Geological Quarterly, Vol. 36, No 1, 1992, p. 75–96

Eugenia GAWOR-BIEDOWA

New foraminifera of the Campanian and Maastrichtian in the Lublin Region (Eastern Poland)

Twelve new species of benthic foraminiferes described from rich microfaunal assemblages of Campanian and Maastrichtian deposits from Eastern Poland — *Fursenkoina polonica* sp.n., *Ellipsodimorphina cretacea* sp.n., *E. hrubieszowiensis* sp.n., *E. rara* sp.n., *E. variabilis* sp.n., *Ellipsoglandulina varsoviensis* sp.n., *E. inflatocamerata* sp.n., *E. ovata* sp.n., *E.polonica* sp.n., *Nodosarella suturicostata* sp.n., *Eponides dorsoconvexus* sp.n., *Gavelinella tenuissima* sp.n.

INTRODUCTION

The studies are based on rich core material from numerous drillings made in the last decade in the Polish Lowlands. Most interesting results have been obtained in the course of analysis of material from boreholes Telatyn IG 1 and Lublin IG 2 (Lublin Region, Eastern Poland — Fig. 1). The drillings were only partly cored which impedes accurate reconstruction of lithological column and drawing stage boundaries. However, all the holotypes of the described species come from core material. The stratigraphic subdivision of the strata was made on the basis of the recorded foraminifera.

The studied collection in housed in the Museum of the State Geological Institute.

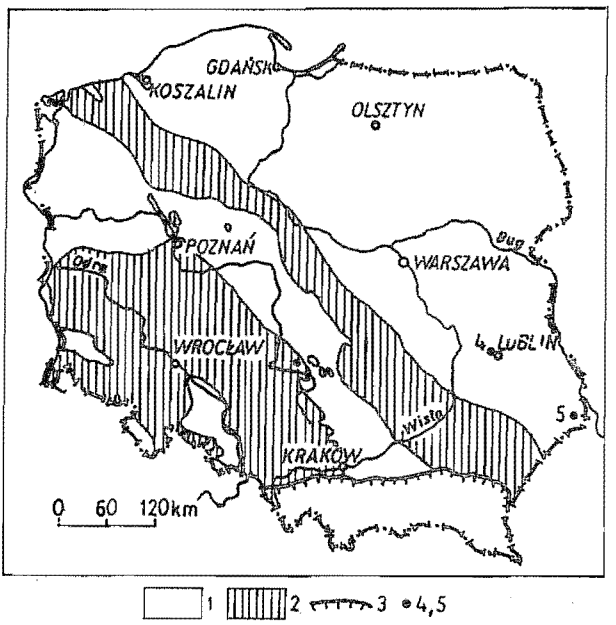


Fig. 1. Upper Cretaceous rocks in Poland (except the Carpathians)
1 — area of occurrence of Upper Cretaceous rocks; 2 — areas of occurrence of rocks older than the Upper Cretaceous; 3 — Carpathian Overthrust; 4, 5 — boreholes: 4 — Lublin IG 2, 5 — Telatyn IG 1
Osady górnej kredy w Polsce (z wyjątkiem Karpat)
1, 2 — obszary występowania osadów: 1 — górnej kredy, 2 — osadów starszych od górnokredowych; 3 — nasunięcie karpackie; 4, 5 — otwory wiertnicze: 4 — Lublin IG 2, 5 — Telatyn IG 1

CHARACTERISTIC OF THE STUDIED STRATA

In the Lublin Region, the Campanian is represented by white marly limestones in lower part, and white and, locally, green (borehole Lublin IG 2) marly limestones, and light — gray marls (borehole Telatyn IG 1). The sediments were dated at the Upper Campanian taking into account cooccurrence of the species *Cibicidoides involutus* (Reuss), *Stensioeina clementiana* (d'Orbigny), *S. exculpta* (Reuss), *Globorotalites multiseptus* (Brotzen), and *Bolivina incrassata* (Reuss). Of the above mentioned species, *Cibicidoides involutus* (Reuss) and *Bolivina incrassata* Reuss pass to the Maastrichtian whereas all the remaining ones do not cross upper boundary of the Campanian.

The Maastrichtian is here divided into two substages:

The Lower Maastrichtian is represented by white or gray-white or, sometimes greenish marls, locally with streaks of gray marls and often with concentrations of

pyrite (borehole Lublin IG 2), fairly brittle and light — gray marls, locally with greenish shade (borehole Telatyn IG 1). Several new species of foraminifers have been found in these marls. Upper part of the Lower Maastrichtian comprises white to gray-white, medium-hard marly limestones, date on the basis of record of *Angulogavelinella gracilis* (Marsson), *Pseudouvigerina cristata* (Marsson), *Neoflabellina recticulata* (Reuss), and several other, less important taxa.

The Upper Maastrichtian is mainly represented by chalk and marly chalk in lower and upper part (borehole Lublin IG 2), and chalk-like marly limestones in the lower part and overlaying marls compact marly opokas or light gray opokas with intercalations of marls and marly limestones (borehole Telatyn IG 1). The recorded foraminifer assemblage appeared very rich. Attention should be paid to the records of *Anomalinoides pinguil* (Jennings), *Bolivinoides draco (Marsson), B. giganteus* Hiltermann et Koch, *Gavelinella gankinoensis* (Neckaja), and *G. danica* (Brotzen).

In Campanian and Maastrichtian strata in the above mentioned part of Poland, foraminifer assemblages are characterized by predominance of benthic foraminifers. The latter include representatives of all the species of the genus *Orbignyna* described from the Lvov Cretaceous by A.E. Reuss in 1851, and the majority of species of the family *Ataxophragmiidae*, described from Podolia by A.M. Voloshyna in 1972.

The recorded microfauna comprises representatives of *Globorotalites emdyensis* Vassilenko and *Ceratocancris caspia* Vassilenko, which may be interpreted as immigrants from the Caspian Sea Region, unknown from areas situated further westwards. The assemblage also comprises representatives of *Globotruncana obliqua* Herm, which may be interpreted as immigrants from the Bavarian Alps. The Lublin Region reflects fairly strong influenses of geosynclinal basin. This is reflected by occurrence of several taxa such as *Pyramidina szajnochae* (Grzybowski), *Hormosina excelsa* (Dylążanka), *Goesella rugosa* (Hanzlikova), typical of marine basins of the geosynclinal zone but up to the present not recorded in any other parts of the Polish Lowlands.

SYSTEMATIC PART

Order **Foraminiferida** Eichwald, 1830
Suborder **Rotaliina** Delage et Hérouard, 1896
Superfamily **Fursenkoinacea** Loeblich et Tappan, 1961
Family **Fursenkoinidae** Loeblich et Tappan, 1961
Genus *Fursenkoina* Loeblich et Tappan, 1961
Fursenkoina polonica sp.n.
(Pl. I, Figs 1, 2)

Holotypus: MUZ IG 45663/86/F, shown in Pl. I, Fig. 1.
Paratypus: MUZ IG 45664/86/F.
Stratum typicum: Lower Maastrichtian.
Locus typicus: borehole Telatyn IG 1, depth 242.0 m, Lublin Region.
Derivatio nominis: after Poland.

