan substance of the cyrtonellids.

Acknowledgements

The author expresses his gratitude to Solange and Daniel Vizcaïno for hospitality and extraordinary help during his study at Carcassonne, as well as for the translation of the French summary. Michal Mergl, Faculty of Pedagogy, Plzeň dismissed the idea of brachiopod appurtenance of *Solandangella*. Professor John S. Peel, Institute of Earth Sciences, Uppsala

*) The generic name *Archinacellopsis* was first used in a table by Horný 1965. By a mistake, a paragraph validising this name was lost at the printers in 1965 and the name has remained invalid. Later it was mentioned or discussed elsewhere (e. g. Starobogatov 1970; Wahlman 1991 - misspelt as *Archinacelliopsis*). Type species: *Carinaropsis patelliformis* HALL, Pal. New York, 1, 1847, p. 183, Pl. 40, figs 2a, b; Middle Ordovician, New York. Diagnosis: Shell low, ovoid in outline, with an apex slightly overhanging the supposedly anterior margin; muscle scar, a narrow ring continuous subapically but with two separate rounded scars in the posterodorsal region. (The diagnosis has been based on a specimen figured by Knight and Yochelson 1958, Pl. 5, fig. 4, determined as *Archinacella patelliformis* (HALL).)

University, kindly read and discussed the manuscript. Leonid Popov (*ibidem*) yielded valuable data concerning possible relationship of *Solandangella* with *Pseudometoptoma* and its allies, and Rudolf Prokop, National Museum, Prague, anxiously contemplated the preparation of the paper. Ellis L. Yochelson, Washington, friendly argued (unfortunately without the possiblity of observing the specimen itself) against the immoderate authors conviction of the tergomyan appurtenance of the genus. The research has been supported by the Grant Commission of Czech Republic, Grant 205/94/0759.

SOLANDANGELLA, UN MOLLUSQUE PROBLÉMATIQUE DE L'ORDOVICIEN INFÉRIEUR DE LA MONTAGNE NOIRE, SUD DE LA FRANCE (résumé)

En étudiant les gastropodes et les cyrtonellidés tergomyens de l'Ordovicien inférieur dans la collection de Daniel Vizcaino de Carcassonne, j'ai découvert un moule interne d'une coquille isolée, suborbiculaire et rapportée à *Archinacella* sp. Le spécimen a été récolté en 1985 par Daniel Vizcaino dans la localité RQ24, située à l'W de l'Escougoussou, au SSW de Roquebrun, Hérault, dans un petit nodule brisé, dont la contre-empreinte n'a pu être retrouvée et à la surface d'un sol récemment labouré pour l'implantation d'une vigne. La faune associée composée de trilobites et de bivalves permet de placer ces terrains dans la partie médiane de la Formation des grès du Foulon, Arenigien, faunizone k. Enregistré dans la collection Vizcaino sous la référence VOMN 434, il sera désormais déposé au Musée National d'histoire naturelle de Paris, section B.

Cette découverte représente un nouveau genre et une nouvelle espèce, *Solandangella vizcainoi*. C'est la première découverte d'un mollusque de l'Ordovicien de la Montagne Noire chez qui les impressions musculaires groupées par paire sont conservées. Les impressions forment un cercle de muscles rappelant très fort les cercles de muscles des tryblidiides (Tergomya). Il est placé au centre de la coquille et à l'avant il est fermé par une empreinte musculaire subapicale reliée avec les grandes empreintes musculaires de la première paire de rétracteurs. L'apex de la coquille ne dépasse pas sa marge et au contraire il est placé en position antérocentrale ce qui est un élément inconnu chez les mollusques tryblidiidés.

La présence de l'impression subapicale fermant antérieurement le cercle de l'empreinte musculaire et également recontrée dans les genres cyrtonellidés *Nyuella* et *Romaniella* de l'Ordovicien inférieur du Sud de l'Oural, ne peut, systématiquement être aussi importante du fait que tous les tergomyens avaient des insertions musculaires dans la région céphalique de la coquille; la question est de savoir si elles sont conservées et visibles sur la surface interne de la coquille.

