Acta Geologica Polonica, Vol. 53 (2003), No. 1, pp. 29-78

Middle Miocene (Badenian) gastropods from Korytnica, Poland; Part IV – Turridae

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ABSTRACT:

BAŁUK, W. 2003. Middle Miocene (Badenian) gastropods from Korytnica, Poland; Part IV – Turridae. *Acta Geologica Polonica*, **53** (1), 29-78. Warszawa.

This report is the fourth part of the monograph of the surprisingly rich assemblage of gastropods occurring in the so-called *Pleurotoma Clays* of Middle Miocene (Badenian) age, exposed in the environs of Korytnica in the Holy Cross Mountains, Central Poland. It contains characteristics of 101 prosobranch species of one family, the Turridae. Within this assemblage, five species are new for the science (including one, formerly reported from Korytnica, but determined erroneously); of the recognized species as many as 72 have not hitherto been reported from Korytnica, and 66 from the Miocene of Poland. As the new species established are: *Clavatula kowalewskii* sp.nov., *Perrona* (*Perrona*) *czarnockii* sp.nov., *Turricula* (*Surcula*) *korytnicensis* sp.nov., *Cythara* (*Mangelia*) *cibori* sp.nov., and *Bela sanctacrucensis* sp.nov.

Key words: Prosobranch gastropods, Turridae, Middle Miocene, Korytnica.

Contents

INTRODUCTION

The present paper is the fourth part of a monographic description (see BAŁUK 1975, 1995, 1997) of the Middle Miocene (Badenian) prosobranch gastropods from Korytnica, occurring within the so-called *Pleurotoma Clays*, the fossiliferous content of which has involved their fame in the European literature since over two centuries.

At Middle Miocene time, the Paratethys sea has transgreded onto the southern slopes of the Holy Cross Mountains, Central Poland, to form a series of rocky bays along dismembered shorezone, the fragments of which are still well recognizable in the present-day morphology. One of these bays has formed, in its terminal part, what is called the Korytnica Basin in which, the *Pleurotoma Clays* with a ubiquity of diverse fossils were the main litho- and biofacies filling up the Basin. The basic data on the setting of the Basin were given by RADWAŃSKI (1969) and BAŁUK & RADWAŃSKI (1977), its age was precisely dated by MARTINI (1977) and RÖGL & BRANDSTÄTTER (1993), whereas a review of the associated fossils was given by the present author (BAŁUK 1975, 1995, 1997) in introductions to the former parts of the present monograph.

Subjected to this paper the representatives of the family Turridae (formerly, more often referred to as Pleurotomidae) are the most spectacular elements not only of the gastropod assemblage, but of all Korytnica fossils. These very gastropods, primarily and the most largely the representatives of the genus *Clavatula* are these that strike the view of any collector searching over the cropland at Korytnica, and which gave the birth of the name of *Pleurotoma Clays*.

The former students, since ZEUSCHNER (1830) have been able to distinguish 30 species amongst the Korytnica turrids. Of these, only one, that is *Surcula laurae* (HOERNES & AUINGER, 1891), has not been found by the present author. This species was listed by SIEMIRADZKI (1909, p. 241) who presented an account of ZEUECHNER's collection revised by A.M. ŁOMNICKI. It was also reported by FRIEDBERG (1912, pp. 209-210, Pl. 13, Fig. 10), upon one specimen regarded to by ideally concordant with the holotype (the only specimen) coming from Lapugy in Transylvania. The FRIEDBERG's specimen has been lost, and its illustration is very inadequate, but when a figure of the holotype (HOERNES & AUINGER 1891, Pl. 38, Fig. 8) is taken into account, it is reasonable to estimate a unique character of this extremely rare species. As concerns the turrids, the species list presented by SIEMIRADZKI (1909) contains also an enigmatic item "*P.*[*leurotoma*] aff. *turonica* BROC.", whose reality cannot be ascertained: BROCCHI's type of this species has not been considered by PINNA & SPEZIA (1978).

The present author has long been aware of a great similarity of the gastropod assemblage of Korytnica to that of Kostej in Transylvania, as described by BOETTGER (1896, 1901, 1906, 1907) and subsequently illustrated by ZILCH (1934, 1935). This has been especially well demonstrated by the herein presented family Turridae, of whose species established by BOETTGER as new, as many as 42 are recognized at Korytnica (regardless 4 others, taken herein as younger synonyms). Impressively, of some species established by BOETTGER upon unique, single specimens from Kostej, the four species, viz. *Mitrolumna paraptycha* (BOETTGER, 1906), *Clathurella casilorica* BOETTGER, 1906, *C. postuma* BOETTGER, 1906, and *C. carolinae* (BOETTGER, 1901), have first been found repeatedly, since almost a century, in another locality where are represented by 1, 4, 30, and 1 specimens, respectively.

During the present investigation, due to courtesy of the former Director of the Geological Survey of Poland, Professor Dr. S. SPECZIK, and of H. GRODZICKA, M.Sc., the Keeper of its Museum, the author had an opportunity to acquaint with a part of the materials collected at Korytnica in the thirties by K. KOWALEWSKI and by J. CZARNOCKI. Some specimens of this collection are included into the present paper (the photograph were taken due to courtesy of Dr. G. PIEŃKOWSKI, the former Director of the Museum). All these persons are cordially acknowledged, the same as Dr. A. ŁAPTAŚ, of the Museum of the Polish Academy of Sciences in Cracow, for making an access to FRIEDBERG's collection, as well as Mr. J. GUBAŁA for lending some rare specimens of his famous collection.

Formerly, it was thought (BAŁUK 1995, p. 250) that the present fourth part of the monograph would also contain a chapter of the *ADDENDA* to describe some new materials collected either personally or by private finders. The number of such materials has, however, been increased so distinctly that they could not be contained in this paper. Consequently, announced herein is the fifth part of the present monograph of the prosobranch gastropod from Korytnica, entitled as *ADDENDA et CORRIGENDA*. It is intended to include therein some taxa new for Korytnica, some rare species recovered by numerous specimens, some specimens remarkably better preserved or of much larger size, as well as the species which need a further comment and/or supplementary information (or, correction).

The present research program has financially been supported by the University of Warsaw (Grants BW 1410/1, BW 1454/1, and BW 1484/1) what is herein acknowledged.

SYSTEMATIC ACCOUNT

Family Turridae SWAINSON, 1840

Genus *Clavatula* LAMARCK, 1801

Clavatula camillae (HOERNES & AUINGER, 1891)
(Pl. 1, Figs 1-3)

1891. *Pleurotoma* (*Clavatula*) *Camillae* nov.form.; R. HOERNES & M. AUINGER, p. 340, Pl. 43, Figs 12-13.
1912. *Clavatula Camillae* R.HOERN. i AUING.; W. FRIEDBERG, pp. 193-194, Pl. 12, Fig. 4.
1954. *Clavatula camillae* HOERN. et AUING.; I. CSEPREGHY-MEZNERICS, p. 51, Pl. 7, Figs 6-7.
?1960. *Clavatula* (*Clavatula*) *camilae* (HOERNES und AUINGER); E. KOJUMDGIEVA, p. 198, Pl. 47, Fig. 10.
1966. *Clavatula camillae* HOERNES & AUINGER; L. STRAUSZ, p. 405, Pl. 15, Fig. 15.
?1968. *Clavatula* (*Clavatula*) *camilae* (HOERNES et AUINGER); L. HINCULOV, pp. 147-148, Pl. 37, Fig. 3.
1973. *Clavatula camillae* (HOERNES et AUINGER); I. BOHN-HAVAS, p. 1065, Pl. 6, Fig. 8.
1982. *Clavatula* (*Clavatula*) *camillae* (R. HOERNES et M. AUINGER); J. ŠVAGROVSKÝ, p. 414, Pl. 8, Fig. 4.
?1994. *Clavatula* (*Clavatula*) *camillae* (HOERNES, AUINGER); P. I. NIKOLOV, p. 56, Pl. 6, Figs 1-2.
?1998. *Clavatula* (*Clavatula*) *camillae* (HOERNES R. & AUINGER); V. MIKUŽ, pp. 70-71, Pl. 2, Fig. 3.

MATERIAL: Two hundred and fifty specimens.

DIMENSIONS: The largest specimen (see Pl. 1, Fig. 2) is 52 mm high and 21.5 mm wide.

REMARKS: The studied specimens are evidently conspecific with those coming from Lapugy in Transylvania, and distinguished by HOERNES & AUINGER (1891) as a separate species *Clavatula camillae* (HOERNES & AUINGER). If this separateness, as recognized by HOERNES & AUINGER (1891) is fully justified, their opinion that their species is transitional (*Übergang*) between groups of species *Clavatula interrupta* and *Clavatula asperulata* is obviously false.

The variability of the numerous specimens from Korytnica is very low, having been expressed only by a variable number (usually 3, rarely 2 or 4) of spiral riblets on the margin of the last whorl. At Korytnica the specimens of *Clavatula camillae* (HOERNES & AUINGER) are not only frequently met, but they also are typically quite showy and large (see dimensions); the conspecific forms reported in the literature never exceed 44 mm in height and 18 mm in width.

A specimen from Dolenja Brezovica in Slavonia, illustrated by MIKUŽ (1998), differs from these of Korynica, as well as those of Lapugy, by its distinctly less slender shape; it cannot be thus ascribed inequivocally to the discussed species.

The species *Clavatula camillae* (HOERNES & AUINGER, 1891) was recorded from Korytnica by SIEMIRADZKI (1909), FRIEDBERG (1912, 1938) and KOWALEWSKI (1930).

Clavatula eleonorae (HOERNES & AUINGER, 1891)
(Pl. 3, Figs 6-9)

partim 1856. *Pleurotoma asperulata* LAM.; M. HÖRNES, pp. 341-342, Pl. 37, Fig. 5; *non* Figs 1-4.
1891. *Pleurotoma* (*Clavatula*) *Eleonorae* nobis; R. HOERNES & M. AUINGER; pp. 349-350, Pl. 45, Figs 1-3.
1912. *Clavatula Eleonorae* R. HOERNES i AUINGER; W. FRIEDBERG, p. 198, Pl. 12, Fig. 6.
1998. *Clavatula* (*Clavatula*) *eleonorae* (HOERNES R. & AUINGER); V. MIKUŽ, p. 71, Pl. 1, Fig. 3.

MATERIAL: Five specimens, of which one is kept in the collection of the Museum of the Earth, Warsaw, and another one in the collection of the Museum of the Geological Survey of Poland.

DIMENSIONS: The largest specimen (see Pl. 3, Fig. 9) is 57 mm high and 24 mm wide.

REMARKS: The two specimens of the author's own collection (see Pl. 3, Figs 3 and 4) differ one from the other by their slenderness. A specimen from Korytnica illustrated by FRIEDBERG (1912) is transitional between these two extremes. All these recognitions evidence a rather great diversity in the overall shape of the species. Similar diversity, although much less advanced, is also visible in the specimens illustrated by HOERNES & AUINGER (1891). The conspecifity of Korytnica and Vienna Basin specimens does not yield any doubts, as already remarked by FRIEDBERG (1912).

Furthermore, the four other specimens and the fifth one from the collection of the Museum of Geological Survey of Poland, all presumably juvenile (see Pl. 3, Figs 1-5), are suggestive of the premature shells of *Clavatula eleonorae.* In this species, the ornamentation of juvenile whorls in adult specimens has not however been known as yet. All specimens presented in the literature, as well as these studied from Korytnica, bear the surface of their primary whorls preserved very inferiorly. The specimens studied are thus classified as "*Clavatula* sp., an *Clavatula eleonorae* (HOERNES & AUINGER, 1891)", with an under-

standing that they cannot be accomodated into any other *Clavatula* species.

The species *Clavatula eleonorae* (HOERNES & AUINGER, 1891) was reported from Korytnica by SIEMIRADZKI (1909), FRIEDBERG (1912) and KOWALEWSKI (1930).

Clavatula evae (HOERNES & AUINGER, 1891)
(Pl. 5, Figs 1-8)

1891. *Pleurotoma* (*Clavatula*) *Evae* nov.form.; R. HOERNES & M. AUINGER, pp. 344-345, Pl. 44, Figs 3-4.
1912. *Clavatula* c.f. *Evae* R. HOERN. i AUING.; W. FRIEDBERG, p. 195, Pl. 12, Fig. 10;
1912. *Clavatula Evae* R. HOERN. i AUING. var.; W. FRIEDBERG, pp. 195-196, Text-fig. 48.
1938. *Clavatula Evae* R. HOERN. u. AUING.; W. FRIEDBERG, p. 143.
1971. *Clavatula asperulata* cfr. *evae* HOERNES & AUINGER; I. CSEPREGHY-MEZNERICS, p. 32, Pl. 15, Fig. 19.

MATERIAL: Forty-five specimens.

DIMENSIONS: The largest specimen (see Pl. 5, Fig. 8) is 80 mm high and 26 mm wide.

REMARKS: The studied specimens are fully concordant with that one which FRIEDBERG (1912, Pl. 12, Fig. 10) regarded as "*Clavatula* c.f. *Evae* R. HOERN. i AUING.", as well as with another one (see FRIEDBERG 1912, Text-fig. 48) classified as "*Clavatula Evae* R. HOERN. i AUING. var.", both coming from Korytnica.

A specific assignation of the studied specimens makes a difficulty, as they do differ, although slightly, from those described by HOERNES & AUINGER (1891) from Grund in the Vienna Basin. The Korytnica specimens are more slender, and they bear the more concave whorls and the more conspicuous spiral sculpture. In the present author's opinion, such a diversity should be accepted as possible within the species *Clavatula evae* (HOERNES & AUINGER), to which the Korytnica specimens are therefore assigned.

A peculiar morphologic feature of shells of the studied species is their sculpturing by specific biogenic structures distinguished by RADWAŃSKI & BAŁUK (1997) as a trace fossil, *Clavatulicola evaephilus*, attributed to some symbionts of the live gastropods, and recognized also in shells from Grund presented by HOERNES & AUINGER (1891).

The species *Clavatula evae* (HOERNES & AUINGER, 1891) was recorded from Korytnica by SIEMIRADZKI (1909), FRIEDBERG (1912, 1938) and KOWALEWSKI (1930). Presumably, this very species was observed at Korytnica by MURCHISON (1845) who recorded it as "*Pleurotoma interrupta* BROCCHI".

Clavatula granulatocincta (MÜNSTER, 1843)
(Pl. 6, Figs 1-3)

1837. *Pleurotoma cataphracta* BAST. var. β; G.G. PUSCH, p. 144, Pl. 12, Fig. 15.
1843. *Pleurotoma granulato-cincta* MÜNSTER; G. MÜNSTER *in* A. GOLDFUSS, p. 20, Pl. 171, Fig. 5.
1856. *Pleurotoma granulato-cincta* MÜNST.; M. HÖRNES, p. 344, Pl. 37, Figs 14-17.
1891. *Pleurotoma* (*Clavatula*) *granulato-cincta* MÜNST.; R. HOERNES & M. AUINGER, p. 353, Pl. 43, Figs 11 and 14; ?Pl. 46, Fig. 16.
partim 1891. *Pleurotoma* (*Clavatula*) *Angelae* nov.form.; R. HOERNES & M. AUINGER, pp. 353-354, Pl. 46, Fig. 19; *non* Figs 17-18.
1912. *Clavatula granulato-cincta* MÜNST.; W. FRIEDBERG, pp. 200-201, Pl. 12, Figs 8-9.
1931. *Clavatula granulato-cincta* (MUNSTER); A. PEYROT, pp. 90-91, Pl. 8, Figs 76-77.
1953. *Clavatula granulatocincta* (MÜNST.); I. CSEPREGHY-MEZNERICS, p. 20, Pl. 1, Figs 23-24.
?1953. *Clavatula granulatocincta angelae* HÖRN. & AUING.; I. CSEPREGHY-MEZNERICS, p. 20, Pl. 1, Figs 27-28.
1958. *Clavatula* (*Clavatula*) *granulatocincta granulatocincta* MÜNSTER; J. ŠVAGROVSKÝ, p. 13, Pl. 3, Figs 1-3.
1966. *Clavatula granulatocincta* MÜNSTER (*in* GOLDFUSS); L. STRAUSZ, pp. 407-408, Pl. 16, Fig. 11.
1998. *Clavatula* (*Clavatula*) *granulatocincta* (MÜNSTER); O. SCHULTZ, p. 74, Pl. 30, Fig. 3.
1998. *Clavatula* (*Clavatula*) *granulatocincta* (MÜNSTER); V. MIKUŽ, pp. 76-77, Pl. 5, Fig. 1.

MATERIAL: Ten specimens, of which one is in the private collection of Mr. J. GUBAŁA.

DIMENSIONS: The largest specimen (see Pl. 6, Fig. 2; the same as presented by BAŁUK & RADWAŃSKI 1991, Pl. 1, Fig 2a) is 54 mm high and 23 mm wide.

REMARKS: The studied specimens are close to that one from Pötzleinsdorf in the Vienna Basin, as presented by HOERNES & AUINGER (1891), although they are slightly more pronouncedly sculptured. They are also concordant with a specimen from Möllersdorf, regarded by HOERNES & AUINGER (1891) as transitional between *Clavatula granulatocincta* and *Clavatula angelae* (HOERNES & AUINGER), the latter of which has, however, more distinct prickly nodes in the posterior of 3-4 last whorls. The studied specimens from Korytnica do not resemble that one from Gainfahren, because their whorls are more concave, and their proximal part of the teleoconch is much more slender. According to HOERNES & AUINGER (1891, p. 353), the shells of the studied species are featured by their

outer lip being smooth marginally, but spirally striated more innerly, as stated already by FRIEDBERG (1912, p. 200), also for the specimens from Korytnica. Of the specimens at the present author's collection only one bears very indistinct striae. The largest specimen from Korytnica, above-mentioned as used for other studies by BAŁUK & RADWAŃSKI (1991, Pl. 1, Fig. 2) has been cut into halves, but nowhere its inner surface yielded a spiral striation. It therefore seems that the presence or absence of such striation may be included into the features much variable within the species.

The species *Clavatula granulatocincta* (MÜNSTER, 1843) was reported from Korytnica by PUSCH (1837), HÖRNES (1856) who mentioned that he personally collected it herein, as well as by EICHWALD (1853), SIEMIRADZKI (1909), FRIEDBERG (1912), and KOWALEWSKI (1930).

Clavatula juliae (HOERNES & AUINGER, 1891)
(Pl. 7, Figs 1-5)

1891. *Pleurotoma* (*Clavatula*) *Juliae* nov.form.; R. HOERNES & M. AUINGER, p. 350, Pl. 45, Figs 4-6.
non 1928. *Clavatula laevigata* EICHW. var., aff. *Cl. Juliae*; W. FRIEDBERG, pp. 569-570, Text-fig. 81 *right.*
non 1930. *Clavatula laevigata* EICHW. var. *Juliae* HOERN. i AUING.; K. KOWALEWSKI, p. 92.

MATERIAL: Five specimens, of which one is in the private collection of Mr. J. GUBAŁA.

DIMENSIONS: The largest specimen (see Pl. 7, Fig. 5) is 64 mm high and 25 mm wide; another one (see Pl. 7, Fig. 4) is 42 mm and 20 mm, respectively.

REMARKS: The present author is of the opinion that a separateness of the species *Clavatula juliae* (HOERNES & AUINGER) is disputable, or even problematic. Nevertheless, this very assignment is herein used for the five of Korytnica specimens, whose overall shape and ornamentation are fully concordant with those of specimens coming from Lapugy in Transylvania, upon which the species was established.

As concerns the presence of *Clavatula juliae* (HOERNES & AUINGER) at Korytnica, it was FRIEDBERG (1928, pp. 569-570), who reported it when having one specimen (see FRIEDBERG 1928, Text-fig. 81 right) quite distinctly different from those of Lapugy. This specimen was devoid of the two uniformly strong files of prickly nodes at the margin of the last whorl, as well as of a spiral row of bead-like nodes at the base of the last whorl (that is at the place where that base transforms into the siphonal canal). FRIEDBERG (1928) classified that specimen as "*Clavatula laevigata* EICHW. var., aff. *Cl. Juliae*", but this assignment cannot be herein justified.

The species *Clavatula juliae* (HOERNES & AUINGER, 1891) has not hitherto been known in the Miocene of Poland. A report by KOWALEWSKI (1930, p. 92) concerns his reference to the above-discussed specimen of FRIEDBERG (1928).

Clavatula laevigata (EICHWALD, 1853)
(Pl. 7, Figs 7-10)

1853. *Pleur. laevigata* m.; E. EICHWALD, pp. 183-184, Pl. 8, Fig. 3.
partim 1912. *Clavatula laevigata* EICHW.; W. FRIEDBERG, pp. 191-193.
partim 1938. *Clavatula laevigata* EICHW.; W. FRIEDBERG, p. 142.
1960. *Clavatula sublaevigata* n.sp.; T. BÁLDI, p. 80, Pl. 3, Fig. 1.

MATERIAL: 760 specimens.

DIMENSIONS: The largest specimen (see Pl. 7, Fig. 9) is 60 mm high and 22 mm wide.

REMARKS: The species *Clavatula laevigata* (EICHWALD) was first reported from Korytnica by FRIEDBERG (1912). This commonly occurring species has earlier been not distinguished from *Clavatula asperulata* (LAMARCK) [recte: *Clavatula polonica* (PUSCH)]. Having 80 specimens at his disposal, FRIEDBERG (1912) accepted their conspecifity both with specimens from Podolya described by EICHWALD (1853) as "*Pleur. laevigata* m.", as well as with specimens coming from Baden in the Vienna Basin and described by HOERNES & AUINGER (1891) as "*Pleurotoma* (*Clavatula*) *Susannae* nov.form.". It is evident that the specimens illustrated by FRIEDBERG (1912, Text-figs 45 and 46; Pl. 12, Figs 3a-b and 3c) are identical with the latter ones.

The present author, having at his disposal (over two thousands) much more specimens concordant with those described by FRIEDBERG, is of the opinion that the two taxa were present in the collection. A part is represented by these of smaller and more slender shells with more concave whorls and as if of a more smoother surface. When a necessity of division of the shell collection appeared, it became evident that a group of smaller and slender specimens (numbering 760) never had the above-indicated biogenic structures distinguished as *Clavatulicola evaephilus* by RADWAŃSKI & BAŁUK (1997). Another group (of 1400 specimens) was typified by such structures, recognizable in the majority of these shells. As suggested earlier by RADWAŃSKI & BAŁUK

(1997), such a high host-specifity of the gastropod commensals allows to regard the presence of their shell paradigm as species distinctive. If so, two different species should be demonstrated within those classified by FRIEDBERG (1912) as *Clavatula laevigata* (EICHWALD), the name of which having been kept by the present author to the smaller and more slender specimens. Such specimens are ideally concordant with that are illustrated by EICHWALD (1853) from the Miocene of Podolya, at present in the state of the Ukraine.The other specimens are regarded by the present author (see below) as conspecific with *Clavatula suturalis* (ANDRZEJOWSKI).

BÁLDI (1960) described from the Szokolya Clays in Hungary a separate species, *Clavatula sublaevigata* BÁLDI, based upon one specimen which seems to be identical with those from the herein presented specimens of Korytnica. This Hungarian specimen is, unfortunately, not fully grown (its dimensions: height 38.4 mm, width 15.4), and its aperture is much damaged. Such a height (38-39 mm) is quite common in the Korytnica specimens, and in ten haphazardly taken specimens the width was of similar range (15-16 mm). In the present author's opinion, a distinction of the separate species *Clavatula sublaevigata* BÁLDI is not acceptable.

The species *Clavatula laevigata* (EICHWALD, 1853), understood the same as taken by FRIEDBERG (1912, 1928, 1938), was reported from Korytnica also by KOWALEWSKI (1930).

Clavatula polonica (PUSCH, 1837)
(Pl. 1, Figs 4-8 and Pl. 2, Figs 1-8)

1837. *Pleurotoma tuberculosa* BAST. Var. *polonica*; G.G. PUSCH, p. 142, Pl. 12, Fig. 6.
1853. *Pleur. aculeata* m.; E. EICHWALD, pp. 182-183, Pl. 8, Fig. 4.
partim 1856. *Pleurotoma asperulata* LAM.; M. HÖRNES, pp. 341-342, Pl. 37, Figs 1 and 3-4; *non* Figs 2 and 5.
1891. *Pleurotoma* (*Clavatula*) *asperulata* LAMK.; R. HOERNES & M. AUINGER, pp. 343-344, Pl. 44, Fig. 5.
1912. *Clavatula asperulata* LAM.; W. FRIEDBERG, pp. 188-190, Pl. 12, Figs 1-2.
1912. *Clavatula* aff. *calcarata* GRAT.; W. FRIEDBERG, p. 197, Pl. 12, Fig. 5.
1912. *Clavatula Olgae* R. HOERN. i AUINGER var.; W. FRIEDBERG, p. 196, Pl. 12, Figs 11-12.
1931. *Clavatula asperulata* LAMARCK, var. *tortonica* nov. var.; A. PEYROT, p. 75, Pl. 5, Figs 19, 24 and 30-31.
?*partim* 1931. *Clavatula calcarata* GRATELOUP; A. PEYROT, pp. 85-87, Pl. 5, Figs 32-33; *non* Pl. 5, Fig. 6; Pl. 8, Figs 55-56.
1938. *Clavatula polonica* PUSCH; W. FRIEDBERG, p. 142.
1953. *Clavatula asperulata* (LAM.); I. CSEPREGHY-MEZNERICS, p. 9, Pl. 1, Figs 19-20.
1958. *Clavatula* (*Clavatula*) *asperulata asperulata* LAMARCK; J. ŠVAGROVSKÝ , p. 11, Pl.1, Figs 7-8.
1959. *Clavatula asperulata* (LAM.); M. EREMIJA, p. 187, Pl. 1, Figs 2-2a.
partim 1966. *Clavatula interrupta sophiae* HOERNES & AUINGER; L. STRAUSZ, p. 404, Pl. 15, Figs 7-8; *non* Figs 4-6.
partim 1966. *Clavatula asperulata* LAMARCK; L. STRAUSZ, pp. 405-406, Pl. 15, Fig. 17; ?Figs 18-19, *non* Figs 20-21.
1971. *Clavatula asperulata tortonica* PEYROT; I. CSEPREGHY-MEZNERICS, p. 32, Pl. 15, Fig. 24.
1998. *Clavatula* (*Clavatula*) *asperulata* (LAMARCK); V. MIKUŽ, p. 70, Pl.1, Figs 5-7; Pl. 2, Fig. 1.

MATERIAL: 1200 specimens.

DIMENSIONS: The largest specimen is 79 mm high and about 31 mm wide; another, completely preserved specimen (see Pl. 1, Fig. 8) is 73 mm and 33 mm, respectively.

REMARKS: The studied specimens are the most magnificant representatives of gastropods occurring in the Korytnica Clays. They are significantly common, and attain reasonably large dimensions, having been showy tidbits of the collectors since almost two centuries. This species was one of the four species recorded from herein by ZEUSCHNER (1830).

PUSCH (1837, Pl. 12, Fig. 6) was the first, who presented an adequate illustration of the species, although he supposedly understood it in a slightly wider sense, the same as subsequently did HÖRNES (1856). PUSCH (1837), who ascribed the specimens from Korytnica to the species "*Pleurotoma tuberculosa* BAST.", was aware of their distinction to the type, and thus he classified them as "Var. *polonica*". HÖRNES (1856), who personally collected specimens over the cropland of Korytnica, and had PUSCH's monograph at his disposal, determined both these and the Vienna Basin specimens as "*Pleurotoma asperulata* LAM.". This very name has long been in a common use, excepted by EICHWALD (1853), and in an earlier report by FRIEDBERG (1912), who later (FRIEDBERG 1936, 1938) accepted the name introduced by PUSCH (1837). The latter statement has certainly been inspired by PEYROT (1931), who indicated that the name *Clavatula asperulata* (LAMARCK) concerns a species whose shells are smaller, more slender, and profusely striated spirally. In consequence, FRIEDBERG (1938) supplemented his earlier description (FRIEDBERG 1912, p. 188) with a note that the last whorls of *Clavatula polonica* (PUSCH) from Korytnica are devoid of spiral striation. FRIEDBERG's (1936, 1938)

conclusion referred both to specimens from Korytnica, and to those from the Vienna Basin, having been traditionally treated as *Clavatula asperulata* (LAMARCK). Unfortunately, the subsequent authors were not familiar with FRIEDBERG's opinion or, as STRAUSZ (1966), regarded *Clavatula asperulata* differently, in a way similar to that of HÖRNES (1856).

FRIEDBERG's recognition does not concern the specimens presented by HINCULOV (1968, p. 148, Pl. 37, Figs 4-5) as *Clavatula* (*Clavatula*) *asperulata* (LAMARCK) from the Miocene of Romania. These are quite distinct from those of Korytnica, and even HINCULOV herself did not identify them with those of the Vienna Basin, and of the Aquitaine Basin.

The shells of *Clavatula polonica* (PUSCH) are much variable, primarily in their slenderness and prominence of ornamentation, the extremes of which are herein illustrated (see Pl. 1, Figs 4-8 and Pl. 2, Figs 1-8). To note, the variability range of ornamentation (and usually also its prominence) is identical in the initial 8-10 whorls of the teleoconch (see Pl. 2, Figs 1 and 2), and it is quite distinct from that of other comparable species. The ornamentation variability of *Clavatula polonica* (PUSCH) comprises also the number of spiral rows of nodes distributed along the margin of the last whorl, that ranges from 2 (see Pl. 1, Fig. 4; Pl. 2, Fig. 5) through 4 (see Pl. 2, Fig. 8), but 3 being the most common (see Pl. 1, Figs 7 and 8; Pl. 2, Figs 3 and 6). This variability range was certainly a reason why FRIEDBERG (1912) had troubles with a specific assignment of some specimens from Korytnica. In the present author's opinion, as many as 12 specimens determined by FRIEDBERG (1912) jako "*Clavatula Olgae* R. HOERN. i AUINGER var." and one specimen as "*Clavatula* aff. *calcarata* Grat." should evidently be included into *Clavatula polonica* (PUSCH). The first ones (see FRIEDBERG 1912, Pl. 12, Figs 11-12) are evidently the juveniles of the discussed species (cf. Pl. 2, Figs 2 and 4), and the last one (see FRIEDBERG 1912, Pl. 12, Fig. 5) is a specimen bearing the strongly pronounced nodes of the upper row (cf. Pl. 2, Fig. 7).

The majority of the studied shells (92%) are sculptured by the above-indicated biogenic paradigm *Clavatulicola evaephilus* RADWAŃSKI & BAŁUK, 1997, attributed to the acivity of an unknown commensal of the gastropod.

The species *Clavatula polonica* (PUSCH, 1837) was, under various names (see synonymy), reported from Korytnica by ZEUSCHNER (1830), PUSCH (1837), MURCHISON (1845), EICHWALD (1853), KONTKIEWICZ (1882), SIEMIRADZKI (1909), FRIEDBERG (1912, 1936, 1938), and KOWALEWSKI (1930). Moreover, it was also recorded by HÖRNES (1856) who noticed its significantly common occurrence at Korytnica.

Clavatula pretiosa (BELLARDI, 1847)
(Pl. 7, Fig. 6)

1877. *Pleurotoma pretiosa* BELL.; L. BELLARDI, pp. 185-186, Pl. 6, Fig. 9.

1981. *Clavatula pretiosa* (BELLARDI); E. FERRERO MORTARA & *al*., p. 78, Pl. 15, Fig. 2.

MATERIAL: One specimen.

DIMENSIONS: Height about 53 mm, width about 19 mm.

REMARKS: Although the only specimen is partly damaged at the apex and aperture, its attribution to the species *Clavatula pretiosa* (BELLARDI) described from the Miocene of northern Italy seems to be evident. Its juvenile whorls, just above the lower (anterior) suture, are adorned with a characteristic row of densely spaced, bead-like nodes. Such very row is well discernible in a picture given by BELLARDI (1877), as well as in a specimen indicated as the syntype of the species in the photograph (see FERRERO MORTARA & *al*. 1981, Pl. 10, Fig. 2).

The species *Clavatula pretiosa* (BELLARDI) was recorded from Enzesfeld in the Vienna Basin by HÖRNES (1856). Subsequently, BELLARDI (1877) himself was of the opinion that the Viennese specimens differ from the Italian ones by their ornamentation of juvenile whorls, and thus should be classified as a separate species. HOERNES & AUINGER (1891, pp. 361-362) accepted BELLARDI's statement and called the Enzesfeld specimens as "*Pleurotoma emmae* nobis"; the illustrated specimens were lacking of the row of bead-like nodes. If so, such a difference does seem to exist, although the majority of Enzesfeld specimens had the juvenile whorls damaged. HOERNES & AUINGER (1891) indicated still another feature of *Clavatula emmae*, distinctive from *Clavatula pretiosa*, namely the presence of a distinct spiral striation on the whorl surface (see HOERNES & AUINGER 1891, Pl. 48, Figs 1-3). Such a striation is, however, present in the studied specimen from Korytnica.

The species *Clavatula pretiosa* (BELLARDI, 1847) has not hitherto been known from the Miocene of Poland; the herein presented specimen has earlier been illustrated by BAŁUK & RADWAŃSKI (1996, Pl. 7, Fig.4).

Clavatula reginae (HOERNES & AUINGER, 1891)
(Pl. 4, Figs 1-5)

1891. *Pleurotoma* (*Clavatula*) *Reginae* nov.form.; R. HOERNES & M. AUINGER, pp. 335-336, Pl. 46, Figs 1-3.

MATERIAL: Eight specimens, of which 3 are in the private collection of Mr. J. GUBAŁA.

DIMENSIONS: The larger specimen (see Pl. 4, Fig. 4) is 27 mm high and 9.5 mm wide; another one (see Pl. 4, Fig. 3) is 25 mm and 10.3 mm, respectively.

REMARKS: The studied specimens are probably conspecific with those coming from Lapugy in Transylvania, upon which the species *Clavatula reginae* was established by HOERNES & AUINGER (1891) who illustrated the only three specimens they had, but which slightly differ in their slenderness and ornamentation details. The Korytnica specimens are slightly larger (the largest of Lapugy, as given by HOERNES & AUINGER, was 22 mm high and 9 mm wide), but also variable in their slenderness. The illustrated specimens (cf. Pl. 4, Figs 1-5) seem to be less distinctly ornamented, particularly as concerns the prickly nodes at the upper (posterior) suture where they are spaced more sparsely.

The species *Clavatula reginae* (HOERNES & AUINGER, 1891) has not hitherto been known from the Miocene of Poland.

Clavatula sophiae (HOERNES & AUINGER, 1891)
(Pl. 3, Figs 10-11)

1856. *Pleurotoma interrupta* BROCC.; M. HÖRNES, pp. 340-341, Pl. 36, Fig. 19.
1891. *Pleurotoma* (*Clavatula*) *Sophiae* nobis; R. HOERNES & M. AUINGER, pp. 340-341, Pl. 43, Figs 8-9.
1953. *Clavatula sophiae* HÖRNES & AUINGER; I. CSEPREGHY-MEZNERICS, p. 10, Pl. 1, Figs 21-22.
?1966. *Clavatula interrupta sophiae* HOERNES & AUINGER; L. STRAUSZ, p. 404, Pl. 15, Figs 4-8.
1970. *Clavatula* aff. *sophiae* (R. HÖRNES & AUINGER); W. BAŁUK, pp. 145-146, Pl. 13, Figs 7-8.
1998. *Clavatula* (*Clavatula*) *sophiae* (HOERNES R. & AUINGER); V. MIKUŽ, p. 75, Pl. 4, Fig. 5.

MATERIAL: Seven specimens.

DIMENSIONS: The largest specimen is 42 mm high and 17 mm wide; another one (see Pl. 3, Fig. 11) is 37.5 mm and 13.5 mm, respectively.

REMARKS: The studied specimens are supposedly concordant with those presented by HOERNES & AUINGER (1891) from Enzesfeld in the Vienna Basin. Some of them (see Pl. 3, Fig. 10) are, however, more distinctly ornamented, partlicularly by the spiral riblets running on the last whorl, below the lower (anterior) row of nodes. All specimens from Korytnica bear their outer lip striated innerly.

The species *Clavatula sophiae* (HOERNES & AUINGER, 1891) was reported from Korytnica by HÖRNES (1856) and SIEMIRADZKI (1909). In the Miocene of Poland it is also known as *affinis* from Niskowa (BAŁUK 1970).

Clavatula styriaca (HILBER, 1879)
(Pl. 6, Fig. 4)

1879. *Pleurotoma* (*Clavatula*) *styriaca* AUING. in coll.; V. HILBER, p. 19, Pl. 3, Figs 6-7.
1891. *Pleurotoma* (*Clavatula*) *styriaca* AUING.; R. HOERNES & M. AUINGER, pp. 348-349, Pl. 44, Fig. 9; Pl. 47, Figs 4-10.
non 1912. *Clavatula styriaca* AUING., var.; W. FRIEDBERG, Text-fig. 49.
non 1930. *Clavatula styriaca* AUING., var.; K. KOWALEWSKI, p. 93.
non 1970. *Clavatula styriaca* (AUINGER); W. BAŁUK, p. 119, Pl. 13, Fig. 6.
partim 1998. *Clavatula* (*Clavatula*) *styriaca* (HILBER); V. MIKUŽ, p. 73, Pl. 3, Fig. 4, *non* Fig. 3.
1998. *Clavatula* (*Clavatula*) cf. *styriaca* (HILBER); V. MIKUŽ, pp. 73-74, Pl. 4, Fig. 1.

MATERIAL: One specimen.

DIMENSIONS: Height 49 mm, width about 19 mm.

REMARKS: The studied specimen, featured by the slightly less concave whorls is regarded as concordant with *Clavatula styriaca* (AUINGER *in* HILBER) reported from Styria (Steiermark) and the Vienna Basin (HOERNES & AUINGER 1891, Pl. 47, Figs 4-10). The studied specimen from Korytnica is very close to that one coming from Soos near Baden, and which was presented by HOERNES & AUINGER (1891, Pl. 47, Fig. 8) and commented as concordant with the holotype coming from Pöls.

FRIEDBERG (1912, p. 199, Text-fig. 49) described from Korytnica quite a different specimen, classified as "*Clavatula styriaca* AUING. var.", although he hesitated to present a definite opinion. On one side, he regarded this specimen as identical (really, it is distinctly more slender) with one from Soos near Baden presented by HOERNES & AUINGER (1891, Pl. 44, Fig. 10), but on the other side, he suggested its belonging to a separate species. In the present author's collection there are sixty specimens compatible with such one as presented by FRIEDBERG (1912).

The species *Clavatula styriaca* (AUINGER *in* HILBER, 1879) has not hitherto been correctly repeted from Korytnica; the specimens referred to by SIEMIRADZKI (1909), FRIEDBERG (1912) and by KOWALEWSKI (1930), are herein excluded from that species and treated as *Clavatula kowalewskii* sp.nov.

Clavatula suturalis (ANDRZEJOWSKI, 1833)
(Pl. 8, Figs 1-8)

1833. *Pleurotoma suturalis*; A. ANDRZEJOWSKI, pp. 441-442, Pl. 13, Fig. 5.
partim 1856. *Pleurotoma asperulata* LAMK.; M. HÖRNES, pp. 341-342, Pl. 37, Fig. 2; *non* Figs 1 and 3-5.
1891. *Pleurotoma* (*Clavatula*) *Susannae* nov.form.; R. HOERNES & M. AUINGER, p. 347, Pl. 45, Figs 7-8.
1891. *Pleurotoma* (*Clavatula*) *Clarae* nov.form.; R. HOERNES & M. AUINGER, p. 342, Pl. 45, Fig. 9.
1891. *Pleurotoma* (*Clavatula*) *Rosaliae* nobis; R. HOERNES & M. AUINGER, pp. 347-348, Pl. 47, Figs 2-3.
partim 1912. *Clavatula laevigata* EICHW.; W. FRIEDBERG, pp. 191-193, Pl. 12, Fig. 3; Text-figs 45 and 46.
1928. *Clavatula laevigata* EICHW. var.; W. FRIEDBERG, pp. 569-570, Text-fig. 81.
1960. *Clavatula* (*Clavatula*) *laevigata* (EICHWALD); E. KOJUMDGIEVA, pp. 197-198, Pl. 47, Figs 7-8.
1960. *Clavatula laevigata* var. *amaliae* (HOERNES und AUINGER); E. KOJUMDGIEVA, p. 198, Pl. 47, Fig. 9.
1966. *Clavatula asperulata suturalis* ANDRZEJOWSKI; L. STRAUSZ, p. 407, Pl. 15, Fig. 22; Pl. 16, Figs 1-2.
partim 1966. *Clavatula asperulata* LAMARCK; L. STRAUSZ, pp. 405-406, Pl. 15, Figs 20-21; *non* Figs 17-19.
1971. *Clavatula asperulata susannae* HOERNES et AUINGER; I. CSEPREGHY-MEZNERICS, p. 32, Pl. 15, Figs 22-23.
?1983. *Clavatula asperulata* LAMARCK; J. MARTINELL & J. PORTA, p. 101, Pl. 1, Figs 1-3.
?1994. *Clavatula* (*Clavatula*) *rosaliae* (HOERNES, AUINGER); P.I. NIKOLOV, p. 57, Pl. 6, Figs 16-17.
1998. *Clavatula* (*Clavatula*) *asperulata* (LAMARCK); O. SCHULTZ, p. 74, Pl. 30, Fig. 1.
1998. *Clavatula* (*Clavatula*) *laevigata* (EICHWALD); V. MIKUŽ, p. 72, Pl. 3, Figs 1-2.
?*partim* 1998. *Clavatula* (*Clavatula*) *styriaca* (HILBER); V. MIKUŽ, p. 73, Pl. 3, Fig. 3, *non* Fig. 4.

MATERIAL: 1400 specimens.

DIMENSIONS: The largest specimen is 88 mm high and 31.5 mm wide.

REMARKS: The studied specimens are evidently conspecific with those coming from Baden in the Vienna Basin, which were described by HOERNES & AUINGER (1891) as *Clavatula susannae* (HOERNES & AUINGER). The authors of this species, did not inform about the size of the specimens; these illustrated (HOERNES & AUINGER 1891, Pl. 45, Figs 7-8) are slightly smaller than those from Korytnica. Nevertheless, the name *Clavatula susannae* is herein recognized as a younger synonymy of *Clavatula suturalis* introduced earlier by ANDRZEJOWSKI (1833) for specimens from Podolya. It is to note, that the specimen illustrated by ANDRZEJOWSKI (1833, Pl. 13, Fig. 5) bears the biogenic paradigm *Clavatulicola evaephilus* ascribed to the activity of gastropod commensal (RADWAŃSKI & BAŁUK 1997), which are also present in the majority of Korytnica specimens.

The species *Clavatula suturalis* (ANDRZEJOWSKI, 1833) from Korytnica was recorded under the name of *Clavatula susannae* by SIEMIRADZKI (1909), and subsequently as *Clavatula laevigata* by FRIEDBERG (1912, 1928, 1938) and KOWALEWSKI (1930).

Clavatula veronicae (HOERNES & AUINGER, 1891)
(Pl. 4, Figs 9-10)

1891. *Pleurotoma* (*Clavatula*) *Veronicae* nov.form.; R. HOERNES & M. AUINGER, pp. 351-352, Pl. 46, Figs 11-14.
1953. *Clavatula granulatocincta angelae* HÖRNES & AUINGER; I. CSEPREGHY-MEZNERICS, p. 10, Pl. 1, Figs 27-28.
1966. *Clavatula granulatocincta angelae* HOERNES & AUINGER; L. STRAUSZ, p 408, Pl. 16, Fig. 12.
1966. *Clavatula veronicae* (HOERN. et AUING.); J. KÓKAY, p. 64, Pl. 9, Fig. 17.
1994. *Clavatula Clavatula*) *granulatocincta angelae* (HOERNES, AUINGER); P.I. NIKOLOV, pp. 58-59, Pl. 7, Figs 1-3; Pl. 6, Figs 3-4).

MATERIAL: Two specimens.

DIMENSIONS:The both specimens are 30 mm high and 12.5 mm wide.

REMARKS: The studied specimens are evidently conspecific with those coming from Lapugy in Transylvania, upon which HOERNES & AUINGER (1891) established the species *Clavatula veronicae* (HOERNES & AUINGER). Their size, slenderness and ornamentation are almost identical with those of the larger specimens from Lapugy (see HOERNES & AUINGER 1891, Pl. 46, Figs 13 and 14).

Under discussion is, however, a problem their separateness from a few other, similarly shaped species. CSEPREGHY-MEZNERICS (1953), followed by STRAUSZ (1966), determined the specimens, coming from Szob, and concordant with those from Korytnica, as *Clavatula granulatocincta angelae* (HOERNES & AUINGER). The same assignment for specimens from Opanec and Bivolare in Bulgaria was given by NIKOLOV (1994), who regarded one of his specimens as a transitional form to *Clavatula granulatocincta granulatocincta* (MÜNSTER). The latter statement is not acceptable, since *Clavatula granulatocincta* (MÜNSTER) from Korytnica is well distinctive from

Clavatula veronicae, not only by its relatively shorter siphonal canal, but also by ornamentation and the shape of several (5-6) juvenile whorls. If a separateness of *Clavatula veronicae* is not accepted, then it should be indicated as the closest to *Clavatula schreibersi* (HÖRNES) rather than to *Clavatula granulatocincta* (MÜNSTER) and/or *Clavatula angelae* (HOERNES & AUINGER), what was recognized already by HOERNES & AUINGER (1891, p. 351).