Diagnosis. Test elongate, narrow, cylindrical, smooth and glittering, finely and regularly perforated, poorly incised in outline strongly twisted along vertical axis.
Material. Twenty variously preserved specimens.

Dimensions in mm	Holotype	Paratypes	
	45663/86/F	45664/86/F	45665/86/F
Length	0.335	0.335	0.240
Width	0.096	0.120	0.072

Description. Test elongate, straight, narrow, almost uniform in width or very slight widening along with growth, circular in cross section in proximal part and broadly ovate at the height of the two youngest chambers. Test surface smooth, glittering, and finely and regularly perforated; test outline poorly incised. Chambers slightly convex; septal and spiral sutures weakly depressed and strongly obliquely arranged. Test strongly twisted along vertical axis. Aperture comma-shaped, running from the top of the last chamber to suture separating it and the penultimate one.

Variability. Individual variability small, mainly expressed in dimensions of test and length of the two youngest chambers (varying from a third to a quarter or even a fifth of test length).

Remarks. The new species resembles *Fursenkoina nederi* Sliter in test strongly twisted along vertical axis, differing in two times smaller size and circular cross-section of test and less clear biserial arrangement and smaller size of chambers.

Occurrence. Poland: Cretaceous of the Lublin Region — Campanian and Lower Maastrichtian.

Superfamily **Pleurostomellacea** Reuss, 1860
Family **Pleurostomellidae** Reuss, 1860
Subfamily **Pleurostmellinae** Reuss, 1860
Genus *Ellipsodimorphina* Silvestri, 1901
Ellipsodimorphina cretacea sp.n.
(Pl. I, Fig. 3)

Holotypus: MUZ IG 45666/86/F, shown in Pl. I, Fig. 3.
Stratum typicum: Lower Maastrichtian.
Locus typicus: borehole Telatyn IG 1, depth 246.0 m, Lublin Region.
Derivatio nominis: after the Cretaceous system.
Diagnosis. Test elongate, straight, strongly incised in outline, narrow and flattened in initial part, circular in cross-section in distal part, with smooth and glittering surface.
Material. Five well-preserved specimens.

Dimensions in mm	Holotype	Paratypes	
	45666/86/F	45667/86/F	45668/86/F
Lenght	0.432	0.456	0.408
Width	0.096	0.144	0.096

D e s c r i p t i o n. Test elongate, straight, strongly incised in outline. Test surface smooth, glittering, finely and uniformly perforated. Initial part narrow, flattened, formed of two rows of small poorly visible chambers with slightly convex surface, and equal about a third of test length. Uniserial part slightly widening along with growth and formed of three to four alternating wedge-shaped and strongly convex chambers. Sutures straight, markedly depressed and arranged obliquely. Test circular in cross-section in uniserial part. The last chamber the largest, bulby with fissure-like and somewhat arcuate aperture at the top. Aperture covered by a narrow lip in proximity of the test top.

R e m a r k s . *Ellipsodimorphina cretacea* sp.n. differs from *E. subcompacta* Liebus in narrower and sharper-pointed initial part of test, some twist of uniserial part along vertical axis in relation to the biserial, two times smaller dimensions and also proportions of test. The new species most closely resembles *Nodosarella pandusa* Lipnik, differing from it in smaller size (the type of the latter is 0.68 mm long and 0.20 mm wide), and biserial part sharper-pointed and narrower in relation to the uniserial.

O c c u r r e n c e . Poland: Cretaceous of the Lublin Region — Maastrichtian.

Ellipsodimorphina hrubieszowiensis sp.n.
(Pl. I, Figs 4–6)

H o l o t y p u s : MUZ IG 45669/86/F, shown in Pl. I, Figs 4–6.
P a r a t y p u s : MUZ IG 45670/86/F.
S t r a t u m t y p i c u m : Lower Maastrichtian.
L o c u s t y p i c u s : borehole Telatyn IG 1, depth 246.0 m, Lublin Region.
D e r i v a t i o n o m i n i s : after Hrubieszów town situated about 10 km south of the type locality.
D i a g n o s i s. Test with biserial part beaver tail in shape, and the uniserial one formed of alternating, very strongly convex, wedge-shaped chambers.
M a t e r i a l. Ten variously preserved specimens.

Dimensions in mm	Holotype	Paratype
	45669/86/F	45670/86/F
Length	0.408	0.360
Width of uniserial part	0.144	0.120

D e s c r i p t i o n. Test free, elongate, with smooth, glittering, and finely and uniformly perforated surface. Initial part biserial beaver tail in shape and equal from a quarter to a half of test length, with almost untraceable chambers, narrow and flat. Uniserial part usually formed of four very strongly convex, bulby chambers, alternating

and rapidly growing in size along with growth. Test outline markedly incised in the uniserial part. Sutures straight, oblique in arrangement, strongly depressed. The last chamber dome-like rised, with a narrow, short semicrescent aperture at the top.

V a r i a b i l i t y. The individual variability is expressed in length of biserial part of test and in number of chambers in uniserial part.

R e m a r k s. *Ellipsodimorphina hrubieszowiensis* sp.n. is most similar to *E. subtuberosa* Liebus, differing in biserial part more flattened, narrow and rapidly passing into the uniserial one, and chambers of the latter more loosely arranged and rapidly growing in size. The specimens of *E. hrubieszowiensis* sp.n. resemble those described under the name of *Ellipsoidella* sp. by E.E. Nyong and R.K. Olsson 1983/1984 (p. 477, Pl. 5, Fig. 5).

O c c u r r e n c e . Poland: Cretaceous of the Lublin Region — Campanian and Maastrichtian.

Ellipsodimorphina rara sp.n.
(Pl. II, Fig. 4)

H o l o t y p u s : MUZ IG 45671/86/F, shown in Pl. II, Fig. 4.
S t a r a t u m t y p i c u m : Lower Maastrichtian.
L o c u s t y p i c u s : borehole Telatyn IG 1, depth 239.0 m, Lublin Region.
D e r i v a t i o n o m i n i s : lat. *raro-rare*, after its rarity.
D i a g n o s i s. Test small, ovate and weakly incised in outline, strongly narrowing at both ends, smooth, glittering, and finely and uniformly perforated. Chambers drop like, overlaping one another; sutures weakly depressed. Aperture semicrescent to ovate, situated at the top of the youngest chamber.
M a t e r i a l. Ten well-preserved specimens.