Solandangella rappele aussi les mollusques problématiques de l'Ordovicien inférieur *Pseudometoptoma* ou *Angarella* lesquels étaient auparavant classés comme ayant des relations avec les brachiopodes craniides. Selon les connaissances actuelles se basant surtout sur la microstructure de la coquille, il ne peut s'agir de brachiopodes, mais de mollusques à deux valves dont la position systématique est incertaine.

La microstructure de la coquille de *Solandangella* n'est pas connue, on ne peut prouver son l'existence d'une ou de deux valves, ses caractères rappelant la classe des Tergomya ne sont pas nets. Quoique l'auteur préfère l'appartenance de ce genre aux tryblidiides, il considère comme plus objectif de laisser pour l'insÊtant ce genre de mollusques sans classement supragénérique. Si éventuellement on confirme l'appartenance à l'ordre des Tryblidiida, ce genre devrait être classé dans une nouvelle sous-famille de la famille Tryblidiidae étant caractérisé par une coquille basse, presque circulaire, avec un apex antérocentral, et avec une paire d'empreintes musculaires subapicales reliées par une structure étroite avec la première paire des empreintes latérodorsales.

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EXPLANATION OF PLATES
(specimen covered with ammonium chloride sublimate)

PLATE 1

1. Dorsal view, showing a complete muscle scar pattern and four patches of shell in the anterior, posterocentral, posterior nad right lateral regions. × 6.2.
2. Right lateral view. Note the thickness of the shell patches. × 7.2.

PLATE 2

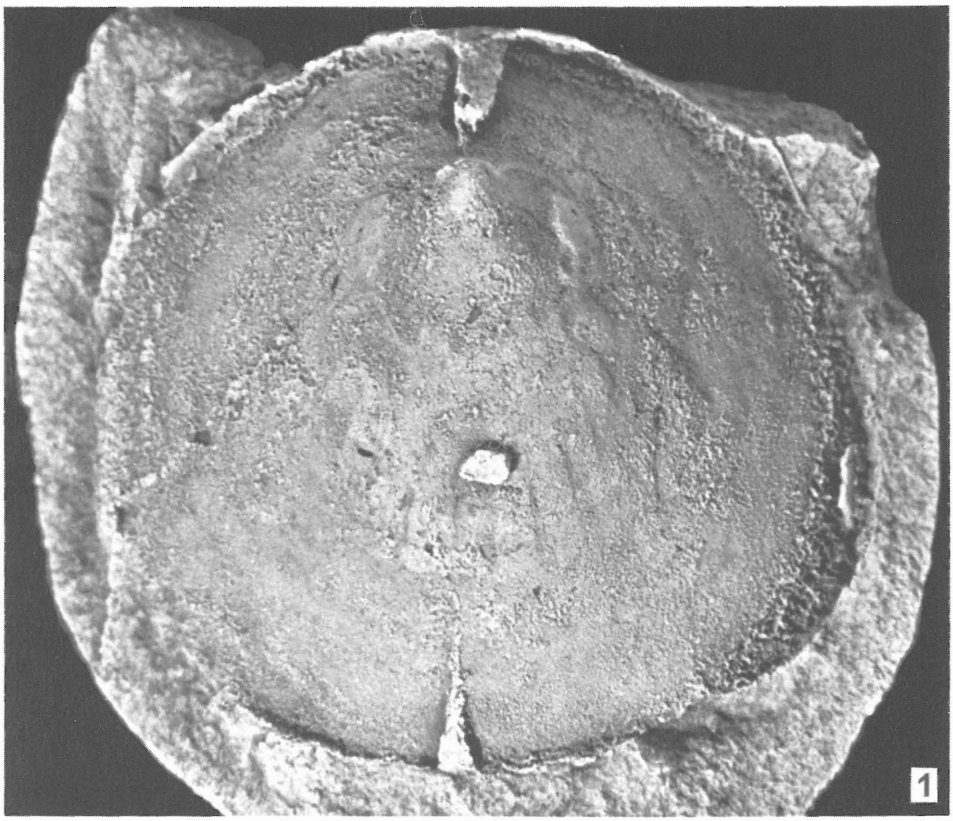
1. Oblique right laterodorsal viev showing radial arrangement of the pedal retractor scars. The "internal muscle scar ring" is well visible in the middle part of the shell. × 7.
2. The right side of the muscle scar pattern. Note the structures addorsaly accompanying the first and the second lateral scars, and the thick patches of the shell. × 7.

