NMBAQC

NE Atlantic Marine Biological Analytical Quality Control Scheme

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Ring Test Bulletin – RTB#68: changes to Howson & Picton (1997)

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July 2025
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Ring Test 68 Details

Ring Test #68 (Year 31)
Type/Contents – Targeted, changes to Howson & Picton (1997)
Circulated – 10/03/25
Results deadline – 16/05/25
Number of Subscribing Laboratories – 23
Number of Participating Laboratories – 19*
Number of Results Received – 19
* Labs 02, 07, 08 and 15 submitted no results

Ring Test Specimen Return Instructions

Please return all ring test specimens by 31st July 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., Unit 3, The Orbital Centre,
Icknield Way, Letchworth Garden City, Hertfordshire SG6 1ET, UK

Introduction to Ring Test 68

RT68 was targeted on changes to Howson & Picton (1997). The first attempt to list British and Irish marine species (Howson, 1987) was updated as the Species Directory (Howson & Picton, 1997), which became a standard resource for many years, together with its code system for the generation of taxonomic sequence. It was restricted to species found shallower than 200m and was never updated in the same form but WoRMS includes a regional sub-register of Marine Species of the British Isles and Adjacent Seas (MSBIAS), also in need of review. The aim of RT68 was to focus on species described or recorded for UK waters since Howson & Picton (1997) but it also includes a few name changes, as well as some species from transitional waters or below 200m. RT68 also introduced an option for participants to identify the target theme, which will not be revealed in future RTs before the interim report.

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.

Species are selected to improve our understanding of the fauna. This may be through inclusion of species not previously sent: RT68 included fourteen species never previously sent, as well as two that had been previously sent under different names. 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. Eleven (44%) of the 25 specimens circulated were annelids, seven (28%) were molluscs, six (24%) were arthropods and one (4%) was a foraminiferan. 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.

Howson, C.M. (ed.), 1987. *Directory of the British marine fauna and flora. A coded checklist of the marine fauna and flora of the British Isles and its surrounding seas*. Marine Conservation Society, Ross-on-Wye. 471pp.

Howson, C.M. & Picton, B.E. (Eds.), 1997. *The species directory of the marine fauna and flora of the British Isles and surrounding seas*. Ulster Museum and the Marine Conservation Society, Belfast and Ross-on-Wye, Ulster Museum Publication No. 276, vi + 508 pp.

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

Summary of differences

The species circulated, size, sex and condition are listed in Table 1, with a summary of differences. Participants were encouraged to question APEM Ltd. identifications where they believed their original identifications to be correct, following circulation of interim results. The full results are given in Table 2, with data arranged with species as columns to enable quick reference to the range of answers received and in Table 3, which presents the results with laboratories as columns.

There were 47 generic level differences (10% of all, 475, genus identifications received from participants) recorded in the 19 data sets received from 19 participating laboratories and 97 species level differences (20% of all, 475, species identifications received from participants). The results were within the mid-range of errors from previous exercises. There were 71 specific differences for annelids, 18 for arthropods, 5 for molluscs and 3 for others; numbers of generic differences per major group were 20, 10, 4 and 3, respectively.

Four of the species circulated were responsible for just over 40% of participants' species level identification differences. These were the oligochaete annelid *Branchiura sowerbyi*, the polychaete annelids *Hypereteone lighti* and *Paucibranchia totospinata* and the isopod crustacean *Nannoniscoides angulatus*. Five of the twenty-five specimens circulated: the isopod crustacean *Astacilla dilatata*, the bivalve mollusc *Thyasira sarsii* and the gastropod molluscs *Turritellinella tricarinata*, *Volvulella acuminata* and *Rapana venosa* were correctly identified by all participants. Most differences related to literature awareness. Most of the species circulated were missing from the most widely used literature and many would have been identified as related but incorrect species from the standard guides. The high error rate for *Branchiura sowerbyi* reflected wider problems with oligochaetes.

Table 1. Species circulated for RT68, with summary of differences

Specimen	Genus	Species	Condition / Size	Total differences for 19 returns	
				Genus	Species
RT6801	*Turritellinella*	*tricarinata*	fair, small, 3-5 mm	0	0
RT6802	*Hemigrapsus*	*takanoi*	fair, small female, 3-4 mm	1	2
RT6803	*Atherospio*	*guillei*	fair, medium, 15-17 chaetigers	3	3
RT6804	*Caprella*	*mutica*	fair, medium, female	1	2
RT6805	*Volvulella*	*acuminata*	fair, medium, 2-3 mm	0	0
RT6806	*Paucibranchia*	*totospinata*	fair, medium, > 50 chaetigers	1	8
RT6807	*Neogyptis*	*rosea*	fair, medium	6	7
RT6808	*Astrorhiza*	*arenaria*	good, medium, 5-10 mm	3	3
RT6809	*Syllis*	*parapari*	fair, medium	0	5
RT6810	*Hypereteone*	*lighti*	good, medium, anal cirri present	0	10
RT6811	*Astacilla*	*dilatata*	good, medium, 4-5 mm	0	0
RT6812	*Pholoe*	*assimilis*	good, medium, proboscis out	0	5
RT6813	*Laonice*	*irinae*	fair, medium, segments past nuchal organ	0	3
RT6814	*Thyasira*	*sarsi*	fair, medium, 7-13 mm	0	0
RT6815	*Caprella*	*mutica*	fair, medium, medium male	0	1
RT6816	*Yoldiella*	*propinqua*	good, medium, 4-5 mm	0	1
RT6817	*Pontocrates*	*moorei*	good, medium, female	0	5
RT6818	*Adontorhina*	*similis*	good, medium, 1-2 mm	1	1
RT6819	*Branchiura*	*sowerbyi*	fair, small	14	14
RT6820	*Pseudopolydora*	*nordica*	fair, small	0	3
RT6821	*Uncispio*	*reesi*	fair, small	6	6
RT6822	*Mytilopsis*	*leucophaeata*	fair, medium, 10-13 mm	3	3
RT6823	*Nannoniscoides*	*angulatus*	fair, small	8	8
RT6824	*Syllis*	*pontxioi*	good, medium, proboscis out	0	7
RT6825	*Rapana*	*venosa*	good, medium, 30-60 mm	0	0
			Total differences	**47**	**97**
			Average differences /lab.	**2.5**	**5.1**

Table 2. The identification of fauna made by participating laboratories for RT68 (arranged by specimen). Names are given only where different from the AQC identification.

	RT6801	RT6802	RT6803	RT6804	RT6805	RT6806	RT6807	RT6808	RT6809	RT6810	RT6811	RT6812	RT6813
Taxon	*Turritellinella tricarinata*	*Hemigrapsus takanoi*	*Atherospio guillei*	*Caprella mutica*	*Volvulella acuminata*	*Paucibranchia totospinata*	*Neogyptis rosea*	*Astrorhiza arenaria*	*Syllis parapari*	*Hypereteone lighti*	*Astacilla dilatata*	*Pholoe assimilis*	*Laonice irinae*
BI_3101	- -	- -	- -	- -	[Rhizorus] [acuminatus]	[Marphysa] -	- -	- -	- -	[Eteone] longa	- [dilitata]	- -	- -
BI_3103	- -	- -	Dipolydora caulleryi	- -	- -	Marphysa sanguinea	- -	Tubus arenarius	- cornuta	[Eteone] longa agg	- -	- baltica	- bahusiensis
BI_3104	- -	- -	- -	- -	- -	- bellii	Podarkeopsis capensis	- -	- -	- -	- -	- -	- -
BI_3105	- -	- -	- -	- -	- -	- -	- -	- -	- cornuta	- -	- -	- inornata	- -
BI_3106	- -	- -	- -	- -	- -	- -	- mediterranea	- -	- mercedesae	- -	- -	- inornata	- -
BI_3109	- -	- -	Dipolydora coeca	- -	- -	- bellii	Podarkeopsis capensis	- -	- prolifera	- foliosa	- -	- -	- bahusiensis
BI_3110	- -	- -	- -	- -	- -	- -	Gyptis propinqua	- -	- -	- heteropoda	- -	- -	- bahusiensis
BI_3111	- -	Pachygrapsus marmoratus	- -	Aeginina longicornis	- -	[Paucibranchiata] -	- -	- -	- -	- foliosa	- -	- inornata	- -
BI_3112	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_3113	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_3114	- -	- -	- -	- -	- -	- bellii	- -	- -	- -	- -	- -	- -	- -
BI_3116	- -	- sanguineus	- -	- linearis	- -	- -	Gyptis mackiei	- -	- -	[Eteone] suecica	- -	- -	- -
BI_3117	- -	- -	- -	- -	- -	- -	- -	- -	- -	- fauchaldi	- -	- -	- -
BI_3118	- -	- -	Scolelepis (Scolelepis) foliosus	- -	- -	- -	Oxydromus flexuosus	- -	- caeca	- foliosa	- -	- -	- -
BI_3119	- -	- -	- -	- -	- -	- bellii	- -	Epizoanthus papillosus	- -	- -	- -	- inornata	- -
BI_3120	- -	- -	- -	- -	- -	- bellii	- -	- -	- -	- foliosa	- -	- -	- -
BI_3121	[Turritellanella] -	- -	- -	- -	- -	- bellii	Gyptis mackiei	Epizoanthus papillosus	- -	- heteropoda	- -	- -	- -
BI_3122	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_3123	- -	- -	- -	- -	- -	- bellii	- -	- -	- -	- -	- -	- -	- -