The species *Clavatula veronicae* (HOERNES & AUINGER, 1891) has not hitherto been known from the Miocene of Poland.

Clavatula kowalewskii sp.nov.
(Pl. 6, Figs 5-10)

1912. *Clavatula styriaca* AUING. var.; W. FRIEDBERG, p. 199, Text-fig. 49.
1930. *Clavatula styriaca* AUING. var.; K. KOWALEWSKI, p. 93.

HOLOTYPE: The specimen (Z.PAL.U.W., No BkK-G928) presented in Pl. 6, Fig. 9.

TYPE HORIZON: Middle Miocene (Badenian).

TYPE LOCALITY: Korytnica, 24 km SSW of Kielce, southern slopes of the Holy Cross Mountains, Central Poland.

DERIVATION OF THE NAME: *kowalewskii* – in memory of Docent Kazimierz KOWALEWSKI (1894-1970), a prominent student of the Miocene fauna of Poland, the author of the classical monograph (1930) of Korytnica locality and its fossils.

DIAGNOSIS: Shell of adult whorls of the teleoconch smooth, with one row of prickly nodes just below the suture.

MATERIAL: Sixty specimens.

DIMENSIONS: The holotype is 50 mm high and 18.5 mm wide; the largest specimen (see Pl. 6, Fig. 10) is 60 mm and 21 mm, respectively.

DESCRIPTION: The shell is fusiform, slender, relatively large. The protoconch not preserved in the studied specimens. The teleoconch attains about 13, slightly concave whorls, separated by deep sutures. Ornamentation of 5-6 initial whorls consists of densely spaced sickle-shaped riblets; on 2-3 successive whorls the median parts of riblets fade gradually out, and nearby sutures there remain bead-like nodes arrayed into two spiral rows. Farther on, these rows disappear, but the upper (posterior) one is the first to vanish. The 3 or 4 final whorls are furnished, below the upper suture, with weak and/or very inconspicuous prickly nodes distributed very sparsely and irregularly. On the last whorl, at its base, there run two indistinct margins. The well preserved specimens display a delicate spiral striation on the surface of whorls, particularly of the earlier ones. The siphonal canal is relatively long and almost straight. The aperture is longitudinally oval. The outer lip sharply outlined, with a deep pleurotomal notch, and smooth innerly; the inner lip thin.

REMARKS: FRIEDBERG (1912, Text-fig. 49) reported from Korytnica one specimen, classified as "*Clavatula styriaca* AUING. var."; he paid an attention to its deviation from the indicated species. In the present author's opinion, this specimen is identical with the studied ones, and they all differ from the other species of the genus *Clavatula* distinctly, and sufficiently to separate them as a new species *Clavatula kowalewskii* sp.nov.

In his subsequent report, FRIEDBERG (1938, p. 143) when commenting *Clavatula styriaca*, reminded from Korytnica still another specimen, which was identical with that from Grund in the Vienna Basin, and classified by HOERNES & AUINGER (1891, Pl. 44, Fig. 9) as a form transitional between *Clavatula asperulata* LAMARCK and *Clavatula styriaca* AUINGER. It only may be guessed that either this was concordant with the studied specimens, or it was a specimen of *Clavatula polonica* PUSCH of extremely inconspicuous ornamentation, similar to one presented herein (see Pl. 1, Fig. 4).

KOWALEWSKI (1930), who followed FRIEDBERG (1912) in reporting "*Clavatula styriaca* AUINGER var." from Korytnica, supplemented his list with 3 specimens named as *Clavatula antoniae* (HOERNES & AUINGER). These could possibly be almost identical with the herein established *Clavatula kowalewskii* sp.nov., but slightly less slender and featured with less concave whorls. Such specimens are also kept in the present author's collection, but their relation to *Clavatula antoniae* (HOERNES & AUINGER) is evidently excluded.

All the studied specimens, classified earlier (RADWAŃSKI & BAŁUK 1997) as *Clavatula styriaca* (AUINGER *in* HILBER), bear the above-indicated biogenic paradigm of shells, the trace fossil *Clavatulicola evaephilus* RADWAŃSKI & BAŁUK, 1997, ascribed to the life activity of unknown commensals to live gastropods.

Genus *Perrona* SCHUMACHER, 1817
Subgenus *Perrona* SCHUMACHER, 1817
Perrona (*Perrona*) *descendens* (HILBER, 1879)
(Pl. 9, Figs 1-7)

partim 1856. *Pleurotoma Jouanneti* DESM.; M. HÖRNES, pp. 346-347, Pl. 38, Figs 4-6; *non* Figs 1-3.
1879. *Pleurotoma* (*Clavatula*) *descendens*; V. HILBER, p. 19, Pl. 3, Fig. 5.
1891. *Pleurotoma* (*Clavatula*) *descendens* HILB.; R. HOERNES & M. AUINGER, p. 355, Pl. 48, Figs 7-9.
1891. *Pleurotoma* (*Clavatula*) *Sabinae* nov.form.; R. HOERNES & M. AUINGER, p. 356, Pl. 48, Figs 10-11.
1912. *Clavatula Jouanneti* DESM.; W. FRIEDBERG, pp. 201-202, Pl. 13, Fig. 1; *synonim*. *excl*.
?*partim* 1931. *Clavatula* (*Perrona*) *Jouanneti* DES MOULINS; A. PEYROT, pp. 109-112, Pl. 8, Fig. 34; *non* Pl. 8, Figs 43, 61-62, 66, 71, and 99.
1960. *Clavatula* (*Perrona*) *emmae* HOERNES und AUINGER; E. KOJUMDGIEVA, p. 199, Pl. 48, Fig. 2.
1960. *Clavatula* (*Perrona*) *emmae* var. *sabinae* (HOERNES und AUINGER); E. KOJUMDGIEVA, pp. 199-200, Pl. 48, Figs 3-4.
1966. *Clavatula jouanneti descendens* HILBER; L. STRAUSZ, p. 401, Pl. 14, Figs 15-16.
1966. *Clavatula* (*Perrona*) *descendens* (HILB.); J. KÓKAY, Pl. 9, Fig. 19.
1971. *Clavatula* (*Perrona*) *jouannetti descendens* HILBER; I. CSEPREGHY-MEZNERICS, p. 32, Pl. 16, Figs 2-3.
1973. *Clavatula* (*Perrona*) *jouanneti descendens* (HILBER); M. BOHN-HAVAS, pp. 1062 and 1118, Pl. 6, Fig. 10.
1994. *Pernona* (*Perrona*) *vindobonensis* (PARTSCH *in* HÖRNES); P.I. NIKOLOV, p. 59, Pl. 6, Figs 9-10.
?1994. *Perrona* (*Perrona*) *vindobonensis nodosa* (CSEPREGHY-MEZNERICS); P.I. NIKOLOV, pp. 59-60, Pl. 6, Figs 14-15.
1998. *Perrona* (*Perrona*) *jouanneti descendens* (HILBER); O. SCHULTZ, p. 74, Pl. 30, Fig. 4.
1998. *Clavatula* (*Perrona*) *jouanneti* (DES MOULINS); V. MIKUŽ, pp. 78-79, Pl. 5, Fig. 8.
1998. *Clavatula* (*Perrona*) *sabinae* (HOERNES R. & AUINGER); V. MIKUŽ, p. 81, Pl. 6, Fig. 3.

MATERIAL: Forty-eight specimens.

DIMENSIONS: Of the two largest specimens the first is 34 mm high and 12.5 mm wide, the second is 32.5 mm and 13 mm, respectively.

REMARKS: The studied specimens are much variable, particularly in the prominence of nodes on the spiral swell running at the upper (posterior) part of the 2 or 3 last whorls. As extremes, these nodes are either very prominent and densely spaced (up to 15 on the last whorl), or merely discernible and dispersed. Variable is also the height and concavity of whorls. The majority of specimens are concordant with those reported by HOERNES & AUINGER (1891, Pl. 48, Figs 7-8) as "*Pleurotoma* (*Clavatula*) *descendens* HILB." from Grund in the Vienna Basin. At Korytnica, however, numerous are also specimens resembling those from Lapugy in Transylvania, and which HOERNES & AUINGER (1891, Pl. 48, Figs 10-11) described as "*Pleurotoma* (*Clavatula*) *Sabinae* nov.form.". In the present author's opinion such differences do not justify to create separate species.

The species *Perrona* (*Perrona*) *descendens* (HILBER, 1879) was recorded from Korytnica by HÖRNES (1856), SIEMIRADZKI (1909), FRIEDBERG (1912, 1938), and KOWALEWSKI (1930).

Perrona (*Perrona*) *czarnockii* sp.nov.
(Pl. 4, Figs 6-8)

HOLOTYPE: The specimen in the collection of the Museum of the Geological Survey of Poland, Warsaw (Catalogue No. 28.II. 179), presented in Pl. 4, Fig. 7.

TYPE HORIZON: Middle Miocene (Badenian).

TYPE LOCALITY: Korytnica, 24 km SSW of Kielce, southern slopes of the Holy Cross Mountains, Central Poland.

DERIVATION OF THE NAME: *czarnockii* – in memory of Jan CZARNOCKI (1889-1951), a prominent student of the Miocene of Poland.

DIAGNOSIS: The course of the pleurotomal notch ("anal fasciole") of fully-growth whorls shaped like a swell with numerous spiral striae beneath; a row of prickly nodes below the suture.

MATERIAL: Three specimens.

DIMENSIONS: The holotype is 37 mm high and 16 mm wide; the largest specimen, lacking juvenile whorls (see Pl. 4, Fig. 8), is 64 mm and 24 mm, respectively.

DESCRIPTION: The protoconch and juvenile whorls of the teleoconch are not preserved in the studied specimens. The earliest of the recognized whorls are adorned with a distinct ridge at the middle between the lower and upper suture. Above that ridge there runs a furrow-like depression, and just when reaching the upper suture there appears a row of densely spaced, fine nodes. The whorl surface is sculptured by very dense riblets, obliquely running below the margin. Such ornamentation continues as far as the last whorl, but the margin then changes gradually into a rodlike swell (where the growthlines mark the pleurotomal notch),

and nodes situated below the upper suture change into indistinct prickles and become more scarcely distributed (11 on the last whorl of the holotype). Below the margin in the last whorls, there run numerous thin spiral striae (numbering about 30 on the last whorl), one of which is distinctly conspicuous. The aperture is not preserved, and it may only be imagined as a *Clavatula*-like, with a long siphonal canal.

REMARKS. No forms of such sculpture have hitherto been known in the literature. The newly established species *Perrona* (*Perrona*) *czarnockii* sp.nov. is the closest to that of the specimen from Saucats (Pelona) in Aquitaine, presented by PEYROT (1931, p. 109, Pl. 6, Fig. 33) under the name of "*Clavatula* (*Perrona*) *carinifera* GRAT., var. *insolita* PEYR." which differs, however, by its complete lack of prickly nodes below the upper suture.

The Korytnica specimens vary in their apical angle, but a low number of specimens does not allow to ascertain a taxonomical significance of this feature.

Genus *Turricula* SCHUMACHER, 1817
Subgenus *Surcula* H. & A. ADAMS, 1853
Turricula (*Surcula*) *consobrina* (BELLARDI, 1877)
(Pl. 14, Fig. 3)

1856. *Pleurotoma recticosta* BELL.; M. HÖRNES, pp. 363 and 683, Pl. 52, Fig. 11.
1877. *Surcula consobrina* BELL.; L. BELLARDI, p. 73, Pl. 2, Fig. 25.
1891. *Pleurotoma* (*Surcula*) *consobrina* BELL. var.; R. HOERNES & M. AUINGER, p. 308, Pl. 38, Figs 25-30.
1960. *Surcula* (*Surcula*) *consobrina* var. *badensis* MEZNERICS; E. KOJUMDGIEVA, pp. 203-204, Pl. 48, Fig. 14.

MATERIAL: One specimen.

DIMENSIONS: Height 22.5 mm, width 6.8 mm.

REMARKS: The studied specimen is not fully grown, having been devoid of two whorls at least. Nevertheless, its conspecifity with those presented by HÖRNES (1856) from Vöslau in the Vienna Basin, and by HOERNES & AUINGER (1891) from Lapugy in Transylvania is evident. It reminds especially the more slender forms, e.g. that one from Lapugy presented by HOERNES & AUINGER (1891, Pl. 38, Fig. 26). The Korytnica specimen is also concordant, although more slender, with the syntype of BELLARDI from Stazzano (North Italy), presented in the photograph by FERRERO MORTARA & *al.* (1981, Pl. 10, Fig. 2).

A specimen from Zgłobice in the Carpathians, described by FRIEDBERG (1928, pp. 568-569, Pl. 37, Fig. 7) as "*Surcula consobrina* BELL. (?)" has a different whorl profile and shape of axial ribs; it thus cannot be identified with this species. The same concerns a specimen from Devecser in Hungary, reported by STRAUSZ (1966, pp. 416-417, Pl. 11, Fig. 5).

The species *Turricula* (*Surcula*) *consobrina* (BELLARDI, 1877) has not hitherto been known from the Miocene of Poland.

Turricula (*Surcula*) *dimidiata* (BROCCHI, 1814)
(Pl. 10, Figs 1-4)

1856. *Pleurotoma dimidiata* BROCC.; M. HÖRNES, pp. 360-361, Pl. 39, Figs 2-3.
1856. *Pleurotoma Neugeboreni* HÖRN.; M. HÖRNES, pp. 351-352, Pl. 38, Figs 12-13.
1891. *Pleurotoma* (*Surcula*) *dimidiata* BROCC.; R. HOERNES & M. AUINGER, pp. 304-305, Pl. 38, Figs 11-22.
1912. *Surcula dimidiata* BROCC. var.; W. FRIEDBERG, pp. 207-208, Pl. 13, Fig. 8.
1931. *Surcula dimidiata* BROCCHI; A. PEYROT, pp. 120-122, Pl. 6, Figs 1, 3, and 11.
1953. *Clavatula* (*Surcula*) *dimidiata* BROCCHI; I. CSEPREGHY-MEZNERICS, p. 12, Pl. 4, Figs 13-14.
1966. *Surcula dimidiata* BROCCHI; L. STRAUSZ, p. 413, Pl. 17, Figs 6-9.
1970. *Clavatula neugeboreni* M. HOERNES; I. CSEPREGHY-MEZNERICS, Pl. 3, Fig. 16.
1971. *Clavatula* (*Surcula*) *dimidiata* BROCCHI; I. CSEPREGHY-MEZNERICS, p. 32, Pl. 15, Figs 15 and 20.
1975. *Turricula* (*Surcula*) *dimidiata* (BROCCHI); E. ROBBA & F. OSTINELLI, p. 318, Pl. 48, Fig. 6.
1976. *Turricula dimidiata* (BROCCHI); E. CAPROTTI, p. 12, Pl. 17, Fig. 12.
1982. *Turricula* (*Surcula*) *dimidiata* (BROCCHI); J. MARTINELL, pp. 96-98, Pl. 1, Figs 3-4.
1983. *Pleurotoma dimidiata* (BROCCHI); J. MARTINELL & J. de PORTA, p. 101, Pl. 1, Fig. 4.
1984. *Turricula dimidiata* (BROCCHI); M. BERNASCONI & E. ROBBA, pp. 300-301, Pl. 6, Fig. 3.
1994. *Turricula* (*Surcula*) *dimidiata* (BROCCHI); P.I. NIKOLOV, pp. 60-61, Pl. 6, Figs 18-20.
1998. *Turricula* (*Surcula*) *dimidiata* (BROCCHI); O. SCHULTZ, p. 74, Pl. 30, Fig. 7.
1998. *Turris* (*Turris*) *neugeboreni* (HÖRNES); O. SCHULTZ, p. 76, Pl. 31, Fig. 3.

MATERIAL: Eighty specimens.

DIMENSIONS: The largest specimen, preserved completely, is 29.5 mm high and 10.0 mm wide; one incomplete is 11.4 mm wide.

REMARKS: The studied specimens are pronounced by their low diversity of slenderness and prominence of marginal nodes. In other classical localities, *e.g.* Soos and Portzteich in the Vienna Basin, and Lapugy in Transylvania, it is much higher, as already stated by HOERNES & AUINGER (1891, p. 304). Of these, the Korytnica specimens are fully concordant only with these the least slender ones (see HOERNES & AUINGER 1891, Pl. 38, Figs 14-15 and 19-20). BELLARDI (1877) included such specimens into his "var. *C*". At Korytnica, there is a lack of more slender specimens, having been regarded as typical. HOERNES & AUINGER (1891) showed many forms of transitional shape and regarded that variety as unjustified.

To note, none of the Korytnica specimens bears its outer lip completely preserved (that is, with the pleurotomal notch). Its location at the whorl margins is recognizable in the course of growthlines, particularly of growth stoppages.These very margins are, however, about 1 mm wide, and thus a separateness of the discussed species and *Pleurotoma neugeboreni* HÖRNES, noted i.a. from Baden and Lapugy, escapes from a distinction which was claimed so that *Turricula* (*Surcula*) *dimidiata* (BROCCHI) had a notch slightly above, and *Pleurotoma neugeboreni* HÖRNES just at the margin. HÖRNES (1856, p. 352) noted also a difference of the slenderness which, as recognized by HOERNES & AUINGER (1891), varies distinctly in the BROCCHI's species, and thus a separateness of these two species remains rather speculative. A definitive decision is premature, as the protoconch of Vienna Basin specimens has never been studied. Of the Korytnica specimens, as many as ten have their protoconch preserved. It is about 0.6 mm in diameter, having been composed of about two and half smooth whorls, and bearing its apex small and as if flattened. The protoconchs of the Korytnica specimens differ slightly from that of the specimen from Rio Torsere, Pliocene of northern Italy (cf. BERNASCONI & ROBBA 1984, Pl. 6, Figs 3a and 3b) by their diameter, number of whorls and the shape of the tip. It is not excluded that *Turricula* (*Surcula*) *dimidiata* (BROCCHI) and *Turricula neugeboreni* (HÖRNES) are really separate, and either they both, or only the second one does really occur at Korytnica.

The species *Turricula* (*Surcula*) *dimidiata* (BROCCHI, 1814) was reported from Korytnica by SIEMIRADZKI (1909), FRIEDBERG (1928, 1938) and by KOWALEWSKI (1930). In the Miocene of Poland this species is also known from Benczyn (KRACH 1950a).

Turricula (*Surcula*) *intermedia* (BRONN, 1837)
(Pl. 10, Figs 9-10)

1856. *Pleurotoma intermedia* BRONN; M. HÖRNES, p. 359, Pl. 39, Fig. 9.
1891. *Pleurotoma* (*Surcula*) *Ottiliae* nov.form.; R. HOERNES & M. AUINGER, p. 302, Pl. 38, Figs 1-3.
1912. *Surcula intermedia* BRONN; W. FRIEDBERG; pp. 208-209, Pl. 13, Fig. 9.
1960. (*Surcula*) *intermedia* (BRONN); E. KOJUMDGIEVA, pp. 204-205, Pl. 48, Figs 15-16.
1966. *Surcula intermedia* BRONN; L. STRAUSZ, pp. 415-416, Pl. 17, Fig. 13.
?1982. *Turricula* (*Surcula*) *intermedia* (BRONN): J. MARTINELL, pp. 98-99, Pl. 1, Figs 1-2.
1984. *Turricula* (*Surcula*) *intermedia* (BRONN); G. RUGGIERI & F. DAVOLI, pp. 67-68, Pl. 5, Fig. 23.
1997. *Turricola intermedia* (BRONN); C. CHIRLI; pp. 99-100, Pl. 28, Fig. 9; ?Figs 7-8.

MATERIAL: Sixteen specimens.

DIMENSIONS: The largest specimen is 39 mm high and 10.3 mm wide.

REMARKS: The studied specimens are fully concordant with those described by HOERNES & AUINGER (1891), from Baden in the Vienna Basin and from Lapugy in Transylvania as "*Pleurotoma* (*Surcula*) *Ottiliae* nov.form". It seems reasonable, however, that they do not differ substancially from the specimens of Steinebrunn, which not only HÖRNES (1856), but also HOERNES & AUINGER (1891) themselves have distinguished as a separate species, namely *Pleurotoma intermedia* BRONN. A variable shell slenderness is herein regarded as of intraspecific variability.

The species *Turricula* (*Surcula*) *intermedia* (BRONN, 1837) was reported from Korytnica by SIEMIRADZKI (1909), FRIEDBERG (1912) and KOWALEWSKI (1930).

Turricula (*Surcula*) *reevei* (BELLARDI, 1847)
(Pl. 10, Figs 5-7)

1856. *Pleurotoma Reevei* BELL.; M. HÖRNES, p. 360, Pl. 39, Figs 10-11.
1891. *Pleurotoma* (*Surcula*) *Reevei* BELL.; R. HOERNES & M. AUINGER, p. 303, Pl. 38, Figs 5-7.
1904. *Surcula Reevei* (BELL.); F. SACCO, p. 43, Pl. 11, Fig. 52.
1950. *Clavatula* (*Surcula*) *reevei* BELLARDI; I. CSEPREGHY-MEZNERICS, p. 59, Pl. 2, Fig. 16.
1955. *Surcula reevei* BELLARDI var. *buiturica* var. nov.; G. MOISESCU, pp. 169-171, Pl. 13, Fig. 24.
1960. *Surcula* (*Surcula*) *reevei* (BELLARDI); E. KOJUMDGIEVA, p. 204, Pl. 48, Fig. 17.
1966. *Surcula reevei* BELLARDI; L. STRAUSZ, p. 417, Pl. 17, Fig. 14.

1968. *Surcula* (*Surcula*) *reveei* (BELLARDI); L. HINCULOV, p. 148, Pl. 37, Fig. 8.
1982. *Surcula reevei* (BELLARDI); J. ŠVAGROVSKÝ , p. 417, Pl. 9, Fig. 4.
1994. *Turricula* (*Surcula*) *reevei buiturica* (MOISESCU); P.I. NIKOLOV; pp. 61-62, Pl. 6, Figs 5-6.

MATERIAL: Twenty specimens.

DIMENSIONS: The largest specimen, lacking the youngest whorls, is 36 mm high and 12.4 mm wide; another specimen, represented by the last whorl only, is 13.0 wide.

REMARKS: The studied specimens are fully concordant with those presented by HÖRNES (1856) from Gainfahren in the Vienna Basin. They should also be regarded as conspecific with those from Bujtur in Transylvania, reported by HOERNES & AUINGER (1891), whose illustrations display specimens of slightly lower whorls and more densely spaced axial ribs. In the present author's opinion such differences are not so significant to distinguish a separate subspecies *Turricula* (*Surcula*) *reevei buiturica* (MOISESCU). The specimen from Bujtur presented by MOISESCU (1955) as the holotype of "*Surcula reevei* BELLARDI var. *buiturica* var. nov." is quite compatible, though slightly larger, with those coming from Korytnica. It is herein important to indicate that FERRERO MORTARA & *al.* (1981, p. 63, Pl. 9, Fig. 4) illustrated as the syntype of BELLARDI's species a specimen quite dissimilar to that presented by SACCO (1904, p. 43, Pl. 11, Fig. 52), although they referenced to this very specimen(!).

The species *Turricula* (*Surcula*) *reevei* (BELLARDI, 1847) was reported from Korytnica by HÖRNES (1856) and SIEMIRADZKI (1909).

Turricula (*Surcula*) *korytnicensis* sp.nov.
(Pl. 10, Fig. 8)

partim 1891. *Pleurotoma* (*Surcula*) *Lamarcki* BELL.; R. HOERNES & M. AUINGER, p. 307, Pl. 38, Fig. 9; *non* Fig. 10.
1930. *Surcula Lamarcki* BELL.; K. KOWALEWSKI, p. 98.

HOLOTYPE: The specimen (Z.PAL.U.W., No BkK-G947), presented in Pl. 10, Fig. 8.

TYPE HORIZON: Middle Miocene (Badenian).

TYPE LOCALITY: Korytnica, 24 km SSW of Kielce, southern slopes of the Holy Cross Mountains, Central Poland.

DERIVATION OF THE NAME: *korytnicensis* – Latinized name of Korytnica.

DIAGNOSIS: Whorls strongly convex, with a slightly concave, smooth part above the margin; stria adhered to the suture very inconspicuous.

MATERIAL: One specimen.

DIMENSIONS: Height 37.0 mm, width 13.8 mm.

DESCRIPTION: Shell fusiform, weakly slender. The protoconch not preserved; the teleoconch consists of 7 whorls. The whorls are rather strongly convex, but their part above the mid-whorl margin is concave. This part above the mid-whorl margin is smooth, having only one spiral stria just at the suture, and discernible growthlines. The latter indicate the location of the pleurotomal notch, which is rather wide, with its end situated at the middle between the margin and the suture. Below the margin, as far as the lower suture, there run conspicuous, wide, rounded axial ribs (numbering 14 on the last, and 13 on the last but one whorl). Both these ribs and their interspaces are covered with spiral riblets, the three of which (one at the margin, and two directly below) are more distinct. The siphonal canal is long and almost straight, covered by spiral riblets outerly. The aperture is siphonostomous; the inner lip is very thin, the outer one not preserved.

REMARKS: The studied specimen is remarkably well compatible with that coming from Lapugy in Transylvania, and presented by HOERNES & AUINGER (1891, Pl. 38, Fig. 9) as "*Pleurotoma* (*Surcula*) *Lamarcki* BELL.". Another specimen from Korytnica, reported by KOWALEWSKI (1930) as identical with the same specimen from Lapugy, has been lost. These two specimens from Korytnica plus one from Lapugy are distinctly different from *Turricula* (*Surcula*) *Lamarcki* (BELLARDI) presented by HÖRNES (1856), FRIEDBERG (1912), CSEPREGHY-MEZNERICS (1953), KOJUMDGIEVA (1960), STRAUSZ (1966), and SCHULTZ (1998). The syntype of the species established by BELLARDI, and photographed by FERRERO MORTARA & *al*. (1981, Pl. 9, Fig. 8) is also different. STRAUSZ (1966) regarded the discussed illustration presented by HOERNES & AUINGER (1891) as erroneous ("*mala*" in Latin); this is, however, not wrong, but it displays a specimen belonging not to *Turricula* (*Surcula*) *Lamarcki* (BELLARDI), but to a separate species for whom the name *Turricula* (*Surcula*) *korytnicensis* sp.nov. is herein proposed.

Genus *Clavus* MONTFORT, 1810
Subgenus *Drillia* GRAY, 1838
Clavus (*Drillia*) *obtusangulus* (BROCCHI, 1814)
(Pl. 14, Figs 1-2)

1856. *Pleurotoma obtusangula* BROCC.; M. HÖRNES, pp. 365-366, Pl. 40, Figs 7-8.
1891. *Pleurotoma* (*Drillia*) *obtusangula* BROCC.; R. HOERNES & M. AUINGER, pp. 317-318, Pl. 40, Figs 13-20.
1904. *Drillia obtusangula* (BR.) et var. *obtusocarinata* SACC.; F. SACCO, p. 45, Pl. 12, Figs 15-18.
1937. *Drillia obtusangula* BR.; E. MONTANARO, pp. 150-151, Pl. 7, Figs 3-4.
1953. *Drillia obtusangula* BROCCHI; I. CSEPREGHY-MEZNERICS, p. 8, Pl. 1, Figs 11-14.
1954. *Clavus* (*Brachytoma*) *obtusangula* BROCCHI; M. GLIBERT, p. 25, Pl. 4, Fig. 4.
1960. *Drillia* (*Drillia*) *obtusangula* (BROCCHI); E. KOJUMDGIEVA, p. 200, Pl. 48, Fig. 5.
1966. *Drillia obtusangulus* BROCCHI; L. STRAUSZ, p. 424, Pl. 19, Figs 12 and 14.
1973. *Clavus* (*Drillia*) *obtusangulus* (BROCCHI); E. CAPROTTI & M. VESCOVI, p. 178, Pl. 2, Fig. 20.
1976. *Clavus obtusangulus* (BROCCHI); E. CAPROTTI, p. 12, Pl. 16, Fig. 20.
1997. *Clavus obtusangulus* (BROCCHI); C. CHIRLI, pp. 41-42, Pl. 11, Figs 8-10.

MATERIAL: Twelve specimens.

DIMENSIONS: The largest specimen (see Pl. 14, Fig. 1) is 12.5 mm high and 4.5 mm wide.

REMARKS: The studied specimens are fully concordant with those presented by HÖRNES (1856) and HOERNES & AUINGER (1891) from various localities in the Vienna Basin and Transylvania. Of their specimens, these from Korytnica belong to those less slender and less sculptured by axial ribs (numbering 11 on the last whorl). An accordance with the holotype photographed by PINNA & SPEZIA (1978, Pl. 38, Fig. 4) is also evident, though the holotype is still less slender (its height of 6 mm given by PINNA & SPEZIA, seems to be faulty).

The species *Clavus* (*Drillia*) *obtusangulus* (BROCCHI, 1814) has not hitherto been known from the Miocene of Poland.

Clavus (*Drillia*) *strombillus* (DUJARDIN, 1837)
(Pl. 11, Figs 1-4)

1856. *Pleurotoma strombillus* DUJ.; M. HÖRNES, pp. 379-380, Pl. 40, Figs 1-2.
1912. *Drillia strombillus* DUJ.; W. FRIEDBERG, p. 219, Pl. 13, Fig. 21.
1928. *Drillia strombillus* DUJ.; W. FRIEDBERG, p. 569, Pl. 37, Fig. 8.
1953. *Drillia strombillus* DUJ.; I. CSEPREGHY-MEZNERICS, p. 20, Pl. 1, Figs 1-4.
1954. *Pleurotomoides strombillus* DUJARDIN; M. GLIBERT, p. 56, Pl. 6, Fig. 6; Pl. 7, Figs 1*a*, *b* and *c*, *d*.
1954. *Drillia strombillus* DUJARDIN; I. CSEPREGHY-MEZNERICS, pp. 49-50, Pl. 7, Figs 18-20.
1957. *Pleurotomoides strombillus* DUJARDIN; G. ZBYSZEWSKI, p.182, Pl. 18, Fig. 193.
?1966. *Pleurotomides hordeaceus strombillus* DUJARDIN; L. STRAUSZ, pp. 436-437, Pl. 19, Fig. 13.
1998. *Pleurotomoides* (*Pleurotomoides*) *strombillus* (DUJARDIN); O. SCHULTZ, p. 76, Pl. 31, Fig. 8.

MATERIAL: Forty-five specimens.

DIMENSIONS: The largest specimen is 30.5 mm high and 12.5 mm wide; another one is 28 mm and 13 mm, respectively.

REMARKS: The studied specimens are fully concordant with those coming from the Vienna Basin and presented by HÖRNES (1856). Their variability concerns the slenderness, as it is well demonstrated by the specimens from Korytnica some of which resemble the specimen illustrated from Vöslau (see HÖRNES 1856, Pl. 40, Fig. 1), and the others do that from Steinebrunn (see HÖRNES 1856, Pl. 40, Fig. 2).

To this species the present author includes, with a hesitation, one specimen (see Pl. 11, Fig. 1) differing by its much smaller size (12.4 mm high, and 5.2 mm); this is thought to be dwarfish. A similar specimen was presented by CSEPREGHY-MEZNERICS (1953, Pl. 1, Figs 1-4) from Szob in Hungary; it is supposedly about 15 mm high, and about 6.5 mm wide (if magnification given for her Figs 3-4 is correct, and faulty for Figs 1-2). Nevertheless, another interpretation is also possible, to follow PEYROT (1931, pp. 209-212, Pl. 8, Figs 25, 27, 37) who such specimens classifies as *Mangelia* (*Clathurella*) *subcostellata* D'ORBIGNY.

The species *Clavus* (*Drillia*) *strombillus* (DUJARDIN, 1837) was reported from Korytnica by PUSCH (1837) under the name of "*Pleurotoma costellata* BAST." [as recognized by FRIEDBERG (1912)], as well as by HÖRNES (1856), KONTKIEWICZ (1882), SIEMIRADZKI (1909), FRIEDBERG (1912, 1928), and KOWALEWSKI (1930).

Genus *Gemmula* WEINKAUFF, 1876
Gemmula annae (HOERNES & AUINGER, 1891)
(Pl. 12, Figs 5-9)

1856. *Pleurotoma turricula* BROCC.; M. HÖRNES, pp. 350-351, Pl. 38, Fig. 11.
1891. *Pleurotoma Annae* nobis, *et* vars *A*, *B*; R. HOERNES & M. AUINGER, pp. 296-298, Pl. 37, Figs 17-25.

1891. *Pleurotoma Mathildae* nov.form.; R. HOERNES & M. AUINGER, p. 298, Pl. 37, Figs 26-27.
1912. *Pleurotoma Annae* R. HOERN. i AUINGER; W. FRIEDBERG, pp. 204-205, Pl. 13, Figs 4-5.
1928. *Pleurotoma Annae* R.H. i A. var. *Mathildae* R.H. & A.; W. FRIEDBERG, p. 567, Pl. 37, Fig. 4.
1953. *Turris annae* HÖRNES & AUINGER; I. CSEPREGHY-MEZNERICS, p. 14, Pl. 2, Figs 24-25.
1953. *Turris mathildae* HÖRNES & AUINGER; I. CSEPREGHY-MEZNERICS, p. 14, Pl. 2, Figs 26-27.
1960. *Pleurotoma* (*Hemipleurotoma*) *annae* HOERNES und AUINGER; E. KOJUMDGIEVA, p. 195, Pl. 46, Fig. 15.
1966. *Pleurotoma annae* HOERNES & AUINGER; L. STRAUSZ, p. 421, Pl. 18, Figs 3-5.
1966. *Pleurotoma annae mathildae* HOERNES & AUINGER; L. STRAUSZ, pp. 421-422, Pl. 18, Figs 6-9.
1998. *Gemmula* (*Hemipleurotoma?*) *annae* (HOERNES & AUINGER); O. SCHULTZ, p. 76, Pl. 31, Fig. 4.

MATERIAL: Twenty-three specimens.

DIMENSIONS: The largest specimen is 33 mm high and 10.5 mm wide.

REMARKS: The studied specimens are assigned to the species *Gemmula annae* (HOERNES & AUINGER) established for those from the Vienna Basin, although their majority are comparable to the variety (Var. A) from Baden, better than to the typical ones. The discussed species is very common in the Vienna Basin (HOERNES & AUINGER 1891, p. 297) and typically it is featured by very variable ornamentation. Moreover, HOERNES & AUINGER (1891) distinguished another species, *Gemmula mathildae*, regarded by them as conjoined (*verbunden* in German) by transitional forms. Of the Korytnica specimens, none has ornamentation such as of *Gemmula mathildae*, that is none bears the main sculptural element, the pleurotomal carina, situated in the lower (anterior) half of the whorl. FRIEDBERG (1928), who had one specimen from Korytnica, described it under the name of "*Pleurotoma Annae* R.H. i A. var. *Mathildae* R.H. i A.", and recorded this element at the middle, not in the lower part of the whorl. In the present author's opinion, these two species should be treated as one, and the specimens from Korytnica as displaying a minor spectrum of the intraspecific variability.

Still more intriguing is the fact that prior to the monographic description by HOERNES & AUINGER (1891) the specimens from the Vienna Basin were classified as *Pleurotoma turricula* (BROCCHI) by HÖRNES (1856), who included into this species also *Pleurotoma contigua* (BROCCHI). It has not been clarified whether designations by HOERNES & AUINGER (1891) are fully legitimate in the light of the Korytnica specimens resembling that one coming from Neogene of northern Italy, and indicated and photographed by PINNA & SPEZIA (1978, Pl. 37, Fig. 2) as the neotype of "*Murex contiguus* BROCCHI". A separateness of the Viennese and Italian specimens was reported by BERNASCONI & ROBBA (1984, p. 294), who stated different structure of the protoconch in *Gemmula contigua* (BROCCHI) and in *Gemmula annae* (HOERNES & AUINGER). The Viennese species was noted to have protoconch of 5 whorls, the last 1.25-2 of which were sculptured by riblets; BERNASCONI & ROBBA (1984) do not inform, however, about a locality the studied specimens of *Gemmula annae* were coming from. At Korytnica, the protoconch is preserved complete only in three specimens; it consists of 4-4.25 whorls, and the riblet-covered part is not longer that a half whorl.

The species *Gemmula annae* (HOERNES & AUINGER, 1891) was reported from Korytnica by PUSCH (1837) under the name of "*Pleurotoma contigua* (BROCCHI)", as well as by HÖRNES (1856), KONTKIEWICZ (1882), FRIEDBERG (1928), and KOWALEWSKI (1930). In the Miocene of Poland it is also known from Benczyn (KRACH 1950a).

Gemmula coronata (MÜNSTER *in* GOLDFUSS, 1843)
(Pl. 12, Figs 1-4)

1843. *Pleurotoma coronata* MÜNSTER; G. MÜNSTER *in* A. GOLDFUSS, p. 21, Pl. 171, Fig. 8.
1856. *Pleurotoma coronata* MÜNST.; M. HÖRNES, pp. 355-356 and 683, Pl. 52, Fig. 9.
1891. *Pleurotoma coronata* MÜNST. Varietas *Lapugyensis*; R. HOERNES & M. AUINGER, p. 295, Pl. 37, Figs 11-13.
1928. *Pleurotoma coronata* MÜNST.; W. FRIEDBERG, pp. 567-568, Pl. 37, Figs 5-6.
1953. *Clavatula* (*Surcula*) *coronata* (MÜNSTER); I. CSEPREGHY-MEZNERICS, p. 10, Pl. 2, Figs 9-12.
1954. *Turris* (*Gemmula*) *coronata* MÜNSTER; M. GLIBERT, pp. 7-8, Pl. 2, Fig. 4.
1960. *Pleurotoma* (*Pleurotoma*) *coronata* MÜNSTER in GOLDFUSS; E. KOJUMDGIEVA, pp. 193-194, Pl. 46, Fig. 10.
1974. *Pleurotoma coronata* MÜNST.; J. URBANIAK, p. 38, Pl. 12, Fig. 1.
1984. *Gemmula* (*Gemmula*) *denticula borealis* (GLIBERT); A.W. JANSSEN, p. 278, Pl. 11, Fig. 3; Pl. 68, Fig. 4.
non 1984. *Gemmula* (*Gemmula*) *coronata* (VON MÜNSTER); A.W. JANSSEN, p. 277, Pl. 11, Fig. 2; Pl. 68, Fig. 5.

MATERIAL: Over three hundred specimens.

DIMENSIONS: The largest specimen (see Pl. 12, Fig. 4) is 19.8 mm high and 6.8 mm wide.

REMARKS: The studied specimens are almost ideally concordant with those coming from Lapugy in Transylvania, and presented by HOERNES & AUINGER (1891) under the name of "*Pleurotoma coronata* MÜNST. var. *Lapugyensis*". They also are concordant with a specimen coming (probably!) from Vöslau in the Vienna Basin, and presented by HÖRNES (1856) whose illustration (HÖRNES 1856, Pl. 52, Fig. 9) does however not display the most important ornamentation feature, viz. the margin of the whorls. All specimens from Korytnica come from that part of the basin whose gastropod assemblage is the most similar to that of Baden in the Vienna Basin (see BAŁUK 1997, p. 49). In all the Korytnica specimens there run two spiral striae on the margin [or, as termed by HOERNES & AUINGER (1891, p. 295) a furrow runs along the mid-margin], that is in the terminology of M. HÖRNES' this should be a "*carina bifasciata*". It has long been known that in many localities of the Vienna Basin, particularly of the Baden Clays ("*badener Tegel*" in German) there occur several similar species which, as already stressed by HOERNES & AUINGER (1891, p. 294), may easily be confused. For instance, such are *Pleurotoma badensis* R. HOERNES, *Pleurotoma rotata* BROCCHI, *Pleurotoma trifasciata* M. HÖRNES, and *Pleurotoma coronata* MÜNSTER *in* GOLDFUSS. In this context, an evident misinterpretation is that claimed by STRAUSZ (1966, p. 419) that *Pleurotoma trifasciata* M. HÖRNES is identical with these described as *Pleurotoma coronata* MÜNSTER *in* GOLDFUSS, those from Korytnica (FRIEDBERG 1928) including. The diagnosis of the species *Pleurotoma trifasciata* M. HÖRNES is satisfactory clear (evident in the figure as well) and there is no reason to widen it at any extent. It may only be assumed that STRAUSZ' misinterpretation was involved by an arbitrary determination by CSEPREGHY-MEZNERICS (1953, Pl. 2, Figs 1-4) of the specimens from Szob in Hungary. STRAUSZ (1966) did not take into account the shell size, and reported for the M. HÖRNES' species height of 30-40 mm, whereas the shells of *Gemmula coronata* (MÜNSTER *in* GOLDFUSS) rarely attain over 20 mm. The species holotype, from Baden, is 16 mm high (*vide* HÖRNES 1856, p. 355); a specimen (supposedly from Vöslau), presented by HÖRNES (1856), is 22 mm high, and of over 300 specimens from Korytnica none exceeds 20 mm. STRAUSZ' (1966) opinion is obviously accepted that the whole discussed group should throughly be revised, an SEM analysis of the protoconch including.

Within the specimens illustrated by JANSSEN (1984) from the Miocene of Winterswijk-Miste in the Netherlands, concordant with these from Korytnica is undoubtedly "*Gemmula* (*Gemmula*) *denticula borealis* (GLIBERT)", whereas JANSSEN's "*Gemmula* (*Gemmula*) *coronata* (von MÜNSTER)" cannot be included to the studied species.

Of the specimens classified by MONTANARO (1939, Pl. 4, Figs 21-27) as "*Pleurotoma coronata* MÜNSTER" from the Miocene of Montegibbio none is concordant with the Viennese specimens. All these Italian specimens, in their posterior (upper) part of the whorls, bear a conspicuous, bead-like spiral which, on the contrary, is absent from all specimens of Baden, Lapugy, and of Korytnica as well.

HÖRNES (1856, p. 353), with a reference to BELLARDI (1847), reports from Korytnica an occurrence of *Pleurotoma monilis* BROCCHI (= *Pleurotoma badensis* R. HOERNES). Since that time nobody of successive collectors has found this species, what has already been commented by KOWALEWSKI (1930, p. 97). It may only be assumed, that HÖRNES had really a similarly ornamented species, just the discussed herein *Gemmula coronata* (MÜNSTER *in* GOLDFUSS).

The species *Gemmula coronata* (MÜNSTER *in* GOLDFUSS, 1843) was reported from Korytnica by FRIEDBERG (1928) and KOWALEWSKI (1930). In the Miocene of Poland it was also mentioned from Zgłobice by URBANIAK (1974).

Genus *Crassispira* SWAINSON, 1840
Crassispira obeliscus (DESMOULINS, 1842)
(Pl. 13, Figs 6-10)

1856. *Pleurotoma obeliscus* DES MOUL.; M. HÖRNES, pp. 371-372, Pl. 39, Fig. 19.
1891. *Pleurotoma* (*Drillia*) *Allionii* BELL.; R. HOERNES & M. AUINGER, pp. 315-316, Pl. 39, Figs 1-17.
1912. *Drillia Allioni* BELL.; W. FRIEDBERG, pp. 214-215, Pl. 13, Fig. 16.
1931. *Drillia* (*Crassipira*) *obeliscus* DESMOULINS; A. PEYROT, pp. 148-149, Pl. 7, Figs 59-61.
1937. *Drillia Allionii* BELL.; E. MONTANARO, p. 117, Pl. 6, Figs 50-51.
1953. *Drillia allionii* HÖRNES & AUINGER; I. CSEPREGHY-MEZNERICS, pp. 7-8, Pl. 1, Figs 9-10.
1960. *Drillia* (*Stenodrillia*) *allionii* BELLARDI; E. KOJUMDGIEVA, p. 201, Pl. 48, Fig. 6.
1966. *Drillia allionii* BELLARDI; L. STRAUSZ, pp. 422-423, Pl. 11, Figs 6-10.
1971. *Drillia* (*Stenodrillia*) *allionii* BELL.; M. EREMIJA, p. 43, Pl. 13, Figs 8-9.
1982. *Surcula consobrina badensis* (CSEPREGHY-MEZNERICS); J. ŠVAGROVSKÝ , p. 416, Pl. 9, Fig. 3.
1998. *Clavus* (*Drillia*) *allionii* BELLARDI; O. SCHULTZ, p. 74, Pl. 30, Figs 11-12.

MATERIAL: Twenty specimens.

DIMENSIONS: The largest specimen (see Pl. 13, Fig. 9) is 34 mm high and 10 mm wide.

REMARKS: The taxonomic assessment of the studied specimens yields some difficulties. Undoubtedly, they are concordant with the specimen from Saubrigues in Aquitaine, presented by PEYROT (1931) under the name of "*Drillia* (*Crassispira*) *obeliscus* (DES MOULINS)". To this very species HÖRNES (1856) assigned specimens from many localities of the Vienna Basin. Such an assignment was objected by HOERNES & AUINGER (1891) who both followed BELLARDI (1877), to classify the discussed specimens as " *Pleurotoma* (*Drillia*) *Allionii* BELL.", a species of very variable morphology; they regarded the illustration of HÖRNES (1856, Pl. 39, Fig. 19) as wrong ("*mala*" in Latin). Almost all subsequent reports on gastropods from the Paratethys basins have accepted this statement regardless an obvious fact that it was HÖRNES who was right.