Dimensions in mm	Holotype	Paratypes	
	45671/86/F	45672/86/F	45673/86/F
Length	0.336	0.288	0.266
Width	0.168	0.096	0.144

D e s c r i p t i o n. Test small, subovate and slightly incised in outline, narrowing towards both ends, smooth, glittering and finely and uniformly perforated. Test narrow and rounded in initial part, rapidly widening along with growth to became similarly narrow in distal part as in the initial. Chambers slightly convex, drop-like, overlapping one another and arranged in two rows. The last chamber with a trend to uniserial arrangement, set vertical and strongly narrowing towards its top in the form of some kind of neck. Aperture semicrescent or ovate, situated at the top of the last chamber. Sutures straight, strongly oblique in arrangement, weakly depressed.

V a r i a b i l i t y. Individual variability high, expressed in degree of widening of test along with growth (varying from very high to intermediate or even almost none as some tests appear almost uniform in width along their whole length), convexity of chambers, and shape of the last chamber. Some specimens are somewhat twisted along vertical axis of the test.

R e m a r k s. The representatives of *Ellipsodimorphina rara* sp.n. most closely resemble those figured as *Pleurostomella zuberi* Grzybowski by Th. Neagu (1970) in arrangement of chambers and test outline, differing in neck-like narrowed top part of the youngest chamber and small, semicrescent or ovate aperture.

O c c u r r e n c e . Poland: Cretaceous of the Lublin Region, borehole Telatyn IG 1, Maastrichtian.

Ellipsodimorphina variabilis sp.n.
(Pl. II, Figs 1, 2)

H o l o t y p u s : MUZ IG 45674/86/7, shown in Pl. II, Fig. 1.
P a r a t y p u s : MUZ IG 45675/86/F.
S t r a t u m t y p i c u m : Lower Maastrichtian.
L o c u s t y p i c u s : borehole Telatyn IG 1, depth 246.0 m, Lublin Region.
D e r i v a t i o n o m i n i s : after high intraspecific variability.
D i a g n o s i s. Test smooth, glittering, finely and uniformly perforated, the widest in the mid-length, strongly narrowing in proximal and distal parts, strongly incised in outline. Initial part of test tress-like and ovate in cross-section, the youngest part built of alternating wedge-like chambers and circular in cross-section. The youngest chamber elongate.
M a t e r i a l . Ten well-preserved specimens.

Dimensions in mm	Holotype	Paratypes	
	45674/86/F	45675/86/F	45676/86/F
Length	0.528	0.456	0.432
Width	0.120	0.096	0.072

D e s c r i p t i o n. Test smooth, glittering, finely and uniformly perforated, the widest in the mid-length, strongly to almost sharp-pointed, narrowing in proximal and distal parts irregularly curved, strongly incised in outline. Initial part with chambers arranged tress-like, equal a third of test length, with chambers slightly convex, and septal and spiral sutures markedly depressed, ovate in cross-section. Embrional chamber easily traceable, spherical. The remaining part built of alternating loosely arranged wedge-like, strongly convex chambers, and circular in cross-section; sutures obliquely arranged, markedly depressed. The youngest chamber narrow with sharp-pointed top part. Aperture small, narrow, semicrescent, situated beneath the top.

V a r i a b i l i t y. Individual variability is mainly expressed in shape of tests. The tests are not straight but rather bent in various ways, usually due to a unproportional size development of one of chambers and their more or less loose arrangement in distal part.

R e m a r k s . The species *Ellipsodimorphina variabilis* sp.n. seems to occupy an intermediate position between those of the genera *Ellipsoidella* Heron-Allen et Earland, and *Ellipsodimorphina* Silvestri. Clearly biserial part, with tress-like arrangement of chambers, makes it closer to representatives of the latter genus whereas the shape and arrangement of chambers in the remaining parts is typical of the former.

O c c u r r e n c e . Poland: Cretaceous of the Lublin Region — Lower Maastrichtian.

Genus *Ellipsoglandulina* Silvestri, 1900
Ellipsoglandulina varsoviensis sp.n.
(Pl. II, Figs 7, 8)

1928 *Ellipsoglandulina elongata* Reuss; A. Franke: p. 55, Pl. 4, Figs 31, 36.
H o l o t y p u s : MUZ IG 45677/86/F shown in Pl. II, Fig. 7.
P a r a t y p u s : MUZ IG 45678/86/F.
S t r a t u m t y p i c u m : Lower Maastrichtian.
L o c u s t y p i c u s : borehole Telatyn IG 1, depth 246.0 m.
D e r i v a t i o n o m i n i s : after the capital of Poland, Warsaw.
D i a g n o s i s. Test smooth, glittering, finely perforated, fairly thick to somewhat squat, circular in cross-section, markedly incised in outline. Chambers slightly convex; sutures straight, weakly depressed. Aperture semicrescent, with lip.
M a t e r i a l. Twelve well-preserved specimens.

Dimensions in mm	Holotype	Paratypes	
	45677/86/F	45678/86/F	45679/86/F
Length	0.912	0.792	0.744
Width	0.360	0.312	0.360

D e s c r i p t i o n. Test smooth, glittering, finely and uniformly perforated, thick to somewhat squat, circular in cross-section, markedly incised in outline, very slightly widening along with growth or almost uniform in width along the whole length. Initial part rounded and always fairly wide, with translucent embrional chamber. Embrional chamber large or small, depending on generation. The remaining chambers (except of the youngest) wider than high, slightly convex. Sutures straight, parallel to one another, quite clearly depressed. Aperture semicrescent, somewhat obscured by cap-like lip.

V a r i a b i l i t y. Individual variability mainly expressed in number of chambers (4 to 5), and shape of test. Individuals of microspheric generation B are more elongate and less squat than those of the megalospheric generation A.

R e m a r k s. The above described specimens seem identical as those described as *Ellipsoglandulina elongata* Reuss by A. Franke (1928). This is especially the case of the individual figured in Pl. 4, Fig. 31 by that author. A. Franke is undoubtedly right stating that his specimens are most similar to forms assigned to *Glandulina elongata* Reuss by A.E. Reuss (1860), except for fissure-like aperture. The specimens assigned to the new species also resemble those of *Ellipsoglandulina manifesta* Franke, differing in more squat and less widening test, more rounded and wider initial part and aperture markedly longer and not bounded by two lips.

O c c u r r e n c e . Poland: Cretaceous of the Lublin Region — Campanian and Maastrichtian; Germany: Upper Senonian.

Genus *Ellipsoidella* Heron-Allen et Earland, 1910
Ellipsoidella inflatocamerata sp.n.
(Pl. I, Fig. 7a–c)

Holotypus: MUZ IG 45680/86/F, shown in Pl. I, Fig. 7a–c.
Stratum typicum: Lower Maastrichtian.
Locus typicus: borehole Telatyn IG 1, depth 246.0 m.
Derivatio nominis: after convex chambers.
Diagnosis. Test smooth, glittering, strongly incised in outline, almost circular in cross-section. Chambers wedge-like, strongly convex.
Material. Ten well-preserved specimens.