Table 2 (cont.). The identification of fauna made by participating laboratories for RT68 (arranged by specimen). Names are given only where different from the AQC identification.

	RT6814	RT6815	RT6816	RT6817	RT6818	RT6819	RT6820	RT6821	RT6822	RT6823	RT6824	RT6825
Taxon	*Thyasira sarsii*	*Caprella mutica*	*Yoldiella propinqua*	*Pontocrates moorei*	*Adontorhina similis*	*Branchiura sowerbyi*	*Pseudopolydora nordica*	*Uncispio reesi*	*Mytilopsis leucophaeata*	*Nannoniscoides angulatus*	*Syllis pontxioi*	*Rapana venosa*
BI_3101	- [sarsi]	- -	- intermedia	- -	- -	- -	- -	- -	Mytilus edulis	- -	- -	[Rapena] -
BI_3103	- -	- -	- -	- -	- -	Heterodrilus subtilis	- paucibranchiata	Trochochaeta multisetosa	- -	Joeropsis brevicornis	- -	- -
BI_3104	- -	- -	- -	- norvegicus	- -	- -	- -	- -	- -	- -	- vittata	- -
BI_3105	- -	- -	- -	- -	- -	Tubificoides parapectinatus	- -	Polychaeta 0	- -	Munnopsidae 0	- pulvinata	- -
BI_3106	- -	- -	- -	- -	- -	Tubificoides parapectinatus	- -	Polychaeta 0	- -	Janiridae 0	- pulvinata	- -
BI_3109	- -	- -	- -	- arenarius	- -	Tubificoides amplivasatus	- -	- -	- -	Eugerda tenuimana	- variegata	- -
BI_3110	- -	- -	- -	- -	Mendicula pygmaea	Tubificoides parapectinatus	- paucibranchiata	Poecilochaetus serpens	- -	Paramunna bilobata	- hyalina	- -
BI_3111	- -	- -	- -	- arcticus	- -	Tubificoides scoticus	- pulchra	- -	- -	[Nannoiscoides] -	- -	- -
BI_3112	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_3113	- [sarsi]	- -	- -	- -	- -	Tubifex tubifex	- -	- -	- -	- -	- -	- -
BI_3114	- [sarsi]	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_3116	- [sarsi]	- septentrionalis	- -	- -	- -	Tubificoides parapectinatus	- -	- -	Dreissena bugensis	Nannoniscidae 0	- -	- -
BI_3117	- -	- -	- -	- -	- -	Potamothrix bavaricus	- -	- -	- -	- -	- -	- -
BI_3118	- -	- -	- -	- norvegicus	- -	Tubificoides insularis	- -	Atherospio disticha	Dreissena polymorpha	Paramunna bilobata	- pulvinata	- -
BI_3119	- -	- -	- -	- -	- -	Tubifex tubifex	- -	- -	- [leucophaeta]	- -	- -	- -
BI_3120	- -	- -	- -	- -	- -	Potamothrix bavaricus	- -	- -	- -	- -	- licheri	- -
BI_3121	- [sarsi]	- -	- -	- altamarinus	- -	Tubificoides parapectinatus	- -	Trochochaeta multisetosa	- -	Eugerda tenuimana	- -	- -
BI_3122	- -	- -	- -	- -	- -	- -	- -	- -	- [leucophaeta]	- -	- -	- -
BI_3123	- [sarsi]	- -	- -	- -	- -	Aulodrilus pluriseta	- -	- -	- -	- -	- -	- -

Specimen Images and Breakdown of Identifications

Basic differences are given below. More detail may be available in the later 'taxonomic and Identification policy considerations' section. The abbreviation "SD" refers to the Species Directory (Howson & Picton, 1997).

(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.

RT6801 – *Turritellinella tricarinata* (Brocchi, 1814) (Figure 1a)

Substratum: Mud. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: North Sea. Condition: Fair. Size
: Small, 3-5 mm. Specimens from ten samples. Listed in SD as *Turritella communis* Risso, 1826; specific name revised in 2004, genus re-assigned in 2019.

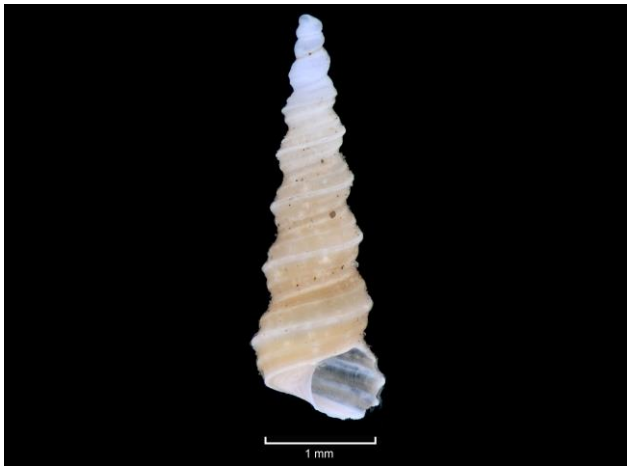


Fig. 1a. *Turritellinella tricarinata* (RT6801; 9210, 73523) – V

No generic or specific differences recorded.

Lab 21 spelled the generic name '*Turritellanella*'.

RT6802 – *Hemigrapsus takanoi* Asakura & Watanabe, 2005 (Figures 2a, 2b)

Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: southeast England. Condition: Fair, legs and claws missing. Size: Small, 3-4 mm. Sex: Female. All specimens from one sample. Not mentioned in SD; non-native species first recognised in UK waters in 2013.

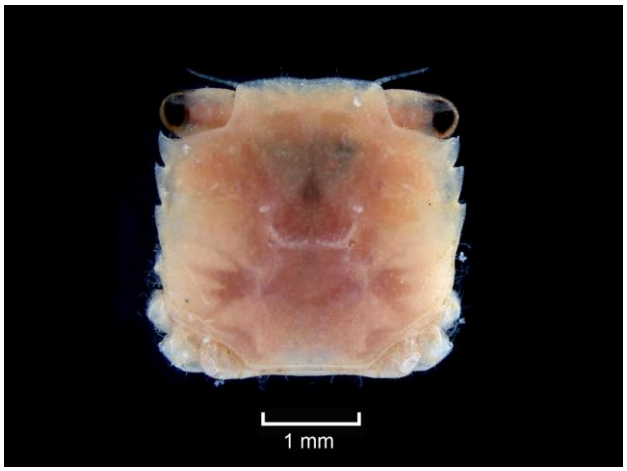


Fig. 2a. *Hemigrapsus takanoi* (RT6802; 732, 58168) – D

One generic and two specific differences: Lab 16 identified as *Hemigrapsus sanguineus* (no material available) (which has a finely striated, undivided suborbital ridge); Lab 11 identified as *Pachygrapsus marmoratus* (no material available) (which has three teeth on the anterior margin of the carapace).

Lab 18 initially identified as *Eriocheir sinensis* (Figure 2c) (which has a more rounded outline at this size) but amended to *H. takanoi*.

