

THE FOSSIL SERPULIDAE AND SABELLIDAE FROM THE ISLE OF WIGHT: PART 3 PALEOGENE SERPULIDAE

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Abstract: Ten species of serpulid worm tube from the Paleogene of the Isle of Wight are described and figured. Both attached and unattached forms are present. They are mostly from marine shallow water clays and muddy sands, but include a potentially brackish/freshwater taxon. Most species are stratigraphically restricted; however, some forms occur in high abundance.

Keywords: Serpulidae, Paleogene, Isle of Wight.

Introduction

Comprising the third part of a series documenting records of fossil 'serpulid' worms from the Isle of Wight, herein are those from the Paleogene rocks which form the northern part of the Island. These taxa have received almost no attention since they were originally named beginning with Solander (1766), Mantell (1822) and the Sowerby brothers between 1812 and 1845. The most common taxa are figured in Todd and Parfitt (2017) and in previous editions of that publication. Besides the overview of European serpulids by Rovereto (1904), and those from the Priabonian of Germany by Oppenheim (1901), the only comprehensive study of the British taxa is that of Wrigley (1951), which predates the major revisions of Upper Cretaceous forms by Regenhardt (1961), Lommerzheim (1979) and Jäger (1983). However, Wrigley seems not to have considered the progress made by Brünnich Nielsen (1931). Nevertheless, Wrigley covers all the recognised taxa from the British Eocene. Based upon the unpublished catalogues of the Isle of Wight Council Geological Collection, previous curators documenting the collection have assigned serpulid finds to those recognised by Wrigley (1951), including specimens from strata that would then have been considered Oligocene in date. With little progress in over two hundred years there is high potential for undescribed taxa from the British Paleogene.

Contrary to those of the deep water Late Cretaceous Chalk, the serpulids of the Paleogene are mostly from marine shallow water clays and muddy sands, including a potentially brackish/freshwater taxon. Most species are stratigraphically restricted, but forms such as the simple tubes of *Ditrupa plana* occur in high abundance concentrations.

Having been stable since the middle of the nineteenth century, the stratigraphic nomenclature of the British Eocene and Oligocene underwent quite radical revision, beginning in the 1980s. Herein, we follow the most recent revision, that of King (2016), simplified versions of which can be found in Todd and Parfitt (2017) and Gale (2019). However, most of the specimens in this study were collected prior to the current nomenclature and therefore are adjusted where practicable to match present terminology.

Institutional abbreviations: IWCMS = Isle of Wight Council Museum Service. MIWG = Museum of Isle of Wight Geology.

Species Descriptions

Phylum ANNELIDA Lamarck, 1809

Class POLYCHAETA Grube, 1850

Subclass SEDENTARIA Lamarck, 1818

Infraclass CANALIPALPATA Rouse and Fauchald, 1997

Order SABELLIDA Dales, 1962

Family SERPULIDAE Rafinesque, 1815

Subfamily SERPULINAE Rafinesque, 1815

Genus SERPULA s.l. Linnaeus, 1758

Serpula cf. *flagelliformis* J. de C. Sowerby, 1844

Fig. 1 Description. Small up to 20 mm in length, and typically less than 2 mm in diameter. The tube is round and thin walled, with numerous closely set growth lines and occasional swellings. It is attached for the entire length. It increases in size gradually and is sinuous and recurved. The inner tube is round.

Remarks. Found as individual tubes attached to shells.

Occurrence. Lutetian: Selsey Formation, Bracklesham Group.

Material. 'Brook Bed', Selsey Formation, Bracklesham Group: MIWG. 2485 Whitecliff Bay.



Fig. 1: *Serpula* cf. *flagelliformis* J. de C. Sowerby, 1844. 'Brook Bed', Selsey Formation, Bracklesham Group. Whitecliff Bay. MIWG. 2485. Attached to the wing of a shell of *Pterynotus* sp. Scale bar: 10mm.

Serpula tenuis J. de C. Sowerby, 1829 Fig. 2–3

Description. Small and narrow, up to 50mm in length. The tube is cylindrical and thin with a single minute carina. It is smooth with occasional very faint growth lines and typically a single abrupt swelling. Some individuals have a single flange. Found in small to large groups of individuals isolated or fixed together, straight or curved.