Dimensions in mm	Holotype	Paratypes	
	45680/86/F	45681/86/F	45682/86/F
Length	0.384	0.408	0.360
Width	0.144	0.144	0.144

Description. Test free, smooth, glittering, finely and uniformly perforated, gradually and slightly widening along with growth, strongly incised in outline, broadly ovate to almost circular in cross-section, biserial along its whole length. Initial part equal a quarter of test length, built of chambers rectangular, weakly convex and tightly adjoining one another. The remaining part built of alternating, loosely arranged, wedge-like, strongly convex and almost spherical chambers. Sutures strongly depressed, straight, obliquely oriented. The last chamber the largest. Aperture subterminal, narrow, arcuate, fissure-like.

Variability. Individual variability insignificant, expressed in length of two youngest chambers (varying from a quarter to half of test length) and degree of widening of test along with growth.

Remarks. *Ellipsoidella inflatocamerata* sp.n. is most similar to *E. kugleri* (Cushman et Renz), differing in broadly ovate cross-section of test, biserial arrangement of chambers along its whole length, not dome but wedge-like shape of the youngest chambers, and smaller dimensions.

Occurrence. Poland: Cretaceous of the Lublin Region — Upper Campanian and Lower Maastrichtian.

Ellipsoidella ovata sp.n.
(Pl. II, Fig. 3)

Holotypus: MUZ IG 45683/86/F, shown in Pl. II, Fig. 3.
Stratum typicum: Lower Maastrichtian.
Locus typicus: borehole Telatyn IG 1, depth 246.0 m.
Derivatio nominis: after egg-like shape of test.
Diagnosis. Test egg-shaped, smooth, finely and uniformly perforated. Aperture fissure-like, covered by tongue-like lip from test top.
Material. Ten well-preserved specimens.

Dimensions in mm	Holotype	Paratypes	
	45683/86/F	45684/86/F	45685/86/F
Length	0.504	0.408	0.264
Width	0.240	0.192	0.120

Description. Test egg-shaped, somewhat more than two times higher than wide, smooth, glittering, finely and uniformly perforated, smooth in outline and circular in cross-section. Chambers arranged in two series, wedge-like, with flat surface; two youngest chambers equal a half of test length. Chambers traceable thanks to sutures visible throught test wall. Sutures flat, obliquely oriented. Aperture fissure-like, slightly, arcuate covered by tongue-like lip from test top.

Variability. Individual variability expressed by differences in roundness of initial part of test (rounded to somewhat narrowing) and visibility of chambers and sutures. Chambers seem to be slightly convex in some specimens.

Remarks. The specimens appear most similar in shape to that described as *Ellipsoglandulina labiata* (Schwager) by J.P. Beckmann (1953, Pl. 23, Fig. 11), differing in generic features.

Occurrence. Poland: Cretaceous of the Lublin Region — Campanian and Maastrichtian.

Ellipsoidella polonica sp.n.
(Pl. II, Figs 5, 6)

Holotypus: MUZ IG 45686/86/F, shown in Pl. II, Figs 5, 6.
Paratypus: MUZ IG 45687/86/F.
Stratum typicum: Lower Maastrichtian.
Locus typicus: borehole Telatyn IG 1, depth 246.0 m.
Derivatio nominis: after Poland.
Diagnosis. Test free, fairly thick, slightly widening along with growth. Chambers obscured in biserial part, wedge-like and with flat surface in the uniserial.
Material. Fifteen well-preserved specimens.

Dimensions in mm	Holotype	Paratypes	
	45686/86/F	45687/86/F	45688/86/F
Length	0.672	0.672	0.576
Width of the last chamber	0.240	0.264	0.216

Description. Test free, fairly thick, rounded at the base, gradually and slightly widening along with growth, smooth in outline, circular in cross-section. Surface smooth, glittering, finely and uniformly perforated. Biserial part poorly visible, short, with chambers obscured. Uniserial part usually built of three alternating wedge-like chambers with flat surface. Septal sutures oblique, somewhat translucent. The youn-

gest chamber the largest, slightly convex, dome-like. Aperture subterminal, fissure-like, somewhat arcuate, slightly obscured by lip.

V a r i a b i l i t y. Individual variability insignificant, expressed in roundness of initial test part, length of biserial part, traceability of chambers and sutures in uniserial part, and size and shape of the youngest chamber.

R e m a r k s. *Ellipsoidella polonica* sp.n. is most similar to *Nodosarella robusta* Cushman, differing in two time smaller and less widening test and age only. However, it cannot be excluded that the specimens from the Maastrichtian of Poland and Miocene of the Island of St. Croix are conspecific.

O c c u r r e n c e . Poland: Cretaceous of the Lublin Region — Campanian and Maastrichtian.

Genus *Nodosarella* Rzehak, 1895
Nodosarella suturicostata sp.n.
(Pl. III, Fig. 1)

H o l o t y p u s : MUZ IG 45689/86/F, shown in Pl. III, Fig. 1.
S t r a t u m t y p i c u m : Lower Maastrichtian.
L o c u s t y p i c u s : borehole Telatyn IG 1, depth of 239.0 m.
D e r i v a t i o n o m i n i s : after riblets developed on sutures.
D i a g n o s i s. Test elongate, slender, straight to slightly bent. Sutures slightly depressed, horizontal, covered with very numerous thin riblets. Riblets also cover surface of chambers in initial part of test.
M a t e r i a l. Sixty more or less well-preserved specimens.

Dimensions in mm	Holotype	Paratypes	
	45689/86/F	45690/86/F	45691/86/F
Length	0.960	0.744	0.552
Width of the last chamber	0.144	0.144	0.096

D e s c r i p t i o n. Test elongate, slender, long, straight to slightly bent somewhat incised in outline, glittering, finely and uniformly perforated, built of six to ten chambers, gradually and insignificantly widening along with growth. Chambers wider than high in initial part and higher than wide later, always slightly convex and almost cylindrical. The youngest chamber fairly strongly convex, with small, semicrescent aperture at the top. Sutures horizontal, straight, weakly depressed and covered with thin, short, very numerous riblets. Riblets also cover surface of chambers in the oldest part of test.

V a r i a b i l i t y. Individual variability very high, expressed mainly in ornamentation of sutures, length of test and number of chambers (from 6 to 10). The ornamentation consists of densely spaced, thin, short riblets occurred on all the sutures (sometimes except for those between the two youngest chambers). Riblets of similar thickness may also occur at two to four of the oldest chambers.

R e m a r k s. The species *Nodosarella suturicostata* sp.n. most closely resembles *Nodosaria (Dentalina) gracilis* d'Orbigny in outline of test and the mode of increase

of chambers with growth, differing in ornamentation developed on sutures and generic features.

Occurrence. Poland: Cretaceous of the Lublin Region — Campanian and Maastrichtian.

