# *UVIGERINAMMINA* MAJZON 1943 (AGGLUTINATED FORAMINIFERA, MORPHO-SYSTEMATIC CONSIDERATIONS)

THEODOR NEAGU

University of Bucharest, Laboratory of Paleontology, 1, N. Bălcescu Bd.

**Abstract.** New data about the structure of the early stage, their presence of the apertural tub for connection between succesive chambers together with the general morphology of the test confirm the affiliation of the genus ***Uvigerinammina* MAJZON 1943** to the Family Prolixoplectidae and not to Verneuilinidae as it is considered by Loeblich & Tappan 1988 (p. 134). There are also described two new species: *U. mysaiosi* and *U. carpathica.*

*Key words*: agglutinated foraminifera, flysch facies, Upper Cretaceous deposits, Southern Carpathians.

## INTRODUCTION

In 1943 L. Majzon (Hungarian micropaleontologist) in the article *Beitrage zur kentnnis einiger Flysch-Schichten des Karpaten vorlandes mit besonderer rucksicht auf die Golotruncanen* (p. 138), describes the new genus *Uvigerinammina* with *U. jankoi* type species.

From the start due to the poor circulation of the magazine *A magyarkiralyi Foltani Inezet Evkoye* (vol. 37, p. 91–170) this new taxon remains unknown to the micropaleontologists of the Carpathian realm for a long time. In 1950, in the last edition of the J. A. Cushman's "*Foraminifera. Their classification and economic use*" mentions for the first time, after 10 years, this genus but without any figures (the original ones are unused). At page 122, the author remarks that the description of the genus is extremely unclear and confusing concluding that: *without a more detailed description of the early stages it is difficult to place this genus with certainity (it is worth mentioning that the quality of the figures provided by the author is far from that required in the description and definition of a new genus, even one with such a confusing description).*

*Treatise on Invertebrate Paleontology* by Loeblich & Tappan (1964) (part C, p. 272) is the first modern treatise that presents this genus in detail (text and figures) using plenty of S. Geroch's 1957 article. The authors consider this genus as belonging to the Verneulinidae family, an opinion also maintained in their last treatise from 1988.

It is the great merit of the Polish micropaleontologist from Krakow, Stanislaw Geroch, who in 1957 in his article: *Uvigerinammina jankoi Majzon (foraminifera) in the Carpathian Flysch* (Ann. Soc. Geol. Pologne, vol. 25, fasc. 3, p. 23, with two plates), rehabilitates this genus by presenting a clear and thorough description of the test, backed up by equally good figures (subsequently used by other treatise as Loeblich & Tappan 1988). All of the authors after S. Geroch unanimously agree on the intrinsec value of this taxon as a remarkable endemic form of the flysch deposits as previously stated by Geroch.

The systematic and taxonomic assignment of this genus to the Verneuilinidae Family has been accepted by all the specialists in the field including Loeblich & Tappan 1988. The authors above, in their classification of agglutinated foraminifera putting a great deal of emphasis on the presence or absence of the canaliculate aspect of the test wall confirm their previous opinions.

The close study of the test (in immersions), of the wall ultrastructure, of the initial growth stages (early stage), shows that all the features, from the young trochospiral (not triserial) stage to the compact non canaliculate wall, to the adult stage with evident tendencies of becoming irregular-biserial do not fit into the typical Verneulinidae.

All of the above mentioned characters, to which are added the compact nature of the wall ultrastructure (clearly visible in immersion) as well as the connecting apertural tube between the chambers, are characters which justify its inclusion into a new family: the Prolixoplectidae (Loeblich & Tappan 1985). The diagnosis of this family, after the authors is: *elongate test, early stage trochospiral later may have a reduced number of chambers per whorl and become triserial, biserial, uniserial, agglutinated noncanaliculate wall, interriomarginal-extra-umbilical to ovoid and terminal aperture.*

The characters of the genus *Uvigerinammina* as mentioned by S. Geroch, as well as of the genus *Gerochammina* Neagu 1990, are in accordance with the diagnosis of this family.

Regarding the populations of *Uvigerinammina* encountered in the Turonian flysch deposits, as was remarked by Geroch in 1957, the following groups can be separated and regarded as distinct species.