Remarks. Commonly found in the marginal marine parts of the Solent Group. Notably forming mounds within the basal part of the Gurnard Member at Howgate Bay. In parts of the Headon Hill Formation, it occurs with freshwater molluscs.

Occurrence. Priabonian: Colwell Bay Member, Headon Hill Formation, and Gurnard Member, Bouldnor Formation, Solent Group. Rupelian: Cranmore Member, Bouldnor Formation Solent Group.

Material. Colwell Bay Member, Headon Hill Formation: MIWG. 3548 and MIWG. 1998 *Neritina* Bed, MIWG. 1134 Oyster Bed, Colwell Bay, Isle of Wight. Gurnard Member, Bouldnor Formation: MIWG. 2158 Whitecliff Bay. Gurnard Member, Bouldnor Formation: IWCMS: 2025.7 Black Rock Ledge. Cranmore Member *Corbula* Bed: MIWG.1246 Bouldnor.



Fig. 2: *Serpula tenuis* J. de C. Sowerby, 1829. 'Neritina Bed', Colwell Bay Member, Headon Hill Formation. Colwell Bay. MIWG. 3548. Scale bar: 10mm.

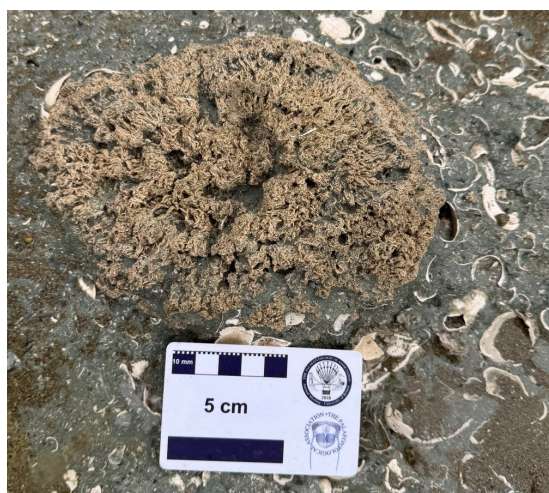


Fig. 3: *Serpula tenuis* J. de C. Sowerby, 1829. Gurnard Member, Bouldnor Formation. Black Rock Ledge, Bembridge. IWCMS: 2025.7. Shows radiating individuals forming a small mound. Scale bar: 50 mm.



Fig. 4: *Serpula* sp. Gurnard Member, Bouldnor Formation. Locality unknown, but presumably Howgate Bay, Bembridge. MIWG. 839. Scale bar: 10mm.

Serpula sp. Fig. 4

Description. Small, forming knot-like colonies approximately 10-15mm across. Both the inner and outer surfaces of the tube are round; the growth habit is convoluted. The surface is smooth with irregular swellings and moderate growth lines.

Remarks. These closely formed knots occur approximately four metres above the base of the Gurnard Member in Howgate Bay.

Occurrence. Priabonian: Gurnard Member, Bouldnor Formation, Solent Group.

Material. Gurnard Member, Bouldnor Formation, Solent Group: MIWG. 839 Locality unknown: Isle of Wight, IWCMS 2020.430 Howgate Bay.

Genus PYRGOPOLON de Montfort, 1808

Formerly SCLEROSTYLA Mørch, 1863

Pyrgopolon sp. Fig. 5-6

Description. Medium sized, up to 25mm in length. Superficially triangular in section with a strong carina on the axis of the tube. The growth lines are strong and irregularly spaced. The inner tube is round. Flattened attachment area. Attached for the full length. **Remarks.** Typically attached to the surfaces of dead shells.

Occurrence. Priabonian: Gurnard Member, Bouldnor Formation, Solent Group. Rupelian: Cranmore Member, Bouldnor Formation Solent Group.



Fig. 5: *Pyrgopolon* sp. Gurnard Member, Bouldnor Formation. Black Rock Ledge, Bembridge. IWCMS: 2025.6.1. attached to the surface of a broken shell of *Ostrea vectensis*. Scale bar: 10mm.