Superfamily Discorbacea Ehrenberg, 1838
Family Eponididae Hofker, 1951
Subfamily Eponidinae Hofker, 1951
Genus *Eponides* de Montfort, 1808
Eponides dorsoconvexus sp.n.
(Pl. III, Figs 2–4)

Holotypus: MUZ IG 45692/86/F, shown in Pl. III, Fig. 2.
Paratypus: MUZ IG 45693/86/F, 45694/86/F.
Stratum typicus: Lower Maastrichtian.
Locus typicus: borehole Lublin IG 2, depth of 463.0 m.
Derivatio nominis: after shape of test.
Diagnosis. Test small, with strongly convex dorsal side and flat ventral; circular in outline, and with sharp margin.
Material. Fifty more or less well-preserved specimens.

Dimensions in mm	Holotype	Paratypes	
	45692/86/F	45693/86/F	45694/86/F
Diameter	0.240	0.216	0.168
Height	0.168	0.168	0.144

Description. Test small, smooth, glittering plano-convex, with flat ventral side and strongly, dome-like rised dorsal, circular in outline. Margin narrow, sharp. The last whorl narrow, traceable at dorsal side; this and two earlier whorls discernible in some specimens only. Ventral side flat, with poorly visible 7 to 9 flat chambers of the last whorl. Surface of chambers perforated. Septal sutures slightly curved, fairly wide, somewhat thickened in proximity of umbilicus. Umbilical depression situated at the center of test, very narrow, circular, open. Aperture fissure-like, situated at the base of the last chamber.

Variability. Individual variability is expressed in degree of convexity of dorsal side, size of test, traceability of whorls at dorsal side and sutures at the ventral, and the mode of development of umbilicus. The dorsal side usually displays only the last whorl (which forms a hat brim-like framing in some specimens) but occasionally one or two older whorls my be also visible. Umbilicus very narrow, open but may be completely obscured by umbilical part of chambers or poorly discernible flat swellings of sutures.

Remarks. *Eponides dorsoconvexus* sp.n. resembles most closely *Discorbis conica* van Bellen, in shape of test, mainly differing in lack of umbilical boss, usually very poorly visible whorls and chambers at dorsal side, and untraceable spiral and septal sutures at ventral side. The differences are best traceable when the above described

specimens are compared with the J. Hofker's (1966) specimens of *D. conica* van Bellen, better preserved and, therefore, displaying more details than the holotype. The latter species was assigned to the genus *Eponides* by J. Hofker in 1966.

The new species also resembles *Eponides vitreus* Voloschyna in shape of test, differing in open umbilicus, very poorly traceable whorls and chambers at dorsal side of test, smaller number of chambers in the last whorl (7–9 and 9–11, respectively), and larger size of test. *Eponides vitreus* Voloschyna seems conspecific with *E. conica* van Bellen.

Occurrence. Poland: Cretaceous of the Lublin Region — Campanian and Maastrichtian.

Superfamily **Chilostomellacea** Brady, 1881
Family **Gavelinellidae** Hofker, 1956
Subfamily **Gavelinellinae** Hofker, 1956
Genus *Gavelinella* Brotzen, 1942
* *Gavelinella tenuissima* sp.n.
(Pl. III, Figs 5, 6)

Holotypus: MUZ IG 45695/86/F, shown in Pl. III, Fig. 5.
Paratypus: MUZ IG 45696/86/F.
Stratum typicum: Upper Campanian.
Locus typicus: borehole Telatyn IG 1, depth 282.1 m, Lublin Region.
Derivatio nominis: after lat. *tenuis* — thin.
Diagnosis. Test very thin, ovate in outline. Dorsal side weakly covex, with boss, ventral side flat to concave; margin narrow almost sharp. Aperture semicrescent, very low, with narrow lip, interiomarginal, extending beneath tongue shaped projections of periumbilical parts of chambers at ventral side.
Material. Fifty more or less well-preserved specimens.

Dimensions in mm	Holotype	Paratypes	
	45695/86/F	45696/86/F	45697/86/F
Longest diameter	0.216	0.216	0.288
Shortest diameter	0.192	0.192	0.264
Height	0.072	0.072	0.096

Description. Test very thin, plano-convex, with somewhat convex dorsal side and flat to weakly concave ventral side, built of 2 1/2 whorls, ovate and smooth in outline. Wall smooth, glittering, very finely and uniformly perforated. Dorsal side displaying all the whorls. The last whorl equal two-thirds of test diameter; older whorls narrow, covered with thin layer of test matter in the form of low boss. The last whorl formed of 10 to 12 trapezoidal chambers with smooth surface, slightly increasing in size along with growth and separated by slightly curved, translucent flat sutures. Ventral side displaying the last whorl only. Chambers and sutures, when visible at ventral side, identical as at the dorsal. Umbilical depression situated in the center of ventral side, very narrow to almost untraceable, surrounded by tongue-shaped projections of periumbilical parts of four to seven youngest chambers. Margin of test narrow,

almost sharp. Aperture semicrescent, very low, with narrow lip, interiomarginal, extending beneath the tongue-shaped projections of periumbilical parts of chambers at ventral side.

V a r i a b i l i t y. Individual variability expressed in dimensions of test, thickness of cover of test matter on older whorls at dorsal side (and, therefore, visibility of these whorls), and traceability of chambers and sutures at ventral side of the last whorl.

O c c u r r e n c e . Poland: Cretaceous of the Lublin Region — Campanian and Maastrichtian.

Translated by W. Brochwicz-Lewiński

Zakład Stratygrafii, Tektoniki i Paleogeografii
Państwowego Instytutu Geologicznego
Warszawa, ul. Rakowiecka 4
Received: 12.11.1991

REFERENCES

BECKMANN J.P. (1953) — Foraminiferen der Oceanic Formation (Eocen — Oligocen) von Barbados, Kl. Antillen. Ecl. Geol. Helv., **46**, p. 301–412, nr 2.

CUSHMAN J.A. (1943) — Some new foraminifera from the Tertiary of the Island of St. Croix. Contr. Cushm. Lab. Foram. Resear., **19**, p. 90–93, part 4.

ELLIS B.F., MESSINA A.R. (1940–1975) — Catalogue of Foraminifera. Amer. Mus. Nat. Hist., Spec. Publ. New York.

FRANKE A. (1928) — Die Foraminiferen der Oberen Kreide Nord- und Mitteldeutschlands. Abh. Preuss. Geol. L.-A., N.F., 111.

HOFKER J. (1966) — Maestrichtian, Danian and Paleocene foraminifera. Palaeontographica, Suppl., **10**.

LIPNIK O.S. (1961) — Foraminifiery i stratigrafia wierchniokrejdowych widkładiw Dniprowsko-Donieckoj zapadiny. Wyd. Akad. Nauk USRR. Kijew.

LOEBLICH A.R., TAPPAN H. (1984) — Suprageneric classification of the Foraminiferida (Protozoa). Micropaleont., **30**, nr 1.

LOEBLICH A.R., TAPPAN H. (1987) — Foraminiferal genera and their classification. Copyright C 1988 by van Nostrand Reinhold. New York.

