

**DESCRIPTIONS OF EOCENE MARGINELLIDAE (MOLLUSCA, GASTROPODA)
FROM THE PARIS BASIN**

by

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Species of the gastropod family Marginellidae occur abundantly in the Eocene deposits of the Paris Basin, more than 40 species are known. In order to facilitate the identification of these species concise descriptions and illustrations are given together with synoptical keys. Four new species, a new subspecies and a new forma are introduced.

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INTRODUCTION

The overwhelming number of species in the Eocene Marginellidae, the sometimes rather delicate differences between the species and the lack of a modern critical revision have hampered the possibilities of identification in this mollusc group a great deal.

Several years ago, initiated by a number of private collectors in the Dutch province of Zeeland, I started my study of these interesting creatures and gradually I had to face all these problems. A severe difficulty was the acquisition of the extensive literature on the subject; especially the older papers were hard to obtain.

A decisive step into the right direction was the appearance of Gougerot & le Renard's paper in 1979. They gave identification keys for all Eocene Paris Basin Marginellid species and it was possible then to check my own results. An English translation of Gougerot & le Renard (1979) will be published before long in *Afzett. Werkgr. Tert. Kwart. Geol.*

In the present paper short descriptions of all species are given, as well as synoptical keys for the identification of genera, subgenera and species. Included are all species mentioned by Gougerot & le Renard and several other taxa that appeared to be undescribed. These new taxa are:

Gibberula pusilla subpusilla n. subsp.

Marginella (Stazzania) stenostoma n. sp.

Marginella (Stazzania) gougeroti n. sp.

Marginella (Stazzania) vandenbergae n. sp.

Marginella (Stazzania) bifidoplicata Charlesworth, 1855 f. *angulata* n.f.

Marginella (Volvarina) keukelaari n. sp.

Most of the species described below are present in my own collection or in collections of other Dutch private collectors I could consult. The illustrated specimens and the holotypes of the new taxa were placed in the collections of the Rijksmuseum van Geologie en Mineralogie (RGM), at Leiden.

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GENERAL CHARACTERISTICS OF MARGINELLIDAE

Species of Marginellidae occurring in the Eocene deposits of the Paris Basin are always small to

rather small, with a shell height varying between less than 2 mm and 15 mm. Columellar folds are present in all species. Except for two species that have collabral sculpture the shell surface is always smooth. The body whorl is large to very large in relation to the height of the spira, in several species the body whorls have the same height as the entire shell. The shell surface is usually covered by a thin and glossy enamel layer. This layer also conceals the suture line which is hardly visible in many species. The siphonal canal is short to very short in all species; in some groups it distinctly cuts into the base of the body whorl, in others it is more superficial without an obvious incision. The inner side of the apertural lip may be either smooth, slightly thickened, have a more or less obvious denticle or bear dentitions or crenulations all over its height.

All species are normally dextral but sinistral specimens are occasionally found. Sinistrality is also a relatively common phenomenon among Recent representatives of this family.

One specimen (see pl. 2, fig. 9) shows obvious remnants of a colour pattern. Such a colour pattern is regularly found in specimens freshly taken from the sediment, but it disappears quickly after exposition to daylight.

In representatives of the genus *Persicula* the spire is always covered by a callus starting from the posterior edge of the apertural lip.

Gibberula species have a spira without callus. The whorls are slightly elevated and always visible. Characteristic is the presence of a callous, ribbon-like enamel layer (fasciola), situated between the second or third columellar fold and encircling the basal part of the body whorl towards the exterior margin of the apertural lip.

Species belonging to *Marginella (Glabella)* have a narrow and inconspicuous enamel layer (fasciola) on the basal part of the body whorl. The siphonal canal is not incised. The apertural lip has a cushion-like thickening, its inner side is smooth.

In *Marginella (Stazzania)* the basal part of the body whorls lacks an enamel layer. Usually the inner side of the apertural lip is smooth, but in one species, *M. (S.) gougeroti* n. sp., fine crenulations are present. The outer lip may bear an obvious denticle in its upper half, but sometimes only a cushion-like thickening is present. The siphonal canal is not incised. The shell form is more or less biconical, the spira is always distinctly elevated, though sometimes only slightly. The posterior columellar folds are rather to slightly oblique.

Species of *Marginella (Volvarina)* have a protracted, almost cylindrical body whorl. The height of the apertura may reach some three quarters or more of the entire shell height. The inner and outer lips are almost parallel, but the upper part of the apertura is narrower than the lower part. The inner side of the apertural lip is always smooth. The thickening of the outer lip is very weak or absent. The columellar folds are narrow and very well defined, rather to very oblique and situated somewhat more into the interior of the shell.

Further characteristics of the supraspecific taxa are given in the key to the genera and subgenera.

LOCALITIES

For the present study I consulted material from the following localities:

Bartonian (Marinesian)

Chavençon (department Val d'Oise)

Bartonian (Auversian)

- Attainville (department Val d'Oise)
- Auvers-sur-Oise (department Val d'Oise)
- Barisseuse (department Oise)
- Baron (department Oise)
- Le Guépelle (St. Witz) (department Val d'Oise)
- Ver-sur-Launette (department Val d'Oise)

Lutetian (level IV)

- Châteaurouge (department Oise)
- Fercourt (department Oise)

Lutetian (level III and IV)

- Damery (department Marne)
- Grignon (department Yvelines)
- Parnes (department Oise)
- Villiers-St. Frédéric (department Yvelines)

Lutetian (level III)

- Chaumont-en-Vexin (department Oise)

Cuisian

- Aizy-Jouy (department Aisne)
- Liancourt-St. Pierre (department Oise).

In the systematical part additional locality data are given, whenever relevant, from literature sources.

SYNOPTICAL KEY TO GENERA AND SUBGENERA OF MARGINELLIDAE

The numbers used in this key refer to

1. *Persicula*
2. *Gibberula*
3. *Marginella (Glabella)*
4. *Marginella (Stazzania)*
5. *Marginella (Volvarina)*

	1	2	3	4	5
Shell form					
- variable (oval, biconical, egg- or pear-shaped, but not distinctly cylindrical)	1	2	3	4	5
- cylindrical (inner and outer lip almost parallel)	-	-	-	-	5
Spira					
- concealed or short to very short	1	2	3	-	5
- clearly protruding, resulting in an almost biconical shell	-	-	-	4	5
Presence of callus on spira					
- callus present, concealing the spira entirely	1	-	-	-	-
- callus absent, suture visible though sometimes covered by thin enamel layer, protoconch visible	-	2	3	4	5
Height of aperture					
- two thirds or less of total shell height	-	-	-	4	-
- three quarters or more of total shell height	1	2	3	4	5

	1	2	3	4	5
Inner side of apertural lip					
- with crenulations, folds or dentitions	1	2	-	(4)	-
- smooth	-	-	3	4	5
Thickening of apertural lip					
- thickening present together with a distinct denticle	-	-	-	4	-
- thickening present, denticle absent	-	2	3	4	-
- thickening very weak or absent, denticle absent	-	-	-	-	5
Fasciola on the body whorl					
- rather extended, distinctly delimited	-	2	-	-	-
- narrow and inconspicuous	-	-	3	-	-
- absent	1	-	-	4	5
Siphonal canal					
- distinctly incised in basal part of body whorl	1	2	-	-	-
- superficial, without distinct incision	1	(2)	3	4	5

SYNOPTICAL KEY TO SPECIES OF *PERSICULA*

The numbers used in this key refer to the following species:

1. *Persicula angystoma* (Deshayes, 1837)
2. *Persicula dautzenbergi* (Cossmann, 1898)
3. *Persicula pseudampulla* Gougerot & le Renard, 1979
4. *Persicula goossensi* (Cossmann, 1889)

	1	2	3	4
Shell form				
- oval or egg-shaped	-	2	-	4
- protracted, almost cylindrical	1	-	-	-
- triangular	-	-	3	-
Height of adult specimens				
- 7 mm or more	1	2	-	4
- 4 mm or less	-	-	3	-
Callus on spira				
- not or slightly elevated	1	2	3	-
- forming an elevated knob	-	-	-	4
Upper part of apertural lip				
- reaching beyond the highest point of the spira	1	2	3	-
- not so	-	-	-	4
Crenulations at inner side of apertural lip				
- fine and close-set	1	-	3	4
- coarse and irregularly spaced	-	2	-	-
Number of columellar folds				
- 5 to 6	1	-	-	4
- 7 to 9	-	2	3	-
Siphonal canal				
- distinctly incised in basal part of body whorl	1	(2)	-	4
- superficial, without distinct incision	-	-	3	-

	1	2	3	4	5	6	7	8	9	10	11	12
(Number of columellar folds)												
- 7 or 8	-	-	-	-	-	-	-	8	9	-	-	-
- 5 or 6	-	2	-	(4)	5	6	7	-	-	10	11	12
- only 4	-	-	3	4	-	-	-	-	-	-	-	-
Parietal callus												
- thick, bounded by a sharp line	1	-	-	-	5	-	7	8	-	10	-	-
- thin, indistinctly bounded	-	2	3	4	-	6	-	-	9	-	11	12
Fasciola												
- distinctly bounded	1	-	-	4	-	-	7	8	9	10	11	12
- thin and indistinctly bounded	-	2	3	-	5	6	-	-	-	-	-	-
Siphonal canal												
- distinctly incised in basal part of body whorl	1	-	3	4	5	6	7	8	9	10	11	12
- superficial, without distinct incision	-	2	-	-	-	-	-	-	-	-	-	-

SYNOPTICAL KEY TO SPECIES OF *MARGINELLA* (*GLABELLA*)

The numbers 1 to 3 used in this key refer to the following species:

1. *Marginella (Glabella) nitidula* Deshayes, 1837
2. *Marginella (Glabella) allixi* (Cossmann, 1919)
3. *Marginella (Glabella) chevallieri* (Cossmann, 1889)

	1	2	3
Shell form			
- oval to spindle-shaped, spira slightly elevated	1	-	3
- trigonal, spira depressed	-	2	-
Height of adult specimens			
- 10 mm or more	1	-	-
- 2.5 mm or less	-	2	3
Upper part of apertural lip			
- reaching beyond the highest part of the spira	-	2	-
- not so	1	-	3
Number of columellar folds			
- 4	1	-	-
- 5 to 7	-	2	3
Fasciola			
- vaguely visible	-	2	3
- absent	1	-	-
Solidity of shell			
- shell thin and fragile	1	-	-
- rather solid to solid	-	2	3

SYNOPTICAL KEY TO SPECIES OF *MARGINELLA* (*STAZZANIA*)

The number used in this key refer to the following species:

1. *Marginella (Stazzania) acutangula* Deshayes, 1865
2. *Marginella (Stazzania) contabulata* Deshayes, 1865
3. *Marginella (Stazzania) pseudovolvarina* Gougerot & le Renard, 1979
4. *Marginella (Stazzania) fragilis* Deshayes, 1865
5. *Marginella (Stazzania) abnormis* Morlet, 1888
6. *Marginella (Stazzania) bifidoplicata* Edwards, 1855
7. *Marginella (Stazzania) stenostoma* n. sp.
8. *Marginella (Stazzania) gougeroti* n. sp.
9. *Marginella (Stazzania) vandenbergae* n. sp.
10. *Marginella (Stazzania) crenulata* Deshayes, 1865
11. *Marginella (Stazzania) crassula* Deshayes, 1865
12. *Marginella (Stazzania) chastaingi* Cossmann, 1889
13. *Marginella (Stazzania) entomella* Cossmann, 1889
14. *Marginella (Stazzania) eburnea* Lamarck, 1803
15. *Marginella (Stazzania) edwardsi* Deshayes, 1865
16. *Marginella (Stazzania) morelletorum* Gougerot & Braillon, 1968
17. *Marginella (Stazzania) dissimilis* Deshayes, 1865
18. *Marginella (Stazzania) dentifera* Lamarck, 1803
19. *Marginella (Stazzania) hordeola* Deshayes, 1837

For the key see page 47.

To be read under the key on page 47:

	1	2	3	4	5	6	7	8	9	
Anterior bifurcations of third and fourth columellar folds (if present)										
- fused	-	-	3	4	-	-	7	8	9	
- curved	1	2	-	-	5	6	-	-	-	
	10	11	12	13	14	15	16	17	18	19
Non-bifurcated columellar folds (if present)										
- thick and heavy	10	11	12	-	-	15	-	-	-	-
- thin and narrow	-	-	-	13	14	-	16	17	18	19

SYNOPTICAL KEY TO SPECIES OF *MARGINELLA* (*VOLVARINA*)

The numbers 1 to 5 refer to the following species:

1. *Marginella (Volvarina) eurychilus* Cossmann, 1891
2. *Marginella (Volvarina) cylindracea* Deshayes, 1865
3. *Marginella (Volvarina) bouryi bouryi* Cossmann, 1889
4. *Marginella (Volvarina) bouryi supraeocaenica* Gougerot & le Renard, 1979
5. *Marginella (Volvarina) keukelaari* n. sp.

For the key see page 48.