The rich populations of the *Uvigerinammina* from the Teleajen Valley area (Pridvaria Valley) Buzău springs (Pârâul Fetii Valley), Întorsura Buzăului area (Hărcăoaia Valley, Floroaia Mică Valley, Floroaia Mare Valley, Scrădoasa Valley, Dealul Stânii Hill), Sita Buzăului area (Bota Valley, Botița Valley, Crasna Valley) are associated with genera *Thalmanammina* div. sp., *Recurvo* ides div. sp. *Paratrochamminoides* div. sp. *Trochammina*, *Ammodiscus*, *Glomospira Ammovertella*, *Rhabdammina*.

The constant and permanent morphological character encountered in all individuals regardless their external characteristics is the presence (in immersion) of the apertural tube which is constantly visible in the chambers of the final 2–3 whorls.

According to their morphological character, the following morpho-systematic groups can be separated:

– First one noted from 1990 by Th. Neagu as belonging to *Uvigerinammina praejankoi* with the following diagnosis: small test, with a conical initial stage, agglutinated with the medium-sized grains, becoming finely agglutinated in the adult stage, with much silicious cement. Chambers in the initial stage are aranged in a helicospire, with three chambers per whorl. The adult stage is pseudo-biserial, with elongated chambers. All chambers are connected by a characteristic apertural tube;

– The second group is composed of small (dominating in terms of numbers of specimens) to moderate size in which the chambers grow rapidly in size, giving the test a tight globulous aspect. The transverse contour of the test is in the shape of an equilateral triangle with the corners strongly rounded;

– The third group has three chambers per whorl in a high trochospiral, which resamble a pyramid with rounded corners and strongly concave sides;

– The final group and the one with the most extreme morphology has a test which is clearly tritaxiform with rounded corners. The presence of a terminal and circular aperture with an internal apertural connexion tube confirms its assignement to this gens.

Stratigraphically, this morphological variation also points out temporal evolution of the genus. The first type, *Uvigerinammina jankoi* appears in the lower part of of the Helvetoglobotruncana helvetica biozone, in association with the classic *Uvigerinammna jankoi,* type which becomes dominant in the lower part of the following biozone with Sigalitruncana sigali, S. marianosi, Dicarinella primitiva. The other morphological types are frequent in the terminal part of this large biozone (terminal Upper Turonian – Lower part of Coniacian).

## PALEONTOLOGICAL PART

Class FORAMINIFERA Eichwald 1830
Scls. ASTRORHINA Saidova 1980
Ord. LITUOLINA Lankaster 1885
Superfamily VERNEUILINACEA Cushman 1911
Family PROLIXOPLECTIDAE Loeblich &Tappan 1985
Genus UVIGERINAMMINA Majzon 1943

**Diagnosis** (after Loeblich & Tappan 1988): Irregularly triserial test with three somewhat inflated chambers per whorl, increasing rapidly in size as added; sutures depressed; finely agglutinated and thick wall; rounded terminal and flush aperture. Lower Cretaceous to Paleocene (Poland, Romania, USSR, Ukraine Carpathians, Atlantic of West Africa).

**Remarks:** *Uvigerinammina* is typically restricted to the flysch facies in which crushing and distortion are frequent.

**Emendation:** By studying the test in immersion, the diagnosis can be completed with the following observation: *the initial stage (early stage) is of a high trochospiral form, followed by a trochospiral stage with 3 chambers per whorl and having an apertural connection tube between chambers. These characters prove, beyond doubt, the inclusion of this genus in the Prolixoplectidae and not Verneuilinidae.*

### ***Uvigerinammina jankoi*** MAJZON 1943
Plate 2, figs. 18–35; plate 3, figs. 1–12

*Uvigerinammina jankoi* MAJZON 1943, pg. 158, pl. 11, fig. 15; GEROCH S., 1957, pg. 232, pl. 14, fig. 1–10; GEROCH S., NOWAK W., 1983, pl. 2, fig. 10, pl. 7, fig. 11–12; KRASHENINIKOV V. A., 1974, pg. 642, pl. 6, fig. 7; NEAGU TH., 1962, pg. 65, pl. 6, fig. 87–90; 1970, pg. 43, pl. 8, fig. 1–2; 1990, pg. 255, pl. 4, fig. 7–15; 2001, pg. 1, fig. 26–29, 34–37.

