



NMQC

NE Atlantic Marine Biological Analytical Quality Control Scheme

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Ring Test Bulletin – RTB#59



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RING TEST DETAILS

Ring Test #59 (Year 27)

Type/Contents – General

Circulated – 02/11/20

Results deadline – 18/12/20

Number of Subscribing Laboratories – 22

Number of Participating Laboratories – 18

Number of Results Received – 18*

*multiple data entries per laboratory permitted

Summary of differences

Specimen	Genus	Species	Condition / Size	Total differences for 18 returns	
				Genus	Species
RT5901	<i>Palaemon</i>	<i>serratus</i>	Good; Large	0	2
RT5902	<i>Sthenelais</i>	<i>boa</i>	Fair; Small	5	5
RT5903	<i>Turtonia</i>	<i>minuta</i>	Good, Medium, 1-2 mm	5	5
RT5904	<i>Pisione</i>	<i>remota</i>	Good (complete tails); Medium	0	1
RT5905	<i>Amaeana</i>	<i>trilobata</i>	Fair; Medium	2	2
RT5906	<i>Pontocrates</i>	<i>arcticus</i>	Good; Medium	1	8
RT5907	<i>Goniada</i>	<i>maculata</i>	Fair (proboscis inverted), medium	1	1
RT5908	<i>Oxydromus</i>	<i>flexuosus</i>	Fair; Medium	1	3
RT5909	<i>Cradoscrupocellaria</i>	<i>reptans</i>	Fair; Small portions	2	2
RT5910	<i>Sigalion</i>	<i>mathildae</i>	Fair (proboscis everted); Small	1	1
RT5911	<i>Tanais</i>	<i>dulongii</i>	Fair; Medium	1	1
RT5912	<i>Alkmaria</i>	<i>romijni</i>	Good; Medium	2	2
RT5913	<i>Corophium</i>	<i>arenarium</i>	Good; Medium, female	0	1
RT5914	<i>Chaetozone</i>	<i>gibber</i>	Fair (no tails); Medium	2	4
RT5915	<i>Melarhapse</i>	<i>neritoides</i>	Fair; Medium, 3-5 mm	2	2
RT5916	<i>Flustra</i>	<i>foliacea</i>	Fair; Medium	1	1
RT5917	<i>Echinogammarus</i>	<i>marinus</i>	Good; Medium, female	0	9
RT5918	<i>Pholoe</i>	<i>baltica</i>	Fair; Medium	0	3
RT5919	<i>Microdeutopus</i>	<i>gryllotalpa</i>	Fair; Medium, female	4	10
RT5920	<i>Skeneopsis</i>	<i>planorbis</i>	Good; Medium, 1-2 mm	1	1
RT5921	<i>Priapulid</i>	<i>caudatus</i>	Fair; Medium	2	2
RT5922	<i>Scalibregma</i>	<i>inflatum</i>	Good; Medium	0	0
RT5923	<i>Tubulanus</i>	<i>polymorphus</i>	Fair; Medium	2	2
RT5924	<i>Reptadeonella</i>	<i>violacea</i>	Good; Large colonies, dry	4	5
RT5925	<i>Littorina</i>	<i>saxatilis</i>	Good; Small, 2-4 mm	0	3
Total differences				39	76
Average differences /lab.				2.2	4.2

Figure 1. The number of differences from the AQC identification of specimens distributed in RT59 for each of the participating laboratories. Arranged in order of increasing number of differences (by specific followed by generic errors).

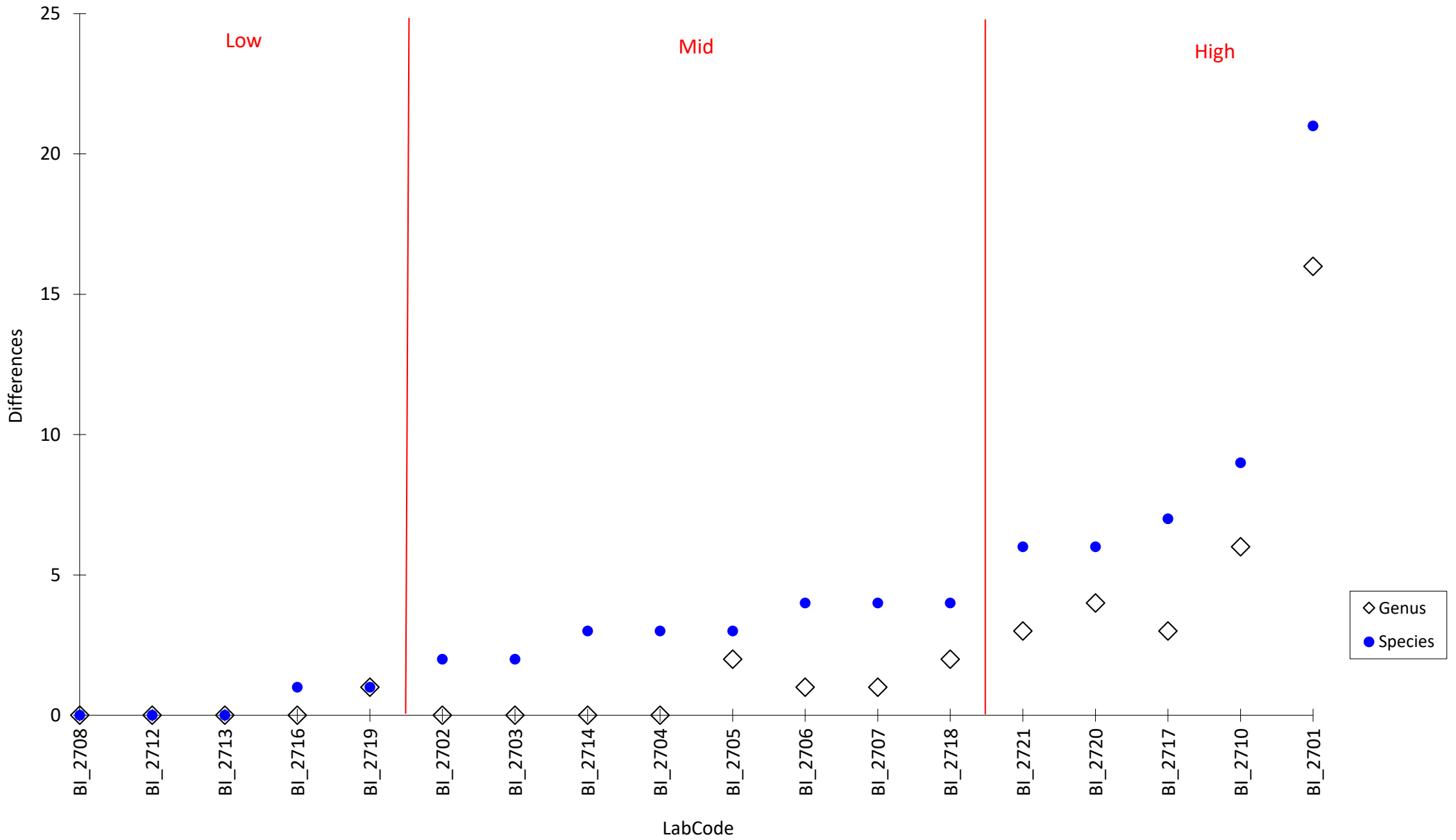


Table 1. The identification of fauna made by participating laboratories for RT59 (arranged by specimen). Names are given only where different from the AQC identification.

	RT5901	RT5902	RT5903	RT5904	RT5905	RT5906
Taxon	<i>Palaemon serratus</i>	<i>Sthenelais boa</i>	<i>Turtonia minuta</i>	<i>Pisione remota</i>	<i>Amaeana trilobata</i>	<i>Pontocrates arcticus</i>
BI_2701	- longirostris	Harmothoe fernandi	Abra 0	--	Polycirrus medusa	Westwoodilla caecula
BI_2702	--	--	--	--	--	- arenarius
BI_2703	--	--	--	--	--	--
BI_2704	--	[Fimbriosthenelais] [minor]	--	--	--	--
BI_2705	--	Pholoe baltica	--	--	--	--
BI_2706	--	[Fimbriosthenelais] [minor]	Lasaea rubra	- inkoi	--	--
BI_2707	--	[Fimbriosthenelais] [minor]	--	--	Lysilla nivea	- arenarius
BI_2708	--	--	--	--	--	--
BI_2710	--	[Fimbriosthenelais] [minor]	Lasaea adansoni	--	[Amaena] -	- arenarius
BI_2712	--	[Fimbriosthenelais] [minor]	--	--	--	--
BI_2713	--	[Fimbriosthenelais] [minor]	--	--	--	--
BI_2714	--	--	--	--	--	--
BI_2716	--	--	--	--	--	--
BI_2717	- adpersus	Fimbriosthenelais zetlandica	Lasaea adansoni	--	--	- arenarius
BI_2718	--	[Fimbriosthenelais] [minor]	--	--	--	- altamarinus
BI_2719	--	Fimbriosthenelais zetlandica	--	--	--	--
BI_2720	--	--	Kurtiella bidentata	--	--	- arenarius
BI_2721	--	Eusthenelais hibernica	--	--	--	- arenarius

Table 1. The identification of fauna made by participating laboratories for RT59 (arranged by specimen). Names are given only where different from the AQC identification.

	RT5907	RT5908	RT5909	RT5910	RT5911
Taxon	<i>Goniada maculata</i>	<i>Oxydromus flexuosus</i>	<i>Cradoscrupocellaria reptans</i>	<i>Sigalion mathildae</i>	<i>Tanais dulongii</i>
BI_2701	Glycera tridactyla	Alitta virens	Scrupocellaria scruposa	Phyllodoce 0	--
BI_2702	--	--	--	--	--
BI_2703	--	--	--	--	--
BI_2704	--	--	- [ellisii]	--	--
BI_2705	--	--	Tricellaria inopinata	--	--
BI_2706	--	- pallidus	[Scrupocellaria] [ellisii]	--	--
BI_2707	--	--	--	--	--
BI_2708	--	--	- [ellisii]	--	--
BI_2710	--	--	--	--	--
BI_2712	--	--	- [ellisii]	--	--
BI_2713	--	--	- [ellisii]	--	--
BI_2714	--	- pallidus	--	--	--
BI_2716	--	--	--	--	--
BI_2717	--	--	--	--	--
BI_2718	--	--	--	--	--
BI_2719	--	--	--	--	--
BI_2720	--	- [vittatus]	- [ellisii]	--	--
BI_2721	--	--	[Scrupocellaria] -	--	Sinelobus vanhaareni

Table 1. The identification of fauna made by participating laboratories for RT59 (arranged by specimen). Names are given only where different from the AQC identification.

	RT5912	RT5913	RT5914	RT5915	RT5916
Taxon	<i>Alkmaria romijni</i>	<i>Corophium arenarium</i>	<i>Chaetozone gibber</i>	<i>Melarhappe neritoides</i>	<i>Flustra foliacea</i>
BI_2701	Melinna palmata	- volutator	Cirriformia 0	Littorina saxatilis	Chartella papyracea
BI_2702	--	--	--	--	--
BI_2703	--	--	--	--	--
BI_2704	--	--	--	--	--
BI_2705	--	--	--	--	--
BI_2706	--	--	--	--	- [foliacia]
BI_2707	--	--	--	--	--
BI_2708	--	--	--	--	--
BI_2710	--	--	Caulleriella alata	--	--
BI_2712	--	--	--	--	--
BI_2713	--	--	--	--	--
BI_2714	--	--	--	--	--
BI_2716	--	--	- zetlandica	--	- [foliacaea]
BI_2717	--	--	--	--	--
BI_2718	--	--	--	Lacuna crassior	--
BI_2719	--	--	--	--	--
BI_2720	Hypania invalida	--	--	--	--
BI_2721	--	--	- caputesocis	--	--

Table 1. The identification of fauna made by participating laboratories for RT59 (arranged by specimen). Names are given only where different from the AQC identification.

