The Upper Miocene gastropods of northwestern France. Part 8: *fine*, *addenda* and *corrigenda*

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In this paper we conclude the taxonomic revision of the gastropods of Assemblage I (*sensu* Van Dingenen *et al*., 2015) of the Upper Miocene Tortonian of northwestern France. Additions and revisions to previous parts of the work are included resulting in the description of nine new species: *Palazzia omalogyroides* nov. sp., *Skeneoides karrineae* nov. sp., *Alvania praetermissa* nov. sp., *Setia minutissima* nov. sp., *Cerithiella bisulcata* nov. sp., *Ophieulima ligeriana* nov. sp., *Costoanachis haurzhauseri* nov. sp., *Suluspira gallica* nov. sp., and *Andonia fosseensis* nov. sp.. *Bolma redoniana* nov. nom. is proposed for *Turbo trochleatus* Millet, 1865, *non* zu Münster, 1841.

Key words: northwestern France, Upper Miocene, Gastropoda, fine, addenda and corrigenda, new taxa

Introduction

For introduction to this series, geological setting and material and methods, see Landau *et al*. (2017). In this part we conclude the systematic section with a description of species in the superfamily Oxynooidea Stoliczka 1868 (1847) and superorder Eupulmonata Haszprunar & Huber, 1990, we add new records of species covered in previous parts of this series either revised, previously omitted, or found subsequent to the publications, and correct some errors made in previous parts of the series.

Abbreviations:

FVD	Frank Van Dingenen private collection (Brecht, Belgium).
LC	Luc Ceulemans private collection (Rixensart, Belgium).
MNHN.F	Muséum national d'Histoire naturelle, collection de Paléontologie (Paris, France).
NHMW	Naturhistorisches Museum Wien collection (Vienna, Austria).
RGM	Rijksmuseum van Geologie en Mineralogie, now Naturalis Biodiversity Center, collection Cainozoic Mollusca (Leiden, The Netherlands).

dp = diameter protoconch, dn = diameter nucleus

Systematics (*fine*)

Superfamily Oxynooidea Stoliczka 1868 (1847)
Family Juliidae E.A. Smith, 1885
Subfamily Juliinae E.A. Smith, 1885
Genus *Candinia* Le Renard, Sabelli & Taviani, 1996

Type species – *Candinia pliocaenica* Le Renard, Sabelli & Taviani, 1996, by original designation, Pliocene, Italy.

1996 *Candinia* Le Renard, Sabelli & Taviani, p. 230.

Candinia pliocaenica Le Renard, Sabelli & Taviani, 1996

Plate 1, figs 1-2

*1996 *Candinia pliocaenica* Le Renard, Sabelli & Taviani, p. 232, figs 1-4.

Material and dimensions – Maximum diameter 8.9 mm, width 7.3 mm (incomplete). **St-Clément-de-la-Place**: NHMW 2016/0103/2123 (1). **Renauleau**: NHMW 2016/0103/0998-0999 (2). **Beugnon**: RGM.1352733 (1 incomplete large specimen maximum diameter 8.9 mm).

Discussion – We have compared the scant Assemblage I

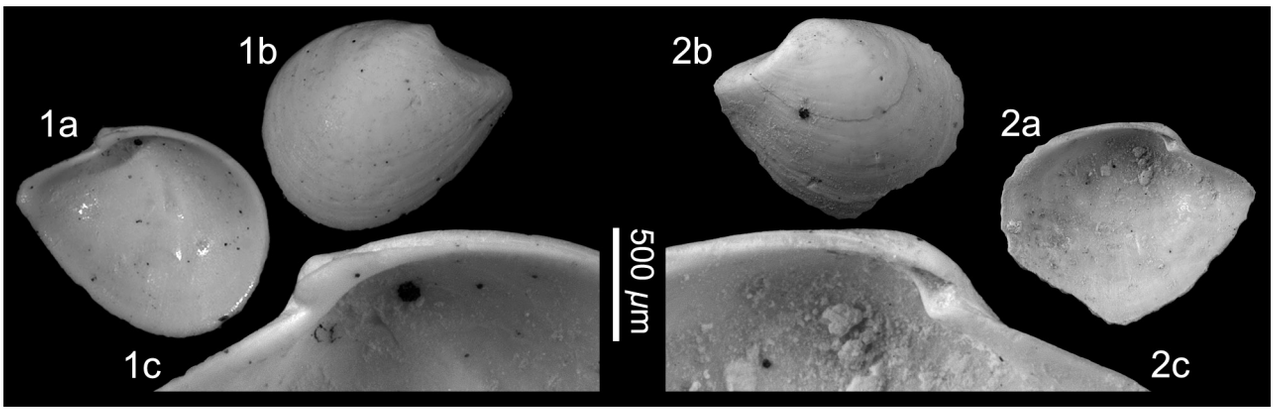

Plate 1. *Candinia pliocaenica* Le Renard, Sabelli & Taviani, 1996; 1. NHMW 2016/0103/0998 (left valve), diameter 3.5 mm, 1c, detail of hinge area; 2. NHMW 2016/0103/0999 (right valve), diameter 3.4 mm, 2c, detail of hinge area (digital images). Renauleau, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

material with more plentiful specimens of *Candinia pliocaenica* Le Renard, Sabelli & Taviani, 1996 from the type locality of Poggio alla Staffa, Pietrafitta, Italy (NHMW coll.) and find no consistent differences between them. The posterior portion of the valves is more produced in the Assemblage I specimens illustrated than in specimens figured by Le Renard *et al.* (1996, figs 1-3). However, in the Poggio alla Staffa material at hand most of the valves are more produced posteriorly than illustrated in the type series. The small coiled protoconch decollates in adult specimens and is not present in our material. Three species are known within the genus; *C. pliocaenica*, *C. krachi* Bałuk & Jakubowski, 1968 from the Middle Miocene of the Paratethys in Poland, which was fully compared by Le Renard *et al*. (1996, p. 234), and *C. lakoniae* Schneider, Hochleitner & R. Janssen, 2008 from the Upper Pliocene of Greece. *Candinia lakoniae* differs from *C. pliocenica* in being smaller shelled (max. height 5.8 mm vs. 8.9 mm), the posterior part of the shell is more acutely angled, and internally the adductor scar and pallial line more pronounced.

Distribution – Upper Miocene: Atlantic (Tortonian), NW France (this paper). Lower Pliocene: central Mediterranean, Italy (Le Renard *et al*., 1996).

Superorder Eupulmonata Haszprunar & Huber, 1990
Order Ellobiidae Pfeiffer, 1854 (1822)
Superfamily Ellobioidea Pfeiffer, 1854 (1822)
Family Ellobiidae Pfeiffer, 1854 (1822)
Subfamily Melampodinae Stimpson 1851 (1850)
Genus *Melampus* de Montfort, 1810

Type species – *Bulimus coniformis* Bruguière, 1789, by original designation, present-day, French Guiana.

1810 *Melampus* de Montfort, p. 318.
1816 *Conovulus* Lamarck, p. 12. Type species (by subsequent designation, Martins, 1996): *Bulimus coniformis* Bruguière, 1789, present-day, French Guiana.
1840b *Detracia* Gray, p. 20. Type species (by monotypy): *Voluta bullaeoides* Montagu, 1808, present-day, Antilles.
1855a *Tifata* H. Adams & A. Adams, p. 245. Type species (by subsequent designation, Martins, 1996): *Auricula globulus* d'Orbigny, 1837, present-day, Ecuador.

***Melampus lineolatus* (de Morgan, 1917)**
Plate 2, fig. 1

*1917 *Auricula* (*?*) *lineolata* de Morgan, p. 24, figs 10-12.
1938 *Auricula* ? *lineolata* De Morgan – Peyrot, p. 320.
1952 *Ellobium* ? *lineolatum* Morgan, 1916 [*sic*] – Glibert, p. 406.

Material and dimensions – Height 6.0 mm, width 3.5 mm. **Sceaux-d'Anjou**: NHMW 2016/0103/2030 (1).

Discussion – *Melampus lineolatus* (de Morgan, 1917) is characterised by its regularly ovate shape with a very low spire, the last whorl comprises almost the entire shell height, the surface is entirely covered in fine spiral sculp-

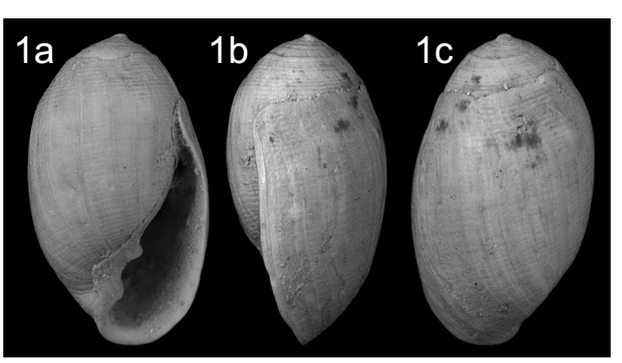

Plate 2. *Melampus lineolatus* (de Morgan, 1917); 1. NHMW 2016/0103/2030, height 6.0 mm, width 3.5 mm (digital image). La Presselière, Sceaux-d'Anjou, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

ture, the aperture is relatively large, the siphonal canal short, wide and posteriorly recurved, and the columella bears two prominent oblique folds abapically. The single specimen at hand from Sceaux-d'Anjou agrees entirely with the figures given by de Morgan (1917, figs 10-12). *Melampus lineolatus* seems to be extremely uncommon both in the Loire Basin and in Assemblage I, where it has been found only at Sceaux-d'Anjou.

Distribution – Middle Miocene: Atlantic, Loire Basin, France (de Morgan, 1917). Upper Miocene: Atlantic (Tortonian), NW France (this paper).

Subfamily Pythiinae Odhner, 1925 (1880)
Genus *Laemodonta* Philippi, 1846

Type species – *Auricula striata* Philippi, 1846, by monotypy, present-day, Hawaii, USA.

1846 *Laemodonta* Philippi, p. 98.
1854b *Plecotrema* H. Adams & A. Adams, p. 120. Type species (by original designation): *Plecotrema typica* H. Adams & A. Adams, 1854, present-day, Malaysia.
1855b *Laimodonta* H. Adams & A. Adams, p. 34. Type species (by subsequent designation; Kobelt, 1880): *Auricula sandwichiensis* Souleyet, 1852, present-day, Hawaii, USA.
1892 *Proplecotrema* Boettger *in* Degrange-Touzin, p. 157. Type species (by monotypy): *Auricula marginalis* Grateloup, 1828, Miocene, France.
1917 *Plecotremopsis* de Morgan, p. 34. Type species (by original designation): *Plecotrema bourgeoisi* Tournouër, 1870, Miocene, France.

***Laemodonta delaunayi* (Tournouër, 1870)**
Plate 3, fig. 1

*1870 *Plecotrema Delaunayi* Tournouër, p. 357.
1872 *Plecotrema Delaunayi* – Tournouër, p. 106, pl. 4, fig. 8.
1886 *Plecotrema Delaunayi* Tournouër – Dollfus & Dautzenberg, p. 140.
1917 *Plecotrema Delaunayi* Tournouër – de Morgan, p. 38, fig. 50.
1938 *Plecotrema Delaunayi* Tounouer [*sic*] – Peyrot, p. 325.
1952 *Laemodonta* (*Laemodonta*) *delaunayi* Tournouër, 1870 – Glibert, p. 399, pl. 15, fig. 12.

Material and dimensions – Maximum height 3.5 mm, width 2.8 mm. **St-Clément-de-la-Place**: NHMW 2016/0103/1063 (1).

Discussion – *Laemodonta delaunayi* (Tournouër, 1870) is easily recognised by having the surface completely covered in spiral sculpture. De Morgan (1917, p. 38) commented that in the Middle Miocene of the Loire Basin there was some variability, but this was difficult to comment on due to its rarity. The same comment applies in the Upper Miocene Assemblage I, where it is known from a single specimen. However, as in the other Ellobiidae from Assemblage I, the apertural armature is less strongly developed than in the Loire Basin material.
We have found it only at St-Clément-de-la-Place.

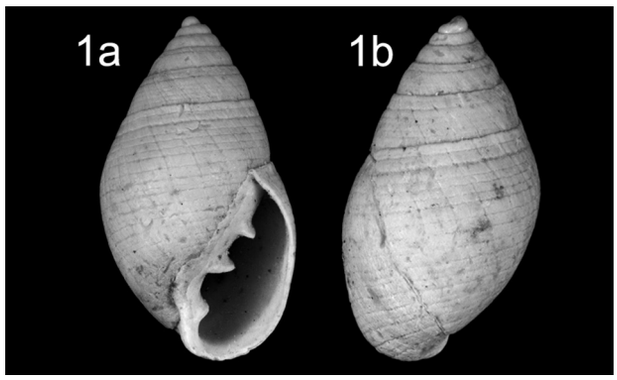

Plate 3. *Laemodonta delaunayi* (Tournouër, 1870); 1. NHMW 2016/0103/1063, height 4.6 mm, width 2.6 mm (digital image). Le Grand Chauvereau, St-Clément-de-la-Place, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

Distribution – Middle Miocene: Atlantic, Loire Basin, France (Tournouër, 1870, 1872; Dollfus & Dautzenberg, 1886; de Morgan, 1917; Peyrot, 1938; Glibert, 1952). Upper Miocene: Atlantic (Tortonian), NW France (Brébion, 1964).

***Laemodonta marginalis* (Grateloup, 1828)**
Plate 4, figs 1-4

*1828 *Auricula marginalis* Grateloup, p. 104.
1838 *Auricula marginalis* Grat. – Grateloup, p. 255, pl. 6, fig. 2.
1847 *Auricula marginalis* Grat. – Grateloup, pl. 11, fig. 2.
1854 *Auricula Umbilicata* Desh. – Millet, p. 154 [*non Cassidula umbilicata* (Deshayes, 1830)].
1870 *Plecotrema marginalis* Grateloup – Tournouër, p. 356.
1872 *Plecotrema marginalis* – Tournouër (*partim*), p. 100, pl. 4, fig. 4b, c [*non* fig 4a = *Myosotella pisolina* (Deshayes, 1830)].
1872 *Plecotrema callibasis* Tournouër, p. 101, pl. 4, fig. 5.
1917 *Plecotrema marginale* Grateloup – de Morgan, p. 36, fig. 43.
1917 *Plecotrema Tournoueri* de Morgan, p. 36, figs 44-45.
1932 *Plecotrema* (*Proplecotrema*) *marginale* Grateloup – Peyrot, p. 228, pl. 14, figs 45, 46, 52-55.
1938 *Plecotrema marginale* Grateloup – Peyrot, p. 323.
1952 *Laemodonta* (*Proplecotrema*) *marginalis* Grateloup, 1827 [*sic*] – Glibert, p. 400, pl. 15, fig. 13.
1964 *Laemodonta* (*Proplecotrema*) *marginalis* Grateloup, 1827 [*sic*] – Brébion, p. 666.

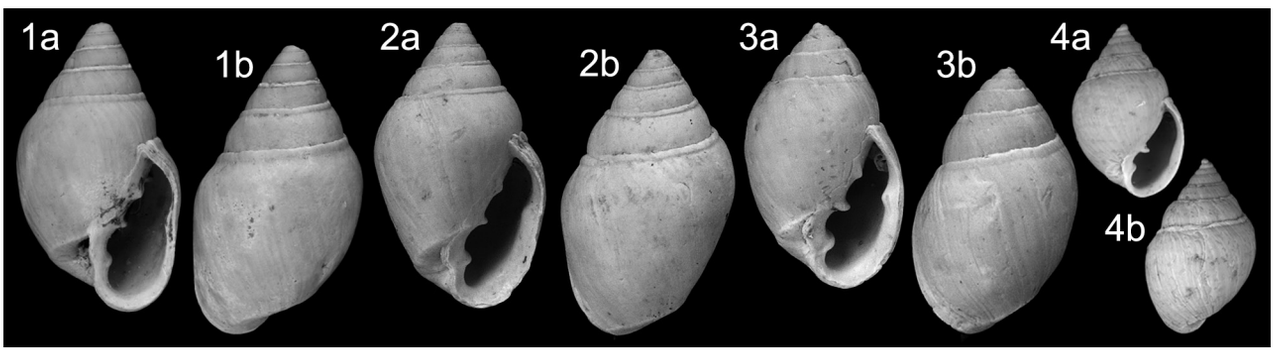

Plate 4. *Laemodonta marginalis* (Grateloup, 1828); 1. NHMW 2016/0103/1064, height 13.6 mm, width 7.6 mm; 2. NHMW 2016/0103/2026, height 9.0 mm, width 5.1 mm; 3. NHMW 2016/0103/2027, height 7.4 mm, width 4.4 mm; 4. NHMW 2016/0103/1065, height 5.9 mm, width 3.8 mm (juvenile) (digital images). Le Grand Chauvereau, St-Clément-de-la-Place, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

Material and dimensions – Maximum height 13.6 mm, width 7.6 mm. **St-Clément-de-la-Place**: NHMW 2016/0103/1064-1065 (1 large adult + 1 juvenile), NHMW 2016/0103/2026-2027 (2), NHMW 2016/0103/1066 (11 subadults and juveniles), RGM.1352425 (2). **Sceaux-d'Anjou**: RGM.718215 (4), RGM.1352451 (2), RGM.1352536 (1).