NEAGU Th. (1970) — Micropaleontological and stratigraphical study of the Upper Cretaceous deposits between the Upper Valleys of the Buzău and Rîul Négru rivers (Eastern Carpathians). Inst. Geol. Mém. Bucarest, **12**, p. 1–109.

NYONG E.E., OLSSON R.K. (1983/1984) — A paleoslope model of Campanian to Lower Maestrichtian Foraminifera in the North American Basin and adjacent Continental Margin. Mar. Micropaleont., **8**, p. 437–477.

ORBIGNY A.D. (1840) — Mémoire sur les Foraminiferes de la craie blanche du bassin de Paris. Mém. Soc. Geol. France, **4**, p. 1–51, nr 1.

REUSS A.E. (1851) — Die Foraminiferen und Entomostraceen des Kreidemergels von Lemberg. Naturwiss. Abh., **4**, p. 17–52, nr 1.

REUSS A.E. (1860) — Die Foraminiferen der westphalischen Kreideformation. Sitzber. Math.-Nat. Cl. K. Akad. Wiss., **40**, p. 147–238.

SLITER W.V. (1968) — Upper Cretaceous foraminifera from Southern California and Northwestern Baja California, Mexico. Univ. Kansas Paleont. Contr., Ser. 49, Protozoa, Art., 7, p. 1–141.

VOLOSHINA A.M. (1972*a*) — K izuczeniju wierchniemiełowych rotaliid Wołynio-Podolii. Wopr. Gieoł. Nieftiegaz. Reg. Ukrainy. Sborn. Stat. Izdat. "Technika". Kijew.

VOLOSCHINA A.M. (1972*b*) — Ataksofragmidy wierchniemiełowych otłożenij Wołyno-Podolskoj okrainy Ruskoj płatformy. Trudy Ukr. Naucz.-Issled., 27. Moskwa.

Eugenia GAWOR-BIEDOWA

NOWE OTWORNICE W UTWORACH KAMPANU I MASTRYCHTU LUBELSZCZYZNY

Streszczenie

Z bogatych w zespoły otwornic osadów kampanu i mastrychtu Lubelszczyzny opisano 12 nowych gatunków należących do różnych rodzajów. Jeden gatunek — do rodzaju *Fursenkoina* (*Fursenkoina polonica* sp.n.), cztery do — *Ellipsodimorphina* (*Ellipsodimorphina cretacea* sp.n., *E. hrubieszowiensis* sp.n., *E. rara* sp.n., *E. variabilis* sp.n.), jeden do — *Ellipsoglandulina* (*Ellipsoglandulina varsoviensis* sp.n.), trzy do — *Ellipsodella* (*Ellipsodella inflatocamerata* sp.n., *E. ovata* sp.n., *E. polonica* sp.n.) i po jednym do rodzajów *Nodosarella* (*Nodosarella suturicostata* sp.n.), *Eponides* (*Eponides dorsoconvexus* sp.n.) oraz *Gavelinella* (*Gavelinella tenuissima* sp.n.).

PLATE I

Figs 1, 2. *Fursenkoina polonica* sp.n.

1 — holotype, MUZ IG 45663/86/F, apertural view; 2 — paratype, MUZ IG 45664/86/F, side view. Borehole Telatyn IG 1, depth 242.00 m, Lower Maastrichtian; x 300

1 — holotyp, widok strony ujściowej; 2 — paratyp, widok z boku. Telatyn IG 1, głęb. 242,00 m, dolny mastrycht; 300 x

Fig. 3. *Ellipsodimorphina cretacea* sp.n.

Holotype, MUZ IG 45666/86/F, side view. Borehole Telatyn IG 1, depth 246.00 m, Lower Maastrichtian; x 300

Holotyp, widok z boku. Telatyn IG 1, głęb. 246,00 m, dolny mastrycht; 300 x

Figs 4–6. *Ellipsodimorphina hrubieszowiensis* sp.n.

4 — holotype, MUZ IG 45669/86/F, side view, x 300; 5 — paratype, MUZ IG 45670/86/F, side view (upper part of the test damaged), x 1100; 6 — holotype, initial part of the test, x 400. Borehole Telatyn IG 1, depth 246.00 m, Lower Maastrichtian

4 — holotyp, widok z boku, 300 x; 5 — paratyp, widok z boku (górna część skorupki zniszczona), 1100 x; 6 — holotyp, początkowa część skorupki, 400 x. Telatyn IG 1, głęb. 246,00 m, dolny mastrycht

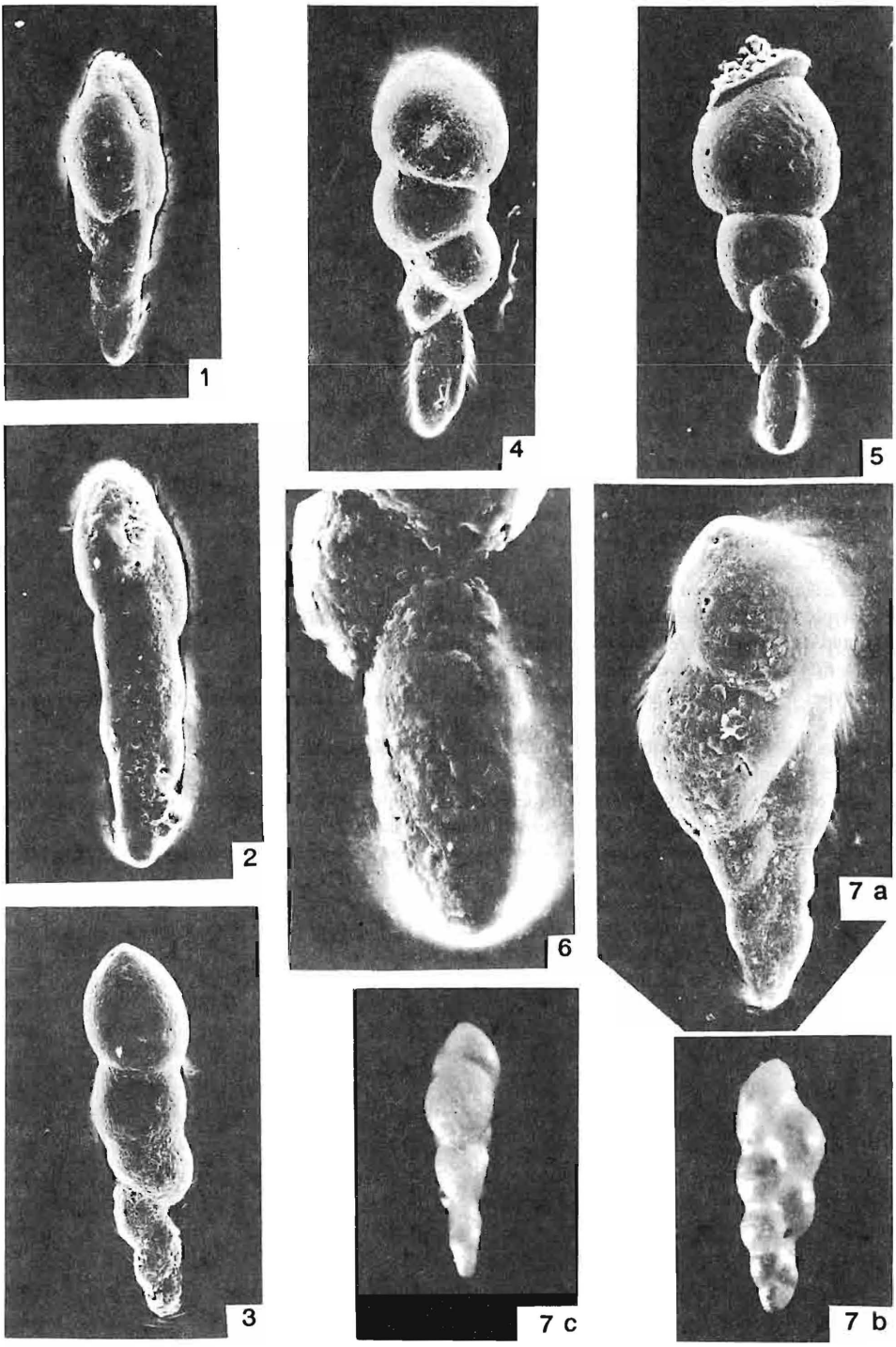
Fig. 7a–c. *Ellipsoidella inflatocamerata* sp.n.