Fig. 6: *Pyrgopolon* sp. Cranmore Member, Bouldnor Formation, Solent Group. Bouldnor Cliff. MIWG. 2116. Attached to a shell of *Granulolabium plicatum*. Scale bar: 30mm.

Material. Gurnard Member, Bouldnor Formation, Solent Group: MIWG. 1948 Whitecliff Bay. Gurnard Member, Bouldnor Formation: IWCMS: 2025.6.1-6. Black Rock Ledge, Bembridge. Cranmore Member, Bouldnor Formation, Solent Group: MIWG. 2116 Bouldnor Cliff.

Pyrgopolon mellevillei (Nyst and Le Hon, 1862) Fig. 7
Description. Medium sized, up to 20 mm in length, straight or recurved. Outer surface with seven carinae which have an irregular pattern of nodes. Periodically, the tube is crossed by strong ridges which mark former hiatuses of growth at irregular intervals. The inner tube is round. The operculum is funnel shaped and its disc radiated.

Remarks. This taxon has undergone some revision (see Read and Fauchald *The World Polychaeta Database*. (<https://www.marinespecies.org/polychaeta>) and includes material previously assigned to *Sclerostyla gallica* Wrigley, 1951 = *Pyrgopolon gallica* (Wrigley, 1951) and *Serpula heptagona* von Hagenow, 1840.

Occurrence. Lutetian: Selsey Formation, Bracklesham Group.

Material. Fisher Bed xvii, Selsey Formation, Bracklesham Group: MIWG. 2307 Whitecliff Bay.



Fig. 7: *Pyrgopolon mellevillei* (Nyst and Le Hon, 1862). Fisher Bed xvii, Selsey Formation, Bracklesham Group. Whitecliff Bay. MIWG. 2307. Scale bar: 30mm.

Tribe FICOPOMATINI Pillai, 1960

Genus DITRUPA Berkeley, 1835

Ditrupa bartonensis Wrigley, 1951 Fig. 8

Description. Small thin gently curved tubes up to 20 mm in length. The outer surface of the tube is smooth, the inner surface of the tube is round.

Remarks. Occurs in crowded masses of individuals.

Occurrence. Bartonian: Barton Clay Formation ('Middle Barton Beds'), Barton Group.

Material. 'Middle Barton Beds', Barton Clay Formation, Barton Group: MIWG. 1082 Alum Bay. *Ditrupa plana* (J. Sowerby, 1815) Fig. 9

Description. Small up to 15 mm in length, gently tapering and curving individual tubes. The outer surface is smooth. The inner tube surface is round, and the aperture is slightly thickened. Found in crowded masses.

Remarks. Small specimens are abundant in the Tilehurst Member (Harwich Formation, Thames

Group) which was formerly known as the London Clay Basement Bed, at Whitecliff Bay, and Alum Bay.

Occurrence. Ypresian: Tilehurst Member, Harwich Formation, Thames Group.

Material. 'London Clay Basement Bed', Tilehurst Member, Harwich Formation, Thames Group: MIWG. 481 Alum Bay, MIWG. 5775 Whitecliff Bay.



Fig. 8: *Ditrupa bartonensis* Wrigley, 1951. 'Middle Barton Beds', Barton Clay Formation, Barton Group. Alum Bay. MIWG. 1082. Scale bar: 50mm.



Fig. 9: *Ditrupa plana* (J. Sowerby, 1815). 'London Clay Basement Bed', Tilehurst Member, Harwich Formation, Thames Group. Whitecliff Bay. MIWG. 5775. Scale bar: 10mm.

Subfamily FILOGRANINAE Rioja, 1923

Genus PROTULA Risso, 1826

Protula extensa (Solander, 1766) Fig. 10 - 11

Description. Large, thick shelled, up to 250 mm in length, and 8 mm in diameter. The tube is almost straight but with occasional kinks. The surface is smooth but faintly corrugated, with numerous nearly equal growth lines. The inner tube is round and is unattached.

Remarks. The largest tube worm from the British Eocene. Occurs singly and in crowded masses.