Discussion – *Laemodonta marginalis* (Grateloup, 1828) is characterised by its subsutural cord, inflated last whorl with a carinate base and aperture with a thickened outer lip and three columellar folds. There are some important changes with ontogeny; juvenile shells are even more globose, and the basal carina and parietal tooth develop late (Pl. 5, fig. 4). Even within the adult populations the development of the teeth and basal carina are variable, which led to the erection of new species for extreme forms, such as *Plecotrema callibasis* Tournouër, 1872 for a form with a strongly developed and somewhat plicate basal carina.
The Assemblage I specimens are mainly juvenile and subadult, but the largest specimens do attain the same large size seen in the Middle Miocene populations from the Loire Basin but are thinner shelled and the outer lip and columellar teeth are thinner. The Lower Miocene specimens from the Aquitaine Basin are smaller (about 6.0 mm, *fide* Brébion, 1964, p. 666).
Brébion (1964, p. 667) recorded this species from the Assemblage I localities of Sceaux-d'Anjou, Renauleau and Thorigné, to which we add St-Clément-de-la-Place.

Distribution – Lower Miocene: Atlantic (Aquitanian and Burdigalian), Aquitaine Basin, France (Grateloup, 1828, 1838; Tournouër, 1870; de Morgan, 1917; Peyrot, 1932). Middle Miocene: Atlantic, Loire Basin, France (Peyrot, 1938; Glibert, 1952). Upper Miocene: Atlantic (Tortonian), NW France (Millet, 1854; Brébion, 1964).

Genus *Myosotella* Monterosato, 1906

Type species – *Auricula myosotis* Draparnaud, 1801, by subsequent designation, Wenz, 1923, present-day, Mediterranean.

1906 *Myosotella* Monterosato, p. 126.
1847 *Alexia* Leach *in* Gray, p. 269. Type species (by monotypy): *Voluta denticulata* Montagu, 1803, present-day, British Isles. Junior homonym of *Alexia* Stephens, 1833 [Coleoptera].
1900 *Kochia* Pallary, p. 239. Type species (by subsequent designation, Monterosato, 1906): *Alexia oranica* Pallary, 1900, present-day, Europe. Junior homonym of *Kochia* Frech, 1891 [Bivalvia].
1920 *Nealexia* Wenz, p. 190. Type species (by typification of replaced name): *Voluta denticulata* Montagu, 1803, present-day, British Isles. *Nom. nov. pro Alexia* Leach in Gray, 1847, *non* Stephens, 1833 [Coleoptera].

***Myosotella pisolina* (Deshayes, 1830)**
Plate 5, figs 1-2

*1830 *Auricula pisolina* Deshayes, p. 90.
1837 *Auricula pisolina* Deshayes – Dujardin, p. 276.
1854 *Auricula Ovicula* Millet, p. 154 (*nomen nudum*).
1865 *Auricula ovicula* Millet, p. 579.
1872 *Auricula* (*Alexia*) *pisolina*– Tournouër, p. 93, pl. 3, fig. 9.
1875 *Alexia pisolina* Deshayes – Sandberger, p. 527, pl. 26, fig. 13.
1886 *Alexia pisolina* Deshayes – Dollfus & Dautzenberg, p. 140.
1917 *Alexia pisolina* Deshayes – de Morgan, p. 29, figs 21-30.
1923 *Nealexia pisolina pisolina* (Deshayes) – Wenz, p. 1135-1136.
1932 *Auricula* (*Alexia*) *pisolina* Deshayes – Peyrot, p. 224, pl. 14, figs 42-44.
1938 *Alexia pisolina* Deshayes – Peyrot, p. 321.
1952 *Alexia* (*Alexia*) *pisolina* Deshayes, 1830 – Glibert, p. 402.
?1962 *Pedipes* (*Nealexia*) *myotis pisolina* Deshayes – Strausz, p. 111, 172, pl. 46, fig. 38-42.
1964 *Ovatella* (*Myosotella*) *pisolina* Deshayes, 1830 – Brébion, p. 670, pl. 15, fig. 43.

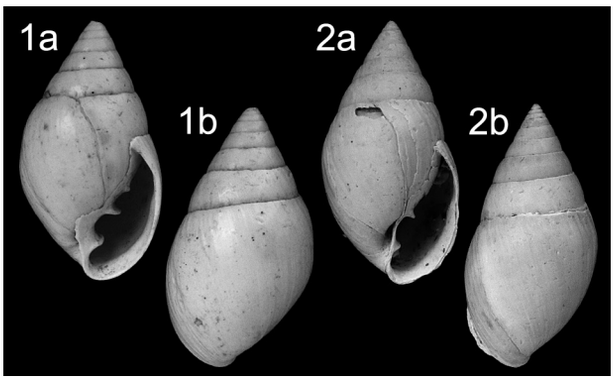

Plate 5. *Myosotella pisolina* (Deshayes, 1830); 1. NHMW 2016/0103/2028, height 10.8 mm, width 5.8 mm. La Presselière, Sceaux-d'Anjou. 2. NHMW 2016/0103/2029, height 10.9 mm, width 5.3 mm (digital images). Le Grand Chauvereau, St-Clément-de-la-Place, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

?1966 *Pedipes* (*Nealexia*) *myotis pisolina* Deshayes, 1831 [*sic*] – Strausz, p. 484, pl. 46, fig. 38-42.
?2002 *Ovatella pisolina* (Deshayes) – Binder, p. 166, pl. 1, figs 11 a-b, 12.

Material and dimensions – Maximum height 10.8 mm, width 5.8 mm. **St-Clément-de-la-Place**: NHMW 2016/0103/2029 (1). **Sceaux-d'Anjou**: NHMW 2016/0103/2028 (1), RGM.739235 (3).

Discussion – *Myosotella pisolina* (Deshayes, 1830) is characterised by its ovate shell with a relatively tall conical spire composed of weakly convex whorls, and an inflated last whorl bearing a small umbilical chink at the base. The columella bears three folds, strengthening and becoming increasingly oblique abapically. As with all the Assemblage I ellobiids, the outer lip is less thickened than in the Loire Basin populations, but even there the development of the apertural armature is highly variable (see de Morgan, 1917, figs 21-30).
Binder (2002) placed this species in the genus *Ovatella* Bivona-Bernardi, 1832 (type species: *Auricula myosotis* Draparnaud, 1801, by subsequent designation, Wenz, 1923, present-day, Mediterranean). Martins (1999) discussed the differences between *Myosotella* and *Ovatella*. He concluded that, amongst other differences, that in *Myosotella* the first parietal tooth was definitely strongest, whereas in *Ovatella* there is a strong anterior parietal tooth, and usually one, sometimes more parietal teeth decreasing in size posteriorly. De Morgan (1917, p. 30, figs 22-27) illustrated the range of variability in the parietal dentition seen in *O. pisolina*
From the Middle Miocene Langhian of the Loire Basin, France, in which the anterior parietal denticle is always strongest, and this is clearly the case in the specimen illustrated here (Pl. 6, figs 1a, 2a).
Millet (1854, p. 154) recorded this species from the Assemblage I localities of Sceaux-d'Anjou, Thorigné, Renauleau and St-Michel, to which we add St-Clément-de-la-Place. Brébion (1964, p. 672) recorded it also from the Assemblage II locality of Apigné. He also included the Assemblage III locality of Le Pigeon Blanc, but this record is provisionally omitted as the record was not confirmed by Ceulemans *et al*. (2018). We are uncertain if the Middle Miocene Paratethyan records are conspecific and include them with some hesitation.

Distribution – Lower Miocene: Atlantic (Burdigalian), Aquitaine Basin, France (Peyrot, 1932). Middle Miocene: Atlantic, Aquitaine Basin, France (Peyrot, 1932), Loire Basin, France (Dujardin, 1837; Tournouër, 1872; Sandberger, 1875; Dollfus & Dautzenberg, 1886; de Morgan, 1917; Peyrot, 1938; Glibert, 1952); ?Paratethys, Austria (Binder, 2002; Romania (Katona *et al*., 2011), Hungary (Strausz, 1962, 1966). Upper Miocene: Atlantic (Tortonian and Messinian), NW France (Millet, 1854; Brébion, 1964).

Genus *Ophicardelus* Beck, 1838

Type species – *Auricula australis* Quoy & Gaimard, 1832, by monotypy, present-day, Australia.

1838 *Ophicardelus* Beck, p. 108.

***Ophicardelus oblongus* (Deshayes, 1830)**
Plate 6, figs 1-2

*1830 *Auricula oblonga* Deshayes, p. 89.
1837 *Auricula oblonga* Deshayes – Dujardin, p. 276.
1854 *Auricula Oblonga* Desh. *Vel acuta* Dujard. – Millet, p. 154.
1872 *Auricula oblonga* Deshayes – Tournouër, p. 96, pl. 4, fig. 2.
1875 *Auricula oblonga* Deshayes – Sandberger, p. 525, pl. 26, fig. 10.
1886 *Auricula oblonga* Deshayes – Dollfus & Dautzenberg, p. 140.
1917 *Auricula oblonga* Deshayes – de Morgan, p. 23, figs 2-7.
1917 *Auricula Roberti* de Morgan, p. 25, fig. 14.
1917 *Auricula pontileviensis* de Morgan, p. 26, fig. 15.
1938 *Auricula oblonga* Deshayes – Peyrot, p. 319.
1938 *Auricula Roberti* De Morgan – Peyrot, p. 319.
1938 *Auricula pontileviensis* De Morgan – Peyrot, p. 320.
1952 *Ellobium* (*Ellobium*) *oblongum* Deshayes, 1830 – Glibert, p. 399, pl. 15, fig. 12.
1964 *Ellobium oblongum* Deshayes, 1830 – Brébion, p. 672, pl. 15, figs 44, 45.

Material and dimensions – Maximum height 10.7 mm, width 4.3 mm. **St-Clément-de-la-Place**: RGM.1352641 (1). **Sceaux-d'Anjou**: NHMW 2016/0103/1067 (1), RGM.718214 (1).

Discussion – *Ophicardelus oblongus* (Deshayes, 1830)

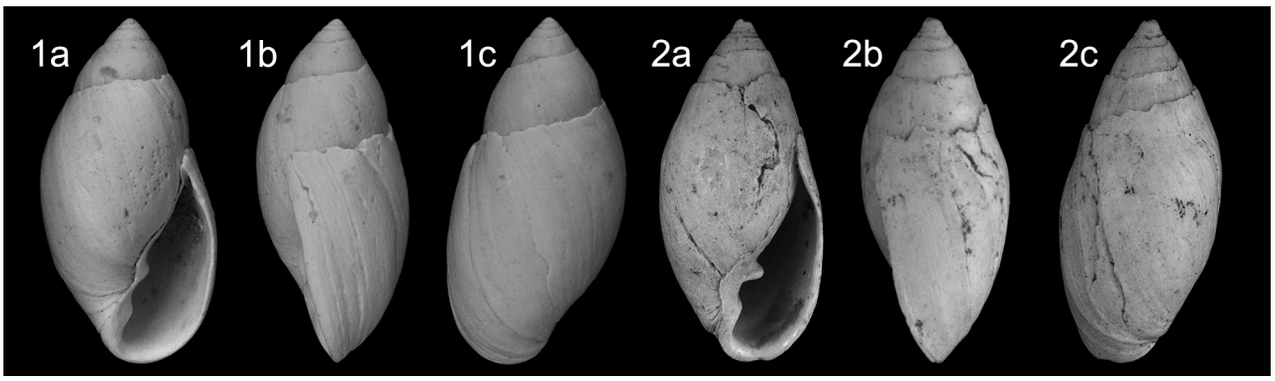

Plate 6. *Ophicardelus oblongus* (Deshayes, 1830); 1. NHMW 2016/0103/1067, height 10.7 mm, width 4.3 mm. La Presselière, Sceaux-d'Anjou. 2. RGM.1352641, height 5.6 mm, width 2.6 mm (digital images). Le Grand Chauvereau, St-Clément-de-la-Place, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

is characterised by its elongated ovate shape with an elongated aperture and two strongly oblique folds on the columella. Little can be said from the very scant material from Assemblage I, except that like the rest of the Ellobiidae from this assemblage the shell is thinner and the apertural armature less strongly developed than is specimens from the Middle Miocene Loire Basin. As in other ellobiids, the shell shape changes with ontogeny (see de Morgan, 1917, figs 2-7) and the adult shell is somewhat variable. Glibert (1952) placed some of de Morgan's species in synonymy. Millet (1854, p. 154) recorded this species from the Assemblage I locality of Renauleau, Brébion (1964, p. 673) added Thorigné and we add Sceaux-d'Anjou.

Distribution – Middle Miocene: Atlantic, Loire Basin, France (Dujardin, 1837; Tournouër, 1872; Sandberger, 1875; Dollfus & Dautzenberg, 1886; de Morgan, 1917; Peyrot, 1938; Glibert, 1952). Upper Miocene: Atlantic (Tortonian), NW France (Millet, 1854; Brébion, 1964).

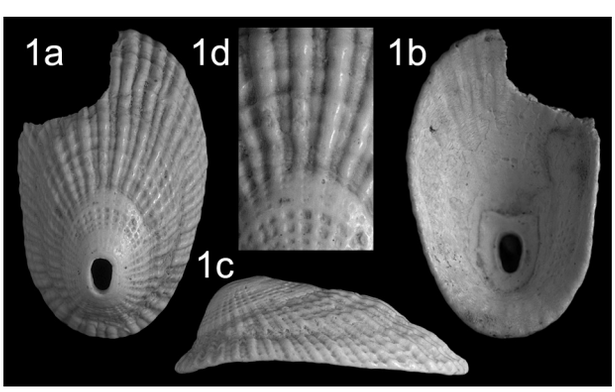

Plate 7. *Diodora* aff. *gibberula* (Lamarck, 1822); 1. RGM.739156, maximum diameter 8.5 mm, width 5.2 mm, height 2.6 mm, 1d, detail of sculpture (digital image). La Presselière, Sceaux-d'Anjou, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

Addenda

Subclass Vetigastropoda
Superfamily Fissurelloidea Fleming, 1822
Family Fissurellidae Fleming, 1822
Subfamily Emarginulinae Children, 1834
Tribe Diodorini Odhner, 1932
Genus *Diodora* Gray, 1821

Type species (by monotypy) – *Patella apertura* Montagu, 1803, present-day, British Isles.

1821 *Diodora* Gray, p. 233.

For generic synonymy see Ceulemans *et al*. (2016, p. 54).

***Diodora* aff. *gibberula* (Lamarck, 1822)**
Plate 7, fig. 1

cf. *1822 *Fissurella gibberula* Lamarck, p. 15.
cf. 1994 *Diodora gibberula* (Lamarck, 1822) – Giannuzzi-Savelli *et al*., p. 44, figs 63-67.
cf. 2003 *Diodora gibberula* (Lamarck, 1822) – Landau *et al*., p. 25, pl. 4, fig. 3.

Material and dimensions – Maximum diameter 8.5 mm, width 5.2 mm. **Sceaux-d'Anjou**: RGM.739156 (1).

Discussion – This single, incomplete specimen represents a *Diodora* species with a low elongate shell, the apex placed close to the posterior edge, the anterior slope is long and convex, the posterior slope short and concave, and sculpture consists of ribs of alternating strength, the secondary ribs strengthening towards the margin, where the ribs are of almost equal strength. The axial ribs are made squamous by relatively strong concentric sculpture. Three congeners from Assemblage I were reviewed by Landau *et al*. (2017). *Diodora graeca* (Linnaeus, 1758) is the largest congener in Assemblage I and, apart from its greater size, differs in having ribs of primary to tertiary strength remaining unequal to

the margin, and a more centrally placed apex. *Diodora multifida* (Deshayes, 1830) differs in having finer sculpture than *D. graeca*, and again has cords of primary to tertiary strength. The shell is taller, and the apex more centrally placed than in the species illustrated (Pl. 7, fig. 1). *Diodora sancticlementensis* Landau, Van Dingenen & Ceulemans, 2017 is a very small, thin-shelled species with fine sculpture and the apex placed a short distance posterior to the centre. *Diodora italica* (Defrance, 1820), which also has more equal ribs separated by narrow intercostals, is distinguished by its much larger size and the apex is placed more centrally. We note that Glibert (1949, pl. 1, fig. 15) illustrated a similar small shell from the Middle Miocene Loire Basin of France as *D. italica* 'anomalie', with the apex placed almost at the posterior edge. If this is an abnormal specimen, it is difficult to ascribe it to any of the three *Diodora* species known from Assemblage I. The most similar species is probably *D. gibberula* (Lamarck, 1822), which is characterised by its relatively small size and more regular sculpture with ribs of alternating strength and strong concentric sculpture. We hesitate to synonymise the Assemblage I specimen as the shell is lower, *D. gibberula* usually has a high-domed shell, and the apex is even more posterior than in *D. gibberula*. With the scant material available we cannot come to any further conclusions.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

Superfamily Seguenzioidea [unassigned] Verrill, 1884
Genus *Palazzia* Warén, 1991

Type species (by original designation) – *Omalogyra ausonia* Palazzi, 1988, present-day, Mediterranean.