a — holotype, MUZ IG 45680/86/F, slightly oblique side view; b — side view, x 406; c — edge view, x 200. Borehole Telatyn IG 1, depth 246.00 m, Lower Maastrichtian

a — holotyp, widok z boku, nieco skośny; b — widok z boku, 406 x; c — widok od krawędzi skorupki, 200 x. Telatyn IG 1, głęb. 246,00 m, dolny mastrycht

Photographs of the Plates I–III (with the exception of Pl. I, Fig. 7b, c) taken with the scanning electron microscope

Zdjęcia na tabl. I–III (z wyjątkiem tabl. I, fig. 7b, c) wykonano w mikroskopie elektronowym



Eugenia GAWOR-BIEDOWA — New foraminifera of the Campanian and Maastrichtian in the Lublin Region (Eastern Poland)

PLATE II

Figs 1, 2. *Ellipsodimorphina variabilis* sp.n.

1 — holotype, MUZ IG 45674/86/F, side view; 2 — paratype, MUZ IG 45675/86/F, apertural view. Borehole Telatyn IG 1, depth 246.00 m, Lower Maastrichtian; x 200

1 — holotyp, widok z boku; 2 — paratyp, widok strony ujściowej. Telatyn IG 1, głęb. 246,00 m, dolny mastrycht; 200 x

Fig. 3. *Ellipsoidella ovata* sp.n.

Holotype, MUZ IG 45683/86/F. Borehole Telatyn IG 1, depth 246.00 m, Lower Maastrichtian; x 300

Holotyp. Telatyn IG 1, głęb. 246,00 m, dolny mastrycht; 300 x

Fig. 4. *Ellipsodimorphina rara* sp.n.

Holotype, MUZ IG 45671/86/F, side view. Borehole Telatyn IG 1, depth 239,00 m, Lower Maastrichtian; x 400

Holotyp, widok z boku. Telatyn IG 1, głęb. 239,00 m, dolny mastrycht; 400 x

Figs 5, 6. *Ellipsoidella polonica* sp.n.

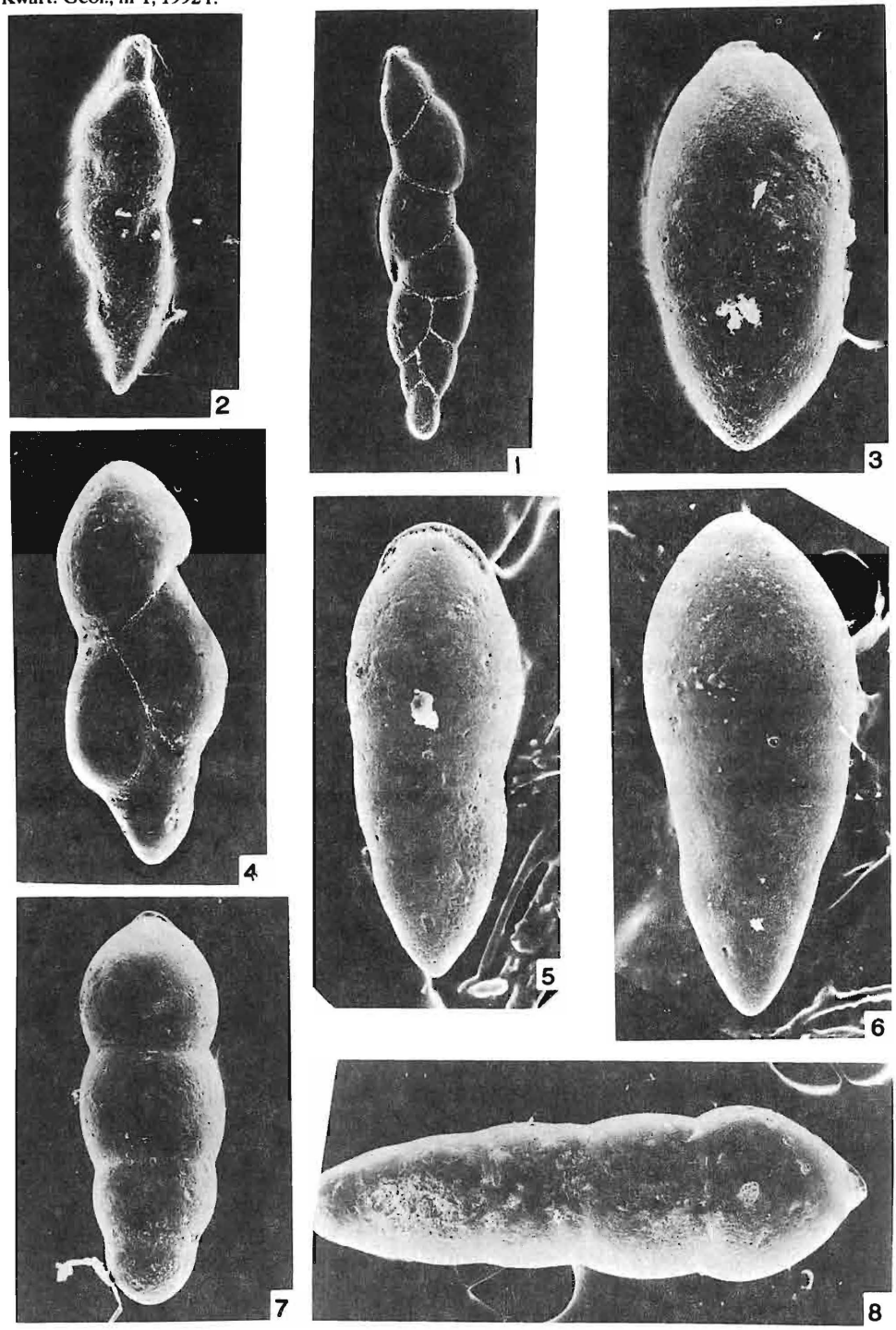
5 — holotype, MUZ IG 45686/86/F, apertural view; 6 — paratype, MUZ IG 45687/86/F, oposite side view. Borehole Telatyn IG 1, depth 246.00 m, Lower Maastrichtian; x 200

5 — holotyp, widok strony ujściowej; 6 — paratyp, widok od strony przeciwnej. Telatyn IG 1, głęb. 246,00 m; 200 x

Figs 7, 8. *Ellipsoglandulina varsoviensis* sp. n.