Another trail of discussion was involved by BERNASCONI & ROBBA (1984) who, upon morphological studies of the protoconchs, concluded that the five closely related species from the Miocene and Pliocene of Italy, one of which was *Pleurotoma allionii* BELLARDI, represent really one species, whose priority name should be "*Pleurotoma Bellardii* DESMOULINS". If their conclusion on such a "poke" species is certainly correct, an use of the name introduced by DESMOULINS is inadequate, since it should preferably be ascribed to specimens from the type locality (Saubrigues in Aquitaine); neither topotype material, nor DESMOULINS' paper were analysed by BERNASCONI & ROBBA (1984). Moreover, DESMOULINS (*fide* PEYROT 1931) described from Saubrigues two similar species, *Pleurotoma obeliscus* and *Pleurotoma bellardii*, of which the first has not been studied by BERNASCONI & ROBBA (1984) who abstained from discussion because they had "no shell material at hand". A relation of these two species established by DESMOULINS remains therefore still unclear and requires a further study. It may only be assumed, when based on description and photos reported by PEYROT (1931), that these two species do not differ sufficiently to be treated as separate. If so, it is herein advocate consequently, that the priority name is *Pleurotoma obeliscus* used by DESMOULINS on an earlier page of the same paper (*vide* PEYROT 1931). Finally, it is to indicate that several specimens from Korytnica bear their protoconch preserved; both its size and sculpture are well compatible with these presented by BERNASCONI & ROBBA (1984, Pl. 7, Figs 3a, 4 and 5) in *Stenodrillia bellardii* (DESMOULINS).

The species *Crassispira obeliscus* (DESMOULINS, 1842) has not hitherto been known from Korytnica. In the Miocene of Poland it was mentioned under the name of "*Drillia allioni*" from Benczyn (KRACH 1950a), and Grudna Dolna by UHLIG (*fide* FRIEDBERG 1912), as well as from the vicinity of Miechów (KRACH 1947).

Crassispira pustulata (BROCCHI, 1814)
(Pl. 13, Figs 1-5)

1837. *Pleurotoma pustulata* BRONN u. BROCCHI, var.; G.G. PUSCH, pp. 143-144, Pl. 12, Fig. 9.
1856. *Pleurotoma pustulata* BROCC.; M. HÖRNES, pp. 369-370, Pl. 39, Fig. 21.
1891. *Pleurotoma* (*Drillia*) *pustulata* BROCC. var.; R. HOERNES & M. AUINGER, pp. 319-320, Pl. 40, Figs 1-12.
1912. *Drillia pustulata* BROCC.; W. FRIEDBERG, pp. 215-217, Pl. 13, Fig. 17.
1931. *Drillia* (*Crassipira*) *pustulata* BROCCHI; A. PEYROT, pp. 154-156, Pl. 7, Figs 92-94.
1954. *Drillia pustulata* BROCCHI; I. CSEPREGHY-MEZNERICS, p. 50, Pl. 6, Figs 22-23 and 28-29.
1955. *Drillia augustae* R. HÖRNES und AUINGER; G. MOISESCU, pp. 166-168, Pl. 13, Figs 20-23.
1958. *Clavus* (*Crassispira*) *pustulatus* (BROCCHI); J. ŠVAGROVSKÝ, pp. 23-24, Pl. 7, Figs 6-13.
1959. *Clavatula augustae* R. HOERN. et AUING.; M. EREMIJA, p. 187, Pl. 1, Fig. 8.
1960. *Drillia pustulata* (BROCCHI); E. KOJUMDGIEVA, p. 202, Pl. 48, Fig. 10.
1966. *Drillia pustulata* BROCCHI; L. STRAUSZ, pp. 424-425, Pl. 19, Fig. 9.
?1968. *Drillia* (*Drillia*) *rotundicosta crassicostata* (SACCO); L. HINCULOV, pp. 148-149, Pl. 37, Fig. 9.
1970. *Clavus* (*Crassispira*) *pustulatus* (BROCCHI); W. BAŁUK, p. 119, Pl. 13, Fig. 10.
1973. *Clavus pustulatus* (BROCCHI); M. BOHN-HAVAS, p. 1065, Pl. 6, Fig. 6.
?1982. *Drillia augustae* (R. HOERNES et M. AUINGER); J. ŠVAGROVSKÝ , pp. 409-410, Pl. 10, Fig. 1.
1984. *Crassispira* (*Crassispira*) *pustulata* (BROCCHI); G. RUGGIERI & F. DAVOLI, p. 69, Pl. 5, Figs 5-9.
1990. *Crassispira* (*Crassispira*) *pustulata* (BROCCHI); F. DAVOLI, pp. 91-92, Pl. 8, Figs 22-23; Pl. 9, Figs 2-7.
1994. *Clavatula* sp.; B. IONESI & E. NICORICI, Pl. 3, Figs 21-22.
1998. *Clavus* (*Drillia*) *pustulatus* (BROCCHI); O. SCHULTZ, p. 74, Pl. 30, Fig. 10.
1998. *Drillia pustulata* (BROCCHI); V. MIKUŽ, pp. 67-68, Pl. 1, Fig. 1.

MATERIAL: Thirty-two specimens.

DIMENSIONS: The four largest specimens are 25.5, 23.5, 22.0, or 21.5 mm high, and 8.2, 8.0, 8.6, or 7.7 mm wide, respectively.

REMARKS: The studied specimens are evidently concordant with all those commonly known (see synonymy) from Miocene sequences of the Paratethys and classified as *Crassispira pustulata* (BROCCHI). The shells of this

species are very variable, especially in their size and ornamentation details, as demonstrated e.g. by HOERNES & AUINGER (1891) and STRAUSZ (1966).

Under discussion, however, remains the problem of identity of the specimens from the Vienna Basin and from the northern Italy, studied already by HOERNES & AUINGER (1891) who regarded the Viennese specimens as of an unnamed variety (*varietas*). The Italian specimens are really slightly different from those of the Vienna Basin and, thereby, also from these of Korytnica. Those from northern Italy differ in their ornamentation of the last whorl, and this concerns also the holotype of the species, photographed by PINNA & SPEZIA (1978, Pl. 41, Fig. 3). Recently, of the Italian authors it has been DAVOLI (1990) who recognized his specimens as concordant with those herein studied from Korytnica.

The present author includes into the discussed species the specimens which MOISESCU (1955), from Bujtur in Transylvania, and EREMIJA (1959), from Klašnić in Croatia, described as *Drillia augustae*, or as *Clavatula augustae* (HOERNES & AUINGER), respectively. Both the size and ornamentation (shape and the number of axial ribs) suggest their erroneous assignment.

The species *Crassispira pustulata* (BROCCHI, 1814) was recorded from Korytnica by PUSCH (1837), EICHWALD (1853), HÖRNES (1856), SIEMIRADZKI (1909), FRIEDBERG (1912), and KOWALEWSKI (1930). In the Miocene of Poland, it is also known from Benczyn (KRACH 1950*a*), Niskowa (FRIEDBERG 1912, 1938; SKOCZYLASÓWNA 1930; BAŁUK 1970), and Grudna Dolna (UHLIG, *fide* FRIEDBERG 1912). A report by URBANIAK (1974, Pl. 12, Fig. 9) from Zgłobice cannot be confirmed as the state of preservation of the illustrated specimen is too inferior.

Genus *Miraclathurella* WOODRING, 1928
Miraclathurella granaria (DUJARDIN, 1837)
(Pl. 11, Figs 5-8)

1856. *Pleurotoma granaria* DUJ.; M. HÖRNES, pp. 382-389, Pl. 40, Fig. 10.
1877. *Drillia Matheroni* BELL.; L. BELLARDI, p. 117, Pl. 4, Fig. 5.
1891. *Pleurotoma* (*Drillia*) *granaria* DUJ.; R. HOERNES & M. AUINGER, pp. 321-322, Pl. 41, Figs 14-20.
1912. *Drillia granaria* DUJ.; W. FRIEDBERG, pp. 217-218, Pl. 13, Figs 18-19.
1931. *Drillia* (*Crassipira*) *granaria* DUJARDIN; A. PEYROT, pp. 162-163, Pl. 9, Fig. 33; Pl. 10,Figs 45-47.
1953. *Drillia granaria szobensis* n.subsp.; I. CSEPREGHY-MEZNERICS, pp. 8-9, Pl. 1, Figs 15-16.
1954. *Clavus* (*Crassispira*) *granaria* DUJARDIN; M. GLIBERT, p. 31, Pl. 5, Figs 1*a*, *b*.
1960. *Drillia* (*Stenodrillia*) *granaria* (DUJARDIN); E. KOJUMDGIEVA, pp. 201-202, Pl. 48, Figs 8-9.
1966. *Drillia granaria szobensis* CSEPREGHY-MEZNERICS; L. STRAUSZ, p. 425, Pl. 19, Fig. 10.
1966. *Drillia* (*Stenodrillia*) *granaria* DUJ.; J. KÓKAY, Pl. 9, Fig. 13.
1981. *Drillia matheroni* BELLARDI; E. FERRERO MORTARA & *al.*, p. 71, Pl. 11, Fig. 11.
1984. *Miraclathurella matheroni* (BELLARDI); M.P. BERNASCONI & E. ROBBA, pp. 317-319, Pl. 8, Figs 4-5.
1997. *Miraclathurella matheroni* (BELLARDI); C. CHIRLI, pp. 38-39, Pl. 10, Figs 8-10.

MATERIAL: A hundred and eighty specimens.

DIMENSIONS: The largest specimen (see Pl. 11, Fig. 7) is 11 mm high and 4.3 mm wide.

REMARKS: The studied specimens are concordant with those described and commented by HOERNES & AUINGER (1891, p. 322), who stated that in some localities of the Vienna Basin *Pleurotoma granaria* DUJARDIN is common (e.g. at Forchtenau, Niederleis) and typically very variable. This variability concerns generally their ornamentation, and particularly the shape of axial ribs, which range from narrow, but numerous on the whorl to those rather scarce and broad. HOERNES & AUINGER did not indicate definite numbers of these ribs, but the illustrated forms (HOERNES & AUINGER 1891, Pl. 41, Figs 14-20) are evidently identical with these from Korytnica, in which the number of axial ribs on the last but one whorl ranges between 9 and 14. From localities of other countries, this number is reported usually as 12 (FRIEDBERG 1912, Pl. 13, Fig. 19; PEYROT 1931), and maximally as 16 (FRIEDBERG 1912, Pl. 13, Fig. 18); a specimen with extremely numerous axial ribs (not counted) was also presented by GLIBERT (1954) from Ferriere-Larćon in the Loire Basin. Consequently, in the present author's opinion unjustifiable is a treatment by CSEPREGHY-MEZNERICS (1953) who established, upon one unique specimen from Szob in Hungary, a separate subspecies *Drillia granaria szobensis* CSEPREGHY-MEZNERICS diagnosed solely on broad and not numerous ribs, numbering 8 according to STRAUSZ (1966).

The studied specimens from Korytnica are also concordant with those coming from the Neogene of North Italy, and presented by BELLARDI (1877), BERNASCONI & ROBBA (1984), and CHIRLI (1997) under the name "*Drillia matheroni* BELLARDI 1877". They are of identical size and ornamentation of the protoconch, and they always bear two spiral cords at the front of the first teleoconch whorl. To note, BERNASCONI & ROBBA (1984, p. 319) considered *Pleurotoma granaria* DUJARDIN, 1837, and *Drillia matheroni* BELLARDI, 1877, to be closely

related species, but they did not know the protoconch of the former.

The species *Miraclathurela granaria* (DUJARDIN, 1837) has not hitherto been known from the Miocene of Poland. The specimens described by FRIEDBERG (1912) were coming from localities Dryszczów and Zborów, at present in the Ukraine.

Genus *Haedropleura* BUCQUOY, DAUTZENBERG & DOLLFUS, 1882

Haedropleura adami (FRIEDBERG, 1912)
(Pl. 15, Figs 1-3)

1912. *Raphitoma Adami* FRIEDB.; W. FRIEDBERG, p. 239, Pl. 14, Fig. 22.
1938. *Bela septangularis* MONT.; W. FRIEDBERG, p. 147.
non 1960. *Raphitoma adami* FRIEDBERG; G. RADO, p. 104, Pl. 2, Fig. 2.

MATERIAL: Fifteen specimens.

DIMENSIONS: The largest specimen is 6.7 mm high and 2.7 mm wide.

REMARKS: The studied specimens are concordant with those coming from the locality Zborów (at present, in the state of the Ukraine), for which FRIEDBERG (1912) established the species *Raphitoma adami*. The present author convinced this when comparing the specimens with Korytnica from topotypes kept at the Museum of the Polish Academy of Sciences in Cracow (Collection: ZGN PAN A-I-50). Subsequently, FRIEDBERG (1938) recognized that his species is identical with *Bela septangularis* (MONTAGU). As concerns this very assignment, the present author claims serious doubts as the Korytnica specimens (and these from Zborów) differ more or less distinctly from those presented in the literature, *e.g.* by SACCO (1904, p. 47, Pl. 12, Figs 51-52), PEYROT (1931, pp. 176-177, Pl. 9, Figs 65-67), GLIBERT (1954, pp. 52-53, Figs 12*a* and 12*b*), and by STRAUSZ (1966, p. 434, Pl. 20, Figs 3-4). The Korytnica specimens are less slender, with usually 8 (rarely 9) axial ribs on the last, and 9 (rarely 8 or 10) on the last but one whorl; all these ribs usually do not locate one above the other. On the last whorl, associated with a varix at the outer lip, there may also appear one or two accessory varices. Consequently, the present author accepts herein an earlier FRIEDBERG's designation.

Supposedly, an allied species is *Haedropleura secalima* (PHILIPPI, 1844) to which assigned were the specimens presented from the Neogene of North Italy, for instance by BERNASCONI & ROBBA (1984, pp. 279-281, Pl. 3, Fig. 2) and CHIRLI (1997, pp. 36-37, Pl. 9, Figs 10-12). When compared to the Korytnica specimens, those from Italy bear slightly more densely spaced axial ribs (10 per whorl). The Italian specimens vary in the structure of their protoconch: according to BERNASCONI & ROBBA (1984), the protoconch consists of 3.25 whorls, but CHIRLI (1997) report only 1.5. Of the photographed specimens from Korytnica only one (Pl. 15, Fig. 1) bears its protoconch completly preserved; it is identical with that of a Lower Pliocene specimen from Rio Torsero (see BERNASCONI & ROBBA (1984, Pl. 3, Fig. 2).

The species *Haedropleura adami* (FRIEDBERG, 1912) has not hitherto been known from the Miocene of Poland.

Haedropleura avenacea BOETTGER, 1906
(Pl. 14, Figs 4-6)

1906. *Haedropleura avenacea* n.sp.; O. BOETTGER, p. 60.
1934. *Haedropleura avenacea* BOETTGER; A. ZILCH, p. 262, Pl. 18, Fig. 35.

MATERIAL: One hundred and ten specimens.

DIMENSIONS: The largest specimen (see Pl. 14, Fig. 5) is 8.5 mm high and 3.6 mm wide.

REMARKS: The studied specimens, quite common at Korytnica, seem to be conspecific with those described by BOETTGER (1906) from Kostej, Lapugy, and Bujtur in Transylvania. Commented should only be the size of specimens from Korytnica, where numerous are such ones as noted by BOETTGER (that is, up to 5-6 mm high and 2-2.5 mm wide), but these much larger ones (up to 8.5 mm high) are also present; and they are generally more slender than the lectotype presented by ZILCH (1934). Such larger specimens resemble those from Stazzano in northern Italy, presented by SACCO (1904, p. 47, Pl. 12, Figs 53-54) under the name of "*Bela* (*Haedropleura*) *septangularis* var. *parvulata* SACC."

The species *Haedropleura avenacea* BOETTGER, 1906, has not hitherto been known from the Miocene of Poland.

Haedropleura cristallina BOETTGER, 1906
(Pl. 15, Figs 4-6)

1906. *Haedropleura cristallina* n.sp.; O. BOETTGER, p. 59.
1934. *Haedropleura cristallina* BOETTGER; A. ZILCH, p. 262, Pl. 18, Fig. 34.
?1969. *Haedropheura cristallina* BOETTGER; M. ATANACKOVIĆ, p. 213, Pl. 12, Fig. 7.

MATERIAL: Fourteen specimens.

DIMENSIONS: The largest specimen (see Pl. 15, Fig. 6) is 6.5 mm high and 3.0 mm wide.

REMARKS: The taxonomic assessment of the studied specimens yields some difficulties.They seem to be conspecific with those described by BOETTGER (1906) from Kostej in Transylvania, as they also bear 7-8 axial ribs and usually two (exceptionally even 3) varices on the last whorl, and are lustrous. Their whorls, however, are more convex and not smooth, but delicately grooved spirally. These features make the specimens from Korytnica similar to another species from Kostej, namely *Haedropleura corae* BOETTGER, the axial ribs of which are, however, more densely spaced (numbering 11-12 plus a wide varix), according to BOETTGER (1906).

An assignment of the Miocene specimens from Bosna, presented by ATANACKOVIĆ (1969) is not quite evident as their state of preservation is very inferior.

The species *Haedropleura cristallina* BOETTGER, 1906, has not hitherto been known from the Miocene of Poland.

Haedropleura etelkae (BOETTGER, 1901)
(Pl. 14, Figs 7-8)

1901. *Drillia* (*Haedropleura*) *etelkae* n.sp.; O. BOETTGER, pp. 45-46.
1906. *Haedropleura etelkae* BTTGR.; O. BOETTGER, p. 57.
1934. *Haedropleura etelkae* (BOETTGER); A. ZILCH, p. 261, Pl. 18, Fig. 30.

MATERIAL: Thirty specimens.

DIMENSIONS: The largest specimen (see Pl. 14, Fig. 8) is 7.8 mm high and 3.4 mm wide.

REMARKS: The studied specimens are concordant with those described by BOETTGER (1901) from Kostej in Transylvania. The number of axial ribs on the last whorl in the specimens from Korytnica ranges from 10 to 12 associated with a prominent varix, although some specimens bear two, and exceptionally (on one specimen) even three varices on the last whorl.

The species *Haedropleura etelkae* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

Haedropleura pseudosigmoidea (BOETTGER, 1901)
(Pl. 15, Figs 7-9)

1901. *Drillia* (*Haedropleura*) *pseudosigmoidea* n.sp.; O. BOETTGER, p. 46.
1906. *Haedropleura pseudosigmoidea* BTTGR.; O. BOETTGER, p. 59.
1934. *Haedropleura pseudosigmoidea* (BOETTGER); A. ZILCH, p. 262, Pl. 18, Fig. 33.
1997. *Cerodrilla exigua* DELLA BELLA & TABANELLI; C. CHIRLI, p. 41, Pl. 11, Figs 6-7.

MATERIAL: Eight specimens.

DIMENSIONS: The largest specimen (see Pl. 15, Fig. 7) is 8.5 mm high and 3.3 mm wide.

REMARKS: The studied specimens seem to be concordant with those described by BOETTGER (1906) from Kostej in Transylvania. They also bear rather weakly developed axial ribs, numbering 7-9 on the last whorl, although a figure of 8-9 was noted by BOETTGER (1906). In the present author's opinion, the Korytnica specimens are identical with those presented by CHIRLI (1997) under the name *Cerodrilla exigua* DELLA BELLA & TABANELLI, 1990 from the Pliocene of Toscania; they are thereby treated herein as conspecific with BOETTGER's species.

The species *Haedropleura pseudosigmoidea* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

? *Haedropleura* sp.
(Pl. 14, Fig. 9)

MATERIAL: One specimen.

DIMENSIONS: Height about 7.2 mm, width about 3.4 mm.

REMARKS: The studied specimen is evidently different from all the studied forms and even its generic assignment remains unclear. Its aperture is damaged, and thus one cannot ascertain whether it is fully grown. It reminds, to some extent, the above-discussed *Haedropleura etelkae* (BOETTGER), but its axial ribs are more sparse (8 on the last whorl). On the other hand, it is similar to a form of much larger size (height 20 mm), *Daphnella* (*Raphitoma*) *mutabilis* MAYER presented by PEYROT (1931, pp. 250-251, Pl. 9, Figs 71-73) from the Miocene of Aquitaine. Not excluded is also a possibility of its separateness at the species level, that is of the representing a species new to science.

Genus *Asthenotoma* HARRIS & BURROWS, 1891
Asthenotoma festiva (HÖRNES, 1856)
(Pl. 16, Figs 1-6)

1856. *Pleurotoma festiva* DODERLEIN; M. HÖRNES, pp. 337-338, Pl. 36, Fig. 15.
1891. *Pleurotoma* (*Oligotoma*) *pannus* BAST.; R. HOERNES & M. AUINGER, pp. 381-382.
1912. *Asthenotoma pannus* BAST.; W. FRIEDBERG, pp. 220-221, Pl. 14, Fig. 1.
1953. *Asthenotoma pannus* BAST.; I. CSEPREGHY-MEZNERICS, p. 15, Pl. 3, Figs 3-7.
1954. *Asthenotoma festiva* HÖRNES; M. GLIBERT, pp. 36-37, Pl. 5, Fig. 9.
1958. *Asthenotoma* (*Asthenotoma*) *pannus* (BASTEROT); J. ŠVAGROVSKÝ, pp. 8-9, Pl. 1, Fig. 1.
1969. *Asthenotoma heckeli* (M. HÖRNES); M. ATANACKOVIĆ, p. 210, Pl. 12, Figs 1-3.
1982. *Astenotoma festiva* (M. HOERNES); J. ŠVAGROVSKÝ, pp. 411-412, Pl. 11, Fig. 1.
1984. *Asthenotoma* (s.lat.) *festiva* (HOERNES); A.W. JANSSEN, pp. 293-294, Pl. 12, Fig. 6; Pl. 70, Fig. 6.
1997. *Asthenotoma festiva* (HÖRNES); R. GATTO, pp. 42-45, Pl. 1, Figs 9-10; Pl. 2, Figs 1-7.
1998. *Asthenotoma festiva* (HÖRNES); O. SCHULTZ, p. 76, Pl. 31, Fig. 6.

MATERIAL: Seventy specimens.

DIMENSIONS: The largest specimen is 21.5 mm high and 6.7 mm wide.

REMARKS: The studied specimens are evidently conspecific with those coming from several localities in the Vienna Basin, and described by HÖRNES (1856) under the name of "*Pleurotoma festiva* DODERLEIN". This conspecifity was already stressed by FRIEDBERG (1912), who followed BELLARDI (1877) and HOERNES & AUINGER (1891), however, with an use of the name, *Asthenotoma pannus* BASTEROT, the first one treated as synonymous. Recently, GATTO (1997) indicated that the Viennese specimens are not conspecific with those from Salles in Aquitaine, and concisely discussed this nomenclatorial misunderstanding to advocate M. HÖRNES as the creator of the species (as already given earlier by GLIBERT 1954).

The species *Asthenotoma festiva* (HÖRNES, 1856) was reported from Korytnica, under the name of *Asthenotoma pannus*, by FRIEDBERG (1912, 1938). In the Miocene of Poland it is also known from Małoszów (KRACH 1947), Rybnica (KOWALEWSKI 1930, 1950), and Nawodzice (BAŁUK & RADWAŃSKI 1968).

Asthenotoma tuberculata (PUSCH, 1837)
(Pl. 16, Figs 7-10)

1837. *Pleurotoma tuberculata* m.; G.G. PUSCH, p. 143, Pl. 12, Fig. 2.
1856. *Pleurotoma Heckeli* HÖRN.: M. HÖRNES, p. 371, Pl. 39, Fig. 20.
1891. *Pleurotoma* (*Oligotoma*) *Heckeli* R. HOERNES & M. AUINGER, p. 382, Pl. 50, Figs 25-26.
1912. *Asthenotoma Heckeli* HOERN.; W. FRIEDBERG, pp. 222-223, Pl. 14, Figs 3-4.
1990. *Asthenotoma tuberculata* (PUSCH); R. GATTO, Fig. 4.
1997. *Asthenotoma tuberculata* (PUSCH); R. GATTO, pp. 39-40, Pl. 1, Figs 1-8; Pl. 7, Fig. 1.

MATERIAL: Fifteen specimens

DIMENSIONS: The largest specimen is 28.5 mm high and 9.7 mm wide.

REMARKS: An accordance of specimens from Korytnica, first described by PUSCH (1837) as *Pleurotoma tuberculata* PUSCH, with those from various localities of the Vienna Basin and Transylvania, classified by HÖRNES (1856) as *Pleurotoma heckeli* HÖRNES is undoubted (cf. *also* GATTO 1990, Fig. 4; 1997, Pl. 1, Figs 1-6). A high similarity of these two taxa was claimed already by HÖRNES (1856) and HOERNES & AUINGER (1891), who were not able to state definitely their identity (possibly, because a poor illustration by PUSCH). This species established by PUSCH has often been identified (BELLARDI 1877, SACCO 1904, MONTANARO 1937) with *Pleurotoma meneghini* MAYER occurring in the Miocene of Montegibbio in Italy, and which has recently been documented by GATTO (1990) to be distinctly separate. Nevertheless, in the Miocene of northern Italy the PUSCH's species is also present, as evidenced subsequently by GATTO (1997, Pl. 1, Figs 7-8) who illustrated two specimens of *Asthenotoma tuberculata* (PUSCH) coming from the Miocene of Stazzano.

The present author has formerly (BAŁUK 1975, p. 13) regarded the name *tuberculata* PUSCH as being a *nomen oblitum*; GATTO (1990, p. 223) indicated that it is not so, and PUSCH's name fulfils the ICZN rules.

The species *Asthenotoma tuberculata* (PUSCH, 1837) was established just upon the specimens from Korytnica, where its occurrence was also noted by SIEMIRADZKI (1909), FRIEDBERG (1912, 1938) and by KOWALEWSKI (1930).

Genus *Microdrillia* CASEY, 1903
Microdrillia crispata (DE CRISTOFORI & JAN, 1832)
(Pl. 17, Figs 5-7)

1856. *Pleurotoma crispata* JAN; M. HÖRNES, pp. 367-368, Pl. 39, Fig. 13.
1891. *Pleurotoma* (*Drillia*) *crispata* JAN; R. HOERNES & M. AUINGER, pp. 324-325, Pl. 42, Figs 7-10.

1931. *Drillia* (*Crassipira*) *crispata* JAN; A. PEYROT, pp. 163-165, Pl. 7, Figs 32-34.
1937. *Drillia* (*Crassispira*) *crispata* (JAN) *in* BELL.; E. MONTANARO, pp. 127-128, Pl. 7, Figs 33-34.
1938. *Drillia crispata* JAN; W. FRIEDBERG, p. 146, Text-fig. 47.
1960. *Drillia*? *crispata* JAN; E. KOJUMDGIEVA, p. 202, Pl. 48, Fig. 11.
1968. *Microdrillia crispata* (JAN); E. ROBBA, pp. 595-597, Pl. 45, Fig. 8.
1973. *Microdrillia* (*Microdrilia*) *crispata* (DE CRISTOFORI & JAN); E. CAPROTTI & M. VESCOVI, p. 179, Pl. 3, Fig. 15.
1976. *Microdrillia crispata* (DE CRISTOFORI & JAN); E. CAPROTTI, p. 12, Pl. 17, Fig. 15.
1984. *Microdrillia crispata* (DE CRISTOFORI and JAN); M. BERNASCONI & E. ROBBA, pp. 268-270, Pl. 1, Figs 5-6.
1997. *Microdrilla crispata* (DE CRISTOFORI & JAN); C. CHIRLI, pp. 28-29, Pl. 7, Figs 11-12; Pl. 8, Figs 1-2.

MATERIAL: A hundred and thirty-seven specimens.

DIMENSIONS: The largest specimen is 12 mm high and 4.4 mm wide.

REMARKS: The studied specimens are evidently concordant both with these coming from the realm of the Paratethys basins (HOERNES & AUINGER 1891, GATTO 1992), as well with those from Neogene of northern Italy (BELLARDI 1877, MONTANARO 1937) and Aquitaine (PEYROT 1931). Within specimens from Korytnica the protoconch has fully been preserved in 40 shells, having been well comparable, although slightly slender, with that presented by BERNASCONI & ROBBA (1984). The peripheral carina on the teleoconch in all specimens from Korytnica is ideally smooth, devoid any knobs. In this feature the Korytnica specimens are concordant with that one from the Pliocene of Fornaci, but they differ from another one, coming from the Miocene of S. Agata Fossili, both from northern Italy (see BERNASCONI & ROBBA 1984, Pl. 1, Figs 5b and 6b).

The species *Microdrillia crispata* (DE CRISTOFORI & JAN, 1832) was reported from Korytnica by FRIEDBERG (1938) only. In the Miocene of Poland it is also known from Benczyn (KRACH 1950a).

Genus *Bathytoma* HARRIS & BURROWS, 1891
Bathytoma cataphracta (BROCCHI, 1814)
(Pl. 17, Figs 2-4)

1856. *Pleurotoma cataphracta* BROCC.; M. HÖRNES, pp. 333-335, Pl. 36, Figs 5-9.
1891. *Pleurotoma* (*Dolichotoma*) *cataphracta* BROCCH.; R. HOERNES & M. AUINGER, pp. 379-380, Pl. 50, Figs 15-24.
1912. *Bathytoma cataphracta* BROCC.; W. FRIEDBERG, pp. 224-225, Pl. 14, Fig. 5.
1931. *Bathytoma cataphracta* BROCCHI, var. *dertogranosa* SACCO; A. PEYROT, pp.182-184, Pl. 8, Figs 45-47.
1937. *Bathytoma cataphracta* (BR.) et var. ; E. MONTANARO, pp. 132-134, Pl. 7, Figs 51-60.
1938. *Bathytoma cataphracta* BROCC.; W. FRIEDBERG, p. 147.
1953. *Moniliopsis* (*Bathytoma*) *cataphracta orientalis* (SACCO); E. KOJUMDGIEVA, pp. 196-197, Pl. 47, Figs 4-5.
?1956. *Bathytoma cataphracta* (BROCCHI); L. BANKE RASMUSSEN, p. 91, Pl. 9, Fig. 3.
1960. *Bathytoma* (*Bathytoma*) *cataphracta* var. *dertogranosa* SACCO; E. KOJUMDGIEVA, p. 196, Pl. 47, Figs 4-5.
1960. *Bathytoma* (*Bathytoma*) *cataphracta* var. *orientalis* MEZNERICS; E. KOJUMDGIEVA, p. 197, Pl. 47, Fig. 6.
1973. *Epalxis* (*Bathytoma*) *cataphracta* (BROCCHI); E. CAPROTTI & M. VESCOVI, p. 180, Pl. 3, Fig. 19.
1976. *Epalxis cataphracta* (BROCCHI); E. CAPROTTI, p. 12, Pl. 17, Fig. 19.
1984. *Epalxis* (*Bathytoma*) *cataphracta* (BROCCHI); G. RUGGIERI & F. DAVOLI, pp. 69-70, Pl. 4, Fig. 24.
1984. *Bathytoma cataphracta* (BROCCHI); M. BERNASCONI & E. ROBBA, pp. 297-299, Pl. 6, Figs 1-2.
1990. *Bathytoma cataphracta* (BROCCHI); F. DAVOLI, pp. 96-97, Pl. 8, Fig. 25.
1997. *Bathytoma cataphracta* (BROCCHI); C. CHIRLI, pp. 33-34, Pl. 9, Figs 7-9.
1998. *Epalxis* (*Bathytoma*) *cataphracta dertogranosa* (SACCO); O. SCHULTZ, p. 76, Pl. 31, Fig. 7.

MATERIAL: Four specimens, of which two are in the private collection of Mr. J. GUBAŁA, and one in the collection of the Museum of the Geological Survey of Poland, Warsaw.

DIMENSIONS: The largest specimen (see Pl. 17, Fig. 4) is 47.5 mm high and 17 mm wide.

REMARKS: The juvenile specimen from Korytnica bears a well preserved protoconch which is very close to these presented by BERNASCONI & ROBBA (1984). It is identically ornamented, though longer of a half whorl at least (thus, having 3.5 whorls), with its distal section adorned with ten sharp, fold-like ribs and attaining almost a half whorl. These variables indicate that the extent of the protoconch in this species is not so stable as suggested by BERNASCONI & ROBBA. The present author thus does not follow them in a definite exclusion of specimens presented by RASMUSSEN (1956) from the range of the discussed species

The species *Bathytoma cataphracta* (BROCCHI, 1814) was recorded from Korytnica by PUSCH (1837), HÖRNES (1856), SIEMIRADZKI (1909) and FRIEDBERG (1938). In the Miocene of Poland it is also known from Benczyn (KRACH 1950a)

Bathytoma lapugyensis (MAYER *in* BELLARDI, 1877)
(Pl. 17, Fig. 1)

1856. *Pleurotoma spiralis* SERR.; M. HÖRNES, p. 357, Pl. 38, Figs 19-20.
1891. *Pleurotoma* (*Rouaultia*) *Lapugyensis* MAY.; R. HOERNES & M. AUINGER, pp. 376-377, Pl. 50, Figs 1-4.
1891. *Pleurotoma* (*Rouaultia*) *Marthae* nobis; R. HOERNES & M. AUINGER, pp. 377-378, Pl. 50, Figs 6-10.
?1891. *Pleurotoma* (*Rouaultia*) *Magdalenae* nov.form.; R.HOERNES & M. AUINGER, p. 378, Pl. 50, Figs 13-14.
1953. *Rouaultia marthae* HÖRNES & AUINGER; I. CSEPREGHY-MEZNERICS, p. 19, Pl. 4, Figs 1-4.
1969. ?*Roualtia lapugyensis badensis* CSEPREGHY-MEZNERICS; I. CSEPREGHY-MEZNERICS, p. 99, Pl. 6,Fig. 13.
1971. *Cochlespira lapugyensis* (MAY.); M. EREMIJA, pp. 45-46, Pl. 14, Fig. 1.

MATERIAL: One specimen.

DIMENSIONS: Height about 23 mm, width 10.5 mm.

REMARKS: The studied specimen, although of a rather inferior preservation state, is fully concordant with that one from Vöslau in the Vienna Basin, and described by HOERNES & AUINGER (1891, Pl. 50, Fig. 7) under the name of "*Pleurotoma* (*Rouaultia*) *marthae* HOERNES & AUINGER". To note, HOERNES & AUINGER (1891) were of the opinion to distinguish in the Vienna Basin and Transylvania still more two other species, viz. *Pleurotoma* (*Rouaultia*) *lapugyensis* MAYER and *Pleurotoma* (*Rouaultia*) *magdalenae* HOERNES & AUINGER, the both yielding the transitional forms ("*Übergangsformen*"). These three species are very similar indeed, and their slight differences concern the prominence of the row of nodes, the concavity of whorls (precisely, their part above that row of nodes), and the slenderness of the shell. In the present author's estimation, a specific separateness of all these forms is very doubtful, and these should rather be treated as intraspecific variants, not uncommon in the genus *Bathytoma*. A single specimen from Korytnica does not allow, however, for a definite judgement. Of another opinion was CSEPREGHY-MEZNERICS (1969), who introduced a new name of the subspecies rank, "*Roualtia lapugyensis badensis* ", for one of the unnamed varieties (var. *B*) of HOERNES & AUINGER (1891).

The discussed forms have often been assigned to the genus *Rouaultia* BELLARDI, 1877, regarded by WENZ (1943) as synonymous with *Cochlespira* CONRAD, 1865. In the present author's opinion, not justified is an accomodation of the discussed species into the genus other than *Bathytoma*. An assignment of this species to the genus *Rouaultia* was already doubted by CSEPREGHY-MEZNERICS (1969) who put a question mark in her systematic account.

The species *Bathytoma lapugyensis* (MAYER *in* BELLARDI, 1877) has not hitherto been known from the Miocene of Poland.

Genus *Genota* H.&A. ADAMS, 1853
Subgenus *Genota* H.&A. ADAMS, 1853
Genota (*Genota*) *elisae* (HOERNES & AUINGER, 1891)
(Pl. 18, Figs 7-9)

partim 1856. *Pleurotoma ramosa* BAST.; M. HÖRNES, pp. 335-336, Pl. 36, Figs 12-14; ?Fig. 10, *non* Fig. 11.
1891. *Pleurotoma* (*Genota*) *Elisae* nob.; R. HOERNES & M. AUINGER, pp. 310-311.
1912. *Genota ramosa* BAST. var. *Elisae* R.H. & AUING.; W. FRIEDBERG, p. 213, Pl. 13, Figs 13-14.
partim 1931.*Genotia ramosa* (BASTEROT) et var. *evanescens* PEYROT; A. PEYROT, pp. 53-56, Pl. 1, Figs 31 and 33; *non* Pl. 1, Figs 29-30, 32, and 34.
1954. *Genota ramosa* f. *elisae* HÖRNES et AUINGER; M. GLIBERT, p. 21, Pl. 4, Fig. 4*a*, ?Fig. 4*b*.
1958. *Genota ramosa elisae* R. HOERNES et AUINGER; J. ŠVAGROVSKÝ , p. 10, Pl. 1, Figs 4-6.
1960. *Genota ramosa* var. *elisae* (HOERNES und AUINGER); E. KOJUMDGIEVA, p. 196, Pl. 47, Fig. 3.
1966. *Genota ramosa elisae* HOERNES & AUINGER; L. STRAUSZ, p. 448, Pl. 22, Figs 8-13.
1998. *Genota ramosa elisae* (HOERNES R. & AUINGER); V. MIKUŽ, pp. 68-69, Pl. 1, Fig. 2.

MATERIAL: Forty specimens.

DIMENSIONS: The largest, complete specimen is 43 mm high and 12 mm wide; another one, broken in its initial part, is 13 mm wide.

REMARKS: HOERNES & AUINGER (1891) established the species *Genota* (*Genota*) *elisae* for specimens some of which were these treated by HÖRNES (1856) as varieties of *Genota ramosa* (BASTEROT). Earlier, BELLARDI (1877) opted for their assignment to the species *Genota mayeri* (BELLARDI) but, as recognized by HOERNES & AUINGER (1891) this was quite separate. Recently, as apparent from the photograph presented by FERRERO MORTARA & *al.* (1981), the syntype of *Genota mayeri* clearly confirms a statement expressed by HOERNES & AUINGER (1891).

The specimen from Borský Mikuláš in Slovakia presented by ŠVAGROVSKÝ (1982, pp. 410-411, Pl. 10, Fig. 2) under the name "*Genota ramosa elisae* (R. HOERNES et

M. AUINGER)" has quite different relation of the height of the spire and of the last whorl; it thereby cannot be conspecific with any of the Korytnica specimens.

The studied specimens from Korytnica do not achieve such larger sizes (73 mm high and 20 mm wide) as do specimens from Grund in the Vienna Basin. To note, the present author has already paid an attention earlier (BAŁUK 1995), that the specimens from Grund are commonly typified by their more or less "enormously" large size.

The species *Genota* (*Genota*) *elisae* (HOERNES & AUINGER, 1891) was reported from Korytnica by HOERNES & AUINGER (1891), FRIEDBERG (1912, 1938), and KOWALEWSKI (1930).

Genota (*Genota*) *ramosa* (BASTEROT, 1825)
(Pl. 18, Figs 2-3)

partim 1856. *Pleurotoma ramosa* BAST.; M. HÖRNES, pp. 335-336, Pl. 36, Fig. 11; *non* Figs 10 and 12-14.
1912. *Genota ramosa* BAST.; W. FRIEDBERG, pp. 211-212, Pl. 13, Fig. 12.
partim 1931. *Genotia ramosa* (BASTEROT) et var.*austro-gallica* MAY.; A. PEYROT, pp. 53-56, Pl. 1, Figs 29-30, 34; *non* Pl. 1, Figs 31-33.
1954. *Genota ramosa* (BASTEROT); I. CSEPREGHY-MEZNERICS, pp. 53-54, Pl. 7, Figs 2, 4 and 10.
1958. *Genota ramosa ramosa* (BASTEROT); J. ŠVAGROVSKÝ, pp. 9-10, Pl. 1, Figs 2-3.
1970. *Genota ramosa* (BASTEROT); W. BAŁUK , p. 119, Pl. 13, Fig. 9.

MATERIAL: Seven specimens.

DIMENSIONS: The largest specimen (see Pl. 18, Fig. 2) is 35 mm high and 12 mm wide.

REMARKS: The specific assignment of the studied specimens bears some difficulties. Their overall shape reminds both these from the Vienna Basin, regarded by HÖRNES (1856) and HOERNES & AUINGER (1891) as typical of *Genota ramosa* (BASTEROT), as well as those from the Miocene of Aquitaine classified by PEYROT (1931, Pl. 1, Fig. 34) as "*Genotia ramosa*, var. *austro-gallica* MAY.". The specimens from Korytnica, however, differ by their ornamentation, the main element of which are prominent nodes at the whorl margin, whereas the extended downwards (anteriorly) axial ribs are weakly developed. The nodes are numbering 13 or 14 on the last but one whorl, while in other localities they are reported (e.g. FRIEDBERG 1912) as being 14-16. To the truth, none of the presented in literature specimens of *Genota ramosa* is fully compatible with the herein-presented ones from Korytnica; possibly all these differences may be regarded as of intraspecific variability. Morphologically, the studied specimens from Korytnica resemble the best that one from Sámsonháza in Hungary, presented by CSEPREGHY-MEZNERICS (1954, Pl. 7, Figs 2, 4 and 10) and by STRAUSZ (1966, Pl. 22, Fig. 6) as well.

The species *Genota* (*Genota*) *ramosa* (BASTEROT, 1825) was reported from Korytnica by HÖRNES (1856), KONTKIEWICZ (1882), HOERNES & AUINGER (1891), SIEMIRADZKI (1909), FRIEDBERG (1912), and KOWALEWSKI (1930). In the Miocene of Poland it is also known from Niskowa (FRIEDBERG 1912, 1938; SKOCZYLASÓWNA 1930; BAŁUK 1970).

Genota (*Genota*) *valeriae* (HOERNES & AUINGER, 1891)
(Pl. 18, Figs 4-6)

1891. *Pleurotoma* (*Genota*) *Valeriae* nov.form.; R. HOERNES & M. AUINGER, pp. 311-312, Pl. 34, Fig. 15.
1912. *Genota Valeriae* R. HOERN. i AUINGER; W. FRIEDBERG, pp. 213-214, Pl. 13, Fig. 15.
partim 1931. *Genotia ramosa* (BASTEROT) [var. *tortonica* PEYROT]; A. PEYROT, pp. 53-56, Pl. 1, Fig. 32; *non* Pl. 1, Figs 29-31, 33-34.
1953. *Genota valeriae* HÖRNES & AUINGER; I. CSEPREGHY-MEZNERICS, p. 18, Pl. 2, Figs 30-31.
1960. *Genota ramosa* (BASTEROT); E. KOJUMDGIEVA, pp. 195-196, Pl. 46, Figs 16-17.

MATERIAL: Fifty-two specimens.

DIMENSIONS: The largest, completely preserved specimen (see Pl. 18, Fig. 6) is 41.5 mm high and 11 mm wide; another one, with a partly damaged siphonal canal is 12.5 mm wide (its height estimated as 45-46 mm).

REMARKS: The studied specimens from Korytnica are undoubtedly conspecific with those coming from Lapugy in Transylvania, described by HOERNES & AUINGER (1891). The specimens from these two localities do not practically one differ from the other. Interestingly, both at Korytnica and Lapugy, the species *Genota valeriae* (HOERNES & AUINGER) is quite common, whereas in other localities of the Vienna Basin, Transylvania, and Hungary it is regarded even as a unique one (CSEPREGHY-MEZNERICS 1953).

The species *Genota* (*Genota*) *valeriae* (HOERNES & AUINGER, 1891) was reported from Korytnica by SIEMIRADZKI (1909) and FRIEDBERG (1912).

Subgenus *Pseudotoma* BELLARDI, 1875
Genota (*Pseudotoma*) *praecedens* (BELLARDI, 1877)
(Pl. 9, Fig. 8)

partim 1856. *Pleurotoma intorta* BROCC.; M. HÖRNES, pp. 331-332, Pl. 36, Fig. 2; *non* Fig. 1.
1877. *Pseudotoma praecedens* BELL.; L. BELLARDI, p. 216, Pl. 7, Fig. 11.
1891. *Pleurotoma* (*Pseudotoma*) *praecedens* BELL. var.; R. HOERNES & M. AUINGER, p. 369, Pl. 34, Fig. 4; Pl. 49, Fig. 5.
1931. *Genotia* (*Pseudotoma*) *intorta* BROCCHI; A. PEYROT, pp. 56-57, Pl. 1, Figs 23, 27.
1938. *Genota praecedens* BELL.; W. FRIEDBERG, p. 154, Text-fig. 50.
?1973. *Genata* (*Pseudotoma*) *intorta* (BROCCHI); E. CAPROTTI & M. VESCOVI, p. 181, Pl. 3, Fig. 18.
?1975. *Genota* (*Acamptogenotia*) *intorta* (BROCCHI); G. PAVIA, pp. 151-152, Pl. 9, Figs 18-19.
1981. *Pseudotoma praecedens* BELLARDI; M. FERRERO MORTARA & *al*., p. 82, Pl. 16, Fig. 4; (=syntype of the species).