Synoptical key to species of *Marginella* (*Stazzania*)

Height/width ratio	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
- less than 1.75	-	-	-	4	-	-	7	-	-	-	-	-	13	-	-	-	-	-	-
- between 1.75 and 2.00	1	2	-	4	5	6	-	8	9	-	-	-	-	-	-	16	-	-	19
- between 2.00 and 2.25	1	-	-	-	-	6	-	-	9	10	-	12	-	14	15	-	-	-	-
- between 2.25 and 2.50	-	-	3	-	-	-	-	-	-	-	11	-	-	-	-	-	17	-	-
- over 2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-
Height of aperture in percentages of shell height	-	-	-	-	-	-	-	-	-	(10)	-	-	-	-	-	-	-	18	-
- less than 50	1	2	3	-	-	-	-	-	-	10	11	12	-	-	15	16	17	-	19
- between 50 and 65	-	-	-	4	5	6	7	8	9	-	-	-	13	14	-	-	-	-	-
- between 65 and 80	-	-	-	4	5	6	7	8	9	-	-	-	13	14	-	-	-	-	-
Inner side of apertural lip	1	-	3	4	-	-	-	8	-	-	-	-	(13)	14	15	16	17	-	-
- thin or slightly thickened in its middle part	-	-	-	-	5	(6)	(7)	-	-	-	-	-	-	-	-	-	-	-	-
- strongly thickened in its middle part	1	2	-	4	-	6	7	-	9	10	11	12	13	-	(15)	16	-	18	19
- thickened above its middle	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-	18	19
- with distinct denticle above its middle	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-
- crenulated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Upper part of body whorl	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- carinated	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- angular, but not carinated	-	-	-	-	-	-	-	-	9	-	11	12	-	14	15	-	-	-	-
- slightly concave below suture, but not angular	1	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-
- with collabral sculpture	-	-	3	4	5	6	7	8	-	-	-	-	13	(14)	-	16	17	18	19
- regularly convex, smooth	1	2	3	4	5	6	7	8	9	-	-	-	-	-	-	-	-	-	-
Columellar folds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- anteriorly bifurcated	1	2	3	4	5	6	7	8	9	-	-	-	-	-	-	-	-	-	-
- not bifurcated	-	-	-	-	-	-	-	-	-	10	11	12	13	14	15	16	17	18	19
- 4 folds present	1	2	3	-	-	6	7	8	9	10	11	12	13	14	15	16	17	18	19
- 5 folds present	-	-	(3)	4	5	(6)	-	-	(9)	-	-	-	-	-	-	-	-	-	-
Vertical parietal furrow	-	-	-	-	-	-	7	-	9	-	-	-	-	-	-	-	16	-	-
- present	1	2	3	4	5	6	-	8	-	10	11	12	13	14	15	-	17	18	19
- absent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	1	2	3	4	5
Height of adult specimens					
- 6 to 7 mm	1	2	-	-	-
- 2 to 3 mm	-	-	3	4	5
Shell form					
- spindle-shaped with largest diameter above the middle	1	-	-	-	-
- spindle-shaped with largest diameter about the middle	-	2	-	-	-
- triangular, largest diameter far above the middle	-	-	3	4	-
- almost cylindrical	-	-	-	-	5
Apertural lip					
- slightly thickened above its middle	1	-	-	4	5
- equally thickened all over its height	-	2	3	-	-
- edge of siphonal canal thickened	1	-	-	-	-
- edge of siphonal canal not thickened	-	2	3	4	5
Columellar folds					
- 5 folds present	1	-	-	-	5
- 4 normally developed folds	-	2	-	-	-
- 4 folds, the posterior one situated interiorly	-	-	3	-	-
- 3 folds, posteriorly sometimes a fourth fold is indicated	-	-	-	4	-

SYSTEMATICAL PART

For each species the following data are given: full name and reference to illustration(s) in this paper, literature references (usually only the original publication and the reference to Cossmann & Pissarro's 'Iconographie' are given), remarks and an indication of the stratigraphical and geographical distribution within the Paris Basin.

In the 'remarks' data additional to the characteristics mentioned in the synoptical keys are given, e.g. about variability.

Phylum Mollusca
 Classis Gastropoda
 Subclassis Streptoneura
 Ordo Neogastropoda
 Subordo Stenoglossa
 Superfamilia Volutacea
 Familia Marginellidae
 Genus *Pericula* Schumacher, 1817

Pericula angystoma (Deshayes, 1837)
 Pl. 1, fig. 1

1837 *Marginella angystoma* Deshayes, p. 710, pl. 95, fig. 23-25.

1913 *Pericula angystoma*, (Desh.) - Cossmann & Pissarro, pl. 46, fig. 208 ter 1.

Description - read column 1 of the synoptical key to *Pericula* species.

Remarks - Rather variable in outline (height/width-ratio).

Distribution - A common species in Lutetian deposits, present at almost all well-known localities. It is less common in Bartonian (Auversian) sediments (Baron, Ver-sur-Launette).

***Persicula dautzenbergi* (Cossmann, 1898)**

Pl. 1, fig. 2

1898 *Marginella Dautzenbergi* Cossmann, p. 231 (95), pl. 7, fig. 13-15.

Description - read column 2 of the synoptical key to species of *Persicula*.

Remarks - This species was originally described from the Nantes Basin, but rarely it is also found in the Paris Basin. I found five specimens at Baron. It may be separated from *P. angystoma* by the coarser and less numerous crenulations at the inner side of the apertural lip, and by the higher number of columellar folds.

Distribution - Bartonian (Auversian). Apart from the specimens mentioned above only one specimen from Baron and one from Barisseuse are known, mentioned by Gougerot & le Renard.

***Persicula pseudampulla* Gougerot & le Renard, 1979**

Pl. 1, fig. 3

1889 *Marginella (Closia) ampulla* (Desh.) - Cossmann, p. 213 (non Deshayes).

1913 *Persicula ampulla*, (Desh.) - Cossmann & Pissarro, pl. 46, fig. 208 ter 3 (non Deshayes).

1979 *Persicula pseudampulla* Gougerot & le Renard, p. 4, fig. 3.

non: 1837 *Marginella ampulla* Deshayes, p. 711, pl. 95, fig. 17-19 (= *Erato* !).

Description - read column 3 of the synoptical key to species of *Persicula*.

Remarks - Specimens of this species may be even more trigonal than the shell represented in pl. 1, fig. 3, sometimes the upper part of the apertural lip reaches beyond the highest point of the spira.

Distribution - Lutetian: not very common, Châteaurouge. Gougerot & le Renard also mention the localities Chaussy and Requicourt.

***Persicula goossensi* (Cossmann, 1889)**

Pl. 1, fig. 4-6

1889 *Marginella (Closia) Goossensi* Cossmann, p. 213, pl. 7, fig. 15-16.

1913 *Persicula Goossensi*, (Cossm.) - Cossmann & Pissarro, pl. 46, fig. 208 ter 2.

Description - read column 4 of the synoptical key to *Persicula* species.

Remarks - In its typical form this species has an extensive, nodular callus covering the spira. None of the specimens I have seen approaches this form completely. At Parnes, however, many shells are found that have the same general outline as *P. goossensi* (compare pl. 1, fig. 5-6). Presumably the type specimen is a gerontic individual. From *P. angystoma* the Parnes material, and also specimens from Fercourt (pl. 1, fig. 4), differ by their more slender form, the solidity of the shell and by the more developed callus on the spira. These characteristics lead me to the preliminary supposition

that these specimens indeed belong to a separate species. Gougerot & le Renard, on the other hand, mention the occurrence, at Parnes, of transitional forms between *P. angystoma* and *P. goossensi*. Shells of the former species from Parnes, however, show a large variability, slender forms occur as well as thick-set shells. Future investigations will be necessary to demonstrate the validity of *P. goossensi* with certainty.

Distribution – Lutetian: Chaumont-en-Vexin (Cossmann), Parnes (leg. Gunst), Fercourt.

Genus *Gibberula* Swainson, 1840

Gibberula frederici (Cossmann, 1889)

Pl. 1, fig. 7

1889 *Marginella (Cryptospira) Frederici* Cossmann, p. 209, pl. 7, fig. 10.

1913 *Cryptospira* (s. str.) *Frederici*, Cossm. – Cossmann & Pissarro, pl. 46, fig. 208 bis 3.

Description – read column 1 of the synoptical key to *Gibberula* species.

Remarks – This is a large species with a height of more than 10 mm. It is easily recognized by its numerous (eleven to twelve) columellar folds and its protracted cylindrical form. The specimen represented on pl. 1, fig. 7 differs from the typical form by the absence of the strongly developed embryonic knob (compare Cossmann's illustrations), but all other characteristics are in good agreement with the original description.

Distribution – This is a very rare species, the shell represented here is the only specimen I found. Lutetian: Chaumont-en-Vexin (Cossmann), Bartonian (Auversian): Baron.

Gibberula cossmanni (Morlet, 1888)

Pl. 1, fig. 8

1888 *Marginella Cossmanni* Morlet, p. 214, pl. 10, fig. 4 (non fig. 6).

1913 *Cryptospira (Gibberula) Cossmanni*, (Morlet) – Cossmann & Pissarro, pl. 46, fig. 208 bis 5.

Description – read column 2 of the synoptical key to species of *Gibberula*.

Remarks – This is the smallest species of the genus in the Paris Basin, its height is 3 mm or less. The general outline is triangular, the upper part of the apertural lip is slightly expanded, the spira is depressed. There are five or six columellar folds.

Judging from his descriptions the figs. 4-4a and 6-6a in Morlet (1888, pl. 1) were confounded. Figs. 6-6a (indicated: *M. Cossmanni*) in reality represent his *M. Burreti*, which is a junior synonym of *M. pusilla* (Edwards, 1855).

Distribution – Bartonian (Marinesian): Le Ruel (Morlet); Lutetian: rather common, e.g. Damery, Villiers-St. Frédéric; Cuisian: very rare, Liancourt-St. Pierre.

Gibberula godini (Cossmann, 1896)

Pl. 1, fig. 9

1896 *Marginella Godini* Cossmann, p. 40, pl. 3, fig. 12-13.

1913 *Cryptospira (Gibberula) Godini*, Cossm. – Cossmann & Pissarro, pl. 46, fig. 208 bis 10.

Description – read column 3 of the synoptical key to the *Gibberula* species.

Remarks – This taxon was based by Cossmann on a single specimen found in Cuisian deposits at Hérouval (municipality of Montjavault, department of Oise). To my knowledge additional specimens have never been found. The illustration in this paper was kindly made by Dr J. le Renard, based on the illustration of Cossmann.

Distribution – Only one specimen was found at Hérouval, Cuisian.

***Gibberula vittata* (Edwards, 1855)**

Pl. 1, fig. 10

1855 *Marginella vittata* Edwards, p. 144, pl. 18, fig. 7a-c.

1913 *Cryptospira (Gibberula) vittata*, (Edw.) – Cossmann & Pissarro, pl 46, fig. 208 bis 7.

Description – read column 4 of the synoptical key to species of *Gibberula*.

Remarks – Protracted olive-like shell with a height of 6 to 7 mm. Generally there are four columellar folds, of which the two adapical ones are rather weak and situated rather interiorly. This species is rather variable. The crenulations on the inner side of the apertural lip are restricted to the thickened part in typical specimens, but sometimes they are already present on the inner shell wall (Pl. 1, fig. 10). Also the number of columellar folds may be higher than four. Some specimens make the impression of transitional forms between the present species and *G. spirata*.

Distribution – Bartonian (Auversian): common, e.g. Barisseuse, Baron, Le Guépelle. Lutetian: common, known from many localities, e.g. Châteaurouge, Damery, Fercourt, Grignon, Villiers-St. Frédéric.

***Gibberula pusilla pusilla* (Edwards, 1855)**

Pl. 2, fig. 1

1855 *Marginella pusilla* Edwards, p. 143, pl. 18, fig. 6a-c.

1913 *Cryptospira (Gibberula) pusilla*, (Edw.) – Cossmann & Pissarro, pl 46, fig. 208 bis 4.

Description – read column 5 of the synoptical key to *Gibberula* species.

Remarks – The general outline of this species is rather thick-set oviform, the height of the shell is 5mm at the most. There are five or six columellar folds, the basal one is comparatively thin and rather long, the next two folds are shorter, whereas the two adapical folds are situated rather deeply into the interior of the shell. Usually the crenulations on the inner side of the apertural lip are restricted to the thickened part of the lip, but sometimes they start on the interior of the body whorl.

Distribution – Bartonian (Marinesian): rare, e.g. Chavençon. Bartonian (Auversian): common, e.g. Attainville, Auvers-sur-Oise, Baron, Le Guépelle, Ver-sur-Launette.

***Gibberula pusilla subpusilla* n. subsp.**

Pl. 2, fig. 2

Locus typicus – Villiers-St. Frédéric, department Yvelines, France.

Stratum typicum – Lutetian, level IV.

Derivatio nominis – named after its successor, *G. pusilla*.

Description – The shell is rather thick-set to protracted olive-like with a shell height up to 4 mm. The spira is slightly elevated. There are six regularly distributed columellar folds of which the basal one is narrow and oblique and increases in thickness anteriorly. The folds are broad at their base and narrow at their top, with the interspaces semicircular in section. From the basal one upwards the columellar folds become gradually less oblique and weaker. The parietal callus is little developed and only visible in a part of the available material. The fasciola is relatively broad. Its upper boundary is situated at the same height as the third or the fourth columellar fold (counting from the basal fold). The fasciola is very thin and ill-defined. The apertural lip is expanded laterally and thickened interiorly. Crenulations are only present on the thickened part of the apertural lip, they are not or only very slightly extended to the interior. For further characteristics read column 6 of the synoptical key to species of *Gibberula*.

