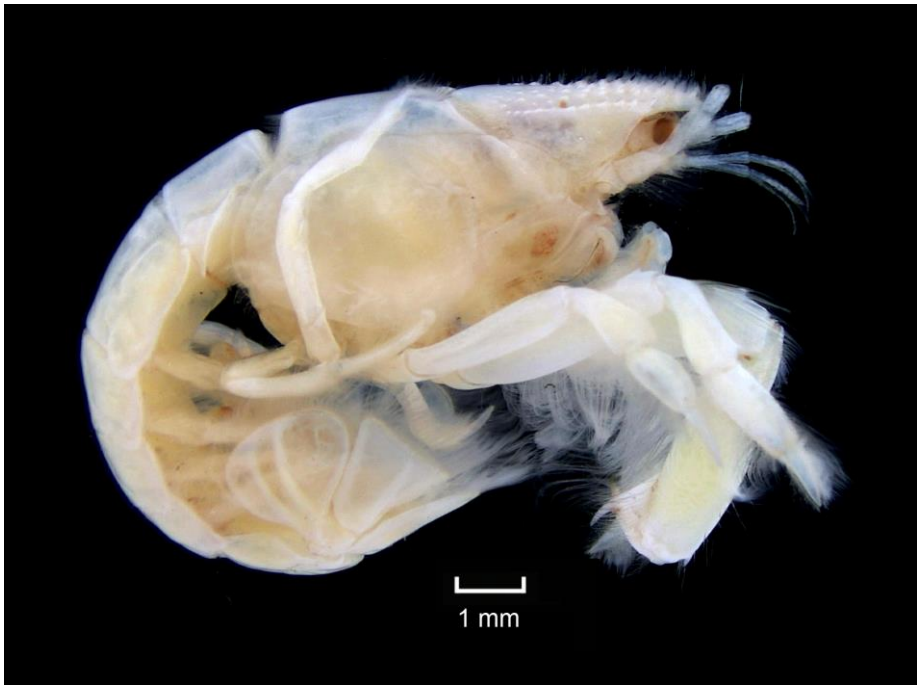
NMBAQC

NE Atlantic Marine Biological Analytical Quality Control Scheme

www.nmbaqcs.org

Ring Test Bulletin – RTB#67



Tim Worsfold
David Hall
Søren Pears (Images)

APEM Ltd.
April 2025

E-mail: nmbaqc@apemltd.co.uk

RING TEST DETAILS

Ring Test #67 (Year 31)

Type/Contents –General

Circulated – 06/01/25

Results deadline – 07/03/25

Number of Subscribing Laboratories – 23

Number of Participating Laboratories – 21

Number of Results Received – 24*

*multiple data entries per laboratory permitted

Summary of differences

Specimen	Genus	Species	Condition / Size	Total differences for 24 returns	
				Genus	Species
RT6701	*Acteon*	*tornatilis*	fair, medium, 2-5 mm	0	0
RT6702	*Limatula*	*subauriculata*	good, medium, 1-2 mm	0	12
RT6703	*Amphilochus*	*tenuimanus*	fair, small	2	2
RT6704	*Callianassa*	*subterranea*	fair, small, 20-30 mm	2	2
RT6705	*Crenella*	*decussata*	good, medium, 2 mm	0	0
RT6706	*Ampelisca*	*provincialis*	fair, small; female; 5-6 mm	0	11
RT6707	*Processa*	*nouveli*	fair, medium; 15-30 mm	0	6
RT6708	*Papillicardium*	*minimum*	good, medium, 1-2 mm	1	1
RT6709	*Melita*	*palmata*	fair, small, 2-3 mm	4	5
RT6710	*Leptochiton*	*asellus*	fair, small, 2-4 mm	1	7
RT6711	*Littorina*	*littorea*	good, small, 1-3 mm	2	6
RT6712	*Gnathia*	*dentata*	good, medium; male; 3-4 mm	0	1
RT6713	*Gammaropsis*	*palmata*	good, medium; female; 2-3 mm	2	4
RT6714	*Mya*	*truncata*	good, small; 6-10 mm	1	8
RT6715	*Heteromastus*	*filiformis*	fair, medium	1	1
RT6716	*Urothoe*	*poseidonis*	good, medium; 3-4 mm	0	3
RT6717	*Ampelisca*	*brevicornis*	fair, medium; 4-5 mm	1	1
RT6718	*Polyophthalmus*	*pictus*	good, medium	1	1
RT6719	*Upogebia*	*deltaura*	fair, small; 5-10 mm carapace	0	0
RT6720	*Anthura*	*gracilis*	fair, small	0	0
RT6721	*Tritia*	*varicosa*	fair, medium; 6-8 mm	0	7
RT6722	*Glycera*	*capitata*	fair, small	0	18
RT6723	*Hesionura*	*elongata*	fair, medium	1	1
RT6724	*Abra*	*tenuis*	good, medium; 3-4 mm	0	0
RT6725	*Glycymeris*	*glycymeris*	good, medium; 45-55 mm	0	0
			Total differences	**19**	**97**
			Average differences /lab.	**0.8**	**4.0**

Figure A. The number of differences from the AQC identification of specimens distributed in RT67 for each of the participating laboratories. Arranged in order of increasing number of differences (by specific followed by generic errors).

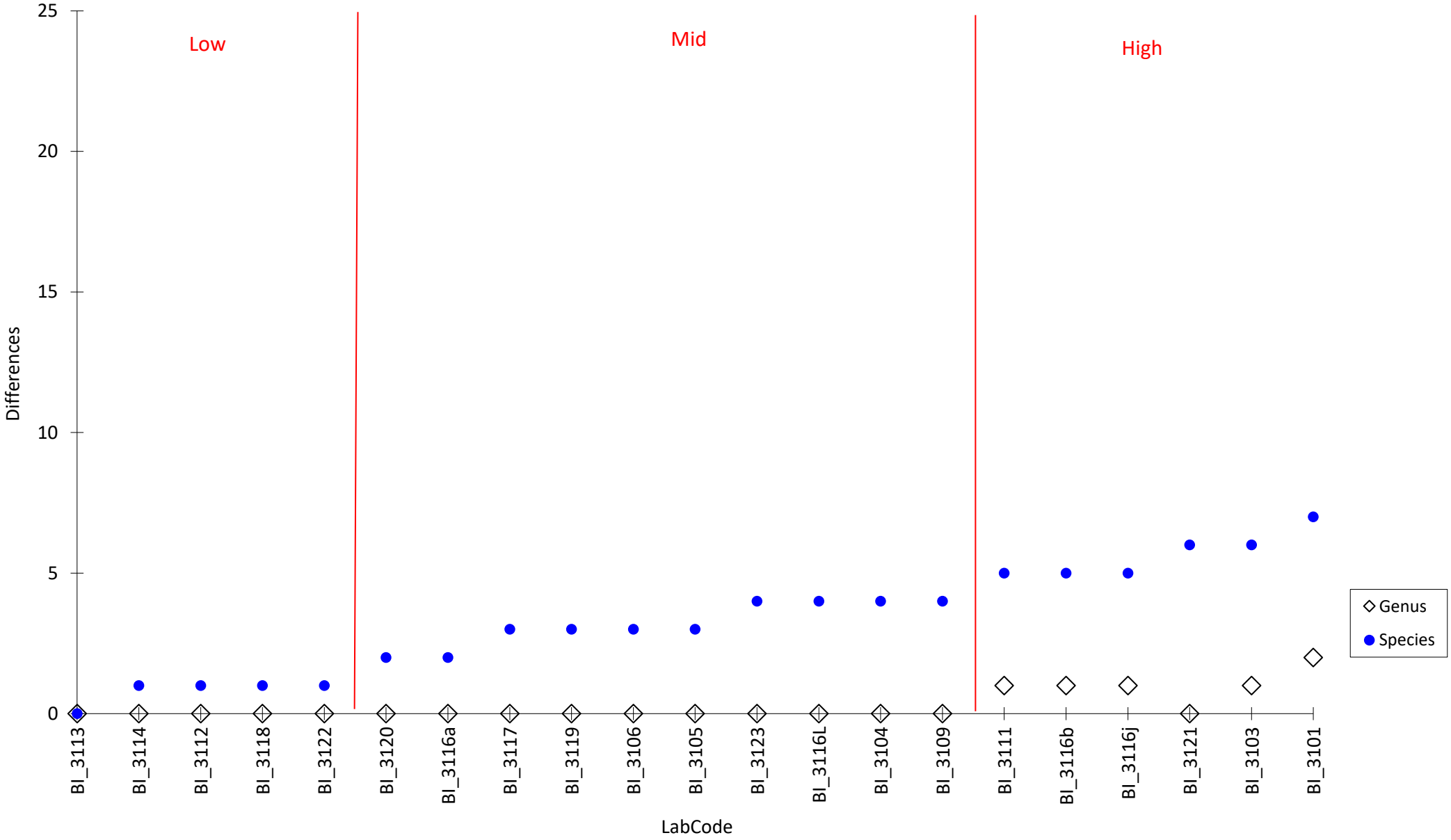


Table 1. The identification of fauna made by participating laboratories for RT67 (arranged by specimen). Names are given only where different from the AQC identification.

	RT6701	RT6702	RT6703	RT6704	RT6705	RT6706	RT6707	RT6708	RT6709	RT6710	RT6711	RT6712
Taxon	***Acteon tornatilis***	***Limatula subauriculata***	***Amphilochus tenuimanus***	***Callianassa subterranea***	***Crenella decussata***	***Ampelisca provincialis***	***Processa nouveli***	***Papillicardium minimum***	***Melita palmata***	***Leptochiton asellus***	***Littorina littorea***	***Gnathia dentata***
BI_3101	- -	- gwyni	- -	- -	- -	- diadema	- [nouveli holthuisi]	- -	Abludomelita obtusata	- -	Calliostoma occidentale	- -
BI_3103	- -	- -	- -	- -	- -	- tenuicornis	- modica modica	- -	Megamoera dentata	- -	- compressa	- -
BI_3104	- -	- -	- -	- -	- -	- diadema	- -	- -	- -	- cancellatus	- arcana	- -
BI_3105	- -	- gwyni	- -	- -	- -	- tenuicornis	- [nouveli holthuisi]	- -	- -	- -	- -	- -
BI_3106	- -	- gwyni	- -	- -	- -	- tenuicornis	- [nouveli holthuisi]	- -	- -	- -	- -	- -
BI_3107	- -	- -	- -	Gilvossius tyrrhenus	- -	- diadema	- canaliculata	- -	- -	Stenosemus albus	- saxatilis	- -
BI_3108	- -	- -	Sophrosyne robertsoni	- -	- -	- gibba	- 0	- -	0 0	- -	- -	- -
BI_3109	- -	- gwyni	- -	- -	- -	- tenuicornis	- [nouveli holthuisi]	- -	- -	- -	- -	- -
BI_3110	- -	- gwyni	- -	- -	- -	- tenuicornis	- -	- -	Allomelita pellucida	- cancellatus	Calliostoma occidentale	- oxyuraea
BI_3111	- -	- -	- -	Gilvossius tyrrhenus	- -	- diadema	- edulis	- -	- -	- -	- -	- -
BI_3112	- -	- gwyni	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_3113	- -	- -	- -	- -	- -	- -	- [nouveli holthuisi]	- -	- -	- -	- -	- -
BI_3114	- -	- gwyni	- -	- -	- -	- -	- [nouveli holthuisi]	- -	- -	- -	- -	- -
BI_3116a	- -	- gwyni	- -	- -	- -	- -	- [nouveli holthuisi]	- -	- -	- -	- -	- -
BI_3116b	- -	- gwyni	- -	- -	- -	- -	- edulis crassipes	Parvicardium pinnulatum	- -	- scabridus	- -	- -
BI_3116j	- -	- -	Apolochus neapolitanus	- -	- -	- -	- [nouveli holthuisi]	- -	- -	- cancellatus	- -	- -
BI_3116L	- -	- gwyni	- -	- -	- -	- -	- canaliculata	- -	- -	- cancellatus	- -	- -
BI_3117	- -	- -	- -	- -	- -	- -	- [nouveli holthuisi]	- -	- -	- -	- -	- -
BI_3118	- -	- -	- -	- -	- -	- -	- [nouveli holthusi]	- -	- -	- -	- -	- -
BI_3119	- -	- gwyni	- -	- -	- -	- tenuicornis	- [nouveli holthuisi]	- -	- -	- -	- -	- -
BI_3120	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_3121	- -	- gwyni	- -	- -	- -	- -	- [nouveli holthuisi]	- -	- hergensis	- -	- saxatilis	- -
BI_3122	- -	- -	- -	- -	- -	- -	- [nouveli holthuisi]	- -	- -	- -	- -	- -
BI_3123	- -	- -	- -	- -	- -	- -	- [nouveli holthuisi]	- -	- -	- cancellatus	- -	- -

Table 1. The identification of fauna made by participating laboratories for RT67 (arranged by specimen). Names are given only where different from the AQC identification.

	RT6713	RT6714	RT6715	RT6716	RT6717	RT6718	RT6719	RT6720	RT6721	RT6722	RT6723	RT6724	RT6725
Taxon	***Gammaropsis palmata***	***Mya arenaria***	***Heteromastus filiformis***	***Urothoe poseidonis***	***Ampelisca brevicornis***	***Polyophthalmus pictus***	***Upogebia deltaura***	***Anthura gracilis***	***Tritia varicosa***	***Glycera capitata***	***Hesionura elongata***	***Abra tenuis***	***Glycymeris glycymeris***
BI_3101	- maculata	- truncata	- -	- -	- -	- -	- -	- -	[Nassarius] [pygmaeus]	- lapidum	- -	- -	- -
BI_3103	- 0	- -	- -	- -	- -	- -	- -	- -	- -	- lapidum	- -	- -	- -
BI_3104	- -	- -	- -	- -	- -	- -	- -	- -	- -	- lapidum	- -	- -	- -
BI_3105	- -	- -	- -	- -	- -	- -	- -	- -	- -	- lapidum	- -	- -	- -
BI_3106	- -	- -	- -	- -	- -	- -	- -	- -	- -	- lapidum	- -	- -	- -
BI_3107	Apherusa clevei	- -	Notomastus latericeus	- grimaldii	- -	Ophelina abranchiata	- -	- -	- -	- lapidum	- -	- -	- -
BI_3108	0 0	Lutraria angustior	- -	- -	Byblis gaimardii	- -	- -	- -	- nitida	- 0	Microphthalmus 0	- -	- -
BI_3109	- -	- -	- -	- elegans	- -	- -	- -	- -	- -	- lapidum	- -	- -	- -
BI_3110	- -	- -	- -	- -	- -	- -	- -	- -	- [pygmaea]	- lapidum	- -	- -	[Glycmeris] [glycmeris]
BI_3111	- -	- truncata	- -	- -	- -	- -	- -	- -	- -	- lapidum agg.	- -	- -	- -
BI_3112	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_3113	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_3114	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_3116a	- -	- -	- -	- -	- -	- -	- -	- -	- [pygmaea]	- lapidum	- -	- -	[Glycmeris] [glycmeris]
BI_3116b	- -	- -	- -	- -	- -	- -	- -	- -	- [pygmaea]	- lapidum	- -	- -	- -
BI_3116j	- -	- -	- -	- pulchella	- -	- -	- -	- -	- reticulata	- lapidum	- -	- -	- -
BI_3116L	- -	- truncata	- -	- [poseidonesis]	- -	- -	- -	- -	- [pygmaea]	- -	- -	- -	- -
BI_3117	- -	- truncata	- [filiformis agg.]	- -	- -	- -	- -	- -	- reticulata	- lapidum	- -	- -	- -
BI_3118	- -	- -	- -	- -	- -	- -	- -	- -	- -	- lapidum	- -	- -	- -
BI_3119	- -	- truncata	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_3120	- -	- -	- -	- -	- -	- -	- -	- -	- nitida	- lapidum	- -	- -	- -
BI_3121	- -	- truncata	- -	- -	- -	- -	- -	- -	- reticulata	- lapidum agg	- -	- -	- -
BI_3122	- -	- -	- -	- -	- -	- -	- -	- -	- reticulata	- -	- -	- -	- -
BI_3123	- -	- truncata	- -	- -	- -	- -	- -	- -	- nitida	- lapidum	- -	- -	- -

Table 2. The identification of fauna made by participating laboratories for RT67 (arranged by participant). Names are given only where different from the AQC identification.

	Taxon	BI_3101	BI_3103	BI_3104	BI_3105	BI_3106	BI_3107	BI_3108	BI_3109	BI_3110	BI_3111
RT6701	*Acteon tornatilis*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6702	*Limatula subauriculata*	- gwyni	- -	- -	- gwyni	- gwyni	- -	- -	- gwyni	- gwyni	- -
RT6703	*Amphilochus tenuimanus*	- -	- -	- -	- -	- -	- -	Sophrosyne robertsoni	- -	- -	- -
RT6704	*Callianassa subterranea*	- -	- -	- -	- -	- -	Gilvossius tyrrhenus	- -	- -	- -	Gilvossius tyrrhenus
RT6705	*Crenella decussata*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6706	*Ampelisca provincialis*	- diadema	- tenuicornis	- diadema	- tenuicornis	- tenuicornis	- diadema	- gibba	- tenuicornis	- tenuicornis	- diadema
RT6707	*Processa nouveli*	- [nouveli holthuisi]	- modica modica	- -	- [nouveli holthuisi]	- [nouveli holthuisi]	- canaliculata	- 0	- [nouveli holthuisi]	- -	- edulis
RT6708	*Papillicardium minimum*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6709	*Melita palmata*	Abludomelita obtusata	Megamoera dentata	- -	- -	- -	- -	0 0	- -	Allomelita pellucida	- -
RT6710	*Leptochiton asellus*	- -	- -	- cancellatus	- -	- -	Stenosemus albus	- -	- -	- cancellatus	- -
RT6711	*Littorina littorea*	Calliostoma occidentale	- compressa	- arcana	- -	- -	- saxatilis	- -	- -	Calliostoma occidentale	- -
RT6712	*Gnathia dentata*	- -	- -	- -	- -	- -	- -	- -	- -	- oxyuraea	- -
RT6713	*Gammaropsis palmata*	- maculata	- 0	- -	- -	- -	Apherusa clevei	0 0	- -	- -	- -
RT6714	*Mya arenaria*	- truncata	- -	- -	- -	- -	- -	Lutraria angustior	- -	- -	- truncata
RT6715	*Heteromastus filiformis*	- -	- -	- -	- -	- -	Notomastus latericeus	- -	- -	- -	- -
RT6716	*Urothoe poseidonis*	- -	- -	- -	- -	- -	- grimaldii	- -	- elegans	- -	- -
RT6717	*Ampelisca brevicornis*	- -	- -	- -	- -	- -	- -	Byblis gaimardii	- -	- -	- -
RT6718	*Polyophthalmus pictus*	- -	- -	- -	- -	- -	Ophelina abranchiata	- -	- -	- -	- -
RT6719	*Upogebia deltaura*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6720	*Anthura gracilis*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6721	*Tritia varicosa*	[Nassarius] [pygmaeus]	- -	- -	- -	- -	- -	- nitida	- -	- [pygmaea]	- -
RT6722	*Glycera capitata*	- lapidum	- lapidum	- lapidum	- lapidum	- lapidum	- lapidum	- 0	- lapidum	- lapidum	- lapidum agg.
RT6723	*Hesionura elongata*	- -	- -	- -	- -	- -	- -	Microphthalmus 0	- -	- -	- -
RT6724	*Abra tenuis*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6725	*Glycymeris glycymeris*	- -	- -	- -	- -	- -	- -	- -	- -	[Glycmeris] [glycmeris]	- -

Table 2. The identification of fauna made by participating laboratories for RT67 (arranged by participant). Names are given only where different from the AQC identification.