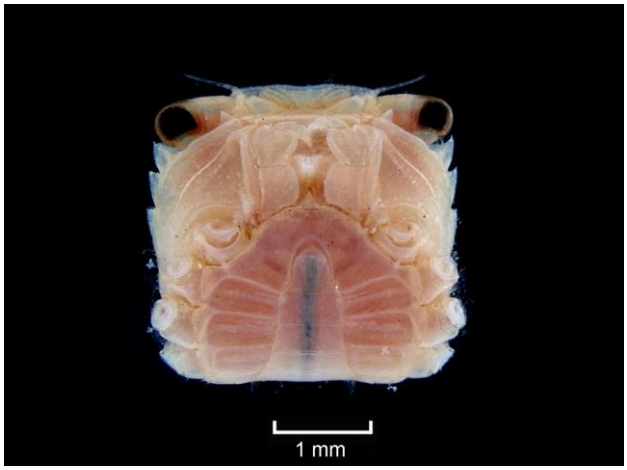


Fig. 2b. *Hemigrapsus takanoi* (RT6802; 732, 58168) – V

Fig. 2c. *Eriocheir sinensis* (P11474, WP66) – D

RT6803 – *Atherospio guillei* (Laubier & Ramos, 1974) (Figures 3a, 3d, 3g)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: North Sea. Condition: Fair. Size: Medium, 15-17 chaetigers. Specimens from six samples. Not in SD, mention of additional species in note for *A. disticha*; first identifiable in UK waters in 2005.

Fig. 3a. *Atherospio guillei* (RT6803; 12712, 74925) – D

Three generic and specific differences: Lab 09 identified as *Dipolydora coeca* (Figures 3b, 3e, 3h); Lab 03 identified as *Dipolydora caulleryi* (Figures 3c, 3f, 3i) (both of which have notopodial, rather than neuropodial, modified chaetae on chaetiger 5); Lab 18 identified as *Scolelepis foliosus*, an alternative spelling of *S. foliosa* (Figures 3j, 3k) (which lacks modified chaetae on chaetiger 5).

Fig. 3b. *Dipolydora coeca* (P4264, 64108) – D

Fig. 3c. *Dipolydora caulleryi* agg. (P4267, 64442) – D

Fig. 3d. *Atherospio guillei* (RT6803; 12712, 74925) – L

Fig. 3e. *Dipolydora coeca* (P4264, 64108) – L

Fig. 3f. *Dipolydora caulleryi* agg. (P4267, 64442) – L

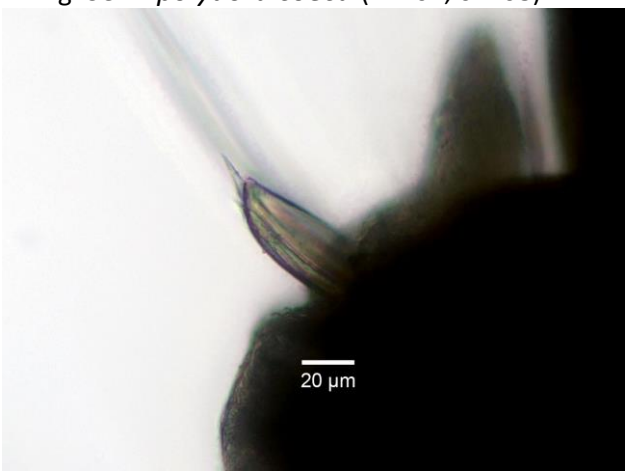


Fig. 3g. *Atherospio guillei* (RT6803; 12712, 74925) – Chaetiger 5

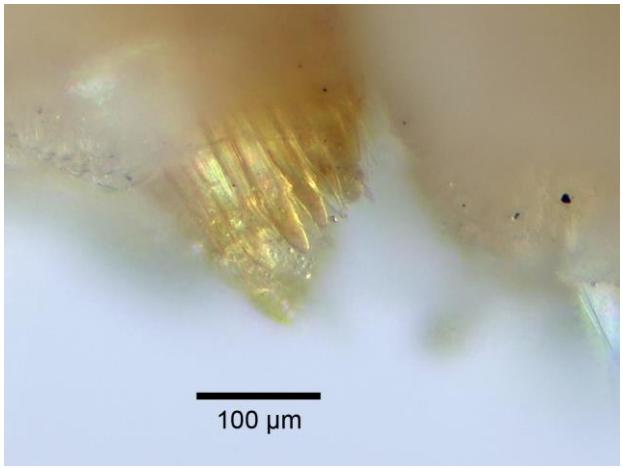


Fig. 3h. *Dipolydora coeca* (P4264, 64108) – Chaetiger 5

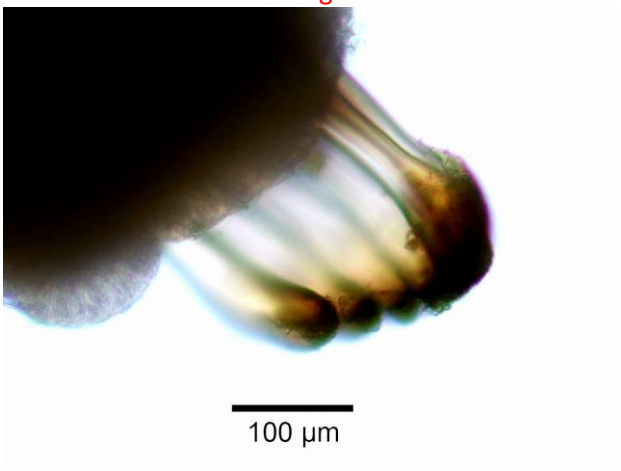


Fig. 3i. *Dipolydora caulleryi* agg. (P4267, 64442)– Chaetiger 5

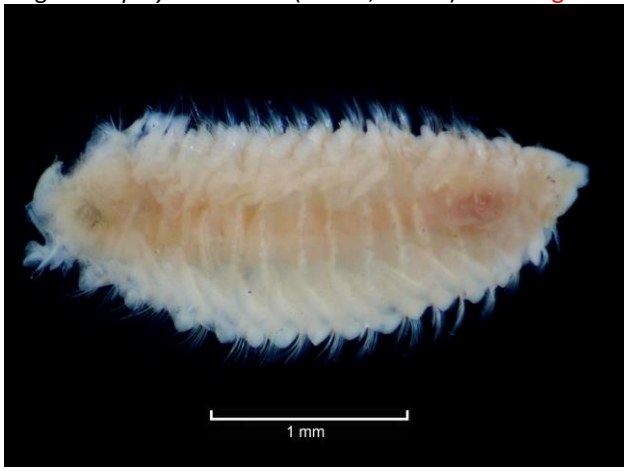


Fig. 3j. *Scolelepis foliosa* (P1883, 59280) – D

Fig. 3k. *Scolelepis foliosa* (P1883, 59280) – L

RT6804 – *Caprella mutica* Schurin, 1935 (Figure 4a)

Substratum: Faunal turf. Salinity: Full (Euhaline). Depth: Infralittoral. Geography: northern Scotland. Condition: Fair. Size: Medium. Sex: Female. All specimens from one sample. Not in SD; non-native species first recognised in UK waters in 2000.

Fig. 4a. *Caprella mutica* (RT6804; 529, 58009) – L

One generic and two specific differences: Lab 16 identified as *Caprella linearis* (Figure 4b) (which has only blunt pereon projections); Lab 11 identified as *Aeginina longicornis* (Figure 4c) (which has acute projections on pereonites 1 and 2 and lateral spines).

Fig. 4b. *Caprella linearis* (413669, 11220) – L

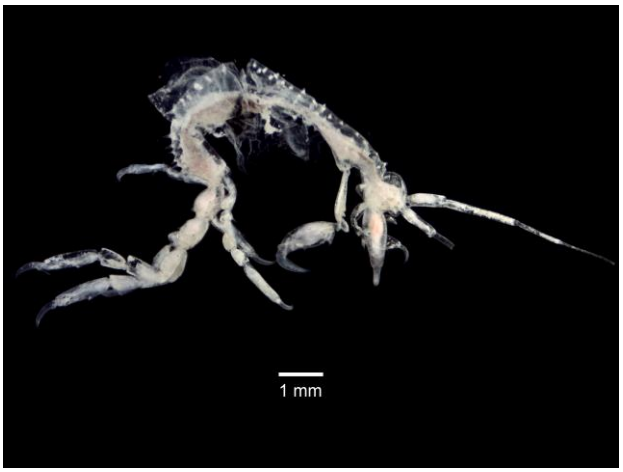


Fig. 4c. *Aeginina longicornis* (P1802, 59456) – L

RT6805 – *Volvulella acuminata* (Bruguière, 1792) (Figure 5a)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Lower Shelf). Geography: North Sea. Condition: Fair. Size: Medium, 2-3 mm. Specimens from seven samples. Listed in SD as *Rhizorus acuminatus* (Bruguière, 1792); last WoRMS edit in 2019.