Distribution – only known from the type locality.

Material – Holotype (leg. Mrs T. Keukelaar-van den Berge) in coll. RGM 225 045. Furthermore 13 paratypes in collection Keukelaar-van den Berge (Wilhelminadorp), 4 paratypes in the collection of the author and 1 in the collection of Prof. Dr L. Gougerot (leg. van Nieulande).

Remarks – The present species differs from *G. pusilla pusilla* by its slightly more elongated form, the considerably more regular columellar folds of which the basal one increases in thickness anteriorly and by the badly developed parietal callus.

***Gibberula ovulata* (Lamarck, 1803)**

Pl. 2, fig. 3

1803 *Marginella (ovulata)* Lamarck, p. 61.

1805 *Marginella ovulata* – Lamarck, pl. 44, fig. 10.

1913 *Cryptospira (Gibberula) ovulata*, (Lamk.) – Cossmann & Pissarro, pl. 46, fig. 208 bis 1.

Description – read column 7 (and 8 for the f. *polyptycta*) of the synoptical key for *Gibberula* species.

Remarks – This is a large species with a shell height of 10 to 12 mm, a rather inflated form and a depressed spira. The typical form has five or six columellar folds that are comparatively strong and increase in strength towards the base of the shell. The f. *polyptycta* Cossmann (1889, p. 208) is characterized by the presence of two to three additional columellar folds, so shells belonging to this form may have 7 or 8 of these folds. A shell of this form is represented on pl. 2, fig. 3.

Distribution – Bartonian (Auversian): common, e.g. Auvers-sur-Oise, Baron, Le Guépelle, Ver-sur-Launette; Lutetian: common, known from many localities, e.g. Chaumont-en-Vexin, Châteaurouge, Damery, Fercourt, Grignon, Villiers-St.Frédéric. The f. *polyptycta* is usually more common than the typical form.

***Gibberula suboliva* (Cossmann, 1889)**

Pl. 2, fig. 4

1889 *Marginella (Cryptospira) suboliva* Cossmann, p. 211, pl. 7, fig. 14.

1913 *Cryptospira (Gibberula) suboliva*, Cossm. – Cossmann & Pissarro, pl. 46, fig. 208 bis 8.

Description – Read column 9 of the synoptical key for species of *Gibberula*.

Remarks – A rather large species, shell height to about 10 mm, with a protracted cylindrical to olive-like form. The spira is moderately elevated. There are seven or eight columellar folds, of these the basal five are very oblique, whereas the more posterior folds are less oblique and lying more into the interior of the shell. The inner side of the apertural lip has rather coarse crenulations that extend onto the inner shell wall of the body whorl. This species was described by Cossmann from the Nantes Basin, but he also mentioned it from localities in the Paris Basin.

Distribution – Bartonian (Marinesian): Le Ruel (Cossmann); (Auversian): Ancy-en-Multien and Le Guépelle (Cossmann); Lutetian: Villiers-St. Frédéric (1 shell in the author's collection).

***Gibberula spirata* (Cossmann, 1889)**

Pl. 2, fig. 5-6

1882 *Marginella (Cryptospira) elevata* Cossmann, p. 127, pl. 6, fig. 8 (non Emmons).

1889 *Marginella (Cryptospira) ovulata*, var. *spirata* Cossmann, p. 208.

1903 *Cryptospira (Gibberula) praeominata* Cossmann, p. 128.

1913 *Cryptospira (Gibberula) ovulata*, (Lamk) var. *spirata*, Cossm. – Cossmann & Pissarro, pl. 46, fig. 208 bis 1''.

1913 *Cryptospira (Gibberula) praeominata*, Cossm. – Cossmann & Pissarro, pl. 46, fig. 208 bis 2.

Description – read column 10 of the synoptical key for *Gibberula* species.

Remarks – The outline of this species is protracted olive-like with a moderately elevated spira (height of the spira 1/6 of the total shell height or more). The edge of the apertural lip is narrow and rather sharp all over its length. The crenulations on its inner side start at a short distance from the edge and continue on the inner shell wall. There are five to six columellar folds.

Cossmann introduced its *M. elevata* from Cuisian deposits, later he changed this name to *praeominata* because of preoccupation. In the meantime, however, he had described *M. ovulata* var. *spirata* from the Lutetian. This latter form cannot be distinguished from the Cuisian *praeominata*, which therefore becomes a junior synonym (compare Gougerot & le Renard, 1979, p. 8).

Distribution – Lutetian: rather rare, e.g. Grignon, Villiers-St. Frédéric.; Cuisian: rather common at Liancourt-St. Pierre, rare at Hérouval (Gougerot & le Renard), Cuise and St. Gobain (Cossmann), furthermore one specimen is known from Aizy-Jouy (Haandrikman leg.).

***Gibberula acutispira* (Cossmann, 1889)**

Pl. 2, fig. 7-9.

1889 *Marginella (Cryptospira) acutispira* Cossmann, p. 210, pl. 7, fig. 12.

1913 *Cryptospira (Gibberula) acutispira*, Cossm. – Cossmann & Pissarro, pl. 46, fig. 208 bis 6.

Description – read column 11 (and 12 for the f. *subconcava*) of the synoptical key to species of *Gibberula*.

Remarks – This species has a slightly to rather strongly elevated spira. The apertural lip is thickened on the inner side in its middle part. The crenulations are rather coarse and may proceed on the inner shell wall. There are five or six columellar folds, of which the basal one is the strongest and the most oblique one; apically the folds decrease regularly in strength.

The f. *subconcava* Cossmann (1889, p. 210, pl. 7, fig. 13; Cossmann & Pissarro, pl. 46, fig. 208 bis') is characterized by the slightly concave outline of the spira, finer crenulations on the apertural lip and a less accentuated thickening of the lip. Of this form I found a specimen at Châteaurouge (pl. 2, fig. 9) in which the colour pattern is preserved.

Distribution - Bartonian (Auversian): rare, e.g. found at Barisseuse and Baron; Lutetian: rather common, e.g. Châteaurouge, Damery, Fercourt, Grignon, Villiers-St. Frédéric. The f. *subconcava* is only known from the Lutetian, e.g. Châteaurouge, Damery, Fercourt, Villiers-St. Frédéric.

Genus *Marginella* Lamarck, 1799
Subgenus *Glabella* Swainson, 1840

Marginella (Glabella) nitidula Deshayes, 1837
Pl. 3, fig. 1

1837 *Marginella nitidula* Deshayes, p. 709, pl. 95, fig. 10-11.

1913 *Marginella (s.str.) nitidula*, Desh. - Cossmann & Pissarro, pl. 46, fig. 208-16.

Description - read column 1 of the synoptical key to species of *Marginella (Glabella)*.

Remarks - Rather large shell, height to more than 10 mm (one very large specimen, H > 17 mm, in coll. RGM 16 992), compared to its size the shell is very thin and fragile. The outline is oviform to spindle-shaped, with a rather elevated spira. The apertural lip is thin or only very slightly thickened, without crenulations. The siphonal canal is superficial, not distinctly incised. There are four columellar folds, which are thin and narrow, and rather widely spaced. The two basal folds are very oblique, the two adapical ones are more horizontal.

Distribution - Lutetian: very rare, e.g. Grignon (coll. Keukelaar-van den Berge).

Marginella (Glabella) allixi (Cossmann, 1919)
Pl. 3, fig. 2

1919 *Cryptospira (Gibberula) Allixi* Cossmann, p. 69, pl. 1, fig. 67-69.

Description - read column 2 of the synoptical key to species of *Marginella (Glabella)*.

Remarks - *M. allixi* is a small species (height to 2.5 mm) with a rather triangular outline and a depressed spira. The apertural lip is thickened in its upper part, which may project beyond the highest point of the spira. There are no crenulations on the inner side of the apertural lip. The siphonal canal is superficial. There are five to seven columellar folds.

Distribution - Lutetian: very rare in the Paris Basin, e.g. Fercourt, Châteaurouge, Villiers-St. Frédéric. This species seems to be more common in the Nantes Basin (Bois-Gouët), from which it was originally described.

Marginella (Glabella) chevallieri (Cossmann, 1889)
Pl. 3, fig. 3

1889 *Marginella (Cryptospira) Chevallieri* Cossmann, p. 212, pl. 7, fig. 17.

1913 *Cryptospira (Gibberula) Chevallieri*, Cossm. - Cossmann & Pissarro, pl. 46, fig. 208 bis 9.

Description – read column 3 of the synoptical key to species of *Marginella (Glabella)*.

Remarks – *M. chevallieri* is also a small species, just like *M. allixi*, with a shell height of maximally 2.5 mm, but it may be distinguished at first glance by its entirely different outline, which is elongated ovoid to oval. Its apertural lip is smooth and thin and never projecting beyond the spira.

Distribution – Bartonian (Auversian): rare, e.g. Baron, La Guépelle; Lutetian: rather common, e.g. Châteaurouge, Chaumont-en-Vexin, Damery, Fercourt, Parnes, Villiers-St. Frédéric.

Subgenus *Stazzania* Sacco, 1889

Marginella (Stazzania) acutangula Deshayes, 1865

Pl. 3, fig. 4

1865 *Marginella acutangula* Deshayes, p. 551, pl. 104, fig. 24-26.

1913 *Marginella (Stazzania) acutangula*, Desh. – Cossmann & Pissarro, pl. 46, fig. 208-10.

Description – read column 1 of the synoptical key to *Marginella (Stazzania)* species.

Remarks – This species can be recognized at once by the presence of a carina at the shoulder of the body whorl. Sometimes small axial folds may be present as well. There are four columellar folds, of which the two posterior ones are bifurcate and flattened. The shell is distinctly biconical in outline.

Distribution – Lutetian: Les Groux, Parnes, Requicourt (rather common), Fontenay-St. Père, Montmirail, Damery, Gomerfontaine (rare), Chaumont-en-Vexin. I found this species only at the latter locality, all other localities were mentioned by Gougerot & le Renard (1979).

Marginella (Stazzania) contabulata Deshayes, 1865

Pl. 3, fig. 5

1865 *Marginella contabulata* Deshayes, p. 551, pl. 104, fig. 30-32.

1913 *Marginella (Stazzania) contabulata*, Desh. – Cossmann & Pissarro, pl. 46, fig. 208-11.

Description – read column 2 of the synoptical key to species of *Marginella (Stazzania)*.

Remarks – This species may be distinguished from the previous one by the form of the shoulder on the body whorl, which is never carinated but only rounded angular. The upper two columellar folds are indistinctly bifurcate.

Distribution – rather common in Lutetian deposits, e.g. Châteaurouge, Chaumont-en-Vexin, Damery, Fercourt, Villiers-St. Frédéric.

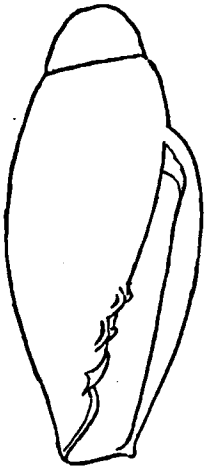
Marginella (Stazzania) pseudovolvarina Gougerot & le Renard, 1979

Pl. 3, fig. 6; text-fig. 1

1979 *Marginella (Stazzania) pseudovolvarina* Gougerot & le Renard, p. 15, fig. 19.

Description – read column 3 of the synoptical key to species of *Marginella (Stazzania)*.

Remarks – Very small species, shell height up to 2 mm only. The outline is elongated biconical.



Text-fig. 1. *Marginella (Stazzania) pseudovolvarina* Gougerot & le Renard, 1979. Villiers-St. Frédéric. Lutetian.

Note the presence of a small denticle at the base of the apertural margin. Drawing made by the author after a specimen in his collection.

Body whorl without any indication of a shoulder. Four columellar folds are usually present, sometimes a fifth one is also developed. The two posterior columellar folds are distinctly bifurcate. The roots of the bifurcations of the third and fourth fold are connected with each other. The two basal folds are very oblique, the two (or three) posterior ones are more horizontal. Very characteristic is the presence, in completely developed specimens, of a small but distinct denticle at the base of the apertural margin (compare text-fig. 1) (pers. comm. Dr J. le Renard).

Distribution - Lutetian: Thionville-sur-Opton (Gougerot & le Renard), Villiers-St. Frédéric. Rare.

***Marginella (Stazzania) fragilis* Deshayes, 1865**

Pl. 3, fig. 7

1865 *Marginella fragilis* Deshayes, p. 553, pl. 104, 19, 39-41.

1913 *Marginella (Stazzania) fragilis*, Desh. - Cossmann & Pissarro, pl. 46, fig. 208-14.

Description - read column 4 of the synoptical key to species of *Marginella (Stazzania)*.

Remarks - A species with a height up to 5 mm, a relatively high apertura with a short spira and a solid, biconical shell. Five columellar folds are present, which are anteriorly bifurcated. The lower branches of these bifurcations are longer than the upper ones. Those of the third and fourth columellar folds are connected.

Distribution - Lutetian: very rare, e.g. Fercourt, Grignon.