	Taxon	BI_3112	BI_3113	BI_3114	BI_3116a	BI_3116b	BI_3116j	BI_3116L	BI_3117	BI_3118	BI_3119	BI_3120	BI_3121	BI_3122	BI_3123
RT6701	*Acteon tornatilis*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6702	*Limatula subauriculata*	- gwyni	- -	- gwyni	- gwyni	- gwyni	- -	- gwyni	- -	- -	- gwyni	- -	- gwyni	- -	- -
RT6703	*Amphilochus tenuimanus*	- -	- -	- -	- -	- -	Apolochus neapolitanus	- -	- -	- -	- -	- -	- -	- -	- -
RT6704	*Callianassa subterranea*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6705	*Crenella decussata*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6706	*Ampelisca provincialis*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- tenuicornis	- -	- -	- -	- -
RT6707	*Processa nouveli*	- -	- [nouveli holthuisi]	- [nouveli holthuisi]	- [nouveli holthuisi]	- edulis crassipes	- [nouveli holthuisi]	- canaliculata	- [nouveli holthuisi]	- [nouveli holthusi]	- [nouveli holthuisi]	- -	- [nouveli holthuisi]	- [nouveli holthuisi]	- [nouveli holthuisi]
RT6708	*Papillicardium minimum*	- -	- -	- -	- -	Parvicardium pinnulatum	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6709	*Melita palmata*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- hergensis	- -	- -
RT6710	*Leptochiton asellus*	- -	- -	- -	- -	- scabridus	- cancellatus	- cancellatus	- -	- -	- -	- -	- -	- -	- cancellatus
RT6711	*Littorina littorea*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- saxatilis	- -	- -
RT6712	*Gnathia dentata*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6713	*Gammaropsis palmata*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6714	*Mya arenaria*	- -	- -	- -	- -	- -	- -	- truncata	- truncata	- -	- truncata	- -	- truncata	- -	- truncata
RT6715	*Heteromastus filiformis*	- -	- -	- -	- -	- -	- -	- -	- [filiformis agg.]	- -	- -	- -	- -	- -	- -
RT6716	*Urothoe poseidonis*	- -	- -	- -	- -	- -	- pulchella	- [poseidonesis]	- -	- -	- -	- -	- -	- -	- -
RT6717	*Ampelisca brevicornis*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6718	*Polyophthalmus pictus*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6719	*Upogebia deltaura*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6720	*Anthura gracilis*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6721	*Tritia varicosa*	- -	- -	- -	- [pygmaea]	- [pygmaea]	- reticulata	- [pygmaea]	- reticulata	- -	- -	- nitida	- reticulata	- reticulata	- nitida
RT6722	*Glycera capitata*	- -	- -	- -	- lapidum	- lapidum	- lapidum	- -	- lapidum	- lapidum	- -	- lapidum	- lapidum agg	- -	- lapidum
RT6723	*Hesionura elongata*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6724	*Abra tenuis*	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RT6725	*Glycymeris glycymeris*	- -	- -	- -	[Glycmeris] [glycmeris]	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

Introduction to Ring Test 67

The aims of the Ring Test (RT) exercises are to examine consistency of species identifications, to highlight identification problems and literature updates and to familiarise participants with species that they may not have previously encountered (Worsfold & Hall, 2017). The results are not used to assess the performance of a laboratory and the graph with categories for numbers of identification differences is provided for interest only. Species are selected to improve our understanding of the fauna. This may be through inclusion of species not previously sent: RT67 included eleven species never previously sent. Species not yet photographed according to current protocols are also selected. Recently, species have also been selected to provide insights to help with the development of a taxonomic discrimination protocol, as detailed under family headings in the discussion section below. The geographical scope was originally British waters. It is now expanded to include northern Europe and specimens may be included from further afield if the species is known from northern Europe or likely to be found there in future.

LabCodes are abbreviated in this report to exclude the Scheme year, *e.g.* BI_3101 = 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.

Worsfold, T.M. & Hall, D.J., 2017. *Benthic Invertebrate component - Ring Test Protocol*. Report to the NMBAQC Scheme participants. 6pp, August 2017.

Specimen Images and Detailed Breakdown of Identifications

(Figure codes: A=anterior; P=posterior; L=lateral; D=dorsal; V=ventral). The codes in brackets following the species names below the figures are sample identification codes to allow tracking of sources of specimens.

RT6701 – *Acteon tornatilis* (Linnaeus, 1758) (Figure 1a)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Lower Shelf). Geography: North Sea. Condition: Fair. Size: Medium, 2-5 mm. Specimens from fourteen samples.

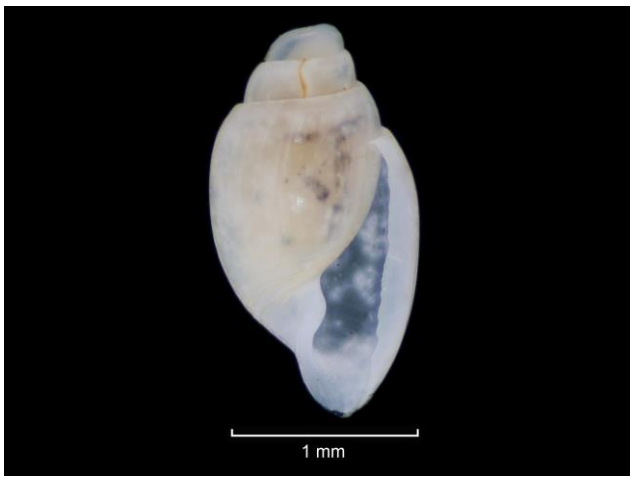


Fig. 1a. *Acteon tornatilis* (RT6701; 9210, 73503) – V

No generic or specific differences recorded.

RT6702 – *Limatula subauriculata* (Montagu, 1808) (Figures 2a, 2c, 2e, 2g, 2i)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: northern Scotland. Condition: Good. Size: Medium, 1-2 mm. Specimens from three samples.

Fig. 2a. *Limatula subauriculata* (RT6702; 9209, 72887) – L

Twelve specific differences: Labs '01, 05, 06, 09, 10, 12, 14, 16a, 16b, 16l, 19 and 21 identified as *Limatula gwyni* (Figures 2b, 2d, 2f, 2h, 2j, 2k) (which has more prominent ears, more numerous radial ribs and a more distinct groove between the median riblets).

Fig. 2b. *Limatula gwyni* (P863, SN3.5) – L

Fig. 2c. *Limatula subauriculata* (9209, 72887) – L

Fig. 2d. *Limatula gwyni* (P863, SN3.5) – L

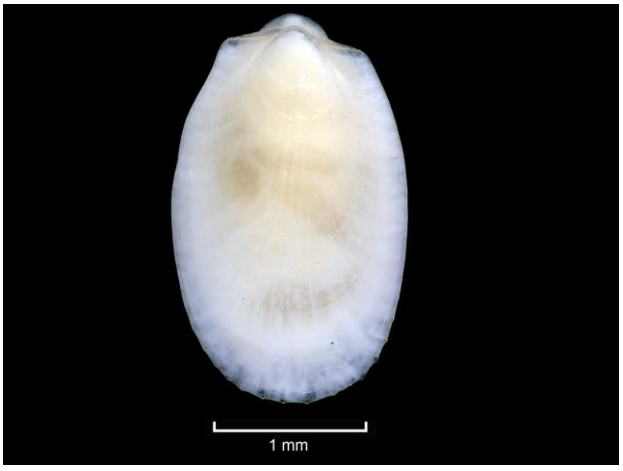


Fig. 2e. *Limatula subauriculata* (9209, 72885) – L

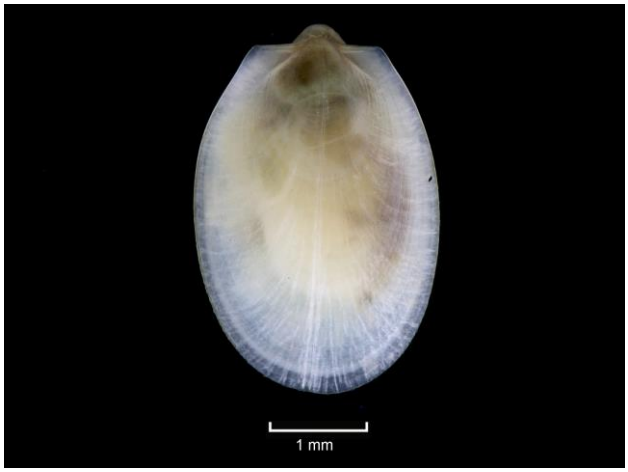


Fig. 2f. *Limatula gwyni* (P16141, 78121) – L

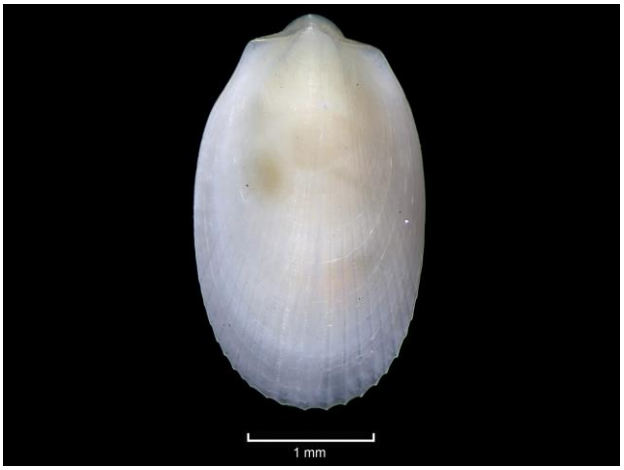


Fig. 2g. *Limatula subauriculata* (9209, 72885) – L

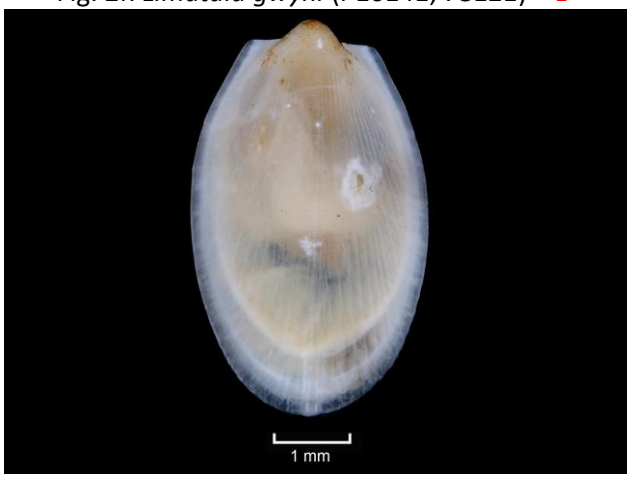


Fig. 2h. *Limatula gwyni* (P863, GG7.2) – L

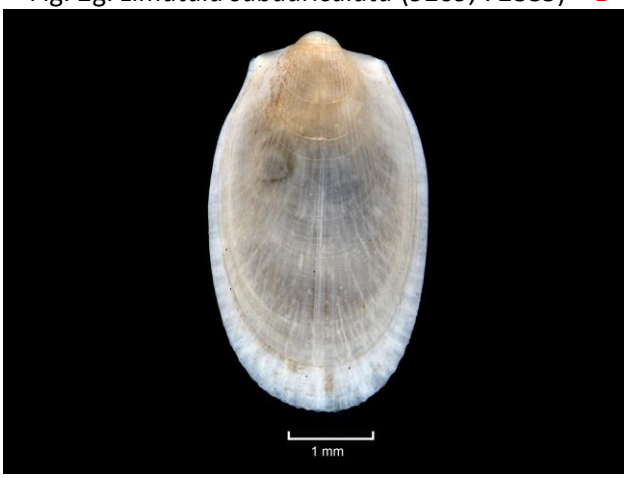


Fig. 2i. *Limatula subauriculata* (412400, 38668) – L

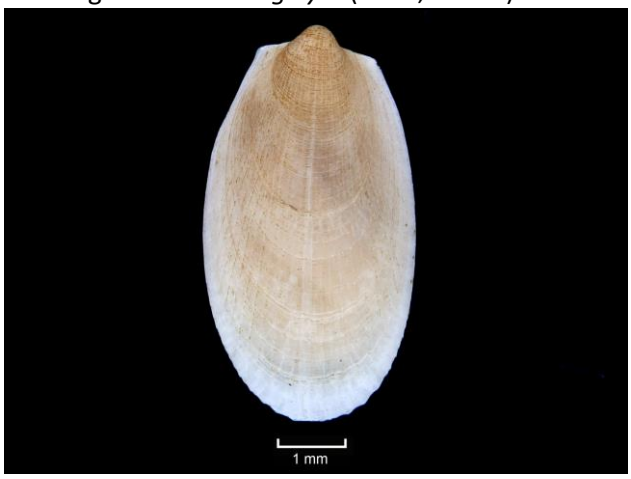


Fig. 2j. *Limatula gwyni* (P1802, 59477) – L

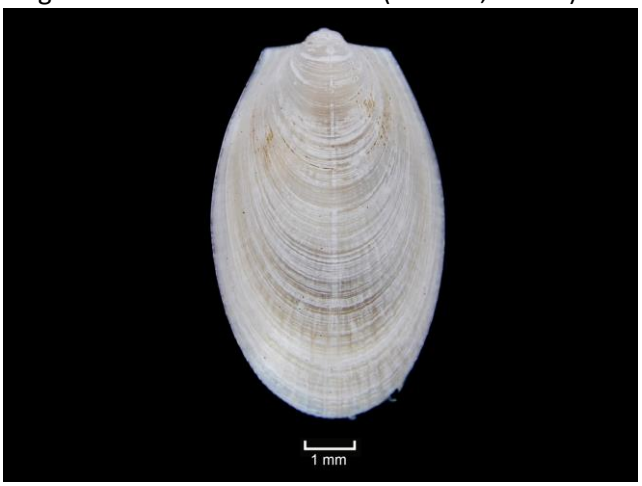
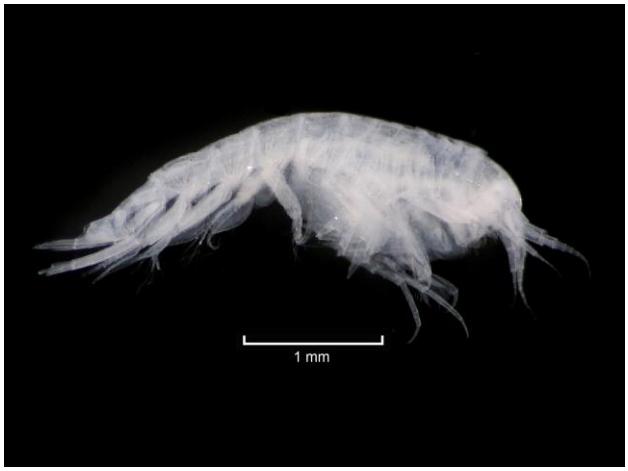


Fig. 2k. *Limatula gwyni* (P863, GG4.2) – L

RT6703 – *Amphilochus tenuimanus* Boeck, 1871 (Figure 3a)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Bathyal. Geography: Atlantic margin. Condition: Fair. Size: Small. Specimens from sixteen samples.



Two generic and specific differences: Lab 16j identified as *Apolochus neapolitanus* (Figure 3b) (which has a more slender gnathopod 2 carpal lobe with apical spines and regular teeth on gnathopod 2 palmar margin); Lab 08 identified as *Sophrosyne robertsoni* (no material available; Figure 3c shows another *Sophrosyne* species) (which has a more expanded Antenna 1 peduncle).

Fig. 3a. *Amphilochus tenuimanus* (RT6703; 15352, 77799) – L

Fig. 3b. *Apolochus neapolitanus* (P12690, 74787) – L

Fig. 3c. *Sophrosyne* sp. (P6065, 66947) – L

RT6704 – *Callianassa subterranea* (Montagu, 1808) (Figures 4a, 4b)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Lower Shelf). Geography: North Sea. Condition: Fair. Size: Medium, 20-30 mm. Specimens from fifteen samples.

Two generic and specific differences: Labs 07 and 11 identified as *Gilvossius tyrrhenus* (Figures 4c, 4d) (which has a rounded telson posterior margin, with setae but no spinule).

Fig. 4a. *Callianassa subterranea* (RT6704; 9210, 73584) – L

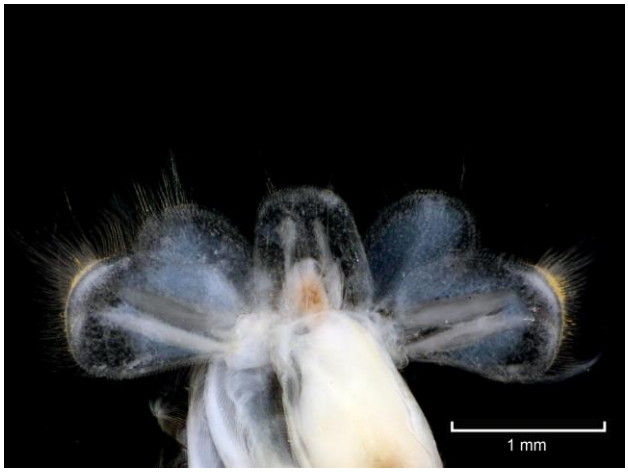


Fig. 4b. *Callianassa subterranea* (RT6704; 9210, 73584) – D, posterior

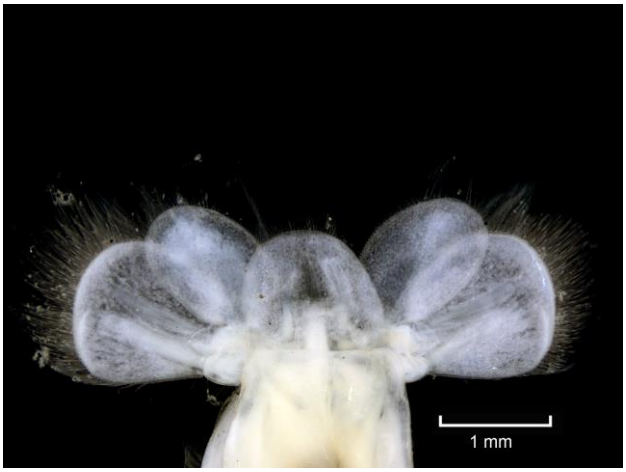


Fig. 4c. *Gilvossius tyrrhenus* (P14612.1, 76660) – D, posterior

Fig. 4d. *Gilvossius tyrrhenus* (P14612.1, 76660) – L

RT6705 – *Crenella decussata* (Montagu, 1808) (Figure 5a)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: north of Ireland. Condition: Good. Size: Medium, 2 mm. All specimens from one sample.