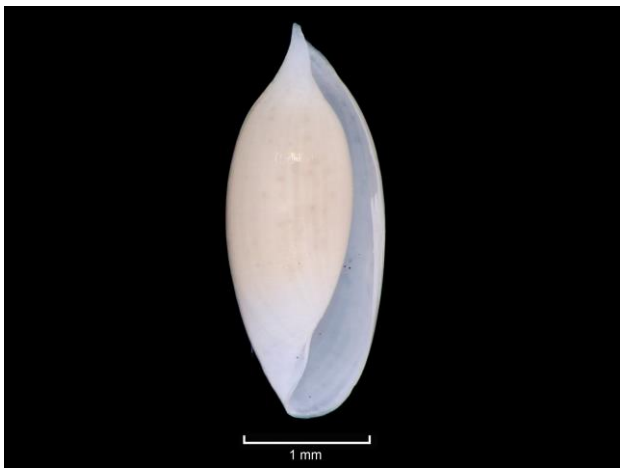


Fig. 5a. *Volvulella acuminata* (RT6805; 1223, 58251) – V

No generic or specific differences recorded.

Lab 01 used the synonym *Rhizorus acuminatus*.

RT6806 – *Paucibranchia totospinata* (Lu & Fauchald, 1998) (Figures 6a, 6b, 6d)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: southeast England. Condition: Fair. Size: Medium, > 50 chaetigers. Specimens from twelve samples. Previously included with (SD sp.) '*Marphysa*' *bellii* (Audouin & Milne Edwards, 1833); described (from Ireland) and distinguished from *M. bellii* in 1998, transferred to new genus *Paucibranchia* in 2018.

Fig. 6a. *Paucibranchia totospinata* (RT6806; 10209, 73672) – L

One generic and eight specific differences: Labs 04, 09, 14, 19, 20, 21 and 23 identified as *Paucibranchia bellii* (no material available) (which lacks compound spinigers in posterior segments); Lab 03 identified as *Marphysa sanguinea* (Figure 6c) (which has a bilobed prostomium).

Lab 11 spelled the generic name '*Paucibranchiata*'.

Fig. 6b. *Paucibranchia totospinata* (RT6806; P10209, 73721) – D

Fig. 6c. *Marphysa sanguinea* (P10209, 73706) – D

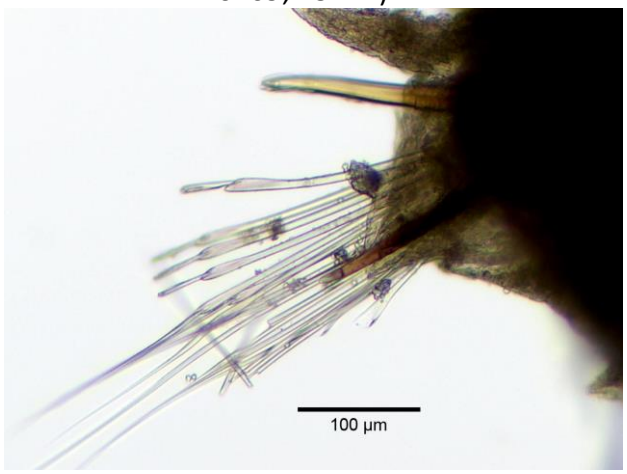


Fig. 6d. *Paucibranchia totospinata* (RT6806; 10209, 73697) – Chaetiger 106

RT6807 – *Neogyptis rosea* (Malm, 1874) (Figures 7a, 7e)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Lower Shelf). Geography: North Sea. Condition: Fair. Size: Medium. Specimens from eight samples. Listed in SD as *Gyptis rosea* (Malm, 1874); genus reassigned in 2012.

Fig. 7a. *Neogyptis rosea* (RT6807; 4264, 63733) – D

Six generic and seven specific differences: Lab 06 identified as *Neogyptis mediterranea* (no material available) (which has dorsal ridges on median segments); Labs 16 and 21 identified as *Gyptis mackiei*; Lab 10 identified as *Gyptis propinqua* (Figures 7b and 7f show *Gyptis* sp.) (both of which have ventral cirri inserted subdistally); Labs 04 and 09 identified as *Podarkeopsis capensis* (Figures 7c and 7g show *Podarkeopsis* sp.); Lab 18 identified as *Oxydromus flexuosus* (Figures 7d, 7h) (both of which have furcate notochaetae).