***Marginella (Stazzania) abnormis* Morlet, 1888**

Pl. 3, fig. 8

1888 *Marginella abnormis* Morlet, p. 216, pl. 10, fig. 5, 5a-b.

1913 *Marginella (Stazzania) abnormis*, Morlet - Cossmann & Pissarro, pl. 46, fig. 208-13.

Description - read column 5 of the synoptical key of *Marginella (Stazzania)* species.

Remarks - Rather small, biconical species, with a shell height up to 3 mm. The spira is relatively high. The middle part of the apertural lip is strongly thickened, as a result of which the apertura is distinctly narrowed. There are four or five columellar folds, of which the second, the third and the fourth are bifurcated.

Distribution – Bartonian (Marinesian): very common, e.g. Chavençon, Le Ruel; Bartonian (Auversian): very rare, Ermenonville (Bois de Perthes) (after Gougerot & Brailion, 1968).

***Marginella (Stazzania) bifidoplicata* Edwards, 1855**
Pl. 4, fig. 1

1855 *Marginella bifido-plicata* Charlesworth, Edwards, p. 139, pl. 18, fig. 2a-g.

1913 *Marginella (Stazzania) bifidoplicata* Charles Worth – Cossmann & Pissarro, pl. 46, fig. 208-12.

Description – read column 6 of the synoptical key to the species of *Marginella (Stazzania)*.

Remarks – This is the most common *Marginella (Stazzania)* species in the Eocene deposits of the Paris Basin. The shell-height reaches about 5 mm, the outline is rather high, biconical, juvenile specimens are more thick-set. There are four to five columellar folds that are distinctly bifurcate to even somewhat excavated. The apertural lip is very thick, especially on the outer side in such a way that the apertura is hardly narrowed. This is a very variable species in which four forms may be distinguished:

forma columbellina Cossmann, 1889

1889 *Marginella bifidoplicata*, Charlesworth var. *columbellina*, Desh., Cossmann, p. 206 (non Deshayes).

1913 *Marginella (Stazzania) bifidoplicata*, Charles Worth var. *columbellina*, Desh. – Cossmann & Pissarro, pl. 46, fig. 208-12 (non Deshayes).

Remarks – This is a large and more elongate form with a higher spira. It is especially found in Lutetian deposits.

Deshayes (1865, p. 552) indicates that the name *columbellina* was used by him in his collection to indicate specimens described as *bifidoplicata* by Edwards. Therefore *columbellina* Deshayes is a manuscript-name that was never formally published by him. Cossmann (1889, p. 206) was the first author who used the name *columbellina* for a form differing from *bifidoplicata* Edwards and has to be regarded as the author.

forma acyensis Cossmann, 1889

1889 *Marginella (s.s.) bifidoplicata*, Charlesworth var. *acyensis* Cossmann, p. 206.

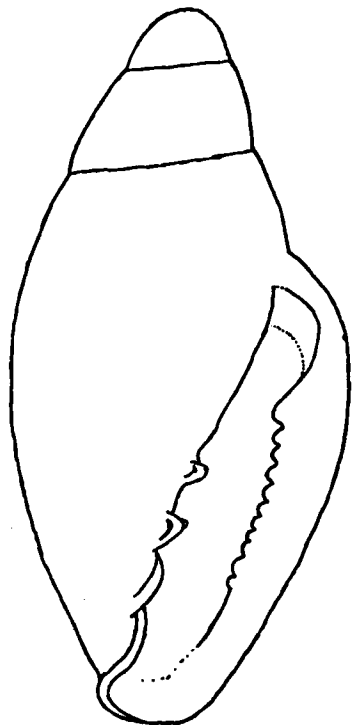
1913 *Marginella (Stazzania) bifidoplicata*, Charles Worth var. *acyensis*, Cossm. – Cossmann & Pissarro, pl. 46, fig. 208-12.

Remarks – This form is characterized by a flattened thickening on the apertural margin. It is known from Bartonian deposits (localities Acy and Multien).

forma suffusa Pezant, 1908

1908 *Marginella bifidoplicata*, var. *suffusa* Pezant, p. 9, pl. 1, fig. 10 (non fig. 11).

Remarks – A large form with an elongated spira and only slightly bifurcate columellar folds. It is only slightly different from the typical form. This form is known from the Bartonian.



Text-fig. 2. *Marginella (Stazzania) bifidoplicata* Edwards, 1855
Barisseuse. Bartonian (Auversian).
Specimen with crenulated apertural margin.
Coll. T. Keukelaar-van den Berge.

forma angulata n. forma
Pl. 4, fig. 2a-b

Diagnosis - A form of *M. (S.) bifidoplicata* characterized by its elongate form, a concave outline of the basal part of the body whorl and the shouldered appearance of the upper part of the apertural lip. Furthermore the anterior columellar fold decreases in strength towards the base.

Remarks - This form is connected with the typical form by intermediate specimens. It is not very common in the Lutetian (level IV) and known from Fercourt, Châteaurouge, Villiers-St. Frédéric and Grignon.

Material - Holotype in coll. RGM 225 067. Furthermore 2 paratypes from the locus typicus (= Fercourt) in the author's collection and 9 in the collection of Mrs Keukelaar-van den Berge. Additional paratypes: Châteaurouge, 1 specimen (coll. Keukelaar-van den Berge); Grignon, 1 specimen (coll. van Nieulande); Parnes, 1 specimen (coll. van Nieulande, leg. J. Gunst); Villiers-St. Frédéric, 1 specimen (coll. van Nieulande).

Distribution - Bartonian (Marinesian and Auversian): common; Lutetian: very common; Cuisian: very rare, Liancourt-St. Pierre (one specimen in coll. le Renard). (The distribution of the forms is given in the remarks of each form).

Marginella (Stazzania) stenostoma n. sp.
Pl. 4, fig. 3-4

Locus typicus - Villiers-St. Frédéric (France, department Yvelines).

Stratum typicum - Lutetian, level IV (so-called level with *Orbitolithes complanatus* and *Lithocardium aviculare*).

Derivatio nominis – from Gr. *στενός* (narrow) and Gr. *στόμα* (mouth); *stenostoma*: with a narrow apertura.

Description – A comparatively small species (height up to 4 mm, breadth to 2.3 mm) with 3½-4 slightly convex whorls. The height of the body whorl is about 4/5 of the entire shell height. The height of the apertura equals about 3/5 of the shell height. The spira is moderately elevated. The apertural lip is slightly angular in its upper part and somewhat thickened anteriorly. The inner part of the lip is strongly thickened almost all over its height, but anteriorly and posteriorly this thickening is bounded by regular, almost semicircular excavations. The thickened inner part of the lip is slightly concave and almost parallel with the opposite columellar side of the apertura. There are four rather solid columellar folds. The anterior one is very oblique and fades into the margin of the siphonal canal. The next three folds are distinctly bifurcate, the branches of the bifurcations are connected between the second and the fourth folds. In adult specimens a narrow vertical depression is present in which the folds are lying. This depression is bordered by the upper branch of the fourth columellar fold, it continues to the upper part of the apertura.

Discussion – Typical for this new species is the very narrow apertura. It may resemble *M. (S.) entomella* in general outline, but this latter species has an entirely different apertural form in which the apertural margin is only very slightly thickened and with non-bifurcate columellar folds.

The present species could be related with *M. (S.) dichotomoptycha* Cossmann, 1898, a species from the Nantes Basin. This latter form may reach larger dimensions (shell height to 6 mm) and has in its adult stage an additional fifth columellar fold. The internal thickening of the apertural lip is somewhat different, not with a regular semicircular excavation at its anterior side. The species from the Nantes Basin has also more obvious bifurcations of the columellar folds.

M. stenostoma may be distinguished from *M. bifidoplicata* by its general outline, the form of the columellar folds and the form of the internal thickening of the apertural lip. Some specimens, however, seem to be intermediate between both species.

Distribution – Lutetian: rather common, e.g. Châteaurouge, Fercourt, Grignon, Parnes and Villiers-St. Frédéric. According to Dr J. le Renard (pers. comm.) this species is common at La Ferme-de-l'Orme.

Material – Holotype and one paratype in coll. RGM 225 057-8. Furthermore from the type locality: 150 specimens (coll. van Nieulande); 5 specimens (coll. Gougerot, leg. van Nieulande), 5 specimens (coll. le Renard, leg. van Nieulande), 140 specimens (coll. Keukelaar-van den Berge). Additional paratypes: Châteaurouge, 5 specimens (coll. van Nieulande); Fercourt, 13 specimens (coll. van Nieulande); Grignon, 7 specimens (coll. van Nieulande) and Parnes, 1 specimen (coll. van Nieulande, leg. J. Gunst).

***Marginella (Stazzania) gougeroti* n. sp.**

Pl. 4, fig. 5a-c

Locus typicus – Villiers-St. Frédéric (France, département Yvelines).

Stratum typicum – Lutetian, level IV (so-called level with *Orbitolithes complanatus* and *Lithocardium aviculare*).

Derivatio nominis – named after Prof. Dr L. Gougerot (Paris).

Description – Very small shell (height 2.2 mm, breadth 1.4 mm), consisting of 2½ whorls. The height of the body whorl is almost 9/10 of the entire shell height. The apertura equals about 4/5 of the shell height. The general outline of the shell is oviform, with a rather depressed spira. The apertura

is rather long, at its posterior side distinctly narrower than anteriorly. The apertural lip is slightly thickened internally and somewhat more on the outer side. The inner side of the apertural margin has fine crenulations that are only very slightly elongated into the interior of the shell. The external thickening of the apertural lip diminishes downwards and fades into the margin of the siphonal canal. This canal is not distinctly incised into the base of the body whorl.

There are four columellar folds of which the anterior two are very oblique, narrow and sharp. The two adapical folds are less oblique and bifurcated. The branches of the bifurcations are connected between the third and the fourth fold.

Discussion - This new species is the first one within the subgenus *Stazzania* with a crenulated inner side of the apertural lip known from the Paris Basin. Comparable crenulations are known from forms of *M. bifidoplicata* from Cotentin and Bois-Gouët (pers. comm. of Prof. Dr L. Gougerot, I could study such specimens in the coll. le Renard). In the collection of Mrs Keukelaar-van den Berge I found a specimen of *M. bifidoplicata* also having such crenulations. This latter specimen (see text-fig. 2) was collected at Barisseuse (Bartonian, Auversian).

An important distinguishing character with respect to *M. bifidoplicata* is the gradually diminishing margin at the posterior side of the apertural lip. In *M. bifidoplicata* this margin diminishes abruptly, looking like an obscure denticle. The inner side of the apertural lip is less thickened in *M. gougeroti* and the angle between the body whorl and the upper part of the apertural lip is distinctly smaller in this species.

The new species shows some resemblance with *M. entomella* in general outline. There are obvious differences, however, in the form of the columellar folds.

The presence of crenulations at the inner side of the apertural lip might be a reason to incorporate the present species in the genus *Gibberula*, but the absence of a distinct incision of the siphonal canal and also the absence of a fasciola indicate clearly that this species belongs to *Marginella* (*Stazzania*).

Distribution - But for the type locality this species is only known from La Ferme-de-l'Orme. Among the material from this latter locality, that I was able to study in the collection of Dr le Renard at Plaisir, some specimens lack the crenulations on the inner side of the apertural margin.

Material - Holotype in coll. RGM 225 055. Paratypes (all from the locus typicus): 47 specimens (coll. van Nieulande), 5 specimens (coll. Gougerot, leg. van Nieulande), 5 specimens (coll. le Renard, leg. van Nieulande) and 17 specimens (coll. Keukelaar-van den Berge).

***Marginella* (*Stazzania*) *vandenbergae* n. sp.**

Pl. 4, fig. 6-7

Locus typicus - Villiers-St. Frédéric (France, department Yvelines).

Stratum typicum - Lutetian, level IV (so-called level with *Orbitolithes complanatus* and *Lithocardium aviculare*).

Derivatio nominis - dedicated to Mrs T. Keukelaar-van den Berge, for her continuous help and encouragement during my study of the Marginellidae.

Description - A small species, with a shell height to 3 mm and a width to 1.5 mm, consisting of 4½ whorls. The body whorl comprises about 3/4 of the entire shell height. The general outline is elongated biconical, with a rather high spira and rather convex whorls. Just below the suture the whorls are concave, causing a slightly shouldered appearance of the whorls.

The height of the apertura is about 7/10 of the total shell height. The apertural lip is thickened

and almost parallel with the columellar side of the apertura. The upper part of the inner side of the apertural lip is distinctly thickened just below the shoulder. In senile specimens this part may develop into a denticle (compare pl. 4, fig. 7). There are four or five columellar folds. In specimens with five folds the thickening of the inner side of the apertural lip is always present as a denticle, so this might also be a characteristic of completely full-grown (to senile) specimens. The two anterior folds are narrow and sharp, placed very obliquely. The two posterior folds are less oblique and clearly bifurcate. The roots of the bifurcations are connected between the third and the fourth fold. The posterior root of the fourth fold is extended as a very thin ridge into the direction of the posterior corner of the apertura. The fifth fold, if present, is never bifurcate and always situated more inwards, hidden behind the posterior extension of the root of the fourth fold.

Discussion - This species is rather variable with respect to the characteristics of the apertura. Still, it may be distinguished from the many representatives of this group in the Paris Basin deposits by a number of features.