MATERIAL: One specimen (in the the collection of the Museum of the Geological Survey of Poland, Warsaw).

DIMENSIONS: Height 63 mm, width 27 mm.

REMARKS: The only specimen (collected by K. KOWALEWSKI) is undoubtedly concordant with that coming from Baden in the Vienna Basin, presented by HOERNES & AUINGER (1891). All specimens from the Vienna Basin were earlier (HÖRNES 1856) classified as *Pleurotoma intorta* BROCCHI, but it was already BELLARDI (1877) who recognized their difference to those from the Neogene of northern Italy. HOERNES & AUINGER (1891) accepted this recognition and stated that the discussed specimen from Baden should be determined as *Pseudotoma praecedens* BELLARDI. This has recently been confirmed by FERRERO MORTARA & *al.* (1981) who photographed the syntype of this species: it is evidently concordant with the specimen from Korytnica. In the present author's opinion, conspecific is also a specimen from Orthez (Paren) in the Aquitaine Basin, presented by PEYROT (1931) under the name of "*Genotia* (*Pseudotoma*) *intorta* BROCCHI". Noteworthy is the size of the Korytnica specimen which is the largest of all hitherto presented *Genota* (*Pseudotoma*) *praecedens* (BELLARDI) in the literature.

The species *Genota* (*Pseudotoma*) *praecedens* (BELLARDI, 1877) has not hitherto been known in the Miocene of Poland. One incomplete specimen presented by FRIEDBERG (1938) was coming from Dryszczów, at present in the Ukraine.

Genota (*Pseudotoma*) *bonellii* (BELLARDI, 1839)
(Pl. 18, Fig. 1)

1856. *Pleurotoma bracteata* BROCC.; M. HÖRNES, pp. 332-333, Pl. 36, Fig. 3.
1891. *Pleurotoma* (*Pseudotoma*) *Bonellii* BELL. et var.; R. HOERNES & M. AUINGER, pp. 370-371, Pl. 34, Figs 5-7, 9-10.
1901. *Pseudotoma bonellii* BELL. var. *subspinosa* BTTGR.; O. BOETTGER, p. 48.
1931. *Genotia* (*Pseudotoma*) *Bonellii* BELLARDI; A. PEYROT, pp. 60-61, Pl. 1, Figs 2-3.
1934. *Genota* (*Pseudotoma*) *bonellii subspinosa* (BOETTGER); A. ZILCH, p. 275, Pl. 22, Fig. 5.
1953. *Genota* (*Pseudotoma*) *bonellii subspinosa* (BOETTGER); I. CSEPREGHY-MEZNERICS, p. 19, Pl. 3, Figs 15-16.
1966. *Acamptogenotia bonelli* BELLARDI; L. STRAUSZ, pp. 446-447, Pl. 22, Figs 3-4.
1968. *Genota* (*Pseudotoma*) *bonellii* (BELLARDI); E. ROBBA, pp. 609-610, Pl. 46, Fig. 6.
1969. *Genota* (*Pseudotoma*) *bonellii* (BELLARDI); I. CSEPREGHY-MEZNERICS, p. 98, Pl. 6, Figs 21-22.
1969. *Genota* (*Pseudotoma*) *bonellii botensis* n.ssp.; I. CSEPREGHY-MEZNERICS, p. 98, Pl. 6, Fig. 23.
1974. *Genota* (*Pseudotoma*) *bonellii* (BELLARDI); E. CAPROTTI, p. 34, Pl. 4, Figs 2 and 7.
1981. *Pseudotoma bonellii* (BELLARDI); M. FERRERO MORTARA & *al*., p. 82, Pl. 16, Fig. 8 (= syntype of the species).
1994. *Genota* (*Pseudotoma*) *bonellii* (BELLARDI); P.I. NIKOLOV, pp. 67-68, Pl. 8, Figs 1-2.
1994. *Genota* (*Pseudotoma*) *bonellii botensis* CSEPREGHY-MEZNERICS; P.I. NIKOLOV, p. 68, Pl. 8, Figs 3-5.
1997. *Genota bonellii* (BELLARDI); C. CHIRLI, pp. 100-101, Pl. 28, Figs 10-12.
1998. *Genota* (*Pseudotoma*) *bonellii* (BELLARDI); O. SCHULTZ, p. 76, Pl. 31, Fig. 9.

MATERIAL: One specimen.

DIMENSIONS: Height about 22 mm, width 12.5 mm

REMARKS: The only specimen from Korytnica is well comparable to that from Baden in the Vienna Basin, presented by HÖRNES (1856). Conspecific are also those from Kostej in Transylvania (BOETTGER 1901, ZILCH 1934) and Szob in Hungary (CSEPREGHY-MEZNERICS 1953), although BOETTGER (1901) regarded them as a variety *subspinosa*. Because the species *Genota bonellii* (BELLARDI) is characterized by a great variability of shape and ornamentation, any distinction of varieties/subspecies (compare BELLARDI 1877, HOERNES & AUINGER 1891) is not justified.

The species *Genota* (*Pseudotoma*) *bonellii* (BELLARDI, 1839) has not hitherto been known in the Miocene of Poland.

Genus *Mitrolumna* BUCQUOY, DAUTZENBERG & DOLLFUS, 1882
Mitrolumna aptycha (BOETTGER, 1906)
(Pl. 19, Fig. 3)

1906. *Mitra* (*Mitromorpha*) *aptycha* n.sp.; O. BOETTGER, pp. 12-13.
1934. *Mitromorpha aptycha* (BOETTGER); A. ZILCH, p. 263, Pl. 18, Fig. 38.

MATERIAL: Two specimens.

DIMENSIONS: The larger specimen (preserved without outer lip) is 6 mm high and 2.7 mm wide.

REMARKS: An accordance of the two studied specimens with the holotype of the species established by BOETTGER (1906) from Kostej in Transylvania is evident, although they are less completely grown (about of one whorl), and their aperture has the outer lip damaged. BOETTGER (1906) noted that the inner lip has two very inconspicuous folds ("*columella media parte pliculis 2 perobsoletis*"), and assigned his two specimens to the subgenus *Mitromorpha* A. ADAMS, 1865, regarded as identical with *Mitrolumna* BUCQUOY, DAUTZENBERG & DOLLFUS, 1882. According to WENZ (1943), these two taxa are separate at the genus level (of the family Turridae, obviously), and this very statement is herein accepted by the present author.

The specimens from the Pliocene of Toscania, presented by CHIRLI (1997, p. 27, Pl. 7, Figs 8-10) under the name *Mitrolumna olivoidea* (CONTRAINE, 1835), are of morphology slightly similar to these studied from Korytnica. They are more squabby and they bear more prominent folds on their inner lip; they are thus taxonomically quite different.

The species *Mitrolumna aptycha* (BOETTGER, 1906) has not hitherto been known from the Miocene of Poland.

Mitrolumna paraptycha (BOETTGER, 1906)
(Pl. 19, Fig. 2)

1906. *Mitra* (*Mitromorpha*) *paraptycha* n.sp.; O. BOETTGER, pp. 13-14.
1934. *Mitromorhpa paraptycha* (BOETTGER); A. ZILCH, p. 263, Pl. 18, Fig. 39.

MATERIAL: One specimen.

DIMENSIONS: Height 9.5 mm, width 3.3 mm.

REMARKS: The only specimen from Korytnica is fully concordant with a unique one from Kostej in Transylvania, being thus the holotype of the species established by BOETTGER (1906). The present author shares opinion of BOETTGER that this species although similar to the preceding one, *Mitrolumna aptycha* (BOETTGER, 1906), makes up a separate taxon.

The species *Mitrolumna paraptycha* (BOETTGER, 1906) has not hitherto been known from the Miocene of Poland.

Genus *Agathotoma* COSSMANN, 1899
Agathotoma perfragilis (BOETTGER, 1901)
(Pl. 19, Fig. 1)

1901. *Mangilia* (*Ditoma*) *perfragilis* n.sp.; O. BOETTGER, pp. 64-65.
1934. *Cythara* (*Agathotoma*) *perfragilis* (BOETTGER); A. ZILCH, p. 263, Pl. 18, Fig. 42.

MATERIAL: Three specimens.

DIMENSIONS: The largest specimen (see Pl. 19, Fig. 1) is 5.4 mm high and 1.8 mm wide.

REMARKS: An accordance of the studied specimens with those described by BOETTGER (1901) from Kostej in Transylwania is undoubted, as evidenced by their shape, ornamentation and the pleurotomal notch being identical. The largest specimen from Korytnica is slightly more completely grown than the holotype; it is larger of almost one whorl which increases in width a little more than all preceding ones.

The species *Agathotoma perfragilis* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

Genus *Cythara* SCHUMACHER, 1817
Cythara (*Mangelia*) *bittneri* (BOETTGER, 1901)
(Pl. 20, Figs 5-6)

1901. *Mangilia bittneri* n.sp.; O. BOETTGER, p. 67.
1906. *Mangilia bittneri* BTTGR.; O. BOETTGER, p. 78.
1934. *Cythara* (*Mangelia*) *bittneri* (BOETTGER); A. ZILCH, p. 264, Pl. 18, Fig. 46.

MATERIAL: Eight specimens.

DIMENSIONS: The largest specimen is 7.5 mm high and 2.8 mm wide.

REMARKS: The state of preservation of the studied specimens is surprisingly worse than an average of the Korytnica material. Nevertheless, their concordance with those described by BOETTGER (1901) from Kostej and

Lapugy in Transylvania is undoubted, although they are slightly less slender.

The species *Cythara* (*Mangelia*) *bittneri* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

Cythara (*Mangelia*) *burdigalica* (PEYROT, 1931)
(Pl. 22, Fig. 5)

1931. *Mangelia* (*Mangiliella*) *burdigalica* nov.sp.; A. PEYROT, pp. 208-209, Pl. 9, Figs 106-107.

MATERIAL: Two specimens.

DIMENSIONS: The larger specimen (see Pl. 22, Fig. 5) is 4.6 mm high and 1.9 mm wide.

REMARKS: The studied specimens seem to be concordant with those described by PEYROT (1931) from Saucats in Aquitaine. The Korytnica specimens are slightly less completely grown, what certainly controlled a smaller number of axial ribs on their last whorl (10 instead of 12).

The species *Cythara* (*Mangelia*) *burdigalica* PEYROT, 1931, has not hitherto been known from the Miocene of Poland.

Cythara (*Mangelia*) *clathrata* (DE SERRES, 1829)
(Pl. 20, Figs 1-2)

1856. *Pleurotoma clathrata* SERR.; M. HÖRNES, p. 379, Pl. 40, Fig. 20.
1901. *Mangilia paucilirata* n.sp.; O. BOETTGER, p. 70.
1904. *Mangilia* (*Clathratomangilia*) *clathrata* (SERR.); F. SACCO, p. 55, Pl. 14, Fig. 31.
1912. *Mangilia clathrata* SERR.; W. FRIEDBERG, pp. 228-229, Pl. 14. Fig. 10.
1931. *Mangelia clathrata* M. DE SERRES; A. PEYROT, pp. 201-203, Pl. 7, Figs 20-22.
1934. *Cythara* (*Mangelia*) *paucilirata* (BOETTGER); A. ZILCH, p. 265, Pl. 19. Fig. 50.
1954. *Clathromangelia clathrata* M. DE SERRES; M. GLIBERT, p. 55, Pl. 6, Fig. 16.

MATERIAL: One hundred and sixty specimens.

DIMENSIONS: The largest specimen completely preserved is 6.5 mm high and 2.9 mm wide; another one (last whorl only) is 3.1 mm wide.

REMARKS: The studied specimens are evidently conspecific with those commonly occurring in the Miocene sequences of Europe, and presented i.a. by HÖRNES (1856) from the Vienna Basin, and by PEYROT (1931) from Aquitaine. In all the referenced specimens (see synonymy) the spiral ornamentation, from a place of its appearance through the last but one whorl including, is developed as two thin striae. In the present author's opinion conspecfic are also the specimens described, under the name of *Mangilia paucilirata*, by BOETTGER (1901) from Kostej in Transylvania, regardless their having of only 9 axial ribs on the last whorl, instead of 9-11 present in the Korytnica specimens.

The species *Cythara* (*Mangelia*) *clathrata* (DE SERRES, 1829) has not hitherto been known from the Miocene of Poland. The specimens described by FRIEDBERG (1912, 1938) were coming from Zborów, at present in the Ukraine.

Cythara (*Mangelia*) *contracta* (BELLARDI, 1877)
(Pl. 20, Figs 3-4)

1877. *Mangelia contracta* BELL.; L. BELLARDI, p. 295.
1904. *Mangilia contracta* BELL.; F. SACCO, p. 55, Pl. 14, Figs 35-36.
1981. *Mangelia contracta* BELLARDI: E. FERRERO MORTARA & *al.*, p. 91, Pl. 17, Figs 6-7.
1997. *Mangelia contracta* BELLARDI; C. CHIRLI, p. 66, Pl. 19, Fig. 7; ?Figs 4-6.

MATERIAL: Twelve specimens.

DIMENSIONS: The largest specimen (see Pl. 20, Fig. 4) is 6.0 mm high and 2.5 mm wide.

REMARKS: The studied specimens seem to be concordant with those from the Miocene of northern Italy, presented by SACCO (1904) and FERRERO MORTARA & *al* (1981). Of the specimens from the Pliocene of Toscania, and presented by CHIRLI (1997) concordant is rather only one (CHIRLI 1997, Pl. 19, Fig. 7), the others being distinctly less slender. The shells of this species are similar to *Cythara* (*Mangelia*) *clathrata* (DE SERRES), differing in having a greater number of spiral striae. A stable difference is kept by the number of 3-4 striae on the last but one whorl, and of 8-9 on the last whorl, whereas in *Cythara* (*Mangelia*) *clathrata* this number is 2, and 5-6, respectively. Another similar species is *Cythara* (*Mangelia*) *clathrataeformis* (DEGRANGE-TOUZIN) described by PEYROT (1931, pp. 203-204, Pl. 8, Figs 105-106) from Salies-Béarn in Aquitaine, but which has 5 spiral striae on the median whorls.

The species *Cythara* (*Mangelia*) *contracta* (BELLARDI, 1877) has not hitherto been known from the Miocene of Poland.

Cythara (*Mangelia*) *fraterna* (BOETTGER, 1901)
(Pl. 22, Fig. 11)

1901. *Rhaphitoma fraterna* n.sp.; O. BOETTGER, p. 76.
1906. *Rhaphitoma fraterna* BTTGR.; O. BOETTGER, p. 84.
1934. *Cythara* (*Mangelia*) *fraterna* (BOETTGER); A. ZILCH, p. 267, Pl. 19, Fig. 63

MATERIAL: One specimen.

DIMENSIONS: Height 8.0 mm, width 3.0.

REMARKS: The studied specimen is fully concordant with those described by BOETTGER (1901, 1906) from Kostej in Transylvania. The shells of this species are easily recognizable from those of other similar species by the relatively large protoconch, the whorls of which are ornamented by a very dense, oblique netting.

The species *Cythara* (*Mangelia*) *fraterna* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

Cythara (*Mangelia*) *fuchsi* (BOETTGER, 1901)
(Pl. 20, Figs 7-8)

1901. *Mangilia fuchsi* n.sp.; O. BOETTGER, pp. 66-67.
1906. *Mangilia fuchsi* BTTGR.; O. BOETTGER, p. 78.
1934. *Cythara* (*Mangelia*) *fuchsi* (BOETTGER); A. ZILCH, p. 264, Pl. 18, Fig. 45.
1938. *Mangilia* aff. *Sassii* BELL.; W. FRIEDBERG, p. 150, Text-fig. 48.

MATERIAL: Seven specimen.

DIMENSIONS: The largest specimen (see Pl. 20, Fig. 8) is 9.5 mm high and 3.8 mm wide.

REMARKS: The studied specimens are evidently conspecific with those described by BOETTGER (1901) from Kostej and Lapugy in Transylvania. An identical specimen was also presented by FRIEDBERG (1938) from the locality Hołdy in the Ukraine, but erroneously regarded as a form related (*affinis*) to *Mangelia sassii* (BELLARDI). This misidentification by FRIEDBERG appeared clear when the syntype of the latter had been photographed by FERRERO MORTARA & *al.* (1981, Pl. 16, Fig. 6).

The species *Cythara* (*Mangelia*) *fuchsi* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

Cythara (*Mangelia*) *paulae* (BOETTGER, 1901)
(Pl. 20, Fig. 10)

1901. *Mangilia paulae* n.sp.; O. BOETTGER, pp. 68-69.
1906. *Mangilia paulae* BTTGR.; O. BOETTGER, pp. 78-79.
1934. *Cythara* (*Mangelia*) *paulae* (BOETTGER); A. ZILCH, p. 264, Pl. 19, Fig. 48.

MATERIAL: Seven specimens.

DIMENSIONS: The largest specimen, completely preserved (see Pl. 20, Fig. 10), is 5.0 mm high and 1.9 mm wide; another one (last whorl only) is 2.0 mm wide.

REMARKS: The studied specimens seem to be concordant (the size including) with those described by BOETTGER (1901, 1906) from Kostej in Transylvania.

The species *Cythara* (*Mangelia*) *paulae* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

Cythara (*Mangelia*) *perforata* (BRUSINA, 1877)
(Pl. 20, Fig. 9)

1856. *Pleurotoma caerulans* PHIL.; M. HÖRNES, pp. 377-378, Pl. 40, Fig. 19.
1877. *Raphitoma (Mangilia) perforata* BRUSINA; S. BRUSINA, pp. 377-378.
1901. *Mangilia detmersiana* n.sp.; O. BOETTGER, p. 69.
1906. *Mangilia detmersiana* BTTGR.; O. BOETTGER, p. 79.
1912. *Mangilia Monterosati* BELL.; W. FRIEDBERG, pp. 227-228, Pl. 14, Fig. 9.
1931. *Mangelia perforata* BRUSINA; A. PEYROT, Pl. 7, Figs 47-49.
1934. *Cythara* (*Mangelia*) *detmersiana* (BOETTGER); A. ZILCH, pp. 264-265, Pl. 19. Fig. 49.
1938. *Mangilia perforata* BRUS.; W. FRIEDBERG, p. 149.

MATERIAL: Three specimens.

DIMENSIONS: The largest specimen (see Pl. 20, Fig. 9) is 6.8 mm high and 2.8 mm wide.

REMARKS: The studied specimens seem to be concordant with those presented by HÖRNES (1856), under an incorrect name of "*Pleurotoma caerulans* PHIL.", from Steinebrunn in the Vienna Basin. They are evidently different from *Mangilia monterosati*, described from northern Italy by BELLARDI (1877), the species morphologically similar or even, as suggested by FRIEDBERG (1938), identical. Unfortunately, none of these forms has ever been presented in the photograph, and the indicated BELLARDI's species has not been catalogued by FERRERO MORTARA & *al.* (1981).

In the present author's opinion the Korytnica specimens are conspecific with those described by BOETTGER

(1901, 1906) under the name of *Mangilia detmersiana* BOETTGER, coming from Kostej in Transylvania; consequently, this species is herein included into the synonymy of the studied one. To note, the Kostej specimens are characterized by having one whorl less than these from Korytnica.

The species *Cythara* (*Mangelia*) *perforata* (BRUSINA, 1877) has not hitherto been known from the Miocene of Poland. FRIEDBERG (1912, 1938) reported it from Zborów, at present in the Ukraine.

Cythara (*Mangelia*) *rugulosa* (PHILIPPI, 1844)
(Pl. 22, Figs 6-10)

1856. *Pleurotoma Vauquelini* PAYR.; M. HÖRNES, p. 378, Pl. 40, Fig. 18.
1901. *Mangilia rugulosa* (PHIL.); O. BOETTGER, pp. 69-70.
1901. *Mangilia subaurea* n.sp.; O. BOETTGER, pp. 72-73.
1904. *Mangilia rugulosa* (PHIL.); F. SACCO, p. 55, Pl. 14, Figs 23-24.
?1904. *Mangilia mitreola* (BON.) et var. *subcarinata* SACC.; F. SACCO, p. 55, Pl. 14, Figs 27-30.
1906. *Mangilia subcostata* n.sp.; O. BOETTGER, pp. 77-78
1906. *Mangilia rugulosa* (PHIL.); O. BOETTGER, p. 79.
1912. *Mangilia rugulosa* PHIL.; W. FRIEDBERG, pp. 225-226, Pl. 14, Fig. 7, ?Fig. 6.
1934. *Cythara* (*Mangelia*) *subcostata* (BOETTGER); A. ZILCH, p. 263, Pl. 18, Fig. 43.
1934. *Cythara* (*Mangelia*) *subaurea* (BOETTGER); A. ZILCH, pp. 265-266, Pl. 19, Fig. 55.
1938. *Mangilia rugulosa* PHIL.; W. FRIEDBERG, p. 148.
1953. *Cythara* (*Mangelia*) *rugulosa* PHIL.; I. CSEPREGHY-MEZNERICS, p. 20, Pl. 3, Figs 11-12.
1958. *Mangelia* (*Mangelia*) *rugulosa* (PHILIPPI); J. ŠVAGROVSKÝ , p. 28, Pl. 8, Fig. 7.
1966. *Mangelia albida rugulosa* PHILIPPI; L. STRAUSZ, p. 439, Pl. 20, Fig. 17.
1975. *Cythara* (*Cytharella*) *rugulosa* (PHILIPPI); G. PAVIA, p. 113, Pl. 8, Figs 8-9.
partim 1981. *Mangelia rugulosa* PHILIPPI; W. KRACH, pp. 74-75, Pl. 22, Fig. 7; *non* Fig. 8.
1982. *Bela subcostata* (BOETTGER); J. ŠVAGROVSKÝ , p. 420, Pl. 11, Fig. 4.

MATERIAL: Three hunhred and seventy specimens.

DIMENSIONS: The largest specimen (see Pl. 22, Fig. 10) is 5.8 mm high and 2.3 mm wide.

REMARKS: The studied specimens are pronouncedly variable, especially in terms of the shell slenderness, the number and prominence of axial ribs on the last whorl (7 to 13), a distinction of the margin at the upper (posterior) part of whorls and, finally, the height of the aperture. Any attempt to distinguish separate groups in such material remained unsuccessful, as the extremes are easly to indicate, but a lot of intermediate forms are also found, what was evident both to HÖRNES (1856) and to FRIEDBERG (1938). A treatment offered by BOETTGER (1901, 1906) upon a material from Kostej in Transylvania is not satisfactory, at least in the present author's opinion. Several species distinguished by BOETTGER (1901, 1906) are very similar one to the other, and these may also be identified at Korytnica, the same as their transitional forms. The forms of strongly convex whorls (see Pl. 22, Fig. 9) resemble those classified as *Cythara* (*Mangelia*) *banatica* (BOETTGER) by ZILCH (1934, p. 264, Pl. 18, Fig. 44).

To note, the studied species is enormously common in many localities of the Paratethys Miocene, e.g. at Kostej in Transylvania, Steinebrunn in the Vienna Basin, and Korytnica as well.

The species *Cythara* (*Mangelia*) *rugulosa* (PHILIPPI, 1844) has not hitherto been known from the Miocene of Korytnica. KRACH (1981) reports it from Łychów, and KOWALEWSKI (1933) from Wieliczka. The specimens reported from Niskowa by the present author (BAŁUK 1970) do not belong to this species. Those described by FRIEDBERG (1912, 1938) were coming from several localities in Podolya, at present in the Ukraine.

Cythara (*Mangelia*) *subcylindrata* (BOETTGER, 1901)
(Pl. 22, Figs 1-4)

1901. *Rhaphitoma subcylindrata* n.sp.; O. BOETTGER, pp. 75-76.
1906. *Rhaphitoma subcylindrata* BTTGR.; O. BOETTGER, p. 83.
1928. *Raphitoma plicatella* JAN; W. FRIEDBERG, pp. 572-573, Pl. 37, Figs 14-16.
1931. *Daphnella* (*Raphitoma*) *helvetica* nov.sp.; A. PEYROT, p. 253, Pl. 9, Figs 2-4.
1931. *Daphnella* (*Raphitoma*) *girundica* nov.sp.; A. PEYROT, p. 254, Pl. 7, Figs 17-18.
1934. *Cythara* (*Mangelia*) *subcylindrata* (BOETTGER); A. ZILCH, p. 267, Pl. 19, Fig. 31.
1938. *Daphnella* sp. an *plicatella* JAN; W. FRIEDBERG, p. 152.
1938. *Daphnella* an n.sp.; W. FRIEDBERG, p. 153, Text-fig. 49.
1958. *Mangelia* (*Mangelia*) *subcylindrata* BOETTGER; J. ŠVAGROVSKÝ , p. 28, Pl. 8, Figs 8-9.

MATERIAL: Over 400 specimens.

DIMENSIONS: The largest specimen is 6.0 mm high and 2.0 mm wide.

REMARKS: The studied specimens may be regarded as

concordant with those described by BOETTGER (1901) from Kostej in Transylvania, but a rather rich material from Korytnica allows to widen the range of this species. According to BOETTGER, included to the species are specimens up to 4.5 mm high and bearing 7-8 axial ribs on the last whorl. The Korytnica specimens attain the height up to 6 mm, and the rib number range from 7 to 11; any distinction of these having more than 8 ribs from the others should have been unreasonable. A specimen from Korytnica described by FRIEDBERG (1938) under the name of "*Daphnella* an n.sp.", suggestive of a separate species, does not differ in any details from the others of the studied material.

The variability of specimens coming from Korytnica is also expressed by the prominence of their ornamentation and slenderness. The present author assumes that the studied taxon includes the specimens classified by PEYROT (1931) as "*Daphnella* (*Raphitoma*) *helvetica* nov.sp." and "*Daphnella* (*Raphitoma*) *girundica* nov.sp.", and coming from various localities of Aquitaine; they differ in the number of axial ribs, which is 11, or 8-9, respectively, what may be regarded as morphological variables of *Cythara* (*Mangelia*) *subcylindrata* (BOETTGER).

The species *Cythara* (*Mangelia*) *subcylindrata* (BOETTGER, 1901) was reported from Korytnica, under the name of "*Raphitoma plicatella* JAN", both by FRIEDBERG (1928, 1938) and by KOWALEWSKI (1930).

Cythara (*Mangelia*) *cibori* sp.nov.
(Pl. 22, Figs 12-13)

HOLOTYPE: The specimen (Z.PAL. U.W., No.BkK-G1039) presented in Pl. 22, Fig.13.

TYPE HORIZON: Middle Miocene (Badenian).

TYPE LOCALITY: Korytnica, 24 km SSW of Kielce, southern slopes of the Holy Cross Mts.

DERIVATION OF THE NAME: *cibori* – in memory of Jacek CIBOR (1957-1988), a technician at the Paleontology Department of the University of Warsaw, an eminent collector of the Korytnica fossils.

DIAGNOSIS: Shell of very pronounced spiral ornamentation, the spiral ribs of which are covered densely by minute tubercles.

MATERIAL: Twenty-seven specimens.

DIMENSIONS: The largest specimen is 6.4 mm high and 2.5 mm wide.

DESCRIPTION: The shell is small, fusiform. The protoconch composed of about 2.5 whorls, the first of which is smooth, and the others are delicately ornamented by numerous (about 20 per whorl) very thin axial ribs, and by two thin spiral ribs. The teleoconch attains almost 5.5 whorls; its boundary with the protoconch is distinctly outlined by diverse ornamentation. On the first teleoconch whorl, the axial ribs become distinctly thicker, and thereby their number drops to 10 or 11, or 8-10 on the last whorl of fully-grown specimens. Spiral ribs are very conspicuous, numbering four initially, six on the last but one and 15-17 on the last whorl, to cover also the siphonal canal. On the two distal whorls there appear intercalatory ribs. All spiral ribs of the teleoconch are coated with very tiny, densely spaced tubercles arrayed into a row. The aperture is elongated, smooth innerly, with thin lips, the outer of which has a shallow but broad pleurotomal notch; the siphonal canal is straight, rather long.

REMARKS: To present author's recognization, no species is known of the so-conspicuous ornamentation, that spiral one particularly. A little similar is the afore-discussed species *Cythara* (*Mangelia*) *subcylindrata* (BOETTGER) whose shells differ, however, by their more pronounced slenderness and another ornamentation. Between the latter species, *Cythara* (*Mangelia*) *subcylindrata* (BOETTGER), and *Cythara* (*Mangelia*) *cibori* sp.nov. there is a lack of any intermediate forms. The ornamentation of the adult whorls resembles that of the species *Cythara* (*Mangelia*) *moroni* VENZO & PELOSIO, 1964, which is featured by the protoconch quite distinct. Upon that latter feature a separate genus *Sorgenfreispira* MORONI, 1979, was established by MORONI (1979), who indicated *Cythara* (*Mangelia*) *moroni* VENZO & PELOSIO, 1964, as the type species.

Genus *Bela* GRAY, 1847
Bela halavatsi (BOETTGER, 1901)
(Pl. 24, Figs 1-3)

1901. *Raphitoma* (*Ginnania*) *halavatsi* n.sp.; O. BOETTGER, p. 80.
1906. *Raphitoma* (*Ginnania*) *halavatsi* BTTGR.; O. BOETTGER, p. 87.
1934. *Cythara* (*Mangelia*) *halavatsi* (BOETTGER); A. ZILCH, p. 268, Pl. 20, Fig. 69.

MATERIAL: Thirty specimens.

DIMENSIONS: The largest specimen (see Pl. 24, Fig. 1) is 5.2 mm high and 2.5 mm wide.

REMARKS: The studied specimens are supposedly conspecific with those described by BOETTGER (1901) from Kostej and Lapugy in Transylvania. To note, in a part of

specimens from Korytnica, following a varix on the outer lip, the shell was growing further on of about half whorl, to form another varix, and occasionally even the third one. Such specimens become slightly wider than those yielding the single varix. Unclear remains a statement by BOETTGER that this species is similar to *Haedropleura pseudosigmoidea.*

The species *Bela halavatsi* BOETTGER, 1901, has not hitherto been known from the Miocene of Poland.

Bela jeffreysi (BELLARDI, 1877)
(Pl. 23, Figs 1-3)

1877. *Raphitoma Jeffreysi* BELL.; L. BELLARDI, p. 303, Pl. 9, Fig. 13.
1912. *Raphitoma holubicensis* FRIEDB.; W. FRIEDBERG, pp. 236-237, Pl. 14, Fig. 19.
1937. *Daphnella* (*Raphitoma*) *Jeffreysi* BELL.; E. MONTANARO, p. 186, Pl. 8, Figs 59-60.
1963. *Cythara* (*Mangelia*) *jeffreysi* (BELL.); S. VENZO & G. PELOSIO, p. 127, Pl. 41, Figs 15-21.
?1997. *Raphitoma jeffreysi* BELLARDI; C. CHIRLI, p. 82, Pl. 23, Fig. 8.

MATERIAL: A hundred and eighty specimens.

DIMENSIONS: The largest specimen (see Pl. 23, Fig. 3) is 8.5 mm high and 3.2 mm wide.

REMARKS: The studied specimens seem to be conspecific with those coming from the Miocene of Vigoleno in northern Italy, and presented by VENZO & PELOSIO (1963). The specimens from Korytnica are slightly larger, featured by 9-11 axial ribs on the last whorl instead of the stable figure of 11 reported by VENZO & PELOSIO (1963) who regarded this species to be identical with *Cythara* (*Mangelia*) *eichwaldi* (FRIEDBERG). The latter opinion is not justified, although these two species are certainly similar. The specimens from Korytnica are evidently conspecific also with those upon which FRIEDBERG (1912, 1938) established the species *Raphitoma holubicensis* FRIEDBERG, and which all were coming from various localities of Podolya in the Ukraine.

An accordance of the Korytnica specimens with that one presented by CHIRLI (1997) from the Pliocene of Toscania at Poggibonsi is uncertain. It has more pronounced spiral ornamentation, and it is comparable rather to specimens of *Raphitoma subvellicata* (BOETTGER) coming both from Korytnica and from Kostej.

The species *Bela jeffreysi* (BELLARDI, 1877) has not hitherto been known from the Miocene of Poland.

Bela submarginata (BONELLI *in* BELLARDI, 1847)
(Pl. 23, Fig. 7)

1847. *Raphitoma submarginata* BON.; L. BELLARDI, p. 95, Pl. 4, Fig. 21.
1856. *Pleurotoma submarginata* BON.; M. HÖRNES, p. 375, Pl. 40, Fig. 9.
1877. *Raphitoma submarginata* BON.; L. BELLARDI, pp. 309-310, Pl. 9, Fig. 21.
1912. *Raphitoma submarginata* BON. var.; W. FRIEDBERG, pp. 233-234, Pl. 14, Fig. 16.
1963. *Cythara* (*Mangelia*) *submarginata* (BON.); S. VENZO & G. PELOSIO, pp. 126-127, Pl. 41, Figs 13-14.
1970. *Mangelia submarginata* (BONELLI); W. BAŁUK, p. 119, Pl. 13, Fig. 1.
1982. *Bela submarginata eichwaldi* (FRIEDBERG); J. ŠVAGROVSKÝ , pp. 417-418, Pl. 10, Figs 3-4.
1997. *Bela submarginata* (BONELLI MS, BELLARDI); C. CHIRLI, p. 55, Pl. 15, Figs 5-8.

MATERIAL: Five specimens.

DIMENSIONS: The largest specimen (see Pl. 23, Fig. 7) is about 8.0 mm high and 3.5 mm wide.

REMARKS: The taxonomic assessment of the studied specimens bears some troubles. Although slightly smaller, they seem to be concordant with those described by HÖRNES (1856) from Steinebrunn in the Vienna Basin, and by FRIEDBERG (1912) from Hołubica in Podolya, the Ukraine. As concerns FRIEDBERG (1912), he doubted of an identity of his specimens, as well as Viennese ones, with those coming from northern Italy. It seems that he was right in his assumption when one compares them with the syntype of the species *Raphitoma submarginata* BELLARDI, coming from the Pliocene of Colli Astesi, and photographed by FERRERO MORTARA & *al.* (1981, Pl. 18, Fig. 12); this syntype is evidently more slender, and featured by a longer siphonal canal. Some other specimens from the Miocene of northern Italy, *e.g.* those from Vigoleno, and presented by VENZO & PELOSIO (1963), may be regarded as conspecific with these from Korytnica.

HÖRNES (1856) assumed that the Viennese specimens are concordant with those described by EICHWALD (1853, p. 186, Pl. 8, Fig. 6), under the name of "*Pleur. costata* m.". On the other hand, FRIEDBERG (1912, p. 235) assigned EICHWALD's specimen to quite another species, to which he proposed the name *Raphitoma eichwaldi* FRIEDBERG. It is apparent that the so-named specimens from Hołubica and Tarnoruda (FRIEDBERG 1938, p. 152) differ distinctly from these herein studied and coming from Korytnica.

The species *Bela submarginata* (BONELLI *in* BELLARDI, 1847) has not hitherto been known from Korytnica. In the Miocene of Poland it was noted from

Łychów (CZARNOCKI 1968) and Niskowa (BAŁUK 1970). FRIEDBERG (1912, 1938) reported it from Hołubica, and other localities, all of which at present are in the territory of the Ukraine.

Bela subturgida (BOETTGER, 1906)
(Pl. 23, Figs 4-6)

1906. *Mangilia subturgida* n.sp.; O. BOETTGER, pp. 80-81.
1934. *Cythara* (*Mangelia*) *subturgida* (BOETTGER); A. ZILCH, p. 266, Pl. 19, Fig. 56.
1966. *Mangelia turgida subturgida* BOETTGER; L. STRAUSZ, pp. 439-440, Pl. 20, Fig. 16.

MATERIAL: Thirty-seven specimens.

DIMENSIONS: The largest specimen (see Pl. 23, Fig. 6) is 7.5 mm high and 3.5 mm wide; another one (Pl. 23, Fig. 5) is 6.0 mm and 2.7 mm, respectively.

REMARKS: The studied specimens are regarded as conspecific with those presented by BOETTGER (1901) from Kostej in Transylvania. The Korytnica specimens are generally a little smaller, and only the largest one is comparable to those from Kostej.

The species *Bela subturgida* (BOETTGER, 1906) has not hitherto been known from the Miocene of Poland.

Bela tumida (BOETTGER, 1906)
(Pl. 24, Figs 4-6)

1906. *Rhaphitoma* (*Ginnania*) *tumida* n.sp.; O. BOETTGER, pp. 87-88.
1934. *Cythara* (*Mangelia*) *tumida* (BOETTGER); A. ZILCH, p. 268, Pl. 20, Fig. 70.

MATERIAL: Ten specimens.

DIMENSIONS: The largest specimen (see Pl. 24, Fig. 6) is 5.2 mm high and 2.2 mm wide.

REMARKS: The studied specimens seem to be concordant with those described by BOETTGER (1906) from Kostej and Bujtur in Transylvania. The largest of the Korytnica specimens is however about one millimeter higher.

The species *Bela tumida* (BOETTGER, 1906) has not hitherto been known from the Miocene of Poland.

Bela vulpecula (BROCCHI, 1814)
(Pl. 24, Figs 10-11)

1901. *Rhaphitoma vulpecula* (BROCC.); O. BOETTGER, p. 75.
1906. *Rhaphitoma vulpecula* (BROCC.); O. BOETTGER, p. 82.
1954. *Mangelia* (s.s.) *vulpecula* BROCCHI; M. GLIBERT, pp. 49-50, Pl. 6, Fig. 9.
1997. *Bela vulpecula* (BROCCHI); C. CHIRLI, pp. 56-57, Pl. 16, Figs 1-3.

MATERIAL: Twenty specimens.

DIMENSIONS: The largest specimen (see Pl. 24, Fig. 10) is 8.5 mm high and 3.5 mm wide.

REMARKS: The studied specimens are very similar to the holotype of BROCCHI's species, photographed by PINNA & SPEZIA (1978, Pl. 40, Fig. 4). They slightly differ only by their size, being half smaller than the holotype (17.3 mm high), as well as the specimens presented by CHIRLI (1997); this is thought to result from their being not fully grown, and having their teleoconch shorter of about one whorl. To note, within the more numerous specimens from Kostej in Transylvania, the largest were those attaining the height of 12 mm and breadth of 4.5 mm.

Within the studied specimens from Korytnica the axial ornamentation is variable, particularly as concerns the number of axial ribs (12-14 on the last by one, and 8-10 on the last whorl) which tend to fade out at the aperture; the spiral ornamentation remains almost identical.

Doubted is an assignment of specimens from Podhorce in the Ukraine presented by FRIEDBERG (1928, pp. 573-574, Pl. 37, Fig. 17), which are featured by a higher spire and appearance of a margin on the whorls, what was already observed by FRIEDBERG (1938, p. 152) himself. Unclear is also an assignment of the specimens coming from the Miocene of Szob and Devecser in Hungary, and presented by STRAUSZ (1966, pp. 437-438, Pl. 20, Figs 18-21). A difference was earlier recognized by CSEPREGHY-MEZNERICS (1953, pp. 16-17, Pl. 3, Figs 8-9), who established a separate subspecies, *Cythara* (*Mangelia*) *vulpecula polonica* CSEPREGHY-MEZNERICS, for the discussed specimens from Podhorce and Szob.

The species *Bela vulpecula* (BROCCHI, 1814) has not hitherto been known from Korytnica. In the Miocene of Poland it was reported from Benczyn (KRACH 1950a).

Bela sanctacrucensis sp.nov.
(Pl. 24, Figs 7-9)

HOLOTYPE: The specimen (Z.PAL. U.W., No.BkK-G1069) presented in Pl. 24, Fig. 9.

TYPE HORIZON: Middle Miocene (Badenian).

TYPE LOCALITY: Korytnica, 24 km SSW of Kielce, southern slopes of the Holy Cross Mts.

DERIVATION OF THE NAME: *sanctacrucensis* – Latinized name of the Holy Cross region.

DIAGNOSIS: Like *Bela tumida* BOETTGER, but with a distinct margin along the whorls; spiral ornamentation of very densely spaced, minute striae covered with very delicate tubercles.

MATERIAL: Four specimens.

DIMENSIONS: The largest specimen (see Pl. 24, Fig. 7) is 6.2 mm high and 2.7 mm wide.

DESCRIPTION: The shell is small, fusiform. The protoconch composed over 3 whorls, of which the first 1.5 are smooth and successive ones ornamented by numerous, very thin axial ribs and by five thin, equally-sized spiral ribs. The teleoconch attains 3.3-3.6 whorls; its boundary with the protoconch is sharply outlined by diverse ornamentation. The teleoconch is featured by a delicate and originally very indistinct margin, above which the whorl becomes slightly concave. On the first teleoconch whorl there run 12 axial ribs, slightly oblique, relative broad and rounded at their crest. The number of axial ribs gradually decreases on successive whorls, being 9-11 on the last whorl. Moreover, the whole teleoconch is sculptured by very thin, densely spaced spiral striae, the number of which attains about 50 on the last whorl; they cover also the siphonal canal. Although all spiral striae are very thin, both primaries and intercalatories are distinguishable, and all are coated with very delicate tubercles. The aperture is elongated, smooth innerly, with not very thin lips, the outer one of which has a shallow but broad pleurotomal notch, whose deepest arch is situated just at the middle between the suture and the margin; the siphonal canal is rather long, almost straight.

REMARKS: To the present author's recognition, also this species, typified by the conspicuous ornamention, particularly spiral, has not been reported in the literature. Slightly similar is the afore-discussed *Bela tumida* BOETTGER, 1906, whose first whorl of the protoconch has a different shape, and all whorls of the protoconch are smooth; moreover, the whorls of the teleoconch lack of a margin, and are ornamented by delicate spiral grooves between which the striae are smooth and a little wider than the striae in *Bela sanctacrucensis* sp.nov.

Genus *Glyphostoma* GABB, 1873
Glyphostoma amphiodon (BOETTGER, 1901)
(Pl. 25, Figs 4-5)

1901. *Clathurella* (*Glyphostoma*) *amphiodon* n.sp.; O. BOETTGER, pp. 49-50.
1906. *Clathurella* (*Glyphostoma*) *amphiodon* BTTGR.; O. BOETTGER, pp. 65-66.
1934. *Glyphostoma amphiodon* (BOETTGER); A. ZILCH, p. 269, Pl. 20, Fig. 72.

MATERIAL: Twenty-eight specimens.

DIMENSIONS: The largest specimen (see Pl. 25, Fig. 5) is 6.8 mm high and 3.0 wide.

REMARKS: The studied specimens are undoubtedly conspecific with those presented by BOETTGER (1901) from Kostej in Transylvania, although they are slightly larger (those of Kostej being maximum 6.0 mm high and 2.75 wide).

The species *Glyphostoma amphiodon* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

Glyphostoma sp.
(Pl. 25, Fig. 6)

MATERIAL: One specimen.

DIMENSIONS: Height of the shell lacking apical whorls is 11.6 mm, width 5.2 mm.

REMARKS: Besides the specimens of the preceding species, *Glyphostoma amphiodon* (BOETTGER), still another one of the genus *Glyphostoma* has been found (see Pl. 25, Fig. 6). It is much larger, of the estimated height about 12.5 mm, and featured with slightly denser spiral ribs and more numerous teeth of the outer lip innerly. This fragmented specimen does not allow to recognize whether it may belong to the preceding species as its large representative. If so, noteworthy should be its teleoconch of about two whorls longer than anyone of the reported specimens of *Glyphostoma amphiodon* (BOETTGER).

Genus *Clathurella* CARPENTER, 1857
Clathurella annamariae BOETTGER, 1901
(Pl. 25, Fig. 1)

1901. *Clathurella* (*Clathromangilia*) *annamariae* n.sp.; O. BOETTGER, pp. 50-51.

1906. *Clathurella* (*Clathromangilia*) *annamariae* BTTGR.; O. BOETTGER, p. 66.
1934. *Clathromangelia annamariae* (BOETTGER); A. ZILCH, p. 269, Pl. 20, Fig. 74.

MATERIAL: Two specimens.

DIMENSIONS: The larger specimen (see Pl. 25, Fig. 1) is 4.8 mm high and 2.3 mm wide.

REMARKS: The studied specimens correspond exactly to those described by BOETTGER (1901) from Kostej and Lapugy in Transylvania. The specimens from these localities were divided by BOETTGER (1901) into two groups: of typical forms (6-6.25 mm high), and of dwarfish ones (of about 4 mm high). The specimens from Korytnica should be treated as typical, but of about half a whorl shorter than those from Transylvania.

The species *Clathurella annamariae* BOETTGER, 1901, has not hitherto been known from the Miocene of Poland.

Clathurella casilorica BOETTGER, 1906
(Pl. 25, Fig. 8)

1906. *Clathurella casilorica* n.sp.; O. BOETTGER, p. 68.
1934. *Clathurella casilorica* BOETTGER; A. ZILCH, p. 272, Pl. 21, Fig. 90.

MATERIAL: Four specimens.

DIMENSIONS: The largest specimen (see Pl. 25, Fig. 8) is 8.2 mm high and 4.1 mm wide.