Fig. 7b. *Gyptis* sp. (P9317, 74403) – D

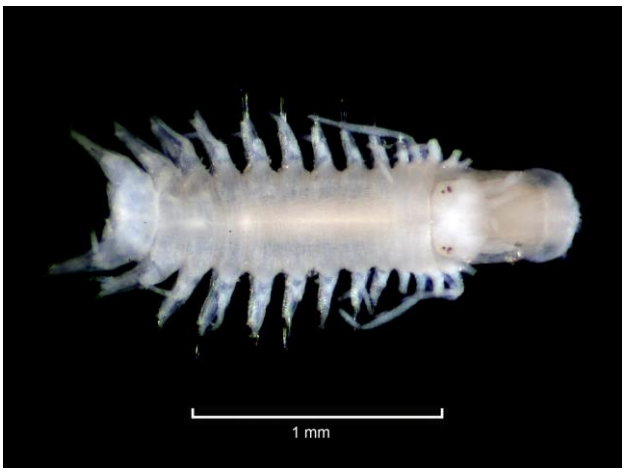


Fig. 7c. *Podarkeopsis* sp. (P13652.1, 75297) – D

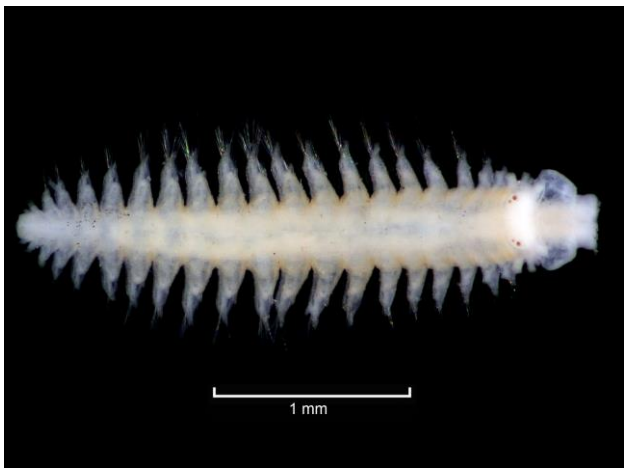


Fig. 7d. *Oxydromus flexuosus* (P13245, 75869) – D

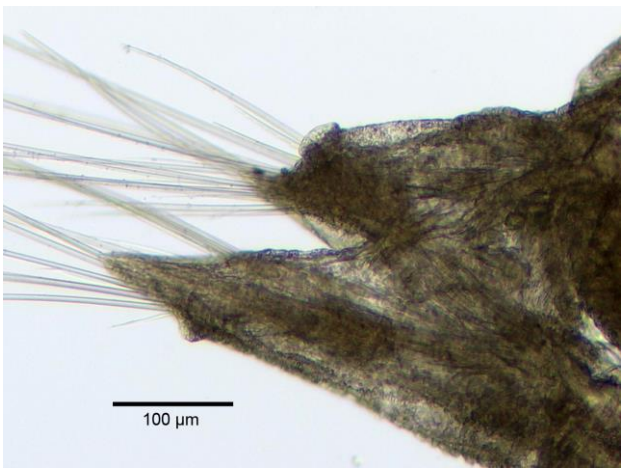


Fig. 7e. *Neogyptis rosea* (RT6807; 4266, 63771) – parapodium

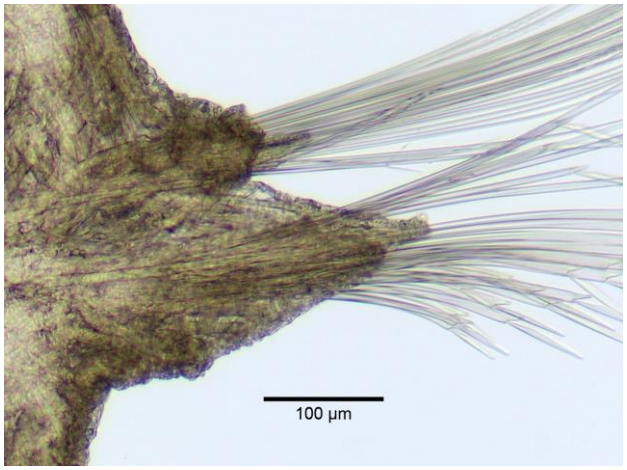


Fig. 7f. *Gyptis* sp. (P9317, 74403) – parapodium

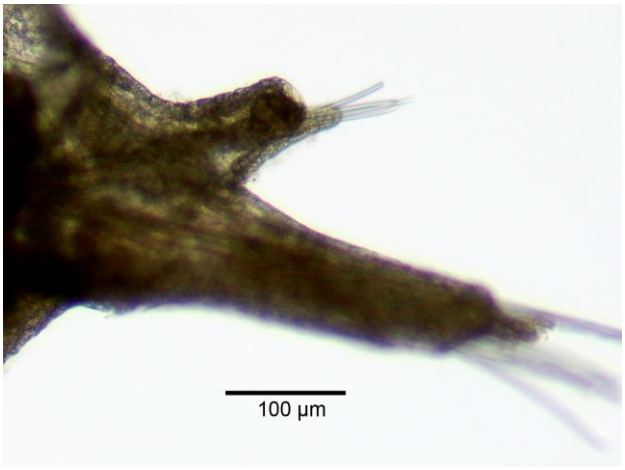


Fig. 7g. *Podarkeopsis* sp. (P13652.1, 75297) – parapodium

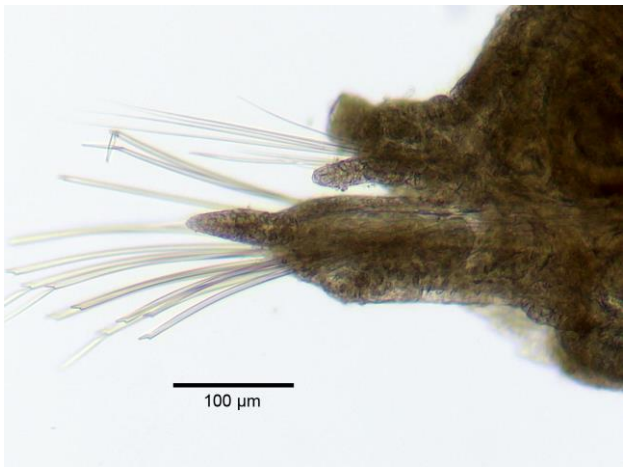


Fig. 7h. *Oxydromus flexuosus* (P13245, 75869) – parapodium

RT6808 – *Astrorhiza arenaria* Carpenter in Norman, 1877 (Figure 8a)

Substratum: Mud. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: North Sea. Condition: Good. Size: Medium, 5-10 mm. Specimens from five samples. Not in SD, 'Protozoa' not listed.

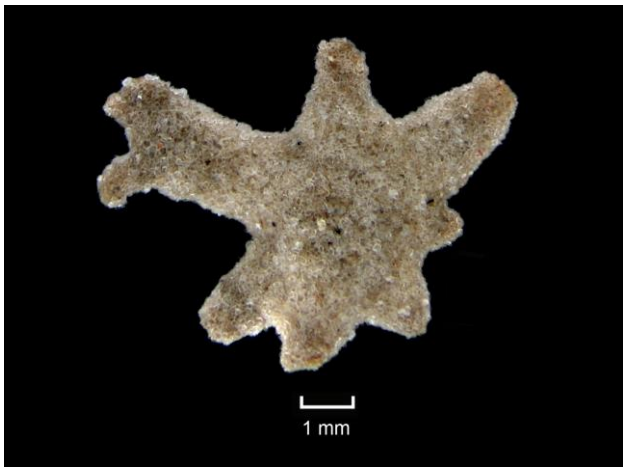


Fig. 8a. *Astrorhiza arenaria* (RT6808; 13229, 75216) – D

Three generic and specific differences: Labs 19 and 21 identified as *Epizoanthus papillosus* (Figures 8b, 8c) (which has discernible polyp structure).

Lab 03 gave a whimsical name: '*Tubus arenarius*'.

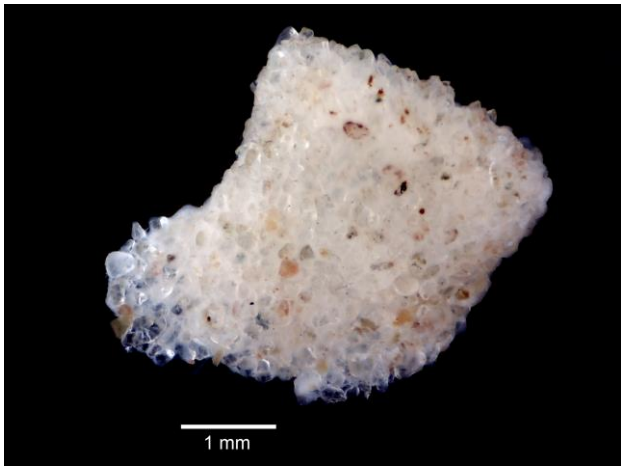


Fig. 8b. *Epizoanthus papillosus* (P2636, 62817) – L

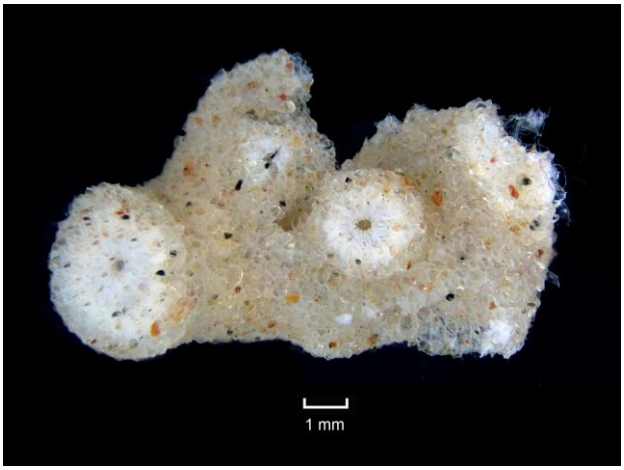


Fig. 8c. *Epizoanthus papillosus* (P2636, 62817) – L

RT6809 – *Syllis parapari* San Martín & López, 2000 (Figures 9a, 9c)

Substratum: Mud. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: western Scotland. Condition: Fair. Size: Medium. Specimens from seven samples. Not in SD, possibly considered under '*Ehlersia* sp.'; recognised in UK waters but sometimes conflated with *S. cornuta* between 2006 and 2014.

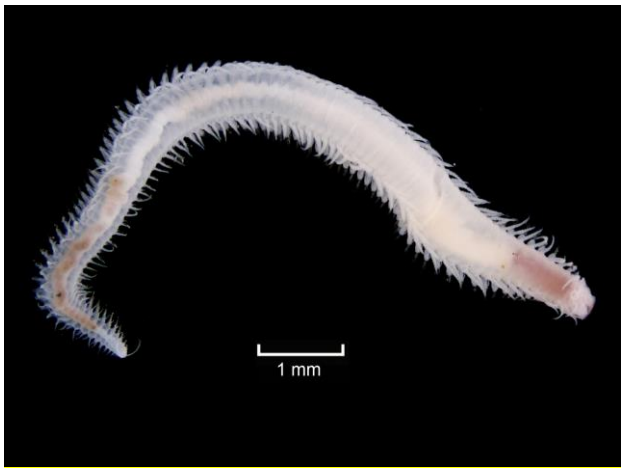


Fig. 9a. *Syllis parapari* (RT6809; 11277, 73618) – D

Five specific differences: Lab 18 identified as *Syllis caeca* (no material available; Figures 9b, 9d show *S. cornuta*); Lab 06 identified as *Syllis mercedesae* (no material available); Labs 03 and 05 identified as *Syllis cornuta* (Figures 9b, 9d) (all of which have more elongated dorsal cirri and clearly bidentate tips to the spiniger blades); Lab 09 identified as *Syllis prolifera* (no material available; Figure 9e shows *S. pontxioi* chaetae) (which lacks spiniger-like chaetal blades).

