

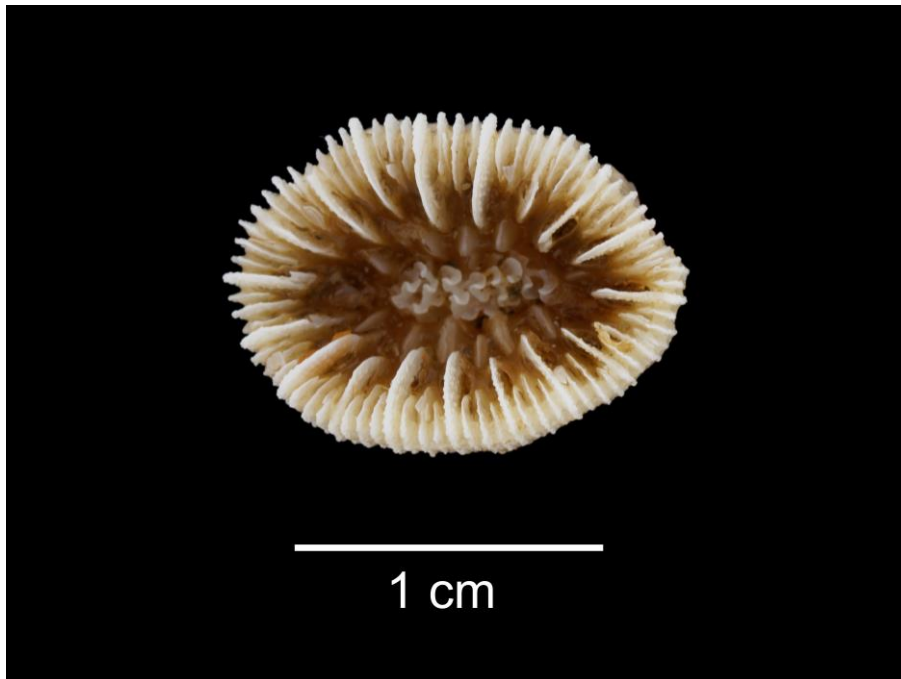


# NMQC

NE Atlantic Marine Biological Analytical Quality Control Scheme

[www.nmbaqcs.org](http://www.nmbaqcs.org)

## Ring Test Bulletin – RTB#60



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## RING TEST DETAILS

Ring Test #60

Type/Contents – Targeted: Biotope-defining species

Circulated – 10/12/20

Results deadline – 11/02/21

Number of Subscribing Laboratories – 22

Number of Participating Laboratories – 22

Number of Results Received – 17\*

\*multiple data entries per laboratory permitted

### Summary of differences

Specimen	Genus	Species	Condition / Size	Total differences for 17 returns	
				Genus	Species
RT6001	<i>Alcyonium</i>	<i>digitatum</i>	Fair; Small portions	2	2
RT6002	<i>Mytilus</i>	<i>edulis</i>	Good; Large, 40-70 mm	0	2
RT6003	<i>Conopeum</i>	<i>reticulum</i>	Fair; Medium colonies	0	2
RT6004	<i>Pisidia</i>	<i>longicornis</i>	Fair (no legs); Small	0	0
RT6005	<i>Scrobicularia</i>	<i>plana</i>	Good; Medium, 10-16 mm	1	1
RT6006	<i>Caryophyllia</i>	<i>smithii</i>	Good; Large	0	0
RT6007	<i>Virgularia</i>	<i>mirabilis</i>	Fair (no bases); Small	1	1
RT6008	<i>Streblospio</i>	<i>shrubsolii</i>	Fair; Medium	0	2
RT6009	<i>Fabricia</i>	<i>stellaris</i>	Good; Medium	2	2
RT6010	<i>Bathyporeia</i>	<i>pilosa</i>	Good; Medium	0	1
RT6011	<i>Aphelochaeta</i>	<i>marioni</i>	Fair (no tails); Medium	1	1
RT6012	<i>Harpinia</i>	<i>antennaria</i>	Good; Medium	1	1
RT6013	<i>Limecola</i>	<i>balthica</i>	Good; Small, 4-5 mm	1	1
RT6014	<i>Molgula</i>	<i>manhattensis</i>	Good; Medium	1	3
RT6015	<i>Magelona</i>	<i>johnstoni</i>	Fair; Medium	0	4
RT6016	<i>Echinocyamus</i>	<i>pusillus</i>	Good; Small, 1-1.5 mm	0	0
RT6017	<i>Cerastoderma</i>	<i>edule</i>	Good; medium, 10-12 mm	1	2
RT6018	<i>Amphiura</i>	<i>chiajei</i>	Fair (bases of arms only); Medium	0	0
RT6019	<i>Lagis</i>	<i>koreni</i>	Good; Medium	0	0
RT6020	<i>Hiatella</i>	<i>arctica</i>	Good; Small, 2-4 mm	0	0
RT6021	<i>Haliclona</i>	<i>oculata</i>	Fair (no bases); Small portions	4	4
RT6022	<i>Eteone</i>	<i>longa</i>	Good; Medium	0	0
RT6023	<i>Modiolula</i>	<i>phaseolina</i>	Good; Small, 1-2 mm	3	3
RT6024	<i>Ascidella</i>	<i>aspersa</i>	Fair; Medium	0	2
RT6025	<i>Einhornia</i>	<i>crustulenta</i>	Fair; Medium colonies	6	6
Total differences				24	40
Average differences /lab.				1.4	2.4

**Figure 1. The number of differences from the AQC identification of specimens distributed in RT60 for each of the participating laboratories. Arranged in order of increasing number of differences (by specific followed by generic errors).**

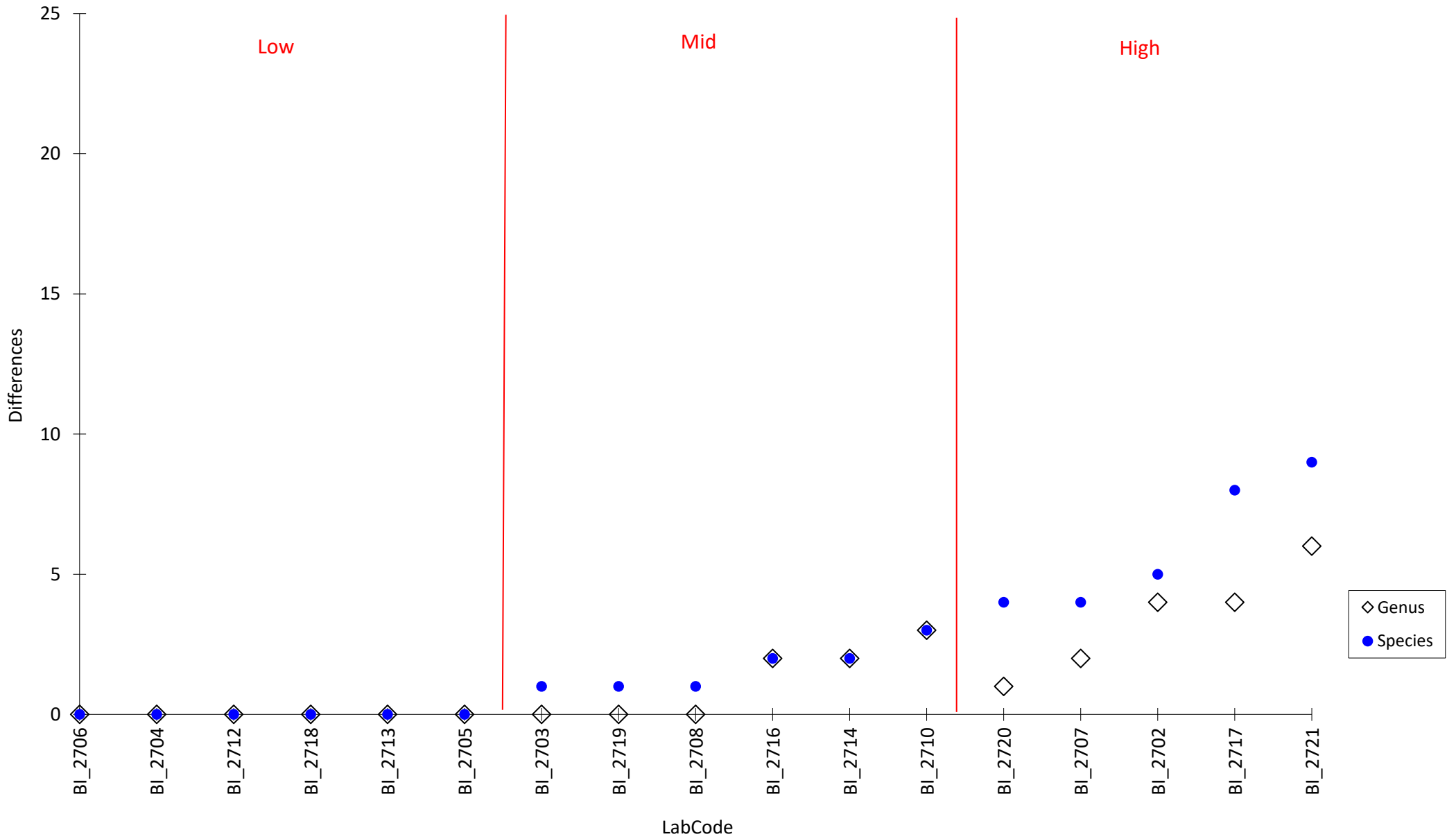


Table 1. The identification of fauna made by participating laboratories for RT60 (arranged by specimen). Names are given only where different from the AQC identification.

	RT6001	RT6002	RT6003	RT6004	RT6005	RT6006	RT6007	RT6008	RT6009	RT6010	RT6011	RT6012
Taxon	<i>Alcyonium digitatum</i>	<i>Mytilus edulis</i>	<i>Conopeum reticulatum</i>	<i>Pisidia longicornis</i>	<i>Scrobicularia plana</i>	<i>Caryophyllia smithii</i>	<i>Virgularia mirabilis</i>	<i>Streblospio shrubsolii</i>	<i>Fabricia stellaris</i>	<i>Bathyporeia pilosa</i>	<i>Aphelochaeta marioni</i>	<i>Harpinia antennaria</i>
BI_2702	--	--	--	--	--	[Caryophyllia (Caryophyllia)] -	Abietinaria fusca	--	Fabriciola baltica	--	--	--
BI_2703	--	--	--	--	--	--	--	- benedicti	--	--	--	--
BI_2704	--	--	--	--	--	--	--	--	--	--	--	--
BI_2705	--	--	[Einhornia] [crustulenta]	--	--	--	--	--	--	--	--	--
BI_2706	--	--	--	--	--	--	--	--	--	--	--	--
BI_2707	Lissoclinum perforatum	--	--	--	--	[Caryophyllia (Caryophyllia)] -	--	--	--	- sarsi	--	--
BI_2708	--	- galloprovincialis	--	- [longiconis]	--	--	--	--	--	--	--	--
BI_2710	--	--	--	--	--	--	--	- [benedicti/shrubsolii]	--	--	--	Phoxocephalus holbolli
BI_2712	--	--	--	--	--	[Caryophyllia (Caryophyllia)] -	--	- [padventralis]	- [stellaris stellaris]	--	--	--
BI_2713	--	--	--	--	--	--	--	--	--	--	--	--
BI_2714	--	--	--	--	--	--	--	- [shrubsolii]	--	--	--	--
BI_2716	--	--	--	--	--	[Caryophyllia (Caryophyllia)] -	--	--	--	--	--	--
BI_2717	--	- galloprovincialis	- seurati	--	--	--	--	--	Pseudofabricia aberrans	--	--	--
BI_2718	--	--	--	--	--	--	--	- [padventralis]	--	--	--	--
BI_2719	--	--	--	--	--	[Caryophyllia (Caryophyllia)] -	--	--	--	--	--	--
BI_2720	--	--	- seurati	--	--	--	--	--	--	--	--	--
BI_2721	Aplidium elegans	--	--	--	Abra alba	[Caryophyllia (Caryophyllia)] -	--	- benedicti	--	--	Tharyx mcintoshi	--

Table 1. The identification of fauna made by participating laboratories for RT60 (arranged by specimen). Names are given only where different from the AQC identification.