7 — holotype, MUZ IG 45677/86/F, apertural view; 8 — paratype MUZ IG 45678/86/F, general view. Borehole Telatyn IG 1, depth 246.00 m, Lower Maastrichtian; x 103

7 — holotyp, widok strony ujściowej; 8 — paratyp, widok ogólny. Telatyn IG 1, głęb. 246,00 m, dolny mastrycht; 103 x



Eugenia GAWOR-BIEDOWA — New foraminifera of the Campanian and Maastrichtian in the Lublin Region (Eastern Poland)

PLATE III

Fig. 1. *Nodosarella suturicostata* sp.n.

Holotype, MUZ IG 45689/86/F, general view. Borehole Telatyn IG 1, depth 239.00 m, Lower Maastrichtian; x 72

Holotyp, widok ogólny. Telatyn IG 1, głęb. 239,00 m, dolny mastrycht; 72 x

Figs 2–4. *Eponides dorsoconvexus* sp.n.

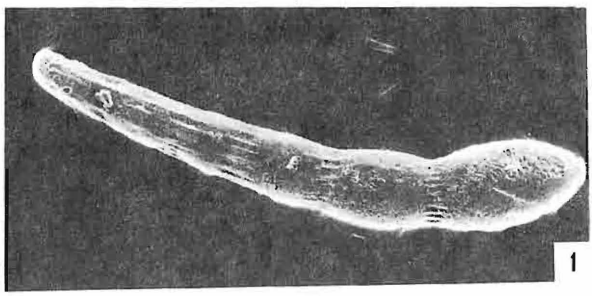
2 — holotype, MUZ IG 45692/86/F, edge view, x 605; 3 — paratype MUZ IG 45693/86/F, ventral side x 505; 4 — paratype MUZ IG 45694/86/F, dorsal side, x 700. Borehole Lublin IG 2, depth 463.00 m, Lower Maastrichtian

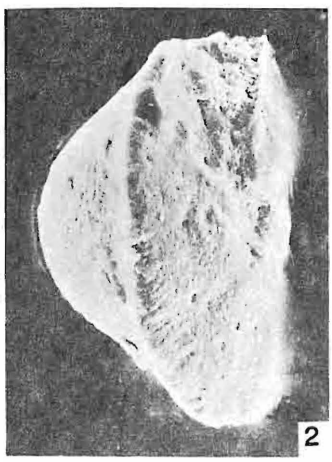
2 — holotyp, widok od krawędzi skorupki, 605 x; 3 — paratyp, strona brzuszna, 505 x; 4 — paratyp, strona grzbietowa, 700 x. Lublin IG 2, głęb. 463,00 m, dolny mastrycht

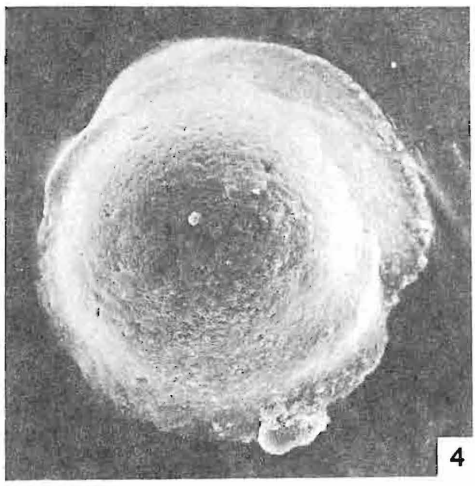
Figs 5, 6. *Gavelinella tenuissima* sp.n.

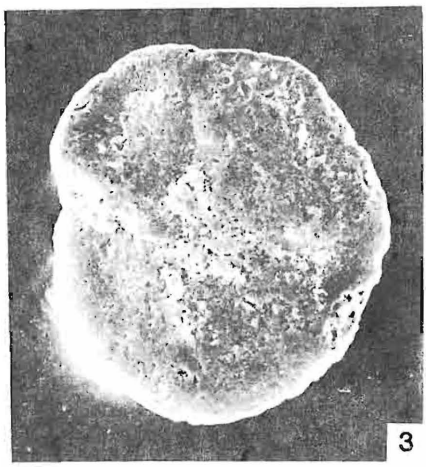
5 — holotype, MUZ IG 45695/86/F, dorsal side, x 300; 6 — paratype MUZ IG 45696/86/F, ventral side, x 200. Borehole Telatyn IG 1, depth 282.10 m, Upper Campanian

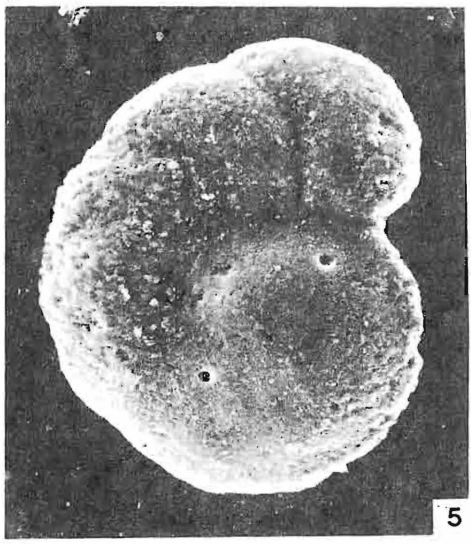
5 — holotyp, strona grzbietowa, 300 x; 6 — paratyp, strona brzuszna, 200 x. Telatyn IG 1, głęb. 282,10 m, górny kampan

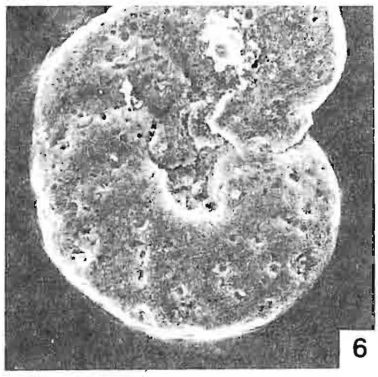












Eugenia GAWOR-BIEDOWA — New foraminifera of the Campanian and Maastrichtian in the Lublin Region (Eastern Poland)