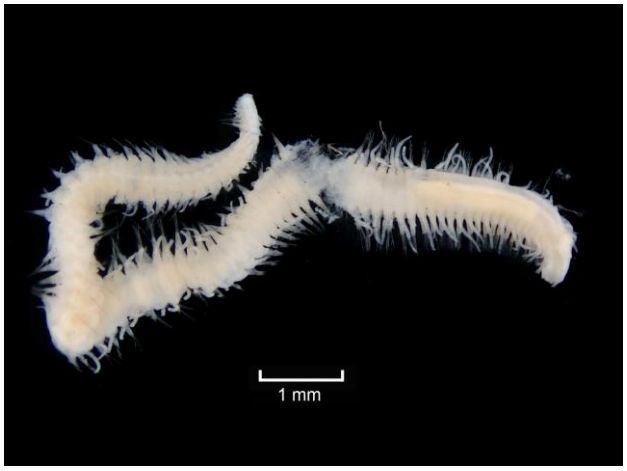


Fig. 9b. *Syllis cornuta* (410974, 33750) – D

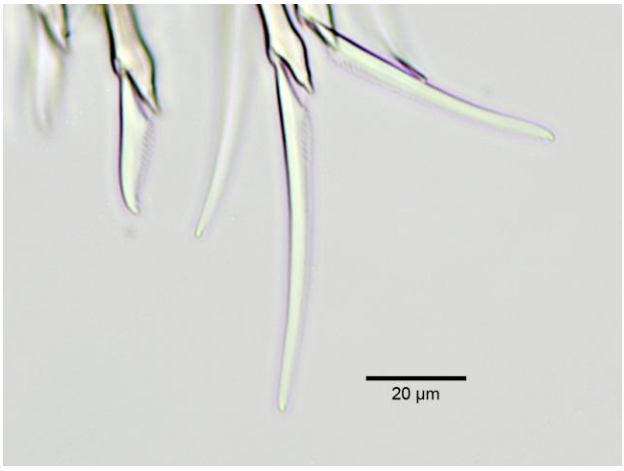


Fig. 9c. *Syllis parapari* (P13483, 75099) – chaetae

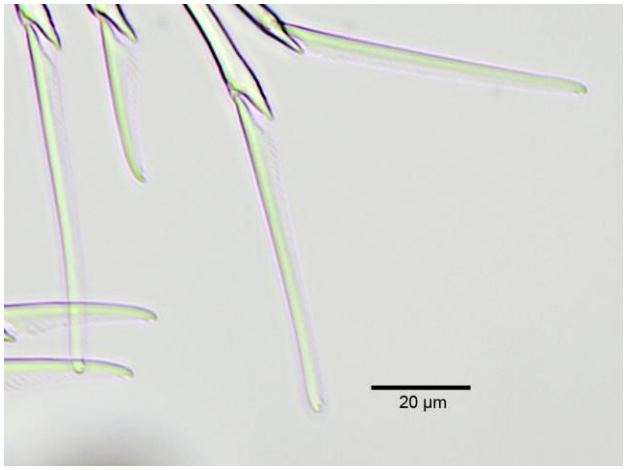


Fig. 9d. *Syllis cornuta* (410974, 33750) – chaetae

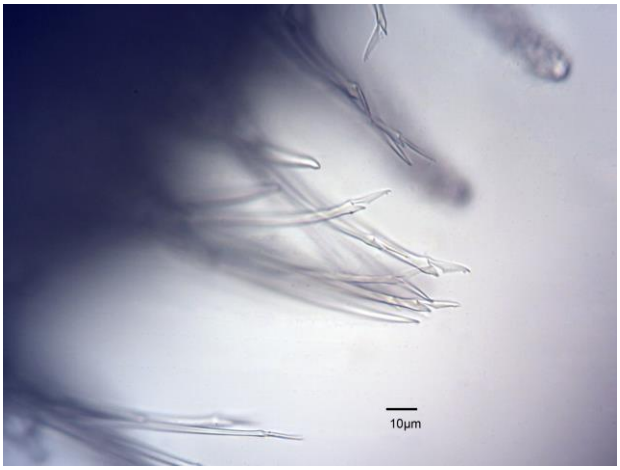


Fig. 9e. *Syllis pontxioi* (RT4807) – chaetae

RT6810 – *Hypereteone lighti* (Hartman, 1936) (Figures 10a, 10d)

Substratum: Mud. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: southeast England. Condition: Good, anal cirri present. Size: Medium. Specimens from five samples. Not in SD; non-native species first published in UK waters in 2024.

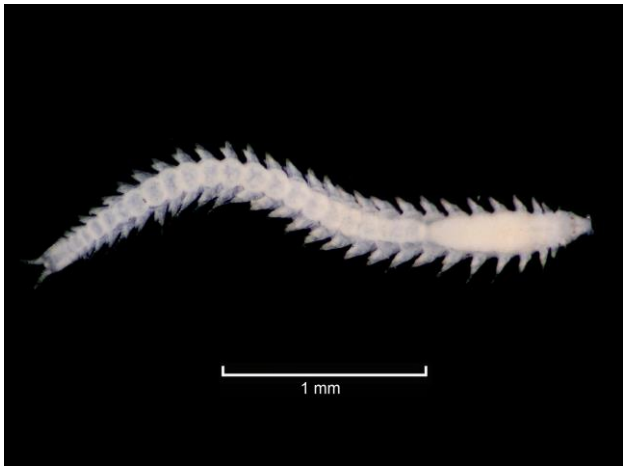


Fig. 10a. *Hypereteone lighti* (RT6810; 732, 57883) – D

Ten generic and specific differences: Labs 01 and 03 identified as *Eteone longa* (Figure 10b); Lab 16 identified as *Eteone suecica* (no material available) (both of which have rounded tips to the anal cirri); Labs 09, 11, 18 and 20 identified as *Hypereteone foliosa* (Figures 10c, 10e) (which lacks chaetae on segment 2 and has unequal teeth on the chaetal shafts); Lab 17 identified as *Hypereteone fauchaldi* (no material available; Figures 10c, 10e show *H. foliosa*) (which has a more elongate prostomium and unequal teeth on the chaetal shafts); Labs 10 and 21 identified as *Hypereteone heteropoda* (no material available; Figures 10c, 10e show *H. foliosa*) (which has unequal teeth on the chaetal shafts).

Eteone and *Hypereteone* are treated as congeneric for this exercise as the validity of *Hypereteone* is disputed.