	RT6013	RT6014	RT6015	RT6016	RT6017	RT6018	RT6019	RT6020	RT6021	RT6022	RT6023	RT6024	RT6025
Taxon	<i>Limecola balthica</i>	<i>Molgula manhattensis</i>	<i>Magelona johnstoni</i>	<i>Echinocyamus pusillus</i>	<i>Cerastoderma edule</i>	<i>Amphiura chiajei</i>	<i>Lagis koreni</i>	<i>Hiatella arctica</i>	<i>Haliclona oculata</i>	<i>Eteone longa</i>	<i>Modiolula phaseolina</i>	<i>Ascidella aspersa</i>	<i>Einhornia crustulenta</i>
BI_2702	--	- occulta	--	--	--	--	--	--	[Haliclona (Haliclona)] -	--	Modiolus modiolus	[Ascidia] [aspera]	Conopeum seurati
BI_2703	--	--	--	--	--	--	--	--	--	--	--	--	--
BI_2704	--	--	--	--	--	--	--	--	--	--	--	--	--
BI_2705	--	--	--	--	--	--	--	--	--	--	--	--	--
BI_2706	--	--	--	- [pusilla]	--	--	--	--	--	--	--	--	--
BI_2707	--	--	- mirabilis	--	--	--	--	--	[Haliclona (Haliclona)] -	--	--	--	Conopeum seurati
BI_2708	--	- [socialis]	--	--	--	--	--	--	--	--	--	--	--
BI_2710	--	Eugyra arenosa	--	--	--	--	--	--	Leucosolenia variabilis	- [longa agg.]	--	- [aspera]	--
BI_2712	--	--	--	--	--	--	--	--	[Haliclona (Haliclona)] -	--	--	--	--
BI_2713	--	--	--	--	--	--	--	--	--	- [longa agg.]	--	--	--
BI_2714	--	--	--	--	--	- [chiajeii]	--	--	Sycon ciliatum	--	--	--	Conopeum seurati
BI_2716	--	--	--	--	--	--	--	--	Leucosolenia botryoides	--	--	--	Conopeum seurati
BI_2717	--	- occulta	- filiformis	--	--	--	--	--	Leucosolenia botryoides	--	Mytilus edulis	--	Conopeum seurati
BI_2718	[Macoma] -	--	--	--	--	--	--	--	--	--	--	--	--
BI_2719	--	--	--	--	--	--	--	--	[Haliclona (Haliclona)] -	--	--	- scabra	--
BI_2720	Abra alba	--	- mirabilis	--	- glaucum	--	--	--	--	--	--	--	--
BI_2721	--	--	- mirabilis	--	Parvicardium scabrum	--	--	--	--	--	Modiolus modiolus	- scabra	Conopeum seurati

Table 2. The identification of fauna made by participating laboratories for RT60 (arranged by participant). Names are given only where different from the AQC identification.

	Taxon	BI_2702	BI_2703	BI_2704	BI_2705	BI_2706	BI_2707	BI_2708	BI_2710	BI_2712
RT6001	<i>Alcyonium digitatum</i>	--	--	--	--	--	Lissoclinum perforatum	--	--	--
RT6002	<i>Mytilus edulis</i>	--	--	--	--	--	--	- galloprovincialis	--	--
RT6003	<i>Conopeum reticulum</i>	--	--	--	[Einhornia] [crustulenta]	--	--	--	--	--
RT6004	<i>Pisidia longicornis</i>	--	--	--	--	--	--	- [longiconis]	--	--
RT6005	<i>Scrabicularia plana</i>	--	--	--	--	--	--	--	--	--
RT6006	<i>Caryophyllia smithii</i>	[Caryophyllia (Caryophyllia)] -	--	--	--	--	[Caryophyllia (Caryophyllia)] -	--	--	[Caryophyllia (Caryophyllia)] -
RT6007	<i>Virgularia mirabilis</i>	Abietinaria fusca	--	--	--	--	--	--	--	--
RT6008	<i>Streblospio shrubsolii</i>	--	- benedicti	--	--	--	--	--	- [benedicti/shrubsolii]	- [padventralis]
RT6009	<i>Fabricia stellaris</i>	Fabriciola baltica	--	--	--	--	--	--	--	- [stellaris stellaris]
RT6010	<i>Bathyporeia pilosa</i>	--	--	--	--	--	- sarsi	--	--	--
RT6011	<i>Aphelochaeta marioni</i>	--	--	--	--	--	--	--	--	--
RT6012	<i>Harpinia antennaria</i>	--	--	--	--	--	--	--	Phoxocephalus holbolli	--
RT6013	<i>Limecola balthica</i>	--	--	--	--	--	--	--	--	--
RT6014	<i>Malgula manhattensis</i>	- occulta	--	--	--	--	--	- [socialis]	Eugyra arenosa	--
RT6015	<i>Magelona johnstoni</i>	--	--	--	--	--	- mirabilis	--	--	--
RT6016	<i>Echinocyamus pusillus</i>	--	--	--	--	- [pusilla]	--	--	--	--
RT6017	<i>Cerastoderma edule</i>	--	--	--	--	--	--	--	--	--
RT6018	<i>Amphiura chiajei</i>	--	--	--	--	--	--	--	--	--
RT6019	<i>Lagis koreni</i>	--	--	--	--	--	--	--	--	--
RT6020	<i>Hiatella arctica</i>	--	--	--	--	--	--	--	--	--
RT6021	<i>Haliclona oculata</i>	[Haliclona (Haliclona)] -	--	--	--	--	[Haliclona (Haliclona)] -	--	Leucosolenia variabilis	[Haliclona (Haliclona)] -
RT6022	<i>Eteone longa</i>	--	--	--	--	--	--	--	- [longa agg.]	--
RT6023	<i>Modiolula phaseolina</i>	Modiolus modiolus	--	--	--	--	--	--	--	--
RT6024	<i>Asciidiella aspersa</i>	[Ascidia] [aspera]	--	--	--	--	--	--	- [aspera]	--
RT6025	<i>Einhornia crustulenta</i>	Conopeum seurati	--	--	--	--	Conopeum seurati	--	--	--

Table 2. The identification of fauna made by participating laboratories for RT60 (arranged by participant). Names are given only where different from the AQC identification.

	Taxon	BI_2713	BI_2714	BI_2716	BI_2717	BI_2718	BI_2719	BI_2720	BI_2721
RT6001	<i>Alcyonium digitatum</i>	--	--	--	--	--	--	--	Aplidium elegans
RT6002	<i>Mytilus edulis</i>	--	--	--	- galloprovincialis	--	--	--	--
RT6003	<i>Conopeum reticulum</i>	--	--	--	- seurati	--	--	- seurati	--
RT6004	<i>Pisidia longicornis</i>	--	--	--	--	--	--	--	--
RT6005	<i>Scrabicularia plana</i>	--	--	--	--	--	--	--	Abra alba
RT6006	<i>Caryophyllia smithii</i>	--	--	[Caryophyllia (Caryophyllia)] -	--	--	[Caryophyllia (Caryophyllia)] -	--	[Caryophyllia (Caryophyllia)] -
RT6007	<i>Virgularia mirabilis</i>	--	--	--	--	--	--	--	--
RT6008	<i>Streblospio shrubsolii</i>	--	- [shrubsolii]	--	--	- [padventralis]	--	--	- benedicti
RT6009	<i>Fabricia stellaris</i>	--	--	--	Pseudofabricia aberrans	--	--	--	--
RT6010	<i>Bathyporeia pilosa</i>	--	--	--	--	--	--	--	--
RT6011	<i>Aphelochaeta marioni</i>	--	--	--	--	--	--	--	Tharyx mcintoshii
RT6012	<i>Harpinia antennaria</i>	--	--	--	--	--	--	--	--
RT6013	<i>Limecola balthica</i>	--	--	--	--	[Macoma] -	--	Abra alba	--
RT6014	<i>Molgula manhattensis</i>	--	--	--	- occulta	--	--	--	--
RT6015	<i>Magelona johnstoni</i>	--	--	--	- filiformis	--	--	- mirabilis	- mirabilis
RT6016	<i>Echinocyamus pusillus</i>	--	--	--	--	--	--	--	--
RT6017	<i>Cerastoderma edule</i>	--	--	--	--	--	--	- glaucum	Parvicardium scabrum
RT6018	<i>Amphiura chiajei</i>	--	- [chiajei]	--	--	--	--	--	--
RT6019	<i>Lagis koreni</i>	--	--	--	--	--	--	--	--
RT6020	<i>Hiatella arctica</i>	--	--	--	--	--	--	--	--
RT6021	<i>Haliclona oculata</i>	--	Sycon ciliatum	Leucosolenia botryoides	Leucosolenia botryoides	--	[Haliclona (Haliclona)] -	--	--
RT6022	<i>Eteone longa</i>	- [longa agg.]	--	--	--	--	--	--	--
RT6023	<i>Modiolula phaseolina</i>	--	--	--	Mytilus edulis	--	--	--	Modiolus modiolus
RT6024	<i>Asciidiella aspersa</i>	--	--	--	--	--	- scabra	--	- scabra
RT6025	<i>Einhornia crustulenta</i>	--	Conopeum seurati	Conopeum seurati	Conopeum seurati	--	--	--	Conopeum seurati

## **Specimen Images and Detailed Breakdown of Identifications**

RT60 was targeted on biotope-defining species, here defined in terms of species that are mentioned in habitat name titles of the EUNIS marine habitat classification, revised 2019 (<https://www.eea.europa.eu/data-and-maps/data/eunis-habitat-classification>). Details are included below each species name, with codes in sequence from Connor *et al.* (2004), EUNIS (2007) and EUNIS (2019). The Ring Test included seven species never previously sent. Several participants highlighted problems with the taxonomy of certain species. The results have identified areas that require further research; these are detailed under the specimen headings and in the discussion section below.

LabCodes are abbreviated in this report to exclude the Scheme year, *e.g.* BI\_2601 = Lab 01. An additional terminal character has been added within each LabCode (small case sequential letters) to permit multiple data entries from each laboratory, *i.e.* two participants from laboratory 01 would be coded as Lab 01a & Lab 01b. For details of your LabCode please contact your Scheme representative or APEM Ltd.