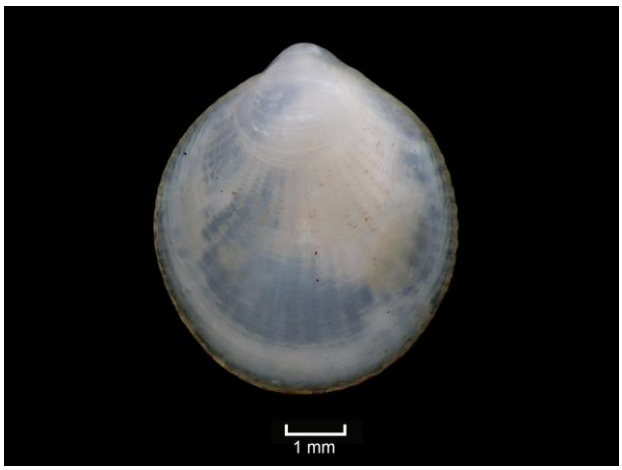


Fig. 5a. *Crenella decussata* (RT6705; 6808.1, 69380) – L

No generic or specific differences recorded.

RT6706 – *Ampelisca provincialis* Bellan-Santini & Kaim-Malka, 1977 (Figures 6a, 6e, 6i)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Bathyal. Geography: Atlantic margin. Condition: Fair. Size: Medium, 5-6 mm. Sex: female. Specimens from fourteen samples.

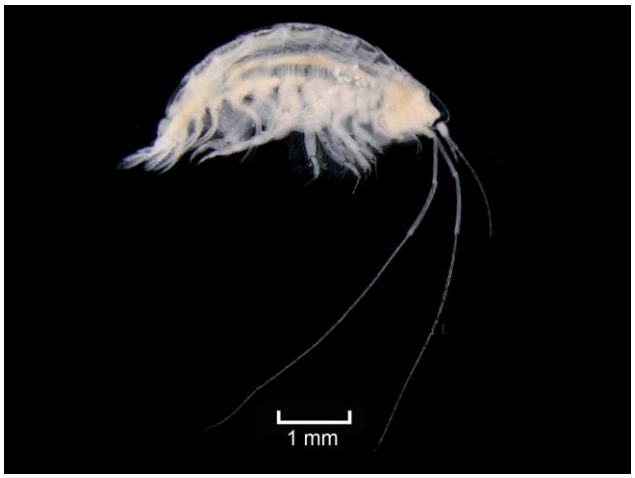


Fig. 6a. *Ampelisca provincialis* (RT6706; 12697, 75468) – L, wide view

Eleven specific differences: Labs 01, 04, 07 and 11 identified as *Ampelisca diadema* (Figures 6b, 6f, 6j); Labs 03, 05, 06, 09, 10 and 19 identified as *Ampelisca tenuicornis* (Figures 6c, 6g, 6k) (both of which have a narrower head and more spines on uropod 2); Lab 08 identified as *Ampelisca gibba* (Figures 6d, 6h, 6l) (which has a large posterodistal lobe on pereopod 7 merus).

Fig. 6b. *Ampelisca diadema* (P4162.1, 65238) – L, wide view

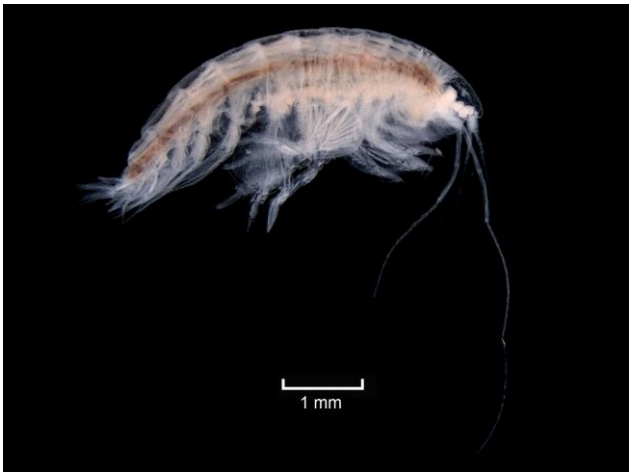


Fig. 6c. *Ampelisca tenuicornis* (P4162.1, 65206) – L, wide view

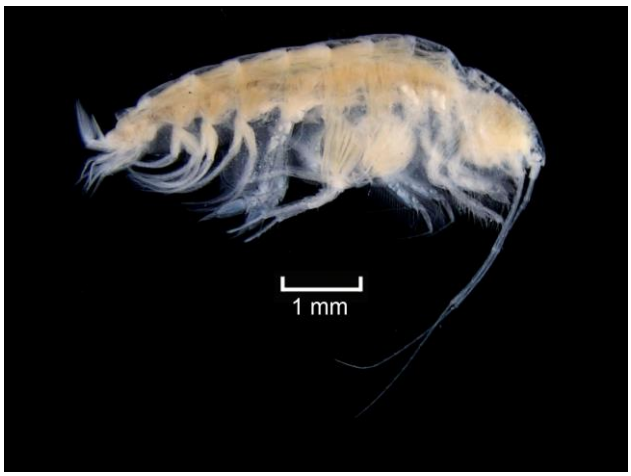


Fig. 6d. *Ampelisca gibba* (P4264, 64074) – L, wide view

Fig. 6e. *Ampelisca provincialis* (RT6706, 75468) – L

Fig. 6f. *Ampelisca diadema* (P4162.1, 65238) – L

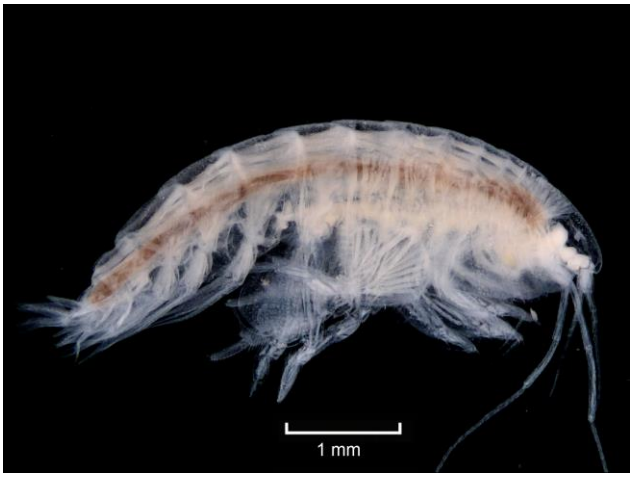


Fig. 6g. *Ampelisca tenuicornis* (P4162.1, 65206) – L

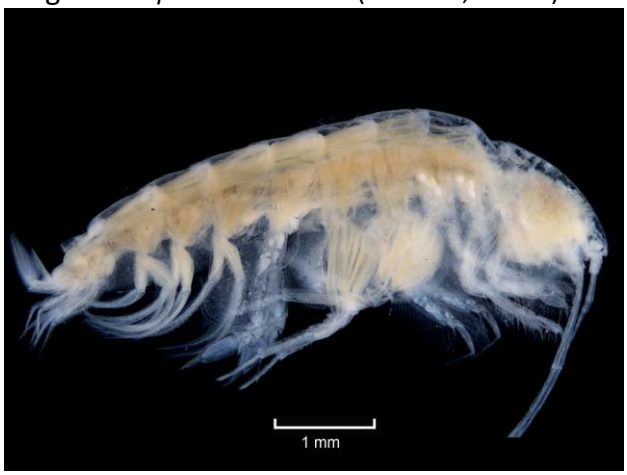


Fig. 6h. *Ampelisca gibba* (P4264, 64074) – L

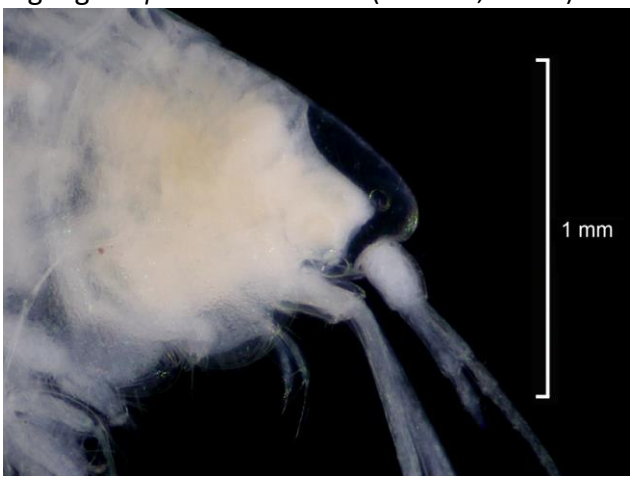


Fig. 6i. *Ampelisca provincialis* (RT6706, 75468) – L, head

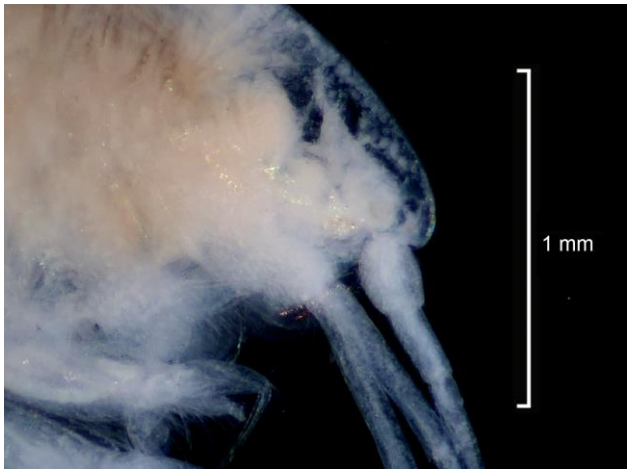


Fig. 6j. *Ampelisca diadema* (P4162.1, 65238) – L, head

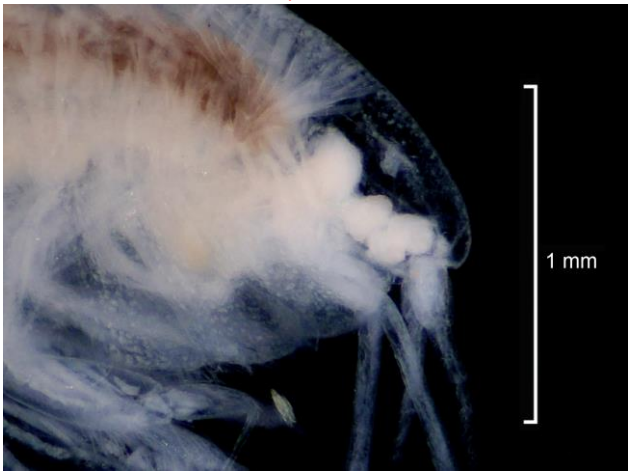


Fig. 6k. *Ampelisca tenuicornis* (P4162.1, 65206) – L, head

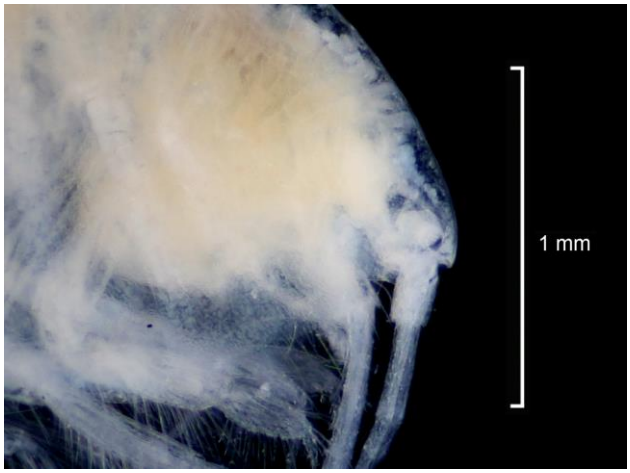


Fig. 6l. *Ampelisca gibba* (P4264, 64074) – L, head

RT6707 – *Processa nouveli* Al-Adhub & Williamson, 1975 (Figure 7a)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Lower Shelf). Geography: North Sea. Condition: Fair, at least 1 G2. Size: Medium, 15-30 mm. Specimens from eighteen samples.

Fig. 7a. *Processa nouveli holthuisi* (RT6707; 9210, 73496) – L

Five specific differences: Labs 11 and 16b identified as *Processa edulis crassipes* (Figure 7b) (which lacks a tooth on the anterior external corner of the stylocerite); Lab 03 identified as *Processa modica modica* (Figure 7c) (which has only 11-15 segments in the carpus of P2 on both sides); Labs 07 and 16l identified as *Processa canaliculata* (Figure 7d) (which has pleonite 5 ventrally straight).

Labs 01, 09, 12, 14 and 20 added the subspecies: *holthuisi*, to the identification or notes. Lab 08 identified as *Processa*; it is recommended that laboratories attempt species level identification of all specimens.

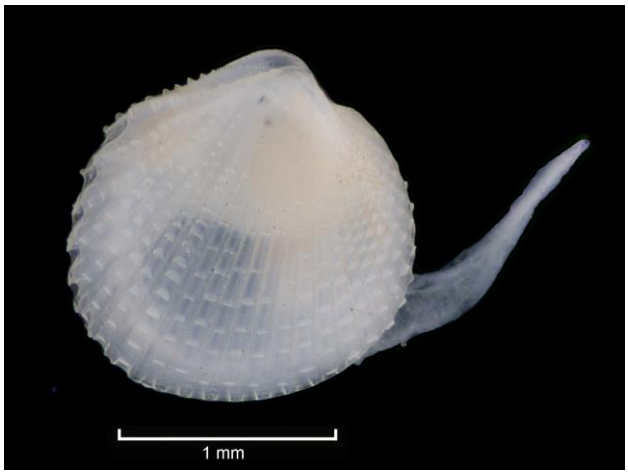
Fig. 7b. *Processa edulis crassipes* (P12690, 74792) – L

Fig. 7c. *Processa modica modica* (P14612.1, 76622) – L

Fig. 7d. *Processa canaliculata* (413430, 42064) – L

RT6708 – *Papillicardium minimum* (R.A. Philippi, 1836) (Figure 8a)

Substratum: Mud. Salinity: Full (Euhaline). Depth: Circalittoral (Lower Shelf). Geography: southwest England. Condition: Condition: Good. Size: Medium, 1-2 mm. Specimens from five samples.



One generic and specific difference: Lab 16b identified as *Parvicardium pinnulatum* (Figure 8b); (which has fewer radial ribs, with spines concentrated on anterior and posterior ribs).

Fig. 8a. *Papillicardium minimum* (RT6708; 6168, 67487) – L

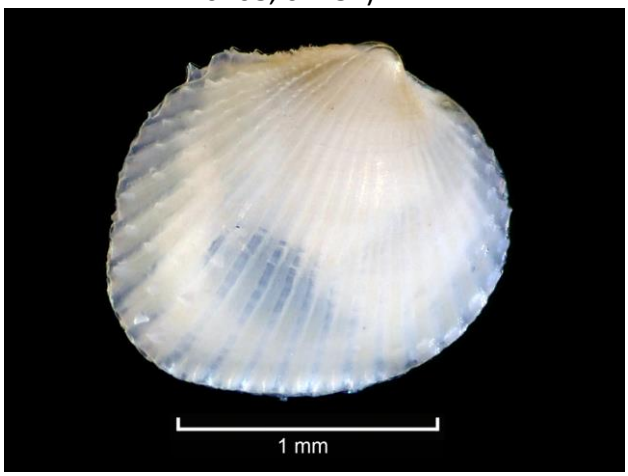


Fig. 8b. *Parvicardium pinnulatum* (P9903, 74518) – L

RT6709 – *Melita palmata* (Walker, 1893) (Figure 9a)

Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: Wales. Condition: Fair (no uropod 3). Size: Medium, 2-3 mm. Sex: Female. Specimens from three samples.

Fig. 9a. *Melita palmata* (RT6709; 7508, 64216) – L

Four generic and five specific differences: Lab 21 identified as *Melita hergensis* (Figure 9b) (which lacks apical spines on the telson); Lab 03 identified as *Megamoera dentata* (no material available) (which has multiple dorsal teeth on pleonite 1); Lab 01 identified as *Abludomelita obtusata* (Figure 9c) (which lacks apical spines on the telson); Lab 10 identified as *Allomelita pellucida* (no material available) (which lacks dorsal teeth on pleonite 1).

Lab 08 gave no identification; it is recommended that laboratories attempt species level identification of all specimens.

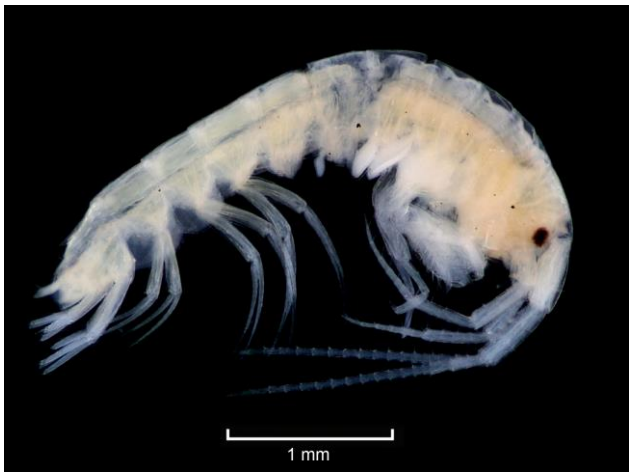


Fig. 9b. *Melita hergensis* (413668_11314) – L

Fig. 9c. *Abludomelita obtusata* (P9615, 72800) – L

RT6710 – *Leptochiton asellus* (Gmelin, 1791) (Figures 10a, 10d, 10f)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: Wales. Condition: Fair. Size: Small, 2-4 mm. Specimens from five samples.

Fig. 10a. *Leptochiton asellus* (RT6710; 9317, 74412) – D

One generic and seven specific differences: Labs 01, 04, 16j, 16l, 23 identified as *Leptochiton cancellatus* (Figures 10b, 10e, 10g) (which has dorsally evenly rounded valves); Lab 16b identified as *Leptochiton scabridus* (no material available) (which has dorsally evenly rounded valves, with coarser sculpture); Lab 07 identified as *Stenosemus albus* (Figure 10c) (which has rounded girdle spicules).