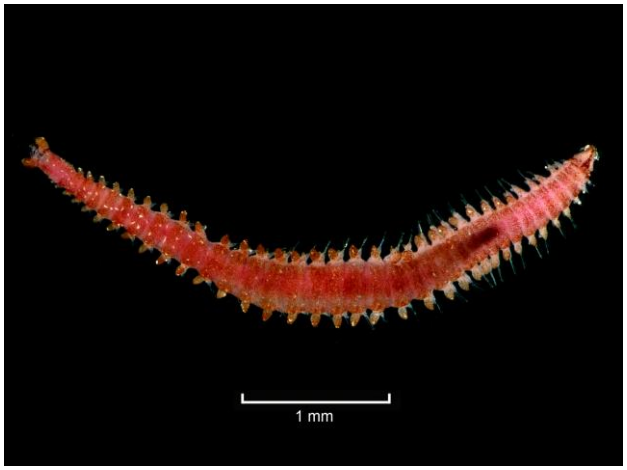


Fig. 10b. *Eteone longa* (P17331.1, 78334) – D

Fig. 10c. *Hypereteone foliosa* (413533, 9805) – D

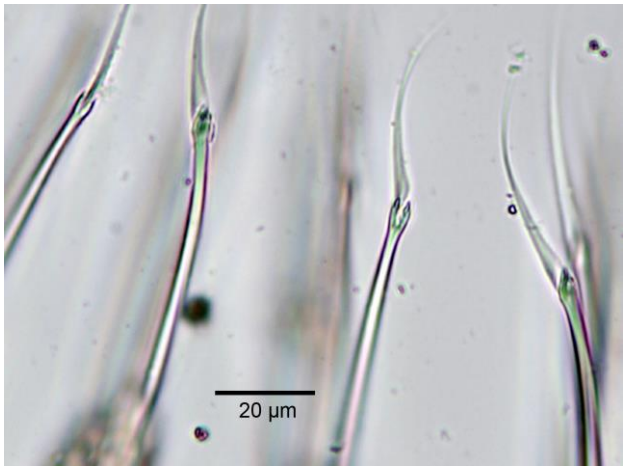


Fig. 10d. *Hypereteone lighti* (RT6810; 732, 57866) – chaetae

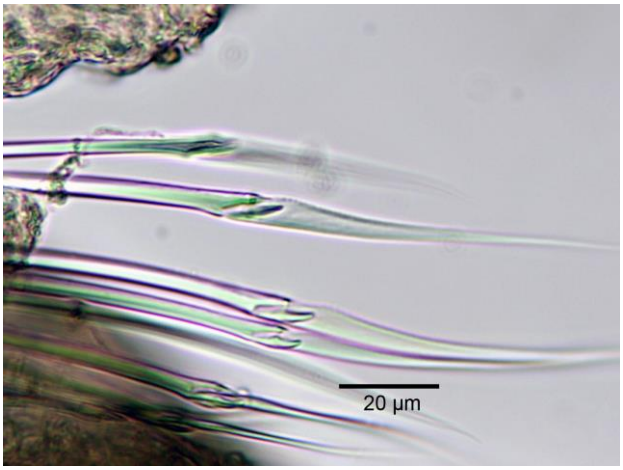


Fig. 10e. *Hypereteone foliosa* (P12545, 75192) – chaetae

RT6811 – *Astacilla dilatata* G.O. Sars, 1883 (Figure 11a)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Lower Shelf). Geography: North Sea. Condition: Good. Size: Medium, 4-5 mm. Specimens from twelve samples. Listed in SD as *Arcturella dilatata* (G.O. Sars, 1883); genus reassigned (*Arcturella* synonymised with *Astacilla*) in 2007.

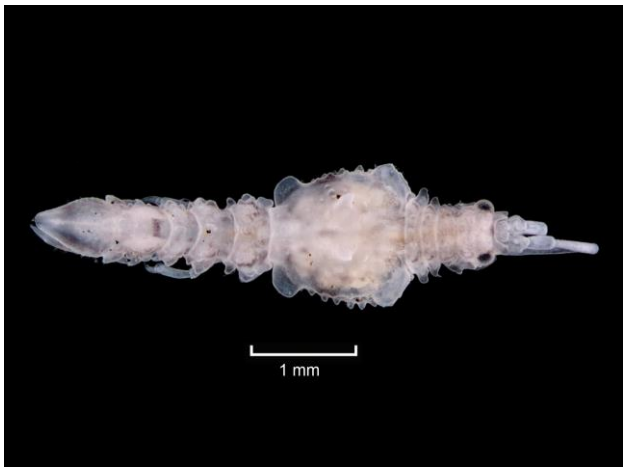


Fig. 11a. *Astacilla dilatata* (RT6811; 9903, 74594) – D

No generic or specific differences recorded.

Lab 01 spelled the specific name *'dilitata'.*

RT6812 – *Pholoe assimilis* Örsted, 1845 (Figure 12a)

Substratum: Mud. Salinity: Full (Euhaline). Depth: Circalittoral (Lower Shelf). Geography: North Sea. Condition: Good, proboscis out. Size: Medium. All specimens from one sample. Not in SD: note that 'all *Pholoe* need to be redescribed'; resurrected in 1998, found in UK waters soon after.

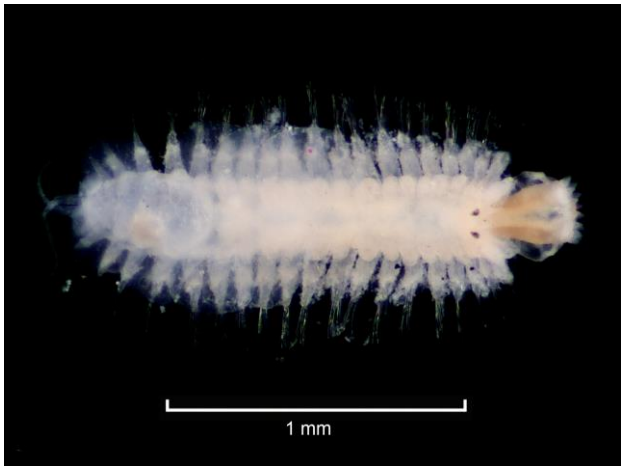


Fig. 12a. *Pholoe assimilis* (RT6812; 413251, 7654) – D

Five specific differences: Labs 05, 06, 11 and 19 identified as *Pholoe inornata* (Figure 12b) (which has tentacular cirri with spine-like papillae); Lab 03 identified as *Pholoe baltica* (Figure 12c) (which has a distinct facial tubercle).

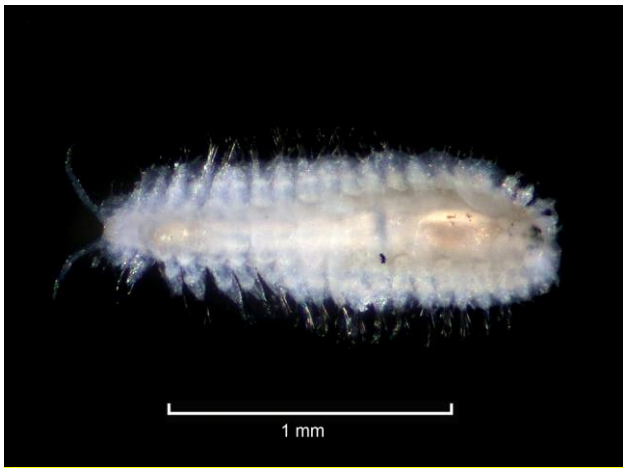


Fig. 12b. *Pholoe inornata* (P13254, 77898) – D

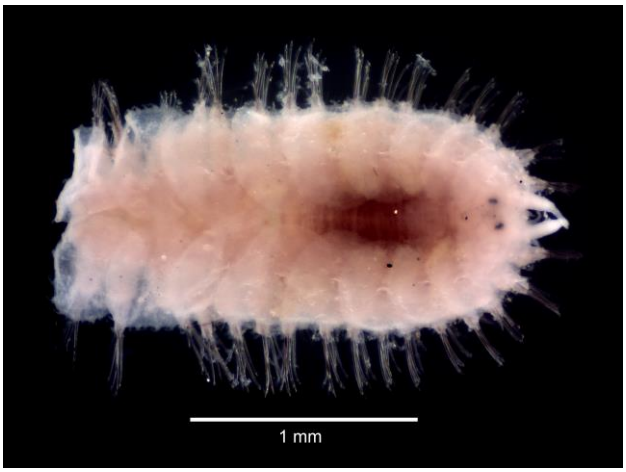


Fig. 12c. *Pholoe baltica* (RT5918; 1341, 58673) – D

RT6813 – *Laonice irinae* Sikorski, Radashevsky & Nygren in Sikorski et al, 2021 (Figures 13a, 13b)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: southwest England. Condition: Fair, segments past nuchal organ. Size: Medium. Specimens from four samples. Previously included with (SD sp.) *L. bahusiensis* Söderström, 1920; described and distinguished from *L. bahusiensis*, including UK waters in 2021.

Fig. 13a. *Laonice irinae* (RT6813; 414075, 55126) – D

Three specific differences: Labs 03, 09 and 10 identified as *Laonice bahusiensis* (Figures 13c, 13d) (which lacks dorsal crests on chaetigers with nuchal organs).