**Description**: (emended) small to mid-sized test; three globular-piriform chambers per whorl; high trochospiral aspect, the chambers gradually increasing in size giving to the test a clustered appearance (uvigeriniform), almost smooth sutures; finely agglutinated siliceous wall with a slightly rough (hispid) aspect; terminal aperture on a shorty neck, interiomarginally on the last whorl representing the exterior opening of the apertural tube; due to the abundant siliceous cement, in immersion studies, the trochospiral (not triserial) aspect of the chambers disposition in the early stage can be observed.

**Dimensions**: Length: 0. 48mm, 0. 36mm – 0. 26mm;
Breadth: 0. 38mm, 0. 31mm – 0. 21mm.

**Remarks**: The hunch-backed appearance of the test, the lack of any elongation or uncoiling trends, clearly define the above described species from all other types.

**Occurence:** Eastern Carpathian flysch deposits: Teliu Valley-Braşov, Întorsura Buzăului area (Scrădoasa Valley, Floroaia Mică Valley, Floroaia Mare Valley, Hărcăoaia Valley, Dealul Stânii Hill), Vama Buzăului area (Pârâul Fetii Valley), Cheia-Teleajen area (Pridvaria Valley), Prahova Valley (Valea Beliei Valley), Macla Valley (Bertea area), Ialomița area (Țâța Valley).

**Stratigraphic distribution:** Turonian (Helvetoglobotruncana helvetica) Coniacian (Biozones with Sigalitruncana sigali-Dicarinella primitiva).

**Type specimens:** LPB. IV. 5812, 5842, 5769, 5792–5796, 6128.

***Uvigerinammina praejankoi* NEAGU 1990**
Plate 1, figs. 1–14; plate 4, figs. 22–25

*Uvigerinammina praejankoi* NEAGU 1990, pg. 255, pl. 3, figs. 1–33; 2011, pl. 1, fig. 30–33.

**Description:** small test, with a conical initial stage, agglutinated with medium-sized grains, becoming finely agglutinated in the adult stage, with much siliceous cement; chambers in the initial (early) stage are arranged in a helicospire with three chambers per whorl; the adult stage is pseudo-biserial with elongated chambers, all chambers are connected by a characteristic apertural tube.

**Dimension:** Hollotype: length 0. 42mm; breadth 0. 24mm.
Paratypes: 0. 19mm, 0. 22mm – 0. 54mm; breadth 0. 20mm – 0. 27mm.

**Occurence**: Eastern Carpathians Upper Cretaceous flysch deposits, Intorsura Buzăului area (Dealul Stânii Hill), Vama Buzăului area (Pârâul Fetii Valley), Teleajen – Cheia area (Pridvaria Valley).

**Stratigraphic distribution**: Turonian (Helvetoglobotruncana helvetica – Sigalitruncana sigali biozones).

***Uvigerinammina mysaiosi*** NEAGU n. sp.
Plate 1, figs. 15–18; plate 4, figs. 5–21

**Derivation of name**: from Mysaios, the name of the Buzău River at the Dacians

**Type level**: Middle-Upper Turonian Sigalitruncana sigali biozone

**Type locality**: Buzău River Area (Pridvaria Valley)

**Type specimens:** hollotype LPB.IV. 12107; paratypes: LPB.IV. 12108, 12112

**Description**: Elongated-Uvigerina-like test, high trochospiral, with three rapidly increasing chambers per whorl; chambers with a globular to piriform appearance, weakly depressed sutures, strongly oblique; fine too moderately agglutinated wall test, the agglutinated particles embedded in a richely siliceous cement which in immersion gives to the specimen under study a translucent character; the aperture is terminal, circular or elliptical and is placed on top of a short neck which represents the exterior opening of the apertural tube that connects the chambers, the outline of the test in transverse section resambles that of a rounded triangle.

**Dimensions:** Hollotype: length 0. 33mm; breadth 0. 19mm
Paratypes: length 0. 38mm – 0. 28mm; breadth 0. 19mm – 0. 26mm

**Remarks:** This species, by its evidently buliminiform aspect of the test, elongated with a weak uncoiling tendency of the chambers of the last whorl due to their accentuated growth, differs from the others morphotypes of this genus.

**Occurence**: Întorsura Buzăului area of the Buzău Rivers, Teleajen-Cheia Valley area (Pridvaria Valley), Macla Valley (North of Bertea-Vărbilău area).