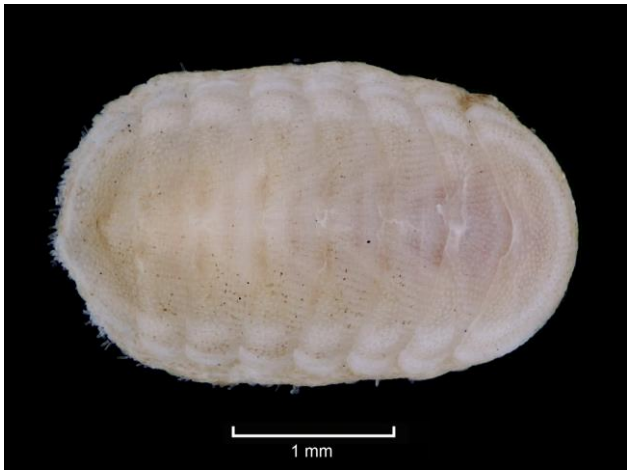


Fig. 10b. *Leptochiton cancellatus* (413532, 42482) – D

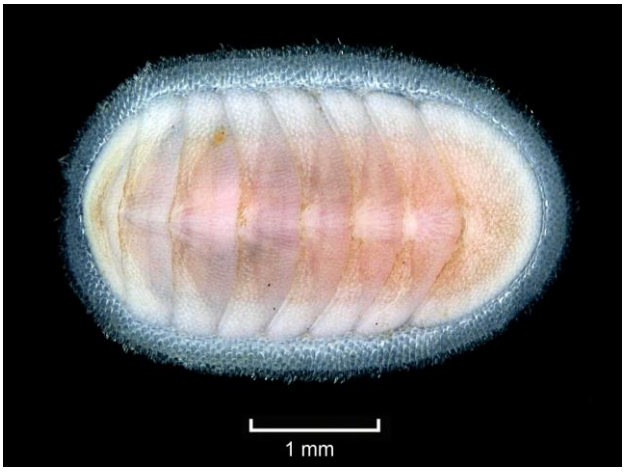


Fig. 10c. *Stenosemus albus* (P2131, 60064) – D

Fig. 10d. *Leptochiton asellus* (P9317, 74412) – D

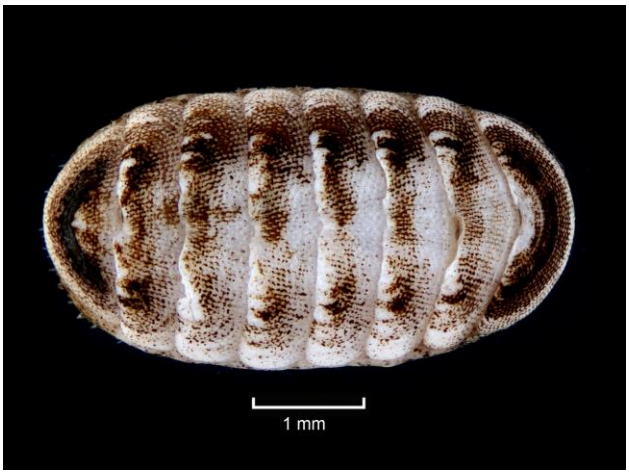


Fig. 10e. *Leptochiton cancellatus* (412692, 39351) – D

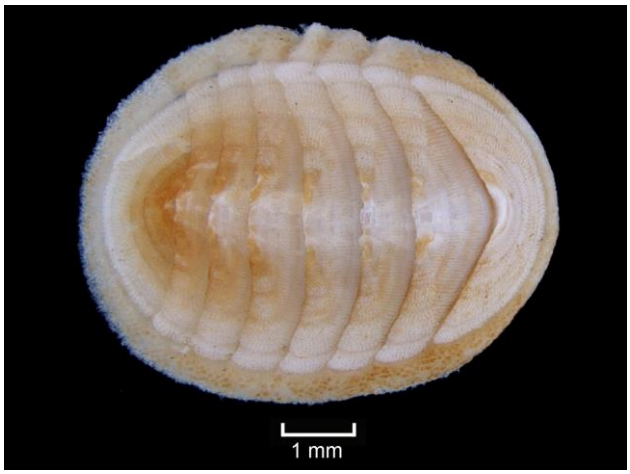


Fig. 10f. *Leptochiton asellus* (P9317, 74368) – D

Fig. 10g. *Leptochiton cancellatus* (412692, 39333) – D

RT6711 – *Littorina littorea* (Linnaeus, 1758) (Figures 11a, 11d, 11f, 11h)

Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: Wales. Condition: Good. Size: Small, 1-3 mm. Specimens from four samples.

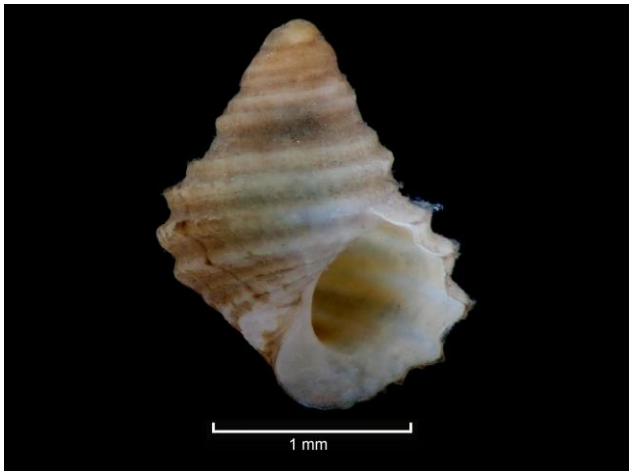


Fig. 11a. *Littorina littorea* (RT6711; 7508, 58702) – V

Two generic and six specific differences: Lab 03 identified as *Littorina compressa*; (Figures 11j, 11k) Lab 04 identified as *Littorina arcana* (no material available – similar to *L. saxatilis*); Labs 07, 21 identified as *Littorina saxatilis* (Figures 11b, 11e, 11g, 11i) (all of which have more rounded shells with less distinct sculpture at this size); Labs 01 and 10 identified as *Calliostoma occidentale* (Figure 11c) (which has an angular aperture and a nacreous shell interior).

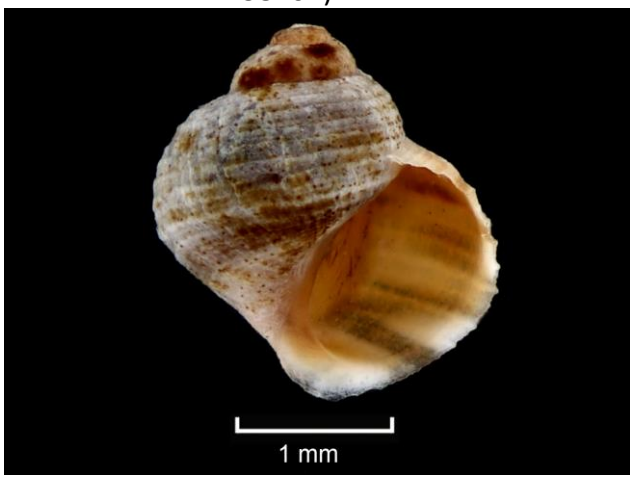


Fig. 11b. *Littorina saxatilis* (P1932, 59960) – V

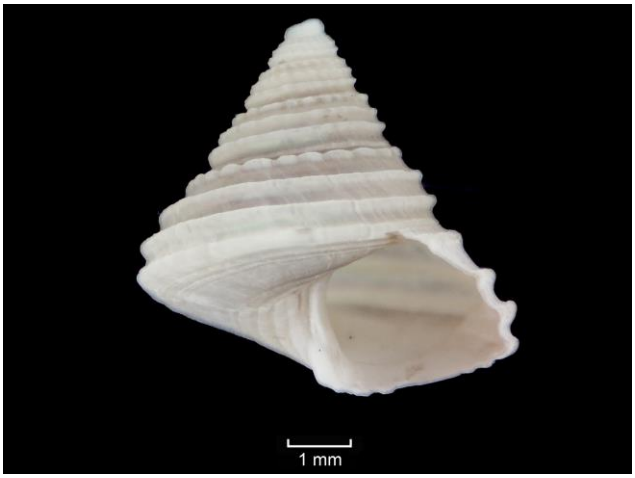


Fig. 11c. *Calliostoma occidentale* (Farnes Deep) – V

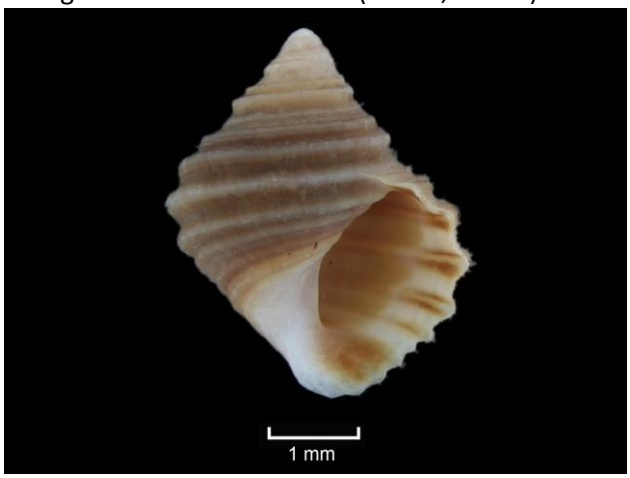


Fig. 11d. *Littorina littorea* (P7508, 70903) – V

Fig. 11e. *Littorina saxatilis* (P1932, 59960) – V

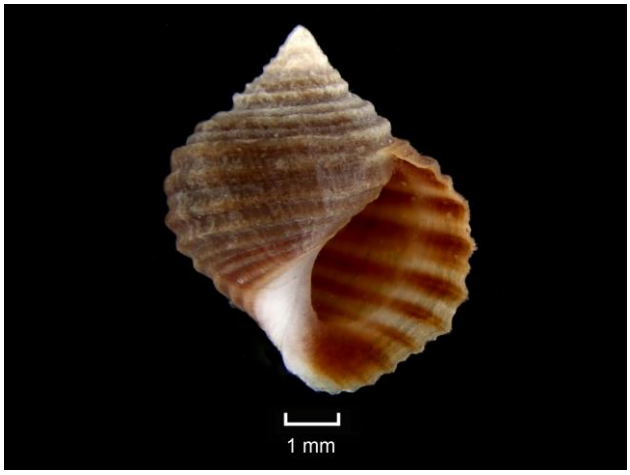


Fig. 11f. *Littorina littorea* (P1932, 59965) – V

Fig. 11g. *Littorina saxatilis* (P529, 58330) – V

Fig. 11h. *Littorina littorea* (TW, Applecross) – V

Fig. 11i. *Littorina saxatilis* (TW, Applecross) – V

Fig. 11j. *Littorina compressa* (RT5325; TW, Applecross) – V

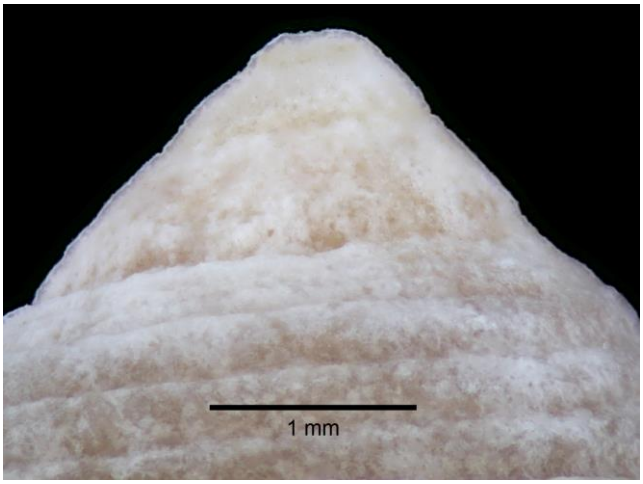


Fig. 11k. *Littorina compressa* (TW, Applecross) – early whorls

RT6712 – *Gnathia dentata* (G.O. Sars, 1872) (Figure 12a)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Lower Shelf). Geography: North Sea. Condition: Good. Size: Medium, 3-4 mm. Sex: Male. Specimens from three samples.

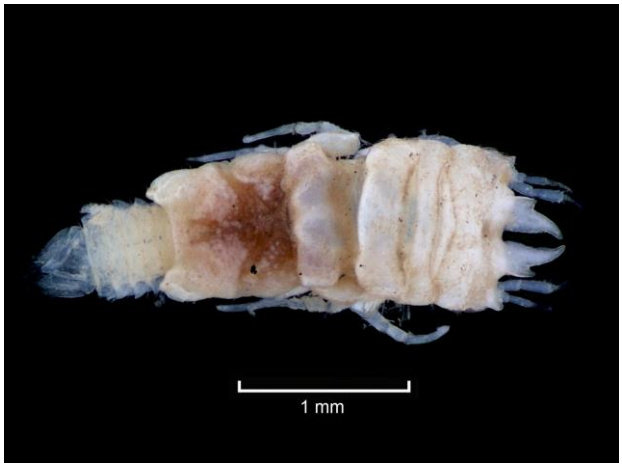


Fig. 12a. *Gnathia dentata* (RT6712; 9903, 74521) – D

One specific difference: Lab 10 identified as *Gnathia oxyuraea* (Figure 12b) (which has lateral mandibular spines not diverging from the mandible).

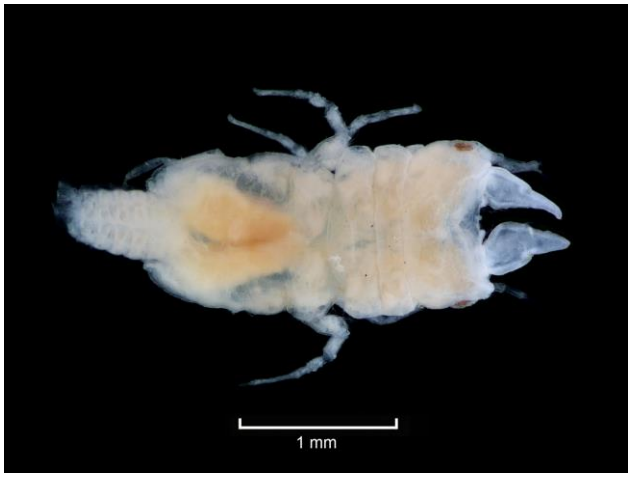


Fig. 12b. *Gnathia oxyuraea* (RT6407; 4162.1, 65256) – D

RT6713 – *Gammaropsis palmata* (Stebbing & Robertson, 1891) (Figure 13a)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: north of Ireland. Condition: Good. Size: Medium, 2-3 mm. Sex: female. Specimens from four samples.

Fig. 13a. *Gammaropsis palmata* (RT6713; 1341, 58714) – L

Two generic and four specific differences: Lab 01 identified as *Gammaropsis maculata* (Figure 13b) (which has two dentate processes on the palm of gnathopod 2); Lab 07 identified as *Apherusa clevei* (Figure 13c) (which has a laminar telson).

Lab 03 identified as *Gammaropsis*; Lab 08 gave no identification. It is recommended that laboratories attempt species level identification of all specimens.

Fig. 13b. *Gammaropsis maculata* (412202, 4797) – L

Fig. 13c. *Apherusa clevei* (P14612.1, 76625) – L

RT6714 – *Mya arenaria* Linnaeus, 1758 (Figures 14a, 14b, 14d, 14f, 14h, 14j, 14l, 14n)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Infralittoral. Geography: north of Ireland. Condition: Good. Size: Small, 6-10 mm. Specimens from five samples.

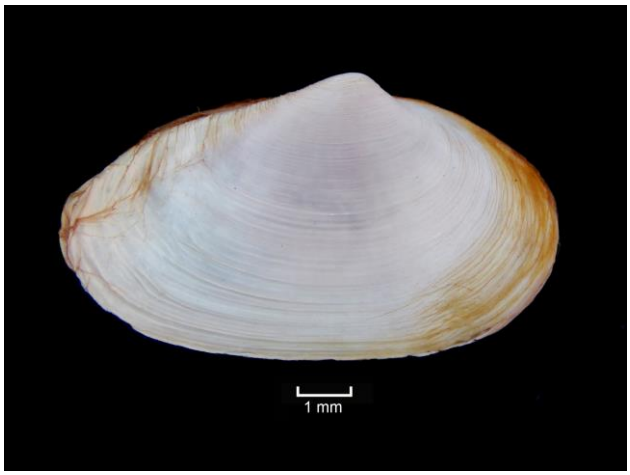


Fig. 14a. *Mya arenaria* (RT6714; 6808.2, 69404) – L

One generic and eight specific differences: Labs 01, 11, 16l, 17, 19, 21 and 23 identified as *Mya truncata* (Figures 14c, 14e, 14g, 14i, 14k, 14m and 14o) (which has growth lines enclosing a more triangular juvenile shell below 2mm); Lab 08 identified as *Lutraria angustior* (Figure 14s; Figures 14p, 14q and 14r show *Lutraria* juv.) (which has a more fragile shell at this size, with a gelatinous-coated pink-orange siphon pair showing through the shell).