	RT5917	RT5918	RT5919	RT5920	RT5921
Taxon	<i>Echinogammarus marinus</i>	<i>Pholoe baltica</i>	<i>Microdeutopus gryllotalpa</i>	<i>Skeneopsis planorbis</i>	<i>Priapulus caudatus</i>
BI_2701	- stoerensis	- assimilis	Gammaropsis palmata	--	Sipunculus 0
BI_2702	--	--	- chelifer	--	--
BI_2703	- obtusatus	- assimilis	--	--	--
BI_2704	- obtusatus	--	- chelifer	--	--
BI_2705	- obtusatus	--	--	--	--
BI_2706	- obtusatus	- [balthica]	--	--	--
BI_2707	- pirloti	--	- anomalus	--	--
BI_2708	--	--	--	--	--
BI_2710	- obtusatus	- assimilis	Aora gracilis	--	Stelligera montagui
BI_2712	--	--	--	--	--
BI_2713	--	--	--	--	--
BI_2714	- pirloti	--	- damnoniensis	--	--
BI_2716	--	--	--	--	[Priapulis] -
BI_2717	- obtusatus	--	Aora typica	--	--
BI_2718	--	--	- anomalus	Omalogyra atomus	--
BI_2719	--	--	--	--	--
BI_2720	--	--	Lembos websteri	--	--
BI_2721	--	--	- 0	--	--

Table 1. The identification of fauna made by participating laboratories for RT59 (arranged by specimen). Names are given only where different from the AQC identification.

	RT5922	RT5923	RT5924	RT5925
Taxon	<i>Scalibregma inflatum</i>	<i>Tubulanus polymorphus</i>	<i>Reptadeonella violacea</i>	<i>Littorina saxatilis</i>
BI_2701	--	Schizomavella (Schizomavella) linearis	0 0	- littorea
BI_2702	--	--	--	--
BI_2703	--	--	--	--
BI_2704	--	--	--	- arcana
BI_2705	--	--	--	--
BI_2706	--	--	--	--
BI_2707	--	--	--	--
BI_2708	--	--	--	--
BI_2710	--	Oerstedtia dorsalis	Haplopoma impressum	--
BI_2712	--	--	--	--
BI_2713	--	--	--	--
BI_2714	--	--	--	--
BI_2716	--	--	--	--
BI_2717	--	--	- insidiosa	--
BI_2718	--	--	--	--
BI_2719	--	--	--	--
BI_2720	--	--	Cribrilaria innominata	- arcana
BI_2721	--	--	Plagioecia sarniensis	--

Table 2. The identification of fauna made by participating laboratories for RT59 (arranged by participant). Names are given only where different from the AQC identification.

	Taxon	BI_2701	BI_2702	BI_2703	BI_2704	BI_2705	BI_2706
RT5901	<i>Palaemon serratus</i>	- longirostris	--	--	--	--	--
RT5902	<i>Sthenelais boa</i>	Harmothoe fernandi	--	--	[Fimbriosthenelais] [minor]	Pholoe baltica	[Fimbriosthenelais] [minor]
RT5903	<i>Turtonia minuta</i>	Abra 0	--	--	--	--	Lasaea rubra
RT5904	<i>Pisione remota</i>	--	--	--	--	--	- inkoi
RT5905	<i>Amatea trilobata</i>	Polycirrus medusa	--	--	--	--	--
RT5906	<i>Pontocrates arcticus</i>	Westwoodilla caecula	- arenarius	--	--	--	--
RT5907	<i>Goniada maculata</i>	Glycera tridactyla	--	--	--	--	--
RT5908	<i>Oxydromus flexuosus</i>	Alitta virens	--	--	--	--	- pallidus
RT5909	<i>Cradoscrupocellaria reptans</i>	Scrupocellaria scruposa	--	--	- [ellisii]	Tricellaria inopinata	[Scrupocellaria] [ellisii]
RT5910	<i>Sigalion mathildae</i>	Phyllodoce 0	--	--	--	--	--
RT5911	<i>Tanais dulongii</i>	--	--	--	--	--	--
RT5912	<i>Alkmaria romijni</i>	Melinna palmata	--	--	--	--	--
RT5913	<i>Corophium arenarium</i>	- volutator	--	--	--	--	--
RT5914	<i>Chaetozone gibber</i>	Cirriformia 0	--	--	--	--	--
RT5915	<i>Melarhaphes neritoides</i>	Littorina saxatilis	--	--	--	--	--
RT5916	<i>Flustra foliacea</i>	Chartella papyracea	--	--	--	--	- [foliacea]
RT5917	<i>Echinogammarus marinus</i>	- stoerensis	--	- obtusatus	- obtusatus	- obtusatus	- obtusatus
RT5918	<i>Pholoe baltica</i>	- assimilis	--	- assimilis	--	--	- [balthica]
RT5919	<i>Microdeutopus gryllotalpa</i>	Gammaropsis palmata	- chelifera	--	- chelifera	--	--
RT5920	<i>Skeneopsis planorbis</i>	--	--	--	--	--	--
RT5921	<i>Priapulid caudatus</i>	Sipunculus 0	--	--	--	--	--
RT5922	<i>Scalibregma inflatum</i>	--	--	--	--	--	--
RT5923	<i>Tubulanus polymorphus</i>	Schizomavella (Schizomavella) linearis	--	--	--	--	--
RT5924	<i>Reptadeonella violacea</i>	0 0	--	--	--	--	--
RT5925	<i>Littorina saxatilis</i>	- littorea	--	--	- arcana	--	--

Table 2. The identification of fauna made by participating laboratories for RT59 (arranged by participant). Names are given only where different from the AQC identification.

	Taxon	BI_2707	BI_2708	BI_2710	BI_2712	BI_2713	BI_2714	BI_2716
RT5901	<i>Palaemon serratus</i>	--	--	--	--	--	--	--
RT5902	<i>Sthenelais boa</i>	[Fimbriosthenelais] [minor]	--	[Fimbriosthenelais] [minor]	[Fimbriosthenelais] [minor]	[Fimbriosthenelais] [minor]	--	--
RT5903	<i>Turtonia minuta</i>	--	--	Lasaea adansoni	--	--	--	--
RT5904	<i>Pisione remota</i>	--	--	--	--	--	--	--
RT5905	<i>Amaeana trilobata</i>	Lysilla nivea	--	[Amaena] -	--	--	--	--
RT5906	<i>Pontocrates arcticus</i>	- arenarius	--	- arenarius	--	--	--	--
RT5907	<i>Goniada maculata</i>	--	--	--	--	--	--	--
RT5908	<i>Oxydromus flexuosus</i>	--	--	--	--	--	- pallidus	--
RT5909	<i>Cradoscrupocellaria reptans</i>	--	- [ellisii]	--	- [ellisii]	- [ellisii]	--	--
RT5910	<i>Sigalion mathildae</i>	--	--	--	--	--	--	--
RT5911	<i>Tanais dulongii</i>	--	--	--	--	--	--	--
RT5912	<i>Alkmaria romijni</i>	--	--	--	--	--	--	--
RT5913	<i>Corophium arenarium</i>	--	--	--	--	--	--	--
RT5914	<i>Chaetozone gibber</i>	--	--	Cauleriella alata	--	--	--	- zetlandica
RT5915	<i>Melarhappe neritoides</i>	--	--	--	--	--	--	--
RT5916	<i>Flustra foliacea</i>	--	--	--	--	--	--	- [foliacea]
RT5917	<i>Echinogammarus marinus</i>	- pirloti	--	- obtusatus	--	--	- pirloti	--
RT5918	<i>Pholoe baltica</i>	--	--	- assimilis	--	--	--	--
RT5919	<i>Microdeutopus gryllotalpa</i>	- anomalus	--	Aora gracilis	--	--	- damnoniensis	--
RT5920	<i>Skeneopsis planorbis</i>	--	--	--	--	--	--	--
RT5921	<i>Priapulus caudatus</i>	--	--	Stelligera montagui	--	--	--	[Priapulis] -
RT5922	<i>Scalibregma inflatum</i>	--	--	--	--	--	--	--
RT5923	<i>Tubulanus polymorphus</i>	--	--	Oerstedtia dorsalis	--	--	--	--
RT5924	<i>Reptadeonella violacea</i>	--	--	Haplopoma impressum	--	--	--	--
RT5925	<i>Littorina saxatilis</i>	--	--	--	--	--	--	--

Table 2. The identification of fauna made by participating laboratories for RT59 (arranged by participant). Names are given only where different from the AQC identification.

	Taxon	BI_2717	BI_2718	BI_2719	BI_2720	BI_2721
RT5901	<i>Palaemon serratus</i>	- adpersus	--	--	--	--
RT5902	<i>Sthenelais boa</i>	Fimbriosthenelais zetlandica	[Fimbriosthenelais] [minor]	Fimbriosthenelais zetlandica	--	Eusthenelais hibernica
RT5903	<i>Turtonia minuta</i>	Lasaea adansoni	--	--	Kurtiella bidentata	--
RT5904	<i>Pisione remota</i>	--	--	--	--	--
RT5905	<i>Amoeana trilobata</i>	--	--	--	--	--
RT5906	<i>Pontocrates arcticus</i>	- arenarius	- altamarinus	--	- arenarius	- arenarius
RT5907	<i>Goniada maculata</i>	--	--	--	--	--
RT5908	<i>Oxydromus flexuosus</i>	--	--	--	- [vittatus]	--
RT5909	<i>Cradoscrupocellaria reptans</i>	--	--	--	- [ellisii]	[Scrupocellaria] -
RT5910	<i>Sigalion mathildae</i>	--	--	--	--	--
RT5911	<i>Tanais dulongii</i>	--	--	--	--	Sinelobus vanhaareni
RT5912	<i>Alkmaria romijni</i>	--	--	--	Hypania invalida	--
RT5913	<i>Corophium arenarium</i>	--	--	--	--	--
RT5914	<i>Chaetozone gibber</i>	--	--	--	--	- caputesocis
RT5915	<i>Melarhaphes neritoides</i>	--	Lacuna crassior	--	--	--
RT5916	<i>Flustra foliacea</i>	--	--	--	--	--
RT5917	<i>Echinogammarus marinus</i>	- obtusatus	--	--	--	--
RT5918	<i>Pholoe baltica</i>	--	--	--	--	--
RT5919	<i>Microdeutopus gryllotalpa</i>	Aora typica	- anomalus	--	Lembos websteri	- 0
RT5920	<i>Skeneopsis planorbis</i>	--	Omalogyra atomus	--	--	--
RT5921	<i>Priapulus caudatus</i>	--	--	--	--	--
RT5922	<i>Scalibregma inflatum</i>	--	--	--	--	--
RT5923	<i>Tubulanus polymorphus</i>	--	--	--	--	--
RT5924	<i>Reptadeonella violacea</i>	- insidiosa	--	--	Cribrilaria innominata	Plagioecia sarniensis
RT5925	<i>Littorina saxatilis</i>	--	--	--	- arcana	--

Specimen Images and Detailed Breakdown of Identifications

RT59 included thirteen species never previously sent and several species anticipated to change our understanding of the fauna. Several participants highlighted problems with the originally circulated identifications and 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_2701 = 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)

RT5901 – *Palaemon serratus* (Horst, 1919) (Figures 1a, c)

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



Fig. 1a. *Palaemon serratus* (RT5901) – L



Fig. 1b. *Palaemon longirostris* (Tilbury) – L



Fig. 1c. *Palaemon serratus* (RT5901) – **chelae and rostrum**

Two specific differences: Lab 01 identified as *Palaemon longirostris* (Figure 1b, d); Lab 17 identified as *Palaemon adpersus* (no material available) (both of which have a straight rostrum).



Fig. 1d. *Palaemon longirostris* (Tilbury) –
chela and rostrum

RT5902 – *Sthenelais boa* (Johnston, 1833) (Figures 2a, f-h)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: North Sea. Condition: Fair. Size: small. Specimens from five samples.



Fig. 2a. *Sthenelais boa* (RT5902; 58657) – D

Five generic and specific differences: Lab 01 identified as *Harmothoe fernandi* (Figure 2b) (which lacks chaetal blades); Lab 05 identified as *Pholoe baltica* (Figure 18a) (which has short chaetal blades); Labs 17, 19 identified as *Fimbriosthenelais zetlandica* (Figures 2c, e) (which has a papillated ventral surface); Lab 21 identified as *Eusthenelais hibernica* (no material available, taxon inquirendum on WoRMS; Figure 2d shows the similar *Neoleanira tetragona*) (which has dorsal cirri).