**Stratigraphic distribution**: Turonian (middle-upper part of the biozone with Sigalitruncana sigali).

***Uvigerinammina carpathica*** NEAGU n. sp.
Plate 2; plate 3, figs. 13–30; plate 4, figs. 1–4

**Type level**: Middle Turonian (Sigalitruncana sigali biozone)

**Type locality**: Întorsura Buzăului area, Botița Valley (Sita Buzăului), Macla Valley (North of Bertea Vărbilău Valley).

**Type specimens**: Holotype LPB.IV. 12109
Paratypes LPB.IV. 12110, 12111

**Description**: Medium-size, elongated test, with a wide trilateral aspect; chambers with typically trocho-spiral arrangement, wall with three chambers per whorl; chambers have a slight globular-edged aspect resulting in a trilateral arched wall and clearly delineating the chambers; the aperture is terminal, elliptical or weakly circular presenting the apertural tube in connection with the previous chamber, clearly visible in immersion; fine to moderately agglutinated test, with quartz grains embedded in an appreciable quantity of siliceous cement (visible in immersion).

**Dimensions:** Hollotype: length 0. 38mm; breadth 0. 21mm;
Paratypes: 0. 19mm.

**Remarks:** The typical strongly rounded triserial aspect of their test similar to *Pyramidina* genus clearly defines this species from all the species of genus *Uvigerinammina*.

**Occurence:** Buzău River area (Botița Valley), Bertea Valley area (Macla Valley).

**Stratigraphic distribution:** Middle-Upper Turonian (Sigalitruncana sigali-Dicarinella primitiva biozone).

**ACKNOWLEDGMENTS**

The author would like to thank to Mr. Cristian-Rudolf Boga for the support in the computer editing of the present work.

**REFERENCES**

Cushman, J. A., 1950, *Foraminifera. Their classification and economic use*. Harvard Univ. Press.

Geroch, S., 1957, *Uvigerinammina jankoi MAJZON 1943 (Foraminifera) in the Carpathian Flysch*. Ann. Soc. Geol. Pologne. 25/3, p. 231, pl. 14–15.

Geroch, S., Nowak, W., 1983, *Proposal of zonation for the Late Tithonian-Late Eocene based upon arenaceous foraminifera from the auter Carpathians Poland*. In: Oertli J. H. (ed.), Benthos '83, 2nd International Symposium on Benthic Foraminifera (Pau, April 1983), 225–239.

Krasheninikov, V. A., 1974, *Upper Cretaceous benthonic agglutinated foraminifera Leg 27 of the DSDP*. Initial Reports of the Deep Sea Drilling Project 21, 631–660.

Loeblich, A .A., Tappan H., 1964, *Treatise on Invertebrate Paleontology*, Part C, Protista 2. Univ. Kansas Press.

Loeblich, A. A., Tappan H., 1988, *Foraminiferal Genera and Their Classification*. Van Nostrand Reinhold Comp.

Majzon, L., 1943, *Beitrage zur kenntnis einiger Flysch-Schichten des Karpaten Vorlands mit besonderer rucksicht auf die Globotruncanen*. A magyar kiralyi Foldtani Intewzet Evkoyve, 37, 1–170.

Neagu, Th., 1962, *Studiul foraminiferelor aglutinante din argilele cretacic superioare de pe Valea Sadovei (Câmpulung Moldovenesc) şi bazinul superior al Văii Buzăului*. Stud. Cerc. Geol., VII/1, 45–79.

Neagu, Th., 1990, *Gerochammina n. g. and related genera from the Upper Cretaceous Flysch type benthic foraminiferal fauna, Eastern Carpathians, Romania*. In: Hemleben Cr., Kaminski M., Kuhnt W. E., Scott D. B., (eds.) Paleoecology, Biostratigraphy, Paleoceanography and Taxonomy of Agglu-tinated Foraminifera, 245–265.

Neagu, Th., 2011, *Turonian marker foraminifera association from the Southern part of the Eastern Carpathians, Dâmbiviţa – Întorsura Buzăului Area*. Acta Paleontol. Romaniae, 7, 249–255.