(Figure codes: A=anterior; P=posterior; L=lateral; D=dorsal; V=ventral)

### **RT6001 – *Alcyonium digitatum* Linnaeus, 1758 (Figures 1a, b)**

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: Southeast England. Condition: Fair. Size: Small portions. All specimens from one sample.

This species is named in six biotopes and sub-biotopes: *Alcyonium digitatum* with dense *Tubularia indivisa* and anemones on strongly tide-swept Atlantic circalittoral rock (CR.HCR.FaT.CTub.Adig, A4.1122, MC12122), *Alcyonium digitatum*, *Pomatoceros triqueter*, algal and bryozoan crusts on wave-exposed circalittoral rock (CR.MCR.EcCr.FaAlCr.Adig, A4.2142, MC12252), *Alcyonium digitatum* with *Securiflustra securifrons* on tide-swept moderately wave-exposed Atlantic circalittoral rock (CR.MCR.EcCr.FaAlCr.Sec, A4.2143, MC12253), Faunal and algal crusts with *Pomatoceros triqueter* and sparse *Alcyonium digitatum* on exposed to moderately wave-exposed Atlantic circalittoral rock (CR.MCR.EcCr.FaAlCr.Pom, A4.2145, MC12255), *Alcyonium digitatum* and faunal crust communities on vertical Atlantic circalittoral bedrock (CR.MCR.EcCr.AdigVt, A4.215, MC1226) and *Alcyonium digitatum* and *Metridium senile* on moderately wave-exposed Atlantic circalittoral steel wrecks (CR.FCR.FouFa.AdigMsen, A4.721, MC12291).

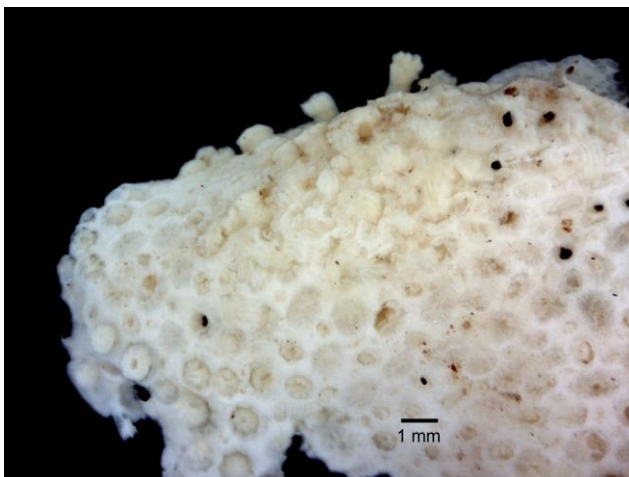


Fig. 1a. *Alcyonium digitatum* (RT6001, 10455)

Two generic and specific differences: Lab 07 identified as *Lissoclinum perforatum* (no material available; Figure 1c shows the related *Diplosoma listerianum*); Lab 021 identified as *Aplidium elegans* (Figures 1d-e); (in both of which the zooids lack eight equal tentacles).



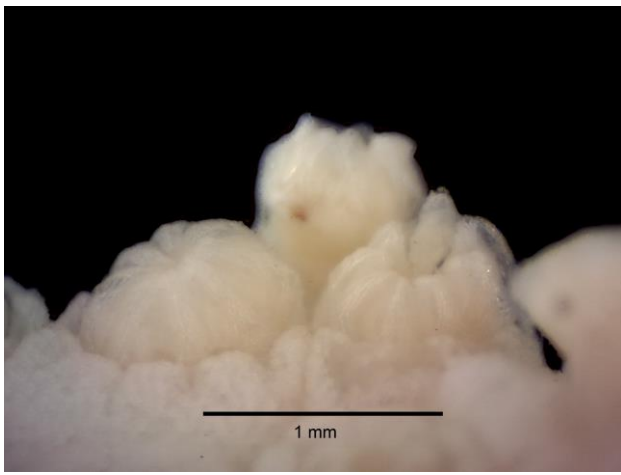


Fig. 1b. *Alcyonium digitatum* (RT6001, 10455)  
– polyps

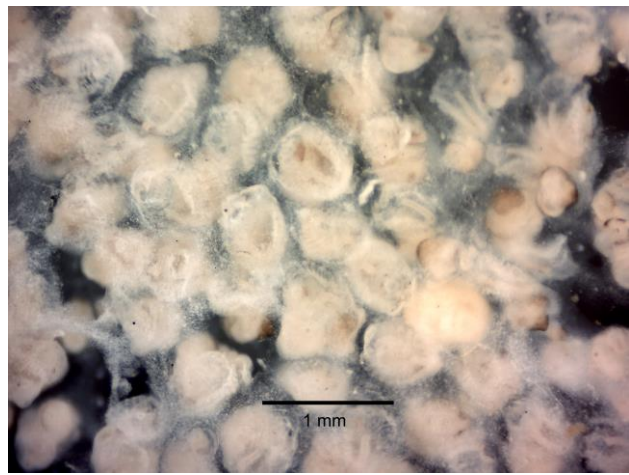


Fig. 1c. *Diplosoma listerianum* (P2188, 61888)  
– zooids

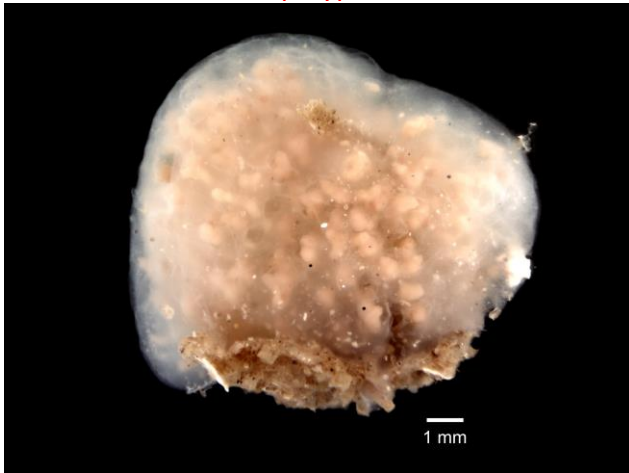


Fig. 1d. *Aplidium elegans?* (P2188, 63688) –  
colony

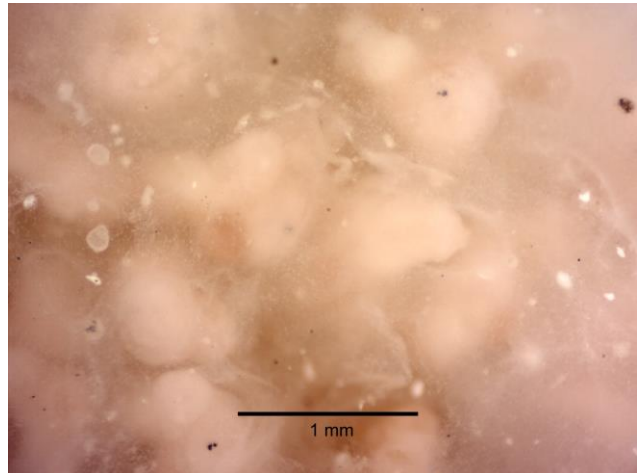


Fig. 1e. *Aplidium elegans?* (P2188, 63688) –  
zooids

**RT6002 – *Mytilus edulis* Linnaeus, 1758 (Figure 2a)**

Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: North of Ireland. Condition: Good. Size: Large, 40-70 mm. All specimens from one sample.

This species is named in fourteen biotopes and sub-biotopes: *Mytilus edulis* and barnacles on very exposed eulittoral rock (LR.HLR.MusB.MytB, A1.111, MA1221), *Mytilus edulis* and *Fucus vesiculosus* on moderately exposed mid eulittoral rock (LR.MLR.MusF.MytFves, A1.221, MA1246), *Mytilus edulis*, *Fucus serratus* and red seaweeds on moderately exposed lower eulittoral rock (LR.MLR.MusF.MytFR, A1.222, MA1247), *Mytilus edulis* and piddocks on eulittoral firm clay (LR.MLR.MusF.MytPid, A1.223, MA1248), *Fucus serratus* and large *Mytilus edulis* on variable salinity lower eulittoral rock (LR.LLR.FVS.FserVS, A1.326, MA1256), *Mytilus edulis* beds on littoral sediments (LS.LBR.LMus.Myt, A2.721, MA2271), Atlantic littoral *Mytilus edulis* beds on mixed substrata (LS.LBR.LMus.Myt.Mx, A2.7211, MA22711), Atlantic littoral *Mytilus edulis* beds on sand (LS.LBR.LMus.Myt.Sa, A2.7212, MA22712), Atlantic littoral *Mytilus edulis* beds on mud (LS.LBR.LMus.Myt.Mu, A2.7213, MA22713), *Mytilus edulis* and *Fabricia sabella* in Atlantic littoral mixed sediment (LS.LSa.St.MytFab, A2.212, MA4221), *Alaria esculenta*, *Mytilus edulis* and coralline crusts on very exposed Atlantic sublittoral fringe bedrock (IR.HIR.KFaR.Ala.Myt, A3.1111, MB12111), *Mytilus edulis* beds on reduced salinity Atlantic infralittoral rock (IR.LIR.IFaVS.MytRS, A3.361, MB1261), *Mytilus edulis* beds with hydroids and ascidians on tide-swept exposed to moderately wave-exposed Atlantic circalittoral rock (CR.MCR.CMus.CMyt, A4.241, MC1227) and *Mytilus edulis* beds on Atlantic circalittoral sediment (SS.SBR.SMus.MytSS, A5.625, MC2217).



Fig. 2a. *Mytilus edulis* (RT6002, 65296) – L

Two specific differences: Labs 08 and 17 identified as *Mytilus galloprovincialis* (Figures 2b-c) (which has more strongly hooked beaks).

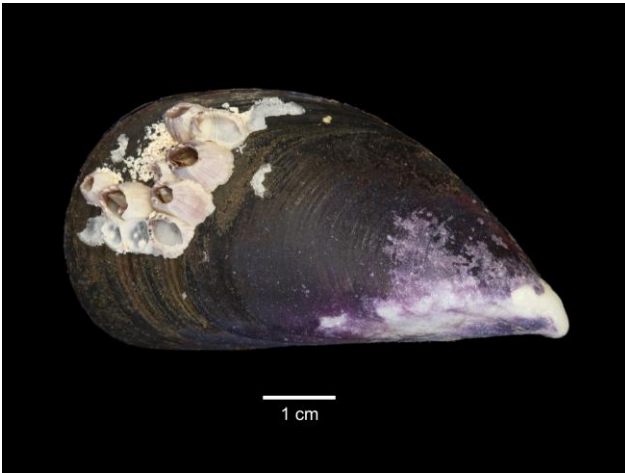


Fig. 2b. *Mytilus galloprovincialis* (TW) – L



Fig. 2c. *Mytilus galloprovincialis* (P3593, 64312) – L

**RT6003 – *Conopeum reticulum* (Linnaeus, 1767) (Figures 3a-b)**

Substratum: Faunal turf. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: North of Ireland. Condition: Good. Size: Large, 40-70 mm. All specimens from one sample.