Labs 04, 06, 07, 10, 12, 13, 18 identified as *Fimbriosthenelais minor*, which has been accepted as correct for the purposes of this exercise (see below).



Fig. 2b. *Harmothoe fernandi* (P848_57866) – D



Fig. 2c. *Fimbriosthenelais zetlandica* (413532,
10175) – D



Fig. 2d. *Neoleanira tetragona* (P1802, 59440) – D



Fig. 2e. *Fimbriosthenelais zetlandica* (413532, 10175) – L



Fig. 2f. *Sthenelais boa* (RT5902; 58657) – L

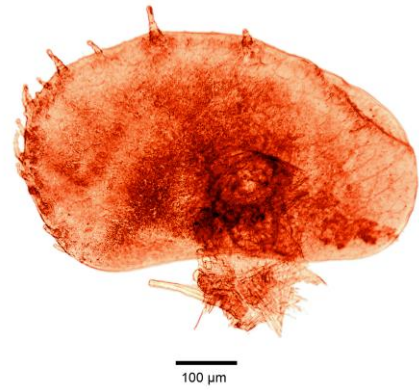


Fig. 2g. *Sthenelais boa* (RT5902; 58657) – scale

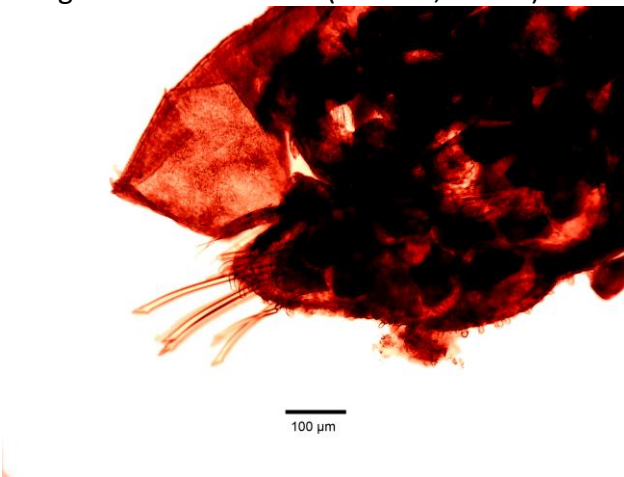


Fig. 2h. *Sthenelais boa* (RT5902; 58657) – parapodium

RT5903 – *Turtonia minuta* (Fabricius, 1780) (Figure 3a)

Substratum: Hard substrata. Salinity: Full (Euhaline). Depth: Infralittoral. Geography: Northern Scotland. Condition: Good. Size: Medium, 1-2 mm. All specimens from one sample.

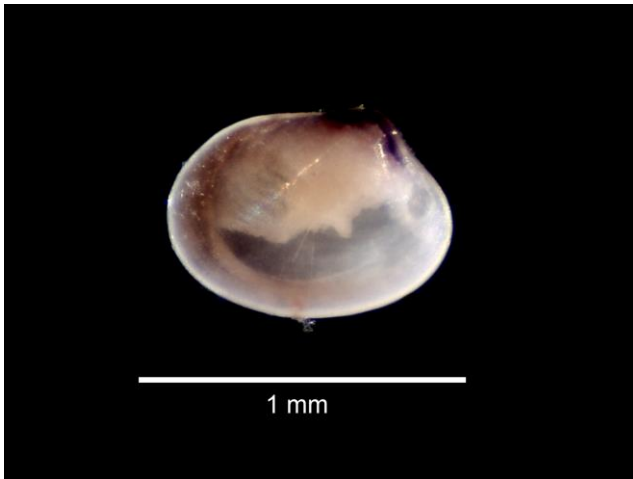


Fig. 3a. *Turtonia minuta* (RT5903; 59867) - L

Five generic and specific differences: Lab 01 identified as *Abra* (Figure 3b shows *A. alba*) (which lacks pigment); Lab 20 identified as *Kurtiella bidentata* (Figure 3c) (which has a shallower lunule and less convex ventral margin); Lab 06 identified as *Lasaea rubra* (Figure 3d) (which has a more tumid shell and a shallower lunule); Labs 10 and 17 identified as *Lasaea adansoni* (no material available; a west African species that has at times been considered a senior synonym of *L. rubra*).

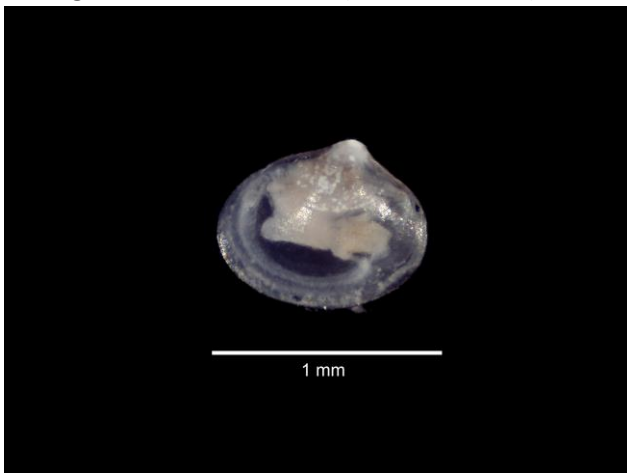


Fig. 3b. *Abra alba* (P589, 57521) - L

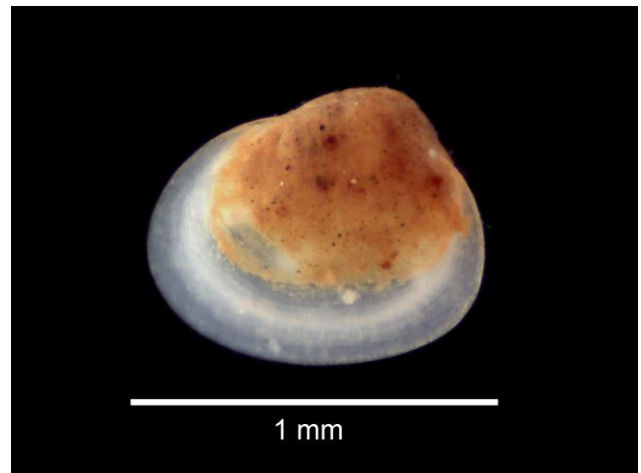


Fig. 3c. *Kurtiella bidentata* (414024, 12362) - L

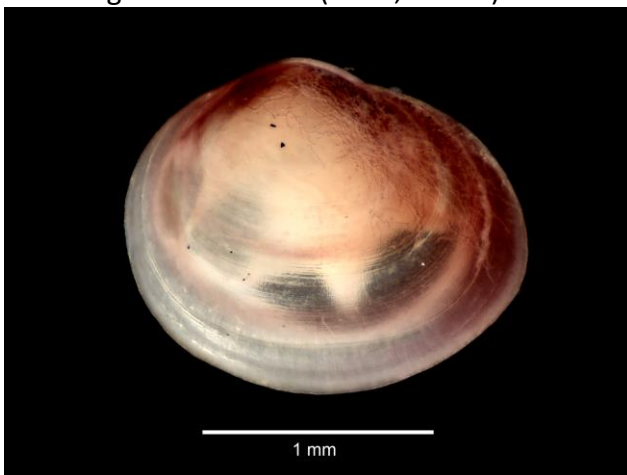


Fig. 3d. *Lasaea rubra* (413284, 9166) - L

RT5904 – *Pisione remota* (Southern, 1914) (Figure 4a)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: North Sea. Condition: Good (complete tails). Size: Medium. All specimens from one sample.

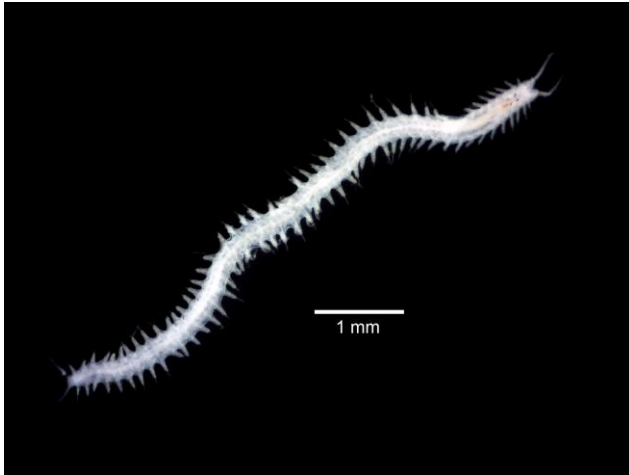


Fig. 4a. *Pisione remota* (RT5904; 61401) - D

One specific difference: Lab 06 identified as *Pisione inkoï* (no material available) (which has notoaciculae projecting through the skin).

RT5905 – *Amaeana trilobata* (Sars, 1863) (Figure 5a)

Substratum: Mud. Salinity: Full (Euhaline). Depth: Infralittoral. Geography: Western Scotland. Condition: Fair. Size: Medium. Specimens from five samples.



Fig. 5a. *Amaeana trilobata* (RT5905; 62890) – V

Two generic and specific differences: Lab 01 identified as *Polycirrus medusa* (Figure 5b); Lab 07 identified as *Lysilla nivea* (Figure 5c) (both of which have a folded upper lip and lack separate lateral lobes formed from the tentacular ridge).

Lab 10 mis-spelled the generic name: *Amaena*.

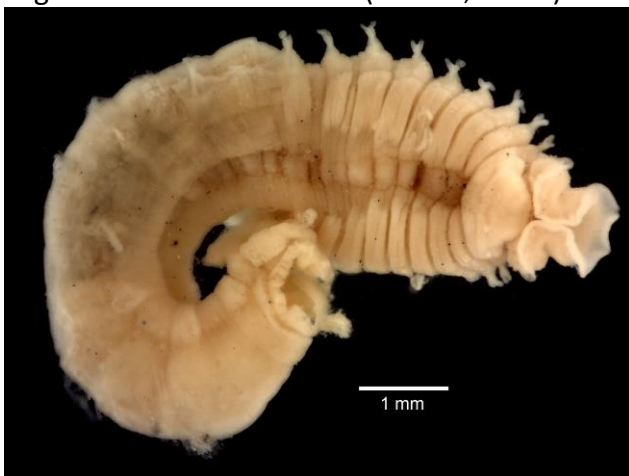


Fig. 5b. *Polycirrus medusa* (413533, 10535) – V

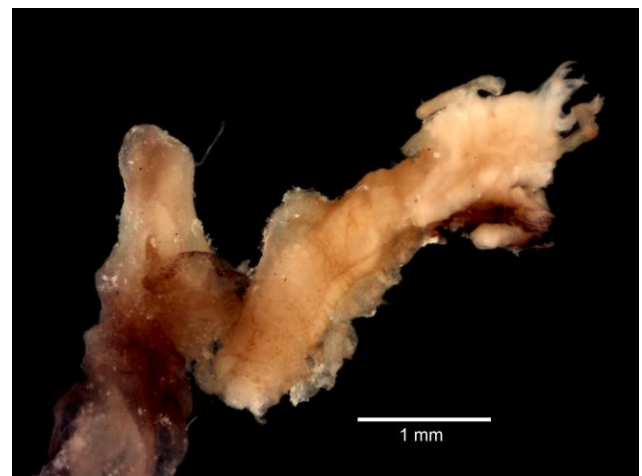


Fig. 5c. *Lysilla nivea* (P1301, 58445) – V

RT5906 – *Pontocrates arcticus* G.O. Sars, 1895; sensu Moore & Beare, 1993 (Figures 6a, e, h)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: North Sea. Condition: Good. Size: Medium. Specimens from three samples.