PLATE 3

1. Anterodorsal view with well visible large anterolateral composite scars of the first anterior pair and the anterior subapical scar, seemingly consisting of two fused insertions. × 7.2.
2. Oblique right anterodorsal view. Note the strand connecting the first large right anterolateral and the anterior subapical scars. × 7.2.

PLATE 4

1. Anterior view, × 6.
2. Posterior view, × 6.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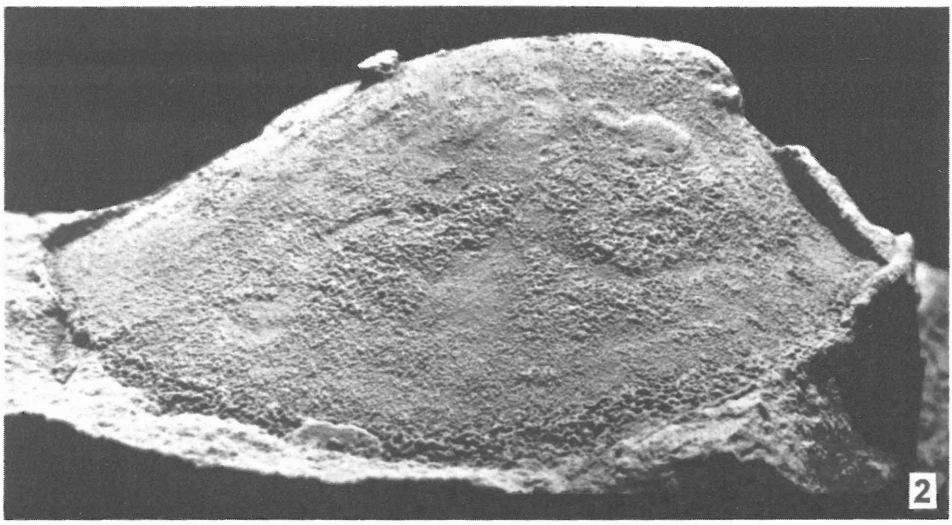
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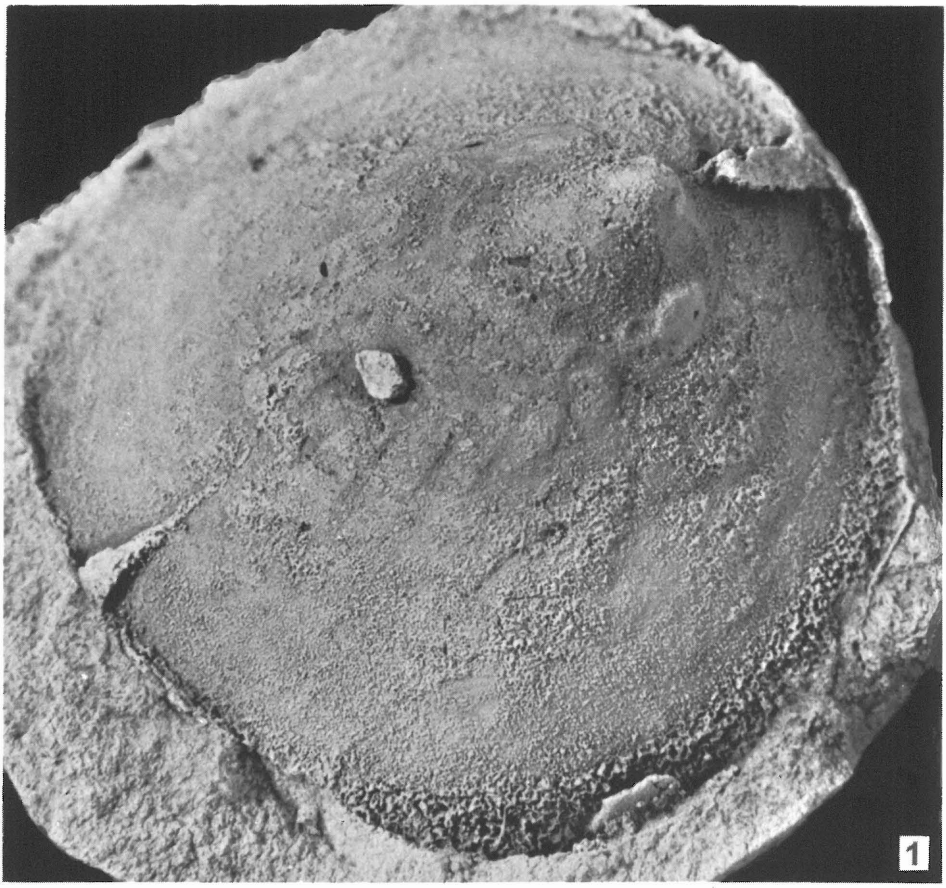