1991 *Palazzia* Warén, p. 75.

***Palazzia omalogyroides* nov. sp.**
Plate 8, fig. 1

ZooBank registration – https://zoobank.org/NomenclaturalActs/0C07E024-AC52-41CC-88FE-5F111B7D7CDC

Type material – Holotype MNHN.F.A70515, diameter 0.8 mm, height 0.3 mm; paratype 1 NHMW 2016/0103/1872, diameter 0.7 mm, height 0.3 mm; paratype 2 NHMW 2016/0103/1873, diameter 0.8 mm, height 0.3 mm, **St-Clément-de-la-Place**. Paratype 3 RGM.1362949, diameter 0.8 mm, paratype 4 RGM.1362950, diameter 0.8 mm, **Sceaux-d'Anjou**.

Other material – Maximum diameter 0.8 mm x 0.3 mm. **St-Clément-de-la-Place**: NHMW 2016/0103/1695 (11). **Sceaux-d'Anjou**: RGM.717922 (14), RGM.718967 (1).

Etymology – Name reflecting the close similarity is shell shape to member of the genus *Omalogyra*. *Palazzia* gender feminine.

Locus typicus – Le Grand Chauvereau, St-Clément-de-la-Place, Maine-et-Loire, NW France.

Stratum typicum – Tortonian, Upper Miocene.

Diagnosis – Planispiral shell with smooth protoconch and low, broad ribs on teleoconch, pitted teleoconch microsculpture.

Description – Shell minute (diameter 0.8 mm, height 0.3 mm), planispiral. Protoconch of three-quarter whorl, smooth, diameter 0.18 mm. Teleoconch of just over 1½ whorls bearing broad, low, poorly delimited axial ribs and very fine growth lines. Pitted teleoconch microsculpture arranged in rows. Aperture D-shaped; lip complete, thickened with broad external slightly flexuous margin; internally smooth.

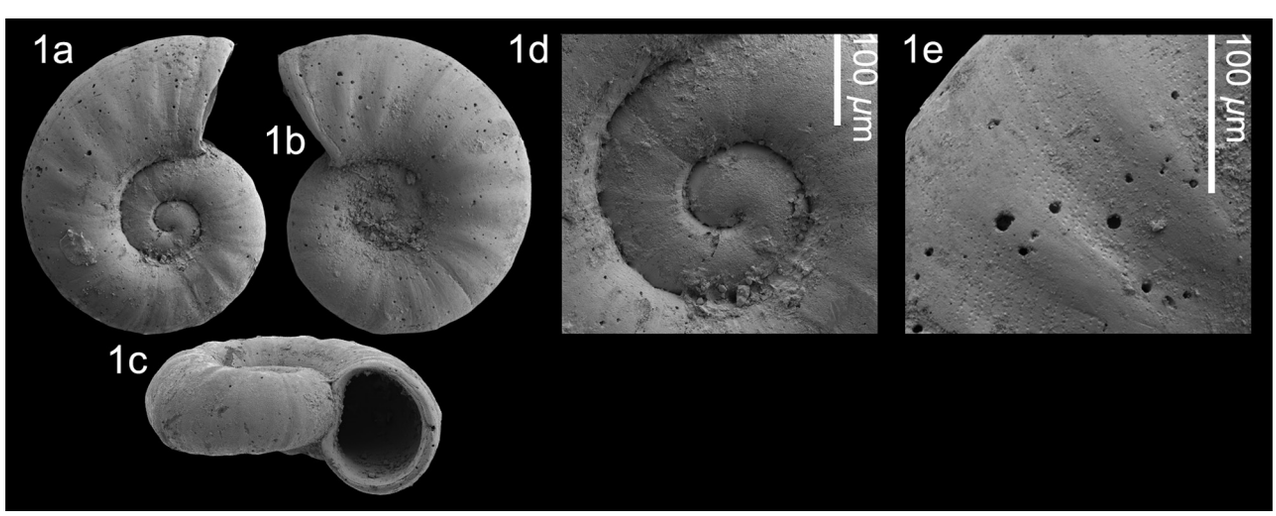

Plate 8. *Palazzia omalogyroides* nov. sp.; 1. **Holotype** MNHN.F.A70515, diameter 0.8 mm, height 0.3 mm, 1d, detail of protoconch, 1e, detail of teleoconch microsculpture (SEM image). Le Grand Chauvereau, St-Clément-de-la-Place, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

Discussion – The shell is similar to those of species in the genus *Omalogyra* Jeffreys, 1860. However, electron microscopy revealed a pitted teleoconch microsculpture (Pl. 8, fig. 1e), which excludes these tiny planispiral shells from the Omalogyroidea Sars, 1878. In his review on Mediterranean Omalogyridae, Palazzi, 1988 described *O. ausonia* Palazzi, 1988 from the Mediterranean. Warén (1991, p. 75) argued that there was no trace of heterostrophy in the larval shell of that species and the teleoconch was finely pitted, and erected the genus *Palazzia* Warén, 1991 within the Archaeogastropoda, family uncertain, and later, based on molecular studies, transferred it to the Seguenzioidea. The new species does not quite fit the generic description given by Warén (1991); the axial ribs are weaker than in its congeners, such as *P. ausonia* and *P. planorbis* (Dall, 1927), and there is no spiral sculpture. Indeed, the shell is at first glance typical for *Omalogyra*, and hence the name. However, as more congeners are recognised the generic description may widen further.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

Superfamily Turbinoidea Rafinesque, 1815
Family Skeneidae Clark, 1851
Genus *Skeneoides* Warén, 1992

Type species (by original designation) – *Delphinula exilissima* Philippi, 1844, present-day, Italy.

1992 *Skeneoides* Warén, p. 156.

***Skeneoides karrineae* nov. sp.**
Plate 9, figs 1-3

Zoobank registration – https://zoobank.org/NomenclaturalActs/EA22AA94-69DA-447A-A8DB-3E6941D2DFE1

Type material – Holotype NHMW 2016/0103/2057, diameter 780 μm, height 520 μm, **Sceaux-d'Anjou**. Paratype 1 NHMW 2016/0103/2273, diameter 760 μm, height 555 μm; paratype 2 NHMW 2016/0103/2274, diameter 735 μm, height 570 μm, **St-Clément-de-la-Place**.

Other material – **St-Clément-de-la-Place**: NHMW 2016/0103/2275 (4).

Etymology – Named after Karinne Vangoethem, partner of one of the authors (LC). *Skeneoides* gender masculine.

Locus typicus – Le Presselière, Sceaux-d'Anjou, Maine-et-Loire, NW France.

Stratum typicum – Tortonian, Upper Miocene.

Diagnosis – *Skeneimorph* species of minute size, micropitted, spirally striate protoconch of 1.5 whorls, teleoconch of 1.5 whorls with strong axials, weak spirals, concave base, moderately narrow umbilicus.

Description – Shell minute (diameter 0.8 mm, height 0.5 mm), skeneimorph, spire moderately depressed. Protoconch of 1.5 whorls, micro-pitted and sculptured by widely spaced spiral cordlets, diameter 0.21 mm. Teleoconch of 1.5 shouldered whorls with flattened subsutural platform, convex below, impressed suture. Sculpture of strong flattened ribs, highly variable in number and development, and few weak spiral cords. Last whorl with sub-horizontal subsutural ramp, convex to base delimited by subobsolete cord. Base concave, umbilicus deep, moderately narrow, with axial ribs. Aperture rounded, outer lip thickened by varix, peristome complete, inside smooth.

Discussion – *Skeneoides karrineae* nov. sp. is closely similar to the present-day Mediterranean *S. jeffreysii* (Monterosato, 1872) in having strongly sculptured ribs that can be bifid (see Warén, 1992, fig. 10c), but differs in having more numerous ribs, and in not having secondary ribs between the primaries (see Warén, 1992, fig. 10d). As illustrated in the type series, the number and character of the ribs in *S. karrineae* is highly variable; the holotype (Pl. 9, fig. 1) has relatively widely spaced ribs that are strongly bifid, paratype 2 (Pl. 9, fig. 3) has closely packed ribs of irregular strength, paratype 1 (Pl. 9, fig. 2) is intermediate between these two forms.
Skeneoides exilissima (Philippi, 1844) from the present-day western Mediterranean is immediately separated based on its weaker axial sculpture. *Skeneoides crassistriata* Lozouet, 1999, with which it occurs in Assemblage I (see Landau *et al*., 2017, p. 152) is larger, more planispiral with a deeper suture, with even more prominent axial ribs that are not bifid, and weaker spiral sculpture. *Skeneoides digeronimoi* La Perna, 1999 from the present-day Tyrrhenian Sea is similar in profile, but the last whorl is separated by a deeper suture, the shoulder is somewhat coronate and there is no spiral sculpture. That species also has a pitted protoconch but lacks the spiral cords. *Skeneoides tenuistriata* Lozouet, 1999 from the Rupelian Oligocene of France has much finer teleoconch sculpture.
Parviturbo seamountensis Rubio, Rolán & Gofas, 2015 from the present-day Azorean seamounts (Hoffman *et al*., 2020, p. 67) is also superficially similar in sculpture, although it is more strongly and evenly reticulated in that species. It differs in its more turbinate or globose-conic profile, characteristics of the genus *Parviturbo* Pilsbry & McGinty, 1945.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

Family Turbinidae Rafinesque, 1815
Genus *Bolma* Risso, 1826

Type species (by monotypy) – *Turbo rugosus* Linné, 1767, present-day, Mediterranean.

1826 *Bolma* Risso, p. 117.

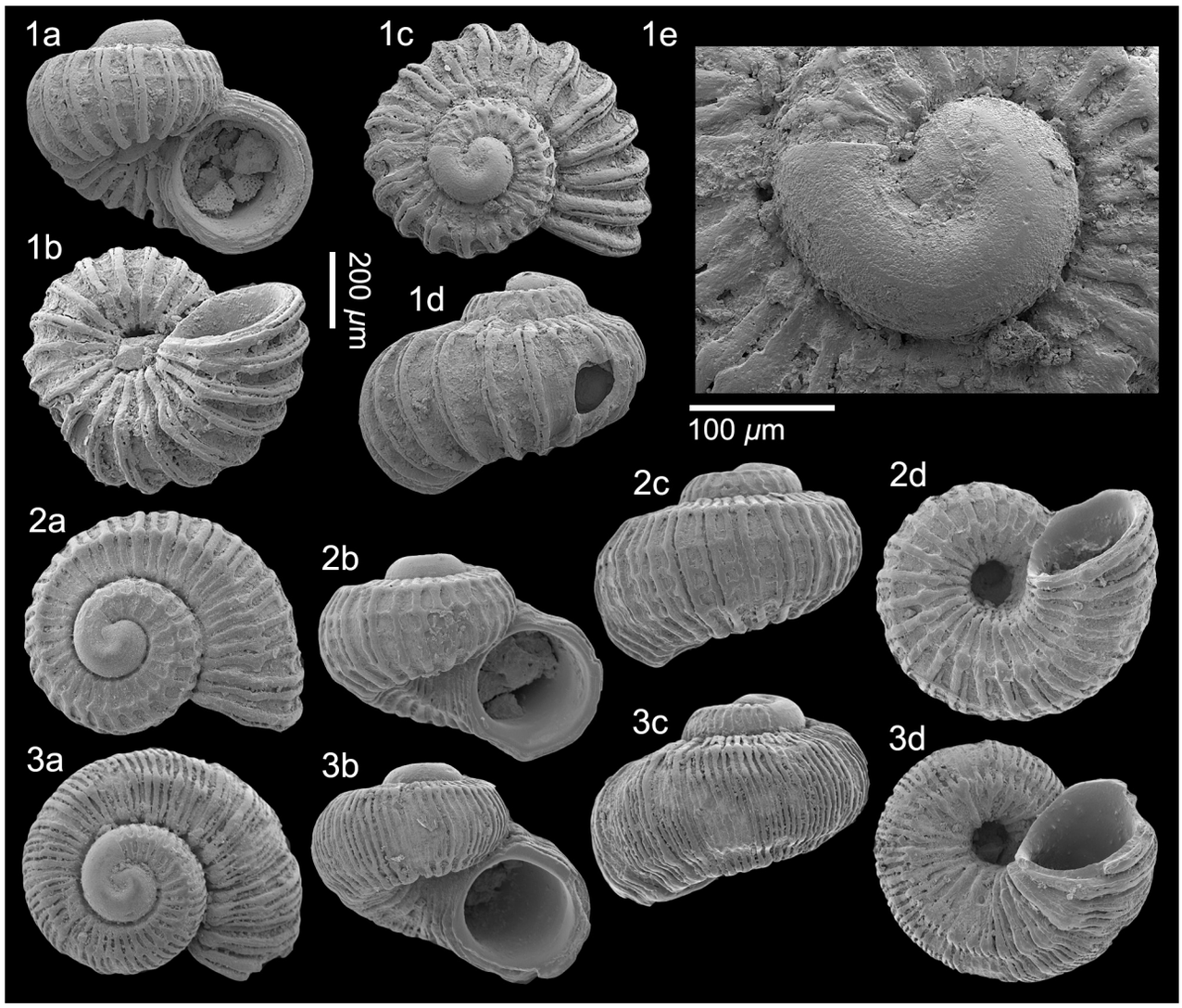

Plate 9. *Skeneoides karrineae* nov. sp.; 1. **Holotype** NHMW 2016/0103/2057, diameter 780 μm, height 520 μm, 1d, detail of protoconch (SEM images). Le Presselière, Sceaux-d'Anjou, Maine-et-Loire NW France, Tortonian, Upper Miocene. 2. **Paratype 1** NHMW 2016/0103/2273, diameter 760 μm, height 555 μm; 3. **Paratype 2** NHMW 2016/0103/2273, diameter 735 μm, height 570 μm. Le Grand Chauvereau, St-Clément-de-la-Place, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

***Bolma redoniana* nov. nom.**
Plate 10, fig. 1

1854 *Turbo Trochleatus* Millet, p. 158 (*non* zu Münster, 1841).
1865 *Turbo trochleatus* Millet – Millet, p. 584.
1964 *Astraea* (*Bolma*) *trochleata* Millet, 1854 – Brébion (*partim*), p. 131, pl. 3, figs 18, 19 (Assemblage 1 records only).
2017 *Bolma* cf. *meynardi* (Michelotti, 1847) – Landau *et al*., p. 115, pl. 40, figs 1-3.

Zoobank registration – https://zoobank.org/NomenclaturalActs/9D20C3B4-4F59-4164-8F2C-351AC567E320

Type material – Neotype 1 RGM.717700, height 21.2 mm, maximum diameter 27.9 mm; **Sceaux-d'Anjou**. Paraneotype 1 NHMW 2016/0103/1434, height 29.7 mm, maximum diameter 37.6 mm; Paraneotype 2 NHMW 2016/0103/1436, height 14.3 mm, maximum diameter 20.3 mm; **Renauleau**.

Other Material – Maximum height 29.7 mm (incomplete), diameter 37.6 mm. **St-Clément-de-la-Place**: RGM.1309690 (1). **Sceaux-d'Anjou**: RGM.1352720 (3 juveniles), FVD (9). **Renauleau**: NHMW 2016/0103/1435 (1), NHMW 2016/0103/1437 (36 adult fragments and juveniles), LC (50+), FVD (50+).

Etymology – Named after the 'Redonian' stage, the name used until recently for these NW French post-Middle Miocene assemblages. *Bolma* gender feminine.

Locus typicus – La Presselière, Sceaux-d'Anjou, Maine-et-Loire, NW France.