Fig. 6a. *Pontocrates arcticus* (RT5906; 61417) – L

One generic and eight specific differences: Lab 01 identified as *Westwoodilla caecula* (Figure 6b) (which has a broadly subchelate palm to gnathopod 2); Lab 18 identified as *Pontocrates altamarinus* (Figures 6c, g) (which has a more strongly oblique palm to gnathopod 1); Labs 02, 07, 10, 17, 20 and 21 identified as *Pontocrates arenarius* (Figures 6d, f, i) (which is more setose and has a less downturned rostrum – see Moore & Beare, 1993; Beare & Moore, P.G., 1998).

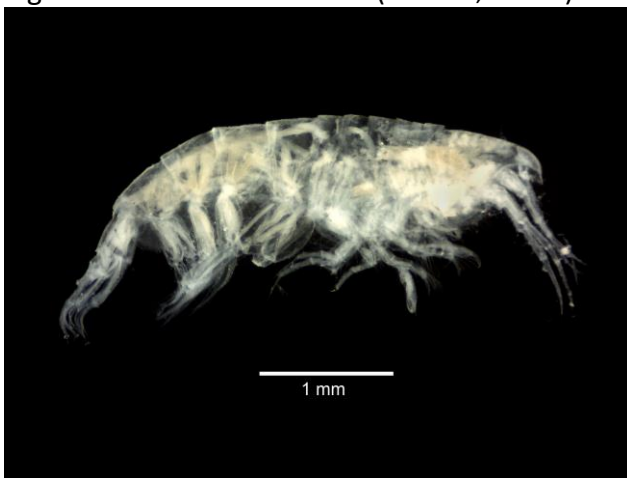


Fig. 6b. *Westwoodilla caecula* (P3132, 62463) – L

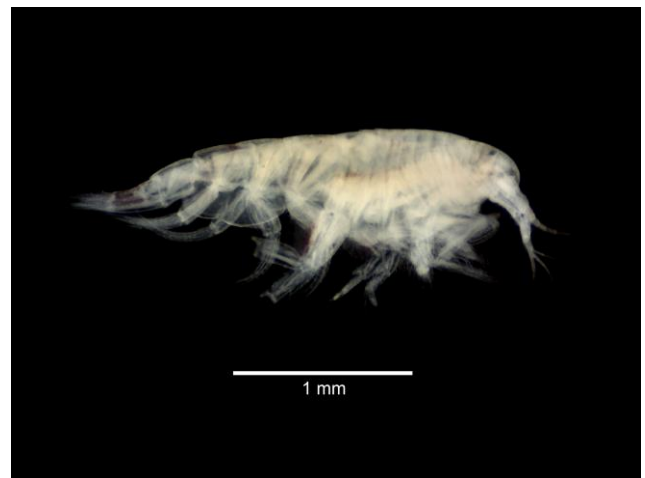


Fig. 6c. *Pontocrates altamarinus* (P3115, 62403) – L



Fig. 6d. *Pontocrates arenarius* (P2236, 60545) – L

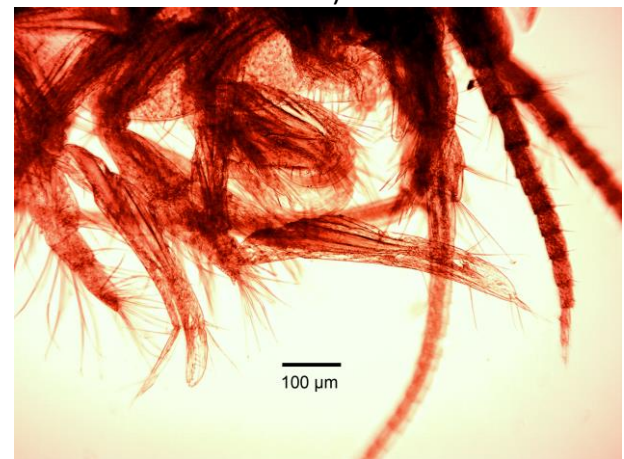


Fig. 6e. *Pontocrates arcticus* (RT5906; 61417) – gnathopods

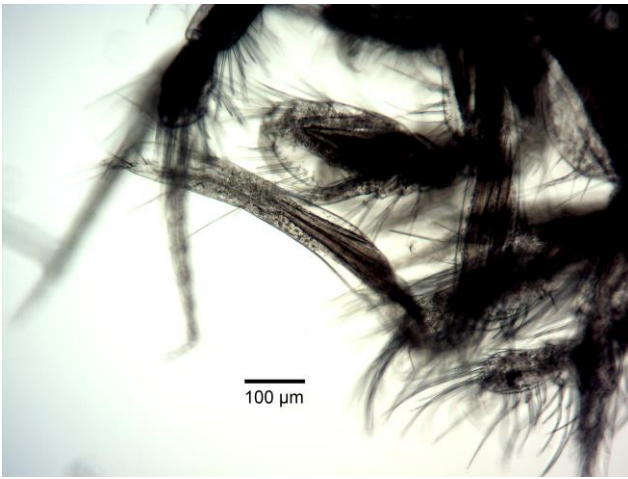


Fig. 6f. *Pontocrates arenarius* (P2236, 60545) – gnathopods

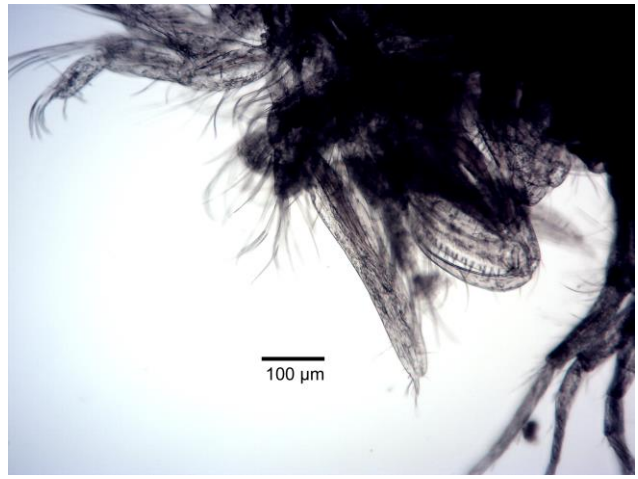


Fig. 6g. *Pontocrates altamarinus* (P3115, 62403) – gnathopods



Fig. 6h. *Pontocrates arcticus* (RT5906; 61417) – head

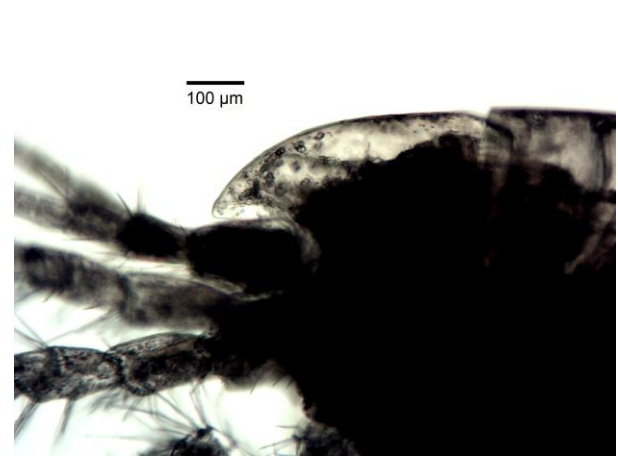


Fig. 6i. *Pontocrates arenarius* (60545) – head

RT5907 – *Goniada maculata* Örsted, 1843 (Figures 7a, c)

Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: Northern Scotland. Condition: Fair (proboscis inverted). Size: Medium. Specimens from seven samples.



Fig. 7a. *Goniada maculata* (RT5907; 61632) – L

One generic and specific difference: Lab 01 identified as *Glycera tridactyla* (Figures 7b, d) (which has uniramous parapodia only).



Fig. 7b. *Glycera tridactyla* (P2684_61213) – D

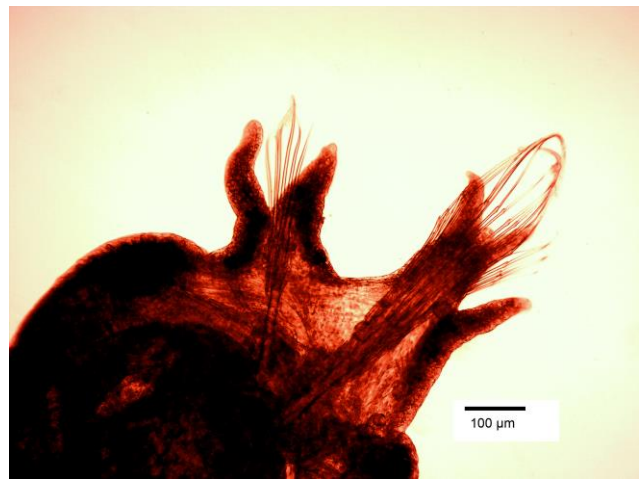


Fig. 7c. *Goniada maculata* (RT5907; 61632) –
posterior parapodium

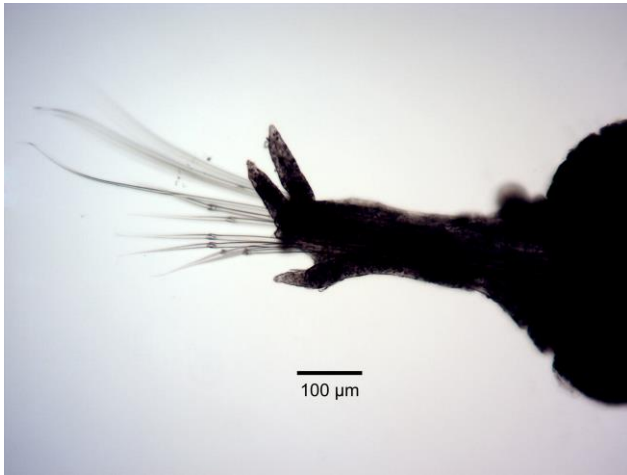


Fig. 7d. *Glycera tridactyla* (P2684_61213) –
posterior parapodium

RT5908 – *Oxydromus flexuosus* (Delle Chiaje, 1827) (Figure 8a)

Substratum: Mud. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: Western Scotland. Condition: Fair. Size: Medium. Specimens from five samples.



Fig. 8a. *Oxydromus flexuosus* (RT5908; 62883) – D

One generic and three specific differences: Lab 01 identified as *Alitta virens* (Figure 8b) (which has a pair of frontal antennae); Labs 06 and 14 identified as *Oxydromus pallidus* (Figure 8c) (which has fewer notochaetae and lacks transverse pale bands).

Lab 20 identified as *Oxydromus vittatus*, which has been scored as correct for the purposes of this exercise (see below).



Fig. 8b. *Alitta virens* (P2732, 62957) – D

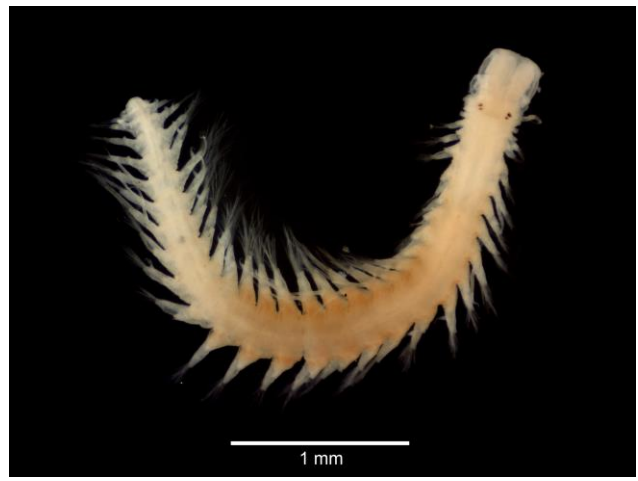


Fig. 8c. *Oxydromus pallidus* (P3411, 62943) – D

RT5909 – *Cradoscrupocellaria reptans* (Linnaeus, 1758) (Figures 9a-e)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: Southeast England. Condition: Fair. Size: Small portions. All specimens from one sample; Sample supplied by the Environment Agency.



Fig. 9a. *Cradoscrupocellaria reptans* (RT5909)

Two generic and specific differences: Lab 01 identified as *Scrupocellaria scruposa* (Figure 9f) (which lacks a scutum); Lab 05 identified as *Tricellaria inopinata* (Figures 9g) (which lacks vibracula).