This species is named in one biotope: *Hartlaubella gelatinosa* and *Conopeum reticulum* on low salinity Atlantic infralittoral mixed substrata (IR.LIR.IFaVS.HarCon, A3.363, MB1263).

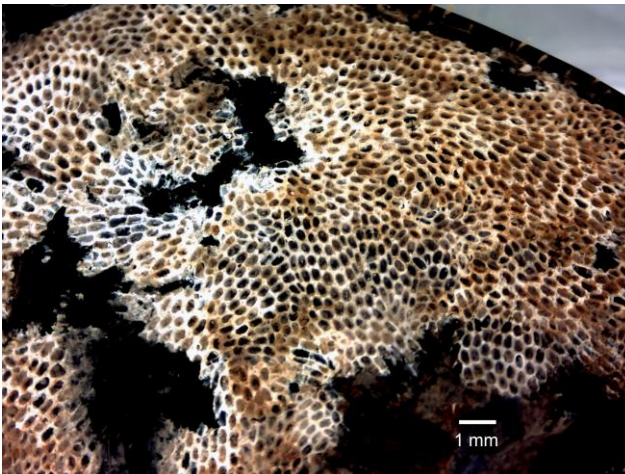


Fig. 3a. *Conopeum reticulum* (RT6003, 65296)

Two specific differences: Labs 17 and 20 identified as *C. serauti* (Figure 3c) (which lacks kenozooids).

Lab 05 identified as *Einhornia crustulenta* (Figures 25a, b) but noted *C. reticulum* as also present and have been scored as correct for the purposes of this ring test.

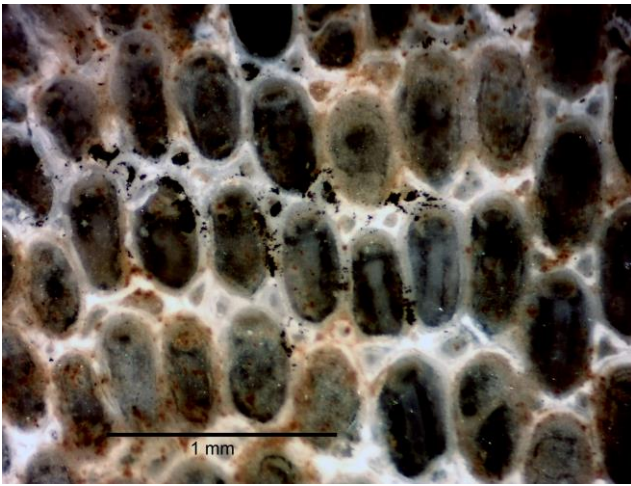


Fig. 3b. *Conopeum reticulum* (RT6003, 65296) -  
zoids

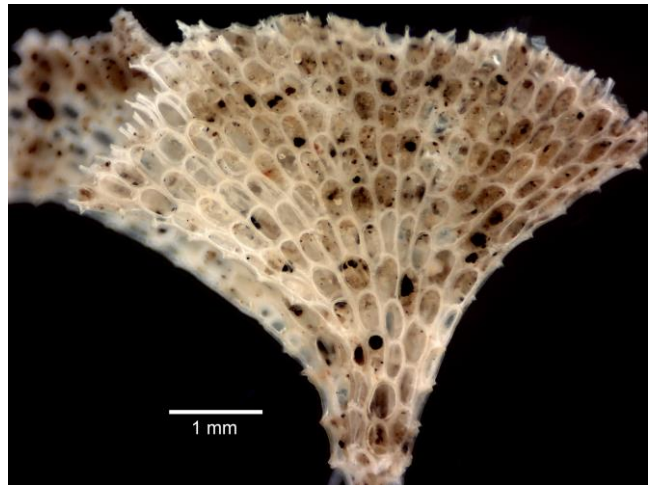


Fig. 3c. *Conopeum serauti* (414272, 55862)

**RT6004 – *Pisidia longicornis* (Linnaeus, 1767) (Figures 4a-b)**

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: southeast England. Condition: Fair, no legs. Size: Small. All specimens from one sample.

This species is named in the 2017 biotope: Pontic silted cobbles with *Balanus eburneus*, ascidians, *Actinia aequina*, *Mytilus galloprovincialis* and *Pisidia longicornis* (A5.13I), although not transposed to the matrix for 2019.

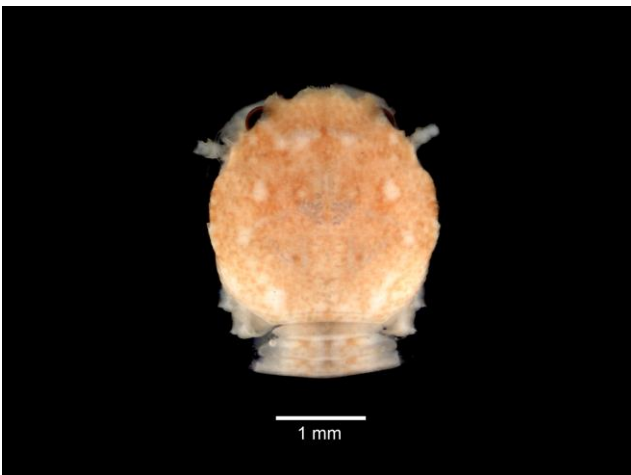


Fig. 4a. *Pisidia longicornis* (RT6004, 11307) - D

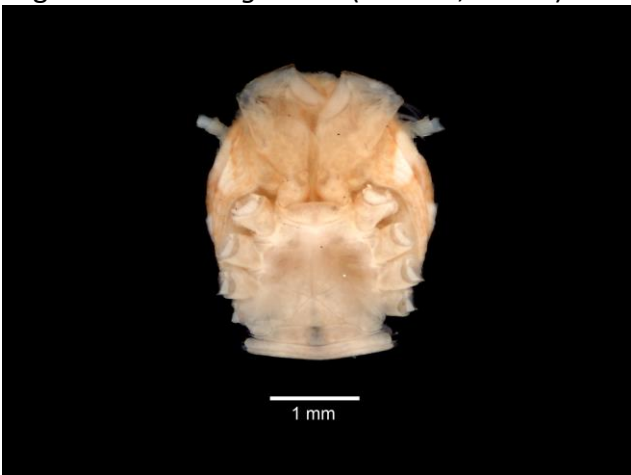


Fig. 4b. *Pisidia longicornis* (RT6004, 11307) - V

No generic or specific differences recorded.

Lab 04 mis-spelled the specific name: *longiconis*.

**RT6005 – *Scrobicularia plana* (da Costa, 1778) (Figure 5a)**

Substratum: Mud. Salinity: Variable (Euryhaline). Depth: Intertidal. Geography: Wales. Condition: Good. Size: Medium, 10-16 mm. Specimens from two samples.

This species is named in two biotopes and sub-biotopes: *Hediste diversicolor* and *Scrobicularia plana* in littoral gravelly mud (LS.LMx.GvMu.HedMx.Scr, A2.4112, MA42322), *Hediste diversicolor*, *Limecola balthica* and *Scrobicularia plana* in Atlantic littoral sandy mud (LS.LMu.MEst.HedMacScr, A2.313, MA6225).



Fig. 5a. *Scrobicularia plana* (RT6005, 57206) – L



Fig. 5b. *Abra alba* (RT5202, 4787) – L

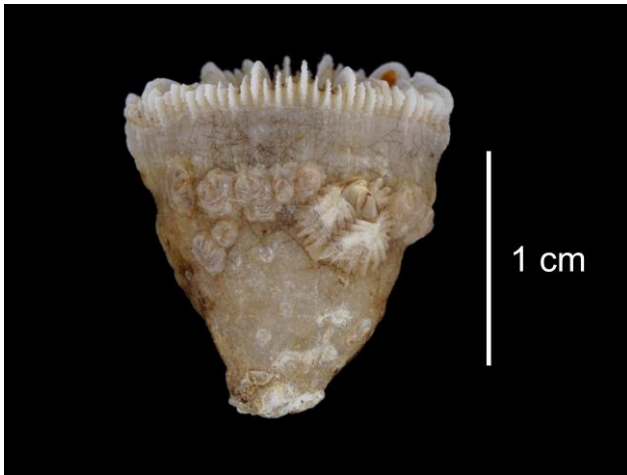
One generic and specific difference: Lab 21 identified as *Abra alba* (Figure 5b) (which has less equilateral umbones).

**RT6006 – *Caryophyllia smithii* Stokes & Broderip, 1828 (Figures 6a, b)**

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: North of Ireland. Condition: Good. Size: Large. Specimens from three samples.

This species is named in nine biotopes and sub-biotopes: Mixed turf of hydroids and large ascidians with *Swiftia pallida* and *Caryophyllia smithii* on weakly tide-swept Atlantic circalittoral rock (CR.HCR.XFa.SwiLgAs, A4.133, MC1215), *Caryophyllia smithii* and *Swiftia pallida* on Atlantic circalittoral rock (CR.MCR.EcCr.CarSwi, A4.211, MC1221), *Caryophyllia smithii*, *Swiftia pallida* and *Alcyonium glomeratum* on wave-sheltered Atlantic circalittoral rock (CR.MCR.EcCr.CarSwi.Aglo, A4.2111, MC12221), *Caryophyllia smithii*, *Swiftia pallida* and large solitary ascidians on exposed or moderately exposed Atlantic circalittoral rock (CR.MCR.EcCr.CarSwi.LgAs, A4.2112, MC12222), *Caryophyllia smithii*, sponges and crustose communities on wave-exposed Atlantic circalittoral rock (CR.MCR.EcCr.CarSp, A4.212, MC1223), Brittlestars overlying coralline crusts, *Parasmittina trispinosa* and *Caryophyllia smithii* on wave-exposed Atlantic circalittoral rock (CR.MCR.EcCr.CarSp.Bri, A4.2121, MC12231), *Caryophyllia smithii* and sponges with *Pentapora foliacea*, *Porella compressa* and crustose communities on wave-exposed Atlantic circalittoral rock (CR.MCR.EcCr.CarSp.PenPcom, A4.2122, MC12232), *Caryophyllia smithii* with faunal and algal

crusts on moderately wave-exposed Atlantic circalittoral rock (CR.MCR.EcCr.FaAlCr.Car, A4.2146, MC12256) and *Caryophyllia smithii* and *Actinauge richardi* assemblage on Atlantic upper bathyal coarse sediment (M.AtUB.Co.SolSci.CarAct, A6, ME3212).



No generic or specific differences recorded.