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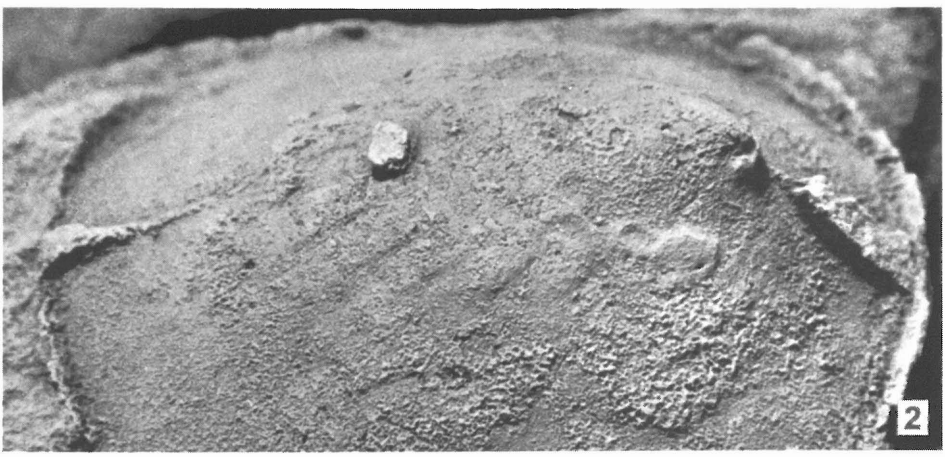
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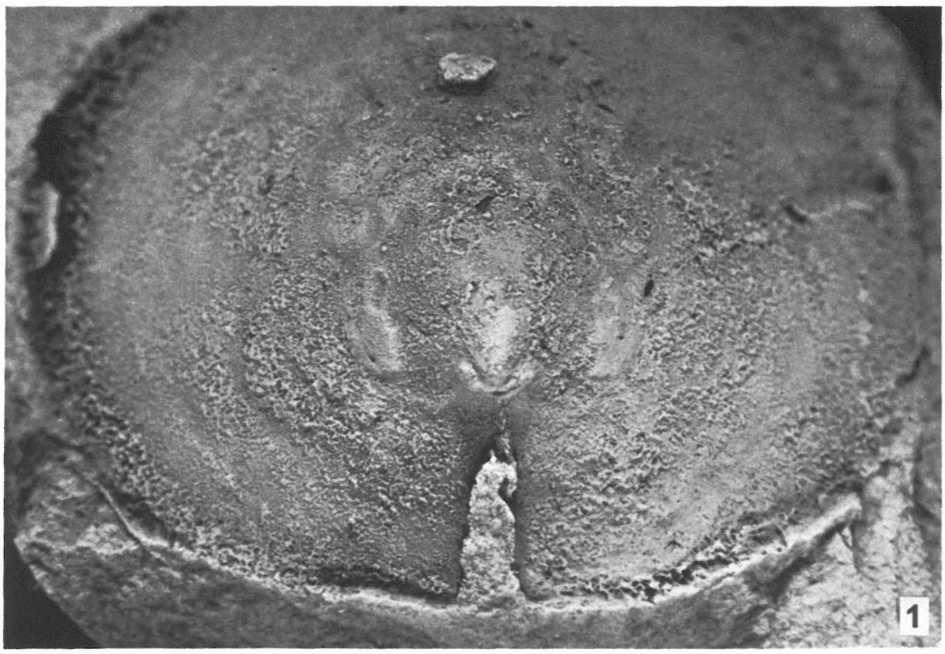
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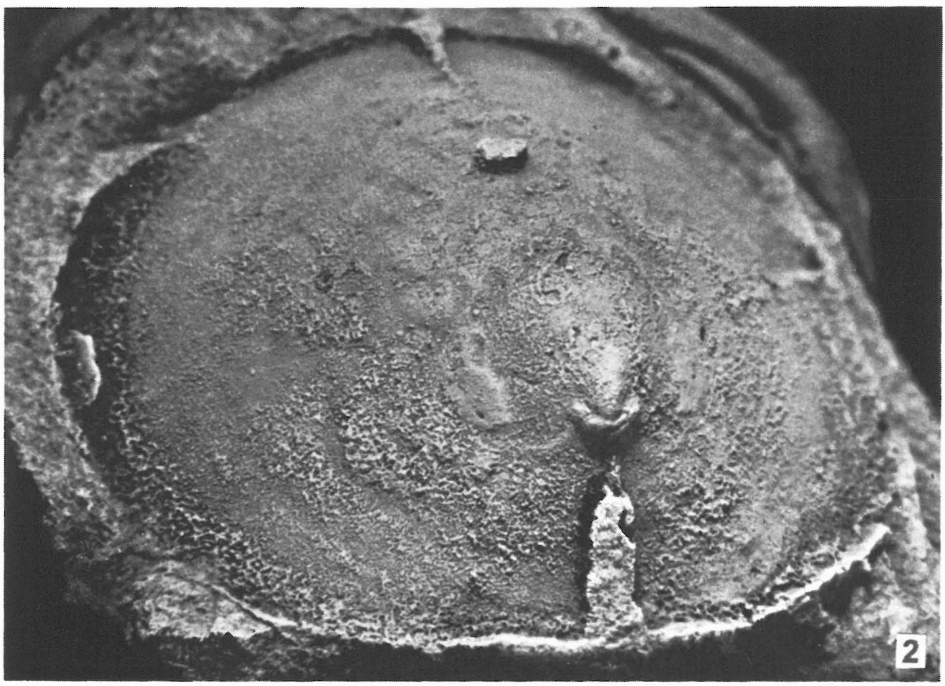