Fig. 14b. *Mya arenaria* (RT4917; 413150, 8521) – L

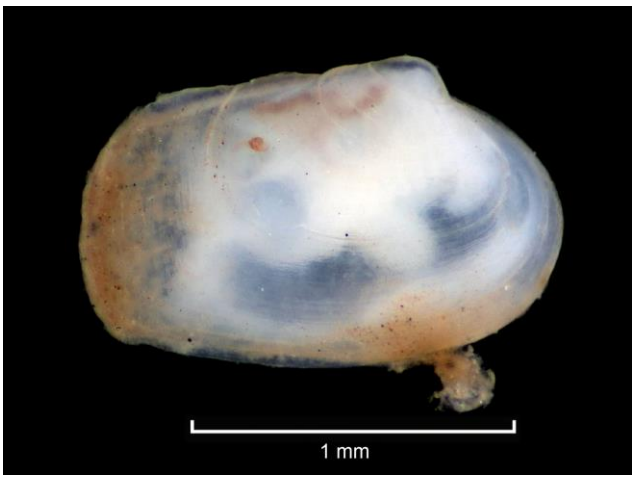


Fig. 14c. *Mya truncata* (P12545, 75192) – L

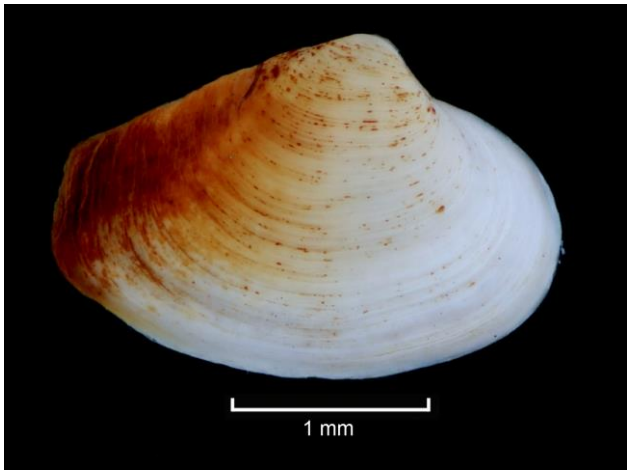


Fig. 14d. *Mya arenaria* (P2217.1, 60231) – L

Fig. 14e. *Mya truncata* (P12545, 75192) – L

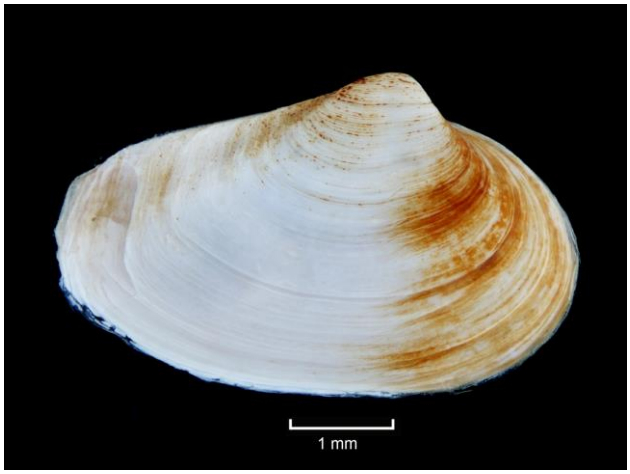


Fig. 14f. *Mya arenaria* (P4162.1, 65244) – L

Fig. 14g. *Mya truncata* (P6808.3, 69454) – L

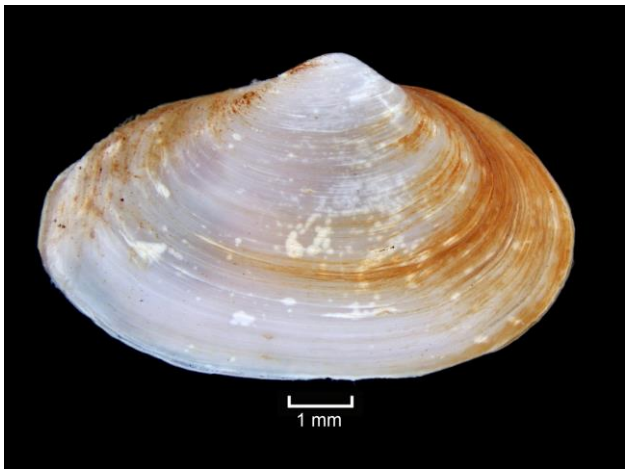


Fig. 14h. *Mya arenaria* (P4162.1, 65244) – L

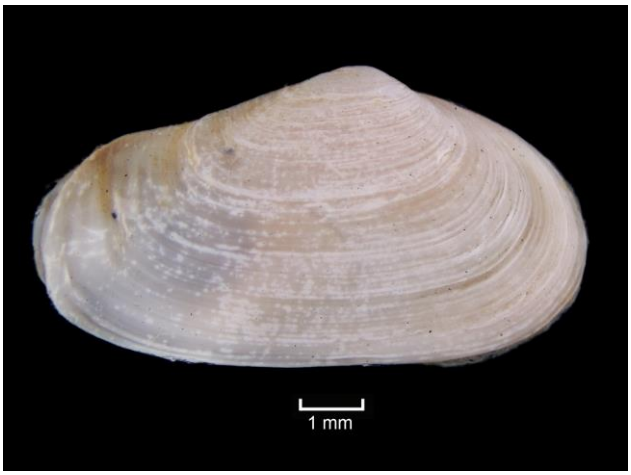


Fig. 14i. *Mya truncata* (P2178, 60534) – L

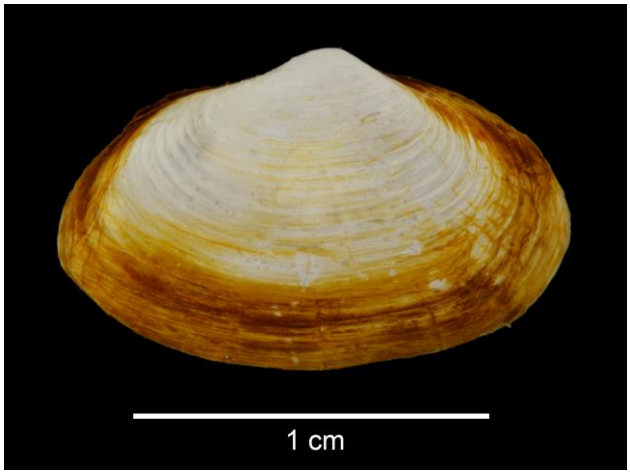


Fig. 14j. *Mya arenaria* (P7808, 70923) – L

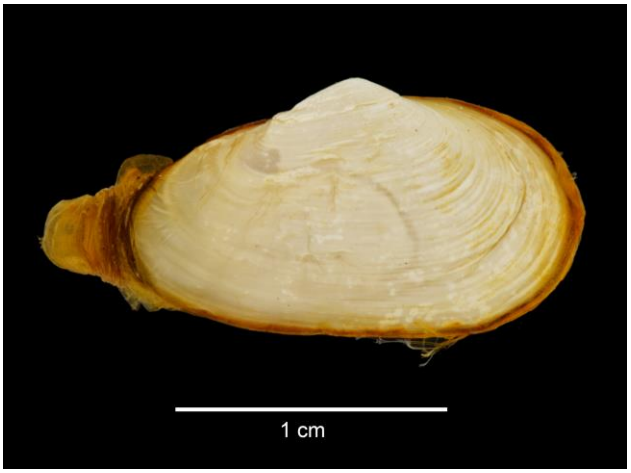


Fig. 14k. *Mya truncata* (413533, 10560) – L

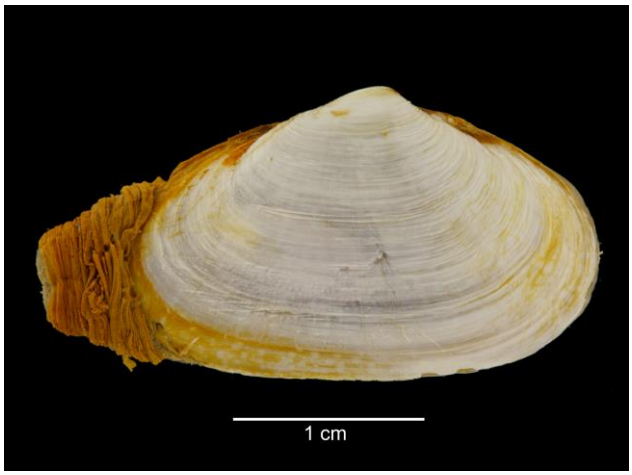


Fig. 14l. *Mya arenaria* (P732, 57894) – L

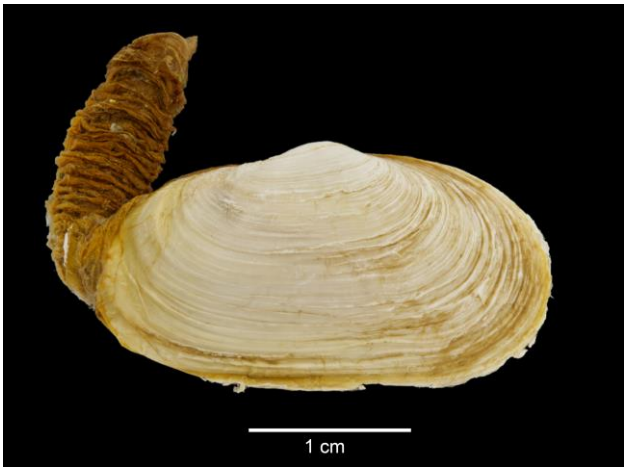


Fig. 14m. *Mya truncata* (P6808.1, 69328) – L

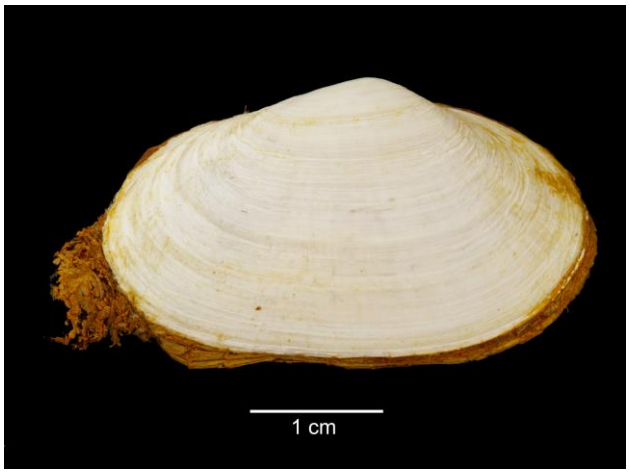


Fig. 14n. *Mya arenaria* (P732, 57898) – L

Fig. 14o. *Mya truncata* (P2178, 60534) – L

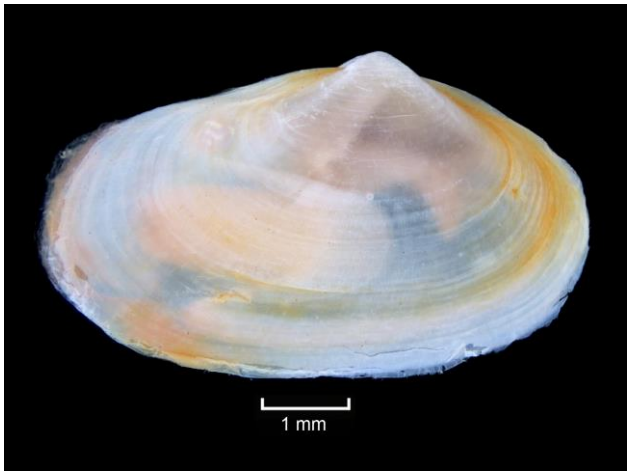


Fig. 14p. *Lutraria* juv. (P9615, 72806) – L

Fig. 14q. *Lutraria* juv. (413531, 43494) – L

Fig. 14r. *Lutraria* juv. (P4389, 66612) – L

Fig. 14s. *Lutraria angustior* (413561, 43427) – L

RT6715 – *Heteromastus filiformis* (Claparède, 1864) (Figure 15a)

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

Fig. 15a. *Heteromastus filiformis* (RT6715; 7508, 70916) – L

One generic and specific difference: Lab 07 identified as *Notomastus latericeus* (Figure 15b) (which has eleven segments with capillary notochaetae).

Labs 12 and 14 noted that they would leave at genus in sample data.

Fig. 15b. *Notomastus latericeus* (P2258_61003) – L

RT6716 – *Urothoe poseidonis* Reibish, 1905 (Figures 16a, 16d)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: North Sea. Condition: Good. Size: Medium, 3-4 mm. Specimens from four samples.

Fig. 16a. *Urothoe poseidonis* (RT6716; 12712, 74904) – L

Three specific differences: Lab 07 identified as *Urothoe grimaldii* (no material available) (which has a spinous dactylus on Pereopod 5); Lab 16j identified as *Urothoe pulchella* (Figures 16b, 16e) (which has P5 carpus less than twice as broad as long); Lab 09 identified as *Urothoe elegans* (Figures 16c, 16f) (which has P5 carpus only as broad as long).

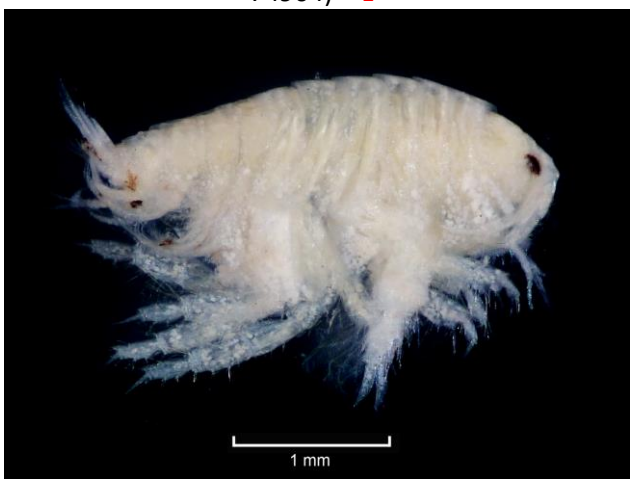


Fig. 16b. *Urothoe pulchella* (413561, 43443) – L

Fig. 16c. *Urothoe elegans* (P12697, 75457) – L

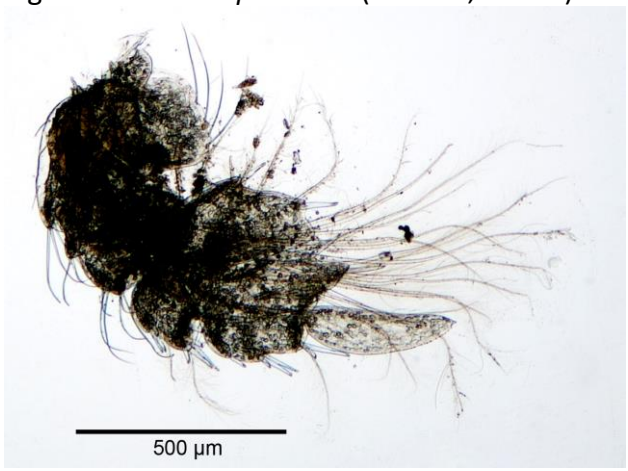


Fig. 16d. *Urothoe poseidonis* (RT6716; 12712, 74885) – Pereopod 5

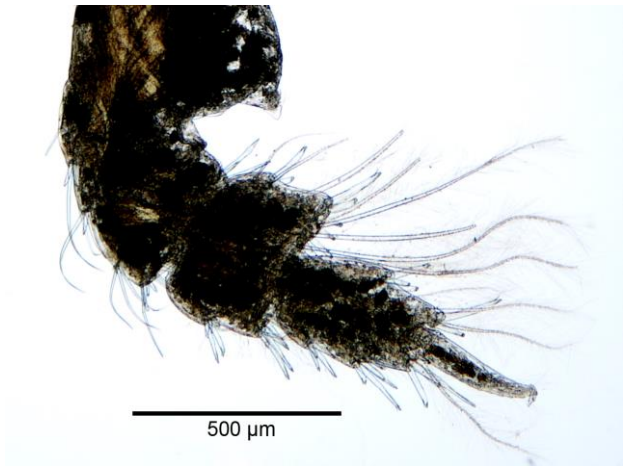


Fig. 16e. *Urothoe pulchella* (413561, 43443) – Pereopod 5

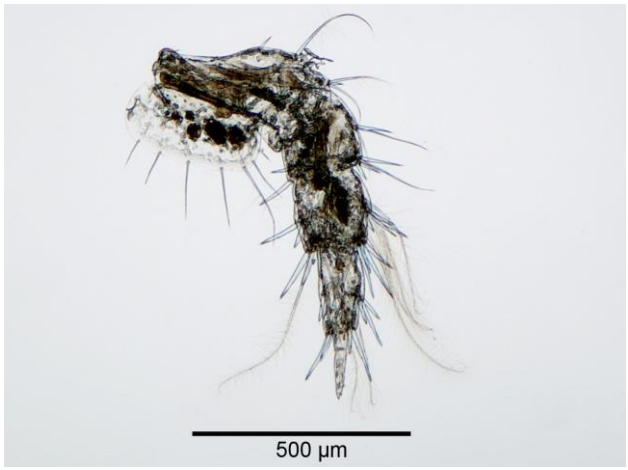


Fig. 16f. *Urothoe elegans* (P12697, 75457) – Pereopod 5

RT6717 – *Ampelisca brevicornis* (A. Costa, 1853) (Figures 17a, 17b)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Intertidal. Geography: Wales. Condition: Fair. Size: Medium, 4-5 mm. Sex: Female. Specimens from three samples.

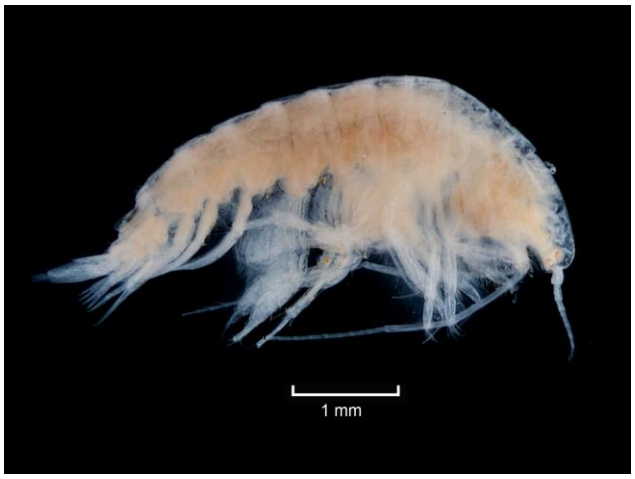


Fig. 17a. *Ampelisca brevicornis* (RT6717; 7508, 70888) – L

One generic and specific difference: Lab 08 identified as *Byblis gaimardii* (Figures 17c, 17d, 17e) (which has setae on the anterior margin of the posterior lobe of pereopod 7 and a convex ventral margin of the head).

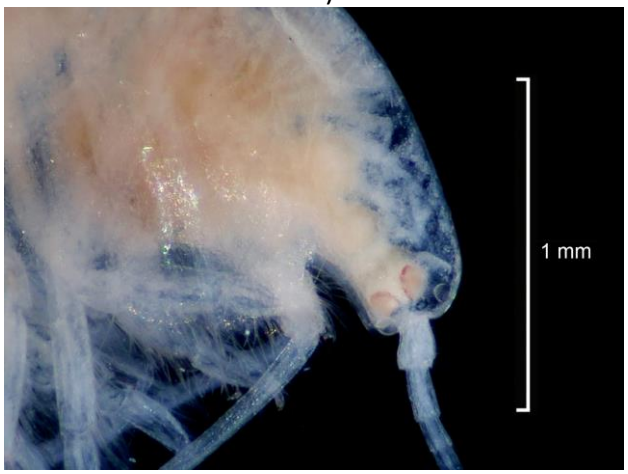


Fig. 17b. *Ampelisca brevicornis* (RT6717; 7508, 70888) – L, head

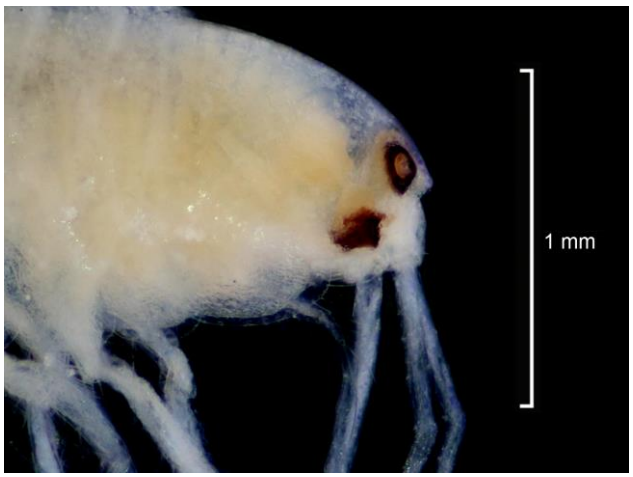


Fig. 17c. *Byblis gaimardii* (410826, 33543) – L, head

Fig. 17d. *Byblis gaimardii* (410826, 33543) – L

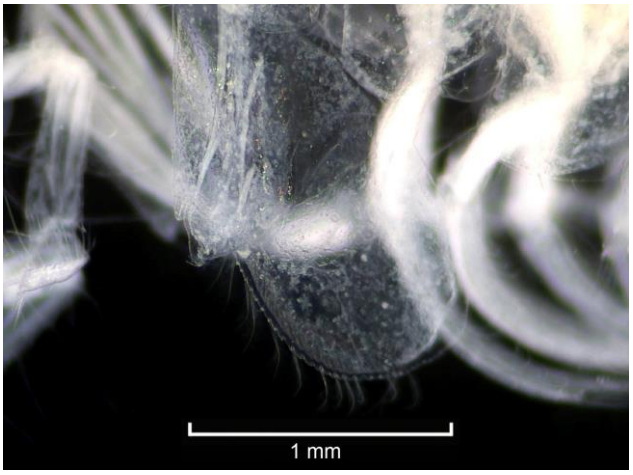


Fig. 17e. *Byblis gaimardii* (410826, 33543) – Pereopod 7 basis

RT6718 – *Polyophthalmus pictus* (Dujardin, 1839) (Figure 18a)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Infralittoral. Geography: western Scotland. Condition: Good. Size: Medium, 1.5-2mm. Specimens from four samples.

Fig. 18a. *Polyophthalmus pictus* (RT6718; 13871, 75824) – L

One generic and specific difference: Lab 07 identified as *Ophelina abranchiata* (Figure 18b) (which lacks lateral eyes and pigment).

Fig. 18b. *Ophelina abranchiata* (P6065, 67098) – L

RT6719 – *Upogebia deltaura* (Leach, 1816) (Figure 19a)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: North Sea. Condition: Fair. Size: Small, 5-10 mm carapace. Specimens from six samples.