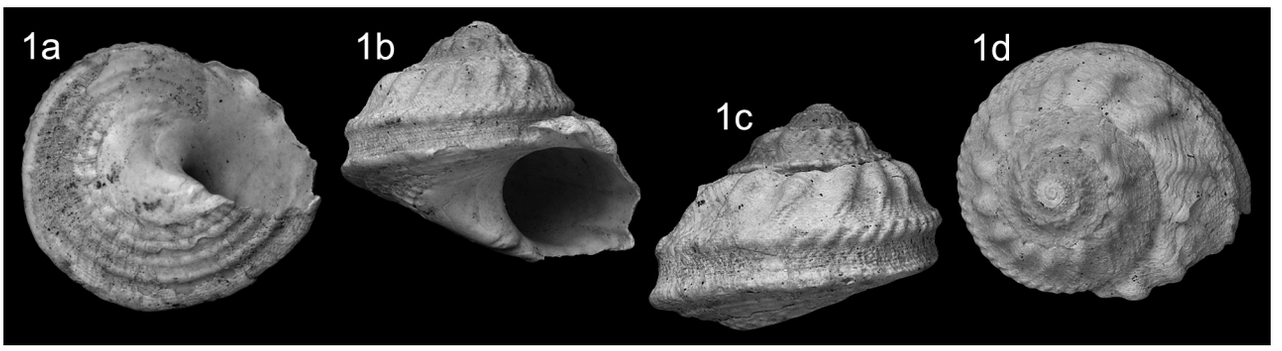

Plate 10. *Bolma redoniana* nov. nom.; 1. **Neotype** RGM.717700, height 21.2 mm, maximum diameter 27.9 mm (digital image). La Presselière, Sceaux-d'Anjou, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

Stratum typicum – Tortonian, Upper Miocene.

Diagnosis – Cyrtoconoid shell of medium size, with strong rugae on adapical two-thirds of whorls, two peripheral carinae on last whorl delimiting shoulder and base, whorl profile between carinae concave, adapical portion of outer lip fused to last whorl between carinae, moderately narrow basal callus for genus.

Description – Shell of medium size, trochiform. Protoconch and first teleoconch whorl abraded. Five moderately depressed teleoconch whorls preserved, bearing strongly opisthocline coarse rugae on adapical two-thirds of whorl, much finer beaded rugae on abapical third. Last whorl strongly bicarinate, adapical carina delimiting shoulder, abapical basal carina delimiting whorl periphery. Rugae on shoulder strongest and broadest just below suture, weaken towards, and disappear before shoulder carina, replaced by finer, more numerous strongly prosocline rugae on lower third of shoulder. Shoulder carinae coarsely beaded by short strongly prosocline ribs. Whorl profile between shoulder and basal carinae strongly concave, bearing subobsolete spiral threads, finely beaded by close-set growth lines. Basal carina smooth, base flattened, with four strong spiral cords, two abapical cords coarsely beaded. Prosocline aperture rounded, outer lip fused adapically to penultimate whorl between shoulder and basal cords, slightly angled at carinae, sharp. Basal callus flattened, covering umbilicus, moderately narrow, not excavated by central depression, ending in double denticle at columellar abapical extremity.

Discussion – Landau *et al*. (2017, p. 115, pl. 40, figs 1-3) recorded this species as *Bolma* cf. *meynardi* (Michelotti, 1847), and lamented the lack of well-preserved material. The presence of a beautifully preserved specimen from Sceaux-d'Anjou in the Mulder/Roest collection (Pl. 10, fig. 1; RGM.717700) allows us to better characterise this species. Millet (1854) proposed the name *Turbo trochleatus* for juvenile shells from the same type locality of Sceaux-d'Anjou, but that is a junior homonym of *T. trochleatus* zu Münster, 1841. Moreover, the type specimens appear to be missing from the Millet collection, as they are not included in the detailed recording and illustration of all known Millet types by Gantier *et al*. (2023). In view of the fact that Millet's species was based on a juvenile that is now assumed lost, we consider it appropriate to designate neotype material in order to clarify the taxonomic status and type locality of the nominal taxon (ICZN, 1999, Art. 75.3). Therefore, we herein propose *Bolma redoniana* nom. nov. Landau *et al*. (2017, p. 116) discussed this taxon and compared it to other European congeners, but in summary *Bolma redoniana* nov. nom. differs from the Pliocene to present-day *B. rugosa* (Linné, 1767) in having a lower spire, in having less nodulose rugae, in having the periphery of the last whorl between the shoulder and basal carinae strongly concave, and in having the outer lip fuse with the last whorl between the shoulder and basal carinae, whereas in *B. rugosa* it fuses below the basal carina. It differs from the Miocene *B. meynardi* in having a much less extensive columellar callus that ends abapically in a double denticles (also present in *B. rugosa*). For further discussion see Landau *et al*. (2017).

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (Landau *et al*., 2017).

Superfamily Epitonoidea Berry, 1910 (1812)
Family Epitoniidae Berry, 1910 (1812)
Genus *Clathroscala* de Boury, 1890

Type species (by original designation) – *Turbo cancellatus* Brocchi, 1814, Miocene, Italy.

1890 *Clathroscala* de Boury, p. 215.

***Clathroscala bureaui* de Boury *in* Cossmann, 1912**
Plate 11, fig. 1.

*1912 *Clathroscala Bureaui* de Boury *in* Cossmann, p. 71, pl. 5, figs 16, 17.
1964 *Amaea* (*Clathroscala*) *cancellata* var. *bureaui* de Boury *in* Cossmann – Brébion, p. 260, pl. 6, figs 31, 32.
2016 *Clathroscala bureaui* de Boury *in* Cossmann, 1912 – Van Dingenen *et al*., p. 166, pl. 15, fig. 8.

Material and dimensions – Height 14.9 mm, width 6.2 mm (incomplete). **Sceaux-d'Anjou**: NHMW 2016/0103/2193 (1).

Discussion – Cossmann (1912) illustrated *Clathroscala bureaui* from the French Redonian, without specifying the locality of his specimen, and included it in the genus *Clathroscala* de Boury, 1890. Although no discussion was provided, the species differs from *C. cancellata* (Brocchi, 1814) in having a much narrower apical angle, weaker axial sculpture; on the last two whorls the spiral sculpture predominates. The sculpture is also finer, forming a denser and rather irregular reticulated surface sculpture. In contrast, *C. cancellata* has a very regular, more open reticulation, with the axial component predominant. Van Dingenen *et al*. (2016) recorded the species from Assemblage III (Le Pigeon Blanc, La Dixmerie). The Assemblage I locality of Sceaux-d'Anjou is added herein.

Distribution – Upper Miocene: Atlantic (Tortonian), NW France (this paper). Lower Pliocene: Atlantic, NW France (Brébion, 1964).

***Clathroscala cancellata* (Brocchi, 1814)**
Plate 11, fig. 2

*1814	*Turbo cancellatus* Brocchi, p. 377, pl. 7, fig. 8.
2006	*Clathroscala cancellata* (Brocchi, 1814) – Landau *et al*., p. 41, pl. 13, figs 3, 4 (*cum syn*.).
2016	*Clathroscala cancellata* (Brocchi, 1814) – Van Dingenen *et al*., p. 166, pl. 15, fig. 9 (*cum syn*).
2018	*Clathroscala cancellata* (Brocchi, 1814) – Brunetti & Cresti, p. 64, fig. 213.

Material and dimensions – Height 6.6 mm, width 2.8 mm (incomplete). **Sceaux-d'Anjou**: RGM.739199 (1).

Discussion – *Clathroscala cancellata* (Brocchi, 1814) seems to be extremely uncommon in Assemblage I, as it is represented by a single apical fragment from Sceaux-d'Anjou. For discussion see Van Dingenen *et al*. (2016, p. 166).

Distribution – Lower Miocene: Proto-Mediterranean, Italy (de Boury, 1890). Upper Miocene: Atlantic (Tortonian), NW France (this paper). Lower Pliocene: Atlantic, NW France (Van Dingenen *et al*., 2016); North Sea Basin, Coralline Crag, England (Wood, 1848, 1872; Harmer, 1920); western Mediterranean, northern Spain (Martinell, 1979), central Mediterranean, Italy (Chirli, 2009; Brunetti & Cresti, 2018). Upper Pliocene: western Mediterranean, Estepona Basin, Spain (Landau *et al*., 2006); central Mediterranean, Italy (de Gregorio, 1889; de Boury, 1890; Sacco, 1891, 1904; Pavia, 1975; Cavallo & Repetto, 1992; Sosso & Dell'Angelo, 2010). Pliocene (indeterminate): The Netherlands (Wesselingh *et al*., 2013).

Superfamily Rissooidea Gray, 1847
Family Rissoidae Gray, 1847
Genus *Alvania* Risso, 1826

Type species (by subsequent designation, Nevill, 1885) – *Alvania europea* Risso, 1826 (= *Turbo cimex* Linnaeus, 1758), present-day, Mediterranean.

1826 *Alvania* Risso, p. 140.

For generic synonymy see Van Dingenen *et al*. (2016, p. 135).

***Alvania praetermissa* nov. sp.**
Plate 12, figs 1-3

Zoobank registration – https://zoobank.org/NomenclaturalActs/D18028E2-BB50-4716-9701-FF9C34CCF283

Type material – Holotype NHMW 2016/0103/2280, height 2.1 mm, width 1.0 mm; paratype 1 NHMW 2016/0103/2281, height 2.6 mm, width 1.2 mm; paratype 2 NHMW 2016/0103/2282, juvenile; paratype 3 NHMW 2016/0103/2283, height 3.4 mm, width 1.5 mm.

Other material – Maximum height 3.4 mm; height 1.5 mm. **St-Clément-de-la-Place**: NHMW 2016/0103/2284 (12).

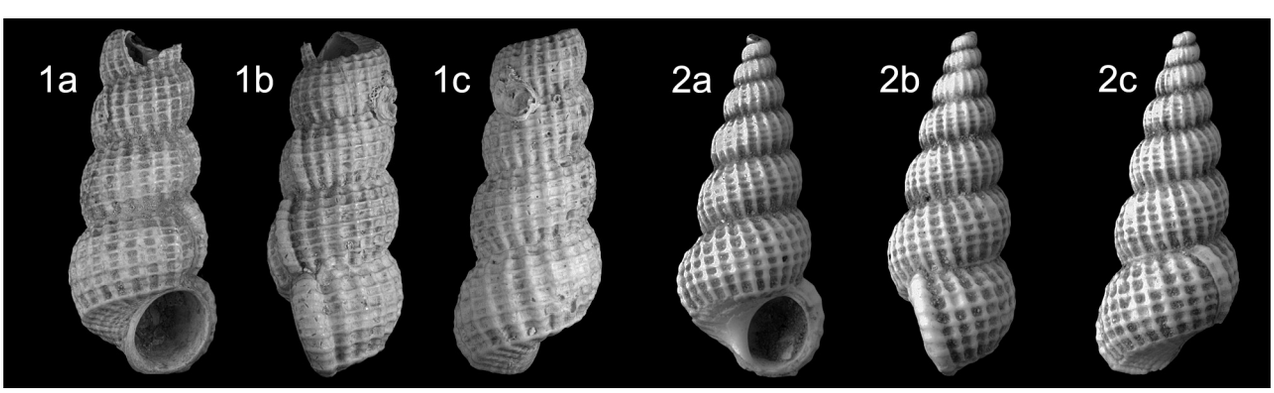

Plate 11. 1. *Clathroscala bureaui* de Boury *in* Cossmann, 1912, NHMW 2016/0103/2193, height 14.9 mm, width 6.2 mm. 2. *Clathroscala cancellata* (Brocchi, 1814), RGM.739199, height 6.6 mm, width 2.8 mm (digital images). La Presselière, Sceaux-d'Anjou, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

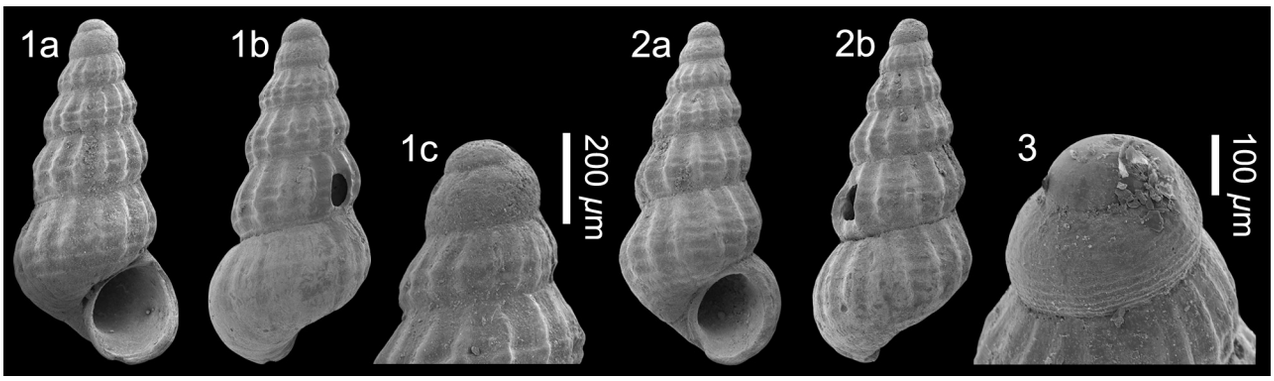

Plate 12. 1. *Alvania praetermissa* nov. sp.; 1. **Holotype** NHMW 2016/0103/2280, height 2.1 mm; height width1.0 mm, 1c, detail of protoconch; 2. **Paratype 1** NHMW 2016/0103/2281, height 2.6 mm; height 1.2 mm; 3. **Paratype 2** NHMW 2016/0103/2282, detail of protoconch microsculpture (juvenile) (SEM images). Le Grand Chauvereau, St-Clément-de-la-Place, NW France, Tortonian, Upper Miocene.

Etymology – Latin '*praetermitto, -ere, -isi, -issus*', verb, meaning omitted or overlooked, as it was not included in the *Alvania* section of these monographs. *Alvania* gender feminine.

Locus typicus – Le Grand Chauvereau, St-Clément-de-la-Place, Maine-et-Loire, NW France.

Stratum typicum – Tortonian, Upper Miocene.

Diagnosis – Elevated spire with tall, slightly pagodiform profile, protoconch of two whorls with spiral microsculpture on second whorl, teleoconch with about 15 ribs, crossed by six narrow spiral cords, short globose last whorl, small, rounded aperture.

Description – Shell medium sized for genus, tall spire, pagodiform profile. Holotype height 2.1 mm; width 1.0 mm. Protoconch of two convex whorls; first whorl smooth, second whorl sculptured by fine spiral threads, height 0.30 mm, width 0.31 mm. Teleoconch of 4.5 convex whorls, with periphery placed at about one-third height, giving whorls slightly pagodiform profile. Sculpture of about 15 orthocline to slightly opisthocline narrow rounded ribs, about one-half width of interspaces, crossed by six narrow spirals, slightly swollen over ribs, axials predominant. Last whorl 50% total height, slightly globose, strongly convex, base not delimited, sculpture persisting over base, narrow umbilical chink. Aperture small, 28% total height, rounded, outer lip strongly convex, not flared abapically, anal and siphonal canals not developed, peristome complete. Columella evenly excavated, columellar callus narrow, internally smooth.

Discussion – Despite being quite different to all the *Alvania* species described from Assemblage I, this species was overlooked by Landau *et al*. (2018). It is characterised by its tall, slightly pagodiform profile and short globose last whorl. Despite being represented by over a dozen specimens, all are abraded. Spiral microsculpture on the protoconch is preserved in only one juvenile specimen (paratype 2**;** Pl. 12, fig. 3). The extant Mediterranean *Alvania pagodula* (Bucquoy, Dollfus & Dautzenberg, 1884) is similar in profile, but differs in having two stronger spiral cords at the periphery that are tubercular over the ribs. *Alvania spinosa* (Monterosato, 1890) is also similar in shape, but has one strong peripheral cord that is spinous over the ribs. *Alvania maurizioi* Chirli, 2006, from the Italian Pliocene, has a similar pagodiform profile and a spirally sculptured protoconch of just under two whorls, but in that species the subsutural ramp is more strongly developed and devoid of spirals, the spirals below the shoulder are sharper and more elevated.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

***Alvania* sp. 1**
Plate 13, fig. 1

Material and dimensions – Height 1.6 mm, width 1.2 mm. **Renauleau**: NHMW 2016/0103/1132 (1).

Discussion – Represented by a single somewhat abraded specimen, it is characterised by its minute size, solid form, dome-shaped multispiral protoconch of three convex whorls with no microsculpture (or not preserved), teleoconch of 2.5 squat, convex whorls with inflated, depressed last whorl. Sculpture consists of 12 elevated rounded axial ribs with spiral cords and grooves visible only in the interspaces. The aperture is small, ovate, the outer lip thickened by labial varix, and the columella is thickened adapically. Despite its minute size, the apertural thickening suggests adulthood. In protoconch, sculpture and apertural characters it resembles a miniature compressed *Alvania lachesis* (de Basterot, 1825) (see Landau *et al*., 2018, p. 256, pl. 83), and may just be a dwarf or monstrosity. Its squat form is also reminiscent of the Italian Pliocene *A. caporalii* Chirli, 2006, but that species has narrow elevated spiral cords. In the absence of further material we cannot reach any firm conclusion.