*Received:* 12.07.2011

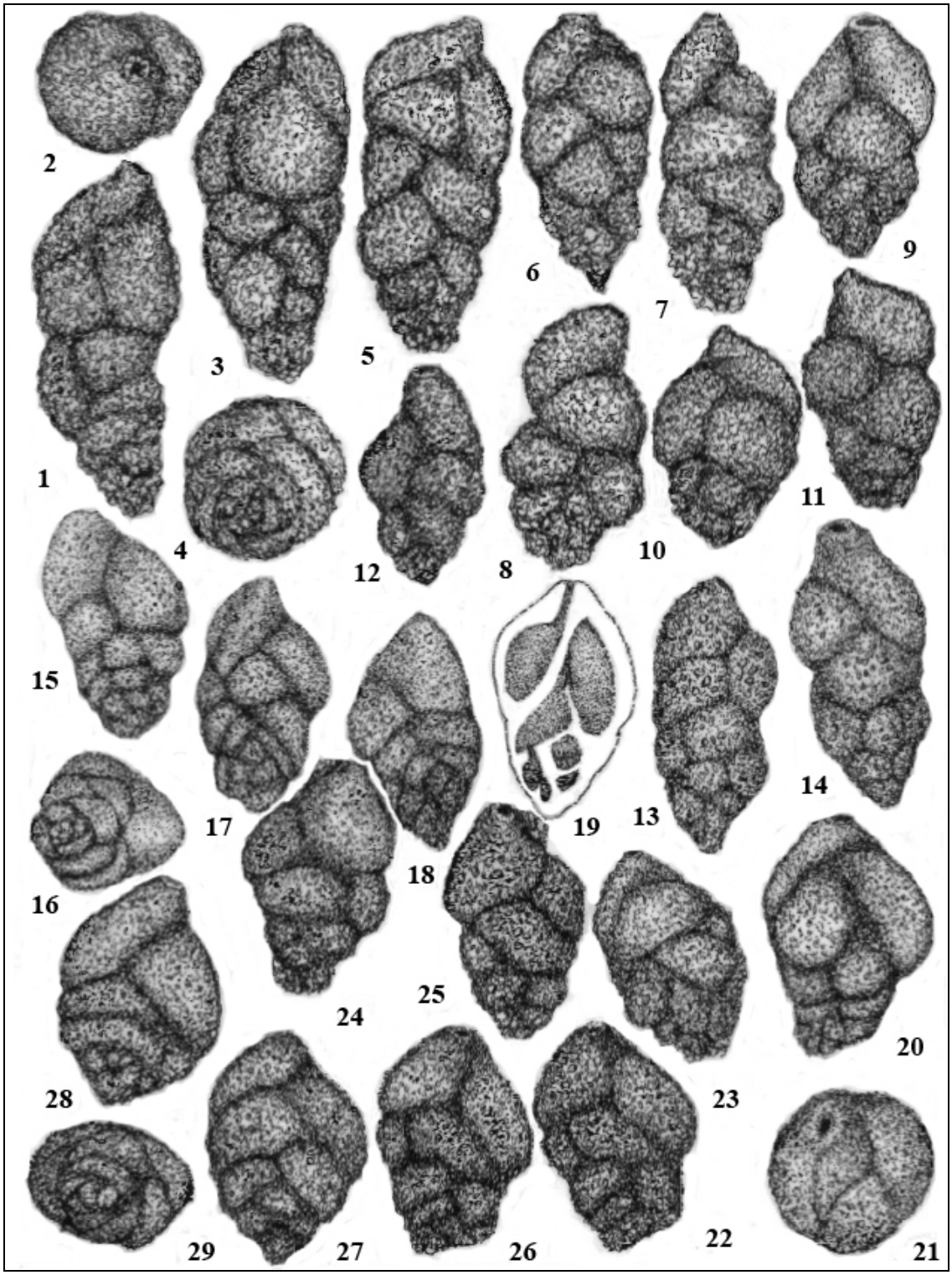


**PLATE 1.** Figs. 1–14 *Uvigerinammina praejankoi* NEAGU 1990, Turonian: Intorsura Buzăului-Cheia (Teleajen Valley). Figs. 1–5 hollotype L.P.B.IV. 6123; Figs. 6–14 paratypes L.P.B.IV.6124, 6126, 6127. Figs. 15–28 *Uvigerinammina mysaiosi* NEAGU n. sp. Turonian, Bertea-Macla Valley, Cheia-Teleajen Valley (Pridvaria Valley); hollotype Figs. 15–18 L.P.B.IV.012197, Figs. 20–29 paratypes L.P.B.IV.12108.