Fig. 6a. *Caryophyllia smithii* (RT6006, 60317) – L; also *Verruca stroemia*

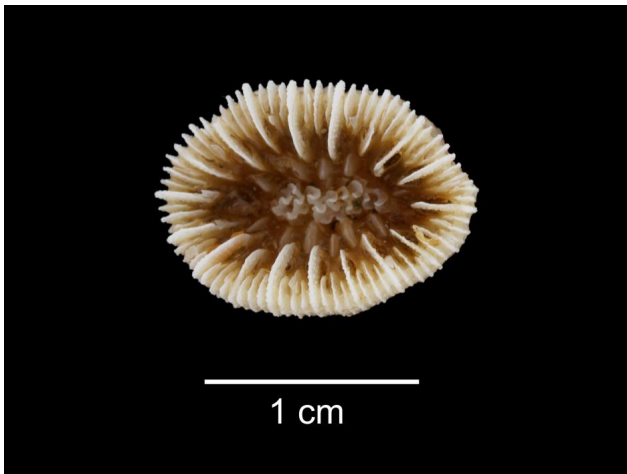


Fig. 6b. *Caryophyllia smithii* (RT6006, 60317) – D

**RT6007 – *Virgularia mirabilis* (Müller, 1776) (Figures 7a-b)**

Substratum: Mud. Salinity: Full (Euhaline). Depth: Circalittoral (Lower Shelf). Geography: North Sea. Condition: Fair, no bases). Size: Small. Specimens from five samples.

This species is named in five biotopes and sub-biotopes: *Philine aperta* and *Virgularia mirabilis* in soft stable Atlantic infralittoral mud (SS.SMu.IFiMu.PhiVir, A5.343, MB6249), *Virgularia mirabilis* and *Ophiura* spp. with *Pecten maximus* on Atlantic circalittoral sandy or shelly mud (SS.SMu.CSaMu.VirOphPmax, A5.354, MC6214), *Virgularia mirabilis* and *Ophiura* spp. with *Pecten maximus*, hydroids and ascidians on Atlantic circalittoral sandy or shelly mud with shells or stones (SS.SMu.CSaMu.VirOphPmax.Has, A5.3541, MC62141), Facies of sticky muds with *Virgularia mirabilis* and *Pennatula phosphorea* on circalittoral mud (A5.392, MC6513) and Facies of sticky muds with *Virgularia mirabilis* and *Pennatula phosphorea* on lower circalittoral mud (A5.392, MD6511).

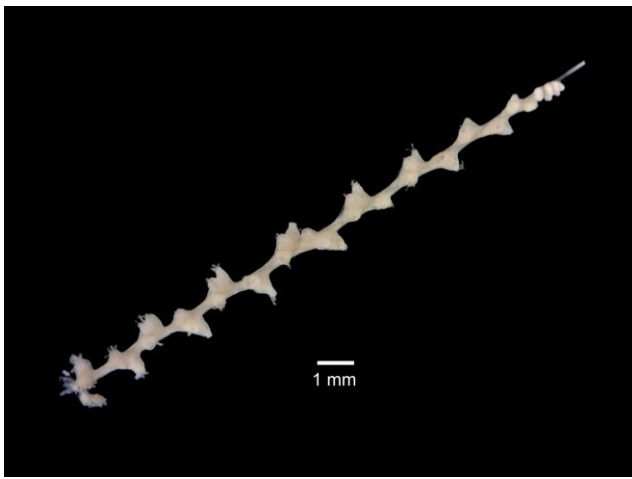


Fig. 7a. *Virgularia mirabilis* (RT6007, 64018)

One generic and specific difference: Lab 02 identified as *Abietinaria fusca* (no material available, Figure 7c shows *A. abietina*) (which has thecate polyps).

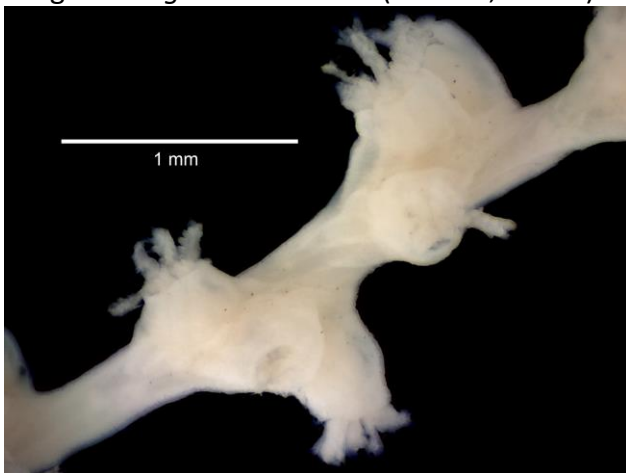


Fig. 7b. *Virgularia mirabilis* (RT6007, 64018) –  
polyps

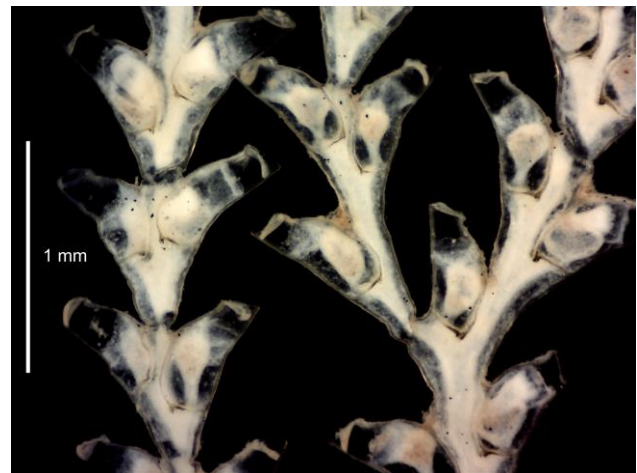


Fig. 7c. *Abietinaria abietina* (414024, 54842) –  
polyps

**RT6008 – *Streblospio shrubsolii* (Buchanan, 1890) (Figures 8a-b)**

Substratum: Mud. Salinity: Variable (Euryhaline). Depth: Intertidal. Geography: Wales. Condition: Fair. Size: Medium. All specimens from one sample.

This species is named in four biotopes and sub-biotopes: *Hediste diversicolor* and *Streblospio shrubsolii* in littoral gravelly sandy mud (LS.LMx.GvMu.HedMx.Str, A2.4113, MA42323), *Nephtys hombergii*, *Limecola balthica* and *Streblospio shrubsolii* in Atlantic littoral sandy mud (LS.LMu.MEst.NhomMacStr, A2.311, MA6223), *Nephtys hombergii* and *Streblospio shrubsolii* in Atlantic littoral mud (LS.LMu.UEst.NhomStr, A2.321, MA6226) and *Hediste diversicolor* and *Streblospio shrubsolii* in Atlantic littoral sandy mud (LS.LMu.UEst.Hed.Str, A2.3221, MA62271).



Fig. 8a. *Streblospio shrubsolii* (RT6008, 62883) – D

Two specific differences: Labs 03 and 21 identified as *Streblospio benedicti* (Figure 8c) (which has neuropodial hooks from chaetiger 7 and a mid-dorsal papilla between the branchial bases).

Lab 10 noted damaged hooks but allowed for *S. shrubsolii* as likely; Labs 12 and 18 identified as *Streblospio padventralis*, which is treated as synonymous for the purposes of this ring test.



Fig. 8b. *Streblospio shrubsolii* (RT6008, 62883) – L



Fig. 8c. *Streblospio benedicti* (RT5102, 58172) - L

**RT6009 – *Fabricia stellaris* (Müller, 1774) (Figure 9a)**

Substratum: Floral turf. Salinity: Full (Euhaline). Depth: Floral turf. Geography: Northern Scotland. Condition: Good. Size: Medium. All specimens from one sample.

This species is named in one biotope: *Mytilus edulis* and *Fabricia sabella* in Atlantic littoral mixed sediment (LS.LSa.St.MytFab, A2.212, MA4221).

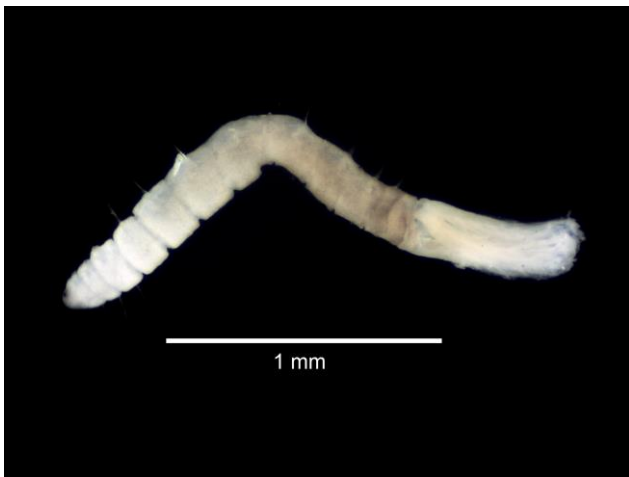


Fig. 9a. *Fabricia stellaris* (RT6009, 58331) – L

Two generic and specific differences: Lab 17 identified as *Pseudofabricia aberrans* (Figure 9b) (which has an elongate peristomial ring collar); Lab 02 identified as *Fabriciola baltica* (no material available) (which has a poorly developed peristomial ring collar).



Fig. 9b. *Pseudofabricia aberrans* (2682, 61183) – L

**RT6010 – *Bathyporeia pilosa* Lindström, 1855 (Figure 10a)**

Substratum: Sand. Salinity: Variable (Euryhaline). Depth: Intertidal. Geography: Wales. Condition: Good. Size: Medium. All specimens from one sample.

This species is named in one biotope: *Bathyporeia pilosa* and *Corophium arenarium* in Atlantic littoral muddy sand (LS.LSa.MuSa.BatCare, A2.244, MA5254).



Fig. 10a. *Bathyporeia pilosa* (RT6010, 57153) – L

One specific difference: Lab 07 identified as *Bathyporeia sarsi* (Figure 10b) (which has a broader distal margin to the antennal peduncle).

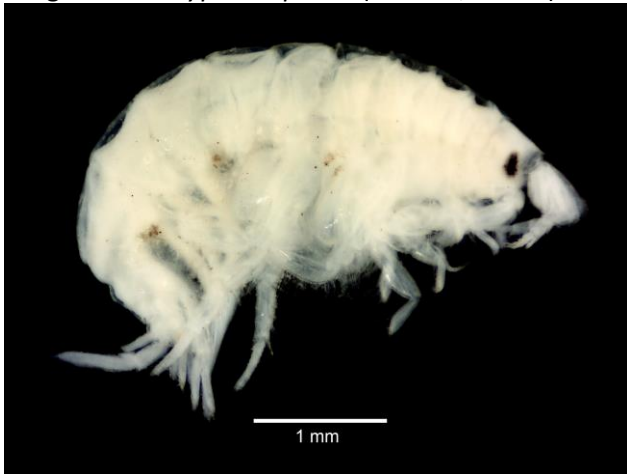


Fig. 10b. *Bathyporeia sarsi* (P2982, 61956) – L

**RT6011 – *Aphelochaeta marioni sensu* MarLIN (non (Saint-Joseph, 1894) (Figure 11a)**

Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: North of Ireland. Condition: Fair, no tails. Size: Medium. All specimens from one sample.

This species is named in one biotope: *Aphelochaeta marioni* and *Tubificoides* spp. in variable salinity Atlantic infralittoral mud (SS.SMu.SMuVS.AphTubi, A5.322, MB6252).