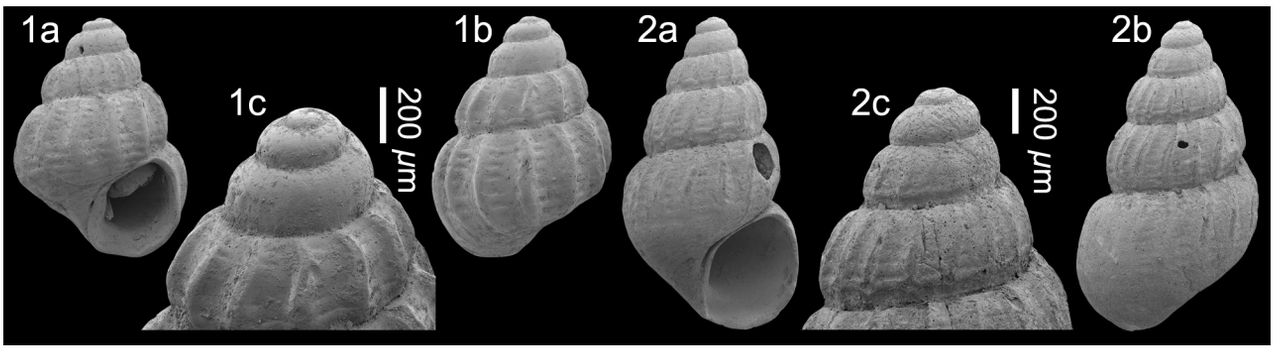

Plate 13. 1. *Alvania* sp. 1; NHMW 2016/0103/1132, height 1.6 mm, width 1.2 mm. 2. *Alvania* sp. 2; NHMW 2016/0103/1757, height 2.9 mm, width 1.6 mm (SEM images). Renauleau, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

***Alvania* sp. 2**
Plate 13, fig. 2

Material and dimensions – Height 2.9 mm, width 1.6 mm. **Renauleau**: NHMW 2016/0103/1757 (1).

Discussion – Represented by a single somewhat abraded specimen, it is characterised by its small rissoiform size, medium thickness, dome-shaped multispiral protoconch of about three convex whorls with no microsculpture (or not preserved), teleoconch of 3.5 strongly convex whorls separated by a deeply impressed suture, and moderately inflated last whorl. Sculpture consists of 15 narrow, strongly opisthocline axial ribs with spiral cords and grooves visible only in the interspaces. On the spire whorls the abapical cord is slightly reinforced. The ribs seem to weaken and are subobsolete on the last half whorl, but this might be due to wear. The aperture is ovate, the outer lip not thickened, and the columella narrow, forming the medial border of a small umbilical chink. In Assemblage I it is most similar to *Alvania couffoni* Landau, Ceulemans & Van Dingenen, 2018, but differs in being smaller with fewer axial ribs. *Alvania miocalasi* Landau, Ceulemans & Van Dingenen, 2018 is also similar in sculpture, but is larger, has a spirally striate protoconch and is more globose. We await further specimens to better characterise this species.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

Genus *Setia* H. & A. Adams, 1852

Type species (by subsequent designation, Schwartz von Mohrenstern, 1860) – *Rissoa pulcherrima* Jeffreys, 1848, present-day, British Isles.

1852 *Setia* H. & A. Adams, p. 359.

For generic synonymy see Landau *et al*. (2018, p. 289).

***Setia minutissima* nov. sp.**
Plate 14, fig. 1

Zoobank registration – https://zoobank.org/NomenclaturalActs/b1938642-57d8-495c-9e0f-b6811cf1b5fd

Type material – Holotype NHMW 2016/0103/2285, height 940 μm; width 680 μm; paratype 1 NHMW 2016/0103/2286, height 1000 μm; width 690 μm; paratype 2 NHMW 2016/0103/2287, height 960 μm; width 690 μm; paratype 3 NHMW 2016/0103/2288, height 1100 μm; height 700 μm.

Other material – Maximum height 1.1 mm; width 0.7 mm. **St-Clément-de-la-Place**: NHMW 2016/0103/2289 (6).

Etymology – Latin '*minute, -ius, -issime*', adverb used in superlative, meaning the smallest size, reflecting its tiny size for the genus. *Setia* gender feminine.

Locus typicus – Le Grand Chauvereau, St-Clément-de-la-Place, Maine-et-Loire, NW France.

Stratum typicum – Tortonian, Upper Miocene.

Diagnosis – *Setia* species of minute size (height 1.0 mm, diameter 0.7 mm), paucispiral protoconch of just over one whorl, teleoconch of two smooth convex whorls, last whorl somewhat flattened mid-whorl, prominent umbilical chink, subtriangular-ovate aperture.

Description – Shell minute, globular-rissoiform. Protoconch paucispiral, smooth, of just over one whorl, with large nucleus (dp = 210 μm, dn = 130 μm). Teleoconch of two smooth, strongly convex whorls, separated by deeply impressed suture. Last whorl inflated, 82% total height, convex, slightly flattened profile mid-whorl, base not delimited, prominent umbilical chink. Aperture subtriangular-ovate, 46% total height, peristome complete, outer lip simple, weakly convex, somewhat flattened below suture, strongly convex at periphery and flared abapically. Parietal lip flattened, columellar lip concave, oblique, slightly thickened, forming erect medial edge to umbilicus.

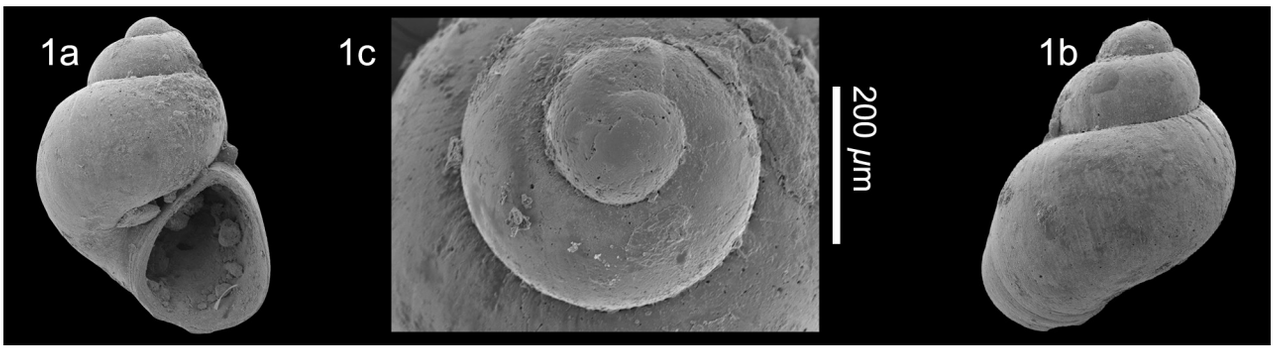

Plate 14. 1. *Setia minutissima* nov. sp.; 1. **Holotype** NHMW 2016/0103/2285, height 940 μm; width 680 μm, 1c, detail of protoconch (SEM image). Le Grand Chauvereau, St-Clément-de-la-Place, NW France, Tortonian, Upper Miocene.

Discussion – Even for this genus of small-shelled rissoids, *Setia minutissima* nov. sp. is smaller than average, and it has fewer teleoconch whorls. The somewhat flattened aspect of the mid-portion of the last whorl is also not seen in its extant European congeners. The umbilicus is well developed, although slightly variable; the holotype illustrates the average, with some specimens having a slightly wider or narrower umbilicus. The extant *Setia lacourti* (Verduin, 1984) from southern Spain is very similar in size and shape, it differs in having a more flattened nucleus, post-nuclear protoconch is spirally sculptured as opposed to smooth (it is possible that the protoconch microsculpture is abraded in the Assemblage I material), and the last whorl is not flattened mid-whorl. It is also similar to smaller specimens of *Setia bruggeni* (Verduin, 1984) (see Giannuzzi-Savelli *et al*., 1996, p. 90 figs 328a, b), also from southern Spain, but that species does not have the flattened last whorl. Larger specimens of that species have more numerous whorls forming a taller conical spire.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

Superfamily Truncatelloidea Gray, 1840a
Family Truncatellidae Gray, 1840a
Subfamily Truncatellinae Gray, 1840a
Genus *Truncatella* Risso, 1826

Type species (by subsequent designation, ICZN Opinion 1664, 1992) – *Truncatella costulata* Risso, 1826 [=*Truncatella subcylindrica* (Linné, 1767)], present-day, France.

1826 *Truncatella* Risso, p. 124.
1826 *Fidelis* Risso, p. 121. Type species (by monotypy): *Fidelis theresa* Risso, 1826. Invalid, placed on the Official Index by Opinion 344 (ICZN, 1955).
1852 *Glaucothoe* Leach in Gray, p. 147, 199. Type species (by monotypy): *Glaucothoe montaguana* Leach, 1852 [=*Truncatella subcylindrica* (Linné, 1767)], present-day, British Isles. Junior homonym of *Glaucothoe* Milne Edwards, 1830 [Crustacea].
1871 *Blandiella* Guppy, p. 309. Type species (by monotypy): *Blandiella reclusa* Guppy, 1871, present-day, Trinidad.
1880 *Albertisia* Issel, p. 275. Type species (by monotypy): *Albertisia punica* Issel, 1880, present-day, Tunisia.

***Truncatella subcylindrica* (Linné, 1767)**
Plate 15, fig. 1

*1767 *Helix subcylindrica* Linné, p. 1248.
1801 *Cyclostoma truncatulum* Draparnaud, p. 40, pl. 1, figs 28-31.
1803 *Turbo subtruncatus* Montagu, p. 300, pl. 10, fig. 1.
1803 *Turbo truncatus* Montagu, p. 300, pl. 10, fig. 7.
1826 *Truncatella laevigata* Risso, p. 125, pl. 4, fig. 53.
1826 *Truncatella costulata* Risso, p. 125, pl. 4, fig. 57.
1826 *Fidelis theresa* Risso, p. 121, pl. 5, fig. 59.
1826 *Paludina desnoyersii* Risso, p. 166, pl. 5, figs 21-22.
1832 *Truncatella montagui* Lowe, p. 303.
1836 *Cyclostoma concinnum* Scacchi, p. 133.
1852 *Glaucothoe montaguana* Leach, p. 199.
1852 *Truncatella lowei* Shuttleworth, p. 146.
1874 *Truncatella debilis* Mousson, p. 156.
1878 *Truncatella punctata* Monterosato, p. 321.
1878 *Truncatella microlena* Monterosato, p. 321.
1880 *Albertisia punica* Issel, p. 275.
1884 *Truncatella subcylindrica* var. *sublaevigata* Bucquoy, Dautzenberg & Dollfus, p. 321, pl. 32, fig. 26.
1897 *Truncatella truncatula* var. *laevigata* (Risso) – Sacco, p. 30, pl. 3, fig. 2.
?1907 *Truncatella kostejana* Boettger, p. 200.
?1907 *Truncatella biornata* Boettger, p. 200.
?1907 *Truncatella kostejana* Boettger – Zilch, p. 209, pl. 5, fig. 70.
?1907 *Truncatella biornata* Boettger – Zilch, p. 209, pl. 5, fig. 70.
1975 *Truncatella* (*Truncatella*) *subcylindrica* (Linnaeus, 1766 [*sic*]) – Bałuk, p. 64, pl. 8, figs 27-30.
2000 *Truncatella subcylindrica* (L., 1767) – Rolán & Templado, p. 86, figs 15-16, 28.

2004 *Truncatella subcylindrica* (Linnaeus, 1767) – Landau *et al*., p. 33, pl. 4, fig. 10 (*cum syn*.).
2008 *Truncatella subcylindrica* (Linné, 1767) – Chirli, p. 5, pl. 1, figs 6-8.
2010 *Truncatella subcylindrica* (Linnaeus, 1767) – Sosso & Dell'Angelo, p. 23, p. 33 unnumbered fig. 2nd row right.
2011 *Truncatella subcylindrica* (Linnaeus, 1767) – Hernández *et al*., p. 150, figs 45K-N.
2011 *Truncatella subcylindrica* (Linné, 1767) – Chirli & Linse, p. 91, pl. 27, fig. 4.
2016 *Truncatella subcylindrica* (Linnaeus, 1767) – Bakir & Öztürk, p. 447, fig. 3/42.
2019 *Truncatella subcylindrica* (Linnaeus, 1767) – Suárez *et al*., p. 45, fig. 1A.

Material and dimensions – Height 3.7 mm, width 1.5 mm. **Renauleau**: NHMW 2016/0103/2122 (1).

Discussion – The shell of *Truncatella subcylindrica* (Linné, 1767) changes strongly with ontogeny. Adult shells consist of 3-4 weakly convex to almost straight-sided whorls, with the periphery mid-whorl, having a cylindrical shape, with a blunt apex. The protoconch becomes decollate in adult shells. The suture is linear and deeply impressed. Sculpture is highly variable; some specimens are strongly axially ribbed (*e.g*., Suárez *et al*., 2019, fig. 1A), whereas others appear completely smooth (forma *laevigata* Risso). The aperture is small, rounded, with the peristome complete and everted. Juvenile specimens have quite a different appearance, a regularly turriculate shell of six to seven whorls, with stronger axial sculpture and a protoconch made up of two smooth whorls. This variability is reflected in the huge number of synonyms (see chresonymy)., This species lives in a muddy habitat, high on the shore overgrown with plants (Fretter & Graham, 1978),
Truncatella subcylindrica is extremely uncommon in Assemblage I. The single specimen at hand is fully adult, consisting of only three whorls with a truncated apex. Subobsolete axial ribs are visible just adjacent to the suture.
Two other Neogene French Atlantic species have been proposed. *Truncatella wattebledi* Benoist, 1878 from the Lower Miocene of the Aquitaine Basin said to differ in being smaller, broader, with more convex whorls and the axial sculpture is developed on the whole whorl surface as opposed to limited to the area adjacent to the sutures. It seems, however, that the ornament of this species is also very variable (Cossmann & Peyrot 1919, p. 534; de Morgan, 1920, p. 339). *Truncatella hermittei* 'Bardin' de Morgan, 1920, from the Middle Miocene Loire Basin was based on a single specimen and compared only to *T. wattebledi*, which was said to be narrower, more cylindrical, with a more oblique oval aperture. In the Paratethys Boettger (1907) described two forms, *T. kostejana* Boettger, 1907 and *T. biornata* Boettger, 1907 based on two fragments of last whorl, both with relatively strong axial sculpture. Bałuk (1975, p. 64) again stressed the variability in shape and sculpture seen in this group and synonymised these two forms with *T. subcylindrica*.
With the scant material available we cannot separate the Assemblage I shell from present-day *T. subcylindrica* but hesitate to synonymise the other Neogene congeners. We second de Morgan's apt concluding comment "*Il est d'ailleurs très difficile de caractériser les diverses mutations de ce genre, à l'etat fossile*." (1920, p. 339).

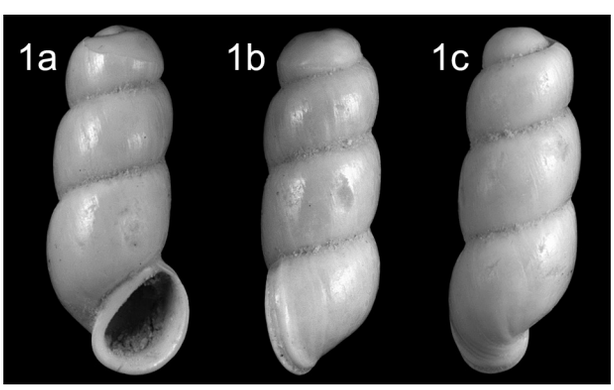

Plate 15. *Truncatella subcylindrica* (Linné, 1767); 1. NHMW 2016/0103/2122, height 3.7 mm, width 1.5 mm (digital image). Renauleau, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

Distribution – Middle Miocene: Paratethys, Poland (Bałuk, 1975), ?Romania (Boettger, 1907). Upper Miocene (Tortonian): Atlantic, NW France (this paper). Lower Pliocene: central Mediterranean, Italy (Sacco, 1897; Forli *et al*., 1999; Chirli, 2008). Upper Pliocene: western Mediterranean, Estepona Basin, Spain (Landau *et al*., 2004), central Mediterranean (Sosso & Dell'Angelo, 2010). Pleistocene: western Mediterranean, Balearic Islands (Cuerda Barceló, 1987), central Mediterranean, Sicily (Ruggieri & Greco, 1965 ; Chirli & Linse, 2011). Present-day: Atlantic, southern coast of England to Canary Islands (Hernández *et al*., 2011), Bay of Biscay, Iberia (Suárez *et al*., 2019), Madeira (Rolán & Templado, 2000), records from Cape Verde Islands not confirmed (Rolán, p. 78), the Mediterranean and Black Sea (Fretter & Graham, 1978), eastern Mediterranean (Bakir & Öztürk, 2016). High on the shore, under stones, wood and plants, in places occasionally wet by seawater (Poppe & Goto, 1991).