Labs 04, 06, 08, 12, 19 and 20 identified as *Cradoscrupocellaria ellisii*, which has been accepted as correct for the purposes of this exercise (see below). Lab 21 used the synonym *Scrupocellaria reptans*.

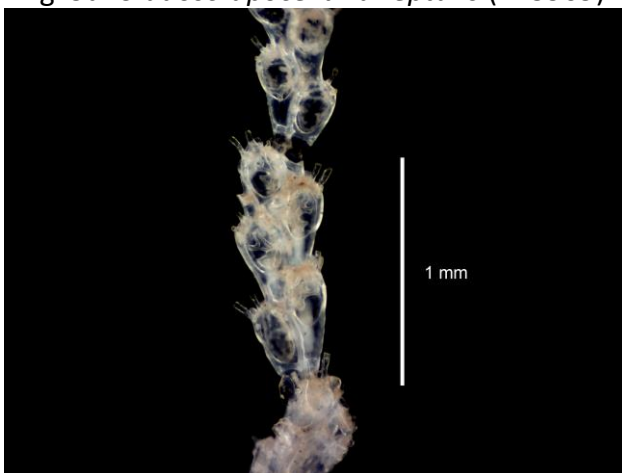


Fig. 9b. *Cradoscrupocellaria reptans* (RT5909) – zooids



Fig. 9c. *Cradoscrupocellaria reptans* (RT5909) – zooids, with rhizoid

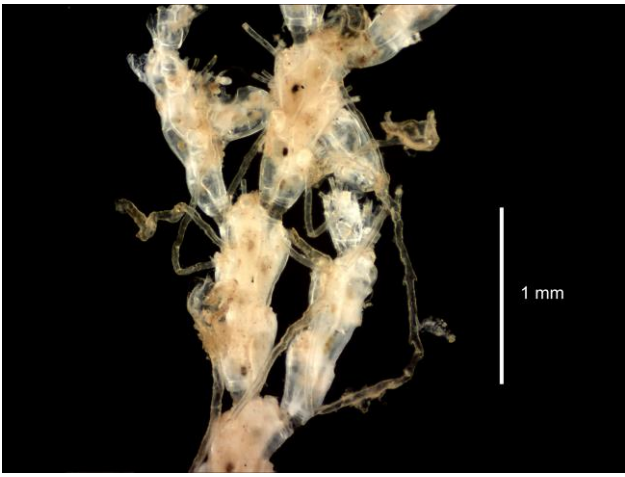


Fig. 9d. *Cradoscrupocellaria reptans* (RT5909) – zooids, with rhizoids



Fig. 9e. *Cradoscrupocellaria reptans* (RT5909) (Peter Barry) – zooids, with rhizoid

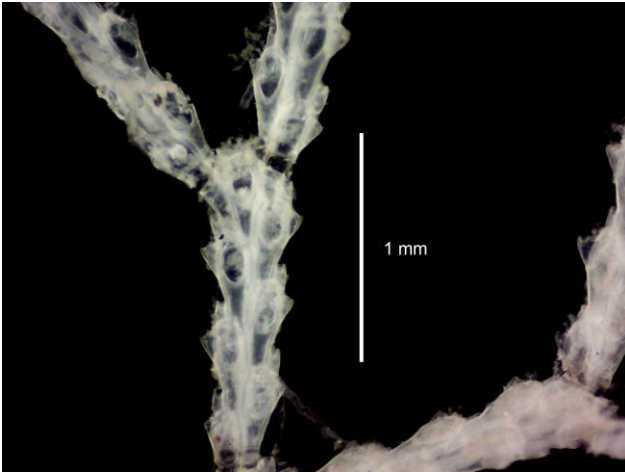


Fig. 9d. *Scrupocellaria scruposa* (P2188, 61879) – zooids

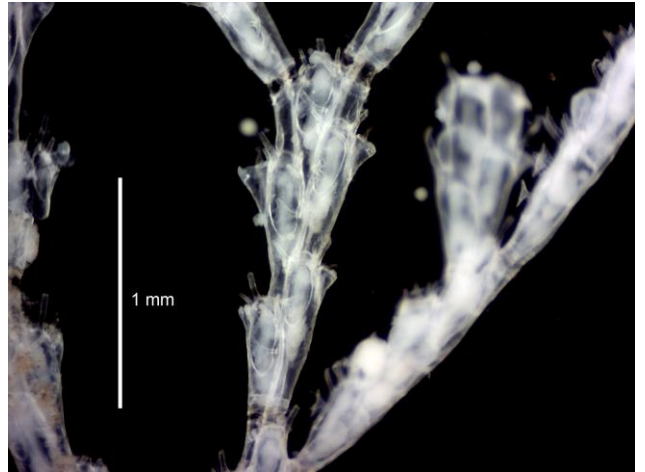


Fig. 9e. *Tricellaria inopinata* (RT5816; P 529, 59880) – zooids

RT5910 – *Sigalion mathildae* Audouin & Milne Edwards in Cuvier, 1830 (Figures 10a, b)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: North Sea. Condition: Fair (proboscis everted). Size: Small. Specimens from three samples.



Fig. 10a. *Sigalion mathildae* (RT5910; 61410) – D

One generic and specific difference: Lab 01 identified as *Phyllodoce* sp. (Figure 10c shows *P. mucosa*) (which has four antennae).

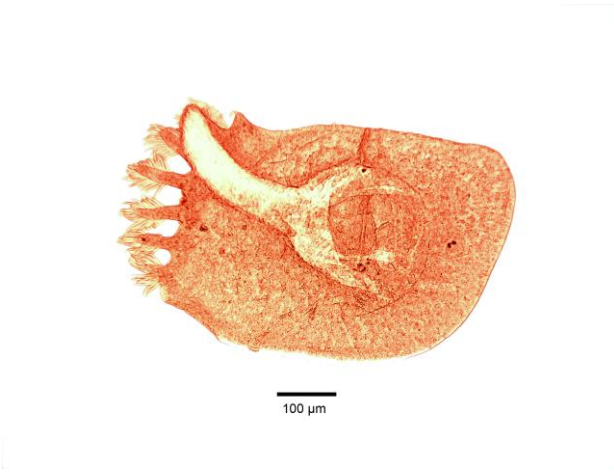


Fig. 10b. *Sigalion mathildae* (RT5910; 61410) – **scale**

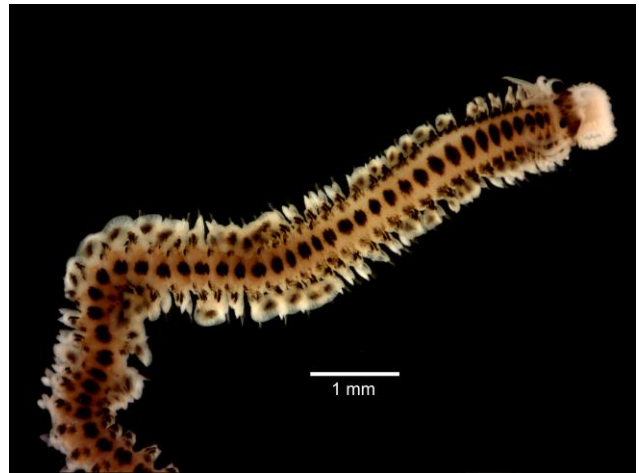


Fig. 10c. *Phyllodoce mucosa* (414120, 55222) – **D**

RT5911 – *Tanais dulongii* (Audouin, 1826) (Figure 11a)

Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: Northern Scotland. Condition: Fair. Size: Medium. Specimens from two samples.



Fig. 11a. *Tanais dulongii* (RT5911; 58332) – **L**

One generic and specific difference. Lab 21 identified as *Sinelobus vanhaareni* (Figure 11b) (in which the rows of plumose setae on the pleon do not reach the midline)



Fig. 11b. *Sinelobus vanhaareni* (P3212, 63254) – **L**

RT5912 – *Alkmaria romijni* Horst, 1919 (Figure 12a)

Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: Southeast England. Condition: Good. Size: Medium. All specimens from one sample; Specimens supplied by Will Musk (Hull Marine Laboratory).

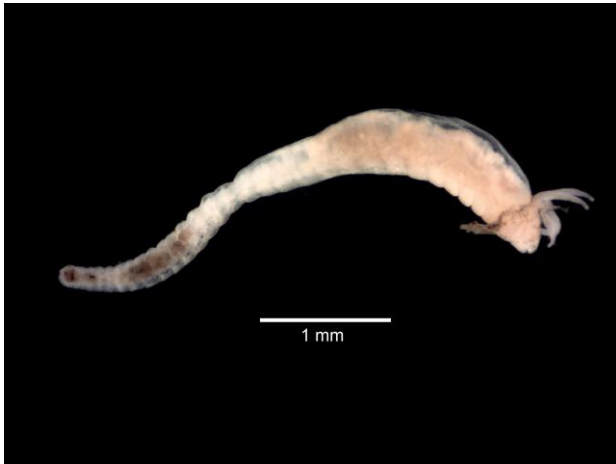


Fig. 12a. *Alkmaria romijni* (RT5912) – L

Two generic and specific differences: Lab 01 identified as *Melinna palmata* (Figure 12b) (which has neurochaetae on segments III-V); Lab 20 identified as *Hypania invalida* (Figure 12c) (which has paleae).



Fig. 12b. *Melinna palmata* (413273, 9591) – L



Fig. 12c. *Hypania invalida* (P4634, 65636) – L

RT5913 – *Corophium arenarium* Crawford, 1937 (Figure 13a)

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



Fig. 13a. *Corophium arenarium* (RT5913; 60737) - L

One generic and specific difference: Lab 01 identified as *Corophium volutator* (which lacks setae on the outer rami of Uropod 1).



Fig. 13b. *Corophium volutator* (P3844, 63438) - L

RT5914 – *Chaetozone gibber* Woodham & Chambers, 1994 (Figure 14a)

Substratum: Mud. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: Northeast England. Condition: Fair (no tails). Size: Medium. All specimens from one sample.



Fig. 14a. *Chaetozone gibber* (RT5914; 62398) – L

Two generic and five specific differences: Lab 01 identified as *Cirriformia* (Figure 14b) (which has multiple tentacular cirri); Lab 10 identified as *Caulleriella alata* (Figure 14c) (which has bifid chaetae in all neuropodia); Labs 16 and 20 identified as *Chaetozone zetlandica* (Figure 14d) (which has longer anterior capillary notochaetae and a less pronounced dorsal hump); Lab 21 identified as *Chaetozone caputesocis* (no material available) (which has acicular chaetae from chaetiger 10).



Fig. 14b. *Cirriformia tentaculata* (414531, 56608) – L



Fig. 14c. *Caulleriella alata* (413531, 55449) – L



Fig. 14d. *Chaetozone zetlandica* (413531, 55449) – L

RT5915 – *Melarhappe neritoides* (Linnaeus, 1758) (Figure 15a)

Substratum: Hard substrata. Salinity: Full (Euhaline). Depth: Intertidal. Geography: Southwest England. Condition: Fair. Size: Medium, 3-5 mm. All specimens from one sample.



Fig. 15a. *Melarhappe neritoides* (RT5915) –
apertural

Two generic and specific differences: Lab 01 identified as *Littorina saxatilis* (Figure 25a) (which has deeper sutures); Lab 18 identified as *Lacuna crassior* (Figure 15b) (which has a thinner shell and deeper sutures).



Fig. 15b. *Lacuna crassior* (413150, 8540) –
apertural

RT5916 – *Flustra foliacea* (Linnaeus, 1758) (Figures 16a, c)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: Southeast England. Condition: Fair. Size: Medium portions. All specimens from one sample; Sample supplied by the Environment Agency.