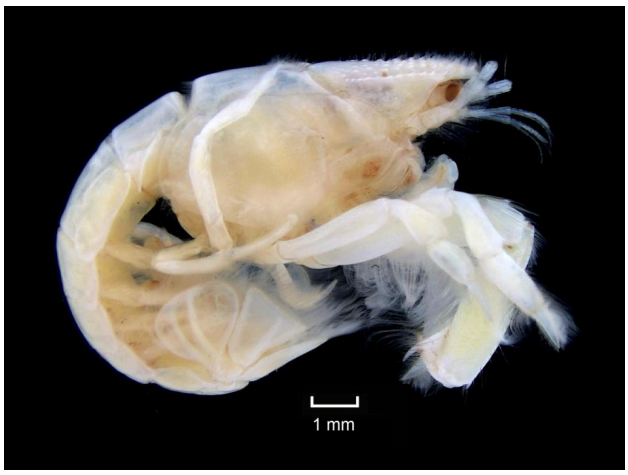


Fig. 19a. *Upogebia deltaura* (RT6719; 12712, 74864) – L

No generic or specific differences recorded.

RT6720 – *Anthura gracilis* (Montagu, 1808) (Figures 20a, 20b)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: Wales. Condition: Fair. Size: Medium. Specimens from three samples.

Fig. 20a. *Anthura gracilis* (RT6720; 9317, 74453) – L

No generic or specific differences recorded.

Fig. 20b. *Anthura gracilis* (RT6720, 74453) – D

RT6721 – *Tritia varicosa* (W. Turton, 1825) (Figures 21a, 21b, 21d, 21f, 21h, 21m)

Substratum: Mud. Salinity: Full (Euhaline). Depth: Infralittoral. Geography: southwest England. Condition: Fair. Size: Medium, 6-8 mm. All specimens from one sample.

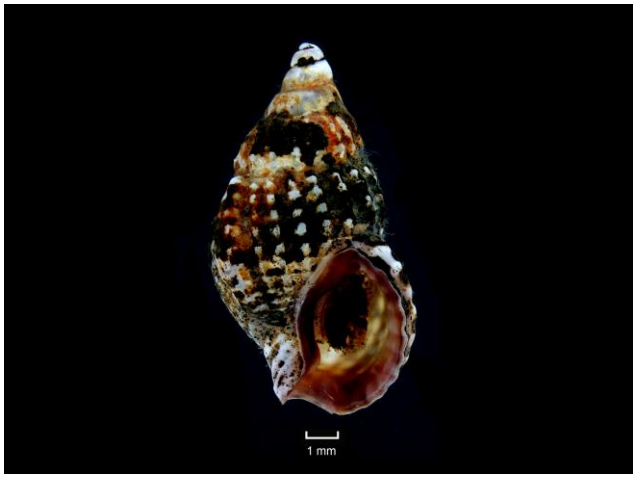


Fig. 21a. *Tritia varicosa* (RT6721; 7998, 73063) – V

Seven specific differences: Labs 16j, 17, 21 and 22 identified as *Tritia reticulata* (Figures 21c, 21e, 21g, 21i, 21k) (which lacks axial varices); Labs 08, 20, 23 identified as *Tritia nitida* (Figures 21j, 21l) (which has axial varices on later whorls only).

Labs 10, 16a, 16b and 16l recorded the synonym *Tritia pygmaea*. Lab 01 recorded the synonym *Nassarius pygmaeus*.

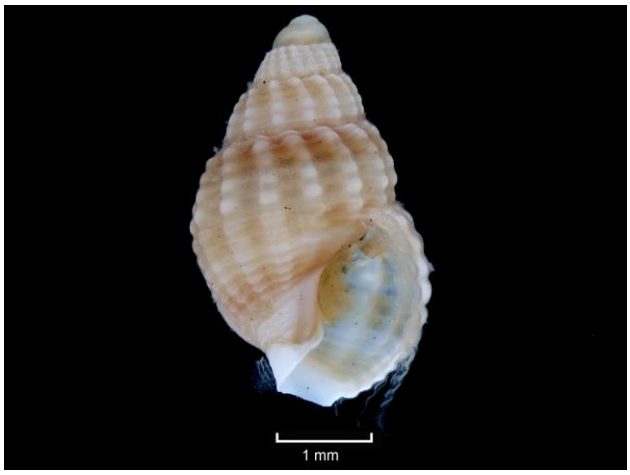


Fig. 21b. *Tritia varicosa* (414082, 55031) – V

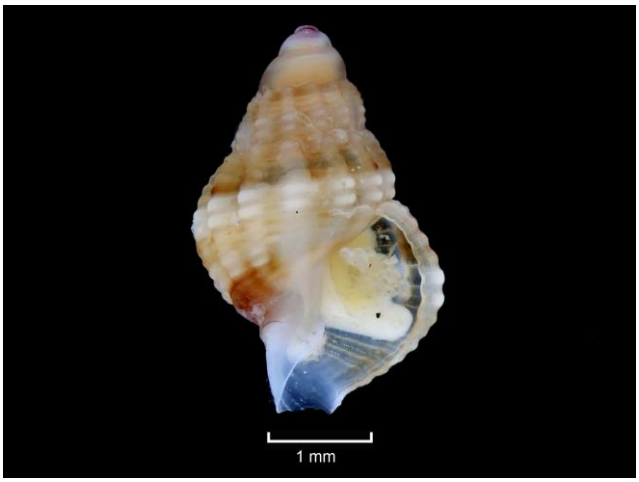


Fig. 21c. *Tritia reticulata* (P9903, 74522) – V

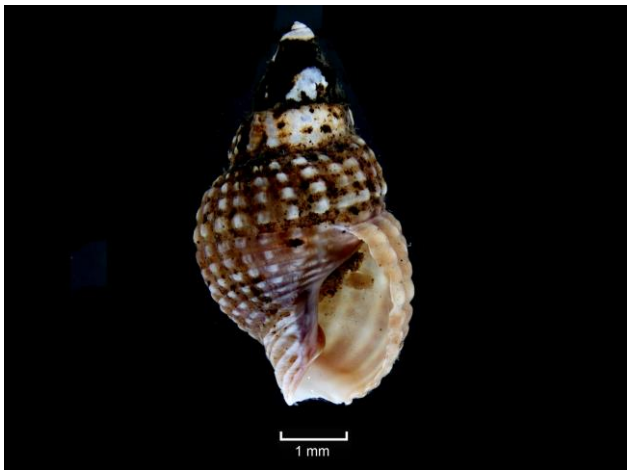


Fig. 21d. *Tritia varicosa* (P7998, 73063) – V

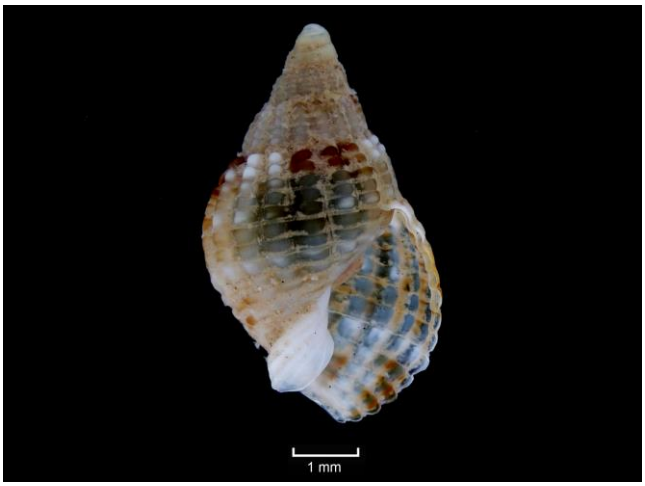


Fig. 21e. *Tritia reticulata* (414488, 57017) – V

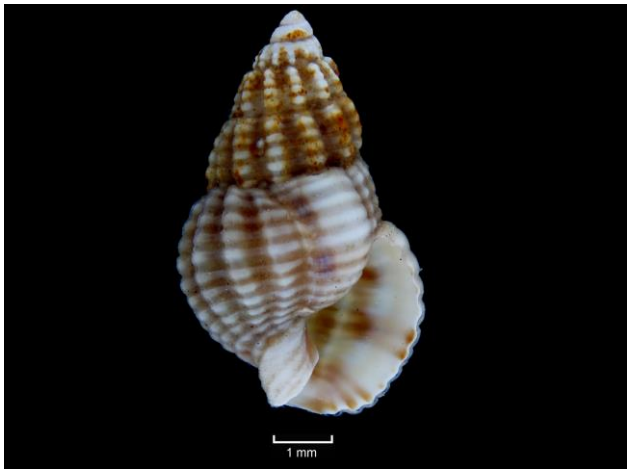


Fig. 21f. *Tritia varicosa* (P10478_72865) – V

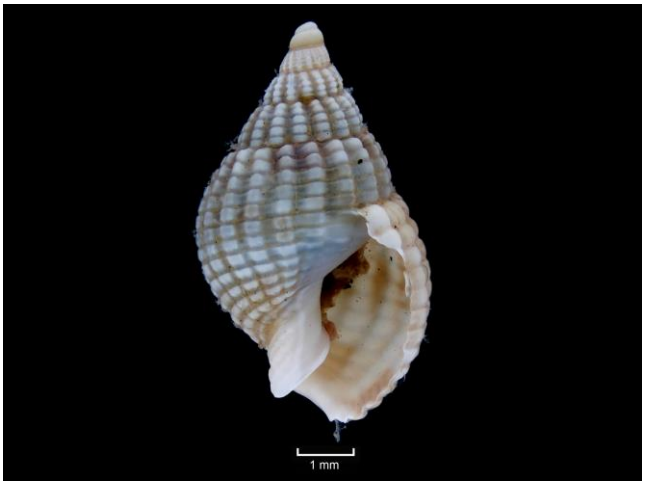


Fig. 21g. *Tritia reticulata* (414488, 57018) – V

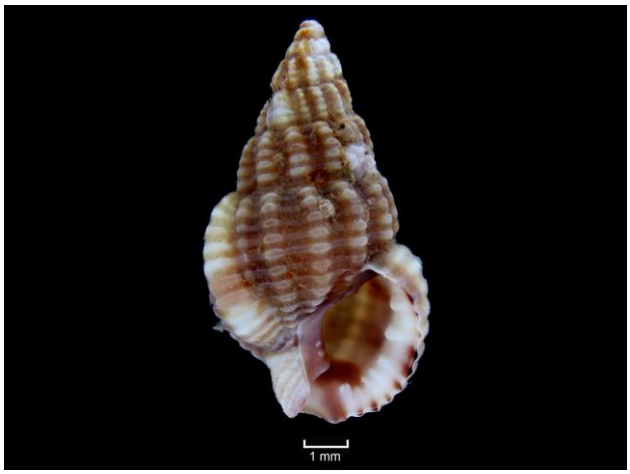


Fig. 21h. *Tritia varicosa* (P13748, 75575) – V

Fig. 21i. *Tritia reticulata* (414488, 57017) – V

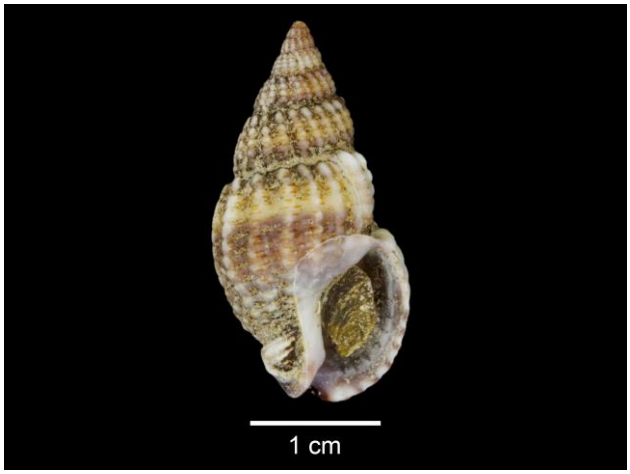


Fig. 21j. *Tritia nitida* (TW, Constanta) – V

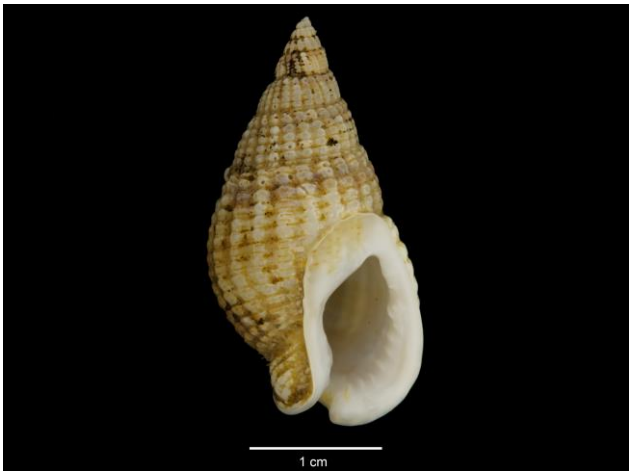


Fig. 21k. *Tritia reticulata* (P9615, 72820) – V

Fig. 21l. *Tritia nitida* (TW, Constanta) – apical

Fig. 21m. *Tritia varicosaa* (RT6721; 7998, 73063) – apical

RT6722 – *Glycera capitata* Örsted, 1842 (Figures 22a, 22d)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Bathyal. Geography: Atlantic margin. Condition: Fair. Size: Medium. Specimens from sixteen samples.

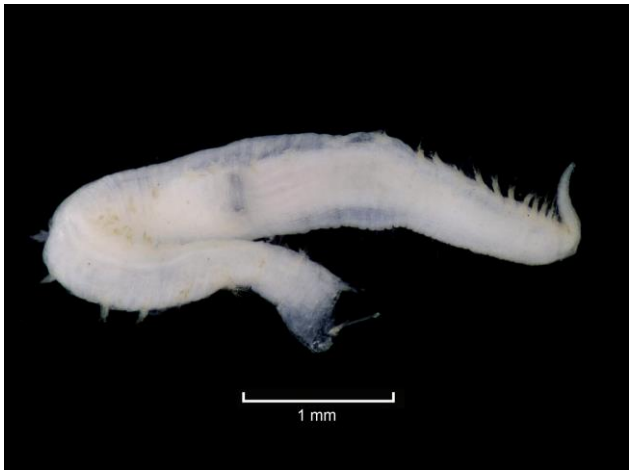


Fig. 22a. *Glycera capitata* (RT6722; 15352, 77824) – D

Eighteen specific differences: Labs 01, 03, 04, 05, 06, 07, 08, 09, 10, 11, 16a, 16b, 16j, 17, 18, 20, 21, 23 identified as *Glycera lapidum* (Figures 22b, 22e) (which has more elongate neuropodial prechaetal lobes and more deeply cleft joints on the chaetal shafts).

Lab 19 identified as *Glycera celtica* (Figures 22c, 22f) (which has two post-chaetal lamellae) but as a transcription error. Lab 21 identified as '*G. Lapidum* agg.', which could include *G. Capitata*; Lab 08 identified as *Glycera*. It is recommended that laboratories attempt species level identification of all specimens.

Fig. 22b. *Glycera lapidum* (P1341.3, 58795) – D

Fig. 22c. *Glycera celtica* (413251, 41864) – L

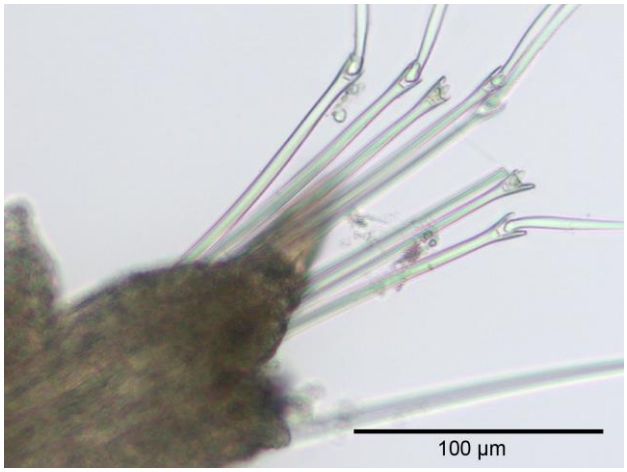


Fig. 22d. *Glycera capitata* (RT6722; 15352, 77824) – parapodium

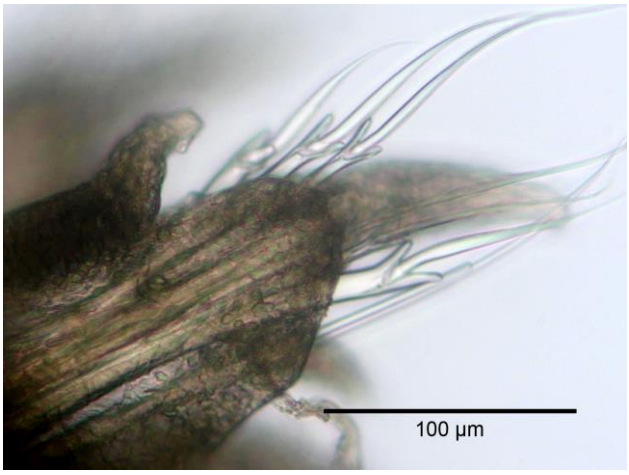


Fig. 22e. *Glycera lapidum* (P1341.3, 58795) – parapodium

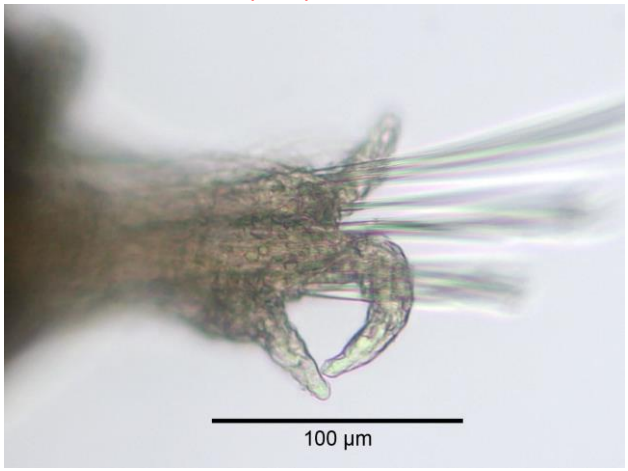


Fig. 22f. *Glycera celtica* (413251, 41864) – parapodium

RT6723 – *Hesionura elongata* (Southern, 1914) (Figures 23a, 23b)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: eastern Scotland. Condition: Fair. Size: Medium. All specimens from one sample.

Fig. 23a. *Hesionura elongata* (RT6723; 13254, 77897) – D

One generic and specific difference: Lab 08 identified as *Microphthalmus* (Figures 23c, 23d) (which have a median antenna and only two pairs of tentacular cirri).