REMARKS: The studied specimens are fully concordant (the illustrated one also by its size) with a unique specimen described by BOETTGER (1906) and figured by ZILCH (1934) from Kostej in Transylvania.

The species *Clathurella casilorica* BOETTGER, 1906, has not hitherto been known from the Miocene of Poland.

Clathurella densestriata BOETTGER, 1906
(Pl. 26, Figs 9-10)

1906. *Clathurella densestriata* n. sp.; O. BOETTGER, p. 69.
1934. *Clathurella densestriata* BOETTGER; A. ZILCH, p. 272, Pl. 21, Fig. 91.

MATERIAL: Fifteen specimens.

DIMENSIONS: The largest, but incomplete specimen (see Pl. 26, Fig. 9) may be estimated as 12 mm high and 4.5 mm wide.

REMARKS: Although no complete specimens have been found, the studied fragments, the protoconch including, as well as the shape, ornamentation and size of the teleoconch are concordant with those of the species described by BOETTGER (1906) and illustrated by ZILCH (1934) from Kostej in Transylvania.

The species *Clathurella densestriata* BOETTGER, 1906, has not hitherto been known from the Miocene of Poland.

Clathurella henrichi BOETTGER, 1901
(Pl. 26, Figs 1-2)

1901. *Clathurella henrichi* n.sp.; O. BOETTGER, pp. 52-53.
1906. *Clathurella henrichi* BTTGR.; O. BOETTGER, p. 66.
1934. *Clathurella henrichi* BOETTGER; A. ZILCH, p. 271, Pl. 21, Fig. 85.

MATERIAL: Ten specimens.

DIMENSIONS: The largest completely preserved specimen (see Pl. 26, Fig. 1) is 3.7 mm high and 1.5 mm wide; another one (see Pl. 26, Fig. 2) is 1.8 mm wide.

REMARKS: The studied specimens are fully concordant, both as concerns the shape, size, and ornamentation, with the specimens described by BOETTGER (1901, 1906) and illustrated by ZILCH (1934) from Kostej in Transylvania.

The species *Clathurella henrichi* BOETTGER, 1901, has not hitherto been known from the Miocene of Poland.

Clathurella januszkiewiczi (FRIEDBERG, 1912)
(Pl. 26, Figs 5-7)

1912. *Mangilia Januszkiewiczi* FRIEDB.; W. FRIEDBERG, pp. 229-230, Pl. 12, Fig. 12.

MATERIAL: Thirty-seven specimens (in majority juvenile).

DIMENSIONS: The largest specimen (see Pl. 26, Fig. 5) is 8.0 mm high and 4.1 mm wide.

REMARKS: The studied specimens are undoubtedly concordant with those described by FRIEDBERG (1912) from Zborów in the Ukraine, and no difference may be indicated between materials collected in these two locali-

ties. FRIEDBERG (1912) assumed a similarity of his species to *Clathurella fuchsi* (BELLARDI), whose photographed holotype (FERRERO MORTARA & *al.* 1981, Pl. 16, Fig. 15) represents, however, quite a distinct species.

The species *Clathurella januszkiewiczi* (FRIEDBERG, 1912) has not hitherto been known from Korytnica. In the Miocene of Poland it was mentioned as "*Mangilia* cf. *Januszkiewiczi* FRIEDB." by KRACH (1950*a*) from Benczyn.

Clathurella postuma BOETTGER, 1906
(Pl. 25, Figs 2-3)

1906. *Clathurella postuma* n.sp.; O. BOETTGER, p. 68.
1934. *Clathurella postuma* BOETTGER; A. ZILCH, p. 272, Pl. 21, Fig. 89.

MATERIAL: Thirty specimens.

DIMENSIONS: The largest specimen is 7.8 mm high and 3.1 mm wide.

REMARKS: The studied specimens are evidently concordant with the holotype described by BOETTGER (1906) from Kostej in Transylvania. This holotype, being heretofore the only specimen of the species, is slightly larger, but less slender (8.5 mm high, 3.9 mm wide). Both the holotype and specimens from Korytnica bear their whorls featured with a detectable margin, what does not allow to classify their profile (cf. BOETTGER 1906, p. 68) as "*nullo modo angulatis*". In this holotype, four thin striae are present between the suture and the margin; some of the Korytnica specimens have five such striae.

The species *Clathurella postuma* BOETTGER, 1906, has not hitherto been known from the Miocene of Poland.

Clathurella undatolirata (BOETTGER, 1901)
(Pl. 25, Fig. 7)

1901. *Drillia undatolirata* n.sp.; O. BOETTGER, pp. 44-45.
1906. *Clathurella undatolirata* (BTTGR.); O. BOETTGER, pp. 67-68.
1934. *Clathurella undatolirata* (BOETTGER); A. ZILCH, p. 272, Pl. 21, Fig. 88.

MATERIAL: Three specimens (one complete, and two being the last whorls).

DIMENSIONS: The complete specimen is 8.6 mm high and 3.8 mm wide; the larger of the two others is 5.2 mm wide.

REMARKS: The studied specimens are fully concordant with those described by BOETTGER (1901, 1906) from Kostej in Tranlsyvania.

The species *Clathurella undatolirata* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

Clathurella vasta (BOETTGER, 1906)
(Pl. 26, Figs 3-4)

1906. *Drillia* (*Crassispira*) *vasta* n.sp.; O. BOETTGER, p. 57.
1934. *Turris* (*Crassispira*) *vasta* (BOETTGER); A. ZILCH, p. 261, Pl. 17, Fig. 29.

MATERIAL: Eight specimens.

DIMENSIONS: The largest specimen (see Pl. 26, Fig. 4) is 6.1 mm high and 3.2 mm wide.

REMARKS: The studied specimens, although devoid the aperture, are undoubtedly conspecific with those described by BOETTGER (1906) from Kostej in Transylvania. BOETTGER (1906) hesitated to attribute this species either to the genus *Drillia*, or *Clathurella.* The structure of the protoconch, preserved in one of the Korytnica specimens indicates the second of this possibilities.

The species *Clathurella vasta* (BOETTGER, 1906) has not hitherto been known from the Miocene of Poland.

Clathurella cf. *carolinae* (BOETTGER, 1901)
(Pl. 26, Fig. 11)

1901. *Surcula carolinae* n.sp.; O. BOETTGER, pp. 41-42.
1906. *Clathurella subtilis* (PTSCH.); O. BOETTGER, pp. 66-67.
1934. *Clathurella subtilis* (PARTSCH) = *Surcula carolinae* BOETTGER; A. ZILCH, pp. 271-272, Pl. 21, Fig. 86.

MATERIAL: One specimen.

DIMENSIONS: The specimen, having its siphonal canal broken off, is 8 mm high (total height should be estimated as about 11 mm) and 3.5 mm wide.

REMARKS: The only specimen from Korytnica seems to be concordant with the holotype of the species, established by BOETTGER (1901), and coming from Kostej in Transylvania. An inferior state of preservation of this specimen, having its siphonal canal broken, does not allow for its definitive assignment. The author of this species, in his subsequent paper (BOETTGER 1906) classified the earlier

established species as conspecific with *Pleurotoma subtilis* PARTSCH, reported by HÖRNES (1856, pp. 381-382, Pl. 40, Fig. 4). The present author has no possibility the latter assignment, and therefore suggests to accept the former one, of BOETTGER (1901). The two discussed species differ by a longer size and much more densely spaced axial ribs in the species introduced by PARTSCH.

The species *Clathurella carolinae* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

Clathurella sp.
(Pl. 26, Fig. 8)

MATERIAL: Eight specimens.

DIMENSIONS: The largest specimen is 7.2 mm high and 3.2 mm wide.

REMARKS: The studied specimens are either fragmented, or not fully grown to possess the final aperture. The best preserved one (see Pl. 26, Fig. 8), due to its shape, structure of the protoconch, and ornamentation, does evidently belong to the genus *Clathurella*. Details of its ornamentation are, however, different from those of any known species of this genus, and should be distinctive at the species level. The present author therefore suggests its separateness, although a lack of the complete specimen does not allow to create a new taxon.

Genus *Teretia* NORMAN, 1888
Teretia anceps (EICHWALD, 1853)
(Pl. 27, Figs 1-3)

1853. *Pleur. anceps* m.; E. EICHWALD, pp. 186-187, Pl. 8, Fig. 7.
1856. *Pleurotoma anceps* EICHW.; M. HÖRNES, pp. 368-369, Pl. 40, Fig. 11.
1877. *Homotoma anceps* (EICW); L. BELLARDI, p. 280.
1877. *Homotoma turritelloides* BELL.; L. BELLARDI, p. 281, Pl. 8, Fig. 29.
?1904. *Teres anceps* (EICHW.); F. SACCO, p. 54, Pl. 14, Figs 15-17.
1912. *Teres anceps* EICHW.; W. FRIEDBERG, pp. 232-233, Pl. 14, Fig. 15.
1953. *Daphnella anceps* (EICHW.); I. CSEPREGHY-MEZNERICS, p. 18, Pl. 2, Figs 19-21.
1966. *Teretia anceps* EICHWALD; L. STRAUSZ, pp. 435-436, Pl. 18, Fig. 16.
1972. *Teretia anceps* (EICHWALD); F. NORDSIECK, p. 115, Pl. 29, Fig. 190.
1972. *Teretia anceps fusianceps* n.ssp.; F. NORDSIECK, p. 115, Pl. 29, Fig. 191.
1975. *Teretia anceps* (EICHWALD); G. PAVIA, p. 114, Pl. 8, Figs 25-26.
1977. *Teretia anceps* (EICHWALD); G. JAKUBOWSKI, pp. 113-114, Pl. 16, Figs 5-6.
1982. *Teretia anceps* (EICHWALD); J. ŠVAGROVSKÝ, p. 422, Pl. 11, Fig. 5.
1984. *Teretia anceps* (VON EICHWALD); A.W. JANSSEN, pp. 326-328, Pl. 75, Fig. 2; Pl. 80, Fig. 2.
1984. *Teretia fusianceps* NORDSIECK; A.W. JANSSEN, p. 328, Pl. 75, Fig. 3; Pl. 80, Fig. 3.

MATERIAL: Ninety-eight specimens.

DIMENSIONS: The largest specimen is 6.0 mm high and 2.2 mm wide.

REMARKS: The studied specimens are fully concordant with those presented by EICHWALD (1853) from Żukowce in Podolya, and by HÖRNES (1856) from Baden in the Vienna Basin. Although in the original illustration of the holotype, the median spiral stria is not more conspicuous than the others, but in its description EICHWALD (1853) indicates that feature firmly. Within the specimens from Korytnica there occur two specimens with all striae equally developed (see Pl. 27, Fig. 3), what certainly should be ascribed to the intraspecific variability. Consequently, the present author does not share a treatment to distinguish the subspecies, or species *Teretia fusianceps* NORDSIECK. A conspecifity of the studied specimens with those coming from northern Italy is not evident, as the latter ones are almost of a twice longer size.

ATANACKOVIĆ (1969, p. 213, Pl. 12, Fig. 6) presented, under the name of "*Teres anceps* (EICHWALD)" the specimens from the Miocene of Bosna which differ in size and ornamentation from these of Korytnica so distinctly, that they evidently are not conspecific, and their determination is actually erroneous.

The species *Teretia anceps* (EICHWALD, 1853) was reported from Korytnica only by FRIEDBERG (1938). In the Miocene of Poland it is also known from Rybnica (KOWALEWSKI 1950), Trzydnik (KRACH 1950*b*), Monastyrz (JAKUBOWSKI 1977), Gliwice Stare (KRACH 1954), Wieliczka (KOWALEWSKI 1933), and Brzeźnica (KRACH 1960).

Genus *Daphnella* HINDS, 1844
Subgenus *Favriella* HORNUNG, 1923
Daphnella (*Favriella*) *alterego* (BOETTGER, 1906)
(Pl. 27, Fig. 4)

1906. *Surcula alterego* n.sp.; O. BOETTGER, pp. 54-55.
1934. *Clavatula* (*Surcula*) *alterego*; A. ZILCH, p. 261, Pl. 17, Fig. 28.

MATERIAL: Three specimens.

DIMENSIONS: The largest specimen (see Pl. 27, Fig. 4) is 5.5 mm high and 2.2 mm wide.

REMARKS: The studied specimens are supposedly concordant with those described by BOETTGER (1906) from Kostej in Transylvania, although of about one whorl lesser. BOETTGER hesitated whether his specimens, numbering five, should be separated, or accomodated into the species *Daphnella* (*Favriella*) *tenerrima* as its variety. In the present author's opinion the differences are so substantial that a unifying of these two species into one is not motivated.

The species *Daphnella* (*Favriella*) *alterego* (BOETTGER, 1906) has not hitherto been known from the Miocene of Poland.

Daphnella (*Favriella*) *dorae* (BOETTGER, 1906)
(Pl. 27, Figs 5-7)

1901. *Drillia rotundicosta* n.sp.; O. BOETTGER, p. 44.
1906. *Drillia dorae* BTTGR. n.nom.; O. BOETTGER, p. 56.
1934. *Drillia dorae* BOETTGER; A. ZILCH, p. 260, Pl. 17, Fig. 25.

MATERIAL: Ninety specimens.

DIMENSIONS: The largest, completely preserved specimen (see Pl. 27, Fig. 5) is 7.0 mm high and 2.7 mm wide; another one, represented only by its last whorl is 3.3 mm wide.

REMARKS. The studied specimens are undoubtedly conspecific with those described by BOETTGER (1901, 1906) from Kostej in Transylvania. The Korytnica specimens are about one whorl lesser than the holotype. All of them are rather very variable as concerns their shape: more common are slender forms (see Pl. 27, Fig. 5), but as many as 20 specimens are more stumpy, almost conical (see Pl. 27, Fig. 6). The number of axial ribs on the last whorl attains 7 or 8 (in one stumpy specimens even 9), whereas BOETTGER (1901) noted it as 6 or 7.

BOETTGER (1906) accomodated his species, althought not without hesitation, to the genus *Drillia* GRAY. According to the present author, it should be assigned rather to the genus *Daphnella* HINDS, 1844, and subgenus *Favriella* HORNUNG, 1923, similarly as two other species distinguished by BOETTGER as "*Surcula tenerrima*" and the above-disscussed "*Surcula alterego*". A close relationship of those three species was evident already for BOETTGER (1906, p. 55). They all display the features compatible with those of the type species of the genus *Daphnella* (*Favriella*) *weberi* described from the Pliocene of northern Italy (WENZ 1943, p. 1455). The specimens from Korytnica bear a multispiral protoconch of an almost identical shape and ornamentation as those of *Favriella sinuosa* (SORGENFREI) presented from the Pliocene of Zinola in northern Italy by BERNASCONI (1989, Pl. 1, Figs 4-5).

The species *Daphnella* (*Favriella*) *dorae* (BOETTGER, 1906) has not hitherto been known from the Miocene of Poland.

Daphnella (*Favriella*) *tenerrima* (BOETTGER, 1901)
(Pl. 27, Figs 8-9)

1901. *Surcula tenerrima* n.sp.; O. BOETTGER, pp. 42-43.
1934. *Clavatula* (*Surcula*) *tenerrima* (BOETTGER); A. ZILCH, p. 261, Pl. 17, Fig. 27.

MATERIAL: Two specimens.

DIMENSIONS: The smaller, but almost complete specimen (see Pl. 27, Fig. 8), is 6.5 mm high and about 3 mm wide; the larger, but with its siphonal canal broken, is about 5.5 mm wide, and of the height estimated as about 10 mm.

REMARKS. The two specimens, of which smaller one is slightly more slender, are fully concordant with those described detaily by BOETTGER (1901), whose specimens from Kostej in Transylvania bear 9-12 axial ribs on their last whorl. The smaller of the Korytnica specimens bears 9 such ribs on the last whorl, and 8 ribs on the first whorl of the teleoconch; the larger specimen bears 12 and 11 ribs, respectively. In both specimens the ribs are of similar width and distribution. To note, BOETTGER (1901) reported from Kostej (locality Valea semini) a similar variability displayed by 4 larger and 4 smaller specimens.

The species *Daphnella* (*Favriella*) *tenerrima* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

Genus *Raphitoma* BELLARDI, 1848
Raphitoma hispida BELLARDI, 1877
(Pl. 21, Figs 4-5)

1877. *Raphitoma hispida* BELL.; L. BELLARDI, p. 299, Pl. 9, Fig. 5.
1937. *Daphnella* (*Raphitoma*) *hispida* BELL.; E. MONTANARO, p. 180, Pl. 8, Figs 37-39.
1968. *Raphitoma* (*Raphitoma*) *hispida* BELLARDI; E. ROBBA, pp. 605-606, Pl. 46, Fig. 3.
1971. *Cythara* (*Mangelia*) *hispida* BELLARDI; I. CSEPREGHY-MEZNERICS, p. 33, Pl. 16, Figs 34 and 36.

1981. *Raphitoma hispida* BELLARDI *in* SEGUENZA; E. FERRERO MORTARA & *al*. p. 92, Pl. 18, Fig. 9.
partim 1981. *Mangelia hispidula* (JAN *in* BELLARDI); W. KRACH, p. 74, Pl. 22, Fig. 6; *non* Fig. 5.
?1997. *Raphitoma hispida* BELLARDI in SEGUENZA; C. CHIRLI, pp. 79-80, Pl. 22, Figs 11-12.

MATERIAL: Forty-five specimens.

DIMENSIONS: The largest specimen is 8.6 mm high and 4.1 mm wide.

REMARKS: The studied specimens seem to be concordant with those described by BELLARDI (1877) from Stazzano in the Miocene of northern Italy. A doubt arises as concerns the size of the Korytnica specimens smaller than that of the BELLARDI's holotype (height 12 mm, width 5 mm); the other Italian specimens, however, are of the same size as these from Korytnica. The largest specimen reported by MONTANARO (1937) from Montegibbio was 7.2 mm high, and 3.3 mm wide, whereas a unique one presented by ROBBA (1968) from Santa Agata-Fossili was only 7.0 mm in its height and 3.5 mm in width. An accordance of the Korytnica specimens with one presented by CHIRLI (1997), and coming from the Pliocene of Toscania at Empoli, is uncertain. That specimen is distinctly more slender, being 11.2 mm high and 4.3 mm wide. To note, the specimens from Korytnica are featured by the presence of 9-11 axial ribs on the last whorl.

The species *Raphitoma hispida* BELLARDI, 1877, has not hitherto been known from the Miocene of Poland.

Raphitoma plicatella JAN *in* BELLARDI, 1847
(Pl. 21, Figs 1-3)

1847. *Raphitoma plicatella* JAN; L. BELLARDI, p. 92, Pl. 4, Fig. 18.
partim 1856. *Pleurotoma plicatella* JAN; M. HÖRNES, pp. 374-375, Pl. 40, Fig. 6; *non* Fig. 5.
1877. *Raphitoma plicatella* JAN; L. BELLARDI, p. 307, Pl. 9, Fig. 19.
1901. *Rhaphitoma plicatella* (JAN); O. BOETTGER, pp. 73-74.
1912. *Raphitoma Zejszneri* FRIEDB.; W. FRIEDBERG, pp. 234-235, Pl. 14, Fig. 17.
1928. *Raphitoma hispidula* JAN; W. FRIEDBERG, p. 572, Pl. 37, Figs 12-13.
1938. *Daphnella hispidula* JAN; W. FRIEDBERG, p. 152.
1938. *Daphnella Zejszneri* FRIEDB.; W. FRIEDBERG, p. 152.
1969. *Raphitoma hispidula* (JAN); M. ATANACKOVIĆ, p. 212, Pl. 12, Fig. 12.
1971. *Cythara* (*Mangelia*) *hispida* BELLARDI; I. CSEPREGHY-MEZNERICS, p. 33, Pl. 16, Figs 34 and 36.
1997. *Raphitoma plicatella* JAN in BELLARDI; C. CHIRLI, pp. 85-86, Pl. 24, Fig. 8.

MATERIAL: Six hundred and seventy specimens.

DIMENSIONS: The largest specimen is 13.7 mm high and 4.5 mm wide.

REMARKS: A specific assignment of these specimens, quite common at Korytnica bears some troubles, as they are very variable in their slenderness (compare Pl. 21, Fig. 1 and Fig. 2) and the number of axial ribs, ranging 9 to 13 on the last but one, and 8 to 12 on the last whorl. FRIEDBERG (1912), when having one specimen at his disposal, established a separate species *Raphitoma zejszneri* FRIEDBERG, but later when keeping four other specimens, he classified them (FRIEDBERG 1928) as *Raphitoma hispidula* JAN, regardless their similar slenderness and an identical number (12) of ribs. FRIEDBERG believed that his specimens of *Raphitoma hispidula* are concordant with those described by HÖRNES (1856, pp. 374-375, Pl. 40, Figs 5-6) under the name of "*Pleurotoma plicatella* JAN", although the dimensions reported by HÖRNES for the Viennese specimens were different - at the height of 10 mm, they were of 7 mm in breadth. [Supposedly, FRIEDBERG deduced from an illustration of HÖRNES that these dimensions are false]. However, FRIEDBERG was familiar with the fact that the Viennese specimens (or, their part at least) and these of Korytnica differ from *Raphitoma hispidula* JAN by their lesser number of axial ribs; his treatement remains unclear.

In the present author's opinion, the studied specimens from Korytnica may either be regarded as conspecific with *Raphitoma plicatella* JAN, or with *Raphitoma zejszneri* FRIEDBERG. The first possibility is vague by the fact that BELLARDI (1847, 1877) has twice figured specimens of "*Raphitoma plicatella* JAN" of a much larger size. A specimen first illustrated (BELLARDI 1847, Pl. 4, Fig. 18) and thus being the holotype of the species (see PINNA 1971, p. 437), is about 23.5 mm high and about 9.0 mm wide, featured by a distinct margin on all whorls. A specimen illustrated secondly (BELLARDI 1877, Pl. 9, Fig. 19) is still larger, and almost lacking a margin on the distal whorls. BOETTGER (1901) when studying gastropods from Kostej in Transylvania, classified as *Raphitoma plicatella* JAN specimens 12.5 mm high and 5 mm wide, having 10-14 axial ribs on the last whorl, whereas larger forms (up to 15 mm in height) and with 19 axial ribs he assigned to *Raphitoma hispidula* JAN.

The present author follows HÖRNES (1856) and BOETTGER (1901, 1906) to classify the Korytnica specimens as *Raphitoma plicatella* JAN *in* BELLARDI. It is unfortunate that this taxon has been omitted in the photo catalogue (PINNA 1971) of holotypes established by JAN, as well as in that one (FERRERO MORTARA & *al.* 1981) of the species introduced by BELLARDI and by SACCO. The original description by BELLARDI (1847, p. 92), repeated by CHIRLI (1997, p. 85) is very unclear, also as concerns the holotype; the only precise information is that on the number of axial ribs as about 13 ("*13 circiter*"). The name *Raphitoma zejszneri* FRIEDBERG, 1912, should thus be regarded as a younger synonym of *Raphitoma plicatella* JAN *in* BELLARDI.

The specimens from Łychów, described by KRACH (1981, p. 74, Pl. 22, Figs 5-6) under the name of "*Mangelia hispidula* (JAN *in* BELLARDI)", are twice smaller than those from Korytnica, and they supposedly belong neither to this species nor to *Raphitoma plicatella* (JAN *in* BELLARDI, 1847). Their part may be close to *Raphitoma hispida* BELLARDI, 1877, as assumed by KRACH himself.

Noteworthy is also that FRIEDBERG (1928) attributed the name "*Raphitoma plicatella* JAN" to quite a different species [see remarks hereafter, to *Cythara* (*Mangelia*) *subcylindrata* (BOETTGER)].

The species *Raphitoma plicatella* JAN *in* BELLARDI, 1847 from Korytnica was reported under the names of "*Raphitoma hispidula*" or "*Raphitoma zejszneri*" by FRIEDBERG (1912, 1928, 1938) and by KOWALEWSKI (1930). Under the latter name, it may be recognized from Gliwice Stare in the report by KRACH (1954), the same as under the name of "*Daphnella Zejszneri* FRIEDB." reported by KRACH (1950*a*) from Benczyn.

Raphitoma polyacantha (BOETTGER, 1906)
(Pl. 21, Fig. 9)

1906. *Rhaphitoma polyacantha* n.sp.; O. BOETTGER, pp. 82-83.
1934. *Cythara* (*Mangelia*) *polyacantha* (BOETTGER); A. ZILCH, p. 266, Pl. 19, Fig. 60.

MATERIAL: Five specimens.

DIMENSIONS: The largest specimen (see Pl. 21, Fig. 9) is 11.9 mm high and 4.6 mm wide.

REMARKS: The studied specimens are regarded as conspecific with those described by BOETTGER (1906) from Kostej in Transylvania, although their number of axial ribs on the last whorl is slightly lesser (9-10 instead of 11-13). A variability of such an extent is typical of many species of this genus, as exemplified *i.a.* by the above-discussed *Raphitoma hispida.*

The specimen from Borský Mikuláš in Slovakia presented by ŠVAGROVSKÝ (1982, pp. 419-420, Pl. 11, Fig. 3) under the name "*Bela polyacantha* (BOETTGER)" bears different ornamentation, and it cannot be regarded as conspecific with those from Kostej, or from Korytnica.

The species *Raphitoma polyacantha* (BOETTGER, 1906) has not hitherto been known from the Miocene of Poland.

Raphitoma sparsa (BOETTGER, 1901)
(Pl. 21, Figs 6-8)

1901. *Rhaphitoma sparsa* n.sp.; O. BOETTGER, p. 74.
1906. *Rhaphitoma sparsa* BTTGR.; O. BOETTGER, p. 82
1934. *Cythara* (*Mangelia*) *sparsa* (BOETTGER); A. ZILCH, p. 266, Pl. 19, Fig. 58.
1966. *Mangelia sparsa* BOETTGER; L. STRAUSZ, p. 438, Pl. 20, Figs 27-32 and 34-39.

MATERIAL: Fourteen specimens.

DIMENSIONS: The largest specimen (see Pl. 21, Fig. 8) is 7.7 mm high and 3.3 mm wide; another one is 5.9 mm and 2.9 mm, respectively.

REMARKS: The studied specimens are fully concordant with those described by BOETTGER (1901) from Kostej in Transylvania. These coming from Korytnica bear the number of axial ribs on the last whorl 9 or 10, what complies well with the figure given by BOETTGER who reported it as "ca. 9". The shells of this species are easy to distinguish from the allied species by their relatively very large protoconch.

The specimen from Borský Mikuláš in Slovakia presented by ŠVAGROVSKÝ (1982, p. 419, Pl. 11, Fig. 2) under the name "*Bela sparsa* (BOETTGER)" bears its initial whorls quite different, and it cannot be regarded as conspecific with those from Kostej, or from Korytnica.

The species *Raphitoma sparsa* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

Raphitoma subvellicata (BOETTGER, 1901)
(Pl. 23, Fig. 8)

1901. *Rhaphitoma subvellicata* n.sp.; O. BOETTGER, pp. 78-79.
1906. *Rhaphitoma subvellicata* BTTGR.; O. BOETTGER, p. 85.
1934. *Cythara* (*Mangelia*) *subvellicata* (BOETTGER); A. ZILCH, p. 267, Pl. 20, Fig. 65.

MATERIAL: Two specimens.

DIMENSIONS: The larger specimen (see Pl. 23, Fig. 8) is 7.8 mm high and 3.0 mm wide.

REMARKS: The studied specimens are undoubtedly conspecific with those described by BOETTGER (1901, 1906) from Kostej in Transylvania. In comparison with the holotype of the species, presented by ZILCH (1934), the larger of the Korytnica specimens is shorter of about one whorl, and its spiral striae between the suture and the margin are slightly less developed.

The species *Raphitoma subvellicata* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

Genus *Philbertia* MONTEROSATO, 1884
Philbertia adelgundae (BOETTGER, 1906)
(Pl. 28, Figs 9-10)

1906. *Peratotoma* (*Cordieria*) *adelgundae* n.sp.; O. BOETTGER, p. 74.
1934. *Philbertia adelgundae* (BOETTGER); A. ZILCH, p. 271, Pl. 20, Fig. 82.

MATERIAL: Twenty specimens.

DIMENSIONS: The largest specimen (see Pl. 28, Fig. 10) is 5.6 mm high and 2.6 mm wide; another one is 4.6 mm and 2.3 mm, respectively.

REMARKS: The studied specimens seem to be conspecific with those described by BOETTGER (1906) from Kostej in Transylvania. A hesitation arises, however, from fact that none of the Korytnica specimens bear 16 axial ribs on the last whorl as diagnosed by BOETTGER, but either 15 or even 14 in the case of the largest specimen (Pl. 28, Fig. 10).

The species *Philbertia adelgundae* (BOETTGER, 1906) has not hitherto been known from the Miocene of Poland.

Philbertia microhystrix (BOETTGER, 1901)
(Pl. 28, Figs 2-3)

1901. *Peratotoma* (*Cordieria*) *microhystrix* n.sp.; O. BOETTGER, pp. 54-55.
1906. *Peratotoma* (*Cordieria*) *microhystrix* BTTGR.; O. BOETTGER, p. 70.
1934. *Philbertia microhystrix* (BOETTGER); A. ZILCH, p. 270, Pl. 20, Fig. 78.
1966. *Raphitoma microhystrix* (BOETTG.); J. KÓKAY, p. 65, Pl. 10, Figs 8-9.

MATERIAL: One hundred and twenty specimens.

DIMENSIONS: The largest specimen is 4.1 mm high and 2.0 mm wide.

REMARKS: The studied specimens are undoubtedly conspecific with those reported by BOETTGER (1901) from Kostej and Lapugy in Transylvania, as well as from Soos in the Vienna Basin.

The species *Philbertia microhystrix* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

Philbertia parahystrix (BOETTGER, 1901)
(Pl. 28, Fig. 1)

1901. *Peratotoma* (*Cordieria*) *parahystrix* n.sp.; O. BOETTGER, pp. 53-54.
1906. *Peratotoma* (*Cordieria*) *parahystrix* BTTGR.; O. BOETTGER, p. 69.
1934. *Philbertia parahystrix* (BOETTGER); A. ZILCH, p. 270, Pl. 20, Fig. 77.

MATERIAL: One specimen.

DIMENSIONS: Height 3.7 mm, width 2.0 mm.

REMARKS: The only specimen from Korytnica is not fully grown, being about two whorls lesser than those described by BOETTGER (1901) from Kostej in Transylvania; nevertheless, its conspecifity with the latter ones is undoubted.

The species *Philbertia parahystrix* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

Philbertia praehispida (BOETTGER, 1906)
(Pl. 28, Fig. 4)

1906. *Peratotoma* (*Cordieria*) *praehispida* n.sp.; O. BOETTGER, p. 71.
1934. *Philbertia praehispida* (BOETTGER); A. ZILCH, p. 270, Pl. 20, Fig. 80.

MATERIAL: One incomplete specimen.

DIMENSIONS: Roughly estimated width should be not lesser than 2.5 mm.

REMARKS: This damaged specimen, although incomplete, is undoubtedly concordant with those described by BOETTGER (1906) from Kostej in Transylvania.

In the present author's opinion, quite uncertain is an assignment to this species of a specimen from the Miocene of Winterswijk-Miste in the Netherlands presented by JANSSEN (1984, pp. 322-323, Pl. 74, Fig. 5) under the name of "*Philbertia praehispida* (BOETTGER)".

The species *Philbertia praehispida* (BOETTGER, 1906) has not hitherto been known from the Miocene of Poland.

Philbertia raynevali (BELLARDI, 1877)
(Pl. 28, Figs 5-6)

1877. *Homotoma Raynevali* BELL.; L. BELLARDI, p. 274, Pl. 8, Fig. 24.
1981. *Homotoma raynevali* BELLARDI; E. FERRERO MORTARA & *al.*, p. 88, Pl. 18, Fig. 3.
1997. *Raphitoma raynevali* (BELLARDI); C. CHIRLI, p. 87, Pl. 25, Figs 1-4.

MATERIAL: Ninety specimens.

DIMENSIONS: The largest specimen (see Pl. 28, Fig. 6) is 6.7 mm high and 2.5 mm wide.

REMARKS: The studied specimens seem to be conspecific with those described by BELLARDI (1877) from the Pliocene of Colli Astesi in northern Italy. Although FERRERO MORTARA & *al.* (1981) selected as the syntype of the species a specimen slightly less slender and with a shorter siphonal canal, but the original illustration by BELLARDI (1877) presents a specimen to which these from Korytnica are fully concordant. The less slender specimens, having their siphonal canal of comparable length, have recently been presented by CHIRLI (1997) from the Pliocene of Toscania. Such differences should be regarded as of the species variability.

The species *Philbertia raynevali* (BELLARDI, 1877) has not hitherto been known from the Miocene of Poland.

Philbertia subpurpurea (BOETTGER, 1901)
(Pl. 28, Figs 11-13)

1901. *Peratotoma* (*Philbertia*) *subpurpurea* n.sp.; O. BOETTGER, p. 57.
1906. *Peratotoma* (*Philbertia*) *subpurpurea* BTTGR.; O. BOETTGER, p. 73.
1934. *Philbertia subpurpurea* (BOETTGER); A. ZILCH, p. 269, Pl. 20, Fig. 75.

MATERIAL: Seventy specimens.

DIMENSIONS: The largest specimen is 8.4 mm high and 3.7 mm wide.

REMARKS. The studied specimens are fully concordant with those described by BOETTGER (1901, 1906) from Kostej in Transylvania, and some of them are even slightly larger; according to BOETTGER (1906, p. 73), the largest of his specimens attained only to 7 mm in its height.

The species *Philbertia subpurpurea* (BOETTGER, 1901) has not hitherto been known from the Miocene of Poland.

Philbertia ulricae (BOETTGER, 1906)
(Pl. 28, Figs 7-8)

1906. *Peratotoma* (*Cordieria*) *ulricae* n.sp.; O. BOETTGER, p. 70.
1934. *Philbertia ulricae* (BOETTGER); A. ZILCH, p. 270, Pl. 20, Fig. 79.

MATERIAL: Twenty-five specimens.

DIMENSIONS: The two largest specimens are both 5.7 mm high, and 2.8 or 2.6 mm wide.

REMARKS: The studied specimens seem to be conspecific with those described by BOETTGER (1906) from Kostej in Transylvania, although their axial ribs are more densely spaced (10-12 on the last whorl, instead of 10-11 as given by BOETTGER), and their size is slightly larger. KRACH (1981, p. 75, Pl. 22, Figs 3-4) described from Łychów under the name of "*Philbertia ulricae* (BOETTGER)" still larger specimens (7.5 mm high) and serrated along the outer lip innerly. The specimens from Korytnica as well as those from Kostej are featured by the smooth lips at their inner side. Consequently, a conspecifity of specimens coming from these three localities cannot be ascertained.

The specimens from Várpalota in Hungary, presented by STRAUSZ (1966, p. 444, Pl. 21, Figs 13-18) under the same name, are supposedly also not conspecific with these from Korytnica; all bear a conspicuous margin on the whorls, lesser number of axial ribs, and a different ornamentation on the siphonal canal.

The species *Philbertia ulricae* (BOETTGER, 1906) has not hitherto been known from the Miocene of Poland.

Genus *Peratotoma* HARRIS & BURROWS, 1891
Peratotoma augustae BOETTGER, 1901
(Pl. 19, Figs 4-6)

1901. *Peratotoma augustae* n.sp.; O. BOETTGER, pp. 58-59.
1906. *Peratotoma augustae* BTTGR.; O. BOETTGER, p. 75.
1934. *Peratotoma augustae* BOETTGER; A. ZILCH, p. 273, Pl. 21, Fig. 96.

MATERIAL: Fourteen specimens.

DIMENSIONS: The largest specimen (see Pl. 19, Fig. 6) is 7.5 mm high and 3.8 mm wide.

REMARKS: The studied specimens are fully concordant with those described by BOETTGER (1901) from Kostej in Transylvania.

A specimen described by ŠVAGROVSKÝ (1958, pp. 32-33, Pl. 9, Fig. 13) from Kuznice in Czech Republic, under the name of "*Raphitoma* aff. *augustae* (BOETTGER)" is evidently misinterpreted. In the present author's opinion, it is neither allied to this species, nor belongs to the family Turridae; most probably, it is an indeterminable juvenile representative of the family Muricidae FLEMING, 1828.

The species *Peratotoma augustae* BOETTGER, 1901, has not hitherto been known from the Miocene of Poland.

Peratotoma echinus BOETTGER, 1901
(Pl. 29, Figs 5-8)

1901. *Peratotoma echinus* n.sp.; O. BOETTGER, pp. 60-61.
1906. *Peratotoma echinus* BTTGR.; O. BOETTGER, p. 72.
1934. *Peratotoma echinus* BOETTGER; A. ZILCH, p. 273, Pl. 21, Fig. 92.

MATERIAL: Forty specimens.

DIMENSIONS: The largest specimen is about 7.5 mm high and 3.8 mm wide.

REMARKS: The studied specimens are supposedly conspecific with those described by BOETTGER (1901) from Kostej in Transylvania. The largest of the Korytnica specimens is slightly higher of about 1 mm than the lectotype illustrated by ZILCH (1934, Pl. 21, Fig. 92). In the majority (21) of specimens with the outer lip preserved, distantly to the margin of the outer lip there appear thin, lath-shaped teeth innerly. Such teeth are recognizable on the lectotype of the species. In eight of the studied specimens (see Pl. 29, Fig. 7), instead of the lath-shaped teeth there develops a smooth rib-like elevation terminated with a swell at both its ends. To note, BOETTGER (1901) reports only on such a swell situated superiorly („*superne leviter unituberculato*").

The species *Peratotoma echinus* BOETTGER, 1901 has not hitherto been known from the Miocene of Poland.

Peratotoma herminae BOETTGER, 1901
(Pl. 29, Figs 1-3)

1901. *Peratotoma herminae* n.sp. ; O. BOETTGER, pp. 56-57.
1906. *Peratotoma herminae* BTTGR.; O. BOETTGER, p. 73.
1934. *Peratotoma herminae* BOETTGER; A. ZILCH, p. 273, Pl. 21, Fig. 94.

MATERIAL: Ten incomplete specimens.

DIMENSIONS: The largest specimen (see Pl. 29, Fig. 2) is 5.2 mm high and about 2.5 mm wide.

REMARKS: The studied specimens, all fragmentary, exhibit complementarily the features fully concordant with those of numerous (146) specimens described by BOETTGER (1901) from Kostej in Transylvania. To note, in his subsequent paper BOETTGER (1906) supplemented the description when finding at Kostej a still larger specimen (6.75 mm high), that possessed its outer lip serrated innerly. The latter feature is typical of all specimens from Korytnica (see Pl. 29, Fig. 3).

The species *Peratotoma herminae* BOETTGER, 1901, has not hitherto been known from the Miocene of Poland.

Peratotoma hildae BOETTGER, 1901
(Pl. 29, Fig. 4)

1901. *Peratotoma hildae* n.sp.; O. BOETTGER, pp. 62-63.
1906. *Peratotoma hildae* BTTGR.; O. BOETTGER, p. 75.
1934. *Peratotoma hildae* BOETTGER; A. ZILCH, p. 275, Pl. 21, Fig. 4.

MATERIAL: Two specimens.

DIMENSIONS: The larger specimen, lacking its initial whorls, is 4.5 mm (total estimated as about 5.5 mm) high and 2.4 mm wide.

REMARKS: Although incomplete, the studied two specimens seem to be fully concordant with those described by BOETTGER (1901, 1906) from Kostej in Transylvania.

The species *Peratotoma hildae* BOETTGER, 1901, has not hitherto been known from the Miocene of Poland.

Peratotoma leufroyi (MICHAUD, 1828)
(Pl. 29, Fig. 12)

1856. *Pleurotoma Leufroyi* MICH.; M. HÖRNES, pp. 373-374, Pl. 40, Fig. 16.
1904. *Peratotoma* (*Leufroya*) *Leufroyi* (MICHD.); F. SACCO, p. 53, Pl. 13, Figs 52-53.
1912. *Mangilia Leufroyi* MICHD.; W. FRIEDBERG, pp. 226-227, Pl. 14, Fig. 8.
non 1938. *Mangilia Leufroyi* MICHD.; W. FRIEDBERG, pp. 150-151.

MATERIAL: Two specimens.

DIMENSIONS: The larger specimen (see Pl. 29, Fig, 12) is 10.5 mm high and 4.9 mm wide.

REMARKS: The studied specimens are undoubtedly conspecific with those coming from Steinebrunn in the Vienna Basin, and presented by HÖRNES (1856). They do not differ, either in size and shape, or in ornamentation. The specimens reported from Korytnica by FRIEDBERG (1938, pp. 150-151) under the name of "*Mangilia Leufroyi* MICHD." do not belong to this species, but they do evidently to *Peratotoma unica* BOETTGER, 1901.

The species *Peratotoma leufroyi* (MICHAUD, 1828) has not hitherto been known from Korytnica. In the Miocene of Poland it was reported from Łychów (CZARNOCKI 1968). FRIEDBERG (1912) described it from Hołubica, at present in the Ukraine.

Peratotoma philberti (MICHAUD, 1828)
(Pl. 29, Fig. 11)

1856. *Pleurotoma Philberti* MICH.; M. HÖRNES, pp. 372-373, Pl. 40, Fig. 17.
?1904. *Peratotoma Philberti* var. *pliocostulatissima* SACC.; F. SACCO, p. 53, Pl. 13, Fig. 51.
?1997. *Philbertia philberti* (MICHAUD); C. CHIRLI, p. 94, Pl. 27, Figs 1-4.

MATERIAL: One specimen.

DIMENSIONS: Height 9.3 mm, width 3.1 mm.

REMARKS: An assignment of the only specimen from Korytnica may bear some doubts, because it differ from the description of HÖRNES (1856) by a lack of serration along the outer lip. The latter may be caused by a premature nature of the studied specimen. The specimens from the Pliocene of Toscania, presented by CHIRLI (1997), are more slender and have their axial ribs more densely spaced. They thus differ distinctly from only specimen collected at Korytnica.

The species *Peratotoma philberti* (MICHAUD, 1828) has not hitherto been known from the Miocene of Poland.

Peratotoma subaequalis BOETTGER, 1901
(Pl. 19, Figs 7-9)

1901. *Peratotoma subaequalis* n.sp.; O. BOETTGER, pp. 57-58.
1906. *Peratotoma subaequalis* BTTGR.; O. BOETTGER, p. 74.
1934. *Peratotoma subaequalis* BOETTGER; A. ZILCH, p. 273, Pl. 21, Fig. 95.

MATERIAL: Six specimens.

DIMENSIONS: The largest specimen (see Pl. 19, Fig. 9) is 7.6 mm high and about 4.2 mm wide.

REMARKS: The studied specimens are fully concordant with those described by BOETTGER (1901, 1906) from Kostej and Lapugy in Transylvania.

The species *Peratotoma subaequalis* BOETTGER, 1901, has not hitherto been known from the Miocene of Poland.

Peratotoma unica BOETTGER, 1901
(Pl. 29, Figs 9-10)

1901. *Peratotoma unica* n.sp.; O. BOETTGER, p. 61.
1906. *Peratotoma unica* BTTGR.; O. BOETTGER, p. 76.
1934. *Peratotoma unica* BOETTGER; A. ZILCH, p. 274, Pl. 21, Fig. 2.
1960. *Peratotoma unica* (BOETTGER); E. KOJUMDGIEVA, pp. 207-208, Pl. 48, Figs 24-25.

MATERIAL: Three hundred and fifty specimens

DIMENSIONS: The largest specimen (see Pl. 29, Fig. 9) is 14.8 mm high and 4.9 mm wide; another one (see Pl. 29, Fig. 10) is 14.5 and 5.5 mm, respectively.

REMARKS: The studied specimens are undoubtedly conspecific with those coming from Kostej in Transylvania; they accord with the original description given by BOETTGER (1901) and his supplementary remarks (BOETTGER 1906). In the earlier paper BOETTGER (1901) had the only specimen at his disposal, and reported the number of axial ribs on the last whorl as 18. Within very numerous specimens from Korytnica that number ranges from 13 to 25. Moreover, the collected specimens vary in their overall shape, having been either slender (see Pl. 29, Fig. 9) or much more stout (see Pl. 29, Fig. 10) with all intermediates.

The species *Peratotoma unica* BOETTGER, 1901, was presented from Korytnica by FRIEDBERG (1938) under the false name of "*Mangilia Leufroyi* MICHD."[see remarks to that species, above].

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Manuscript submitted: 10th November 2001
Revised version accepted: 15th June 2002

PLATES 1 - 29

PLATE 1

Family **Turridae**

Page

1-3 – *Clavatula camillae* (HOERNES & AUINGER), × 1; 1 - U.W., BkK-G867; 2 - U.W., BkK-G868; 3 - U.W., BkK-G869 33

4-8 – *Clavatula polonica* (PUSCH), × 1; 4 - U.W., BkK-G894; 5 - U.W., BkK-G895; 6 - U.W., BkK-G896; 7 - U.W., BkK-G897; 8 - U.W., BkK-G898 36

Photo 1 taken by B. MALINOWSKA

Photos 2-3 and 7-8 taken by B. DROZD, M.Sc.