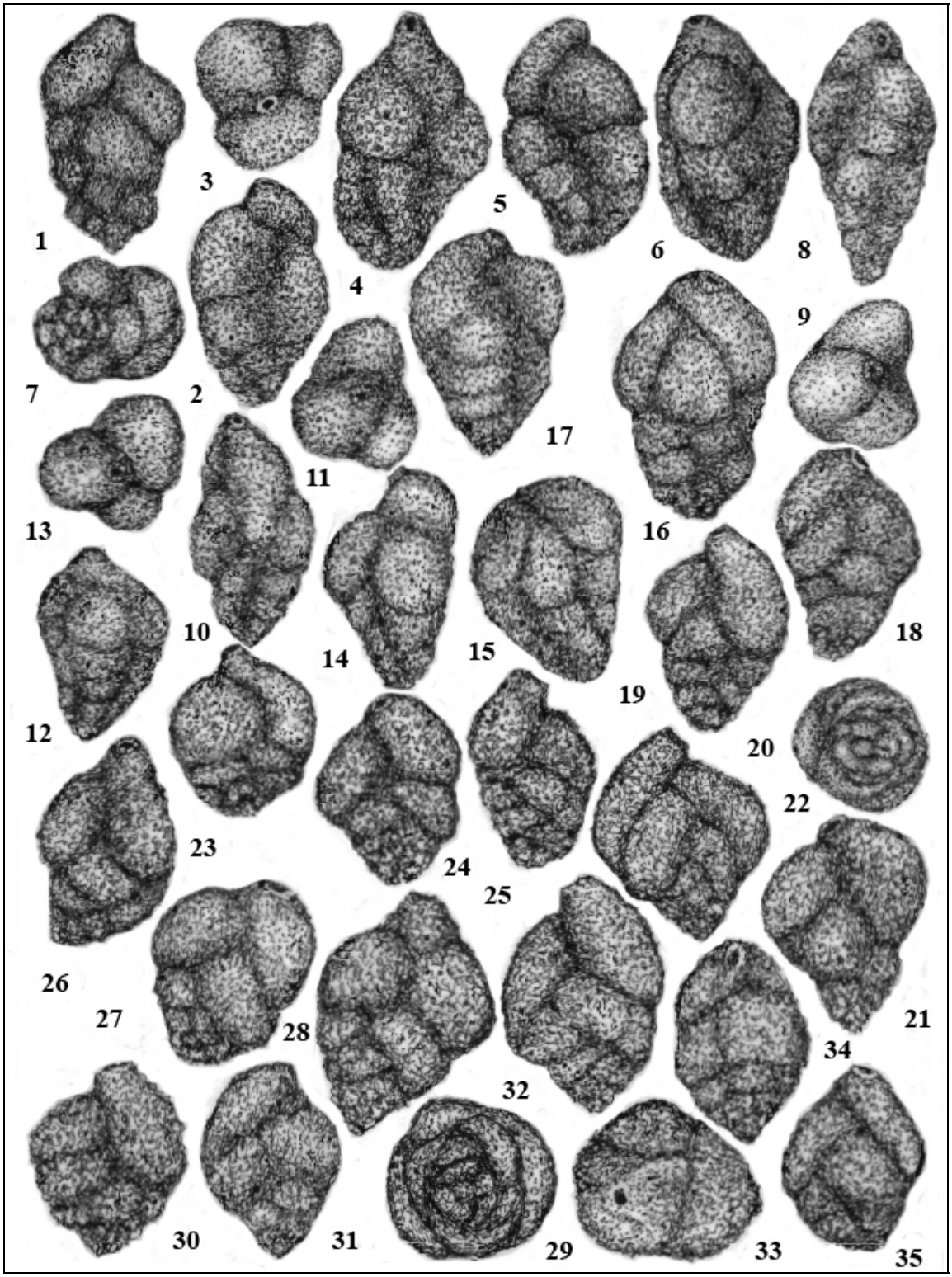


**PLATE 2.** Figs. 1–17 *Uvigerinammina carpathica* NEAGU n. sp. Turonian: Figs. 1–17 hollotype L.P.B.IV.12109 Bertea Valley (Macla Valley), Figs. 7–17 L.P.B.IV.12110 Buzău Valley (Botiţa Valley); Figs.18–35 *Uvigerinammina jankoi* MAJZON 1943. Turonian: Întorsura Buzăului L.P.B.IV. 5769, Cheia-Teleajen Valley (Pridvaria Valley) L.P.B.IV.12113.