Superfamily Triphoroidea Gray, 1847
Family Newtoniellidae Korobkov, 1955
Subfamily Laeocochlidinae Golikov & Starobogatov, 1987
Genus *Laeocochlis* Dunker & Metzger, 1874

Type species (by monotypy) – *Laeocochlis pommeraniae* Dunker & Metzger, 1874 [=*Laeocochlis sinistratus* (Nyst, 1835)], present-day, Norway.

1874 *Laeocochlis* Dunker & Metzger, p. 7. *Laiochochlis* incorrect original spelling as ruled by ICZN Opinion 1700 (1993).

***Laeocochlis* sp. 1**
Plate 16, fig. 1

Material and dimensions – Height 2.1 mm, width 840 μm. **St-Clément-de-la-Place**: NHMW 2016/0103/2221 (1). **Sceaux-d'Anjou**: RGM.734923 (1).

Description – Shell minute, fusiform-cylindrical. Protoconch paucispiral, consisting of one convex whorl with large nucleus. Faint cords weakly developed over second half of protoconch whorl, strengthening over first quarter teleoconch whorl. Junction with teleoconch not sharply delimited. Teleoconch of three convex whorls separated by impressed linear suture. Sculpture composed of ten fine spiral cords, about one-third width of their interspaces. Last whorl 65% total height, convex, constricted at base, bearing 18 spiral cords. Base smooth, weakly concave. Aperture short, 33% total height. Outer lip and aperetural characters not preserved.

Discussion – see below under *Laeocochlis* sp. 3.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

***Laeocochlis* sp. 2**
Plate 16, figs 2, 3

Material and dimensions – Maximum height 4.0 mm, width 1.3 mm (incomplete). **Sceaux-d'Anjou**: RGM.717996 (1), RGM.734922 (1).

Description – see below under *Laeocochlis* sp. 3.

Discussion – see below under *Laeocochlis* sp. 3.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

***Laeocochlis* sp. 3**
Plate 16, fig. 4

Material and dimensions – Height 1.2 mm, width 450 μm (incomplete). **Sceaux-d'Anjou**: NHMW 2016/0103/2286 (1).

Description – Shell minute, cylindrical. Protoconch paucispiral, dome-shaped, consisting of 1-1.5 convex whorl with protruding nucleus. Junction with teleoconch not sharply delimited. Four faint cords weakly developed over second half of protoconch whorl, strengthening over first quarter teleoconch whorl. Broad, prosocline, flattened axial ribs over protoconch weaken over first half teleoconch whorl. 2.5 teleoconch whorls preserved, separated by impressed linear suture. Sculpture composed of flattened spiral cords slightly wider than their interspaces, five on first teleoconch whorl, six on last whorl. Last whorl 63% total height, weakly convex, strongly constricted at base: base smooth. Aperture short 36% total height. Outer lip and apertural characters not preserved.

Discussion – We consider the specimens figured on Plate 16 to represent three species, probably within the same genus. The protoconch is paucispiral in all three species and it is not possible to distinguish the boundary with the teleoconch. They are similar to *Seila* A. Adams, 1861 species, but in that genus the protoconch/teleoconch boundary is sharply delimited. We have followed the advice given by Philippe Bouchet (MNHN, Paris; BL personal communication, 14/02/20) and considered them dextral forms of *Laeocochlis* Dunker & Metzger, 1874. In *Laeocochlis* sp. 1 (Pl. 16, fig. 1) the protoconch bears very faint spiral sculpture that rapidly strengthens on the first half of the first teleoconch whorl. *Laeocochlis* sp. 2 (Pl. 16, figs 2, 3) also has fewer faint spiral cords and very weak axial sculpture. In contrast, *Laeocochlis* sp. 3 (Pl. 16, fig. 4) has weak spiral sculpture, but broad flattened strap-like ribs that disappear on the first half of the first

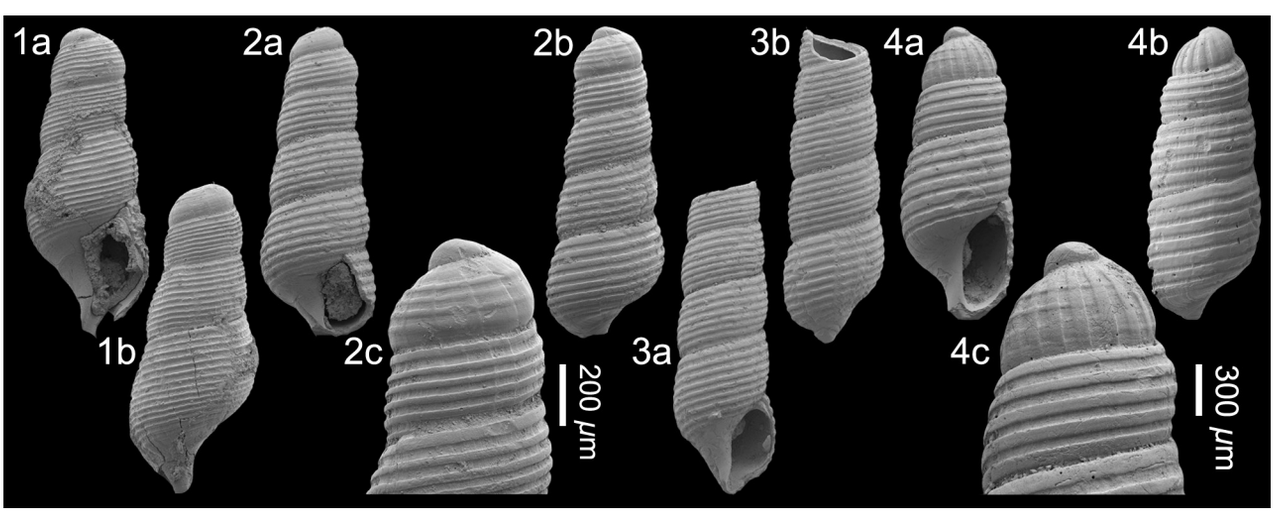

Plate 16. *Laeocochlis* sp. 1; 1. RGM.734923, height 2.1 mm, width 840 μm. *Laeocochlis* sp. 2; 2. RGM.717996, height 2.4 mm, width 840 μm, 2c, detail of protoconch; 3. RGM.734922, height 4.0 mm, width 1.3 mm; *Laeocochlis* sp. 3; 4. NHMW 2016/0103/2286, height 1.2 mm, width 450 μm (SEM images). La Presselière, Sceaux-d'Anjou, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

teleoconch whorl. All three have spiral teleoconch sculpture, narrow and crowded in *Laeocochlis* sp. 1, broader in *Laeocochlis* sp. 2 and 3, which have a similar number of cords, but the whorls in *Laeocochlis* sp. 3 are less convex and taller than in *Laeocochlis* sp. 2. The protoconch sculpture in *Laeocochlis* sp. 3 is reminiscent of that seen in the *Hebeseila* Finlay, 1926 species group (see Landau *et al*., 2018, p. 240).
All three species have been found only at Sceaux-d'Anjou and in insufficient numbers to further elucidate the relationship between these three forms. We therefore provisionally ascribe them to *Laeocochlis* and leave them in open nomenclature.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

Subfamily Newtoniellinae Korobkov, 1955
Genus *Cerithiella* Verrill, 1882

Type species (by typification of replaced name) – *Cerithium metula* Lovén, 1846, present-day, Norway.

1878 *Lovenella* G.O. Sars, p. 187. Type species (by monotypy): *Cerithium metula* Lovén, 1846, present-day, Norway. Junior homonym of *Lovenella* Hincks, 1869 [Cnidaria].
1882 *Cerithiella* Verrill, p. 522.
1885 *Stilus* Jeffreys, p. 52. Type species (by monotypy): *Stilus insignis* Jeffreys, 1885, present-day, NE Atlantic.
1893a *Newtonia* Cossmann, p. 721. *Nom. nov. pro Lovenella* Sars, 1878, *non* Hincks, 1868 [Cnidaria]. Junior homonym of *Newtonia* Schlegel, 1867 [Aves].
1893b *Newtoniella* Cossmann, p. 18. *Nom. nov. pro Newtonia* Cossmann, 1893, *non* Schlegel, 1867 [Aves], which was earlier *nom. nov. pro Lovenella* Sars, 1878, *non* Hincks, 1868 [Cnidaria].
1903 *Cerithiolinum* Locard, p. 110. Type species (by typification of replaced name): *Cerithium metula* Lovén, 1846, present-day, Norway. Unnecessary *nom. nov. pro Cerithiella* Verrill, 1882.
1915 *Chasteria* Iredale, p. 334. Type species (by original designation): *Cerithium procerum* Jeffreys, 1877, present-day, NE Atlantic.
1951 *Binda* Laseron, p. 361. Type species (by original designation): *Binda tasmantis* Laseron, 1951, present-day, New South Wales, Australia.
1951 *Euseila* Cotton, p. 387. Type species (by original designation): *Euseila pileata* Cotton, 1951, present-day, South Australia.

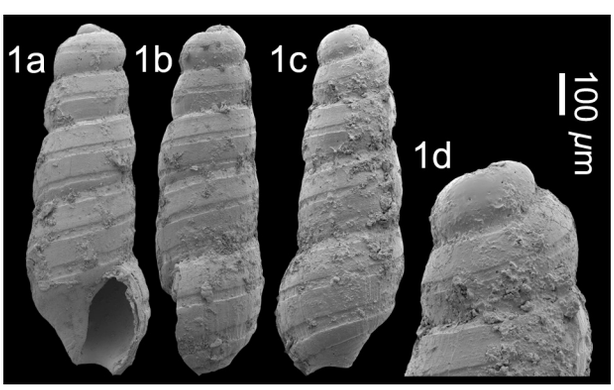

Plate 17. *Cerithiella bisulcata* nov. sp.; 1. **Holotype** NHMW 2016/0103/2054, height 1.9 mm, width 0.6 mm, 1d, detail of protoconch (SEM image). La Presselière, Sceaux-d'Anjou, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

***Cerithiella bisulcata* nov. sp.**
Plate 17, fig. 1

Zoobankregistration–https://zoobank.org/NomenclaturalActs/5A01F12F-6CBE-411E-BC67-D8A5C2CCD29E

Type material – Holotype NHMW 2016/0103/2054, height 1.9 mm, width 620 μm.

Other Material – Only known from holotype.

Etymology – Latin '*sulcus, -i*', noun, meaning furrow. Name reflecting the two wide grooves present on the teleoconch whorls. *Cerithiella* gender feminine.

Locus typicus – La Presselière, Sceaux-d'Anjou, Maine-et-Loire, NW France.

Stratum typicum – Tortonian, Upper Miocene.

Diagnosis – Highly elevated species of minute size, paucispiral protoconch, sculpture of three broad flattened bands separated by broad grooves.

Description – Shell minute (height 1.9 mm, width 0.6 mm), cylindrical. Protoconch paucispiral, consisting of one smooth convex whorl with protruding nucleus. Junction with teleoconch not sharply delimited. Teleoconch of four whorls separated by shallow linear suture. First whorl strongly convex, with single wide groove placed midwhorl. Abapically, whorls progressively less convex; on second whorl a second groove appears at abapical suture. Penultimate whorl with three flattened strap-like cords separated by broad shallow grooves, upper two cords subequal in width and broad, abapical narrower. Axial growth lines weakly developed, orthocline. Last whorl 52% total height, weakly convex, moderately constricted at base, bearing three broad spiral bands separated by two broad grooves. Base smooth, weakly concave. Aperture short, 28% total height. Outer lip regularly convex, not thickened; anal canal not developed; siphonal canal very short, broad, open.

Discussion – We have placed this most unusual minute shell in the genus *Cerithiella* Verrill, 1882 due to its similarity to *Turritella microscopica* May, 1911 (*non* J. Müller, 1851) from Tasmania. Philippe Bouchet (MNHN, Paris) kindly sent us SEM images of a specimen that shows

similar teleoconch sculpture composed of flattened bands separated by broad grooves, but the protoconch of the extant species is more pointed and less convex. The apertural characters, especially the short, broad siphonal canal, are remarkably similar. There are no remotely similar European fossil or extant congeners with which to compare this species. So far, it has been found only at Sceaux-d'Anjou, where it is uncommon. We note that *Turritella microscopica* May, 1911 is a junior homonym of *T. microscopica* Müller, 1851 (p. 29) and requires a new name.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

Superfamily Vanikoroidea Gray, 1840a
Family Eulimidae Philippi, 1853
Genus *Aclis* Lovén, 1846

Type species (by monotypy) – *Alvania supranitida* Wood, 1842 [= *Aclis minor* (Brown, 1827)], Pliocene, British Isles.

1846 *Aclis* Lovén, p. 148.

For generic synonymy see Van Dingenen *et al*. (2016, p. 157).

***Aclis talaverai* Brunetti & Cresti, 2018**
Plate 18, fig. 1

1975 *Eulima scalaris* García-Talavera, p. 98, pl. 3, fig. 7, pl. 4, fig. 6 (secondary homonym of *Aclis scalaris* Seguenza, 1876) .
*2018a *Aclis talaverai* Brunetti & Cresti, p. 195, figs 1a-c. *Nom nov. pro Eulima scalaris* García-Talavera, 1975.
2018b *Aclis scalaris* (García-Talavera, 1975) – Brunetti & Cresti, p. 62, fig. 197.

Material and dimensions – Height 1.4 mm, width 0.5 mm (juvenile). **Sceaux-d'Anjou**: NHMW 2016/0103/2059 (1), RGM.718019 (7).

Discussion – These specimens from Sceaux-d'Anjou are all small and seem to represent juveniles of *Aclis talaverai* Brunetti & Cresti, 2018, a very characteristic species that is smooth with a strong keel delimiting the subsutural ramp. The keel strengthens abapically on later teleoconch whorls and becomes sharp and crest-like. The Sceaux-d'Anjou specimens consist of the protoconch and the very early teleoconch whorls with the first keeled whorl, which is not yet strongly developed. *Eulima scalaris* García-Talavera, 1975, being an *Aclis* species, becomes a secondary homonym of *Aclis scalaris* Seguenza, 1876, and was renamed *Aclis talaverai* Brunetti & Cresti, 2018 (Brunetti & Cresti, 2018b).

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper). Upper Pliocene: central Mediterranean, Italy (Brunetti & Cresti, 2018a, b). Present-day, Mauritania (García-Talavera, 1975).

Genus *Ophieulima* Warén & Sibuet, 1981

Type species (by original designation) – *Stilifer minima* Dall, 1927, present-day, Georgia, USA.

1981 *Ophieulima* Warén & Sibuet, p. 107

***Ophieulima ligeriana* nov. sp.**
Plate 18, fig. 2

Zoobankregistration–https://zoobank.org/NomenclaturalActs/38F2E387-B83E-4700-A99F-A945B25E3733

Type material – Holotype NHMW 2016/0103/2058, height 2.3, width 1.2 mm; paratype 2 RGM.1352721, height 3.4, width 1.6 mm; paratype 3 RGM.1352722, height 2.0, width 1.0 mm. **Sceaux-d'Anjou**. Paratype 1 NHMW 2016/0103/2109, height 2.2, width 1.2 mm, **Renauleau**.

Other Material – **Sceaux-d'Anjou**: RGM.718999 (4).