Fig. 11a. *Aphelochaeta marioni* (RT6011, 60277) – V

One generic and specific difference: Lab 21 identified as *Tharyx mcintoshi* (Figures 11b-c show *Aphelochaeta* Species A, which may be equivalent to *Tharyx mcintoshi*) (it is a species of uncertain status described from fully marine habitats unlikely to be conspecific with the specimen sent).



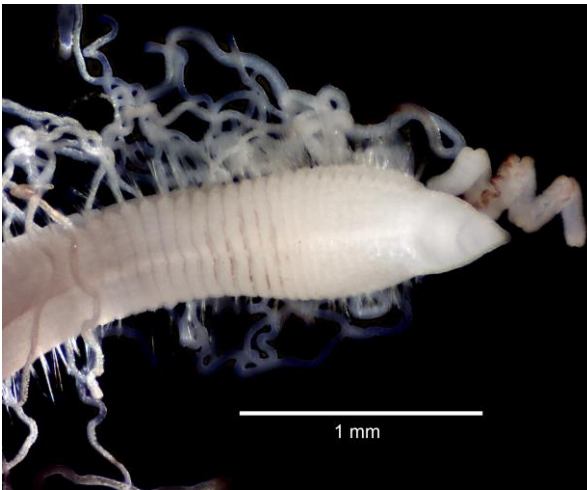


Fig. 11b. *Aphelochaeta* Species A (413531, 56620) – V



Fig. 11c. *Aphelochaeta* Species A (413531, 56620) – L

**RT6012 – *Harpinia antennaria* Meinert, 1890 (Figure 12a)**

Substratum: Sand. Salinity: Full (Euhaline). Depth: Infralittoral. Geography: North of Ireland. Condition: Good. Size: Medium. Specimens from two samples.

This species is named in one biotope: Medium to very fine sand, 100-120 m, with polychaetes *Spiophanes kroyeri*, *Amphipectene auricoma*, *Myriochele* sp., *Aricidea wassi* and amphipods *Harpinia antennaria* (A5.253, MC5213).



Fig. 12a. *Harpinia antennaria* (RT6012; 58719) – L

One generic and specific difference: Lab 12 identified as *Phoxocephalus holbolli* (Figure 12b) (which has a broad basis to pereopod 5).



Fig. 12b. *Phoxocephalus holbolli* (414524, 56900) – L

**RT6013 – *Limecola balthica* (Linnaeus, 1758) (Figure 13a)**

Substratum: Mud. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: Wales. Condition: Good. Size: Small, 4-5 mm. All specimens from one sample.

This species is named in fourteen biotopes: *Hediste diversicolor* and *Limecola balthica* in littoral gravelly mud (LS.LMx.GvMu.HedMx.Mac, A2.4111, MA42321), *Limecola balthica* and *Arenicola marina* in Atlantic littoral muddy sand (LS.LSa.MuSa.MacAre, A2.241, MA5251), *Hediste diversicolor*, *Limecola balthica* and *Eteone longa* in Atlantic littoral muddy sand (LS.LSa.MuSa.HedMacEte, A2.243, MA5253), *Nephtys hombergii*, *Limecola balthica* and *Streblospio shrubsolii* in Atlantic littoral sandy mud (LS.LMu.MEst.NhomMacStr, A2.311, MA6223), *Hediste diversicolor* and *Limecola balthica* in Atlantic littoral sandy mud (LS.LMu.MEst.HedMac, A2.312, MA6224), *Hediste diversicolor*, *Limecola balthica* and *Scrobicularia plana* in Atlantic littoral sandy mud (LS.LMu.MEst.HedMacScr, A2.313, MA6225), *Nephtys cirrosa* and *Limecola balthica* in variable salinity Atlantic infralittoral mobile sand (SS.SSa.SSaVS.NcirMac, A5.222, MB5242), Baltic infralittoral sand dominated by *Limecola balthica* (AA.J3L1, A5.211, MB5371), *Nephtys hombergii* and *Limecola balthica* in Atlantic infralittoral sandy mud (SS.SMu.ISaMu.NhomMac, A5.331, MB6241), Baltic infralittoral mud dominated by *Limecola balthica* (AA.H3L1, A5.311, MB6381), Baltic circalittoral sand dominated by *Limecola balthica* (AB.J 3L1, A5.273, MC5331), Baltic circalittoral sand dominated by multiple infaunal bivalve species: *Cerastoderma* spp., *Mya arenaria*, *Astarte borealis*, *Arctica islandica*, *Limecola balthica* (AB.J 3L9, A5.273, MC5334), Baltic offshore circalittoral sand dominated by *Limecola balthica* (AB.J3L1, A5.273, MD5321) and Baltic offshore circalittoral mud dominated by *Limecola balthica* (AB.H3L1, A5.37, MD6371).

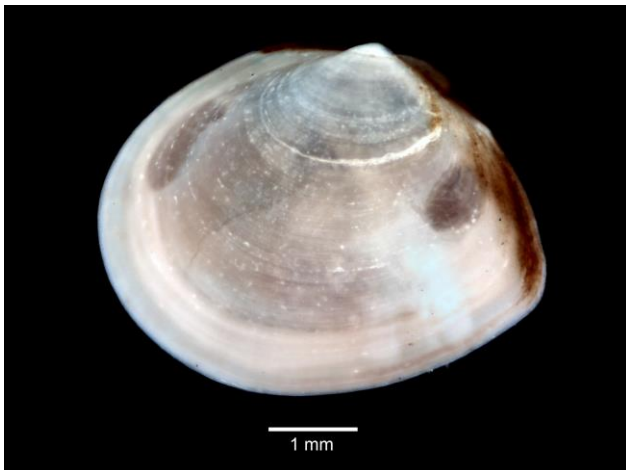


Fig. 13a. *Limecola balthica* (RT6013, 57172) - L

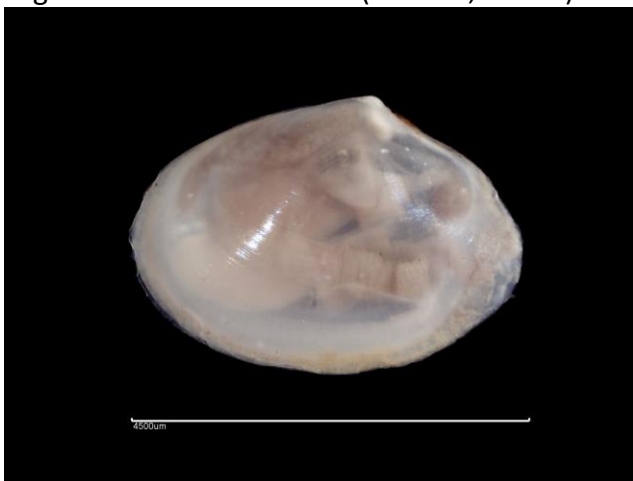


Fig. 13b. *Abra alba* (589, 57521) - L

One generic and specific difference: Lab 20 identified as *Abra alba* (Figure 13b) (which has a more even outline and a less pronounced ligament).

Lab 18 used the synonym *Macoma balthica*.

**RT6014 – *Molgula manhattensis* agg. (De Kay, 1843) (Figures 14a-b)**

Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: Southeast England. Condition: Good. Size: Medium. All specimens from one sample.

This species is named in one biotope: *Molgula manhattensis* with a hydroid and bryozoan turf on tide-swept moderately wave-exposed Atlantic circalittoral rock (CR.HCR.XFa.Mol, A4.138, MC121A).



Fig. 14a. *Molgula manhattensis* (RT6014, 64704)

One generic and three specific differences: Lab 10 identified as *Eugyra arenosa* (Figures 14c-e) (which lacks folds on the branchial sac); Labs 02 and 17 identified as *Molgula occulta* (Figures 14f-g) (which has 7 folds on each side of the branchial sac).

Lab 08 identified as *Molgula socialis*, which is treated as part of the aggregate, correct for the purposes of this ring test).



Fig. 14b. *Molgula manhattensis* (RT6014, 64704)  
– left side, test removed



Fig. 14c. *Eugyra arenosa* (P1347, 58787)



Fig. 14d. *Eugyra arenosa* (P1347, 58787) – left  
side, test removed



Fig. 14e. *Eugyra arenosa* (P1347, 58787) – right  
side, test removed

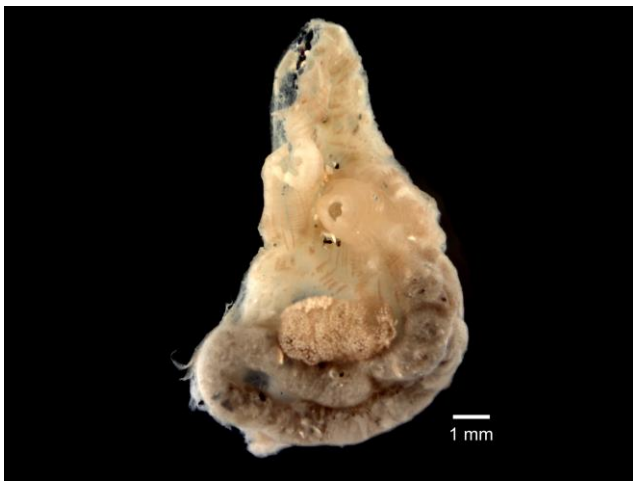


Fig. 14f. *Molgula occulta* (P1987, 59320) – left side, test removed

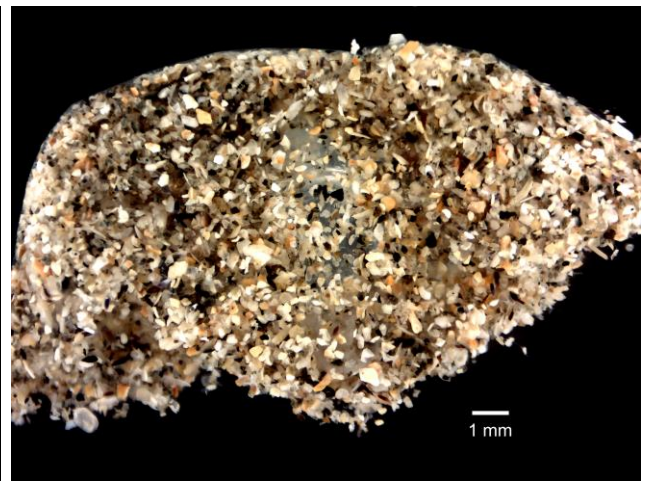


Fig. 14g. *Molgula occulta* (P1987, 59320)

**RT6015 – *Magelona johnstoni* Fiege, Licher & Mackie, 2000 (Figure 15a)**

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: northwest England/Isle of Man. Condition: Fair. Size: Medium. All specimens from one sample.

This species is named in one biotope: *Fabulina fabula* and *Magelona mirabilis* with venerid bivalves and amphipods in Atlantic infralittoral compacted fine muddy sand (SS.SSa.IMuSa.FfabMag, A5.242, MB5236). The reference to *M. mirabilis* is from before the recognition of *M. johnstoni* and, by the biotope description, would actually refer to *M. johnstoni*.



Fig. 15a. *Magelona johnstoni* (RT6015, 57029) – D

Four specific differences: Lab 17 identified as *Magelona filiformis* (Figure 15b) (which has frontal horns on the prostomium); Labs 07, 20 and 21 identified as *M. mirabilis* (Figures 15c) (which lacks lateral pouches between chaetigers 10 and 11).