M. (S.) bifidoplicata has a different outline with less convex whorls and other proportions of the spira. Its apertural lip is more thickened, also at the outer side, but it has never a denticle like in *M. vandenbergae*. Furthermore the columellar folds are considerably heavier in *M. bifidoplicata*.

M. (S.) fragilis may be distinguished by its convex whorls without a concavity below the suture. Also the general outline and the characteristics of the apertura are very different, as is indicated in the illustrations.

Distribution - Lutetian, rather common, known from Villiers-St. Frédéric, Châteaurouge, and Grignon. According to Dr J. le Renard (pers. comm.) this species is common at la Ferme-de-l'Orme.

Material - Holotype and one paratype in coll. RGM 225050-1. Furthermore the following paratypes: Villiers-St. Frédéric, 154 specimens (135 with four and 19 with five columellar folds, coll. van Nieulande), 83 specimens (coll. Keukelaar-van den Berge), 5 specimens (coll. Gougerot, leg. van Nieulande), 5 specimens (coll. le Renard, leg. van Nieulande); Châteaurouge, 1 specimen (coll. van Nieulande), 3 specimens (coll. Keukelaar-van den Berge); Grignon, 8 specimens (coll. van Nieulande), 13 specimens (coll. Keukelaar-van den Berge).

***Marginella (Stazzania) crenulata* Deshayes, 1865**
Pl. 4, fig. 8

1865 *Marginella crenulata* Deshayes, p. 550, pl. 104, fig. 18-20.

1913 *Marginella (Stazzania) crenulata*, Desh. - Cossmann & Pissarro, pl. 46, fig. 208-9.

Description - read column 10 of the synoptical key to species of *Marginella (Stazzania)*.

Remarks - This species is easily recognized by the presence of short axial folds just below the suture.

Distribution - Lutetian: not very common, Villiers-St. Frédéric, La Ferme de l'Orme.

***Marginella (Stazzania) crassula* Deshayes, 1865**
Pl. 5, fig. 1

1865 *Marginella crassula* Deshayes, p. 547, pl. 104, fig. 9-11

1913 *Marginella (Stazzania) crassula*, Desh. - Cossmann & Pissarro, pl. 46, fig. 208-2.

Description – read column 11 of the synoptical key for *Marginella (Stazzania)* species.

Remarks – This species is characterized by an elongated shell form and by the presence of four rather solid columellar folds that are never bifurcate.

Distribution – Bartonian (Auversian): not very common, e.g. Barisseuse, Baron, Le Guépelle; Lutetian: common, e.g. Châteaurouge, Chaumont-en-Vexin, Damery, Fercourt, Villiers-St. Frédéric.

***Marginella (Stazzania) chastaingi* Cossmann, 1889**

Pl. 5, fig. 2

1882 *Marginella ventricosa* Cossmann, p. 292, pl. 13, fig. 6 (non Fischer).

1889 *Marginella (s.s.) chastaingi* Cossmann, p. 204, pl. 6, fig. 20-21.

1913 *Marginella (Stazzania) chastaingi*, Cossm. – Cossmann & Pissarro, pl. 46, fig. 208-3.

Description – read column 12 of the synoptical key to species of *Marginella (Stazzania)*.

Remarks – This species may be recognized by its four very solid columellar folds, that are gradually flattening out anteriorly, not abruptly truncated.

Distribution – Bartonian (Auversian): rare, e.g. Baron; Lutetian: not very common, e.g. Chaumont-en-Vexin, Damery, Fercourt, Villiers-St-Frédéric.

***Marginella (Stazzania) entomella* Cossmann, 1889**

Pl. 5, fig. 3

1889 *Marginella (Egouena) entomella* Cossmann, p. 207, pl. 7, fig. 20.

1913 *Marginella (s. str.) entomella*, Cossm. – Cossmann & Pissarro, pl. 46, fig. 208-17.

Description – read column 13 of the synoptical key to *Marginella (Stazzania)* species.

Remarks – Easily recognizable species with four non-bifurcate, narrow and sharp, widely spaced columellar folds and an apertural margin that is only slightly thickened on the inside. The upper part of the body whorl is somewhat shouldered. This is a very rare species, of which I found only one specimen up to now.

Distribution – Lutetian: Villiers-St. Frédéric (coll. RGM 225 053, van Nieulande leg.), Frileuse, La Ferme-de-l'Orme, Chaussy (Gougerot & le Renard), Parnes (Cossmann).

***Marginella (Stazzania) eburnea* Lamarck, 1803**

Pl. 5, fig. 4

1803 *Marginella eburnea* Lamarck, p. 61.

1805 *Marginella eburnea* – Lamarck, pl. 44, fig. 9.

1913 *Marginella (Stazzania) eburnea*, Lamk. – Cossmann & Pissarro, pl. 46, fig. 208-1.

Description – read column 14 of the synoptical key to species of *Marginella (Stazzania)*.

Remarks – A rather large species (shell height normally to 10 mm, but reaching 15 mm according to Cossmann!). The general outline is biconical with a somewhat inflated body whorl. There are

four non-bifurcate, narrow and sharp columellar folds that are rather widely spaced. The apertural lip is slightly thickened.

Completely adult (or senile) specimens have the aperture relatively higher and five columellar folds. This form was considered by Cossmann (1889, p. 203) to be a variety (var. *pentaptycta*) of *M. eburnea*, but Gougerot & le Renard (1979, p. 13) raised it to the rank of subspecies under the name of *M. (S.) eburnea pentaptycta* Cossmann, 1889. The fact, however, that both forms occur together at several localities convinced me that in reality *pentaptycta* may not be given subspecific rank and should be considered as a forma. A specimen of this form is represented in pl. 5, fig. 5. The occurrence of a fifth (additional) columellar fold in this species may be compared with corresponding features in the species *M. abnormis*, *M. bifidoplicata* and *M. vandenbergae*.

Distribution - Lutetian: common.

***Marginella (Stazzania) edwardsi* Deshayes, 1865**

Pl. 5, fig. 6

1865 *Marginella Edwardsi* Deshayes, p. 547, pl. 104, fig. 12-14.

1913 *Marginella (Stazzania) Edwardsi*, Desh. - Cossmann & Pissarro, pl. 46, fig. 208-4.

Description - read column 15 of the synoptical key to species of *Marginella (Stazzania)*.

Remarks - Shell height to 9 mm, the initial whorls are rather flat to only very slightly convex, but the body whorl is inflated. There are four heavy columellar folds, of which the posterior one is directed upwards. This is a rather variable species and several specimens could only be classified dubitatively.

Distribution - Bartonian (Auversian): e.g. Auvers-sur-Oise, Barisseuse, Baron, Le Guépelle, Ver-sur-Launette; Lutetian: Gougerot & le Renard (1979) reported dubious specimens from Montmirail-Montchavet and St. Lubin-de-la-Haye.

***Marginella (Stazzania) morelletorum* Gougerot & Braillon, 1968**

Pl. 5, fig. 7

1968 *Marginella (Stazzania) morelletorum* Gougerot & Braillon, p. 196, pl 1, fig. 4.

Description - read column 16 of the synoptical key to *Marginella (Stazzania)* species.

Remarks - A small species (height to 3 mm) with a somewhat elongated biconical outline. The initial whorls are very convex. The inner and outer apertural lips are almost parallel. There are four very thin columellar folds.

Distribution - Bartonian (Auversian): rare, Gougerot & le Renard (1979) report specimens from Barisseuse and from Ronquerolles; Lutetian: rare, Chaumont-en-Vexin (1 specimen) and Villiers-St. Frédéric (2 specimens).

***Marginella (Stazzania) dissimilis* Deshayes, 1865**

Pl. 5, fig. 8

1865 *Marginella dissimilis* Deshayes, p. 548, pl. 104, fig. 15-17.

1913 *Marginella (Stazzania) dissimilis*, Desh. - Cossmann & Pissarro, pl. 46, fig. 208-5.

Description – read column 17 of the synoptical key to species of *Marginella (Stazzania)*.

Remarks – A typical characteristic for this species is the presence of a narrow vertical depression in which the four columellar folds are lying. This depression is separated from the body whorl by a blunt ridge. The middle part of the inner side of the apertural margin is somewhat thickened, by which the apertura is narrowed in its middle.

Distribution – Bartonian (Marinesian): rather rare, Chavençon; Bartonian (Auversian): not very common, e.g. Auvers-sur-Oise, Baron, Le Guépelle; Lutetian: rather common: e.g. Châteaurouge, Chaumont-en-Vexin, Damery, Fercourt, Grignon, Parnes, Villiers-St. Frédéric.

***Marginella (Stazzania) dentifera* Lamarck, 1803**

Pl. 6, fig. 1

1803 *Marginella dentifera* Lamarck, p. 61.

1913 *Marginella (Dentimargo) dentifera*, Lamk. – Cossmann & Pissarro, pl. 46, fig. 208-7.

Description – read column 18 of the synoptical key to *Marginella (Stazzania)* species.

Remarks – This species may be recognized at first glance by its very elongate spira and by the presence of a pointed denticle at the upper right corner of the apertura. The shell may reach 8 mm in height. *M. arctata* Deshayes, 1865, is only a very slender form of this species.

Distribution – Bartonian (Marinesian): very rare, Le Quoniam (Gougerot & le Renard, 1979); (Auversian): very rare, Le Fayel (Cossmann), Ronquerolles (Gougerot & le Renard, 1979); Lutetian: rather common.

***Marginella (Stazzania) hordeola* Deshayes, 1837**

Pl. 6, fig. 2.

1837 *Marginella hordeola* Deshayes, p. 708, pl. 95, fig. 26-29.

1913 *Marginella (Dentimargo) hordeola*, Desh. – Cossmann & Pissarro, pl. 46, fig. 208-8.

Description – read column 19 of the synoptical key to *Marginella (Stazzania)* species.

Remarks – This species is less elongate and has narrower columellar folds than the previous one. The thickening of the apertural margin decreases markedly from the denticle downwards and the outer side of the apertural margin is more thickened than in *M. dentifera*.

Distribution – Lutetian: rare, e.g. Fercourt, La Ferme de l'Orme.

Subgenus *Volvarina* Hinds, 1844

***Marginella (Volvarina) eurychilus* Cossmann, 1891**

Pl. 6, fig. 3

1891 *Marginella eurychilus* Cossmann, p. 72, pl. 3, fig. 14.

1913 *Marginella (Volvarina) eurychilus*, Cossm. – Cossmann & Pissarro, pl. 46, fig. 208-18.

Description – read column 1 of the synoptical key to species of *Marginella (Volvarina)*.

Remarks – This is a very rare species and one of the very few Marginellidae known from the Cuisian. Personally I have never found specimens of this species. The drawing given here was kindly made by Dr J. le Renard (Plaisir). Typical for this species is the fact that the anterior columellar fold continues as the margin of the siphonal canal, which gradually passes into the thickened apertural margin.

Distribution: Cuisian: very rare, Liancourt-St. Pierre (Cossmann).

***Marginella (Volvarina) cylindracea* Deshayes, 1865**

Pl. 6, fig. 4

1865 *Marginella cylindracea* Deshayes, p. 549, pl. 104, fig. 21-23.

1913 *Marginella (Volvarina) cylindracea*, Desh. – Cossmann & Pissarro, pl. 46, fig. 208-6.

Description – read column 2 of the synoptical key to species of *Marginella (Volvarina)*.

Remarks – This is also a very rare species. It may be distinguished from *M. eurychilus* by its more slender, almost cylindrical shell form and by the fact that the anterior columellar fold does not continue as the margin of the siphonal canal. Furthermore the only slightly thickened inner side of the apertural margin is somewhat turned down into the apertura.

Distribution: Bartonian (Marinesian): very rare, Chavençon (Gougerot & le Renard); (Auversian): very rare, Le Fayel (Deshayes), Le Guépelle (Cossmann); Lutetian: very rare, Grignon, Chaussy, La Ferme-de-l'Orme (Cossmann), Thionville-sur-Opton (Gougerot & le Renard), Villiers-St. Frédéric.

***Marginella (Volvarina) bouryi bouryi* Cossmann, 1889**

Pl. 6, fig. 5-6

1889 *Marginella (s.s.) Bouryi* Cossmann, p. 207, pl. 7, fig. 19.

1913 *Marginella (Volvarina) Bouryi*, Cossm. – Cossmann & Pissarro, pl. 46, fig. 208-15.

Description – read column 3 of the synoptical key to *Marginella (Volvarina)* species.

Remarks – Much smaller than the two species of this subgenus described above (shell height reaching only 2.5 mm). Also very different in outline: oviform with a very depressed spira. There are four columellar folds, of which the posterior one is placed more internally and therefore sometimes hardly visible. In juvenile specimens (pl. 6, fig. 6), however, this fold is obviously present.

Distribution – Lutetian: rare, Nauphlette, Chambors (Cossmann), Fercourt, Grignon, La Ferme-de-l'Orme (Gougerot & le Renard).

***Marginella (Volvarina) bouryi supraeocaenica* Gougerot & le Renard, 1979**

Pl. 6, fig. 7

1979 *Marginella (Volvarina) Bouryi supraeocaenica* Gougerot & le Renard, p. 16, fig. 37.