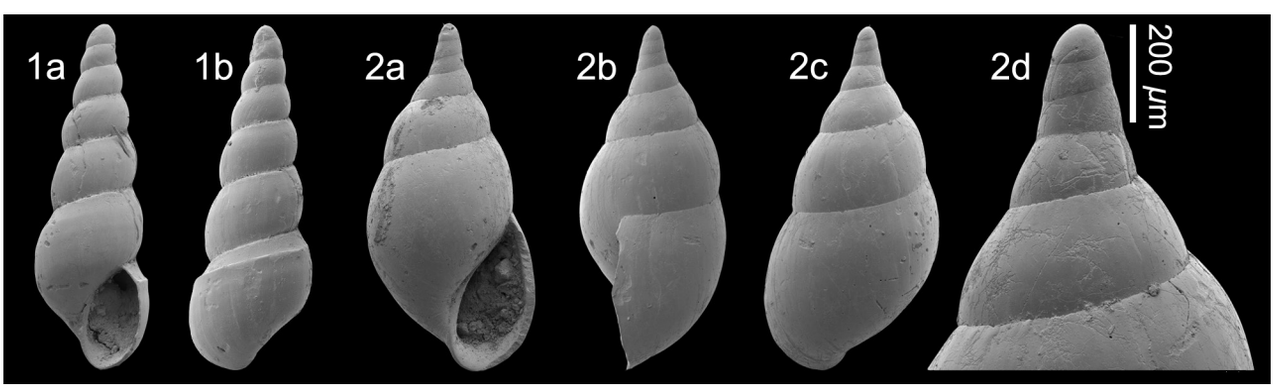

Plate 18. 1. *Aclis talaverai* Brunetti & Cresti, 2018, NHMW 2016/0103/2059, height 1.4 mm, width 0.5 mm (SEM image). 2. *Ophieulima ligeriana* nov. sp.; **Holotype** NHMW 2016/0103/2058, height 2.3 mm, width 1.2 mm (SEM image). La Presselière, Sceaux-d'Anjou, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

Etymology – Named after the palaeo Ligerian Bay in which this species occurred. *Ophieulima* gender feminine.

Locus typicus – La Presselière, Sceaux-d'Anjou, Maine-et-Loire, NW France.

Stratum typicum – Tortonian, Upper Miocene.

Diagnosis – Raised pyriform species with relatively solid and weakly inflated shell for genus, tall multispiral pupiform protoconch, 3.5 inflated teleoconch whorls devoid of sculpture, except weakly prosocline, slightly sinuous growth lines.

Description – Shell small (height 2.3 mm, width 1.2 mm), pyriform, relatively solid and weakly inflated for genus. Protoconch tall pupiform, of 3.5 whorls. Teleoconch of 3.5 convex whorls rapidly growing in height and inflation abapically, separated by superficial linear suture. Surface smooth, except for faint, slightly sinuous, weakly prosocline growth lines. Last whorl relatively inflated for genus, ovate, regularly convex, base not delimited. Aperture pyriform, outer lip simple, slightly expanded adapically. Columella short, slightly oblique, no columellar or parietal callus developed.

Discussion – Generic placement in *Ophieulima* Warén & Sibuet, 1981 is based on its multispiral pupiform protoconch and relatively inflated last whorl. The eulimid genera *Pelseneeria* Koehler & Vaney, 1908 and *Stilapex* Iredale, 1925 differ in having an even more inflated last whorl and a protoconch of less than two whorls (Bouchet & Warén, 1986, p. 347). Moreover, *Pelseneeria* species are thinner shelled. Species included in the genus *Stilifer* Broderip, *in* Broderip & Sowerby, 1832 have even more globose shells (Warén, 1980, figs 36-44). *Echineulima* Lützen & Nielsen. 1975 species also have an inflated last whorl, but the protoconch, although tall, is not mammillate. As mentioned above, *Ophieulima ligeriana* nov. sp. differs from all its European congeners in having a more pyriform and not globular shell, and consequently a more elongate aperture; it lacks a sculpture. In contrast, the present-day northern Atlantic *Ophieulima minima* (Dall, 1927) shows a weak oblique spiral sculpture.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

Superfamily Buccinoidea Rafinesque, 1815
Family and genus uncertain

Buccinid sp.
Plate 19, fig. 1

Material and dimensions – Height 8.0 mm, width 3.8 mm. **St-Clément-de-la-Place**: NHMW 2016/0103/2204 (1).

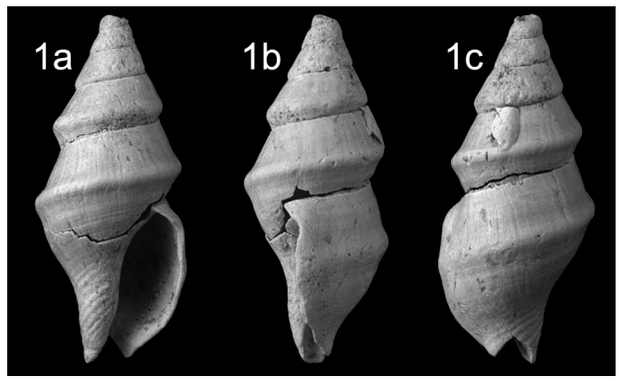

Plate 19. Buccinid sp.; 1. NHMW 2016/0103/2204, height 8.0 mm, width 3.8 mm (digital image). Le Grand Chauvereau, St-Clément-de-la-Place, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

Description – Shell small, medium-thickness, buccinifom. Protoconch missing. Teleoconch of five whorl separated by impressed linear suture. First two whorls weakly convex, on third whorl shoulder appears at abapical suture and migrates adapically, so that subsequent whorls strongly shouldered, with wide, steeply sloping subsutural ramp, angled at raised shoulder cord, tapering strongly inwards to suture below. Surface smooth, except for prominent orthocline growth ridges. Last whorl 66% of total height, subsutural ramp straight, strongly shouldered by elevated cord mid-whorl, weakly convex below, slightly constricted at base. Siphonal fasciole poorly delimited, elongated bearing spiral cords. Aperture ovate, 43% total height; outer lip not thickened by varix, smooth within, obtusely angled at shoulder, convex below; anal canal not developed; siphonal canal moderate length, open (tip missing). Columella weakly excavated, columellar and parietal calluses hardly developed.

Discussion – Represented by a single incomplete specimen, its placement is uncertain. It could be a member of the Buccinidae Rafineque, 1815 or Columbellidae Swainson, 1840. Despite searching through hundreds of kilograms of residues we have failed to find a second specimen.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

Family Columbellidae Swainson, 1840
Subfamily Atiliinae Cossmann, 1901
Genus *Costoanachis* Sacco, 1890

Type species (by subesquent designation; Pace, 1902) – *Costoanachis saccostata* Radwin, 1977 [= *Columbella* (*Anachis*) *turrita* Sacco, 1890, *non Columbella turrita* G.B. Sowerby I, *in* Broderip & G.B. Sowerby I, 1832], Miocene, Italy.

1890 *Costoanachis* Sacco, p. 57.

***Costoanachis harzhauseri* nov. sp.**
Plate 20, figs 1-4

1964 *Anachis terebralis* Grateloup, 1834 – Brébion, p. 407, pl. 9, fig. 32 [*non Costoanachis terebralis* (Grateloup, 1834)].

2019b *Costoanachis terebralis* (Grateloup, 1834) – Landau *et al*., p. 152, pl. 15, figs 1-4 [*non Costoanachis terebralis* (Grateloup, 1834)].

Zoobank registration – https://zoobank.org/NomenclaturalActs/AD9F9CB5-BFBF-4442-A737-59BA7C76DEFD

Type material – Holotype NHMW 2016/0103/0809, height 5.1 mm, width 2.7 mm; paratype 1 NHMW 2016/0103/1840, height 6.2 mm, width 2.4 mm; paratype 2 NHMW 2016/0103/1841, height 6.1 mm, width 2.2 mm; paratype 3 NHMW 2016/0103/0810 (juvenile).

Other material – Maximum height 6.4 mm, width 2.8 mm. **St-Clément-de-la-Place**: NHMW 2016/0103/0811 (50+), RGM.1349080 (3), LC (50+), FVD (50+). **Sceaux-d'Anjou**: NHMW 2016/ 0103/0812 (22), RGM.1348914 (50+), RGM. 718097 (50+), RGM.1349266 (50+), RGM.1352196 (50+), RGM.1352577 (5), LC (2), FVD (12). **Renauleau**: LC (2).

Etymology – Named after friend, colleague and co-author Mathias Harzhauser from the Natural History Museum of Vienna, Austria. *Costoanachis* gender feminine.

Locus typicus – Le Grand Chauvereau, St-Clément-de-la-Place, Maine-et-Loire, NW France.

Stratum typicum – Tortonian, Upper Miocene.

Diagnosis – Elevated conical species of small size, with multispiral dome-shaped protoconch, relatively convex teleoconch whorls, close-set axial sculpture persisting through ontogeny, weak spirals restricted to base, aperture with broad anal sinus and five moderately developed outer lip denticles, D1 strongest.

Description – Shell small (holotype height 5.1 mm, width 2.7 mm), squat fusiform, with conical spire and narrowly incised suture. Protoconch raised conical with rounded nucleus, multispiral of 3.5 convex whorls, height 0.5 mm, width 0.5 mm. Teleoconch of 3.5 moderately convex whorls, with periphery at abapical suture. Sculpture of prominent, opisthocline, more or less closely set axial ribs, roughly equal in width to their interspaces; variable in strength and density on penultimate and last whorl but persisting throughout ontogeny. Last whorl regularly convex, with moderately constricted base and moderately short siphonal canal. Spiral sculpture of weak cords confined to base and siphonal fasciole. Aperture moderately narrow; anal sinus broad U-shaped; siphonal canal moderately narrow and short. Outer lip with relatively weakly developed internal labial callus pad, with about five moderately developed denticles within, D1 (= first from top) slightly stronger. Columellar callus moderately thickened forming sharply delimited callus rim, with three prominent denticles on middle portion of outer columellar edge. Parietal callus weakly developed.

Discussion – During the revision of the Paratethyan Miocene Columbellidae (Harzhauser & Landau, 2021), it became clear that what had been called *Costoanachis terebralis* (Grateloup, 1834), originally described from the Lower Miocene of the northeastern Atlantic, by authors working on Paratethyan assemblages was not that species, but *Costoanachis guembeli* (Hoernes & Auinger, 1880). *Costoanachis terebralis* differs from the Paratethyan shells in their less convex last whorl, straight axial ribs and the high conical protoconch with strongly convex whorls (see Lozouet 2015, pl. 7, figs 2, 6, 10, pl. 8, figs 10-12).
Likewise, it was noted that the specimens from the Tortonian of the north-eastern Atlantic, ascribed to *C. terebralis* by Landau *et al*. (2019b, pl. 15, fig. 2) were also not conspecific. The Assemblage I specimens differ in having a teleoconch whorl less, narrower axial ribs, a very broad U-shaped anal canal, and fewer internal outer lip denticles, of which D1 is the strongest, whereas in both *C. terebralis* and *C. guembeli* D2 is strongest.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

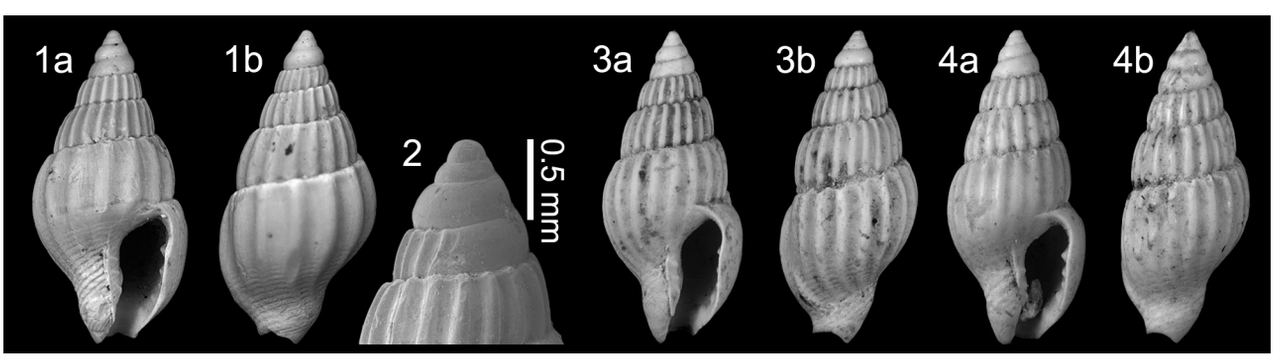

Plate 20. *Costoanachis harzhauseri* nov. sp.; 1. **Holotype** NHMW 2016/0103/0809, height 5.1 mm, width 2.7 mm; 2. **Paratype 3** NHMW 2016/0103/0810 (juvenile), detail of protoconch; 3. **Paratype 1** NHMW 2016/0103/1840, height 6.2 mm, width 2.4 mm; 4. **Paratype 2** NHMW 2016/0103/1841, height 6.1 mm, width 2.2 mm (1, 3, 4, digital images; 2, SEM image). Le Grand Chauvereau, St-Clément-de-la-Place, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

Superfamily Turbinelloidea Rafinesque, 1815
Family Costellariidae MacDonald, 1860
Genus *Suluspira* Fedosov, Herrmann & Bouchet, 2017

Type species (by typification of replaced name) – *Visaya rosenbergi* Poppe, Guillot de Suduiraut & Tagaro, 2006, present-day, Philippines.

2006 *Visaya* Poppe, Guillot de Suduiraut & Tagaro, p. 104. Type species (by original designation): *Visaya rosenbergi* Poppe, Suduiraut & Tagaro, 2006, present-day, Philippines. Junior homonym of *Visaya* Ahyong, 2004 [Crustacea].

2017 *Suluspira* Fedosov, Herrmann & Bouchet *in* Fedosov *et al*., p. 563. *Nom. nov. pro Visaya* Poppe, Guillot de Suduiraut & Tagaro, 2006, *non* Ahyong, 2004 [Crustacea].

***Suluspira gallica* nov. sp.**
Plate 21, figs 1-2

Zoobank registration – https://zoobank.org/NomenclaturalActs/6A891971-525D-45ED-9A4C-B9E97F9C29EC

Type material – Holotype NHMW2016/0103/2121, height 2.9 mm, width 1.0 mm; paratype 1 NHMW 2016/0103/2095, height 2.7 mm, width 920 μm; paratype 2 RGM.1352717, height 2.4 mm; paratype 3 RGM.1352718, height 2.5 mm; paratype 4 RGM.1352719, height 2.4 mm.

Other Material – **St-Clément-de-la-Place**: NHMW 2016/0103/2222 (1 juvenile). **Sceaux-d'Anjou**: RGM.739233 (3). Middle Miocene (Langhian), **Ferriere-Larçon**: NHMW 2016/0103/2285 (1).

Etymology – Named after the Roman province of Gaul, Latin: '*Gallia*', a region of Western Europe encompassing present-day France. *Suluspira* gender feminine.

Locus typicus – La Presselière, Sceaux-d'Anjou, Maine-et-Loire, NW France.

Stratum typicum – Tortonian, Upper Miocene.

Diagnosis – Elevated species of minute size, dome shaped paucispiral protoconch of two whorls with spiral microsculpture, outer lip only moderately flared, well developed anal sinus on outer lip, four columellar folds.

Description – Shell minute (holotype height 2.9 mm, width 1.0 mm), fusiform-cylindrical, solid. Protoconch paucispiral, dome-shaped, composed of just over two convex whorls, with spiral microsculpture; height 0.6 mm, diameter 0.4 mm. Junction with teleoconch sharply delimited with flexuous lip. Teleoconch of two weakly convex whorls,impressed linear suture, strongly oblique between penultimate and last whorl. Surface covered in close-set orthocline growth lines. Last whorl cylindrical, 74% total height, weakly convex, hardly constricted at base. Aperture elongate, 48% total height, widening abapically. Outer lip somewhat flared abapically, bearing broad, well developed anal sinus adapically; siphonal canal short, broad, open. Columella bearing four oblique folds within. Columellar and parietal callus forming narrow callus rim.