Fig. 15b. *Magelona filiformis* (P2730, 61411) – D



Fig. 15c. *Magelona mirabilis* (412689, 7004) – D

**RT6016 – *Echinocyamus pusillus* (O.F. Müller, 1776) (Figure 16a)**

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: Southwest England. Condition: Good. Size: Small, 1-1.5 mm. All specimens from one sample.

This species is named in one biotope: *Echinocyamus pusillus*, *Ophelia borealis* and *Abra prismatica* in circalittoral fine sand (SS.SSa.CFiSa.EpusOborApri, A5.251, MC5211).

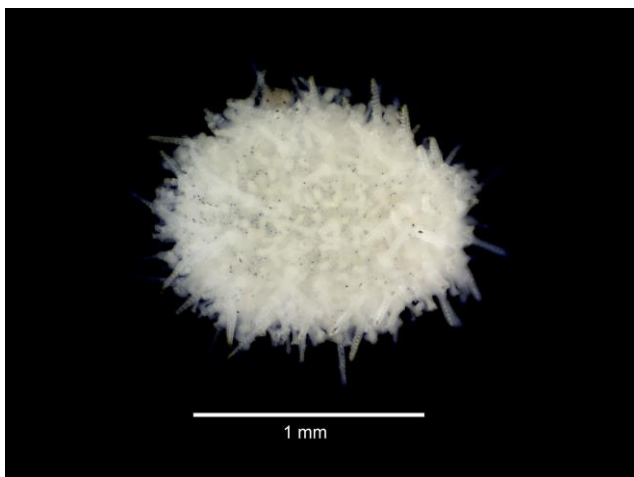


Fig. 16a. *Echinocyamus pusillus* (RT6016, 55072) – D

No generic or specific differences recorded.

Lab 06 mis-spelled the specific name: *pusilla*.

**RT6017 – *Cerastoderma edule* (Linnaeus, 1758) (Figure 17a)**

Substratum: Sand. Salinity: Variable (Euryhaline). Depth: Intertidal. Geography: Southeast England. Condition: Good. Size: Medium, 10-12 mm. All specimens from one sample.

This species is named in three biotopes: Cirratulids and *Cerastoderma edule* in Atlantic littoral mixed sediment (LS.LMx.Mx.CirCer, A2.421, MA4233), *Cerastoderma edule* and polychaetes in Atlantic littoral muddy sand (LS.LSa.MuSa.CerPo, A2.242, MA5252) and *Cerastoderma edule* with *Abra nitida* in Atlantic infralittoral mud (SS.SMu.IFiMu.CerAnit, A5.341, MB6247).

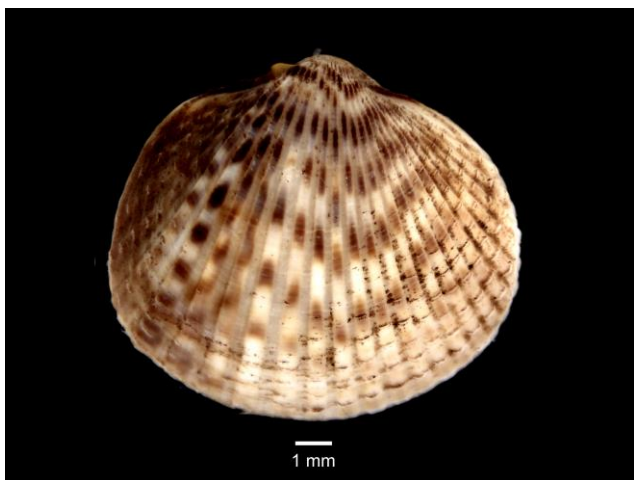


Fig. 17a. *Cerastoderma edule* (RT6017, 61959) – L

One generic and two specific differences: Lab 21 identified as *Parvicardium scabrum* (Figures 17b) (which has more strongly developed scales on its ribs); Lab 20 identified as *Cerastoderma glaucum* (Figures 17c) (which has less evenly rounded ribs).

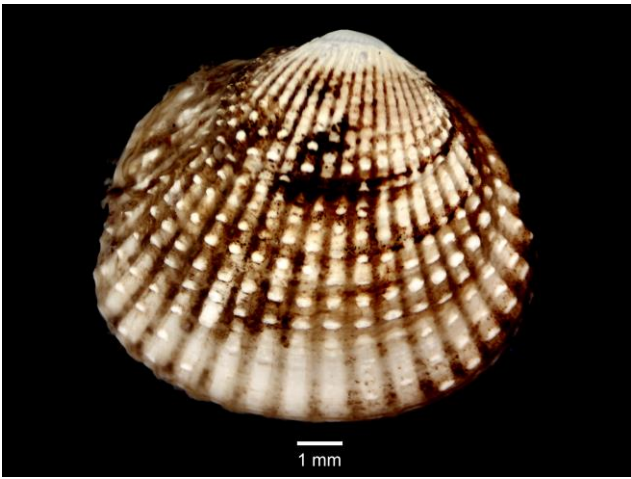


Fig. 17b. *Parvicardium scabrum* (P2165, 60175) – L



Fig. 17c. *Cerastoderma glaucum* (P2191, 60796) – L

**RT6018 – *Amphiura chiajei* Forbes, 1843 (Figures 18a-b)**

Substratum: Mud. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: Western Scotland. Condition: Fair (bases of arms only). Size: Medium. All specimens from one sample.

This species is named in two biotopes: *Brissopsis lyrifera* and *Amphiura chiajei* in Atlantic circalittoral mud (SS.SMu.CFiMu.BlyrAchi, A5.363, MC6218) and Baltic circalittoral mud dominated by *Brissopsis lyrifera* and *Amphiura chiajei* (AB.H3O 2, A5.378, MC63A2).

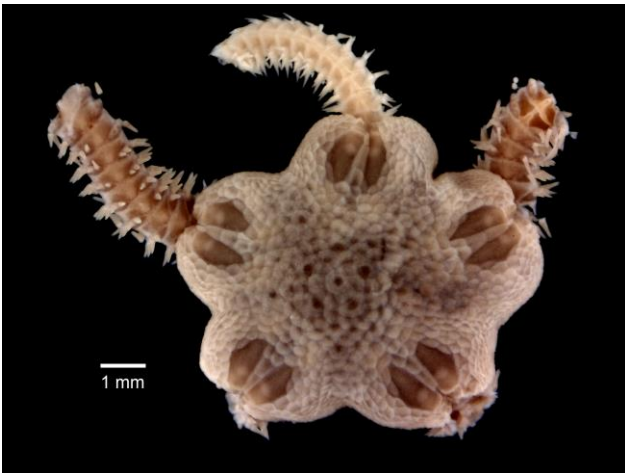


Fig. 18a. *Amphiura chiajei* (RT6017, 58949) – D

No generic or specific differences recorded.

Lab 14 mis-spelled the specific name: *chiajeii*.

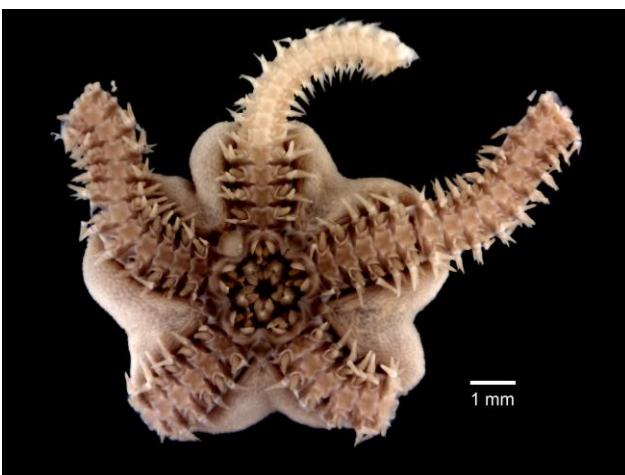


Fig. 18b. *Amphiura chiajei* (RT6017, 58949) – V

**RT6019 – *Lagis koreni* Malmgren, 1866 (Figure 19a)**

Substratum: Mud. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: Northwest England/Isle of Man. Condition: Good. Size: Medium. All specimens from one sample. This species is named in one biotope: *Lagis koreni* and *Phaxas pellucidus* in Atlantic circalittoral sandy mud (SS.SMu.CSaMu.LkorPpel, A5.355, MC6215).



No generic or specific differences recorded.

Fig. 19a. *Lagis koreni* (RT6019, 57031) – D

**RT6020 – *Hiatella arctica* (Linnaeus, 1767) (Figure 20a)**

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: Southeast England. Condition: Good. Size: Small, 2-4 mm. Specimens from two samples. This species is named in two biotopes: *Hiatella arctica* and seaweeds on vertical Atlantic littoral limestone / chalk (IR.MIR.KR.HiaSw, A3.217, MB121D) and *Hiatella arctica* beds on Atlantic circalittoral silty clay with small pebbles and shells (A5.626, MC2218).



No generic or specific differences recorded.

Fig. 20a. *Hiatella arctica* (RT6020, 62564) – L

**RT6021 – *Haliclona oculata* (Linnaeus, 1759) (Figure 21a)**

Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Circalittoral (Upper Shelf). Geography: Southeast England. Condition: Fair. Size: Small portions, no bases. All specimens from one sample.

This species is named in one biotope: *Flustra foliacea* and *Haliclona oculata* with a rich faunal turf on tide-swept Atlantic circalittoral mixed substrata (CR.HCR.XFa.FluHocu, A4.137, MC1219).



Fig. 21a. *Haliclona oculata* (RT6021, 10370)

Four generic and specific differences: Lab 10 identified as *Leucosolenia variabilis*; Labs 16 and 17 identified as *Leucosolenia botryoides* (Figure 21b shows *Leucosolenia* sp.); Lab 14 identified as *Sycon ciliatum* (Figure 21c shows a member of the complex) (all of which have triradial spicules).



Fig. 21b. *Leucosolenia* sp. P2188, 63443)



Fig. 21c. *Sycon ciliatum* agg. 413273, 9594)

**RT6022 – *Eteone longa* (Fabricius, 1780) (Figure 22a)**

Substratum: Mud. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: Wales. Condition: Good. Size: Medium. All specimens from one sample.

This species is named in one biotope: *Hediste diversicolor*, *Limecola balthica* and *Eteone longa* in Atlantic littoral muddy sand (LS.LSa.MuSa.HedMacEte, A2.243, MA5253).

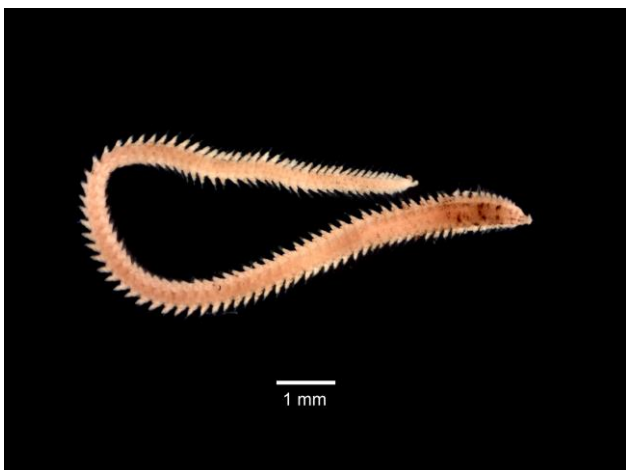


Fig. 22a. *Eteone longa* (RT6022, 57172) – D

No generic or specific differences recorded.