Photos 4-6 taken by S. KOLANOWSKI


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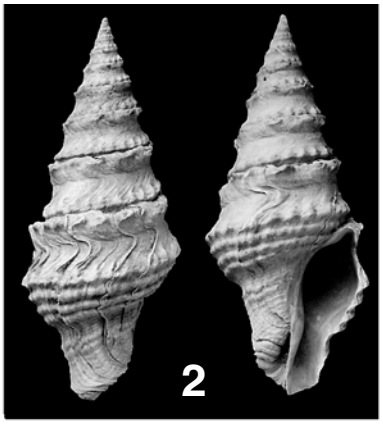
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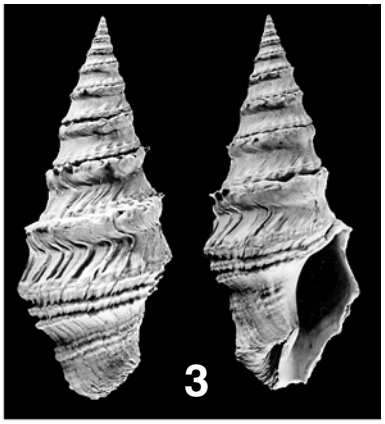
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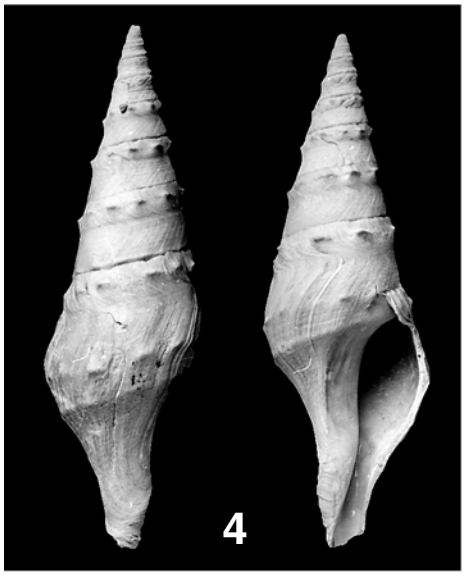
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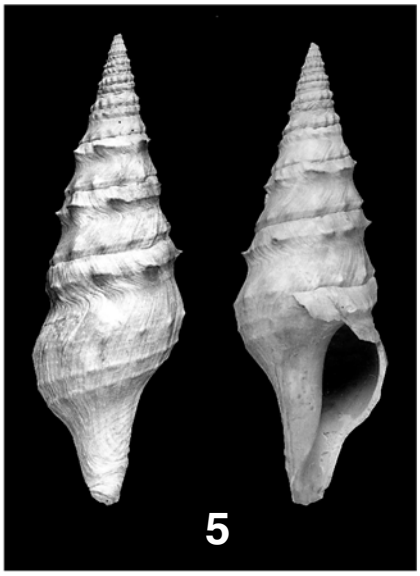
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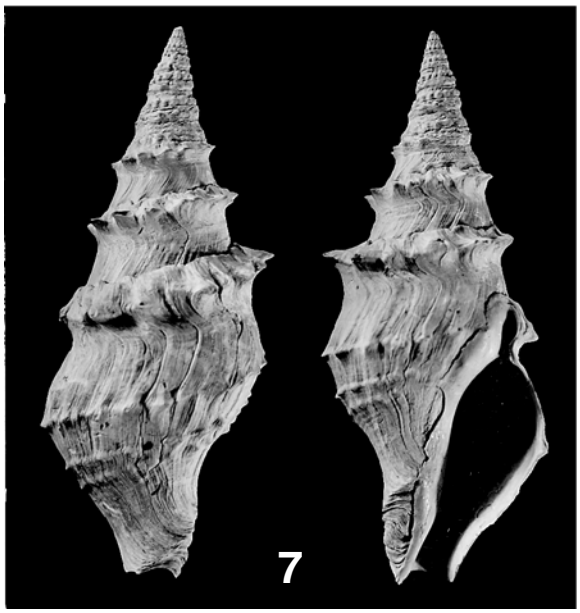
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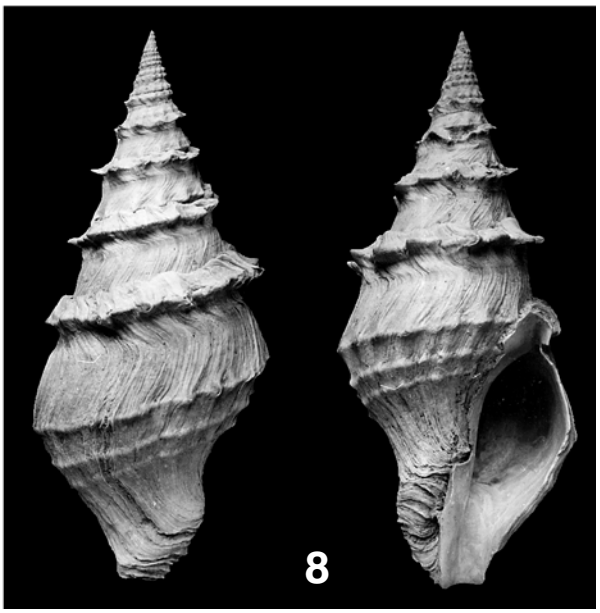
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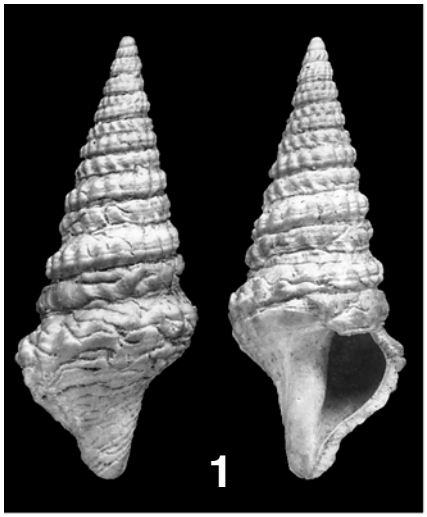
PLATE 2

Family **Turridae**

Page

1-8 – *Clavatula polonica* (PUSCH); 1-2 × 4, 4 × 2, 3 and 5-8 × 1; 1 - U.W., BkK-G899; 2 - U.W., BkK-G900; 3 - U.W., BkK-G901; 4 - U.W., BkK-G902; 5 - U.W., BkK-G903; 6 - U.W., BkK-G904; 7 - U.W., BkK-G905; 8 - U.W., BkK-906 36

Photos 1-4 and 6 taken by S. KOLANOWSKI
Photos 5 and 7-8 taken by B. DROZD, M.Sc.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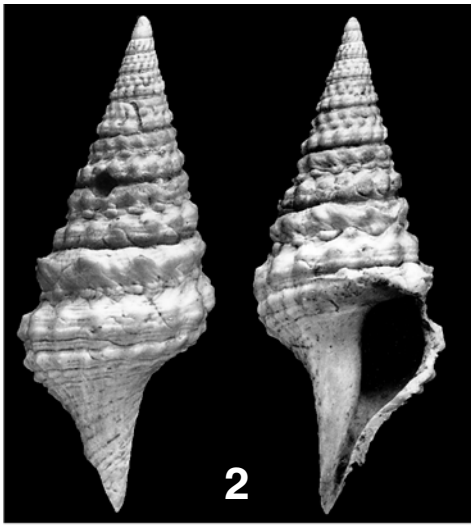
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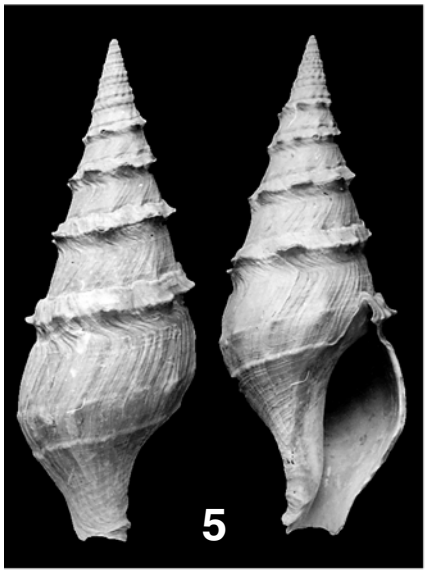
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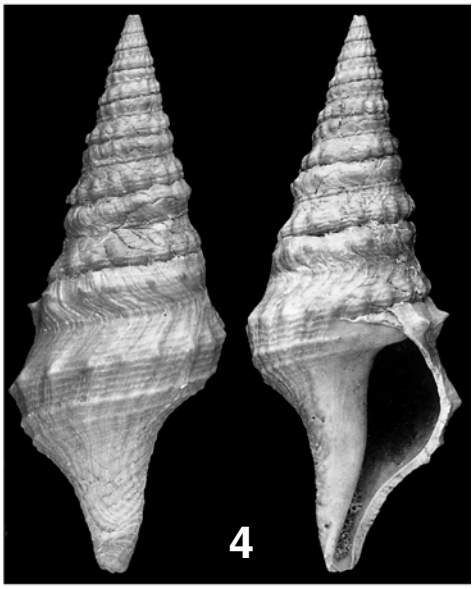
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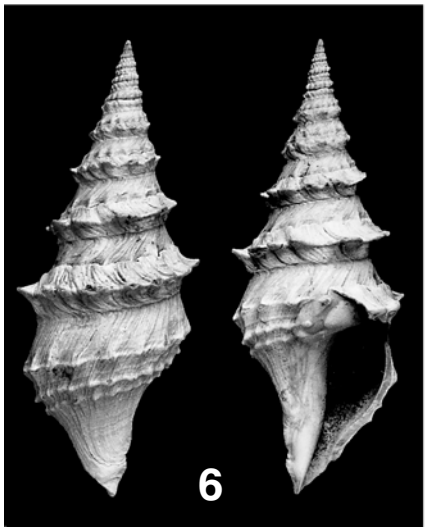
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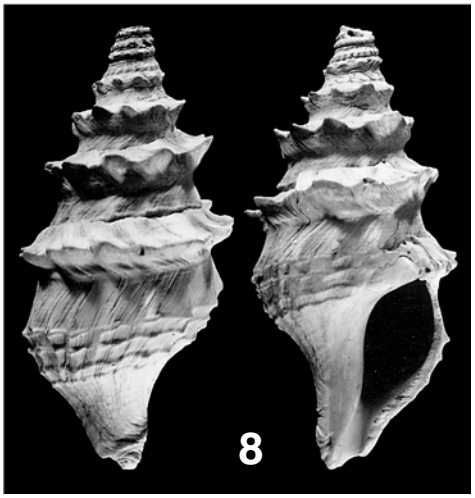
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PLATE 3

Family **Turridae**

Page

1-4 – *Clavatula* sp., an *Clavatula eleonorae* (HOERNES & AUINGER); 1 × 8, 2-4 × 4; 1 - U.W., BkK-G870; 2 - U.W., BkK-G871; 3 - U.W., BkK-G872; 4 - U.W., BkK-G873 33

5 – *Clavatula* sp., an *Clavatula eleonorae* (HOERNES & AUINGER), × 4; Collection of the Museum of the Geological Survey of Poland, Warsaw (Catalogue No. 28.II. 180; coll. K. KOWALEWSKI) 33

6-7 – *Clavatula eleonorae* (HOERNES & AUINGER), × 1; 6 - U.W., BkK-G874; 7 - U.W., BkK-G875 33

8 – *Clavatula eleonorae* (HOERNES & AUINGER), × 1; Collection Museum of the Earth, Warsaw (Catalogue No. MZ VIII Mg. 4114) 33

9 – *Clavatula eleonorae* (HOERNES & AUINGER), × 1; Collection of the Museum of the Geological Survey of Poland, Warsaw (Catalogue No. 28.II. 183; coll. K. KOWALEWSKI) 33

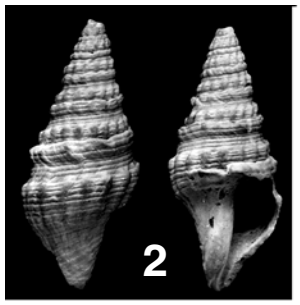
10-11 – *Clavatula sophiae* (HOERNES & AUINGER), × 2; 10 - U.W., BkK-G910; 11 - U.W., BkK-G911 38

Photos 1 and 4 taken by S. KOLANOWSKI

Photos 2, 3, and 8 taken by B. MALINOWSKA

Photos 6-7 and 10-11 taken by B. DROZD, M.Sc.

Photos 5 and 9 taken by A. NOWICKA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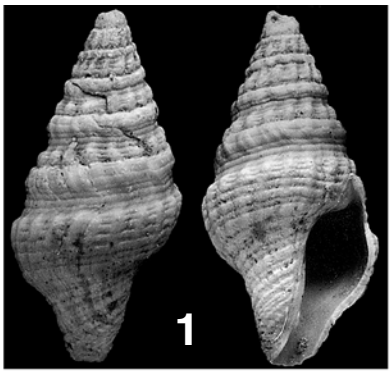
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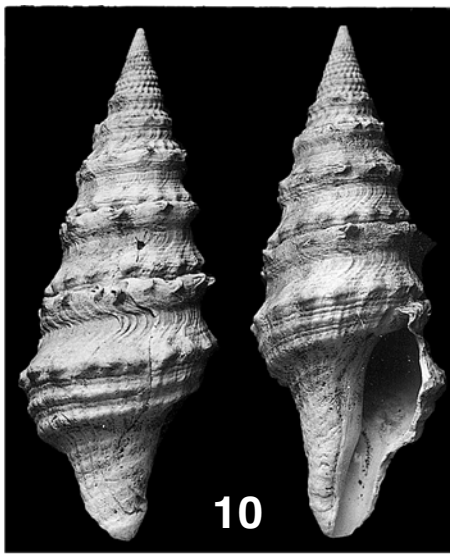
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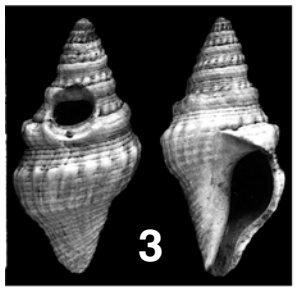
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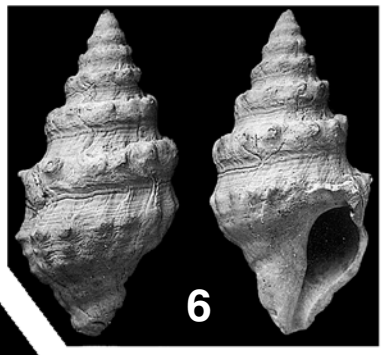
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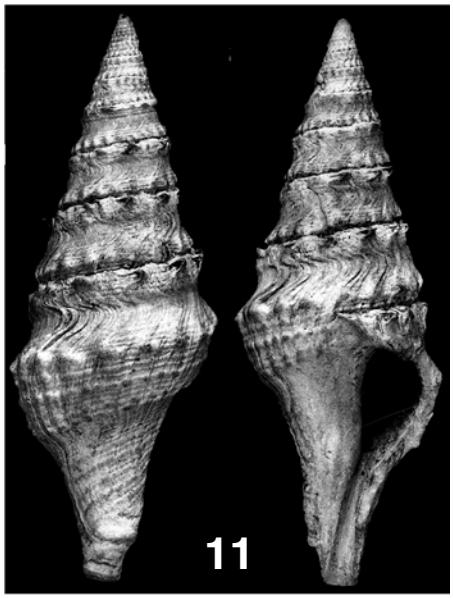
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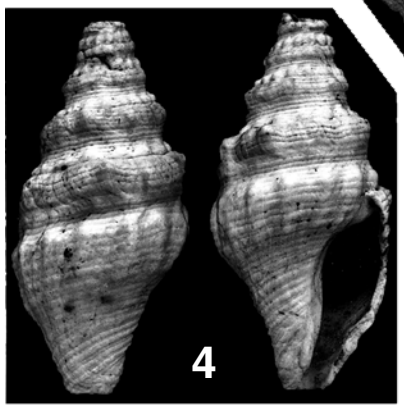
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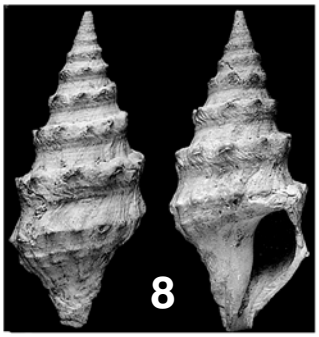
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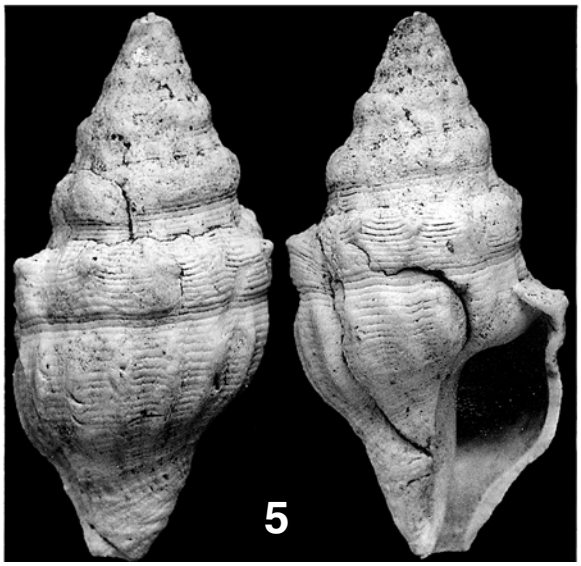
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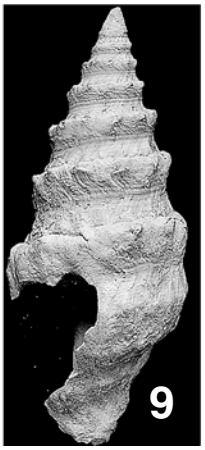
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PLATE 4

Family **Turridae**

Page

1-3 – *Clavatula reginae* (HOERNES & AUINGER), × 2; Private collection of Mr. J. GUBAŁA 37

4-5 – *Clavatula reginae* (HOERNES & AUINGER), × 2; 4 - U.W., BkK-G908; 5 - U.W., BkK-G909 37

6 – *Perrona* (*Perrona*) *czarnockii* sp.nov., × 1; U.W., BkK-G923 41

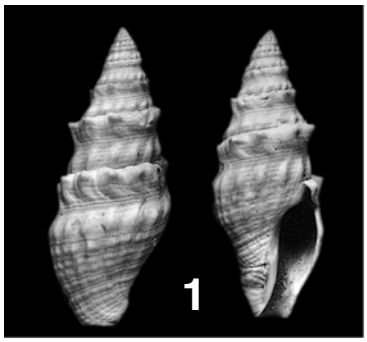
7-8 – *Perrona* (*Perrona*) *czarnockii* sp.nov; 7 × 2, 8 × 1; 7 - the **holotype**, 28.II. 179; 8 - 28.II. 178; both from the K. KOWALEWSKI's collection, Museum of the Geological Survey of Poland, Warsaw 41

9-10 – *Clavatula veronicae* (HOERNES & AUINGER), × 2; 9 - U.W., BkK-G921; 10 - U.W., BkK-G922 39

Photos 1-3 and 9-10 taken by B. MALINOWSKA

Photos 4-6 taken by B. DROZD, M.Sc.

Photos 7-8 taken by A. NOWICKA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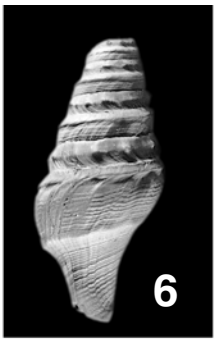
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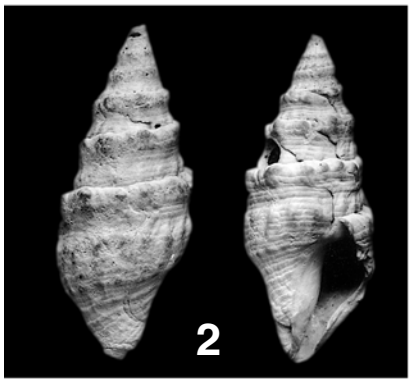
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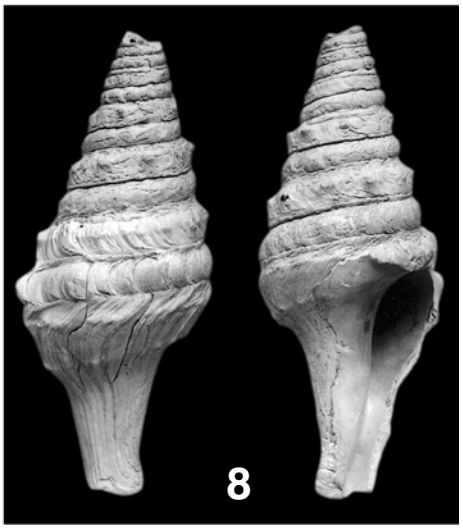
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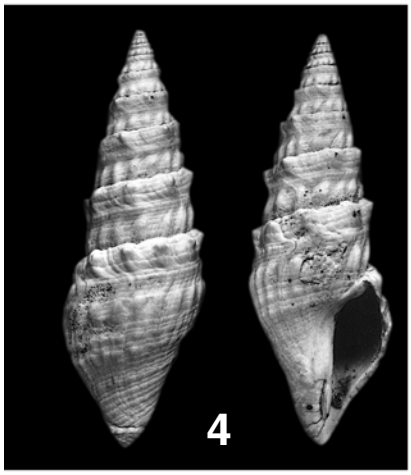
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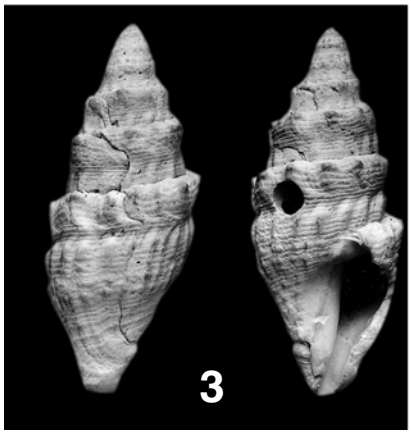
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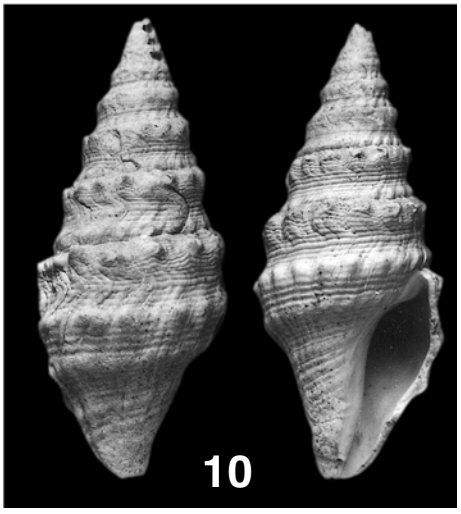
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PLATE 5

Family **Turridae**

Page

1-8 – *Clavatula evae* (HOERNES & AUINGER); 1 × 4, 2-3 × 2, 4-8 × 1; 1 - U.W., BkK-G876; 2 - U.W., BkK-G877; 3 - U.W., BkK-G878; 4 - U.W., BkK-G879; 5 - U.W., BkK-G880; 6 - U.W., BkK-G881; 7 - U.W., BkK-G882; 8 - U.W., BkK-G883 34

Photos 1-3 and 8 taken by S. KOLANOWSKI
Photos 4-7 taken by B. DROZD, M.Sc.

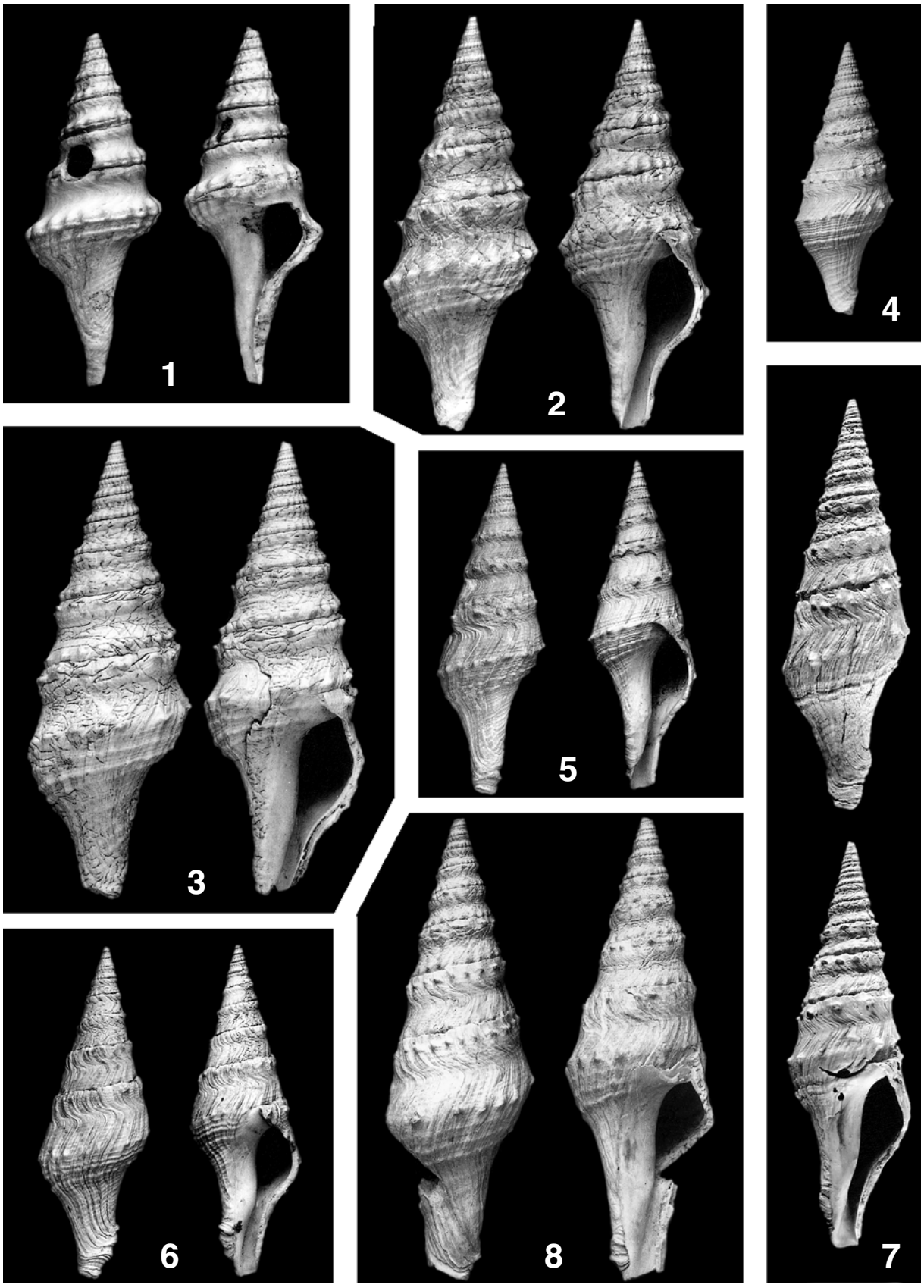
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PLATE 6

Family **Turridae**

Page

1 – *Clavatula granulatocincta* (MÜNSTER), × 2; Private collection of Mr. J. GUBAŁA 34

2-3 – *Clavatula granulatocincta* (MÜNSTER), × 1; 2 - U.W., BkK-G884; 3 - U.W., BkK-G885 34

4 – *Clavatula styriaca* (HILBER), × 1; U.W., BkK-G912 38

5-10 – *Clavatula kowalewskii* sp.nov.; 5-6 × 2, 7-10 × 1; 5 - U.W., BkK-G924; 6 - U.W., BkK-G925; 7 - U.W., BkK-G926; 8 - U.W., BkK-G927; 9 - U.W., BkK-G928, 9 – the **holotype**; 10 – U.W., BkK-G929 40

Photos 1-4 and 9 taken by B. DROZD, M.Sc.

Photos 5-8 and 10 taken by S. KOLANOWSKI

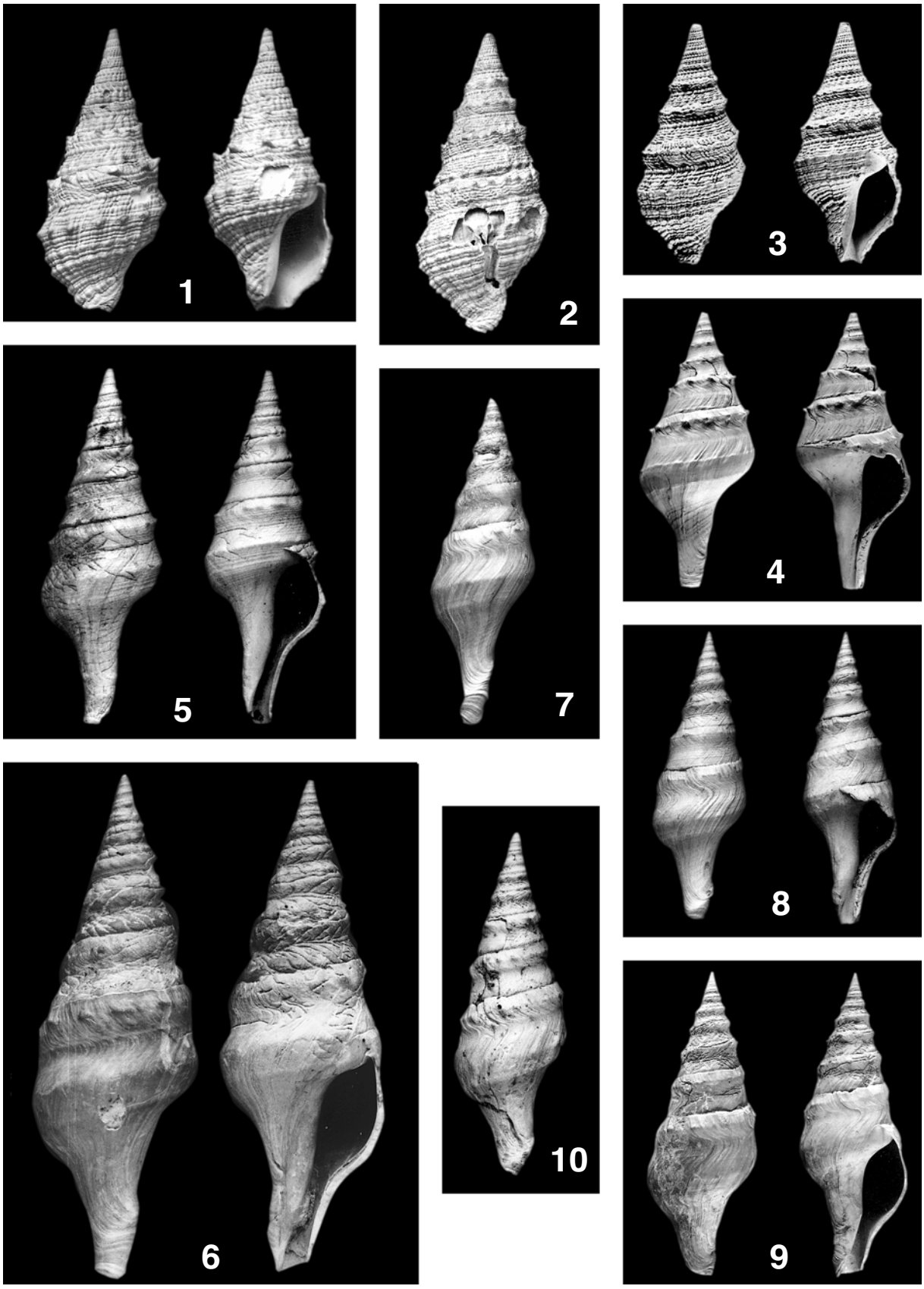
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PLATE 7

Family **Turridae**

Page

1 – *Clavatula juliae* (HOERNES & AUINGER), × 8; U.W., BkK- G886 35

2 – *Clavatula juliae* (HOERNES & AUINGER), × 2; Private collection of Mr. J. GUBAŁA 35

3-5 – *Clavatula juliae* (HOERNES & AUINGER), × 1; 3 - U.W., BkK- G887; 4 - U.W., BkK- G888; 5 - U.W., BkK G889 35

6 – *Clavatula pretiosa* (BELLARDI), ×1; U.W., BkK-G907 37

7-10 – *Clavatula laevigata* (EICHWALD); 7 × 2, 8-10 × 1; 7 - U.W., BkK-G890; 8 - U.W., BkK-G891; 9 - U.W., BkK-G892; 10 - U.W., BkK-G8903 35

Photos 1-2 taken by B. MALINOWSKA

Photos 3-4 and 8-10 taken by B. DROZD, M.Sc.

Photos 5-7 taken by S. KOLANOWSKI

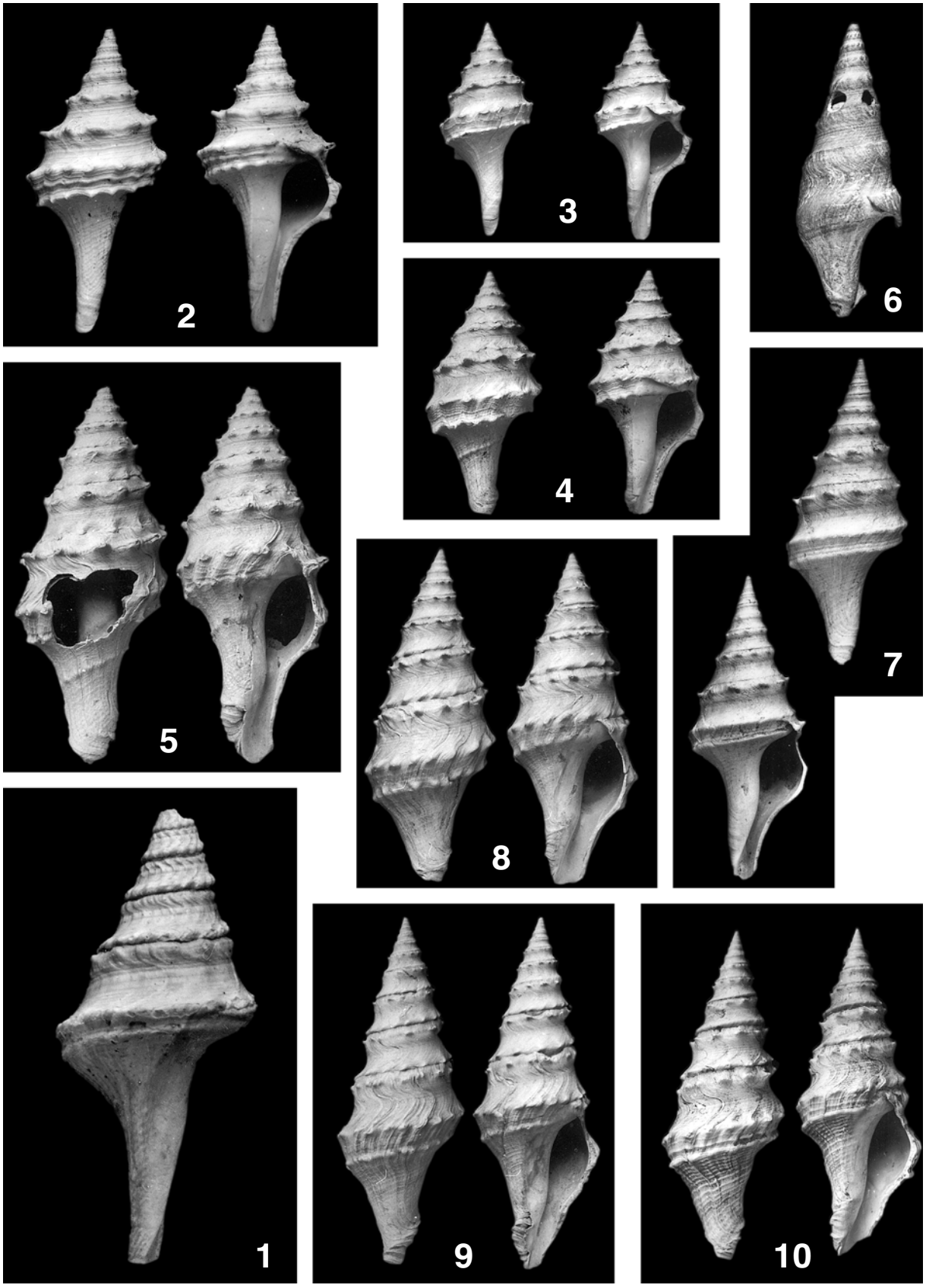
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PLATE 8

Family **Turridae**

Page

1-8 – *Clavatula suturalis* (ANDRZEJOWSKI); 1 × 4, 2 × 2, 3-8 × 1; 1 - U.W., BkK-G913; 2 - U.W., BkK-G914; 3 - U.W., BkK-G915; 4 - U.W., BkK-G916; 5 - U.W., BkK-G917; 6 - U.W., BkK-G918; 7 - U.W., BkK-G919; 8 - U.W., BkK-G920 39

Photos 1-2 and 6 taken by S. KOLANOWSKI

Photos 3-5 and 7-8 taken by B. DROZD, M.Sc.

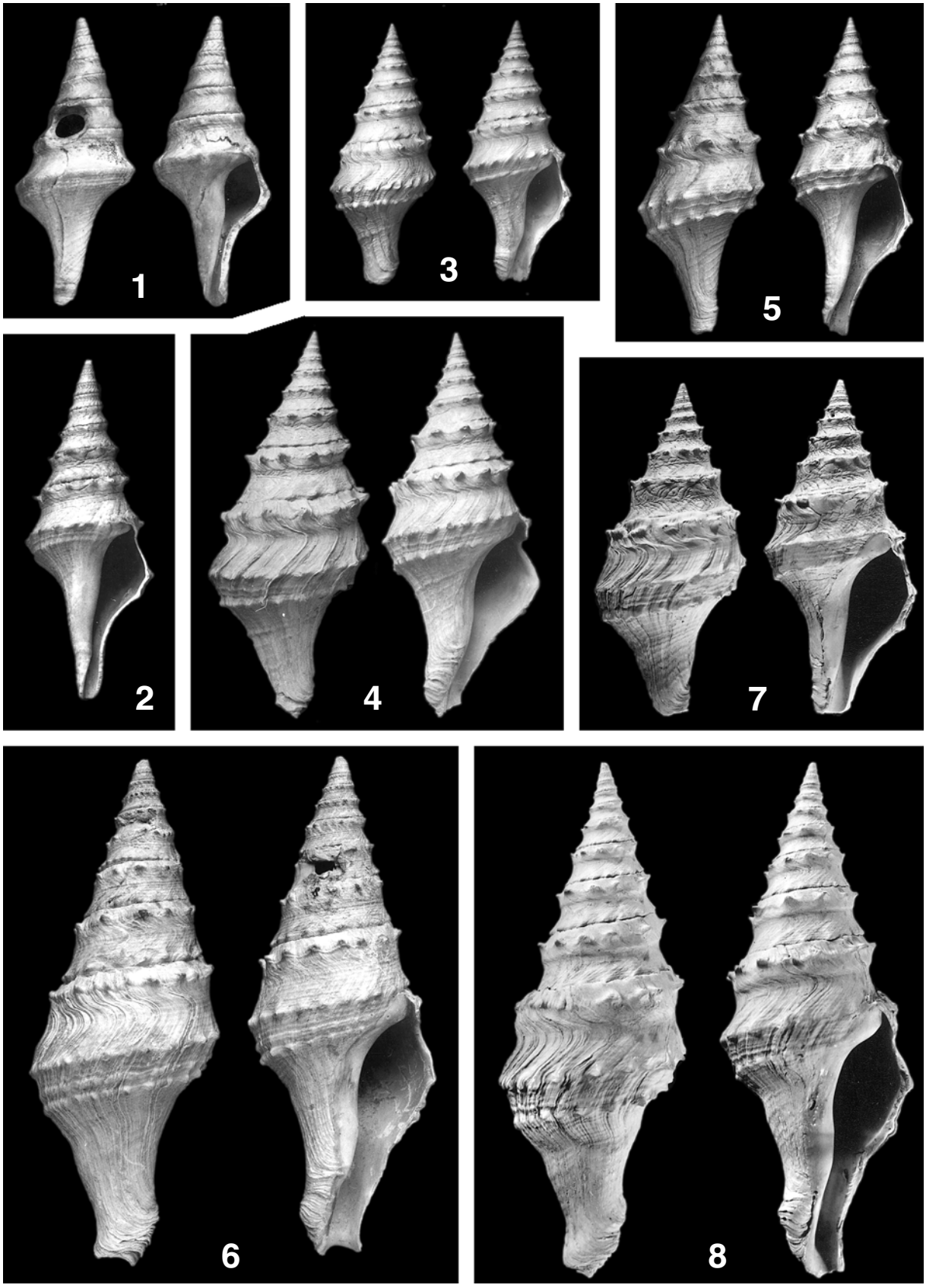
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PLATE 9

Family **Turridae**

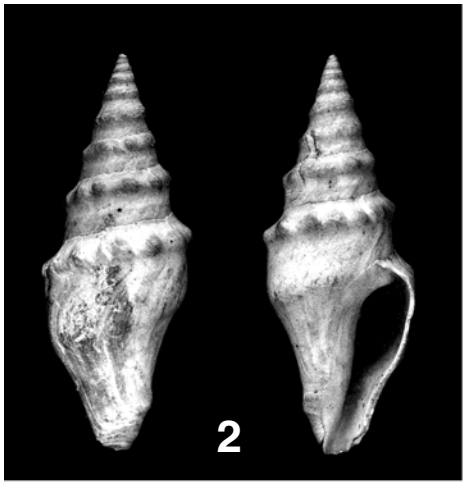
Page

1-7 – *Perrona* (*Perrona*) *descendens* (HILBER); 1 × 4, 2-7 × 2; 1 - U.W., BkK-G930; 2 - U.W., BkK-G931; 3 - U.W., BkK-G932; 4 - U.W., BkK-G933; 5 - U.W., BkK-G934; 6 - U.W., BkK-G935; 7 - U.W., BkK-G936 40

8 – *Genota* (*Pseudotoma*) *praecedens* (BELLARDI); × 1, Collection of the Museum of the Geological Survey of Poland**,** Warsaw (Catalogue No. 28.II. 214; coll. K. KOWALEWSKI) 56

Photos 1-7 taken by S. KOLANOWSKI

Photo 8 taken by A. NOWICKA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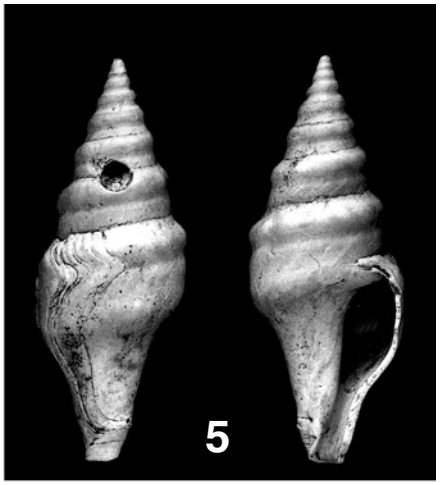
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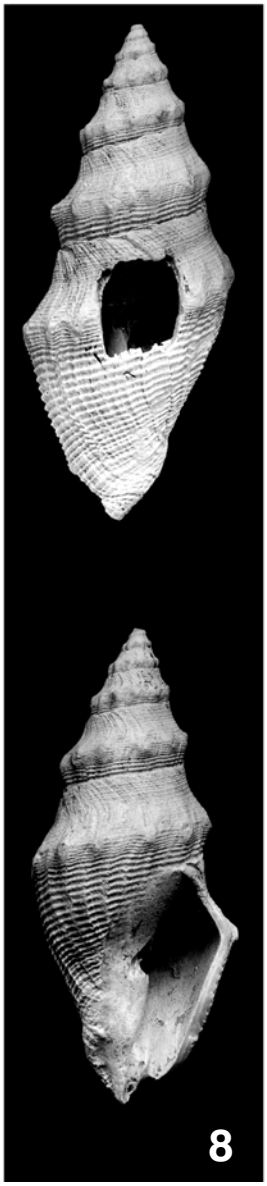
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PLATE 10

Family **Turridae**

Page

1-4 – *Turricula* (*Surcula*) *dimidiata* (BROCCHI); 1 × 4, 2-4 × 2; 1 - U.W., BkK-G938; 2 - U.W., BkK-G939; 3 - U.W., BkK-G940; 4 - U.W., BkK-G941 42

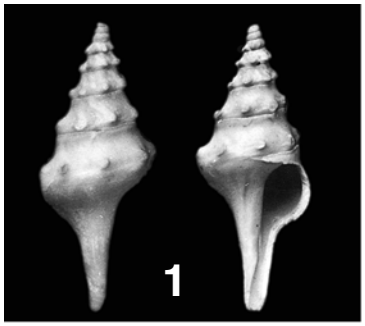
5-7 – *Turricula* (*Surcula*) *reevei* (BELLARDI), × 2; 5 - U.W., BkK-G944; 6 - U.W., BkK-G945; 7 - U.W., BkK-G946 43

8 – *Turricula* (*Surcula*) *korytnicensis* sp.nov., × 2, the **holotype,** U.W., BkK-G947 44

9-10 – *Turricula* (*Surcula*) *intermedia* (BRONN), × 2; 9 - U.W., BkK-G942; 10 - U.W., BkK-G943 43

Photos 1-2, 5, and 8-10 taken by S. KOLANOWSKI

Photos 3-4 and 6-7 taken by B. DROZD, M.Sc.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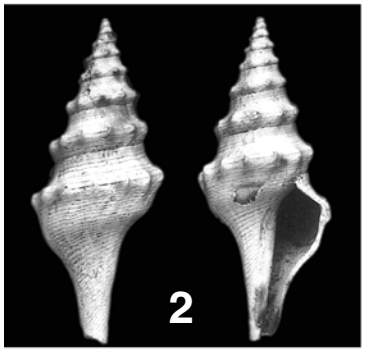
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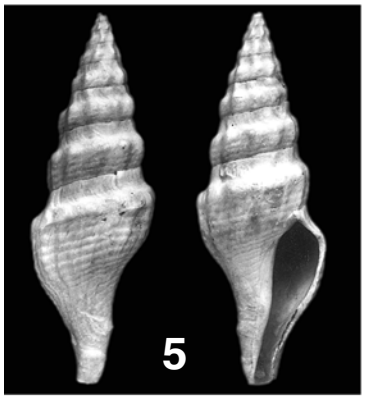
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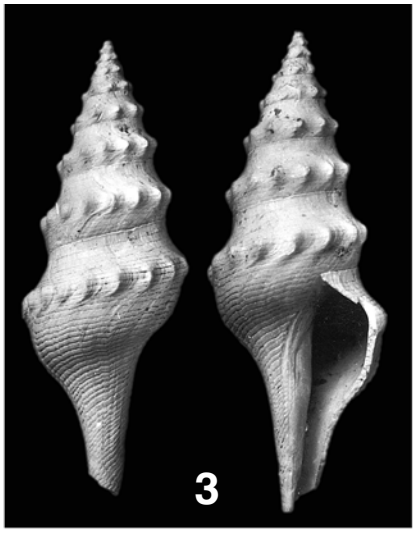
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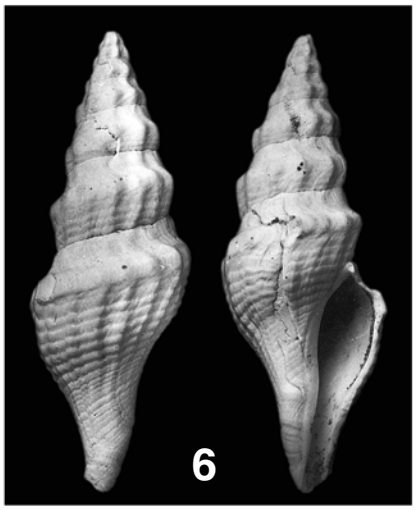
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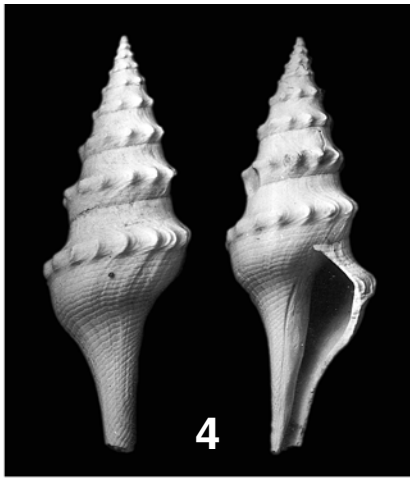
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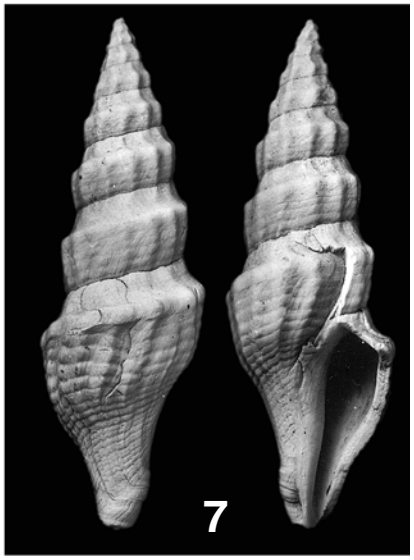
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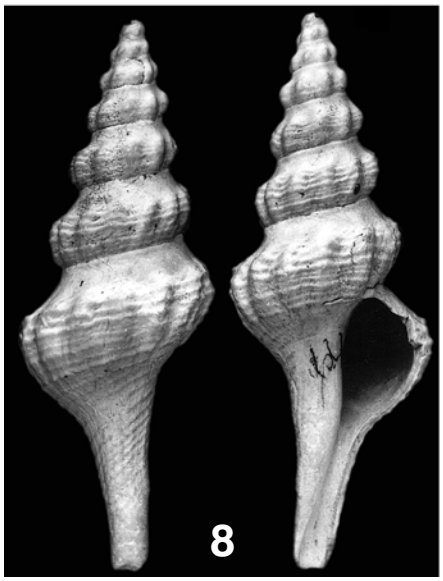
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PLATE 11

Family **Turridae**

Page

1-4 – *Clavus* (*Drillia*) *strombillus* (DUJARDIN); 1 × 4, 2 × 8, 3-4 × 2; 1 - U.W., BkK-G950; 2 - U.W., BkK-G951; 3 - U.W., BkK-G952; 4 - U.W., BkK-G953 45

5-8 – *Miraclathurella granaria* (DUJARDIN), × 8; 5 - U.W., BkK-G963; 6 - U.W., BkK-G964; 7 - U.W., BkK-G965; 8 - U.W., BkK-G966 49

Photos 1, 3-4 and 8 taken by B. DROZD, M.Sc.