Discussion – It is with some surprise that we record what must be one of the smallest Turbinelloidea known, reaching a maximum height of only 2.9 mm. It is quite unlike any European fossil or extant species and seems to be a minute representative of the costellariid genus *Suluspira* Fedosov, Herrmann & Bouchet, 2017. This genus was, until now, monotypic, known from a single species, *Suluspira rosenbergi* (Poppe, Suduiraut & Tagaro, 2006) from the Philippines. Apart from being larger (up to 17.6 mm in height), *S. rosenbergi* differs from *S. gallica* nov. sp. in having a relatively smaller paucispiral protoconch, a far more flared outer lip, and stronger columellar folds. One important difference, which may be of generic significance, is the presence of a well-developed anal sinus on the outer lip adapically in the French species that is absent in *S. rosenbergi*. A single specimen from the Atlantic Middle Miocene (Langhian) of Ferrière-Larçon (Indre-et-Loire, France) is also at hand.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

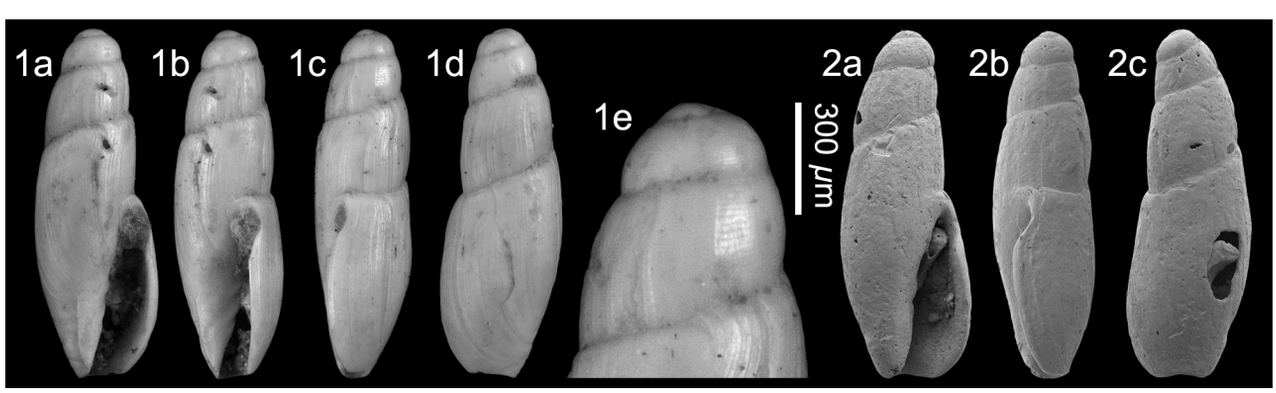

Plate 21. *Suluspira gallica* nov. sp.; 1. **Holotype** NHMW 2016/0103/2121, height 2.9 mm, width 1.0 mm, 1b, rotated to show columellar folds, 1e, detail of protoconch (digital image). 2. **Paratype 1** NHMW 2016/0103/2095, height 2.7 mm, width 920 μm (SEM image). La Presselière, Sceaux-d'Anjou, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

Superfamily Muricoidea Rafinesque, 1815
Family Muricidae Rafinesque, 1815
Subfamily Ergalataxinae Kuroda, Habe & Oyama, 1971
Genus *Cathymorula* Landau, Houart & Silva, 2007

Type species – *Cathymorula cathyae* Landau, Houart & Silva, 2007, by original designation, Pliocene, Spain.

2007 *Cathymorula* Landau, Houart & Silva, p. 53.

***Cathymorula* sp.**
Plate 22, fig. 1

Material and dimensions – Height 10.1 mm, width 6.9 mm. **Renauleau**: NHMW 2016/0103/2287 (1).

Discussion – A single incomplete specimen from Renauleau is ascribed to the ergalataxine genus *Cathymorula* Landau, Houart & Silva, 2007 based on its relatively solid shell, profile, and columellar characters. It is similar to the type species *C. cathyae* Landau, Houart & Silva, 2007 from the Atlantic Lower Pliocene Guadalquivir Basin of Spain and *C. exilis* (Hörnes, 1852) from the Middle Miocene Paratethys, but it is too incomplete and immature to identify with greater certainty.

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

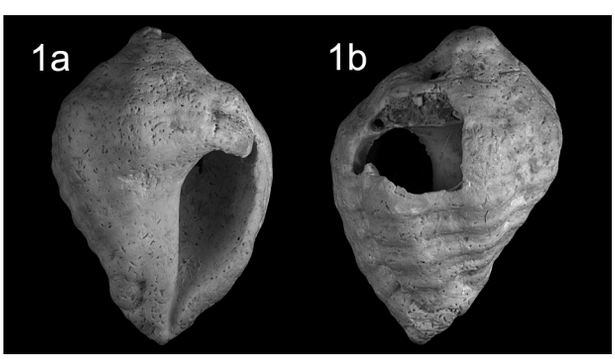

Plate 22. *Cathymorula* sp.; 1. NHMW 2016/0103/2287, height 10.1 mm, width 6.9 mm. Renauleau, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

Superfamily Conoidea Fleming, 1822
Family Raphitomidae Bellardi, 1875
Genus *Andonia* Harris & Burrows, 1891

Type species – *Fusus bonellii* Bellardi & Michelotti, 1840, by typification of replacement name, Pliocene, Italy.

1891 *Andonia* Harris & Burrows, p. 112. *Nom. nov. pro Genea* Bellardi, 1873, *non* Rondani, 1850 [Diptera].

For generic synonymy see Landau *et al*. (2020a, p. 41).

***Andonia fosseensis* nov. sp.**
Plate 23, fig. 1

?2020a *Andonia* cf. *bonellii* (Bellardi & Michelotti, 1840) – Landau *et al*., p. 41, pl. 37, figs 1-3 [*non Andonia* cf. *bonellii* (Bellardi & Michelotti, 1840)].

Zoobank registration – https://zoobank.org/NomenclaturalActs/C1DB82E0-FD90-4C01-90AF-7670C7B41C50

Type material – Holotype NHMW2016/0103/2288, height 6.1 mm, width 2.0 mm.

Other Material – Known from holotype only, although specimens from La Presselière, Sceaux-d'Anjou: NHMW 2016/0103/1994-1995 (2), NHMW 2016/0103/2033 (1), RGM.718192 (2 fragments) recorded as *Andonia* cf. *bonellii* (Bellardi & Michelotti, 1840) by Landau *et al*. (2020a, p. 41) probably represent this species. They are not suitable for type material as their protoconchs are missing.

Etymology – Named after the type locality of 'La Fosse' at Sceaux d'Anjou. *Andonia* gender feminine.

Locus typicus – La Fosse, Sceaux-d'Anjou, Maine-et-Loire, NW France.

Stratum typicum – Tortonian, Upper Miocene.

Diagnosis – Andonia species of small size, slender fusiform, protoconch of two whorls with spiral rows of micropustules and riblets last quarter whorl, teleoconch with strongly convex whorls, shoulder not developed, sculpture of axial ribs that persist to aperture overrun by sharp spiral cords, secondaries hardly developed.

Description – Shell small (height 6.1 mm, width 2.0 mm), slender fusiform. Protoconch paucispiral, dome-shaped, composed of just over two convex whorls, bearing fine, close-set spiral rows of micropustules (somewhat abraded) and close-set, sinuous axial riblets on the last quarter whorl (height 405 μm, diameter 340 μm). Junction with teleoconch delimited by change of sculpture. Teleoconch of 4.5 strongly convex whorls, with shallowly impressed, undulating suture. Axial sculpture of rounded opisthocline ribs that persist to aperture, broadening towards abapical suture, about one-third width of their interspaces, overrun by narrow spiral cords, also about one-third width of their interspaces, six on first teleoconch whorl, nine on penultimate whorl. No secondary spiral sculpture developed. Close-set growth lines give finely lamellose appearance in spiral interspaces. Last whorl slender fusiform, weakly constricted at base, sculptured by 20 sharp subequal cords, single secondary intercalated mid-whorl. Base and siphonal fasciole not delimited. Aperture elongate; outer lip slightly thickened by varix, smooth within; anal sinus very shallow U-shaped; siphonal canal medium length, straight, wide, open. Columella weakly excavated in upper third. Colu-

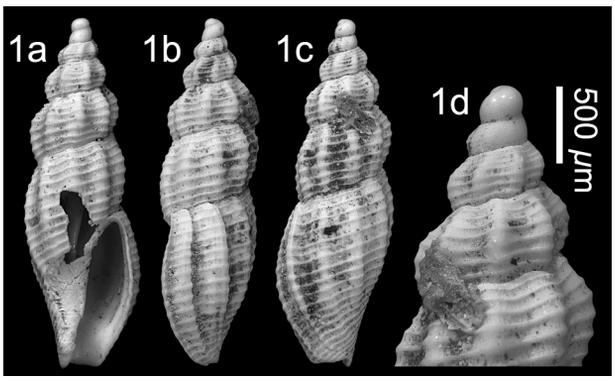

Plate 23. *Andonia fosseensis* nov. sp.; 1. **Holotype** NHMW 2016/0103/2288, height 6.1 mm, width 2.0 mm, 1d, detail of protoconch (digital image). La Fosse, Sceaux-d'Anjou, Maine-et-Loire, NW France, Tortonian, Upper Miocene.

mellar callus poorly developed, forming narrow edge; parietal callus weakly thickened.

Discussion – *Andonia fosseensis* nov. sp. is closely similar to *A. wilhelminamariae* Landau & Mulder, 2020 from the Upper Pliocene, Lower Piacenzian of the Estepona Basin, southern Spain, and have almost identical paucispiral protoconchs, both in shape and microsculpture. However, *Andonia fosseensis* is slenderer for the same height, has an extra teleoconch whorl, the whorls are more strongly convex separated by a deeper suture, the ribs are more elevated and persist to the aperture, whereas in *A. wilhelminamariae* they are subobsolete on the last whorl, and the spirals are sharp, with almost no secondaries developed, whereas in *A. wilhelminamariae* they are flattened with secondaries developed in most interspaces on the last whorl. Landau *et al*. (2020a, pl. 37, figs 1-3) illustrated specimens from the adjacent locality of La Presselière, Sceaux d'Anjou as *Andonia* cf. *bonellii* (Bellardi & Michelotti, 1840) as they did not have their protoconch preserved. Those specimens probably also represent *A. fosseensis* but cannot be ascribed with certainty with their protoconch.
Andonia delgadoi Landau, Van Dingenen & Ceulemans, 2020, also from Assemblage I is immediately separated by its less slender fusiform profile and different sculpture. For further generic discussion and comparison see Landau *et al*. (2020a, p. 42-43) and Landau & Mulder (2020, p. 47).

Distribution – Upper Miocene (Tortonian): Atlantic, NW France (this paper).

Corrigenda

Corrections to Part 2 (Landau** et al**., 2018)
p. 293. *Zebinella obsoleta* (Hörnes, 1856). This species was placed in the genus *Chiliostigma* Melvill, 1918 (type species by monotypy, *Rissoina refigium* Melvill, 1918, present-day, Gulf of Oman) by Faber & Moolenbeek (2014). Therefore, it should be corrected to *Chiliostigma obsoleta* (Hörnes, 1856).

Corrections to Part 3 (Landau** et al**., 2019a)
p. 24. Type material for *Attiliosa pouweri* Landau, Merle, Ceulemans & Van Dingenen, 2019: Paratype 9 RGM. 1348370, height 11.1, width 6.5 mm was omitted (*lapsus*).

Corrections to Part 5 (Landau** et al**., 2020a)
p. 55-56 *Cyrillia michalidesi* Landau, Van Dingenen & Ceulemans, 2020 is corrected to *C. michalidesae*. We apologise profusely to Wieke Michalides for not knowing Wieke was a female name.

Corrections to Part 6 (Landau** et al**., 2020b)
p. 259 *Ebala ornatissima* Landau, Ceulemans & Van Dingenen, 2020. In the figure caption (p. 260, pl. 3) and discussion the genus *Eulimella* is used. This is a *lapsus* and should be *Ebala*.

Corrections to Part 7 (Landau** et al**., 2020c)
p. 314 In the discussion of *Parthenina pouweri* Landau, Micali, Van Dingenen & Ceulemans, 2020 the new species is compared to *P. silvae* nov. sp. This was a manuscript name, later not used and the reference was not deleted (*lapsus*). It is therefore a *nomen nudum*.

Discussion

In this final part of the taxonomic revision of the gastropods of Assemblage I (*sensu* Van Dingenen *et al*., 2015) of the Upper Miocene Tortonian of northwestern France, one species in the superfamily Oxynooidea Stoliczka 1868 (1847) and five in the superorder Eupulmonata Morton, 1955 are recorded (Fig. 1).

In the *addenda* section 22 species are added to parts covered in previous taxonomic works on Assemblage I (Landau *et al*., 2017, 2018, 2019a, 2019b, 2020a, 2020b, 2020c), resulting in the description of nine new species: *Palazzia omalogyroides* nov. sp., *Skeneoides karrineae* nov. sp., *Alvania praetermissa* nov. sp., *Setia minutissima* nov. sp., *Cerithiella bisulcata* nov. sp., *Ophieulima ligeriana* nov. sp., *Costoanachis haurzhauseri* nov. sp., *Suluspira gallica* nov. sp., and *Andonia fosseensis* nov. sp.
Bolma redoniana nov. nom. is proposed for *Turbo trochleatus* Millet, 1865, *non* zu Münster, 1841. Eight species are added in open nomenclature.

This concludes the taxonomic revision of these extremely diverse Assemblage I deposits with a total of 554 gastropod species, of which 196 were described as new, representing 250 genera. 63 species were left in open taxonomy. A full synthesis of Assemblage I is in preparation.

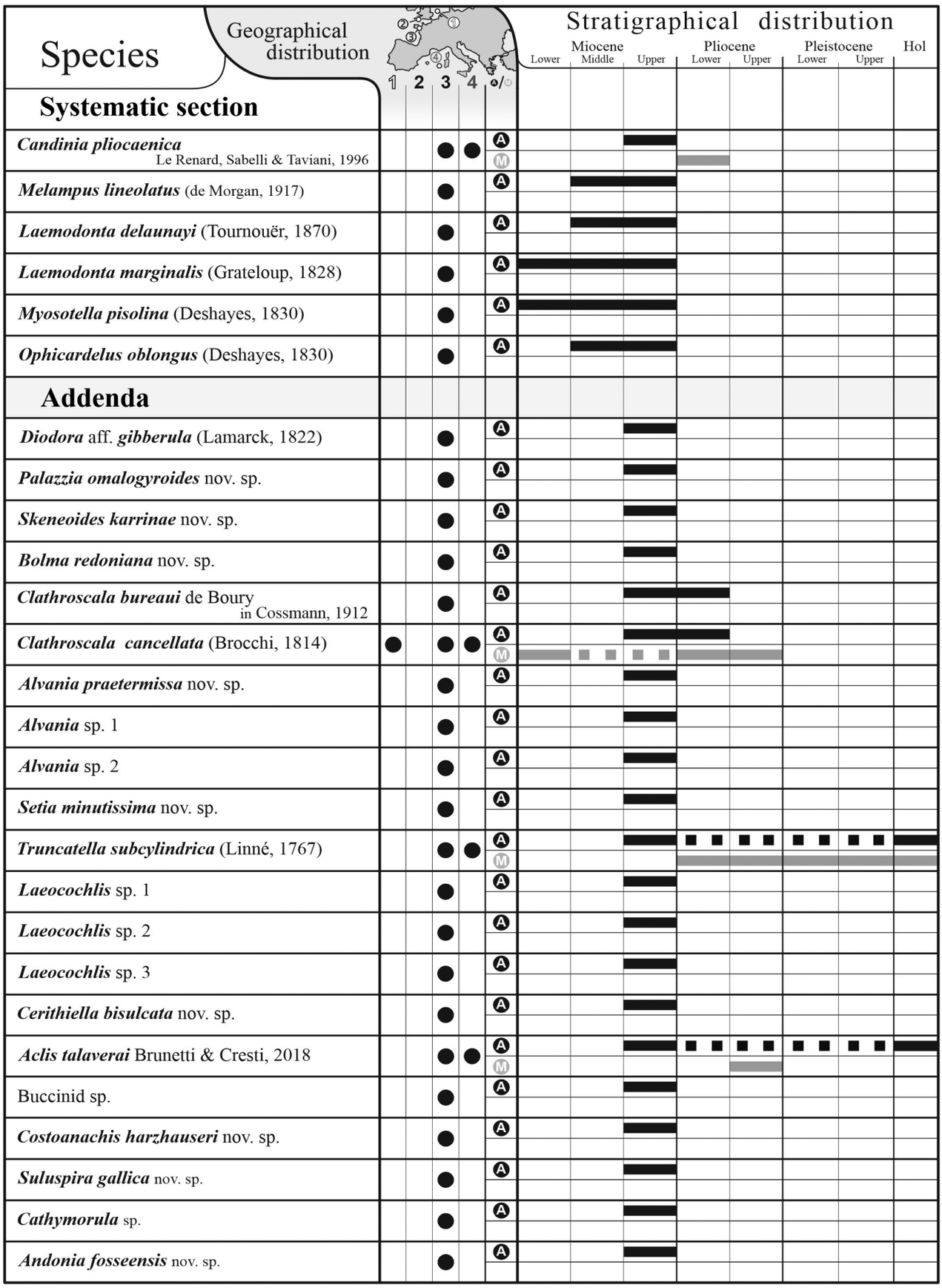

Figure 1. Geography, stratigraphy and distribution of species found in the Upper Miocene Tortonian Assemblage I localities of northwestern France. For geographic distribution 1 = North Sea Basin, 2 = Atlantic coasts British Isles, 3 = NW France, 4 = Mediterranean. For stratigraphic distribution black signifies Atlantic distribution (A), grey Mediterranean distribution (M).

Acknowledgements

Thanks to Carlos Marques da Silva of the University of Lisbon, Portugal, for his advice and help with graphics. Thanks also to Leon Hoffman of the Marine Research Department, Senckenberg am Meer, Wilhelmshaven, Germany for his excellent review.
Special thanks should be given to Mr. Hammoneau, Mr. Justeau, and family Lherbette for allowing us to collect on their properties.

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