Description – read column 4 of the synoptical key to species of *Marginella (Volvarina)*.

Remarks – This form is characterized by the presence of only three columellar folds. A fourth fold

(if present) is placed deeply in the interior and very inconspicuous. Another difference with the nominal species is the form of the apertura. In *M. bouryi bouryi* the apertura is almost equally wide all over its height, but in *bouryi supraeocaenica* it is restricted in its upper part.

Although this form was introduced as a stratigraphical subspecies by Gougerot & le Renard (who knew it only from the Bartonian) the presence of typical specimens in the Lutetian deposits at Villiers-St. Frédéric contradict this supposition. I maintain, for the time being, the subspecific rank of this form, because of the absence of the typical form at Villiers. It might be a geographical subspecies that survived during the Bartonian.

Distribution - Bartonian (Marinesian): very rare, Le Quoniam (Gougerot & le Renard); Lutetian: very rare, Villiers-St. Frédéric.

***Marginella (Volvarina) keukelaari* n. sp.**

Pl. 6, fig. 8a-c

Locus typicus - Barisseuse (France, department Oise).

Stratum typicum - Bartonian (Auversian).

Derivatio nominis - It is a pleasure to dedicate this new species to Mr H. Keukelaar (Nieuwpoort, the Netherlands), who collected the type material.

Description - Shell small (height to 3 mm, width to 1.8 mm). Outline thick-set cylindrical, relatively broad. There are 2½ to 3 whorls, of which the body whorl occupies 7/8 of the entire shell height. The height of the aperture is about 5/6 of the height of the shell. The spira is low and rounded. The apertural margin is almost straight and slightly thickened internally just above its middle. Exteriorly the margin is smooth and hardly or not thickened. Because of the slightly concave columella the apertura is wider anteriorly than posteriorly. The shell has five columellar folds. The two anterior ones are well-developed and oblique. Just in front of the extreme ends of these folds the basal part of the body whorl is thickened. This thickening, that could be considered to be an upward continuation of the margin of the siphonal canal, is restricted to the two lower columellar folds. The third and the fourth folds are much less developed and less oblique, their ends remain more interiorly. The fifth fold is still weaker and sometimes hardly visible in a straight view.

Discussion - The present species shows some resemblance with species of the genus *Hyalina* Schumacher, 1817, especially because of its concave columellar side. On the other hand, the cylindrical shell form, the non-bifurcate folds and the vertical, only slightly thickened apertural margin are characteristics that fit much better in the *Marginella (Volvarina)* group.

The short, cylindrical outline and the thickening at the base of the body whorl readily distinguish the new form from all other species in this group.

Juvenile specimens may resemble *Gibberula pusilla*, in which occasionally the two anterior columellar folds may be stronger developed. They are, however, always more cylindrical in outline and have an almost straight apertural margin. Shells of *G. pusilla* are more inflated-oviform, with a curved apertural margin. In *M.(V.) keukelaari* the inner side of the apertural margin is always smooth and only slightly thickened, in *G. pusilla* it is crenulated and regularly more thickened.

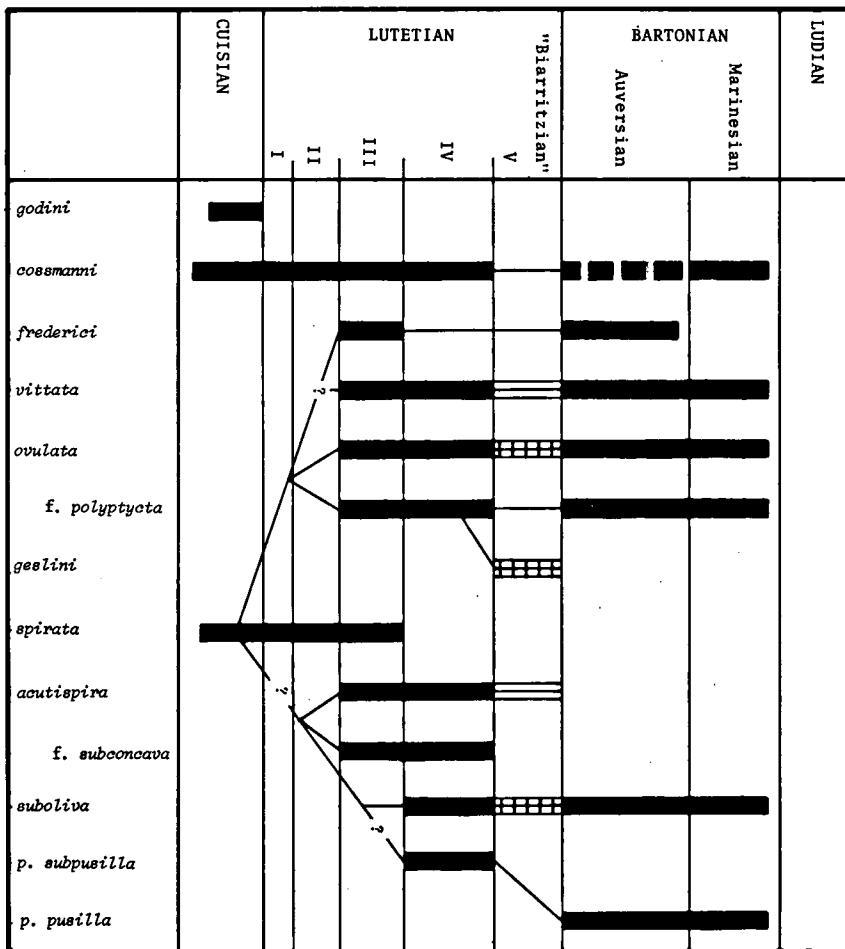
Distribution - only known from the type locality.

Material - Holotype in coll. RGM 225089. Paratypes: 6 specimens (coll. van Nieulande, leg. Keukelaar-van den Berge), 22 specimens (coll. Keukelaar-van den Berge), 1 specimen (coll. Gougerot, leg. Keukelaar-van den Berge), 1 specimen (coll. le Renard).

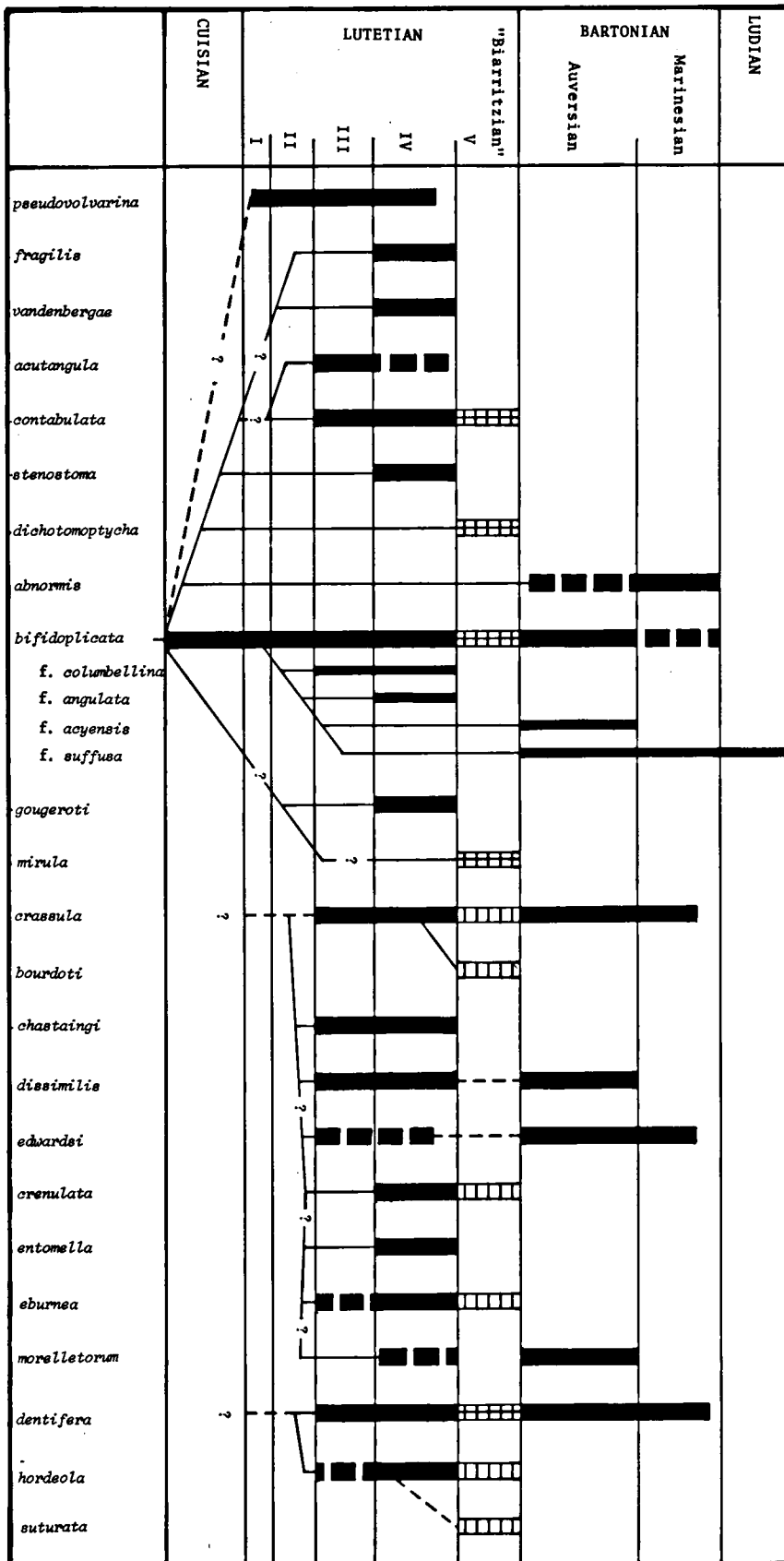
SOME REMARKS ON MARGINELLIDAE INTERRELATIONSHIPS

When studying the Eocene Marginellidae of the Paris Basin one of the most striking features is the presence, during Lutetian and Bartonian, of a large number of species, whereas during the Cuisian only a very restricted number of taxa was present. Marginellidae are unknown from the Palaeocene deposits. Generally the relationships between the Lutetian and the Bartonian forms are obvious. Most Bartonian forms are either identical with their forerunners or can easily be related to Lutetian forms. Only very few taxa are exclusively known from the Bartonian.

If one tries to estimate the mutual relationships of the species it appears to be practically impossible to construct distinct lineages. It would appear that during the Lutetian an explosive development of Marginellid species took place. In text-figures 3 and 4 examples of such explosive developments are given for *Gibberula* and *Marginella (Stazzania)*. To a very high degree, however, the supposed interrelationships are speculative and based on presumptions. It is, for example, certainly not to be excluded that the taxa mentioned belong in reality to more phylogenetical lineages of which the ancestors immigrated during the Lutetian. This latter possibility holds especially for the *Marginella (Stazzania)* group, of which from the Paris Basin only one Cuisian representative is



Text-fig. 3. Possible interrelationships within the Eocene *Gibberula* species in France. Solid black = Paris Basin; vertical hatching = Cotentin Basin; horizontal hatching = Nantes Basin.



Text-fig. 4. Possible interrelationships within the Eocene *Marginella (Stazzania)* species in France.

Solid black = Paris Basin; vertical hatching = Cotentin Basin; horizontal hatching = Nantes Basin.

known. It is interesting to note the presence of a *Gibberula* species, related to *G. acutispira* in Paleocene deposits at Mons, Belgium (Glibert, 1973, p. 81).

In general it is supposed that the Marginellidae developed, together with the family Volutomitridae, during the Eocene from the Volutidae. Ponder (1973) supposes that the Late Cretaceous genus *Myobarbum* Sohl might be an ancestor of the Marginellidae.

Concerning the high number of species during the Middle and Late Eocene it could be suggested that the Marginellidae in general make high demands upon their ecological circumstances, which could be an explanation for the origin of endemisms. Comparable phenomena are known from the Recent tropical Marginellidae, e.g. in Australia, where in certain bays up to twenty different species are found. In a next bay the same number of species occurs, but only few species of these are also present at the first locality. Such phenomena lead to the presence of very delicate differences in morphology between the species, which are, however, constant for large numbers of individuals.

It is obvious that the final words in regard to the phylogeny of the Marginellidae have not yet been spoken. The existing gaps may be a stimulation to further research in this interesting group!

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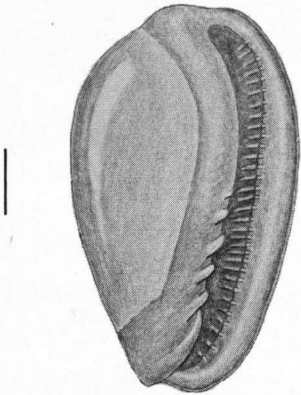
- sont figurés dans la collection des vélins du Muséum. – Ann. Mus. Hist. nat. Paris, 1: 299-312, 383-391, 474-479, 1902; 2: 57-64, 163-169, 217-227, 315-321, 385-391, 1803; 3: 163-170, 266-274, 343-352, 436-441, 1804; 4: 46-55, 105-115, 212-222, 289-298, 429-436, 1804; 5: 28-36, 91-98, 179-188, 237-245, 349-357, 1805; 6: 117-126, 214-221, 337-345, 407-415, pls. 43-46, 1805; 7: 53-62, 130-139, 231-244, 419-430, pls. 13-15, 1806; 8: 156-166, 347-355, 461-469, pls. 35-37, pls. 59-62, 1806; 9: pls. 17-20, pls. 31-32, 1807; 12: pls. 40-43, 1810; 14: pls. 21-23, 1812.
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EXPLANATION OF PLATE 1

All specimens (except nr. 9) are kept in the collections of the Rijksmuseum van Geologie and Mineralogie, Leiden, the Netherlands (RGM registration numbers).