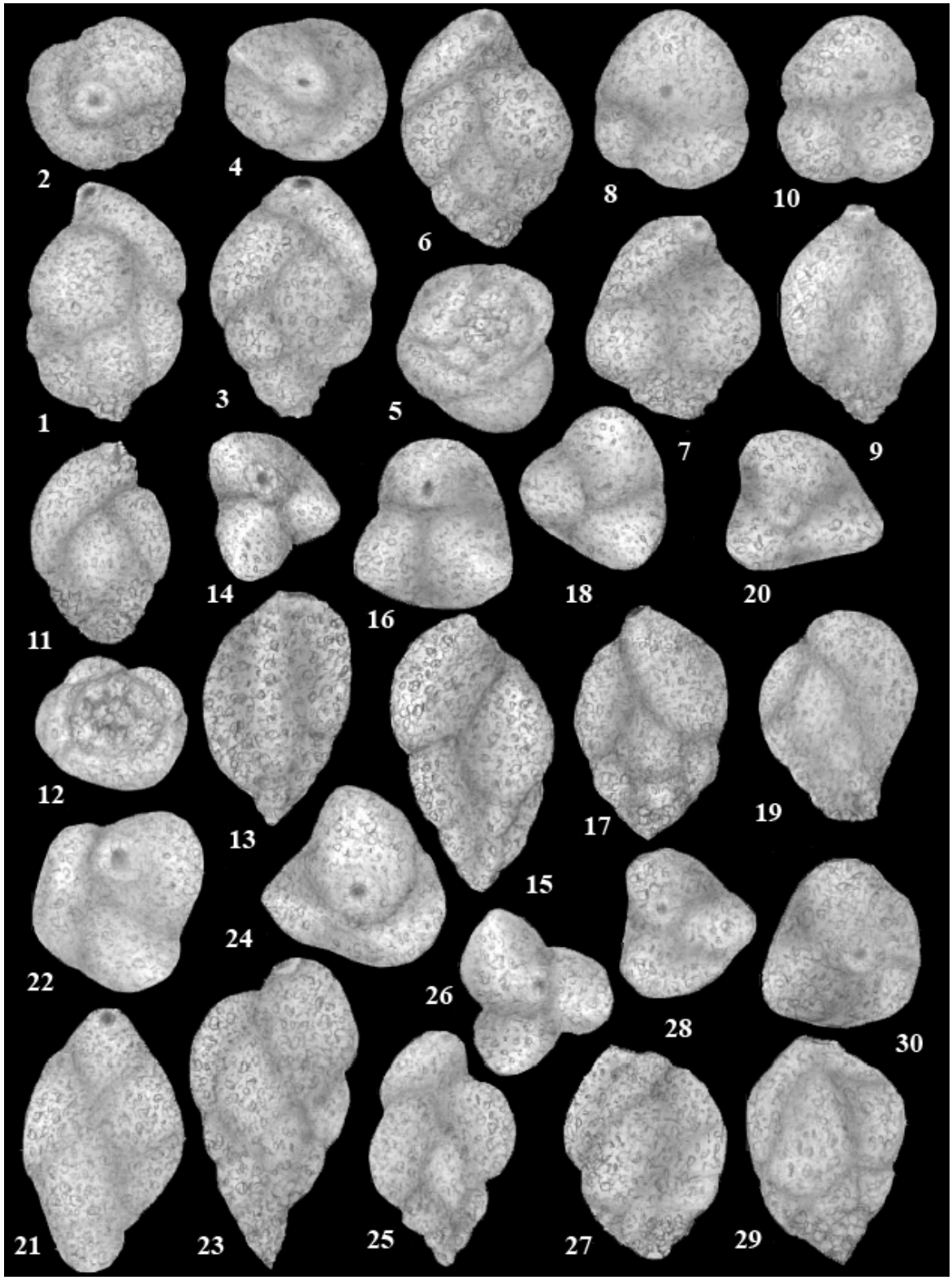


**PLATE 3.** Figs.1–12 *Uvigerinammina jankoi* MAJZON 1943. Turonian (2–3) Bertea Valley (Macla Valley) L.P.B.IV.12113; Figs. 13–30 *Uvigerinammina carpathica* NEAGU n. sp. Turonian: Buzău Valley (Botița Valley) paratypes L.P.B.IV.12109, 12110.