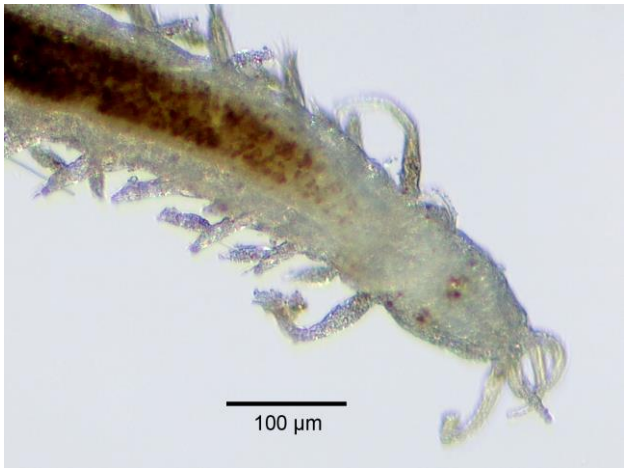


Fig. 23b. *Hesionura elongata* (RT6723; 13254, 77897) – D

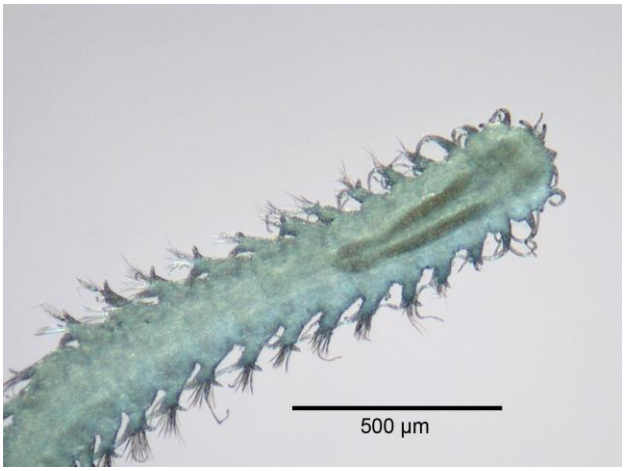


Fig. 23c. *Microphthalmus* (P2730, 61401) – D

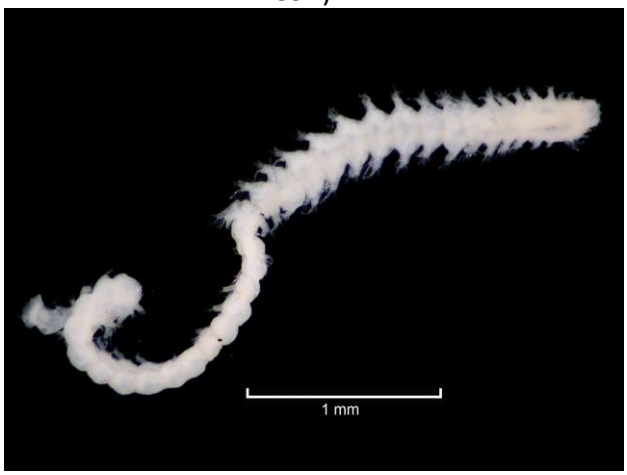


Fig. 23d. *Microphthalmus* (P2730, 61401) – D

RT6724 – *Abra tenuis* (Montagu, 1803) (Figure 24a)

Substratum: Mud. Salinity: Variable (Euryhaline). Depth: Intertidal. Geography: southeast England. Condition: Good. Size: Medium, 3-4 mm. All specimens from one sample.

Fig. 24a. *Abra tenuis* (RT6724; 11911, 74814) – L

No generic or specific differences recorded.

RT6725 – *Glycymeris glycymeris* (Linnaeus, 1758) (Figure 25a)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: Wales. Condition: Good. Size: Large, 45-55 mm. Specimens from three samples.

Fig. 25a. *Glycymeris glycymeris* (RT6725; 9317, 74378) – L

No generic or specific differences recorded.

Taxonomic and Identification policy considerations highlighted by RT67

An important purpose for the ring test exercises is to highlight areas for further work in identification standardisation and taxonomic research. Several identification problems were highlighted through this exercise, discussed above.

Since RT61, more detailed notes have been provided for each of the families represented in the ring test, as progress towards a Taxonomic Discrimination Protocol (TDP) to standardise future data and help with the interpretation of past and current data. Since publication of a draft TDP (Worsfold *et al.*, 2023), it is intended that future RT bulletins include full discussions (TDP implications, with notes from previous RTs) and partial literature reviews (updates to the bibliography document, including recommendations and historical data implications) for the families included. Time has not allowed for complete reviews but notes progressed by RT67 for other families are included below.

Worsfold, T.M., Hall, D.J. & O'Reilly, M. (Ed.), 2023. *Development of standard recording policies for laboratory analysis of north-east Atlantic macrobenthos samples, including a draft Taxonomic Discrimination Protocol (TDP) down to Family level*. Report to the NMBAQC Scheme participants. 48pp, August 2023.

Annelida

Phyllodocidae (RT6723). The draft TDP flags Phyllodocidae for further work, due to taxonomic flux, different taxonomic levels currently used for taxa by labs and difficulties with juveniles and incomplete specimens. There have been several problems and the family will need to be revisited. Members of the *Eteone longa* and *Eumida sanguinea* complexes are given 'agg.' at APEM (and Fugro) but have been named as species at other laboratories. Hebog leave *Eumida* at genus. Others have left other phyllodocids at family or genus, with or without 'juv.'. *Hesionura elongata* was circulated in 1994 (RT0101), with 4% error, 2012 (RT4323), with 5% error and 2025 (**RT6723**). Most labs correctly identified **RT6723** (4% error).

Glyceridae (RT6722). The draft TDP suggests species level identifications for Glyceridae without separation of juveniles. *Glycera*, identified to species or complex by APEM, without separation of juveniles, have been identified at higher taxonomic levels by some laboratories (e.g. *Glycera* juv. for very small specimens at Marinescope). APEM record *G. lapidum*, with 'agg.' as it may be a complex. Glycerids were mainly identified using workshop guides before the publication of a global family revision (Böggemann, 2002). The revision provides good illustrations and identification resources but the distribution maps and remarks suggest that many species have been synonymised in error and may be re-validated in future. The synonymies of *Glycera rouxii* and *G. dayi* are maintained on WoRMS but questioned in guides produced for the 2006 Scheme workshop (O'Connor & Worsfold, 2006; Worsfold, T2007); Parapar & Moreira (2015) also retain these synonymised species. Typical *Glycera lapidum* were circulated in 2004 (RT2318), with 7% error and 2014 (RT4721), with 30% error. *Glycera capitata* was first circulated in 2025 (**RT6722**). Many labs (75% error) identified **RT6722** as *G. lapidum*. *Glycera lapidum* was considered a complex by O'Connor (1987) due to variation in parapodia and habitat range, irrespective of comparison with the *G. mimica/capitata* complex; *G. mimica* was retained as separate from *G. capitata*, as having triannulate segments. *G. mimica* was later synonymised with *G. capitata* by Böggemann (2002). Böggemann (2002) and Parapar & Moreira (2015) separate *G. lapidum* and *G. capitata* using features of the proboscis (inverted in the circulated specimens) and the relative sizes of the prechaetal lamellae; they do not include the chaetal structure difference, which is given by O'Connor (1987) and reproduced by O'Connor & Worsfold (2006). The proboscis papilla difference may be of value, as the SEM of *G. lapidum* in Böggemann (2002) shows strongly convoluted ridges

on the papillae, though some RT6722 material had slight undulations to the ridge. An aileron difference given by Böggemann (2002) but not in the key given by Parapar & Moreira (2015) seems too subtle to be of use and is unlikely to have been checked in many specimens; the illustrations in Parapar & Moreira (2015) are clearer than those in Böggemann (2002), though stated as derived from them. We considered the relative lengths of the prechaetal lobes to be closer to those illustrated for *G. capitata*, though the wording in Böggemann (2002) suggests a lesser difference than shown in their illustrations. Similarly, the wording of the chaetal shaft difference in O'Connor (1987) suggests a complete lack of cleft in *G. mimica* (? = *G. capitata*); the RT6722 specimens had a much less distinct cleft than typical *G. lapidum*. As with many *Glycera*, the distributions and depth ranges given by Böggemann (2002) indicate that several species are conflated within both their *G. lapidum* and their *G. capitata*. Variation is also apparent within British material, including specimens with intermediate prechaetal lobe dimensions and wide habitat and depth ranges. We would recommend retention of 'agg.' for *G. lapidum* and further discussion is needed for *G. capitata* and whether it should be included in the *G. lapidum* complex in data.

Böggemann, M., 2002. Revision of the Glyceridae Grube 1850 (Annelida: Polychaeta). *Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft Frankfurt am Main*, 555, 1-249.

O'Connor, B.D.S., 1987. The Glyceridae (Polychaeta) of the North Atlantic and Mediterranean, with descriptions of two new species. *Journal of Natural History*, 21, 167-189.

O'Connor, B.D.S. & Worsfold, T.M., 2006. *Keys to and Literature on Glyceridae and Goniadiadae*. BEQUALM/NMBAQC 2006 Taxonomic Workshop, Dove Marine Lab., Nov. 2006, 26pp., (unpublished).

Parapar, J. & Moreira, J., 2015. *Familia Glyceridae* Grube, 1850. In: Parapar, J., Moreira, J., Núñez, J., Barnich, R., Brito, M. del C., Fiege, D, Capacciano-Azzati, R. & El-Haddad, M. *Annelida Polychaeta IV*. *Fauna Ibérica*, 41. Ramos M.A. et al. (Eds). Museo Nacional de Ciencias Naturales. CSIC. Madrid, 12-51.

Worsfold, T.M., 2007. Identification guides for the NMBAQC Scheme: 2. Goniadidae, with notes on Glyceridae (Polychaeta) from shallow seas around the British Isles. *Porcupine Marine Natural History Society Newsletter*, 22, 19-23.

Capitellidae (RT6715). The draft TDP flags Capitellidae for further work, due to taxonomic flux and different taxonomic levels currently used for different taxa by different labs, for some genera. APEM (and Fugro) identify most, including *Notomastus*, at genus level; species level for monotypic (in northern Europe) genera. *Heteromastus filiformis* was circulated in 1994 (RT0307), with 9% error, 2012 (RT4318), with 9% error and 2025 (**RT6715**). Most labs identified **RT6715** correctly (4% error). Labs 12 and 14 noted that they usually leave *Heteromastus* at genus. APEM currently treat the estuarine form as *H. filiformis* and leave offshore records at genus; offshore specimens are smaller and there is no distribution continuity.

Ophelidae (RT6718). The draft TDP flags Ophelidae for further work, mainly due to differences between labs, in the treatment of juveniles. Policies vary between laboratories for sizes to record Opheliidae as juvenile, with some (such as Ocean Ecology) separating genera. APEM identify most *Ophelina* to species but leave juveniles at family level if below 5mm, with the exception of certain small species that rarely exceed that size. Fugro leave *Ophelia* as juveniles to Genus if they have a rounded prostomium. *Polyophthalmus pictus* was first circulated in 2025 (**RT6718**). Most labs correctly identified **RT6718** (4% error). Lab 12 noted that *P. pictus* may be an aggregate.

Ampeliscidae (RT6706, RT6717). The draft TDP flags Ampeliscidae for further work, due to taxonomic flux, different taxonomic levels currently used for taxa by labs and difficulties with juveniles and incomplete specimens. APEM currently attempt identification of *Ampelisca* to species but separate juveniles (passing through a 1mm mesh) at genus. As for most amphipods, identifications begin with Lincoln (1979) but many species have been described or recognised from UK waters, since. *Ampelisca provincialis* was first circulated in 2025 (**RT6706**). About half of the labs correctly identified **RT6706** (46% error). Lab 20 noted that their specimen was an intersex male (they were selected as females) and that it could be *A. latifrons*. *A. provincialis* was excluded from Lincoln (1979), as it was then known only from the Mediterranean (Bellan-Santini & Kaïm-Malka, 1977) but it was later described from Irish waters (Myers & McGrath, 1994). *Ampelisca brevicornis* was circulated in 1996 (RT0719), with 6% error, 2004 (RT2409), with 0% error, 2011 (RT4116), with 4% error and 2025 (**RT6717**). Most labs correctly identified **RT6717** (4% error), a species included in Lincoln (1979)**.**

Bellan-Santini, D. & Kaïm-Malka, R.A., 1977. *Ampelisca* nouvelles de Méditerranée (Crustacea, Amphipoda). *Bolletino del Museo Civico di Storia Naturale di Verona*, 4, 479-523.

Lincoln, R., 1979. *British marine Amphipoda: Gammaridea*. British Museum (Natural History), London, 658 pp.

Myers, A.A. & McGrath, D., 1994. *Ampelisca dalmatina* and *A. provincialis* (Amphipoda: Gammaridea) in Irish waters. *Journal of the Marine Biological Association of the United Kingdom*, 74, 403-412.

Urothoidae (RT6716). The draft TDP suggests species identifications for **Urothoidae**, as currently done at APEM, without separation of juveniles. although there may be occasional specimens that must be left at genus, if only the anterior of the body is present. *Urothoe poseidonis* was circulated in 2002 (RT2002), with 20% error, 2012 (RT4313), with 14% error and 2025 (**RT6716**). Most labs correctly identified **RT6716** (13% error). The identification as *Urothoe grimaldii* by Lab 07 stimulated further literature review and the realization that not all *Urothoe* in northern Europe can be identified using Lincoln (1979). *U. poseidonis* has, at times, been synonymised with *U. grimaldii* but both species are valid on WoRMS and distinguished by Conradi et al. (1995), along with new species and a further Atlantic species is described by Bellan-Santini et al. (2004). The recently described species are from further south but *U. grimaldii* is recorded from as far north as the Bay of Seine (Dauvin, 2022). An additional species, *U. bairdii*, described from the Moray Firth (Spence Bate & Westwood, 1861-1863), seems to have been ignored in recent years. Another genus is known from deep water (Jaume & Sorbe, 2001).

Bellan-Santini, D. & Menioui, M., 2004. Une nouvelle espèce d'*Urothoe*, *Urothoe atlantica* (Crustacea: Amphipoda: Urothoidae) de la côte atlantique du Maroc. *Cahiers de Biologie marine*, 45(4), 305-312.

Conradi, M., Lopez-Gonzalez, P.J. & Bellan-Santini, D., 1995. A new species of *Urothoe* (Amphipoda, Gammaridea) from the Iberian Peninsula. *Cahiers de Biologie marine*, 36(1), 9-13.

Dauvin, J.-C., 2022. An update of Amphipoda checklist for the English Channel. *Diversity*, 14, 783, 1-19.

Jaume, D. & Sorbe, J.-C., 2001. A new bathyal amphipod from the Bay of Biscay: *Carangolia barnardi* sp.nov. (Gammaridea: Urothoidae). *Journal of the Marine Biological Association of the United Kingdom*, 81(1), 49-60.

Lincoln, R., 1979. *British marine Amphipoda: Gammaridea*. British Museum (Natural History), London, 658 pp.

Spence Bate, C.S. & Westwood, J.O., 1861-1863. *A history of the British sessile-eyed Crustacea*. Vol. 1. John Van Voorst, London. 507 pp.

Amphilochidae (RT6703). The draft TDP suggests species identifications for amphilochids, without separation of juveniles, as currently done at APEM. *Amphilochus tenuimanus* was first circulated in 2025 (**RT6703**). Most labs identified **RT6703** correctly (8% error). Tandberg & Vader (2018) give a pictorial key to North Atlantic amphilochids, including deep water species.

Tandberg, A.H.S. & Vader, W.V., 2018. On a new species of *Amphilochus* from deep and cold Atlantic waters, with a note on the genus *Amphilochopsis* (Amphipoda, Gammaridea, Amphilochidae). *ZooKeys*, 731, 103-134.

Melitidae (RT6709). The draft TDP suggests species identifications for melitids, without qualifiers for females or juveniles, as done at APEM. *Melita palmata* was circulated in 2001 (RT1713), with 6% error and 2025 (**RT6709**). Most labs correctly identified **RT6709** (21% error), a species included in Lincoln (1979); a non-native, *M. nitida*, may also be found (Gouillieux et al., 2016)**.**

Gouillieux, B., Lavesque, N., Blanchet, H. & Bachelet, G., 2016. First record of the non-indigenous *Melita nitida* Smith, 1873 (Crustacea: Amphipoda: Melitidae) in the Bay of Biscay (NE Atlantic). *BioInvasions Records*, 5(2), 85-92.

Lincoln, R., 1979. *British marine Amphipoda: Gammaridea*. British Museum (Natural History), London, 658 pp.

Photidae (RT6713). The draft TDP suggests species identifications for photids, without qualifiers for females or juveniles, as currently done at APEM. *Gammaropsis palmata* was circulated in 2010 (RT3924), with 8% error and 2025 (**RT6717**). Most labs correctly identified **RT6717** (17% error), a species included in Lincoln (1979); other *Gammaropsis* have since been recorded (Myers & McGrath, 1982)**.**

Myers, A.A. & McGrath, D., 1982. Taxonomic studies on British and Irish amphipoda. The genus *Gammaropsis*. *Journal of the Marine Biological Association of the United Kingdom*, 62, 93-100.

Anthuridae (RT6720). The draft TDP suggests species identifications for anthurids, without separation of juveniles, as done at APEM. *Anthura gracilis* was first circulated in 2025 **(RT6720**). All labs identified **RT6720** correctly.

Gnathiidae (RT6712). The draft TDP suggests species identifications for adult, male gnathiids, with qualifiers for juveniles and females, at Family. There have been different policies used at different laboratories for gnathiids. The TDP is to record 'Gnathiidae female' and 'Gnathiidae juvenile' and identify adult males. Ocean Ecology record females and pranizae (juveniles) at Genus. There is a distinct but undescribed species, named *Gnathia* 'species A' at APEM and other potential undescribed members of the *G. oxyuraea* complex are separated at Fugro. *Gnathia dentata* was first circulated in 2025 **(RT6712**). Most labs identified **RT6712** correctly (4% error).

Processssidae (RT6707). The draft TDP suggests species identifications for adult processids, with qualifiers for larval forms (zoea and megalopa), at Order, as done at APEM. *Processa nouveli* was first circulated in 2025 **(RT6707**). Most labs identified **RT6707** correctly (25% error). Some labs included the subspecies name: *holthuisi*, which would apply to all northern European *P. nouveli*

records. APEM usually exclude subspecies and subgenera from records; some discussion may be useful but the variation should rarely cause problems.

Callianassidae (RT6704). The draft TDP suggests species identifications for adult callianassids, with juveniles separated at Species at 10mm carapace length and qualifiers for larval forms (zoea and megalopa), at Order. APEM separate juvenile Callianassidae at 10mm carapace length but identify to Species; Fugro separate juveniles at 5mm total body length and leave at Family. *Callianassa subterranea* (20-30mm total length) was first circulated in 2025 (**RT6704**). Most labs identified **RT6704** correctly (8% error).

Upogebiidae (RT6705). The draft TDP suggests species identifications for adult upogebiids, with juveniles separated at Species at 10mm carapace length and qualifiers larval forms (zoea and megalopa), at Order. APEM separate juvenile *Upogebia* at 10mm carapace length and leave at Genus; Fugro separate juvenile *Upogebia* at 5mm total body length and also leave at Genus. *Upogebia deltaura* (5-10mm carapace length) was first circulated in 2025 (**RT6705**). All labs identified **RT6705** correctly.