Bar length represents 1 mm. All drawings (except nr. 9) made by the author.

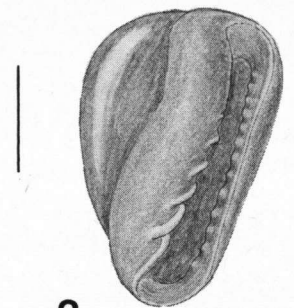
1. *Persicula angystoma* (Deshayes, 1837)
Fercourt. RGM 225 062. Leg. van Nieulande.
2. *Persicula dautzenbergi* Cossmann, 1898
Baron. RGM 225 083. Leg. van Nieulande.
3. *Persicula pseudampulla* Gougerot & le Renard, 1979
Châteaurouge. RGM 225 081. Leg. van Nieulande.
4. *Persicula cf. goossensi* (Cossmann, 1889)
Fercourt. RGM 225 063. Leg. J. Gunst.
5. *Persicula cf. goossensi* (Cossmann, 1889)
Parnes. RGM 225 090. Leg. J. Gunst.
6. *Persicula cf. goossensi* (Cossmann, 1889)
Parnes. RGM 225 091. Leg. van Nieulande.
7. *Gibberula frederici* (Cossmann, 1889)
Baron. RGM 225 084. Leg. van Nieulande.
8. *Gibberula cossmanni* (Morlet, 1888)
Villiers-St. Frédéric. RGM 225 046. Leg. van Nieulande.
9. *Gibberula godini* (Cossmann, 1896)
Hérouval. Drawing made by Dr J. le Renard, based on the original illustration of Cossmann.
10. *Gibberula vittata* (Edwards, 1855)
Grignon. RGM 225 077. Leg. van Nieulande.



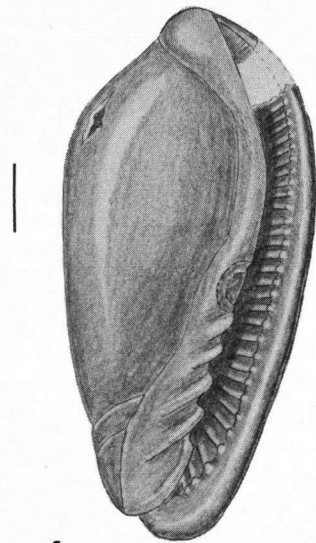
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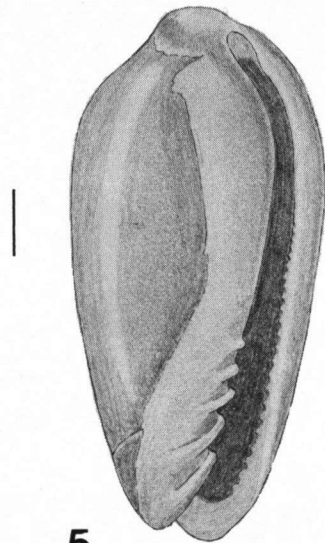
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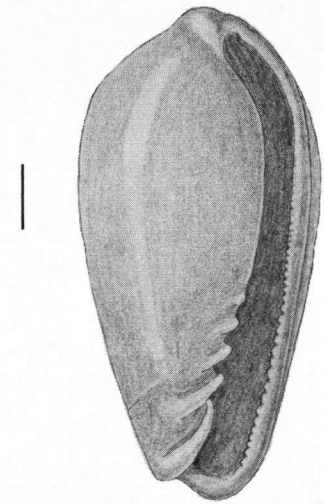
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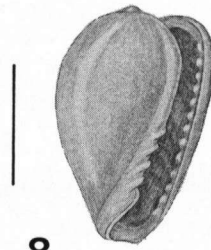
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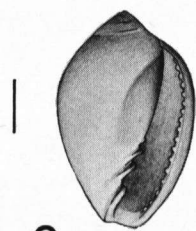
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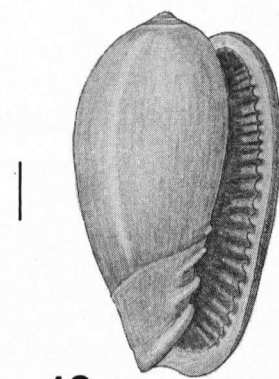
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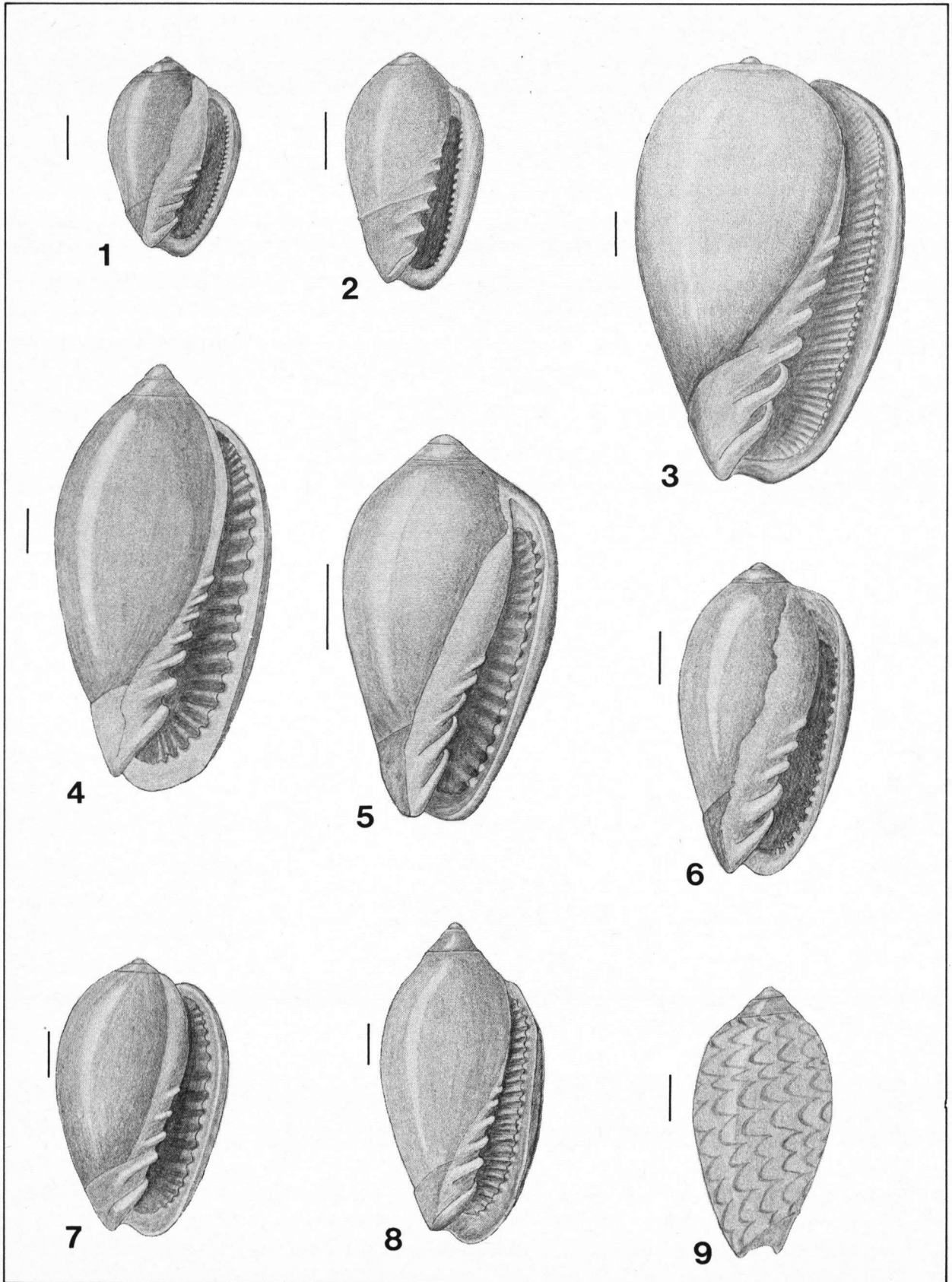
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EXPLANATION OF PLATE 2

All specimens are kept in the collections of the Rijksmuseum van Geologie and Mineralogie, Leiden, the Netherlands (RGM registration numbers).

Bar length represents 1 mm. All drawings made by the author.

1. *Gibberula pusilla pusilla* (Edwards, 1855)
Le Guépelle. RGM 225 086. Leg. van Nieulande.
2. *Gibberula pusilla subpusilla* n. subsp. HOLOTYPE
Villiers-St. Frédéric. RGM 225 045. Leg. van Nieulande.
3. *Gibberula ovulata* (Lamarck, 1803) f. *polyptycta* Cossmann
Damery. RGM 225 073. Leg. van Nieulande.
4. *Gibberula suboliva* (Cossmann, 1889)
Villiers-St. Frédéric. RGM 225 044. Leg. van Nieulande.
5. *Gibberula spirata* (Cossmann, 1889)
Aizy-Jouy. RGM 225 085. Leg. A. Haandrikman.
6. *Gibberula spirata* (Cossmann, 1889)
Grignon. RGM 225 076. Leg. van Nieulande.
7. *Gibberula acutispira* (Cossmann, 1889)
Villiers-St. Frédéric. RGM 225 047. Leg. van Nieulande.
8. *Gibberula acutispira* (Cossmann, 1889) f. *subconcava* Cossmann
Damery. RGM 225 074. Leg. van Nieulande.
9. *Gibberula acutispira* (Cossmann, 1889) f. *subconcava* Cossmann
Châteaurouge. RGM 225 082. Leg. van Nieulande.

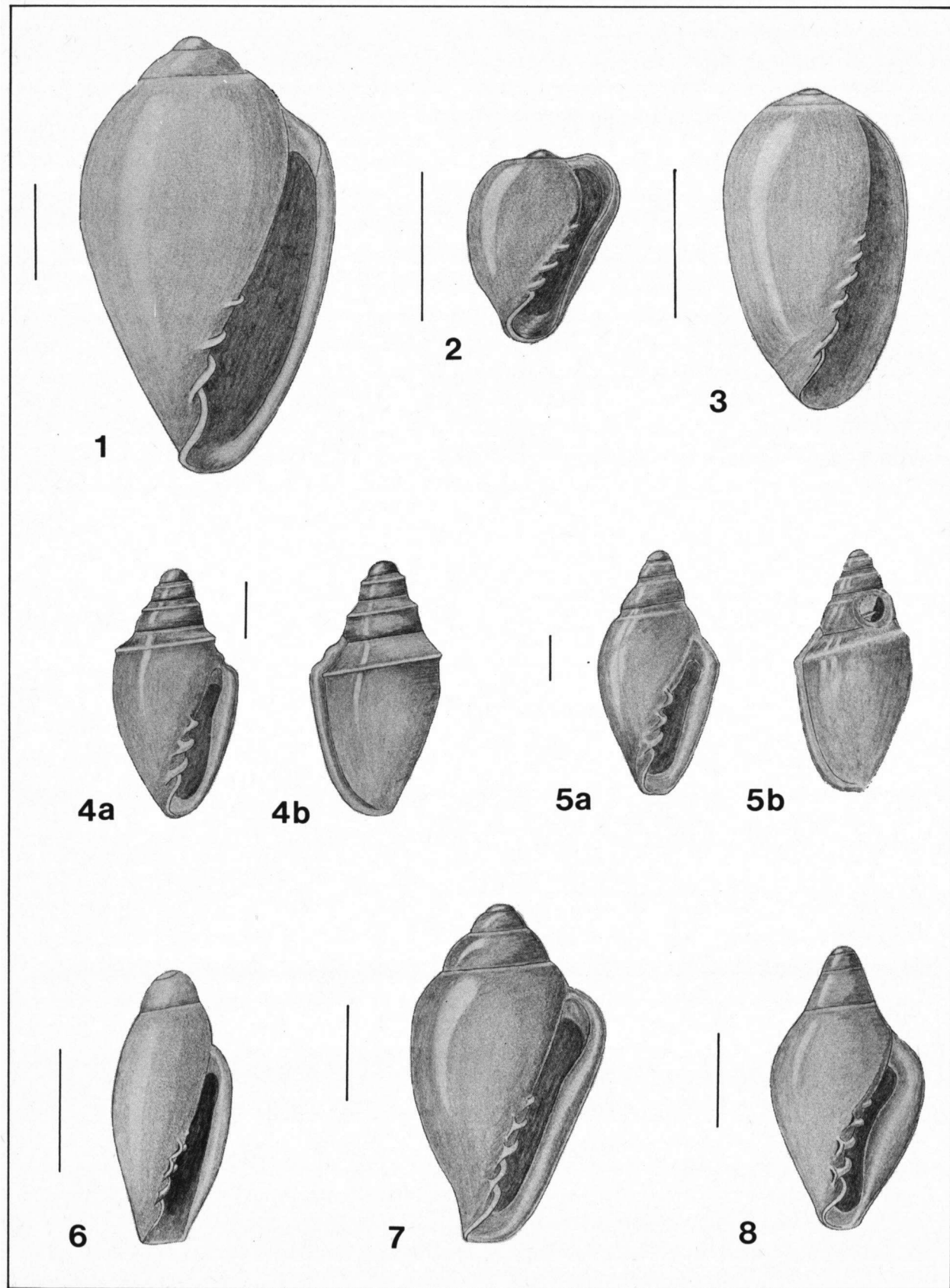


EXPLANATION OF PLATE 3

All specimens are kept in the collections of the Rijksmuseum van Geologie and Mineralogie, Leiden, the Netherlands (RGM registration numbers).