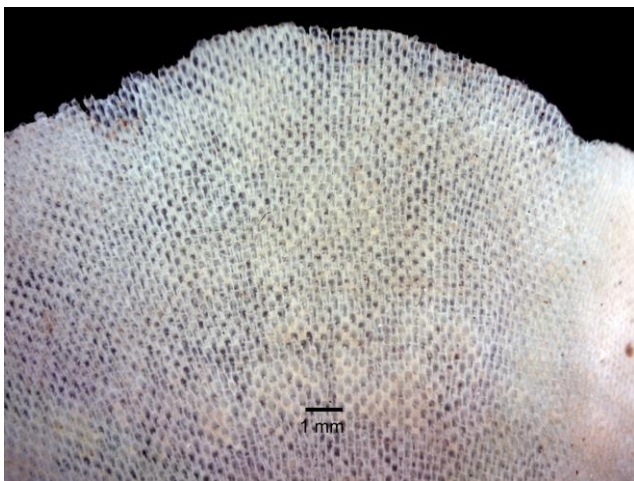


Fig. 16a. *Flustra foliacea* (RT5916)

One generic and specific difference: Lab 01 identified as *Chartella papyracea* (Figures 16b, d) (which has only two spines per zooid).

Labs 06 and 16 mis-spelled the specific name: *foliacia* and *foliacaea*, respectively.

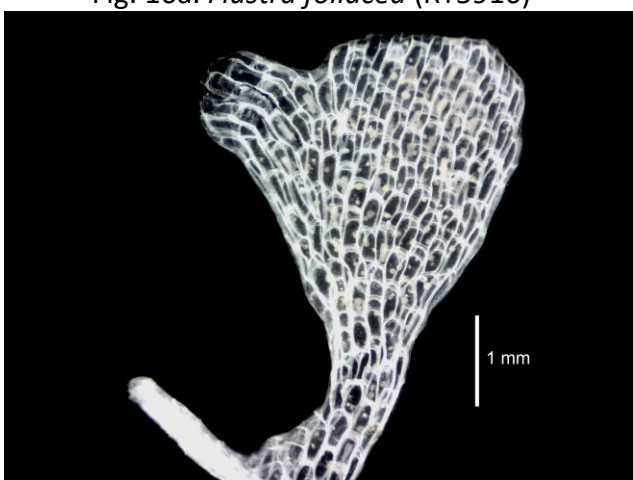


Fig. 16b. *Chartella papyracea* (412689, 7014)

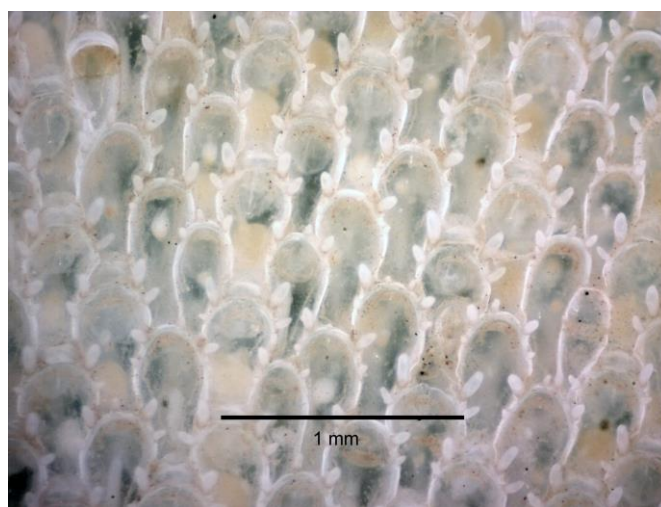


Fig. 16c. *Flustra foliacea* (RT5916) – zooids

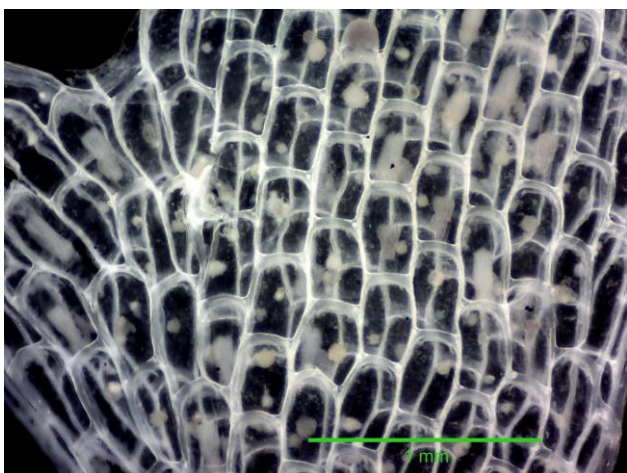


Fig. 16d. *Chartella papyracea* (412689, 7014) – zooids

RT5917 – *Echinogammarus marinus* (Leach, 1815) (Figures 17a, d, e)

Substratum: Gravel. Salinity: Variable (Euryhaline). Depth: Intertidal. Geography: Western Scotland. Condition: Good. Size: Medium, female. All specimens from one sample.



Fig. 17a. *Echinogammarus marinus* (RT5917) – L



Fig. 17b. *Echinogammarus pirloti* (412964, 7738) – L

Nine generic and specific differences: Labs 03, 04, 05, 06, 10 and 17 identified as *Echinogammarus obtusatus* (no material available) (which has several setal groups on the anterior margin of the carpus of gnathopod 2); Labs 07 and 14 identified as *Echinogammarus pirloti* (Figures 17b, f) (which has long plumose setae on the inner margin of the outer ramus of uropod 3); Lab 01 identified as *Echinogammarus stoerensis* (Figures 17c, g) (which lacks long plumose setae on the outer ramus of uropod 3).



Fig. 17c. *Echinogammarus stoerensis* (P2188, 63681) – L

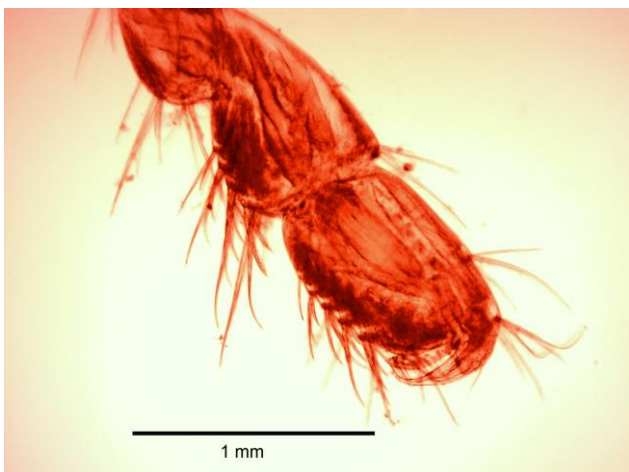


Fig. 17d. *Echinogammarus marinus* (RT5917) – gnathopod 2

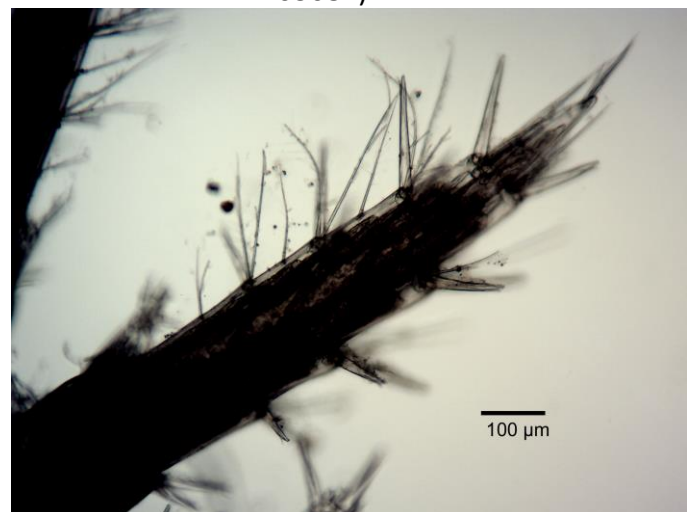


Fig. 17e. *Echinogammarus marinus* (RT5917) – uropod 3

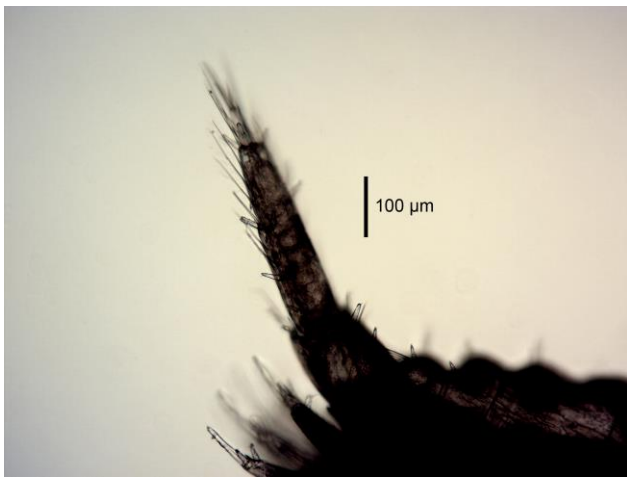


Fig. 17f. *Echinogammarus pirloti* (412964, 7738) – uropod 3

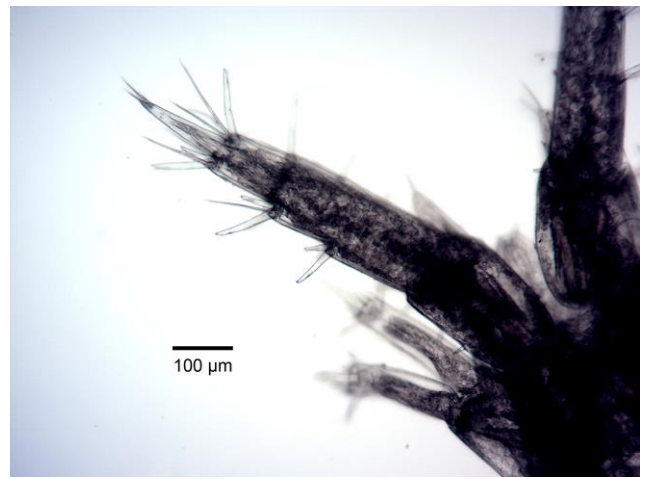


Fig. 17g. *Echinogammarus stoerensis* (P2188, 63681) – uropod 3

RT5918 – *Pholoe baltica* Örsted, 1843 (Figures 18a, c)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: North of Ireland. Condition: Fair. Size: Medium. Specimens from two samples.



Fig. 18a. *Pholoe baltica* (RT5917; 58673) – D

Three generic and specific differences: Labs 01, 03 and 10 identified as *Pholoe assimilis* (Figure 18b) (which lacks a facial tubercle).

Lab 06 mis-spelled the specific name as *Pholoe balthica*.

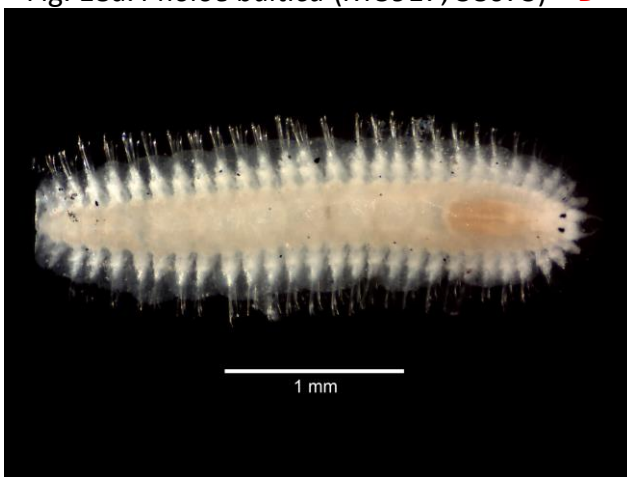


Fig. 18b. *Pholoe assimilis* (413646, 10782) – D

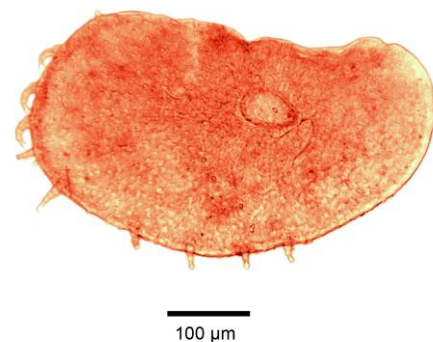


Fig. 18c. *Pholoe baltica* (RT5917; 58673) – scale

RT5919 – *Microdeutopus gryllotalpa* Costa, 1853 (Figure 19a, g)

Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: Northwest England. Condition: Fair. Size: Small, female. All specimens from one sample.