Occurrence. Lutetian: Selsey Formation, Bracklesham Group. Bartonian: Barton Clay Formation ('Middle Barton beds'), Barton Group.

Material. 'Brook Bed', Selsey Formation, Bracklesham Group: MIWG.1259 Whitecliff Bay. 'Upper Bracklesham', Bracklesham Group: MIWG. 523a Gunville, Newport. 'Middle Barton Beds', Barton Clay

Formation, Barton Group: MIWG. 2043 Alum Bay. 'Middle Barton Beds', Barton Clay Formation, Barton Group: MIWG.6173 Alum Bay. 'Barton Beds': MIWG. 4752 Alum Bay.



Fig. 10: *Protula extensa* (Solander, 1766). Upper Bracklesham', Bracklesham Group. Gunville, Newport. MIWG. 523a. Block containing numerous individuals. Scale bar: 50mm.



Fig. 11: *Protula extensa* (Solander, 1766). 'Middle Barton Beds', Barton Clay Formation, Barton Group. Alum Bay. MIWG. 2043. Scale bar: 50mm.

Family SPIROBIDAE Chamberlin, 1919

Subfamily SPIROBINAE Chamberlin, 1919

Genus ROTULARIA Defrance, 1827

Rotularia bogneriensis (Mantell, 1822) Fig. 12-14

Description. Medium sized, with the main disc typically 15 mm in diameter, after five coils the tube becomes straight with irregular swellings. The discoidal part is concave underneath. The outer tube has broad, rounded longitudinal carinae, the inner surface is round.

Remarks. Highly distinctive tube found in the London Clay.

Occurrence. Ypresian: London Clay Formation,



Fig. 12: *Rotularia bogneriensis* (Mantell, 1822). London Clay Formation, Thames Group. Whitecliff Bay. Whitecliff Bay. MIWG. 6029. Block containing individuals. Scale bar: 10mm.

Thames Group.

Material. London Clay Formation, Thames Group: MIWG. 6029 Whitecliff Bay, and MIWG. 6131 Alum Bay.



Fig. 13: *Rotularia bogneriensis* (Mantell, 1822). London Clay Formation, Thames Group. Alum Bay. MIWG. 6131. Single disc. Scale bar: 10mm.

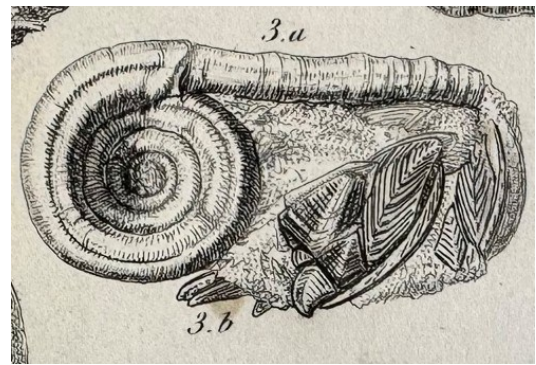


Fig. 14: *Rotularia bogneriensis* (Mantell, 1822). London Clay Formation, Thames Group. Bognor, West Sussex. After Dixon (1850, Tab. XIV fig.3a) engraving J. de C. Sowerby. Shows complete individual. The discoidal part is typically 12-15mm in diameter.

Tribe SPIROBINI Chamberlin, 1919

Genus SPIROBIS Daudin, 1800

Spirorbis exigua (J. de C. Sowerby, 1844) Fig. 15

Description. Small up to 8 mm in height, turbiniform. Expanding, irregular coil with numerous regularly spaced coarse ridges.

Remarks. Sowerby (1844) records specimens as being minute and attached to shells of naticid gastropods from the Barton Clay.



Fig. 15: *Spirorbis exigua* (J. de C. Sowerby, 1844). Fisher Bed iv, Wittering Formation Bracklesham Group. Whitecliff Bay. MIWG. 1789. Scale bar: 10mm.

Occurrence. Ypresian: Wittering Formation, Bracklesham Group. *Material*. Fisher Bed iv, Wittering Formation Bracklesham Group: MIWG. 1789 Whitecliff Bay.

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