Bar length represents 1 mm. All drawings made by the author.

1. *Marginella (Glabella) nitidula* Deshayes, 1837
Grignon. RGM 225 078. Leg. van Nieulande.
2. *Marginella (Glabella) alixi* (Cossmann, 1919)
Fercourt. RGM 225 064. Leg. van Nieulande.
3. *Marginella (Glabella) chevallieri* (Cossmann, 1889)
Fercourt. RGM 225 065. Leg. van Nieulande.
4. *Marginella (Stazzania) acutangula* Deshayes, 1865
Chaumont-en-Vexin. RGM 225 079. Leg. van Nieulande.
5. *Marginella (Stazzania) contabulata* Deshayes, 1865
Villiers-St. Frédéric. RGM 225 054. Leg. van Nieulande.
6. *Marginella (Stazzania) pseudovolvarina* Gougerot & le Renard, 1979
Villiers-St. Frédéric. RGM 225 049. Leg. van Nieulande. See also text-fig. 1!
7. *Marginella (Stazzania) fragilis* Deshayes, 1865
Fercourt. RGM 225 069. Leg. T. Keukelaar-van den Berge.
8. *Marginella (Stazzania) abnormis* Morlet, 1888
RGM 225 088. Leg. van Nieulande.

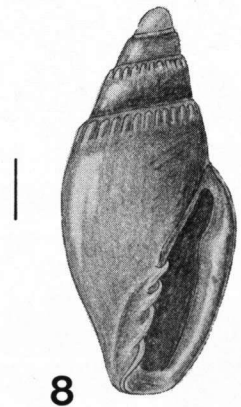
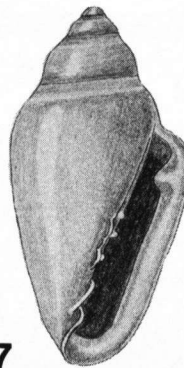
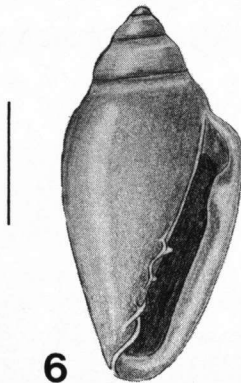
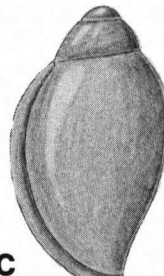
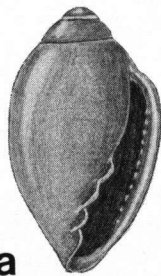
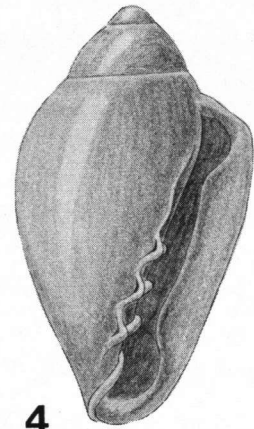
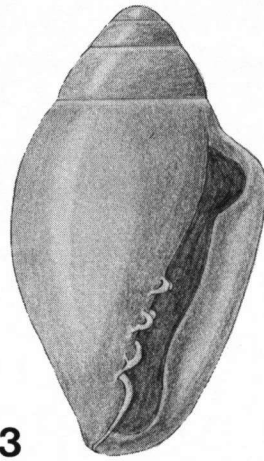
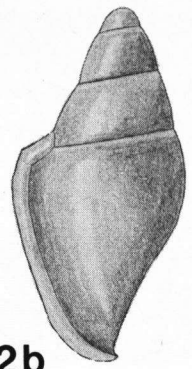
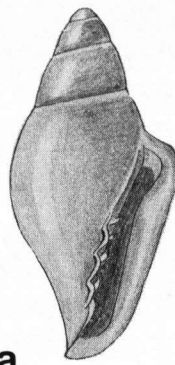
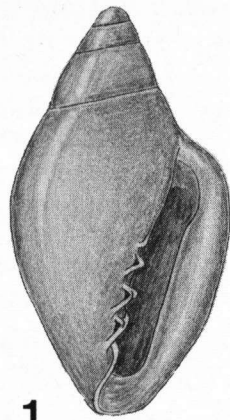


EXPLANATION OF PLATE 4

All specimens are kept in the collections of the Rijksmuseum van Geologie and Mineralogie, Leiden, the Netherlands (RGM registration numbers).

Bar length represents 1 mm. All drawings made by the author.

1. *Marginella (Stazzania) bifidoplicata* Edwards, 1855
Fercourt. RGM 225 068. Leg. van Nieulande.
2. *Marginella (Stazzania) bifidoplicata* Edwards, 1855 f. *angulata* n. forma. HOLOTYPE
Fercourt. RGM 225 067. Leg. van Nieulande.
3. *Marginella (Stazzania) stenostoma* n. sp. HOLOTYPE
Villiers-St. Frédéric. RGM 225 057. Leg. van Nieulande.
4. *Marginella (Stazzania) stenostoma* n. sp. PARATYPE
Villiers-St. Frédéric. RGM 225 058. Leg. van Nieulande.
5. *Marginella (Stazzania) gougeroti* n. sp. HOLOTYPE
Villiers-St. Frédéric. RGM 225 055. Leg. van Nieulande.
6. *Marginella (Stazzania) vandenbergae* n. sp. HOLOTYPE
Villiers-St. Frédéric. RGM 225 050. Leg. van Nieulande.
7. *Marginella (Stazzania) vandenbergae* n. sp. PARATYPE
Villiers-St. Frédéric. RGM 225 051. Leg. van Nieulande.
8. *Marginella (Stazzania) crenulata* Deshayes, 1865
Villiers-St. Frédéric. RGM 225 059. Leg. van Nieulande.

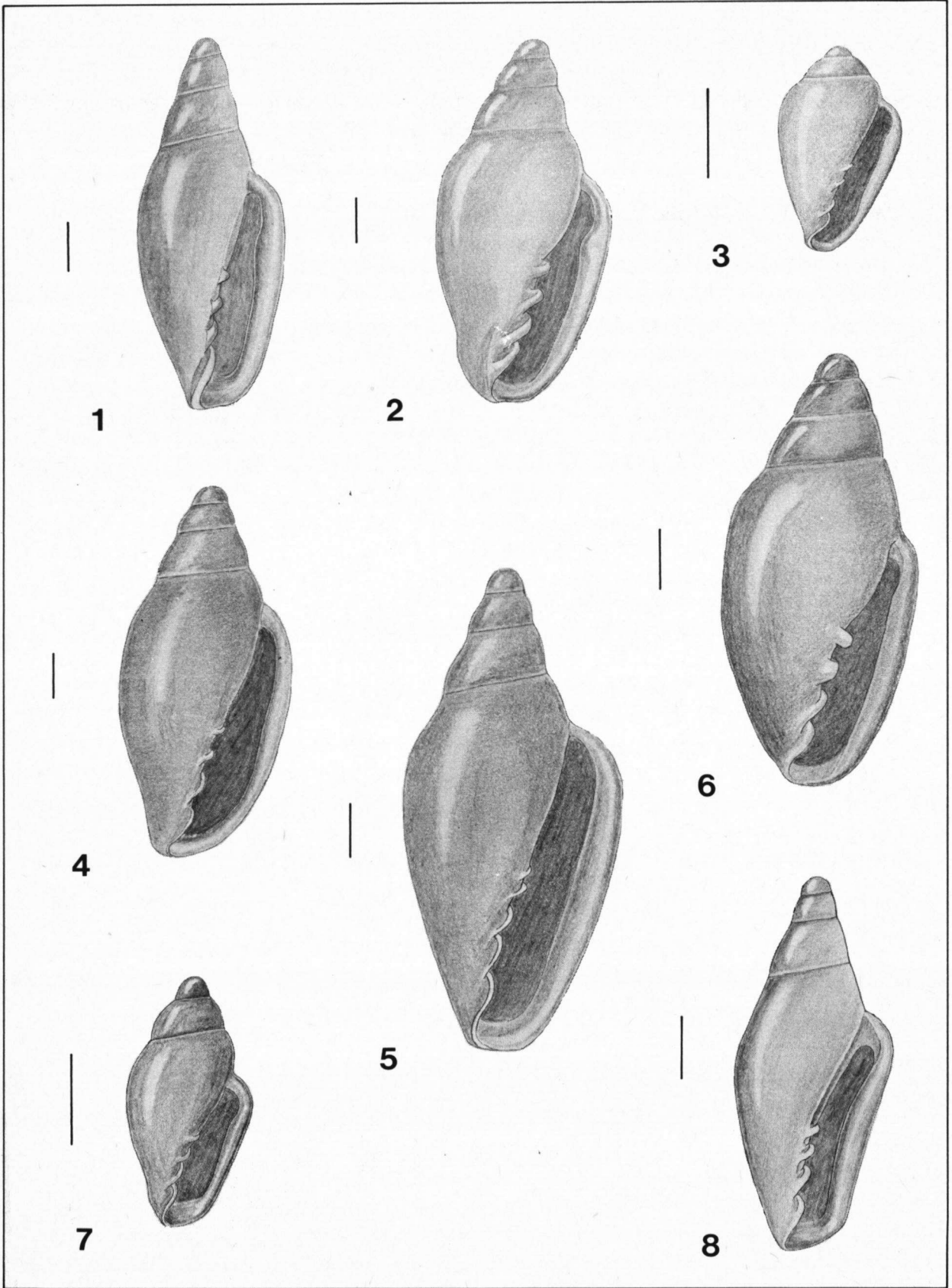


EXPLANATION OF PLATE 5

All specimens are kept in the collections of the Rijksmuseum van Geologie and Mineralogie, Leiden, the Netherlands (RGM registration numbers).

Bar length represents 1 mm. All drawings made by the author.

1. *Marginella (Stazzania) crassula* Deshayes, 1865
Damery. RGM 225 075. Leg. van Nieulande.
2. *Marginella (Stazzania) chastaingi* Cossmann, 1889
Villiers-St. Frédéric. RGM 225 052. Leg. van Nieulande.
3. *Marginella (Stazzania) entomella* Cossmann, 1889
Villiers-St. Frédéric. RGM 225 053. Leg. van Nieulande.
4. *Marginella (Stazzania) eburnea* Lamarck, 1803
Villiers-St. Frédéric. RGM 225 048. Leg. van Nieulande.
5. *Marginella (Stazzania) eburnea* Lamarck, 1803 f. *pentaptycta* Cossmann
Fercourt. RGM 225 066. Leg. van Nieulande.
6. *Marginella (Stazzania) edwardsi* Deshayes, 1865
Auvers-sur-Oise. RGM 225 087. Leg. van Nieulande.
7. *Marginella (Stazzania) morelletorum* Gougerot & Braillon, 1968
Chaumont-en-Vexin. RGM 225 080. Leg. van Nieulande.
8. *Marginella (Stazzania) dissimilis* Deshayes, 1865
Villiers-St. Frédéric. RGM 225 056. Leg. van Nieulande.



EXPLANATION OF PLATE 6

All specimens (except nr. 3) are kept in the collections of the Rijksmuseum van Geologie and Mineralogie, Leiden, the Netherlands (RGM registration numbers).

Bar length represents 1 mm. All drawings (except nr. 3) made by the author.

1. *Marginella (Stazzania) dentifera* Lamarck, 1803
Fercourt. RGM 225 070. Leg. van Nieulande.
2. *Marginella (Stazzania) hordeola* Deshayes, 1837
Fercourt. RGM 225 071. Leg. van Nieulande.
3. *Marginella (Volvarina) eurychilus* Cossmann, 1891
Liancourt-St. Pierre. Drawing made by Dr J. le Renard, based on a specimen in his own collection.
4. *Marginella (Volvarina) cylindracea* Deshayes, 1865
Villiers-St. Frédéric. RGM 225 061. Leg. van Nieulande.
5. *Marginella (Volvarina) bouryi bouryi* Cossmann, 1889
Fercourt. RGM 225 072. Leg. van Nieulande.
6. *Marginella (Volvarina) bouryi bouryi* Cossmann, 1889, juvenile specimen
Grignon. RGM 225 092. Leg. T. Keukelaar-van den Berge.
7. *Marginella (Volvarina) bouryi supraeocena* Gougerot & le Renard, 1979
Villiers-St. Frédéric. RGM 225 060. Leg. van Nieulande.
8. *Marginella (Volvarina) keukelaari* n. sp. HOLOTYPE
Barisseuse. RGM 225 089. Leg. T. Keukelaar-van den Berge.