Photos 2, 5-7 taken by B. MALINOWSKA

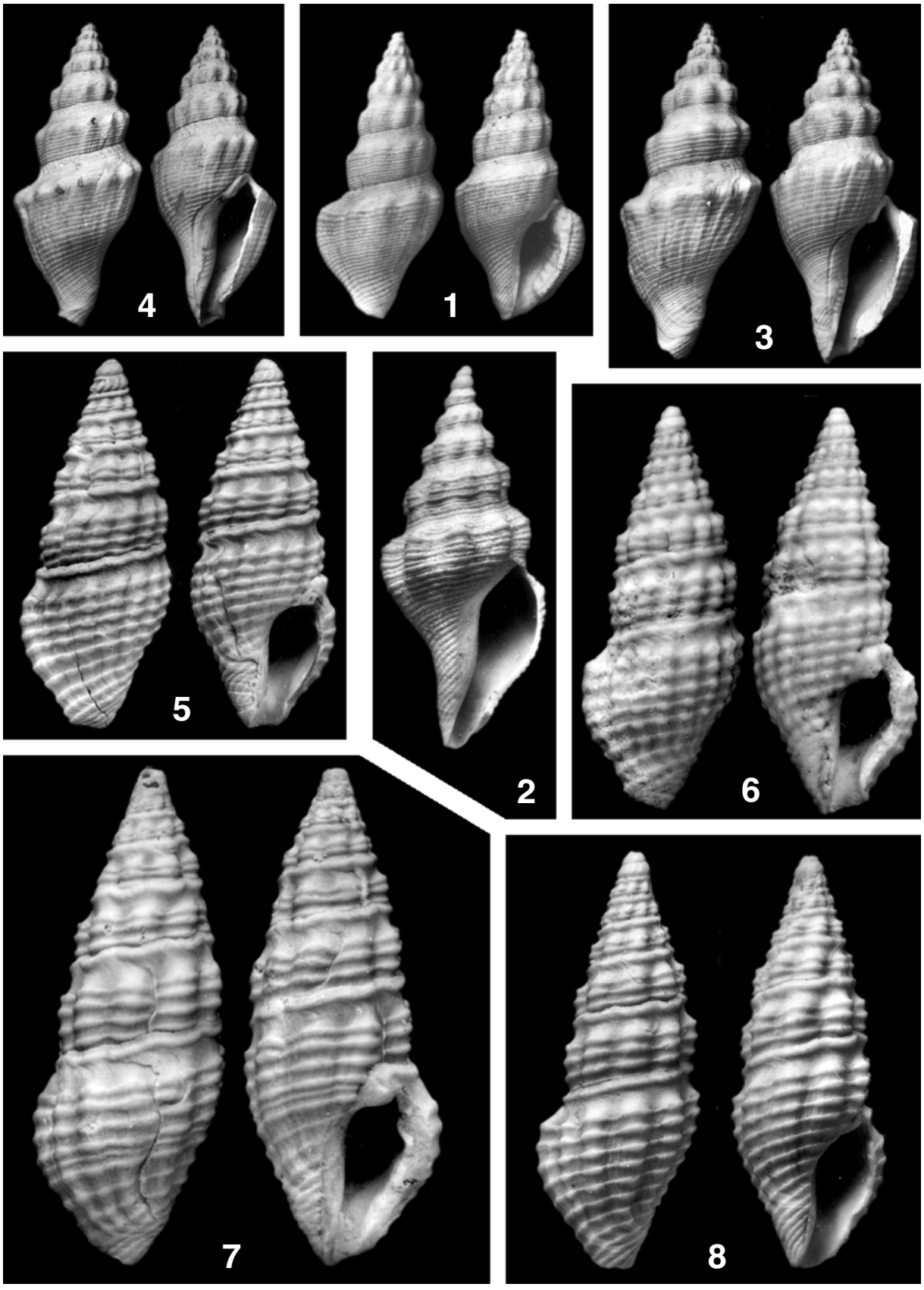
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PLATE 12

Family **Turridae**

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1-4 – *Gemmula coronata* (MÜNSTER *in* GOLDFUSS); 1 × 8, 2-4 × 4; 1 - U.W., BkK-G959; 2 - U.W., BkK-G960; 3 - U.W., BkK-G961; 4 - U.W., BkK-G962 . . . 46

5-9 – *Gemmula annae* (HOERNES & AUINGER); 5 × 8, 6 × 4, 7-9 × 2; 5 - U.W., BkK-G954; 6 - U.W., BkK-G955; 7 - U.W., BkK-G956**; 8** - U.W., BkK-G957; 9 - U.W., BkK-G958 45

Photos 1-2 and 5-6 taken by B. DROZD, M.Sc.
Photos 3-4, 7 and 8-9 taken by B. MALINOWSKA

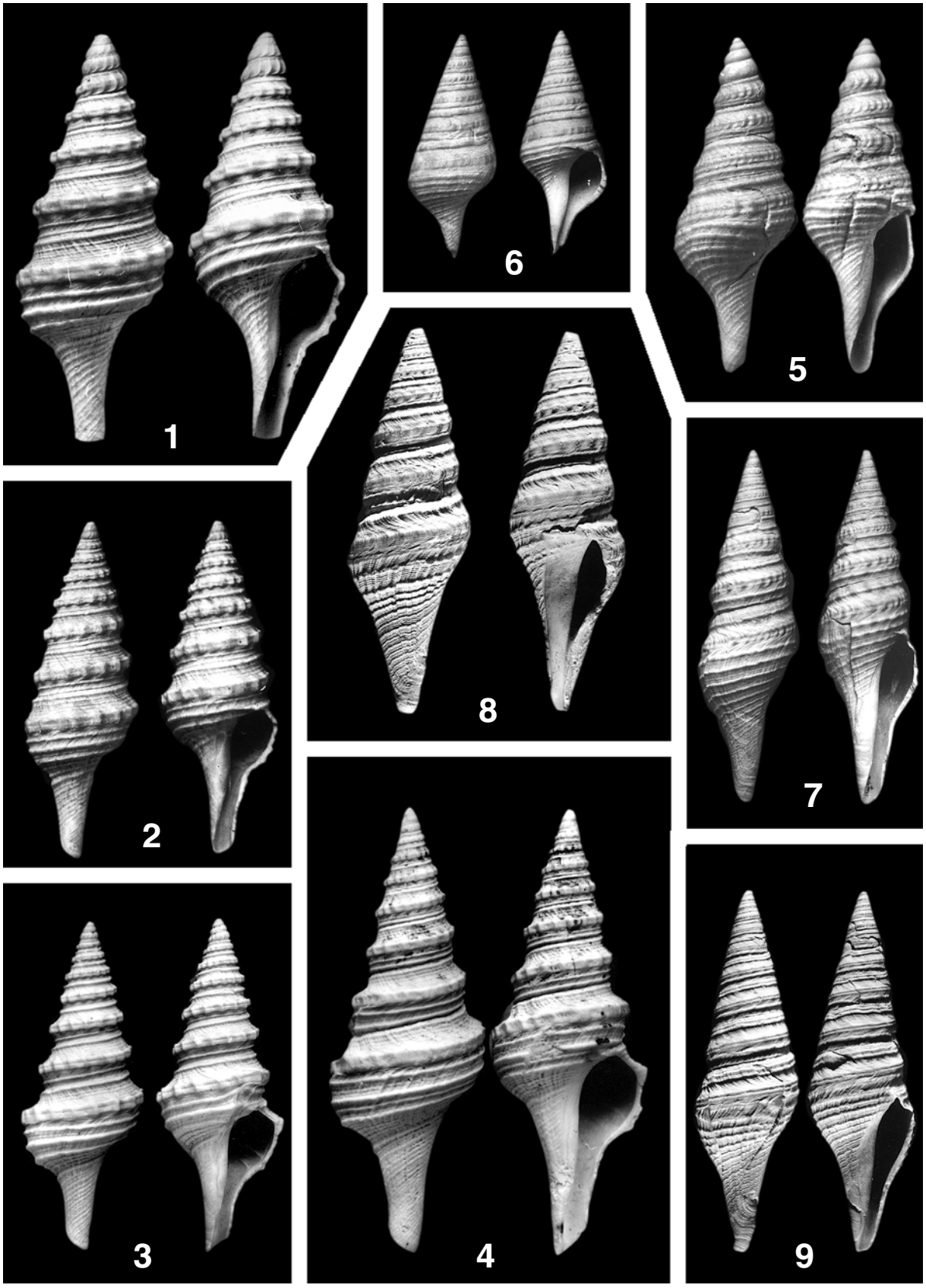
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PLATE 13

Family **Turridae**

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1-5 – *Crassispira pustulata* (BROCCHI); 1 × 8, 2-3 × 4, 4-5 × 2; 1 - U.W., BkK-G972; 2 - U.W., BkK-G973; 3 - U.W., BkK-G974; 4 - U.W., BkK-G975; 5 - U.W., BkK-G976 48

6-10 – *Crassispira obeliscus* (DESMOULINS); 6 × 8, 7-8 × 4, 9-10 × 2; 6 - U.W., BkK-G967; 7 - U.W., BkK-G968; 8 - U.W., BkK-G969; 9 - U.W., BkK-G970; 10 - U.W., BkK-G971 47

Photos 1-3, 6, 8, and 10 taken by B. MALINOWSKA

Photos 4-5, 7, and 9 taken by B. DROZD, M.Sc.

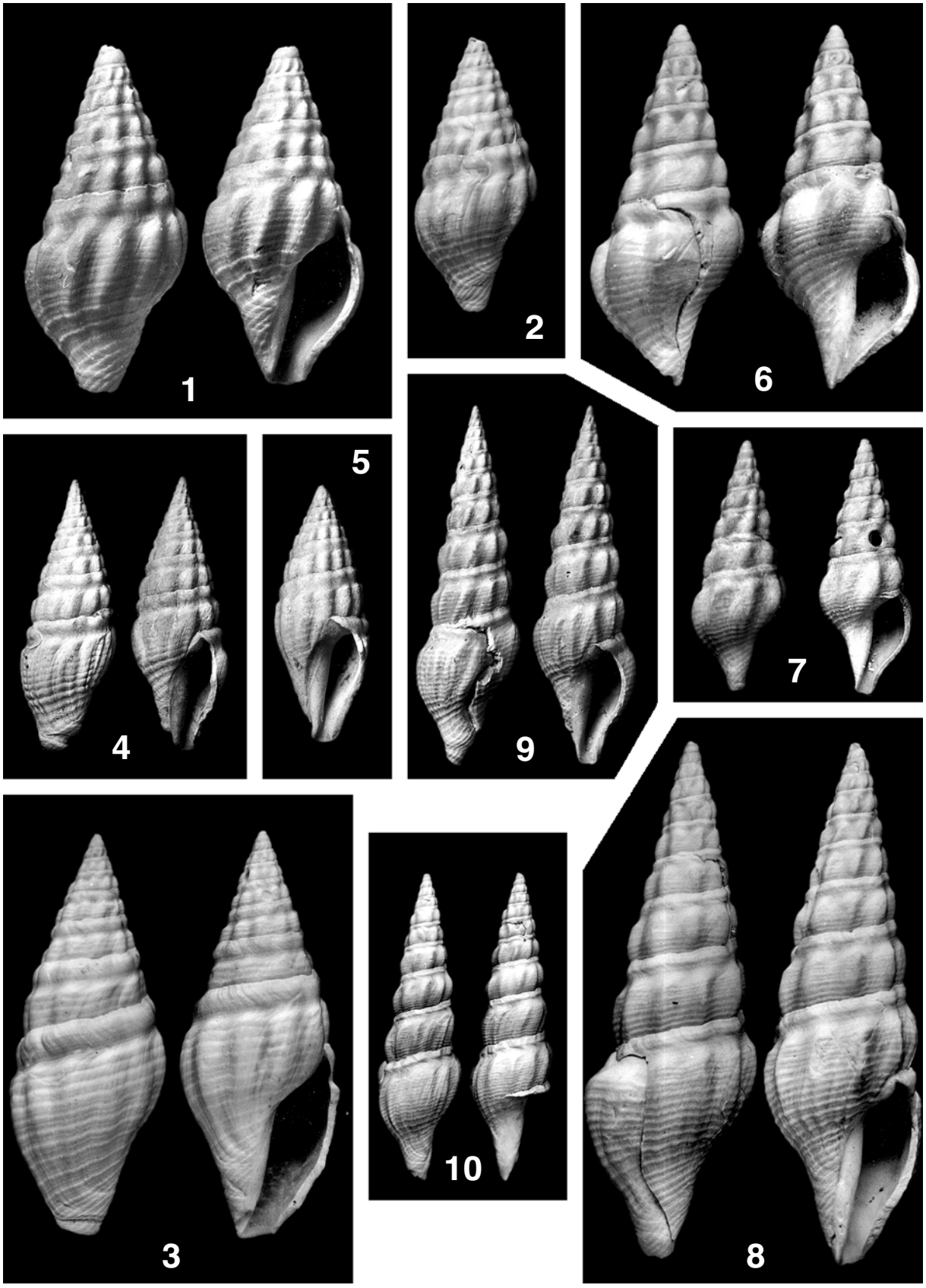
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PLATE 14

Family **Turridae**

Page

1-2 – *Clavus* (*Drillia*) *obtusangulus* (BROCCHI); 1 × 4, 2 × 8; 1 - U.W., BkK-G948; 2 - U.W., BkK-G949 44

3 – *Turricula* (*Surcula*) *consobrina* (BELLARDI), × 2; U.W., BkK-G937 42

4-6 – *Haedropleura avenacea* BOETTGER, × 8; 4 - U.W., BkK-G977; 5 - U.W., BkK-G978; 6 - U.W., BkK-G979 50

7-8 – *Haedropleura etelkae* (BOETTGER), × 8; 7 - U.W., BkK-G983; 8 - U.W., BkK-G984 51

9 – ? *Haedropleura* sp., × 8; U.W., BkK-G991 51

Photos 1-2 and 4-9 taken by B. MALINOWSKA

Photo 3 taken by B. DROZD, M.Sc.

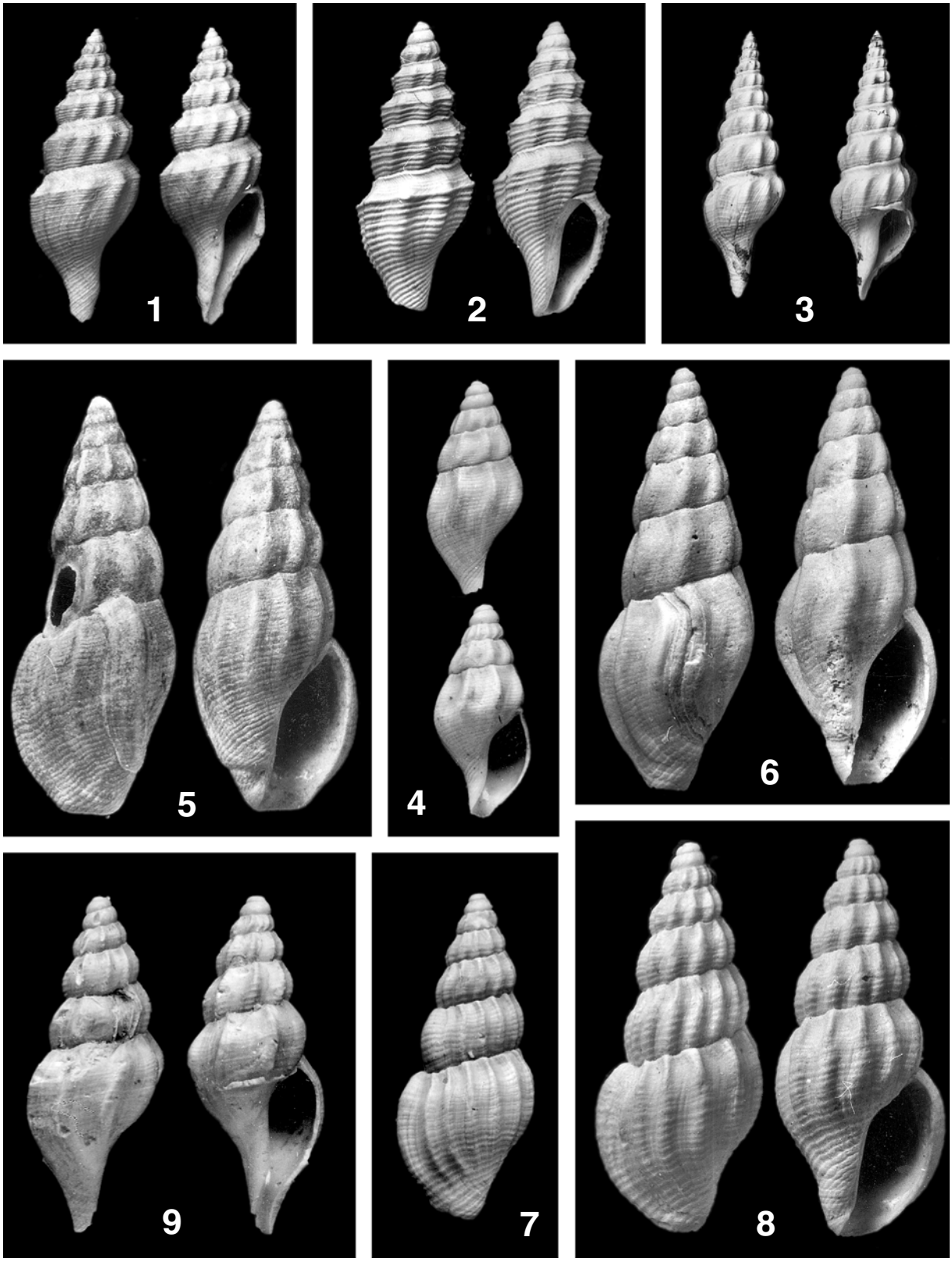
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PLATE 15

Family **Turridae**

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1-3 – *Haedropleura adami* (FRIEDBERG), × 8; 1 - U.W., BkK-G988; 2 - U.W., BkK-G989; 3 - U.W., BkK-G990 50

4-6 – *Haedropleura cristallina* BOETTGER, × 8; 4 - U.W., BkK-G980; 5 - U.W., BkK-G981; 6 - U.W., BkK-G982 50

7-9 – *Haedropleura pseudosigmoidea* (BOETTGER), × 8; 7 - U.W., BkK-G985; 8 - U.W., BkK-G986; 9 - U.W., BkK-G987 51

All photos taken by B. MALINOWSKA

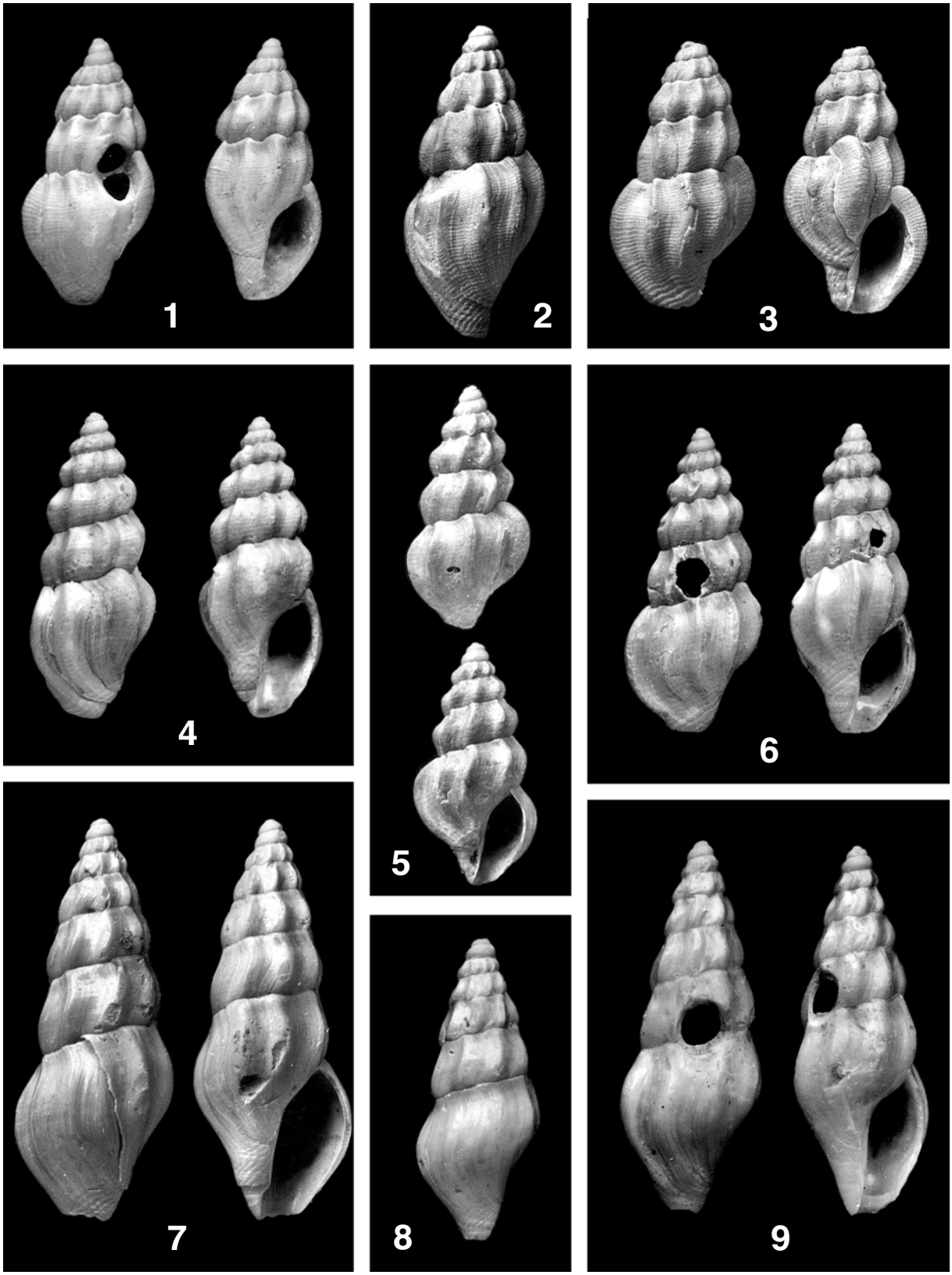
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PLATE 16

Family **Turridae**

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1-6 – *Asthenotoma festiva* (HÖRNES); 1-2 × 8, 3-4 × 4, 5-6 × 2;.1 - U.W., BkK-G992; 2 - U.W., BkK-G993; 3 - U.W., BkK-G994; 4 - U.W., BkK-G995; 5 - U.W., BkK-G996; 6 - U.W., BkK-G997 51

7-10 – *Asthenotoma tuberculata* (PUSCH); 7 × 4, 8-10 × 2;.7 - U.W., BkK-G998; 8 - U.W., BkK-G999; 9 - U.W., BkK-G1000; 10 - U.W., BkK-G1001 52

Photos 1, 5-6 and 9-10 taken by B. DROZD, M.Sc.

Photos 2-4 and 7-8 taken by B. MALINOWSKA

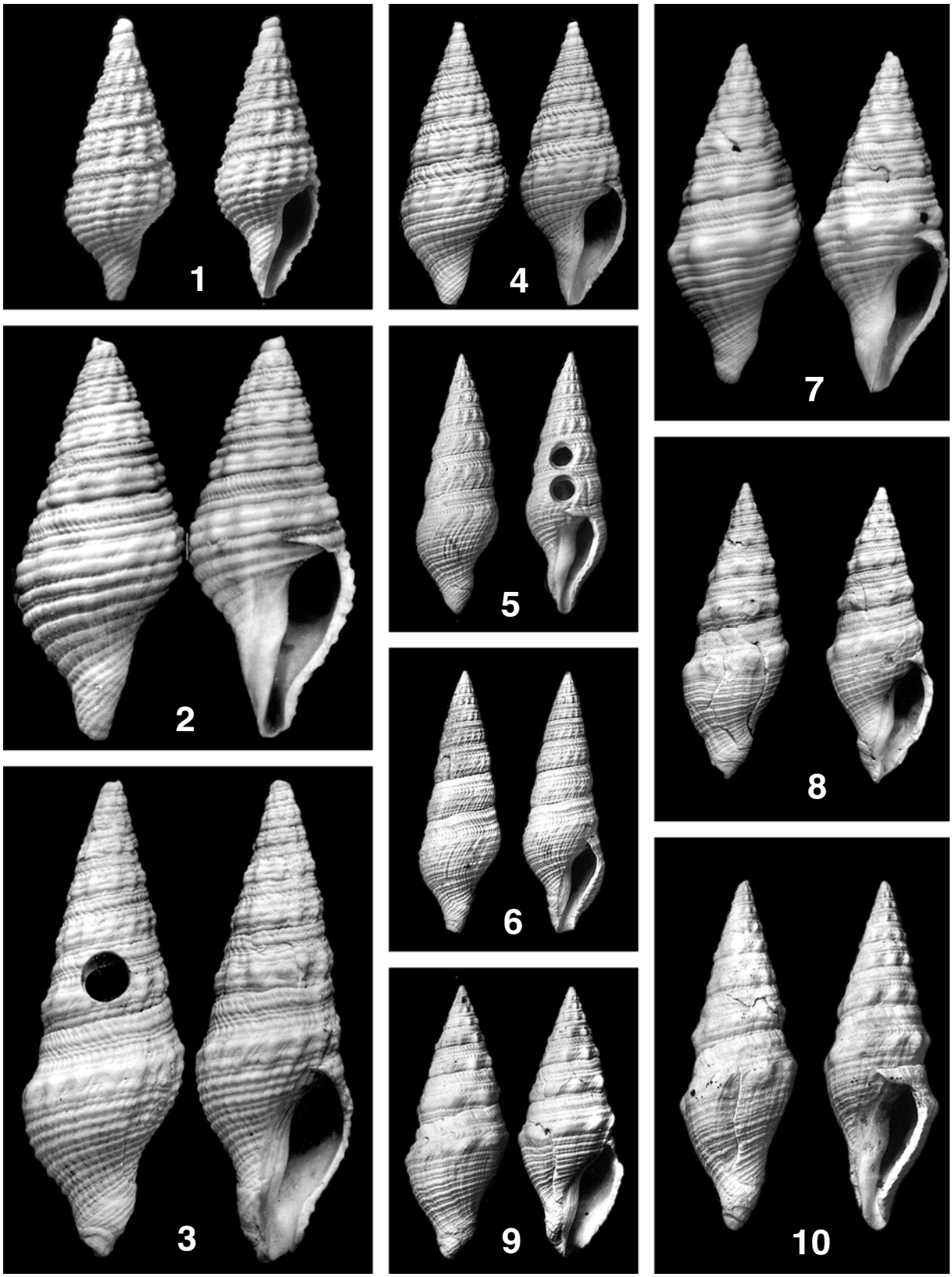
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PLATE 17

Family **Turridae**

Page

1 – *Bathytoma lapugyensis* (MAYER *in* BELLARDI), × 2; U.W., BkK-G1006 54
2 – *Bathytoma cataphracta* (BROCCHI), × 4; U.W., BkK-G1005 53
3 – *Bathytoma cataphracta* (BROCCHI), × 2; Private collection of Mr. J.GUBAŁA 53
4 – *Bathytoma cataphracta* (BROCCHI), × 2; Collection of the Museum of the Geological Survey of Poland**,** Warsaw (Catalogue No. 28.II. 249; coll. K. KOWALEWSKI) 53
5-7 – *Microdrillia crispata* (DE CRISTOFORI & JAN), × 8; 5 - U.W., BkK G1002; 6 - U.W., BkK G1003; 7 - U.W., BkK G1004 52

Photo 1 taken by B. DROZD, M.Sc.
Photos 2-3 and 5-7 taken by B. MALINOWSKA
Photo 4 taken by A. NOWICKA

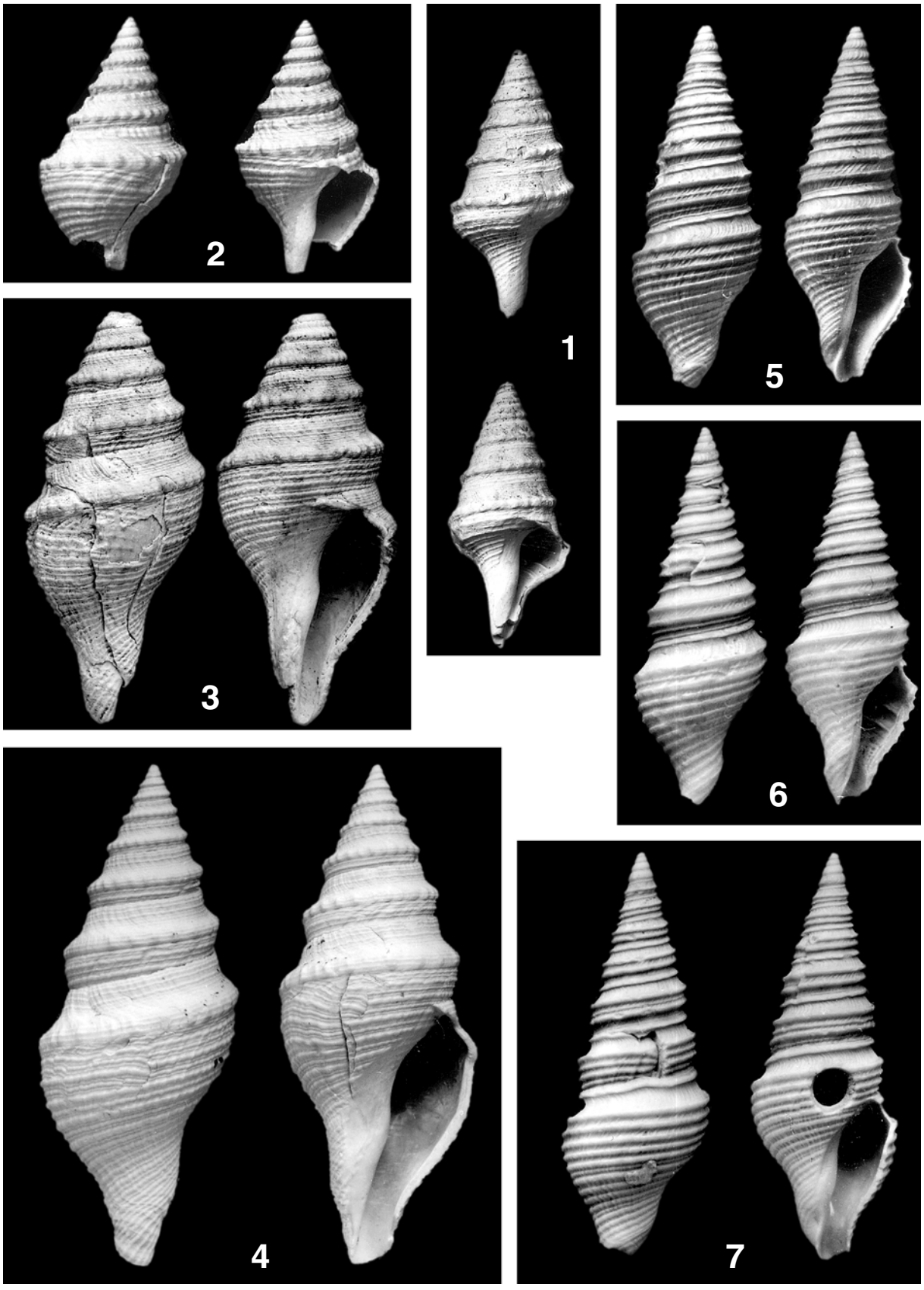
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PLATE 18

Family **Turridae**

Page

1 – *Genota* (*Pseudotoma*) *bonellii* (BELLARDI), × 2; U.W., BkK-G1015. 56

2-3 – *Genota* (*Genota*) *ramosa* (BASTEROT), × 2; 2 - U.W., BkK-G1010; 3 - U.W., BkK-G1011 55

4-6 – *Genota* (*Genota*) *valeriae* (HOERNES & AUINGER), × 2; 4 - U.W., BkK-G1012; 5 - U.W., BkK-G1013; 6 - U.W., BkK-G1014 55

7-9 – *Genota* (*Genota*) *elisae* (HOERNES & AUINGER); 7 × 4, 8-9 × 2; 7 - U.W., BkK-G1007; 8 - U.W., BkK-G1008; 9 - U.W., BkK-G1009 54

All photos taken by B. DROZD, M.Sc.

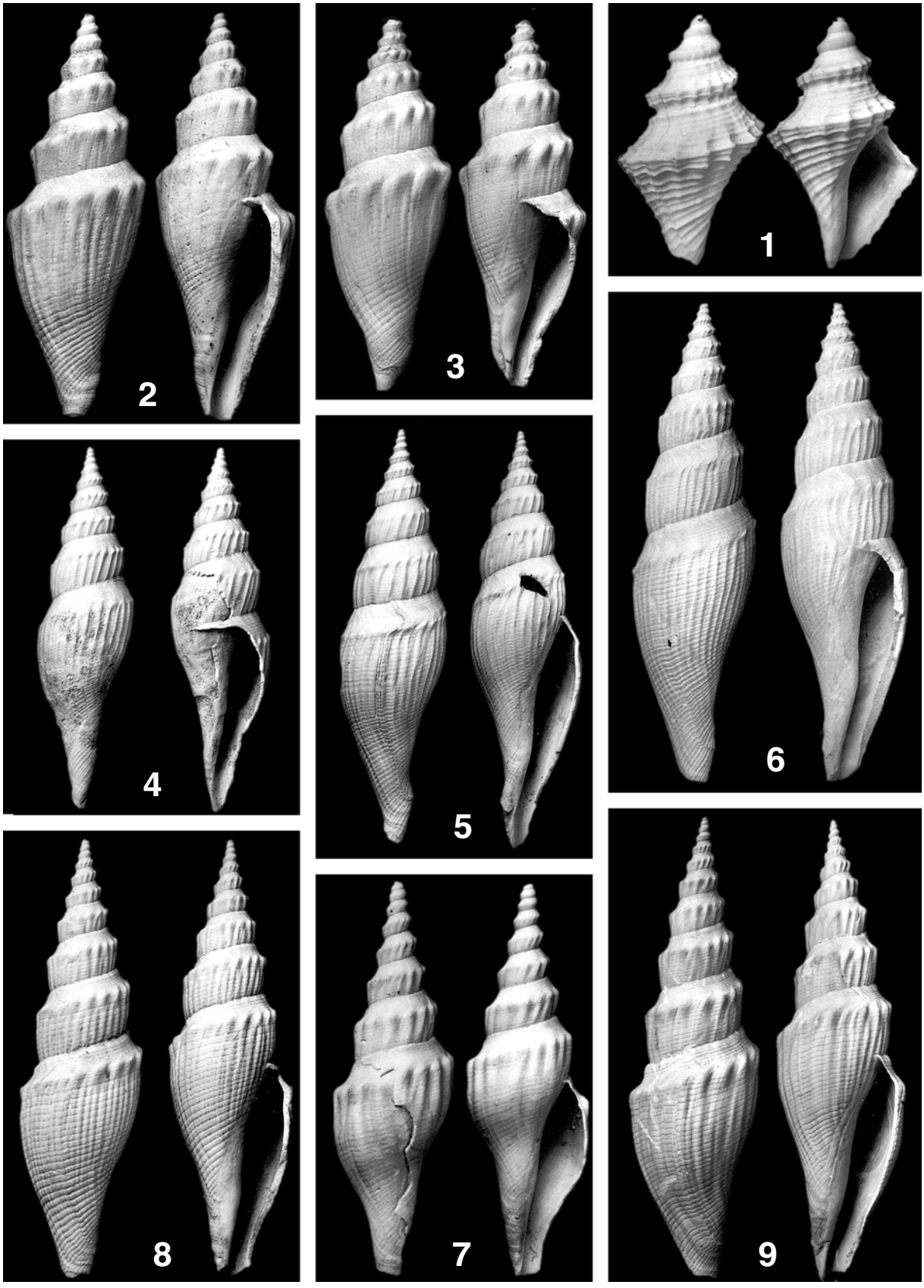
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PLATE 19

Family **Turridae**

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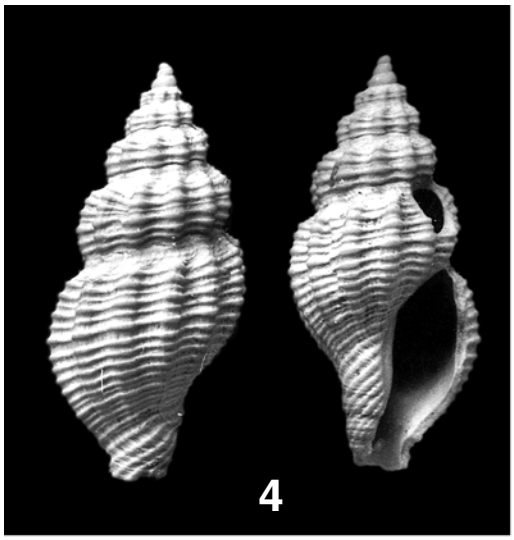
1 – *Agathotoma perfragilis* (BOETTGER), × 8; U.W., BkK-G1018 57
2 – *Mitrolumna paraptycha* (BOETTGER), × 4; U.W., BkK-G1017 57
3 – *Mitrolumna aptycha* (BOETTGER), × 8; U.W., BkK-G1016 57
4-6 – *Peratotoma augustae* BOETTGER, × 8; 4 - U.W., BkK-G1111;
5 - U.W., BkK-G1112; 6 - U.W., BkK-G1113 72
7-9 – *Peratotoma subaequalis* BOETTGER, × 8; No. U.W., BkK-G1124-1126 74

All photos taken by B. MALINOWSKA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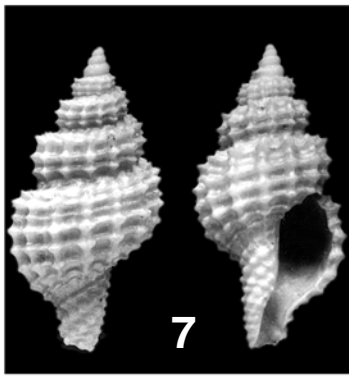
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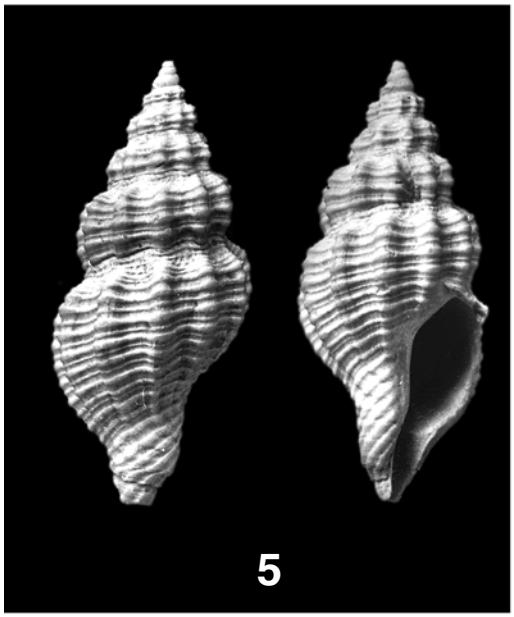
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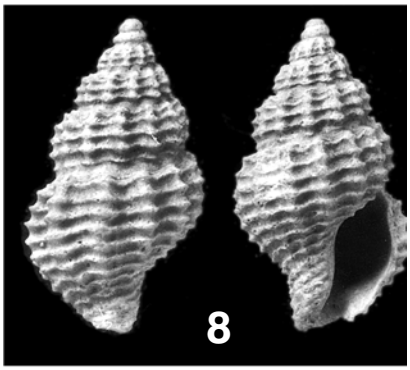
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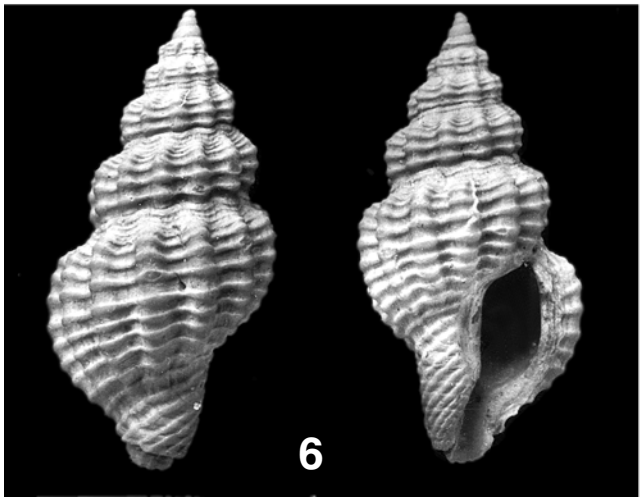
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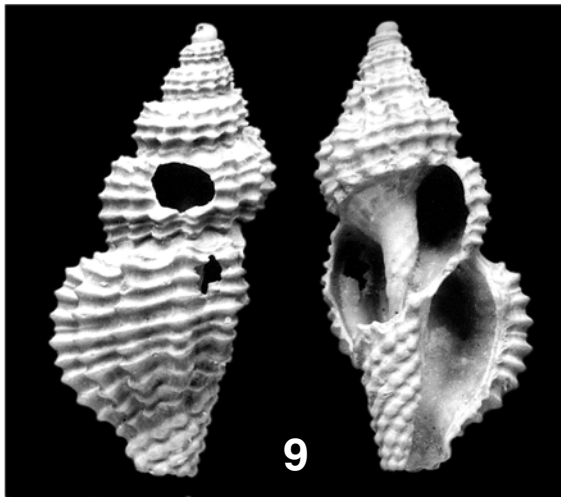
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PLATE 20