Mollusca

Leptochitonidae (RT6710). The draft TDP suggests species identifications for leptochitonids, without separation of juveniles, as currently done at APEM. Some laboratories (e.g., Marinescope) have left some juveniles at family or class. APEM (and Fugro and Thomson Ecology) identify all at species level, without qualifiers. Most do not grow large and can be identified with reference to larger material from the same project, if juvenile. Chitons have usually been identified using Jones & Baxter (1987), although there are other species in deeper water and to the North and South. Leptochitonidae were reviewed globally (Kaas & Van Belle, 1985) but a few others have been described, since (Carmona Zalvide et al., 1999; 2004). *Leptochiton asellus* was circulated in 2002 (RT2025), with 27% error and 2025 (**RT6710**). Most labs identified **RT6710** correctly (29% error).

Carmona Zalvide, P. & Urgorri, V., 1999. Descripción de dos nuevas especies de Moluscos Poliplacóforos en el litoral Atlántico de la Península Ibérica: *Leptochiton (L.) gascognensis* Kaas y van Belle, 1985 y *L. (L.) compostellanum* n. sp. *Iberus*, 17(2), 97-107.

Carmona Zalvide, P., Urgorri, V. & García, F.J., 2004. Two new species of *Leptochiton* Gray, 1847 (Polyplacophora) from the Iberian Peninsula (eastern Atlantic coast). *The Nautilus*, 118(4), 144-151.

Jones, A. & Baxter, J., 1987. *Molluscs: Caudofauveata, Solenogastres, Polyplacophora and Scaphopoda*. Synopses of the British Fauna (NS), No. 37. Published for The Linnean Society of London and The Estuarine and Brackish Water Sciences Association by E. J. Brill/ Dr. W. Backhuys, 123 pp.

Kaas, P. & Van Belle, R.A., 1985. *Monograph of living chitons (Mollusca: Polyplacophora) 1, Order Neoloricata: Lepidopleurina*. E.J. Brill / W. Backhuys, Leiden, 240 pp.

Littorinidae (RT6711). The draft TDP suggests species identifications for littorinids without separation of juveniles, as currently done at APEM. Some laboratories have left juvenile Littorinidae at family or genus (e.g. Marinescope; noted for RT6711) and may have done the same with damaged specimens. APEM identify to species, without separation of juveniles. They do not grow large and can be identified with reference to larger material from the same project, if juvenile. Littorinids are mainly intertidal and more commonly recorded *in situ*; most species are found only in low numbers in macrobenthos samples but they should be identifiable, or

correctable, with experience and reference collection audits. Littorinids were traditionally classified as mesogastropod prosobranch gastropods and the first Linnean Society guide (Graham, 1971) included only common species, with more detail in a series of volumes (Fretter & Graham, 1980, for littorinids), while the next update (Graham, 1988), based on these, became the standard for many years. The next updates were divided between revised taxonomic groups, with littorinids within the Littorinimorpha volume (Wigham & Graham, 2017), though that order is likely polyphyletic (Li et al., 2024) and more taxonomic movements will come for gastropod higher taxa. Wigham & Graham (2017) excludes several species included in Graham (1988), as well as many deeper water and recent records. *Littorina littorea* was circulated in 1995 (RT0601), with 5% error, 2000 (RT1501), with 6% error and 2025 (**RT6711** – juvenile specimens). Most labs identified **RT6711** correctly (25% error). Labs 12, 18 and 20 noted that they would have left them at genus. The sculpture and shape of juvenile *L. littorea* are distinctive, while juveniles in the *L. saxatilis* complex are more variable but consistently more rounded and less evenly sculptured. *L. saxatilis* (RT0615, RT1708, RT4120) and *L. arcana* (named for **RT6711** by one lab) require dissection for certain identification and are indistinguishable as juveniles, while *L. compressa* adults (RT5325) are identifiable. Wigham & Graham (2017) refers to the everted area at the base of the aperture as a distinguishing feature for *L. arcana* but this is a juvenile feature for *Littorina* spp. As *L. arcana* is restricted to rock at exposed intertidal sites it may be reasonable to default to *L. saxatilis* for members of the *L. saxatilis/arcana* complex found in core or grab samples. *L. obtusata* (RT2911) is distinctly different from the above but resembles *L. fabalis*. The projecting base to the aperture shown in the illustration for *L. fabalis* in Wigham & Graham (2017) from is a juvenile feature of *L. obtusata*; the illustration appears to be from Hayward & Ryland (1990) and may result from a misunderstanding of the 'constricted throat' described by Fretter & Graham (1980). All four UK *Lacuna* species have been previously circulated: *L. vincta* (RT0505, RT2311, RT3617, RT4215, RT6218), *L. pallidula* (RT6225), *L. parva* (RT1015, RT2614), *L. crassior* (RT0701, RT1512).

Fretter, V. & Graham, A., 1980. The prosobranch molluscs of Britain and Denmark. Part 5 - Marine Littorinacea. *Journal of Molluscan Studies*, Supplement 7, 242-284.

Graham, A., 1971. *British Prosobranch and other operculate Gastropod Molluscs*. *Keys and notes for the identification of the species*. Synopses of the British Fauna (New Series), No. 2. Published for The Linnean Society of London by Academic Press, London & New York, 112 pp.

Graham, A., 1988. *Molluscs: prosobranch and pyramidellid gastropods*. *Keys and notes for the identification of the species*. Synopses of the British Fauna (New Series), No. 2. (Second Edition). Published for The Linnean Society of London and The Estuarine and Brackish-Water Sciences Association by E. J. Brill/ Dr. W. Backhuys, Leiden, New York, København, Köln, 662 pp.

Hayward, P.J. & Ryland, J.S., 1990. *The marine fauna of the British Isles and North-West Europe: Volume 1: Introduction and protozoans to arthropods*. Clarenden Press, Oxford, 1-627pp.

Li, F., Li, W., Zhang, Y., Wang, A., Liu, C., Gu, Z. & Yang, Y., 2024. The molecular phylogeny of Caenogastropoda (Mollusca, Gastropoda) based on mitochondrial genomes and nuclear genes. *Gene*, 928, p.148790.

Wigham, G.D. & Graham, A., 2017. *Marine Gastropods 2: Littorinimorpha and other unassigned Caenogastropoda*. Synopses of the British Fauna (New Series), No. 61. Published for The Linnean Society of London by the Field studies Council, Shrewsbury, 343 pp.

Nassariidae (RT6721). The draft TDP suggests species identifications for nassariids without separation of juveniles, as currently done at APEM. *Tritia varicosa* was first circulated in 2025 **(RT6721**). Most labs identified **RT6721** correctly (29% error) but several recorded as *T. reticulata*

or *T. nitida*. Labs 17 and 22 noted sculpture differences from typical *T. varicosa*. The specimens were subadult: near adult size but with incomplete outer lip sculpture. All UK *Tritia* have teeth within the outer lip as adults but these are missing in growing specimens of all species. The current Linnean Society guide (Wigham & Graham, 2018) seems to be only partially updated from the previous version (Graham, 1988). It does not clarify the maturity differences, uses superseded nomenclature and excludes a fourth UK species and another that may arrive in future. The circulated specimens were checked for an additional varix to the outer lip, which would have excluded *T. reticulata* and *T. incrassata*. The fourth species, *T. nitida* is discussed as a variety of *T. reticulata* in Fretter & Graham (1985) and Graham (1988) but excluded from Wigham & Graham (2016). The first figure of *T. reticulata* in Wigham & Graham (2016) is juvenile; the second is *T. nitida* (noted as 'var *nitida*' in Graham, 1988). Although *T. nitida* most closely resembles *T. reticulata*, it may have varices, making it technically more difficult to avoid confusion with *T. varicosa*. The four British *Tritia* are distinguished in Smith & Taylor (2019), Smith (2023) and Smith & Taylor (2024) but mostly using adult features. However, the varices of *T. nitida* are said to be on the body whorl of specimens over 15mm, such that they would be absent on specimens of the size circulated as RT6721. Other species that may be recorded from UK waters in future include *T. neritea*, which has reached Brittany (Sauriau, 1991) and *Ilyanassa obsoleta*, a northwest Atlantic species that is established on US west coast (Carlton, 1992) and could spread elsewhere. Trigo et al. (2018) illustrate three other southern European *Tritia* species that have been recorded as far north as Galicia: *T. corniculum*, *T. ovoidea* and *T. pfeifferi*.

Carlton, J.T., 1992. Introduced marine and estuarine molluscs of North America: an end-of-the-20th-century perspective. *Journal of Shellfish Research,* 11(2), 489-505.

Fretter, V. & Graham, A., 1985. The prosobranch molluscs of Britain and Denmark. Part 8 - Neogastropoda. *Journal of Molluscan Studies*, Supplement 15, 435-556.

Graham, A., 1988. *Molluscs: prosobranch and pyramidellid gastropods*. *Keys and notes for the identification of the species*. Synopses of the British Fauna (New Series), No. 2. (Second Edition). Published for The Linnean Society of London and The Estuarine and Brackish-Water Sciences Association by E.J. Brill/ Dr. W. Backhuys, Leiden, New York, København, Köln, 662 pp.

Sauriau, P.G., 1991. Spread of *Cyclope neritea* (Mollusca: Gastropoda) along the north-eastern Atlantic coasts in relation to oyster culture and to climatic fluctuations. *Marine Biology*, 109(2), 299-309.

Smith, I.F., 2023. *Tritia incrassata* (Strøm, 1768) Identification and biology. DOI: 10.13140/RG.2.2.25524.53127.

Smith, I.F. & Taylor, S., 2019. Recognition of *Tritia nitida* (Jeffreys, 1867) in Britain and Ireland. *Mollusc World*, 51, 3-4.

Smith, I.F. & Taylor, S., 2024. *Tritia reticulata* (Linnaeus, 1758) Identification and biology. DOI: 10.13140/RG.2.2.13727.33442.

Trigo, J.E., Agras, G.J.D., Álvarez, Ó.L.G., Sierra, Á.G., da Rocha, J.M., Dieste, J.P., Rolán Mosquera, E., Troncoso, J.S. & Urgorri, V., 2018. *Guía de los Moluscos Marinos de Galicia*. Troncoso, J.S., Trigo, J.E. & Rolán Mosquera, E. (Eds). Servicio de Publicacións da Universidade de Vigo, 836 pp.

Wigham, G.D. & Graham, A., 2018. *Marine Gastropods 3: Neogastropoda*. Synopses of the British Fauna (NS), No 62. Published for The Linnean Society of London by the Field studies Council, 206 pp.

Acteonidae (RT6701). Acteonids were inadvertently excluded from the draft TDP. APEM identify acteonids to species, without separation of juveniles. Small *Acteon tornatilis* were first circulated in 2025 (**RT6701**). All labs identified **RT6701** correctly.

Glycymeridae (RT6725). The draft TDP suggests species identifications for glycymerids, with separation of juveniles (at species level) at 10mm, as at APEM. *Glycymeris glycymeris* was circulated in 2008 (RT3418), with 0% error, 2010 (RT3907), with 21% error and 2025 (**RT6725**). All labs identified **RT6725** correctly.

Mytilidae (RT6705). The draft TDP flags mytilids for further work, mainly due to differences between labs, in the treatment of juveniles. The notes below relate only to *Crenella*, which APEM speciate at all sizes, without separation of juveniles. *Crenella decussata* was circulated in 2000 (RT1516), with 6% error, 2008 (RT3412), with 12% error, 2012 (RT4201), with 4% error, 2014 (RT4612), with 0% error and 2025 (**RT6705**). All labs identified **RT6705** correctly.

Limidae (RT6702). The draft TDP highlights limids for further work due to variation in lab policy. APEM speciate without separation of adults and juveniles, although some very small specimens from deeper water may be left at genus. Fugro separate juvenile *Limatula* at 3mm and leave at Genus. *Limatula subauriculata* was circulated in 2000 (RT1524), with 44% error, 2006 (RT2924), with 50% error and 2025 (**RT6701**). Half of the labs identified **RT6701** correctly (50% error), with all alternative names as *Limatula gwyni*. The small size of the circulation would have made identification difficult and it is unfortunate that the most recent *Limatula* revision (Allen, 2004) excludes *L. gwyni* from the main section. The growth series presented here may help; otherwise reference can be made to the NMW website (https://naturalhistory.museumwales.ac.uk/BritishBivalves/browserecord.php?-recid=142).

Allen, J.A., 2004. The Recent species of the genera *Limatula* and *Limea* (Bivalvia, Limacea) present in the Atlantic, with particular reference to those in deep water. *Journal of Natural History*, 38(20), 2591-2653.

Cardiidae (RT6708). The draft TDP flags Cardiidae for further work, mainly due to difficulties with juveniles. Some other laboratories have left all perceived cardiid juveniles (some juvenile *Parvicardium* records have been adult) at family (Fugro record 'Cardiidae juv.' Below 1mm, except *Laevicardium*, which they speciate at all sizes without separation of adults and juveniles); sometimes superfamily (there is only one living family in Cardioidea; use of superfamilies usually results from their being the main key unit in Tebble, 1956). APEM speciate *Parvicardium* and *Papillocardium* (without separation of juveniles) and, usually, other cardiid genera with segregation of juveniles. Fugro record *Acanthocardia* and *Cerastoderma* at Genus as juveniles between 1mm and 5mm. APEM separate *Acanthocardia* and L*aevicardium* juveniles at 10mm (Genus for *Acanthocardia*). APEM (and Fugro) separate juvenile *Cerastoderma* below 5mm, speciated at APEM (Genus at Fugro). *Papillicardium minimum* was circulated in 2008 (RT3522), with 32% error, 2009 (RT3721), with 30% error, 2012 (RT4202), with 8% error (all above as *Parvicardium minimum*) and 2025 (**RT6708**). Most labs identified **RT6708** correctly (4% error).

Semelidae (RT6724). The draft TDP flags Semelidae for further work, mainly due to difficulties with juveniles. Many laboratories have left juvenile *Abra* at genus (e.g. Fugro if <3mm; Marinescope, if <2mm), sometimes family or superfamily, and may have done the same with damaged specimens. More work is needed. APEM identify almost all *Abra* (unless very badly damaged), without separation of juveniles. Laboratories have also varied in separation of *Scrobicularia plana* juveniles; APEM separate them at 10mm. *Abra tenuis* was circulated in 2001 (RT1711), with 17% error, 2006 (RT2912), with 14% error, 2008 (RT3401), with 12% error, 2014 (RT4608), with 0% error and 2025 (**RT6710**). All labs identified **RT6710** correctly.

Myidae (RT6714). The draft TDP flags Myidae for further work, mainly due to difficulties with juveniles. Many laboratories have left juvenile Myidae at genus, sometimes family. APEM speciate Myidae (with separation of adult and juvenile *Mya* at 10mm). Fugro (and Marinescope; noted for

RT6714) separate juvenile *Mya* below 10mm and leave at Genus. Most guides describe only adults, which are large, although many juveniles are photographed for the online guide (Oliver et al., 2016). *Mya truncata* was circulated in 2006 (RT2709: not on website, no record of size), with 47% error and 2007 (RT3206: juveniles, no measurement but 2-4mm by photo), with 43% error. *Mya arenaria* was circulated in 1996 (RT0811: not on website, no record of size), without error, 1998 (RT1204: not on website, no record of size), with 28% error, 2008 (RT3424: juveniles, no measurement but in 4-6mm range by photo), with 16% error (4 labs named as *M. truncata*), 2011 (RT4013: juveniles, no measurement but in 1-3mm range by photo), with 18% error (2 non-myid; 2 labs named as *M. truncata*), 2015 (RT4917: juveniles, about 1mm), with 45% error (5 non-myid; 4 labs named as *M. truncata*) and 2025 (**RT6714**). Most labs identified **RT6714** correctly (33% error). Labs 18 and 20 noted that they would have left them at genus. The third British myid, *Sphenia binghami*, was circulated in 2015 (RT4903), with 20% error; all for non-myids but *S. Binghami* was named for RT4917 by one lab. We originally considered the **RT6714** specimens to be *M. Truncata* but composition of the growth series photos for this bulletin and comments from Fugro showed them to be *M. arenaria*. The truncate posterior used to identify adult does is not apparent until shells are over 40mm. Juvenile *M. truncata* have elongate shells that are liable to be confused with *M. arenaria* but with more parallell dorsal and ventral margins (more sloping posterior dorsal margin in *M. arenaria*); the differences are clear in shells below 5mm. This RT has shown that the most problematic specimens are those of medium size (5-40mm), which have similar shapes in both species. There is some evidence that *M. Truncata* has a more projecting posterior and stronger growth lines at these sizes but the most reliable identification method may be examination of the shape of the juvenile shell within the 1-5mm growth lines. The (APEM) 10mm juvenile size definition was based, in-part, on identification consistency with the assumption that the smallest specimens were the most difficult to identify but it is now clear that medium-sized specimens have been the most likely to generate errors. We will retain the policy, with review of methods, but more discussion is needed for inter-laboratory comparability.

Oliver, P.G., Holmes, A.M., Killeen, I.J. & Turner, J.A., 2016. *Marine Bivalve Shells of the British Isles*. Amgueddfa Cymru - National Museum Wales. Available from: http://naturalhistory.museumwales.ac.uk/britishbivalves [Accessed: 21 February 2025].

Acknowledgements

We would like to thank all participants who provided feedback following issue of interim results, particularly Fugro, for comments on *Mya*; Labs 17 and 22, for comments on *Tritia* and Maria Bacelar Martinez of MBM Benthic Identification Services, for comments on *Glycera*.

Index (Figures)

Littorina littorea (Linnaeus, 1758) 11a, 11d, 11f, 11h

Littorina saxatilis (Olivi, 1792) 11b, 11e, 11g, 11i

Lutraria Lamarck, 1799 ..... 14p, 14q, 14r

Lutraria angustior R.A. Philippi, 1844 ..... 14s

Melita hergensis Reid, 1939 ..... 9b

Melita palmata (Montagu, 1804) 9a

Microphthalmus Mecznikow, 1865 ..... 23c, 23d

Mya arenaria Linnaeus, 1758 ..... 14a, 14b, 14d, 14f, 14h, 14j, 14l, 14n

Mya truncata Linnaeus, 1758 ..... 14c, 14e, 14g, 14i, 14k, 14m, 14o

Notomastus latericeus (Sars, 1851 ..... 15b

Ophelina abranchiata Støp-Bowitz, 1948 ..... 18b

Papillicardium minimum (R.A. Philippi, 1836) 8a

Parvicardium pinnulatum (Conrad, 1831) 8b

Polyophthalmus pictus (Dujardin, 1839) 18a

Processa canaliculata Leach, 1815 ..... 7d

Processa edulis crassipes Nouvel & Holthuis, 1957 ..... 7b

Processa nouveli holthuisi Al-Adhub & Williamson, 1975 ..... 7a

Processa modica Modica Williamson in Williamson & Rochanaburanon, 1979 ..... 7c

Sophrosyne Stebbing, 1888 ..... 3c

Stenosemus albus (Linnaeus, 1767) 10c

Tritia nitida (Jeffreys, 1867) 21j, 21l

Tritia reticulata (Linnaeus, 1758) 21c, 21e, 21g, 21i, 21k

Tritia varicosa (W. Turton, 1825) 21a, 21b, 21d, 21f, 21h, 21m

Upogebia deltaura (Leach, 1816) 19a

Urothoe elegans Spence Bate, 1857 ..... 16c, 16f

Urothoe poseidonis Reibish, 1905 ..... 16a, 16d

Urothoe pulchella (A. Costa, 1853) 16b, 16e

Ring Test Specimen Return Instructions

Please return all ring test specimens by 2nd May 2025. 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