Fig. 19a. *Microdeutopus gryllotalpa* (RT5919; 60796) – L

Four generic and nine specific differences: Lab 01 identified as *Gammaropsis palmata* (Figure 19b) (in which gnathopod 2 is larger than gnathopod 1); Lab 10 identified as *Aora gracilis* (Figures 19c, h); Lab 17 identified as *Aora typica* (no material available; a South American species previously considered to be a senior synonym of *A. gracilis*); Lab 20 identified as *Lembos websteri* (Figure 19d); Labs 02 and 04 identified as *Microdeutopus chelifera* (no material available); Labs 07 and 18 identified as *Microdeutopus anomalus* (Figures 19e, i); Lab 14 identified as *Microdeutopus damnoniensis* (Figure 19f) (all of which lack plumose setae on gnathopod 2).

Lab 21 identified to genus level only; species level identifications are recommended for the ring test exercise.



Fig. 19b. *Gammaropsis palmata* (413154, 8303) – L



Fig. 19c. *Aora gracilis* female (P529, 58343) – L



Fig. 19d. *Lembos websteri* (414340, 55919) – L

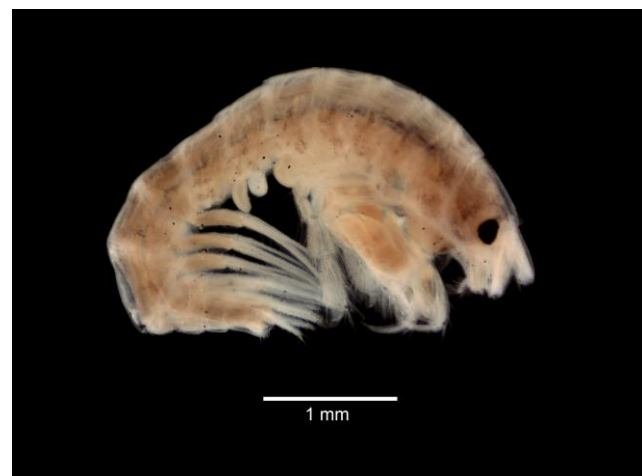


Fig. 19e. *Microdeutopus anomalus* male (412686, 6768) – L



Fig. 19f. *Microdeutopus damnoniensis* male (P4140, 63574) – L

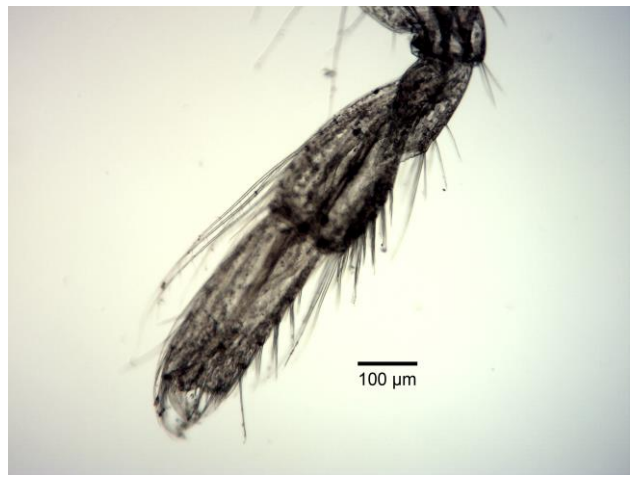


Fig. 19g. *Microdeutopus gryllotalpa* (RT5919; 60796) – gnathopod 2

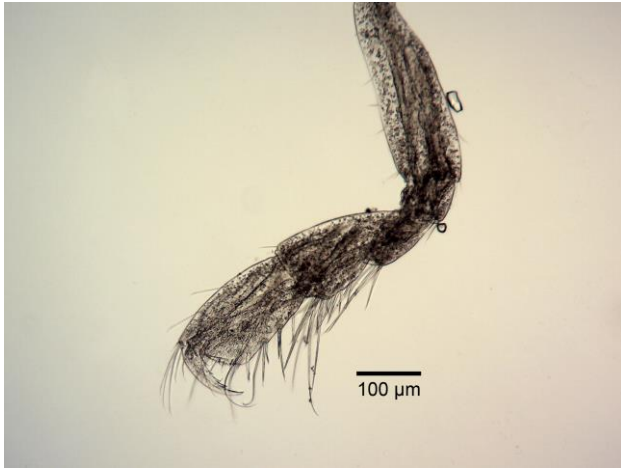


Fig. 19h. *Aora gracilis* female (P529, 58343) – gnathopod 2

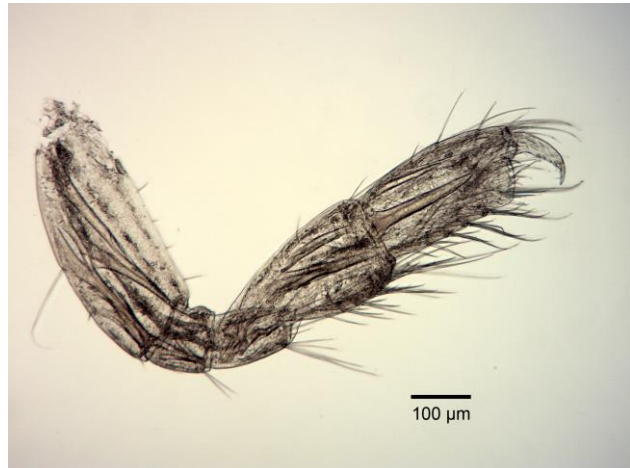


Fig. 19i. *Microdeutopus anomalus* male (412686, 6768) – gnathopod 2

RT5920 – *Skeneopsis planorbis* (O. Fabricius, 1780) (Figures 20a-c)

Substratum: Diamicton. Floral turf: Full (Euhaline). Depth: Intertidal. Geography: Western Scotland. Condition: Good. Size: Medium, 1-2 mm. All specimens from one sample.



Fig. 20a. *Skeneopsis planorbis* (RT5920) – apertural

One generic and specific difference: Lab 18 identified as *Omalogyra atomus* (Figures 20d-f) (which has a less pronounced spire that is almost identical to the umbilicus).

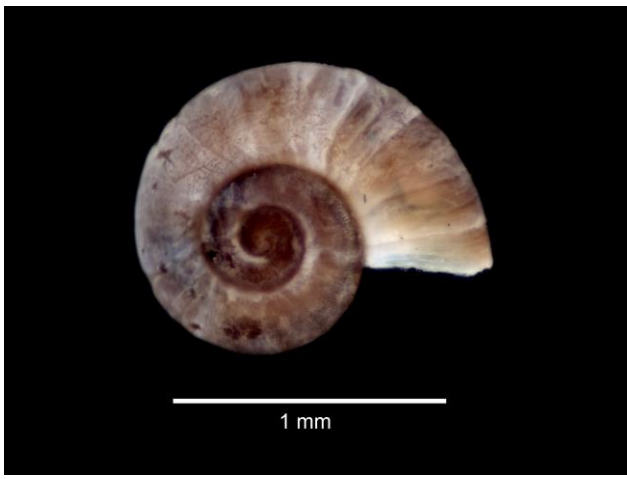


Fig. 20b. *Skeneopsis planorbis* (RT5920) – D

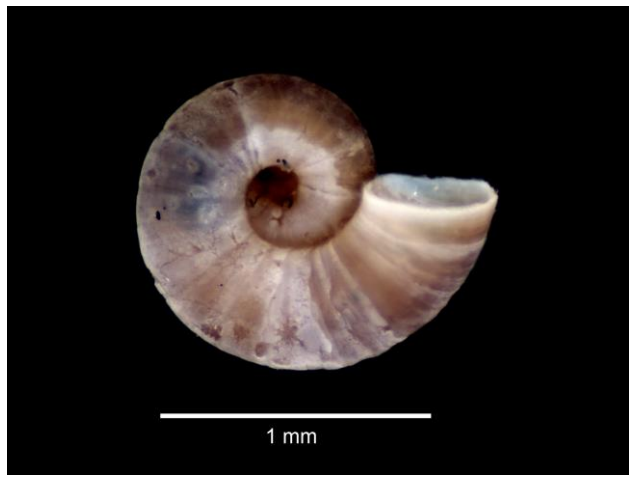


Fig. 20c. *Skeneopsis planorbis* (RT5920) – V



Fig. 20d. *Omalogyra atomus* (TW) – apertural



Fig. 20e. *Omalogyra atomus* (TW) – D



Fig. 20f. *Omalogyra atomus* (TW) – V

RT5921 – *Priapulus caudatus* Lamarck, 1816 (Figures 21a)

Substratum: Mud. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: Western Scotland. Condition: Fair. Size: Medium. Specimens from four samples.



Fig. 21a. *Priapulus caudatus* (RT5921; 61509) – L

Two generic and specific differences: Lab 10 identified as *Stelligera montagui* (Figure 21b shows *Stelligera* sp.) (which lacks a mouth). Lab 01 identified as *Sipunculus* (Figure 21c) (which lacks rings of papillae around the mouth).

Lab 16 mis-spelled the generic name: *Priapulis*.

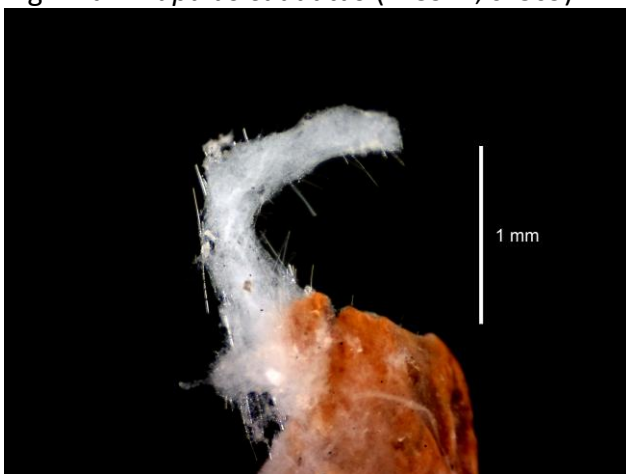


Fig. 21b. *Stelligera* sp. (414075, 55077)



Fig. 21c. *Sipunculus* (P3479, 62994) – L

RT5922 – *Scalibregma inflatum* Rathke, 1843 (Figure 22a)

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



Fig. 22a. *Scalibregma inflatum* (RT5922; 60441) – L

No generic or specific differences.

RT5923 – *Tubulanus polymorphus* Renier, 1804 (Figure 23a)

Substratum: Mud. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: Western Scotland. Condition: Fair. Size: Medium. Specimens from two samples.

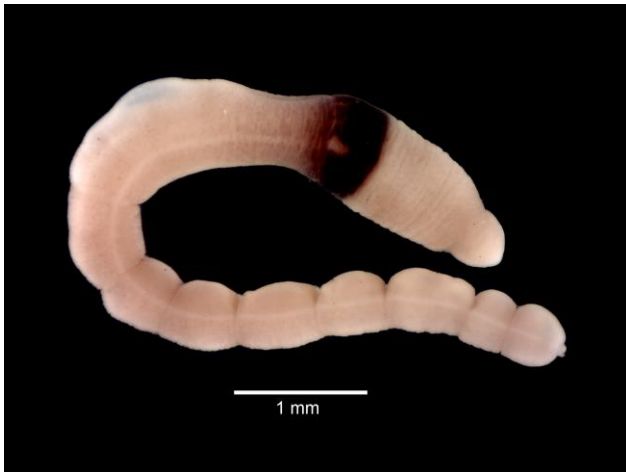


Fig. 23a. *Tubulanus polymorphus* (RT5923; 61503) – D

One generic and specific difference: Lab 10 identified as *Oerstedtia dorsalis* (Figure 23b shows a possible *Oerstedtia* sp.) (which has a less pronounced head and shorter body).

Lab 01 named a bryozoan for Specimen 23, presumably intended for Specimen 24 (see below), and it is assumed that they did not identify Specimen 23. It is recommended that laboratories attempt identification of all specimens.