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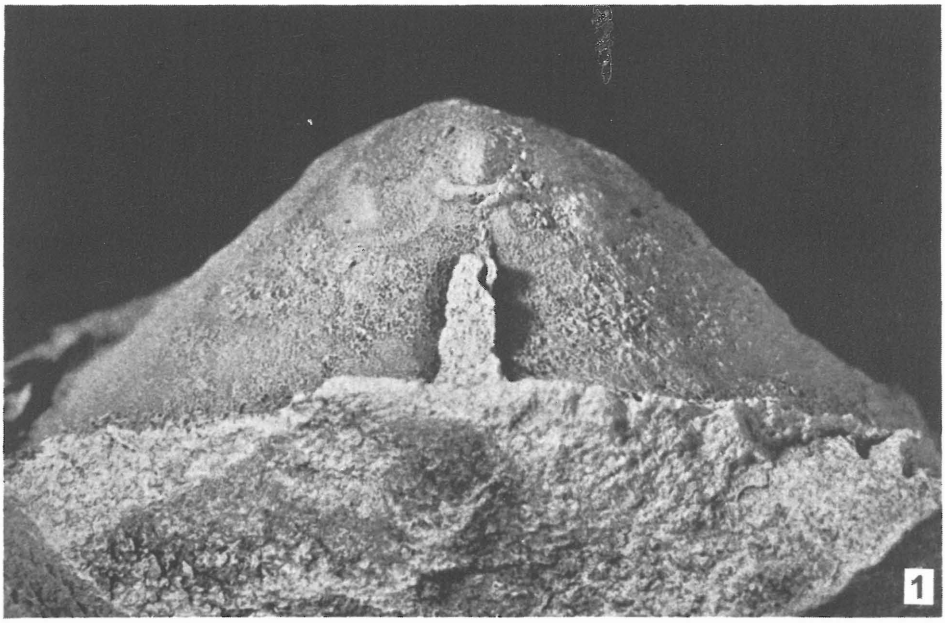
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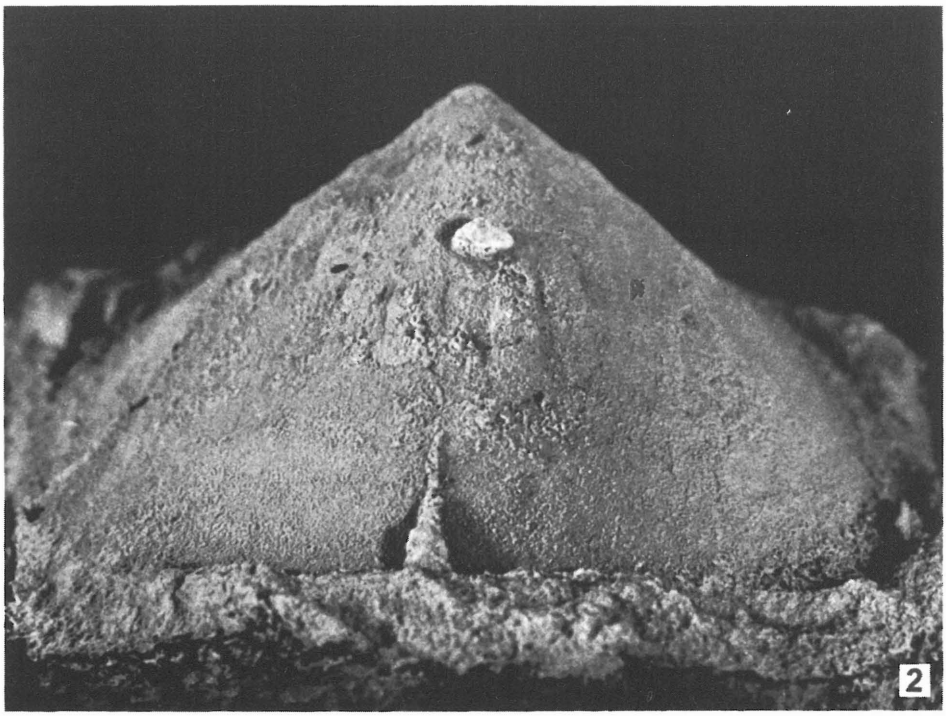
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