Family **Turridae**

Page

1-2 – *Cythara* (*Mangelia*) *clathrata* (DE SERRES), × 8; 1 - U.W., BkK-G1024; 2 - U.W., BkK-G1025 58

3-4 – *Cythara* (*Mangelia*) *contracta* (BELLARDI) , × 8; 3 - U.W., BkK-G1022; 4 - U.W., BkK-G1023 58

5-6 – *Cythara* (*Mangelia*) *bittneri* (BOETTGER), × 8; 5 - U.W., BkK-G1019; 6 - U.W., BkK-G1020 57

7-8 – *Cythara* (*Mangelia*) *fuchsi* (BOETTGER), × 8; 7 - U.W., BkK-G1028; 8 - U.W., BkK-G1029 59

9 – *Cythara* (*Mangelia*) *perforata* (BRUSINA), × 8; U.W., BkK-G1041 59

10 – *Cythara* (*Mangelia*) *paulae* (BOETTGER), × 8; U.W., BkK-G1040 59

All photos taken by B. MALINOWSKA

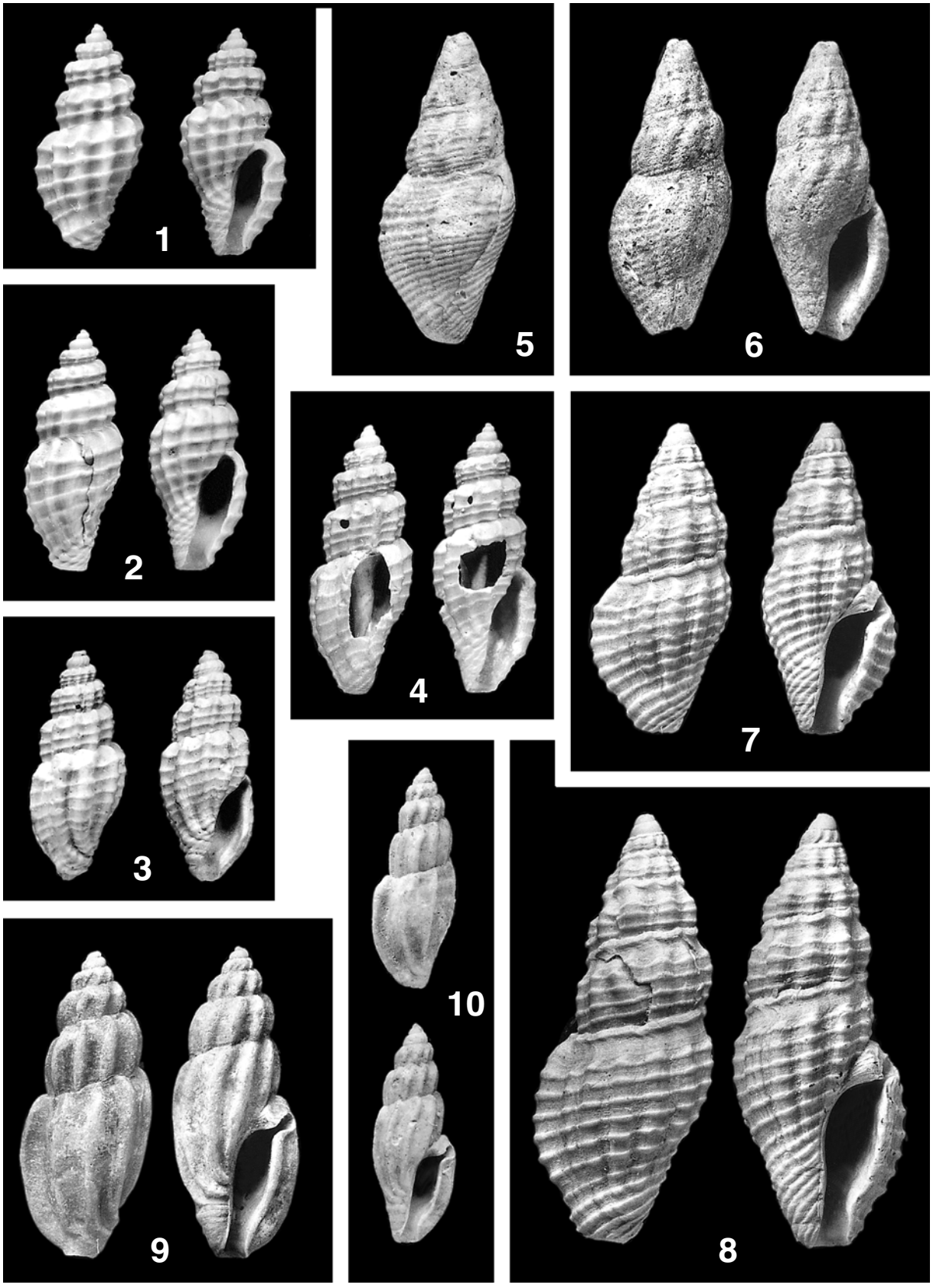
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PLATE 21

Family **Turridae**

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1-3 – *Raphitoma plicatella* JAN *in* BELLARDI, × 4; 1 - U.W., BkK-G1042; 2 - U.W., BkK-G1043; 3 - U.W., BkK-G1044 69

4-5 – *Raphitoma hispida* BELLARDI, × 8; 4 - U.W., BkK-G1033; 5 - U.W., BkK-G1034 68

6-8 – *Raphitoma sparsa* (BOETTGER), × 8; 6 - U.W., BkK-G1051; 7 - U.W., BkK-G1052; 8 - U.W., BkK-G1053 70

9 – *Raphitoma polyacantha* (BOETTGER), × 8; U.W., BkK-G1045 70

All photos taken by B. MALINOWSKA

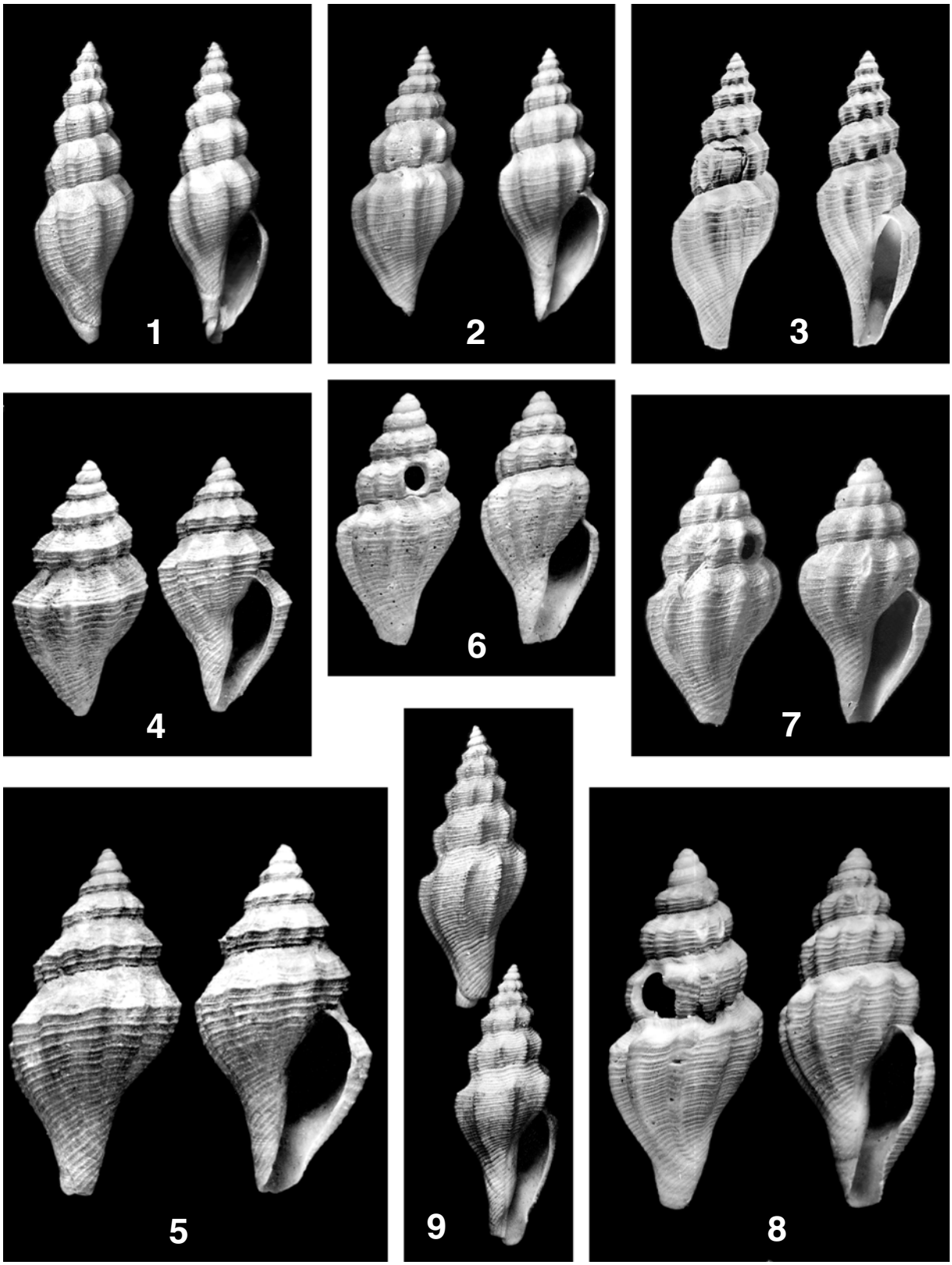
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PLATE 22

Family **Turridae**

Page

1-4 – *Cythara* (*Mangelia*) *subcylindrata* (BOETTGER), × 8; 1 - U.W., BkK-G1054; 2 - U.W., BkK-G1055; 3 - U.W., BkK-G1056; 4 - U.W., BkK-G1057 60

5 – *Cythara* (*Mangelia*) *burdigalica* (PEYROT), × 8; U.W., BkK-G1021 58

6-10 – *Cythara* (*Mangelia*) *rugulosa* (PHILIPPI), × 8; 6 - U.W., BkK-G1046; 7 - U.W., BkK-G1047; 8 - U.W., BkK-G1048; 9 - U.W., BkK-G1049; 10 - U.W., BkK G1050 60

11 – *Cythara* (*Mangelia*) *fraterna* (BOETTGER), × 8; U.W., BkK-G1027 59

12-13 – *Cythara* (*Mangelia*) *cibori* sp.nov., × 8; 12 - U.W., BkK-G1038; 13 - the **holotype** U.W., BkK-G1039 61

All photos taken by B. MALINOWSKA

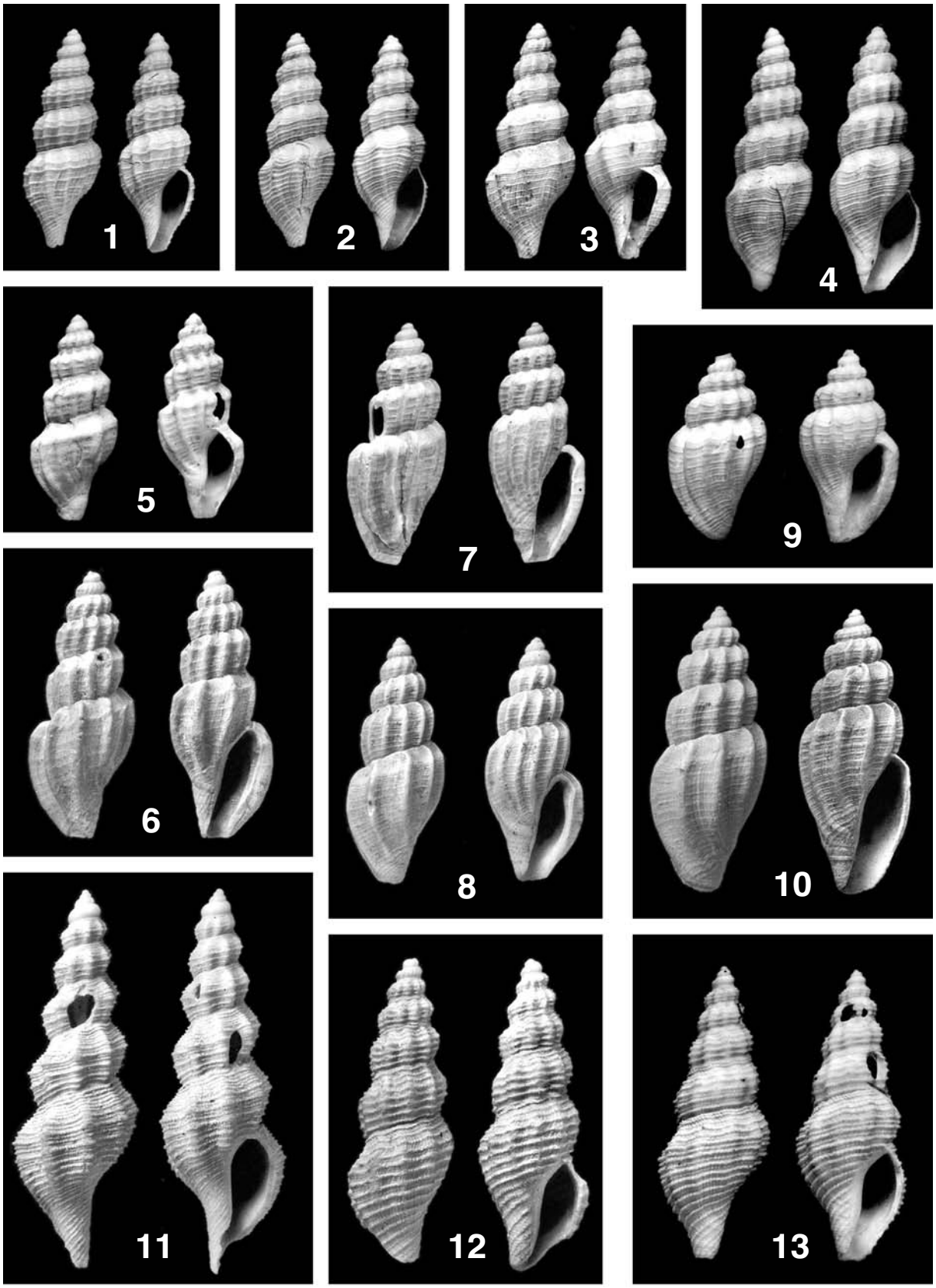
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PLATE 23

Family **Turridae**

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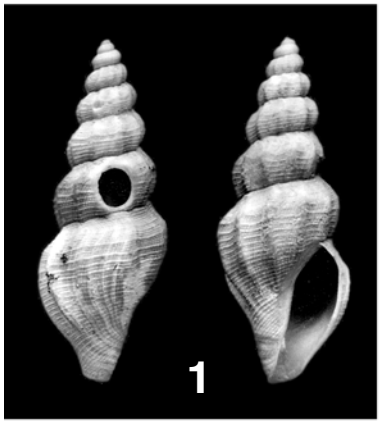
1-3 – *Bela jeffreysi* (BELLARDI), × 8; 1 - U.W., BkK-G1035; 2 - U.W., BkK-G1036; 3 - U.W., BkK-G1037 62

4-6 – *Bela subturgida* (BOETTGER), × 8; 4 - U.W., BkK-G1058; 5 - U.W., BkK-G1059; 6 - U.W., BkK-G1060 63

7 – *Bela submarginata* (BONELLI *in* BELLARDI), × 8; U.W., BkK-G1026 62

8 – *Raphitoma subvellicata* (BOETTGER), × 8; U.W., BkK-G1061 70

All photos taken by B. MALINOWSKA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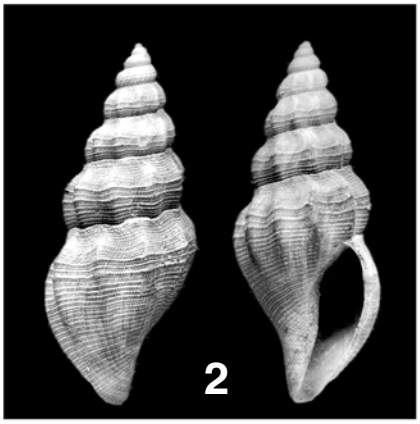
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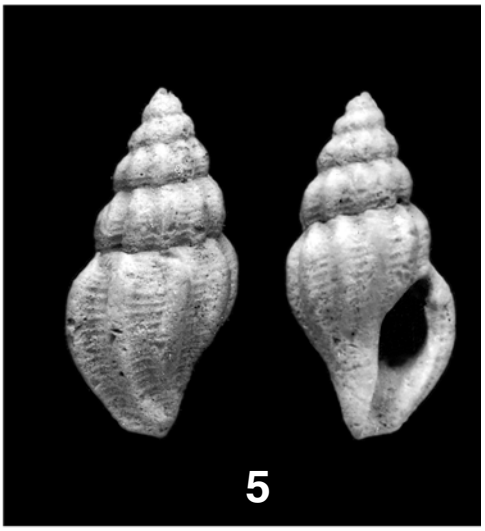
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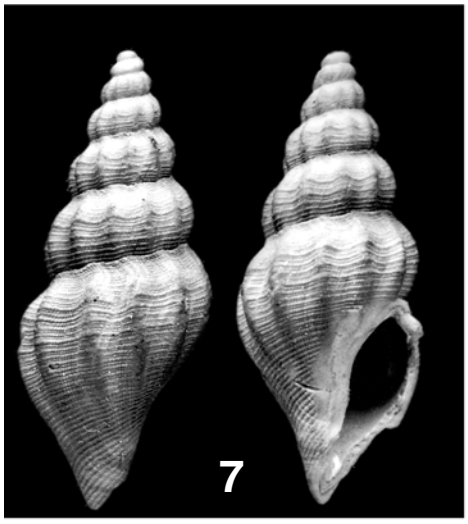
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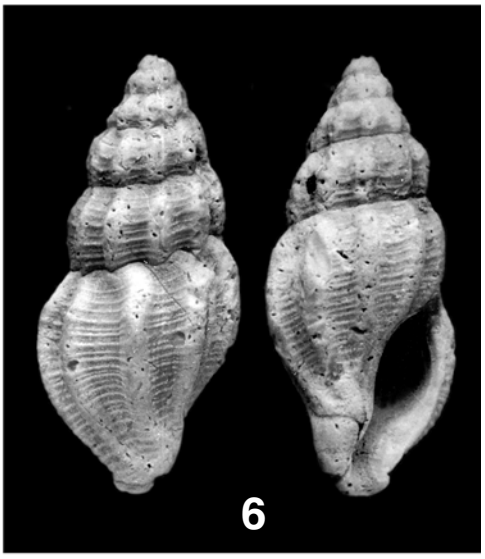
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Family **Turridae**

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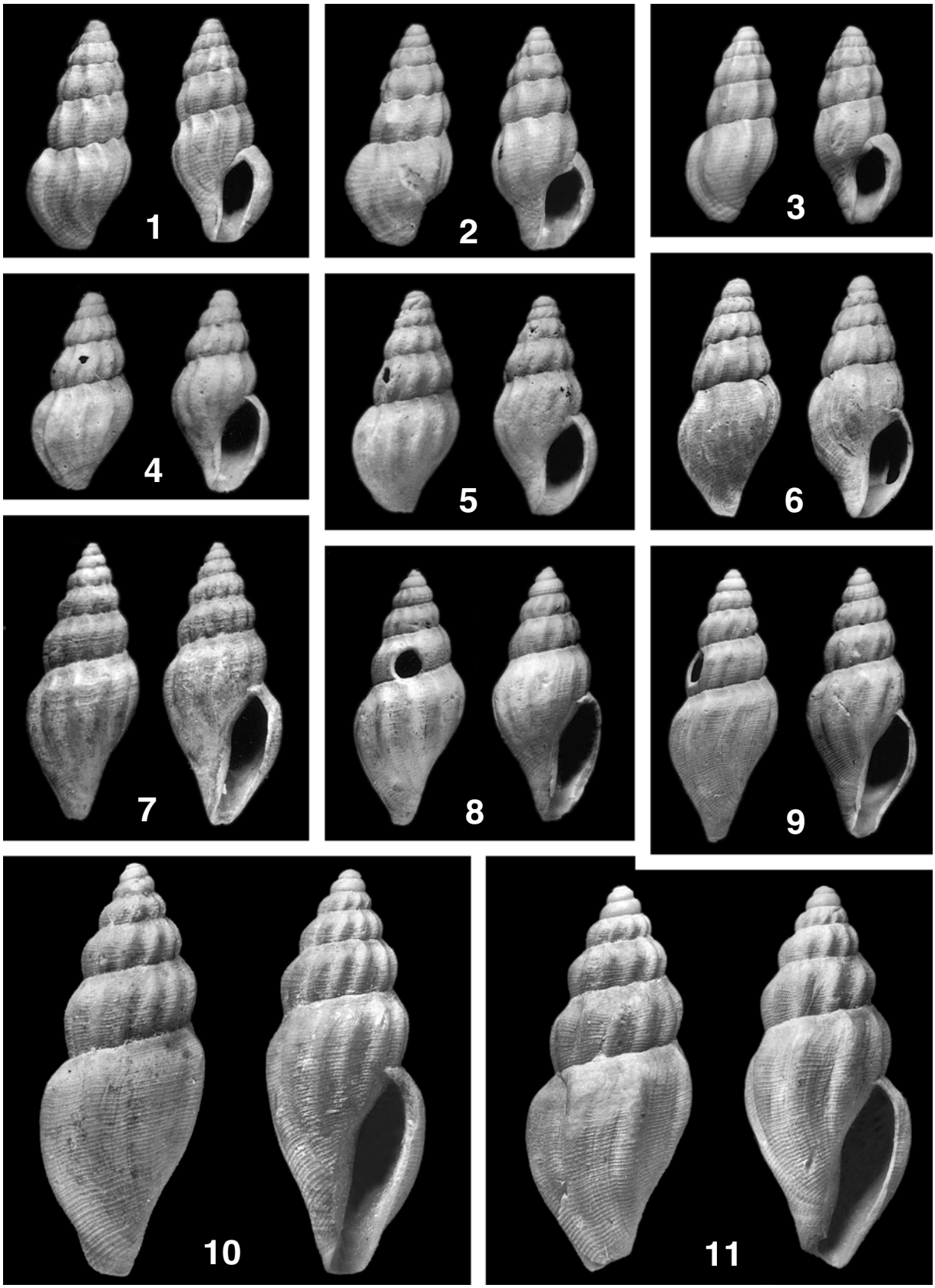
10-11 – *Bela vulpecula* (BROCCHI), × 8; 10 - U.W., BkK-G1065; 11 - U.W., BkK-G1066 63

All photos taken by B. MALINOWSKA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Family **Turridae**

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8 – *Clathurella casilorica* BOETTGER, × 8; U.W., BkK-G1074 65

All photos taken by B. MALINOWSKA

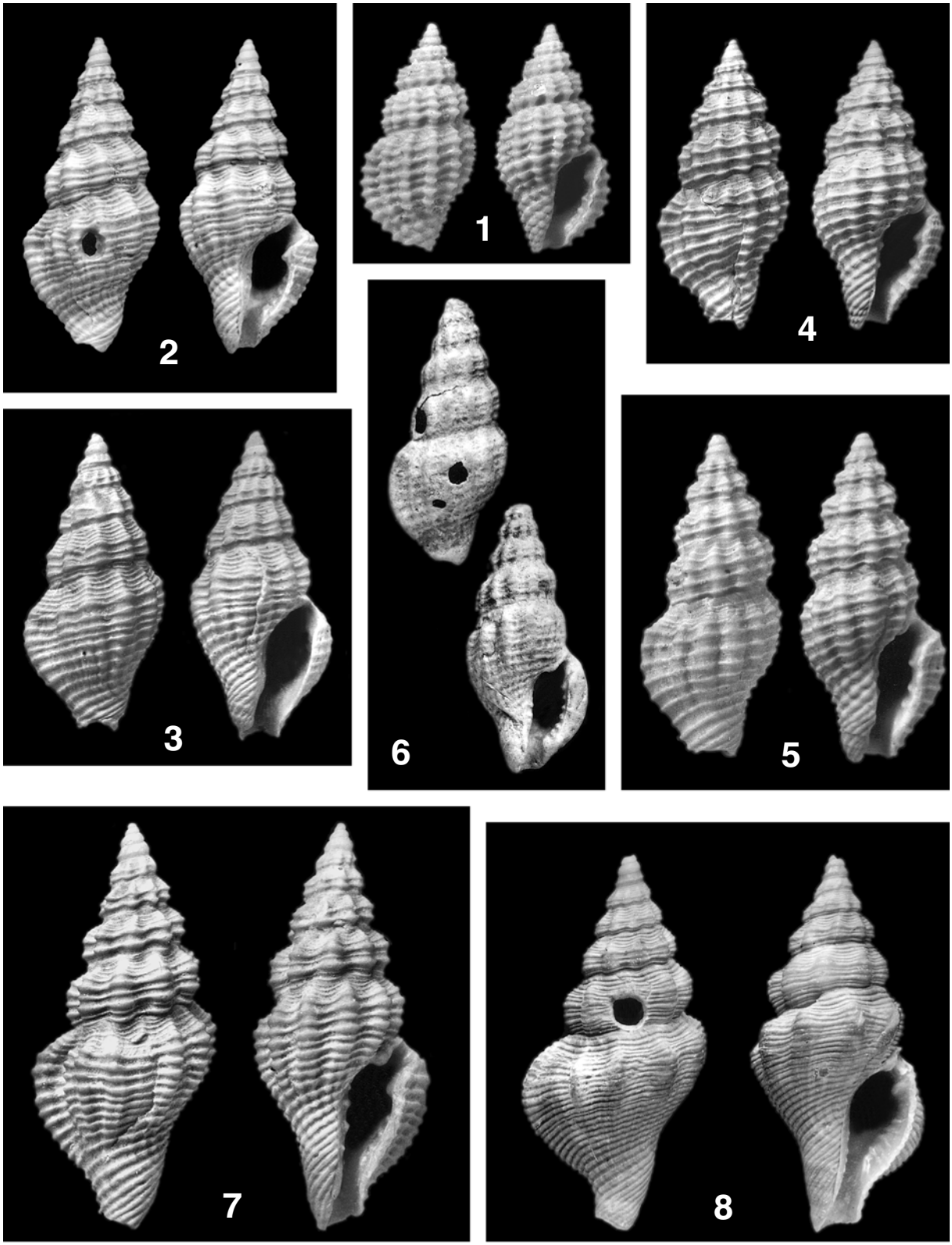
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PLATE 26

Family **Turridae**

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3-4 – *Clathurella vasta* (BOETTGER), × 8; 3 - U.W., BkK-G1085; 4 - U.W., BkK-G1086 66
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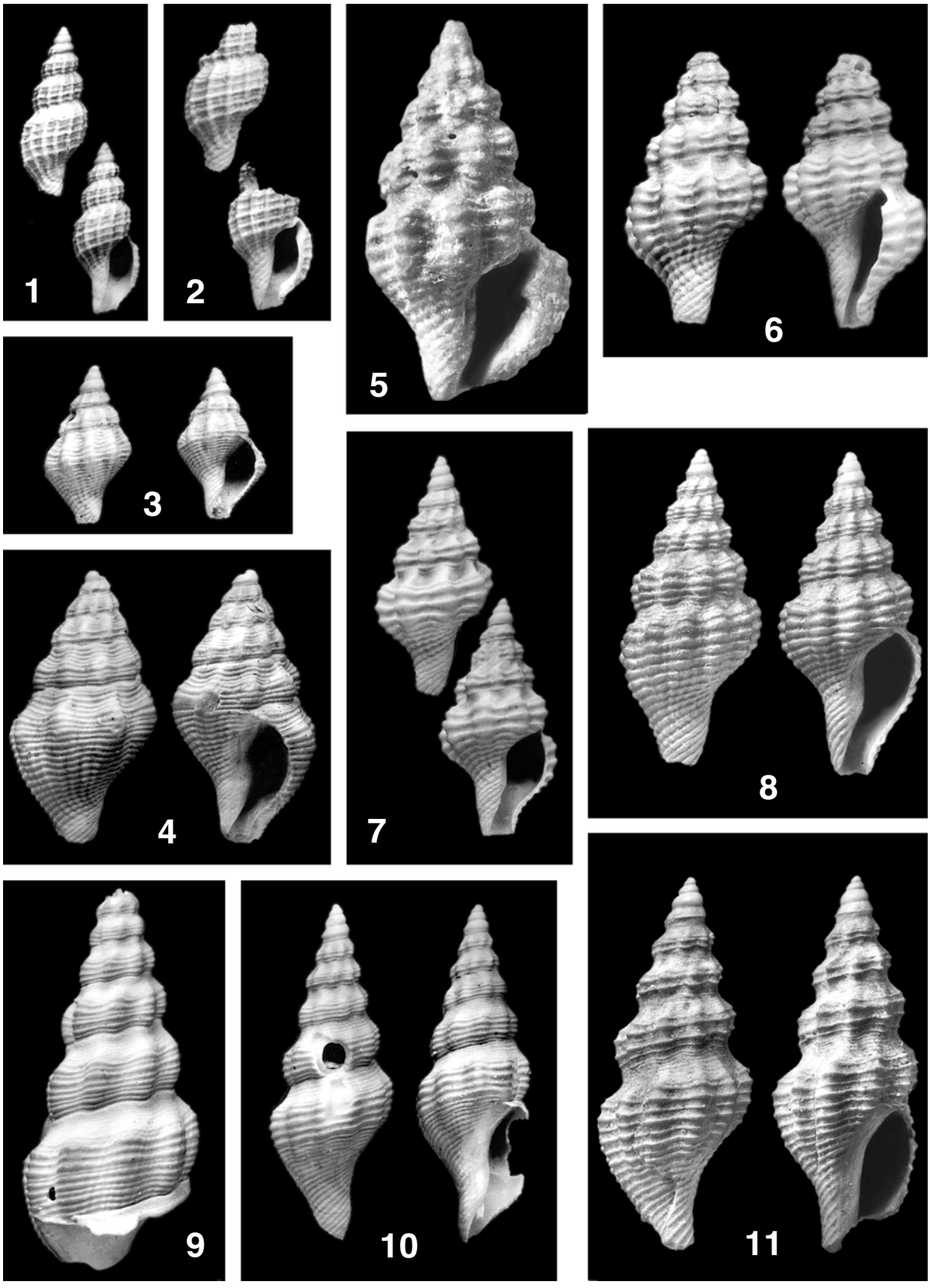
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Family **Turridae**

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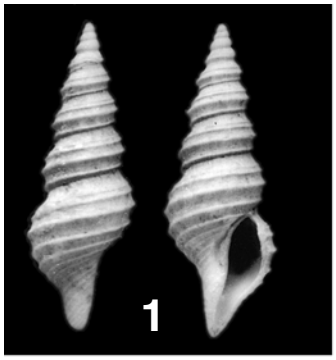
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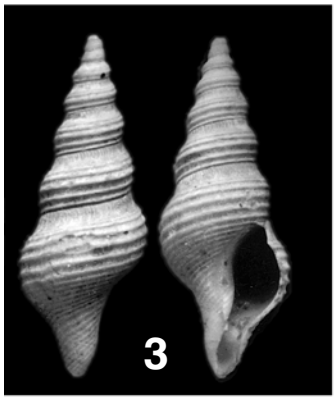
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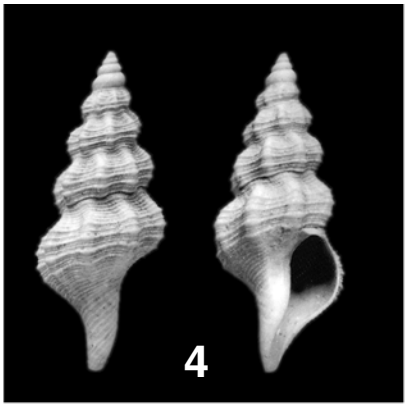
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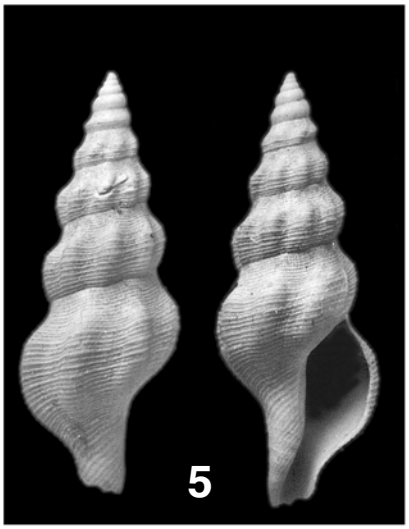
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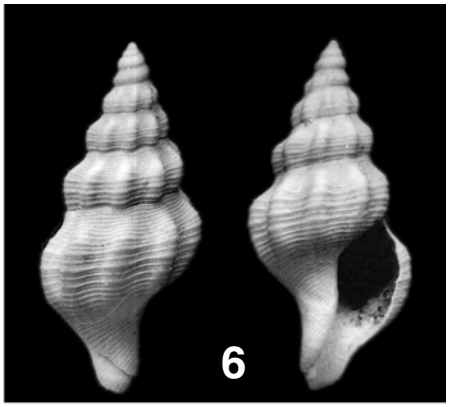
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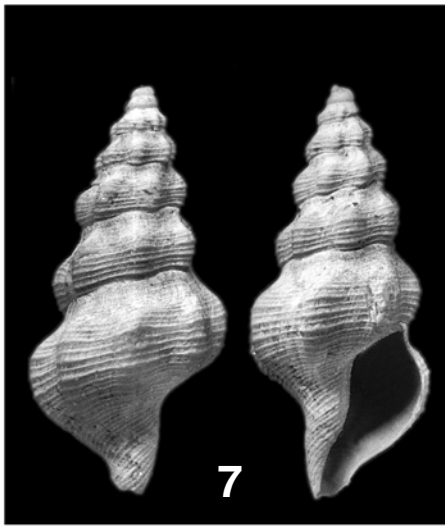
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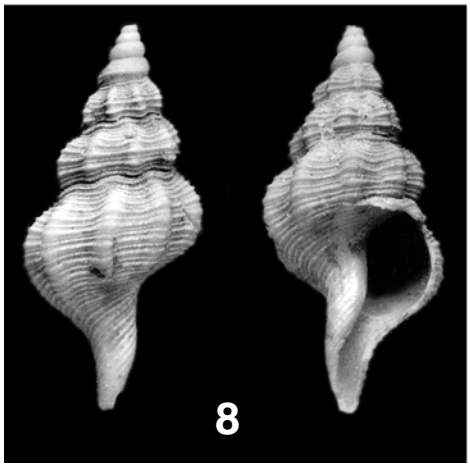
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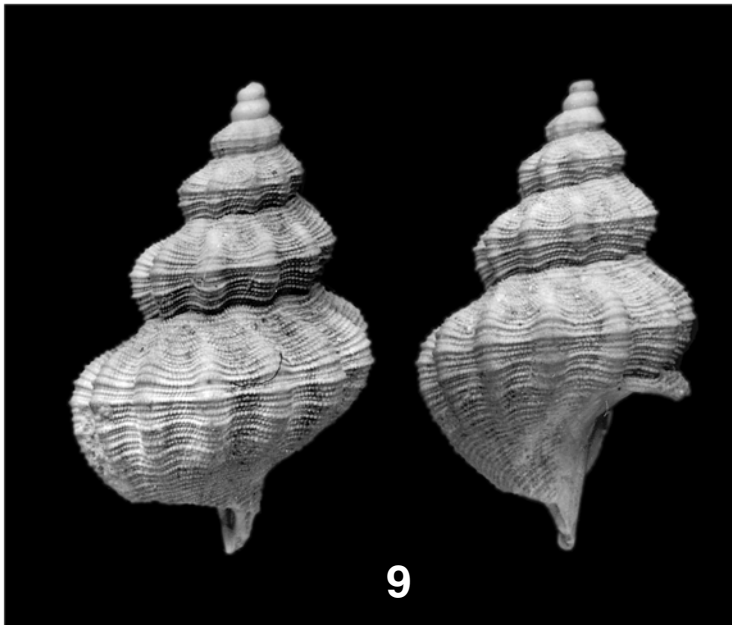
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11-13 – *Philbertia subpurpurea* (BOETTGER), × 8; 11 - U.W., BkK-G1106; 12 - U.W., BkK-G1107; 13 - U.W., BkK-G1108 72

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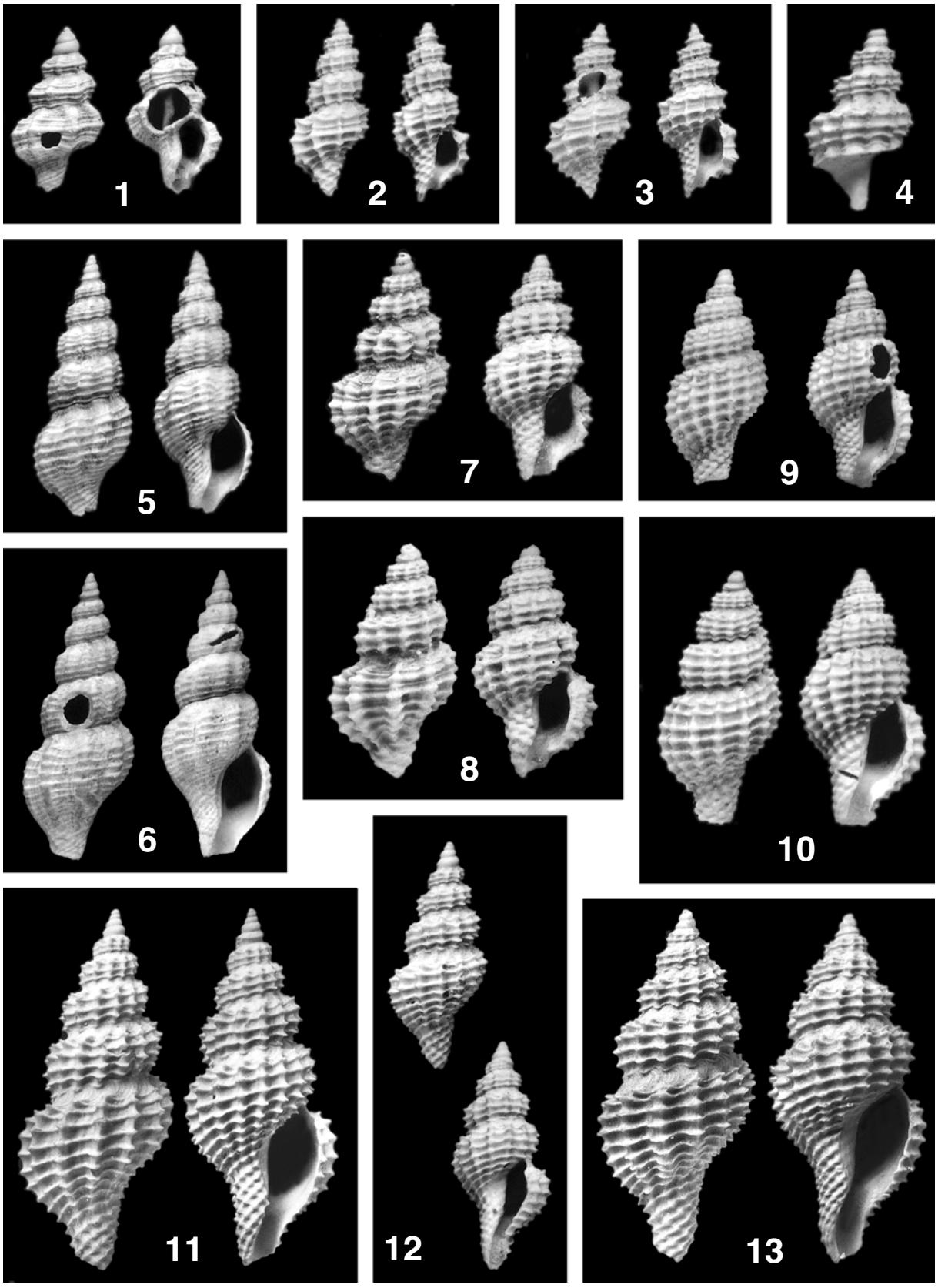
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Family **Turridae**

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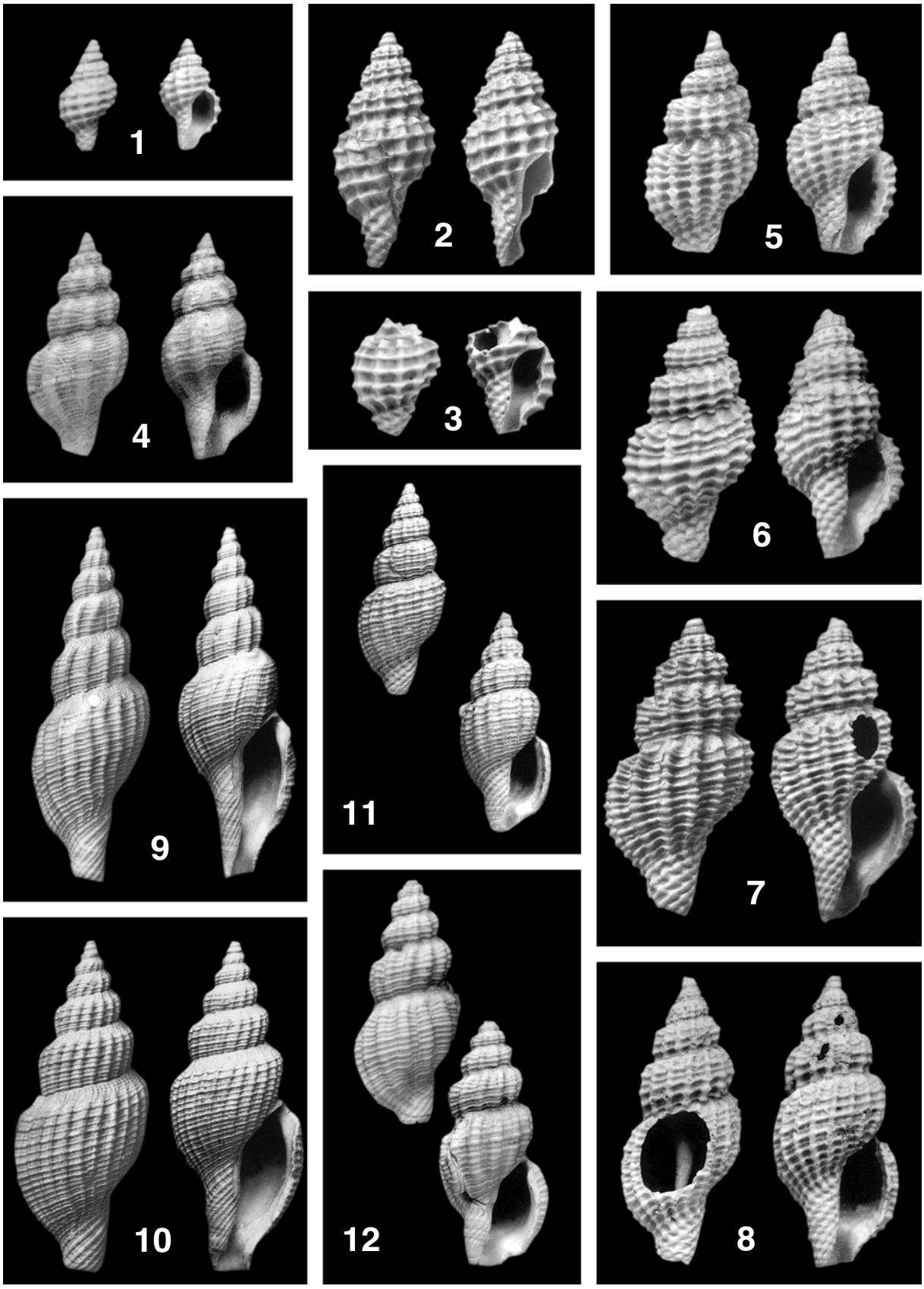
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