Fig. 23b. *Oerstedtia* ? (P2188, 61882) – D

RT5924 – *Reptadeonella violacea* (Johnston, 1847) (Figures 24a-b)

Substratum: Gravel. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: Southeast England. Condition: Good, dry. Size: Large colonies. Specimens from two samples.

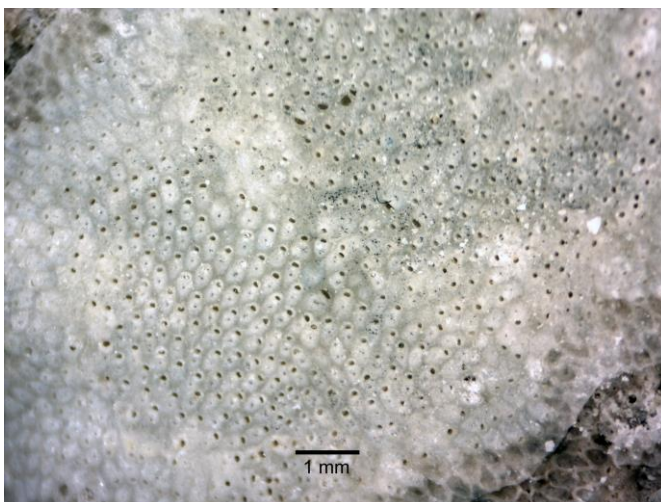


Fig. 24a. *Reptadeonella violacea* (RT5924; 64355)

Four generic and five specific differences: Lab 21 identified as *Plagioecia sarniensis* (Figure 24c) (which has a circular primary orifice); Lab 01 (entry for Specimen 23 assumed to relate to Specimen 24) identified as *Schizomavella linearis* (Figure 24d) (which has a sinuate primary orifice); Lab 20 identified as *Cribrillaria innominata* (Figure 24e) (which has fused, overarched, flattened spines over its frontal membrane); Lab 10 identified as *Haplopoma impressum* (Figure 24f) (which lacks marginal areolae); Lab 17 identified as *Reptadeonella insidiosa* (Figure 24g) (which has paired frontal spiramena).

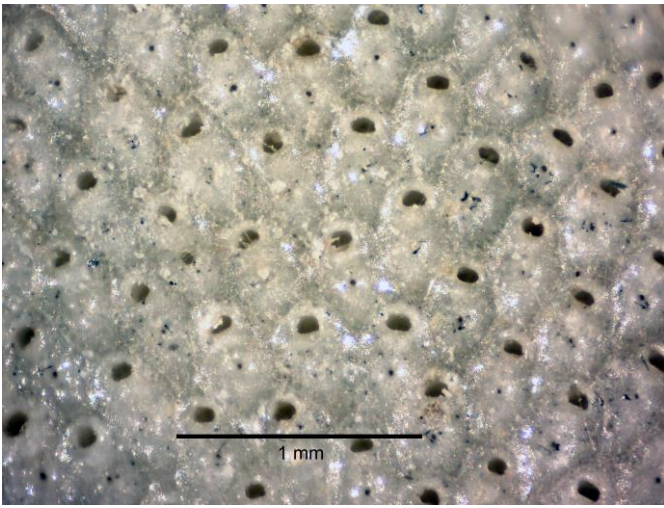


Fig. 24b. *Reptadeonella violacea* (RT5924; 64355)
– zooids

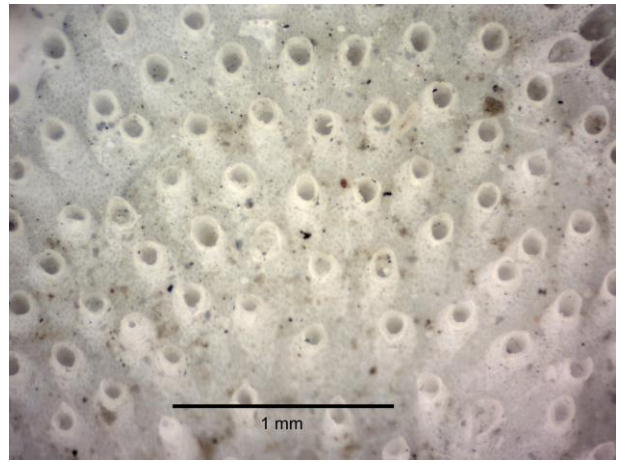


Fig. 24c. *Plagioecia sarniensis*
(414075_55119) – zooids

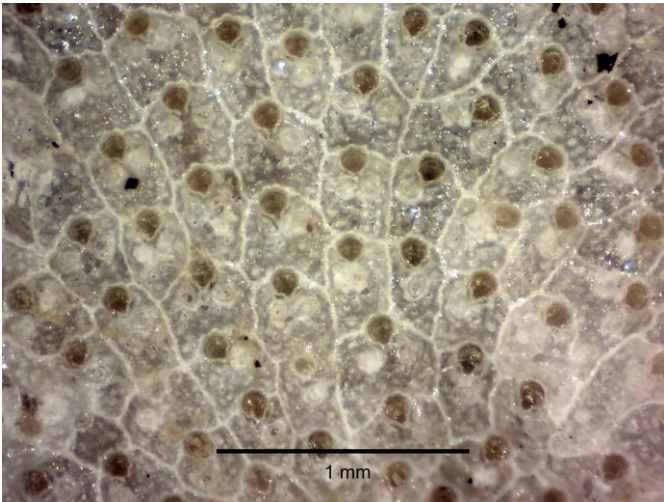


Fig. 24d. *Schizomavella linearis* (412804_7041) –
zooids

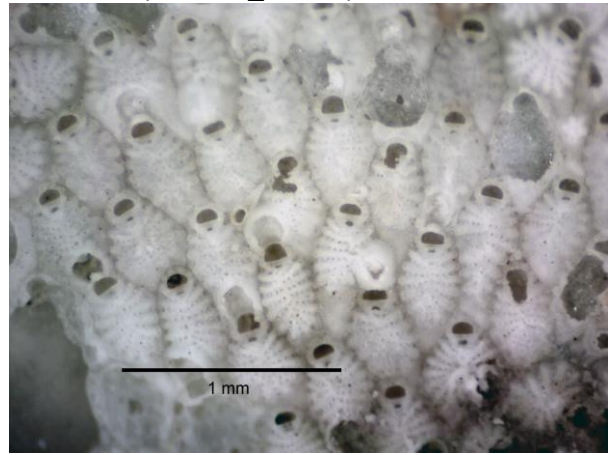


Fig. 24e. *Cribrillaria innominata* (P1322,
58475) – zooids

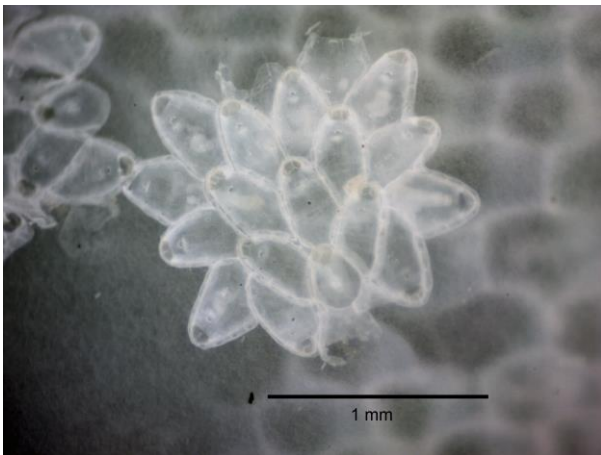


Fig. 24f. *Haplopoma impressum* (414120, 55197)
– zooids

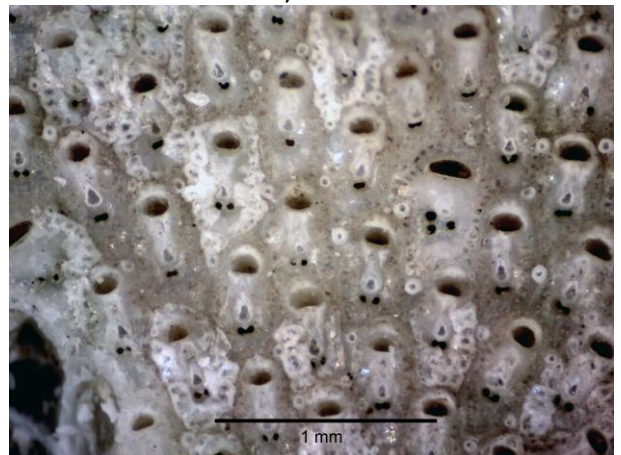


Fig. 24g. *Reptadeonella insidiosa* (413932,
12093) – zooids

RT5925 – *Littorina saxatilis* (Olivi, 1792) (Figure 25a)

Substratum: Hard substrata. Salinity: Variable (Euryhaline). Depth: Intertidal. Geography: Western Scotland. Condition: Good. Size: Small, 2-4 mm. All specimens from one sample.



Fig. 25a. *Littorina saxatilis* (RT5925) – **apertural**

Three specific differences: Lab 01 identified as *Littorina littorea* (Figure 25b) (which has less rounded whorls); Labs 04 and 20 identified as *Littorina arcana* (no material available) (this species has a thinner shell and wider aperture than the specimens sent and lives only at more exposed, fully marine sites).



Fig. 25b. *Littorina littorea* (P529_58337) – **apertural**

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 on some of the specimens and reviews of identifications and scoring policies were made after circulation of the interim results. In addition to the identification problems discussed above, the following taxonomic problems were highlighted through this exercise.

Specimen 02. The scaleworm guide (Barnich, 2011) separates *Fimbriosthenelais minor* from *Sthenelais boa* on the basis of papillated parapodial stylodes, as described in the definition of the genus *Fimbriosthenelais* (Pettibone, 1971). Chambers & Muir (1997) discuss both of the specimens of *F. minor* described up to that time and suggested that they were young *S. boa*, which they considered could have papillated stylodes and sand grains on the elytra. Recent descriptions of *F. minor* (e.g. Parapar et al., 2015) seem not to give distinctions beyond those used in the paper that defined *Fimbriosthenelais* (Pettibone, 1971); the species is accepted on WoRMS but a recent review of the family (Aungtonya & Eibye-Jacobsen, 2014) included *F. minor* as a synonym of *S. boa*. The specimens circulated came from samples that contained wide size ranges of specimens, including large, typical *S. boa* without papillated stylodes. Small specimens were selected for the ring test, for consistency. As *F. minor* may be a synonym of *S. boa* (currently under investigation), it has been accepted as correct for the purposes of this exercise, pending further research.

Specimen 08. The nominal species *Oxydromus vittatus* has been regarded as a synonym of *O. flexuosus* by most recent authors and Villalobos-Guerrero & Harris (2012) considered that more research was needed to determine whether they are distinct. The features used to separate the species by Rizzo et al. (2004) are not consistent with descriptions of material from the type localities. The names are considered synonymous for the purposes of this exercise until further research resolves the problem.

Specimen 09. The portions used for the ring test were selected from a single sample with *Cradoscrupocellaria* colonies on fronds of *Flustra foliacea*. They were originally identified as *C. ellisii* and selected as having smooth rhizoids (Figure 9c), following Vieira & Spencer Jones (2012) and Vieira et al. (2013). However, retroussé hooks were later found (Figure 9e), including some rhizoids with a small number of indistinct hooks (Figure 9d). After discussion with Leandro Vieira (Universidade de São Paulo) and sending photographs, the identifications are amended to *C. reptans*. However, as smooth or almost smooth rhizoids were present on most portions, identifications of *S. ellisii* have been accepted, pending further work.

Acknowledgements

We would like to thank all participants that have provided feedback following issue of interim results. We are grateful to Nina Godsell (Environment Agency) for supply of samples that contained Specimens 09 and 16; and to Will Musk (Hull Marine Laboratory) for supply of Specimen 12. Sergio Ignacio Salazar-Vallejo (ECOSUR) and Leandro Vieira (Universidade de São Paulo) provided valuable discussions on the identities and taxonomy of specimens 08 and 09, respectively; Malin Strand (Swedish Species Information Centre) reviewed photographs for Specimen 23.

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Ring Test Specimen Return Instructions

Please return all ring test specimens by 26th March 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**