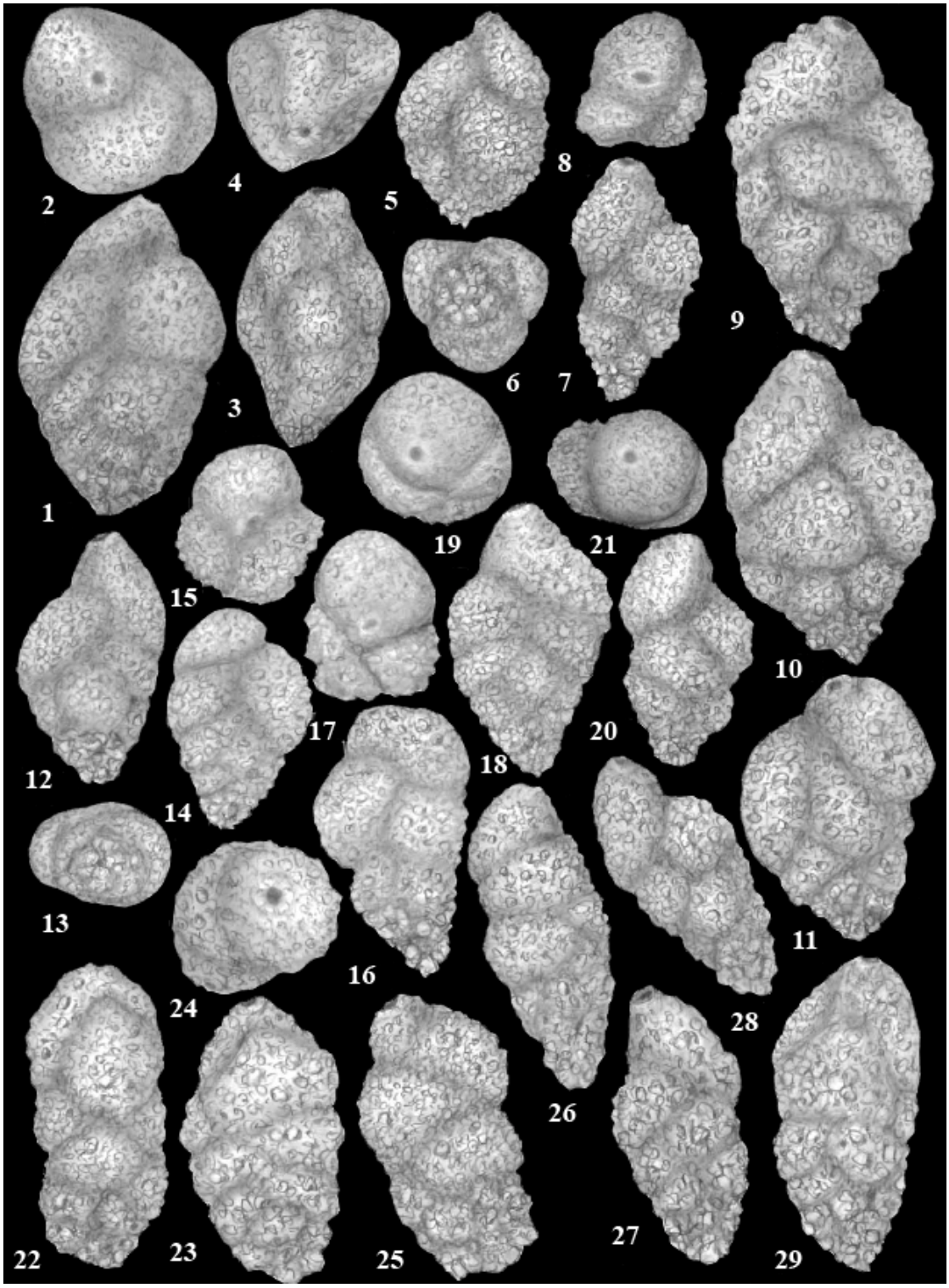


**PLATE 4.** Figs. 1–4 *Uvigerinammina carpathica* NEAGU n. sp. Paratypes Buzău Valley (Botița Valley-Crasna) Turonian, L.P.B.IV. 12110; Figs. 5–21 *Uvigerinammina mysaiosi* NEAGU n. sp. paratypes Buzău Valley (Botița Valley); Figs. 22–32 *Uvigerinammina praejankoi* NEAGU 1990; hollotype Figs. 22–25 L.P.B.IV.6123. paratypes Figs. 26–29 (Pridvaria Valley), L.P.B.IV. 6124.