Labs 10 and 13 added 'agg.' to the name.



**RT6023 – *Modiolula phaseolina* (Philippi, 1844) (Figure 23a)**

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: Wales. Condition: Good. Size: Small, 1-2 mm. Specimens from two samples.

This species is named in one biotope from the 2017 classification: Pontic deep circalittoral muds with *Modiolula phaseolina* (A5.379).



Fig. 23a. *Modiolula phaseolina* (RT6023, 62839) – L

Three generic and specific differences: Lab 17 identified as *Mytilus edulis* (Figure 23b) (in which the periostracal hairs are shorter, narrower, or absent); Labs 02 and 21 identified as *Modiolus modiolus* (Figure 23c) (in which the periostracal hairs are broader at the base).

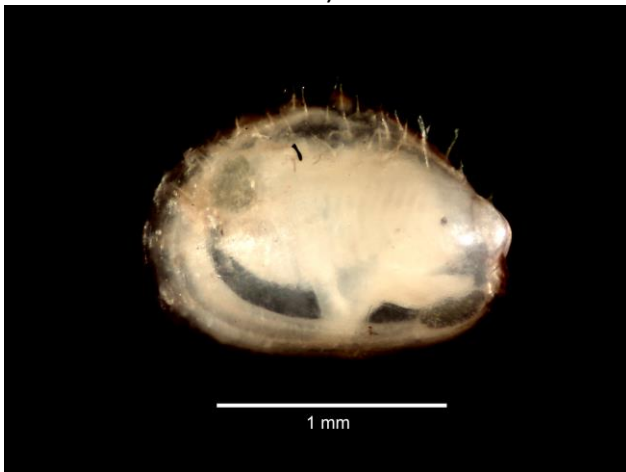


Fig. 23b. *Mytilus edulis* (P2191, 60835) – L

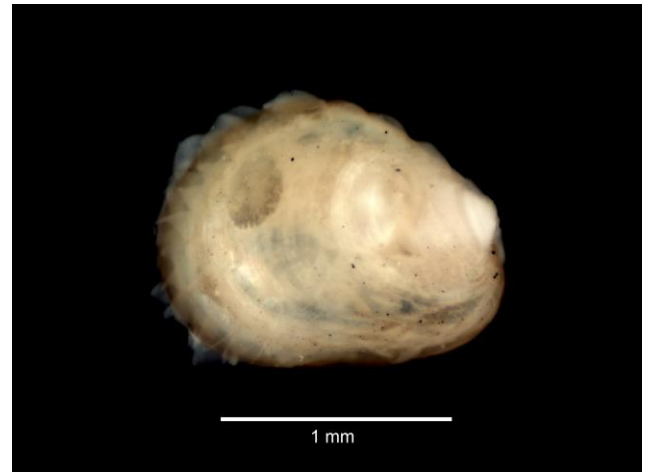


Fig. 23c. *Modiolus modiolus* (2217, 60278) – L

**RT6024 – *Ascidella aspersa* (Müller, 1776) (Figures 24a-b)**

Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: Southeast England. Condition: Fair. Size: Medium. All specimens from one sample.

This species is named in two biotopes: *Sagartiogeton undatus* and *Ascidella aspersa* on Atlantic infralittoral sandy mud (SS.SMu.ISaMu.SundAasp, A5.332, MB6242), *Ascidella aspersa* on Atlantic circalittoral artificial substrata (CR.FCR.FouFa.Aasp, A4.722, MC12292).

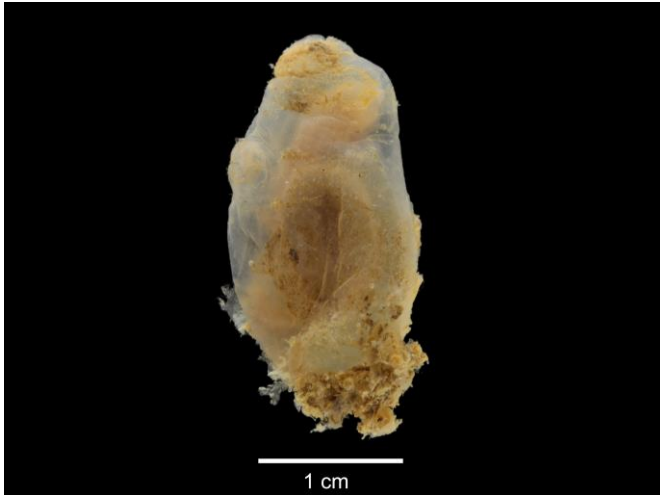


Fig. 24a. *Ascidella aspersa* (RT6024) – L

Two specific differences: Labs 19 and 21 identified as *Ascidella scabra* (Figures 24c-d) (which has oral tentacles more numerous than internal longitudinal branchial bars).

Lab 02 used the synonym/spelling error *Ascidia aspera*.

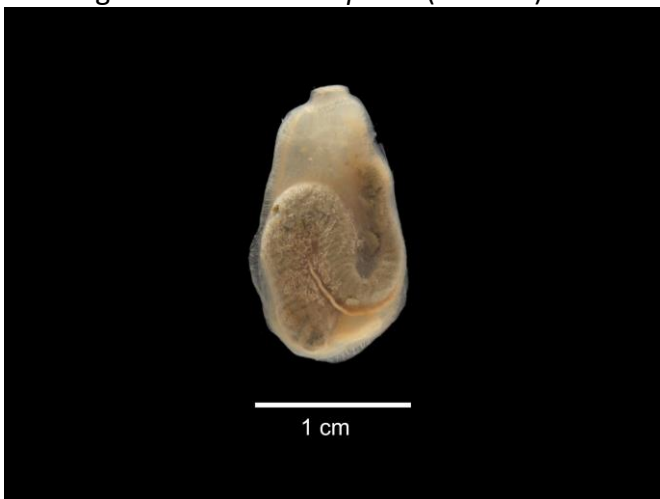


Fig. 24b. *Ascidella aspersa* (RT6024) – left side, test removed



Fig. 24c. *Ascidella scabra* (P2165, 60400) – L



Fig. 24d. *Ascidella scabra* (P2165, 60183) – left side, test removed

**RT6025 – *Einhornia crustulenta* (Pallas, 1766) (Figures 25a, b)**

Substratum: Diamicton. Salinity: Reduced (Mesohaline). Depth: Infralittoral. Geography: Southeast England. Condition: Fair. Size: Medium colonies. All specimens from one sample.

This species is named in one biotope: *Cordylophora caspia* and *Electra crustulenta* on reduced salinity Atlantic infralittoral rock (IR.LIR.IFaVS.CcasEle, A3.362, MB1262).

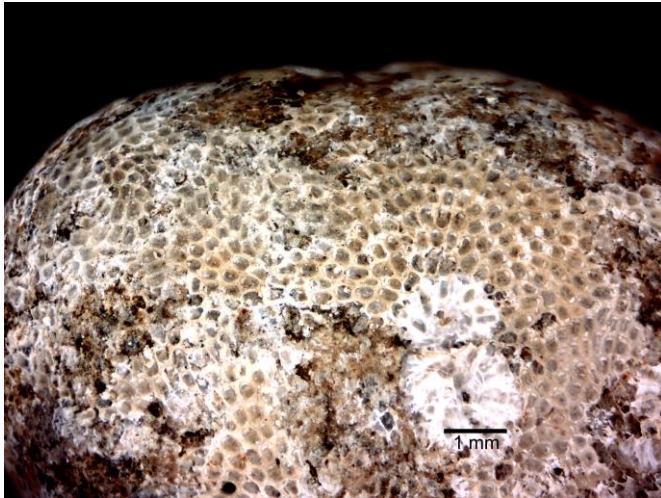


Fig. 25a. *Einhornia crustulenta* (RT6025, 66530)

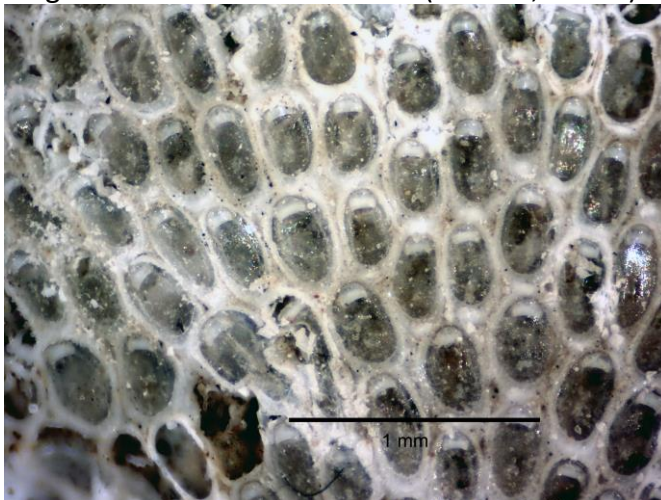


Fig. 25b. *Einhornia crustulenta* (RT6025, 66530) –  
zoids

Six generic and specific differences: Labs 02, 07, 14, 16, 17 and 21 identified as *Conopeum seurati* (Figure 3c); (which lacks a calcareous operculum and proximal boss on the gymnocyst).

## **Taxonomic and Identification policy problems highlighted by this RT**

An important purpose for the ring test exercises is to highlight areas for further work in identification standardisation and taxonomic research. Several participants submitted comments following submission of the initial results and reviews of identifications and scoring policies were made after circulation of the interim results. Several taxonomic and identification problems were highlighted through this exercise, discussed above.

**Specimen 02.** We consider the specimens circulated to have been fairly typical *Mytilus edulis* but several participants noted similarities to *M. galloprovincialis*. It is noted that molecular methods may be necessary to consistently distinguish between the three British *Mytilus* species (Beaumont *et al.*, 2008) and that genus level identifications may be recommended in future.

**Specimen 11.** It was noted in the Scheme cirratulid guide that the species traditionally called *Aphelochaeta marioni* would eventually prove to be something else but that the name should be retained until its identity is resolved. We currently add 'sensu MarLIN' to records in recognition that it is not *A. marioni* but that it is the species named as *A. marioni* for the interpretation of biotopes and most ecological studies. The species is most probably *Tharyx maryae* of Blake & Göransson (2015) but may yet prove to be covered by an earlier name.

### **Acknowledgements**

We would like to thank all participants that have provided feedback following issue of interim results.

### **References**

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### **Ring Test Specimen Return Instructions**

**Please return all ring test specimens by 16<sup>th</sup> April 2021.** These are reference collection specimens and must be returned to our museum. Your laboratory will be ineligible for future ring tests if specimens are not returned.

Return address:        **David Hall, APEM Ltd., 7a Diamond Centre,  
Works Road, Letchworth, Hertfordshire SG6 1LW, UK**