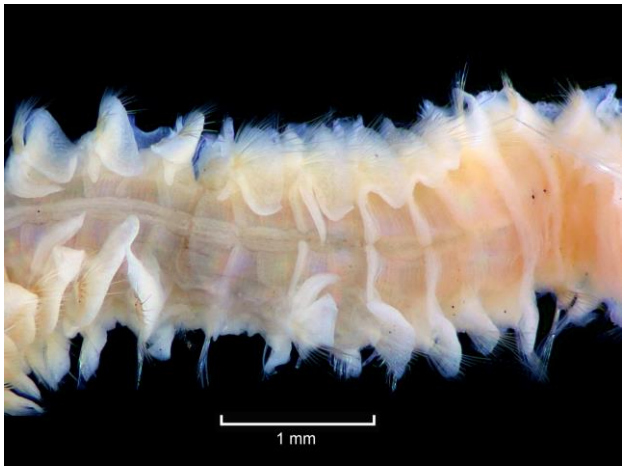


Fig. 13b. *Laonice irinae* (RT6813; 414075, 55126) – D, mid body

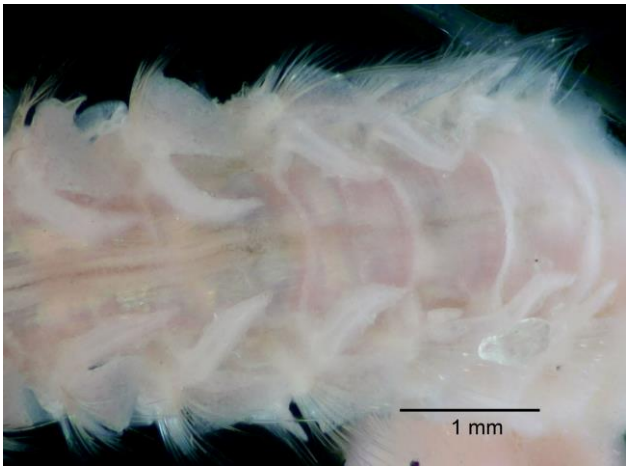


Fig. 13c. *Laonice bahusiensis* (P5984.9, 71523) – D, mid body

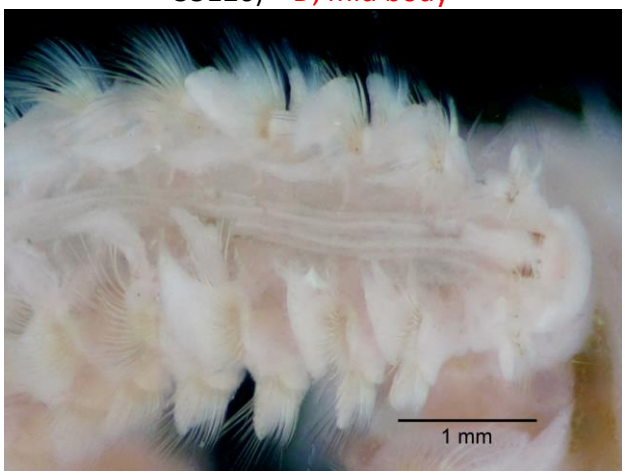


Fig. 13d. *Laonice bahusiensis* (P5984.9, 71523) – D

RT6814 – *Thyasira sarsii* (Philippi, 1845) (Figure 14a)

Substratum: Mud. Salinity: Full (Euhaline). Depth: Circalittoral (Lower Shelf). Geography: North Sea. Condition: Fair. Size: Medium, 7-13 mm. Specimens from three samples. Not in SD; first recognised in UK waters in 1990s, published in 2002.

Fig. 14a. *Thyasira sarsii* (RT6814; P134, RIN-EX.3) – L

No generic or specific differences recorded.

Labs 01, 13, 14, 16, 21 and 23 spelled the specific name *'sarsi'*.

RT6815 – *Caprella mutica* Schurin, 1935 (Figure 15a)

Substratum: Faunal turf. Salinity: Full (Euhaline). Depth: Infralittoral. Geography: northern Scotland. Condition: Fair. Size: Medium. Sex: Male. All specimens from one sample. Not in SD; non-native species first recognised in UK waters in 2000.

Fig. 15a. *Caprella mutica* (RT6815; 529, 58009) – L

One specific difference: Lab 16 identified as *Caprella septentrionalis* (Figure 15b) (which has only blunt pereon projections).

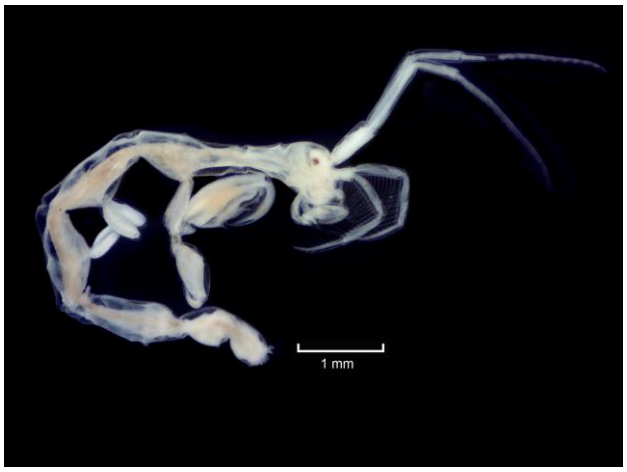


Fig. 15b. *Caprella septentrionalis* (413169, 8416) – L

RT6816 – *Yoldiella propinqua* (Leche, 1878) (Figure 16a)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Bathyal. Geography: Atlantic margin. Condition: Good. Size: Medium, 4-5 mm. Specimens from five samples. Excluded from SD, probably as found only below 200m.

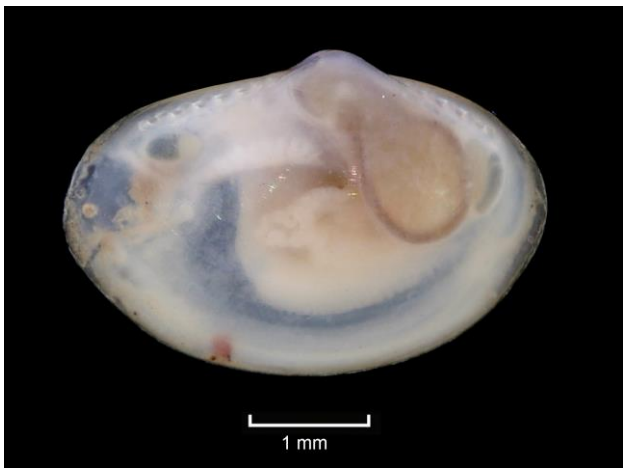


Fig. 16a. *Yoldiella propinqua* (RT6816; 15352, 77774) – L

One specific difference: Lab 01 identified as *Yoldiella intermedia* (Figure 16b) (which has a more horizontal dorsal margin and more prominent umbones).

Fig. 16b. *Yoldiella intermedia* (P863, GtB 5.13.3) – L

RT6817 – *Pontocrates moorei* Myers & Ashelby, 2022 (Figures 17a, 17f, 17h)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Infralittoral. Geography: northern Scotland. Condition: Good. Size: Medium. Sex: Female. All specimens from one sample. Previously included with (SD sp.) *P. arcticus* G O Sars, 1893; described and distinguished from *P. arcticus*, including UK waters in 2022.

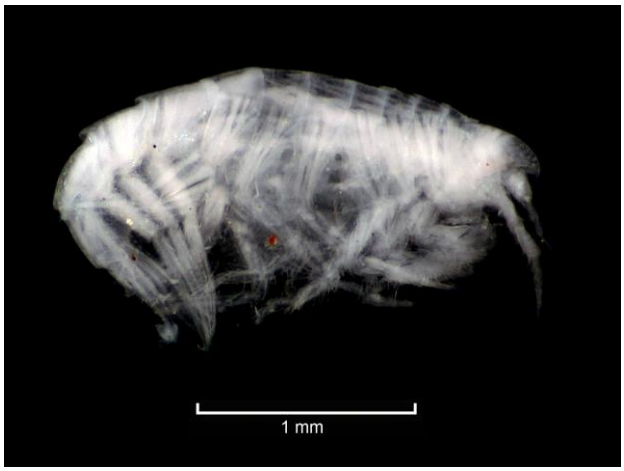


Fig. 17a. *Pontocrates moorei* (RT6817; 2406, 60780) – L

Five specific differences: Lab 09 identified as *Pontocrates arenarius* (Figures 17b, 17g) (which is more setose and has a less downturned rostrum); Labs 04 and 18 identified as *Pontocrates norvegicus* (Figures 17c, 17i) (which has a truncate gnathopod 1 merus); Lab 11 identified as *Pontocrates arcticus* (Figures 17d, 17j) (which has a toothed gnathopod 1 palmar margin); Lab 21 identified as *Pontocrates altamarinus* (Figures 17e, 17k) (which has a more elongated gnathopod 1 palmar margin).

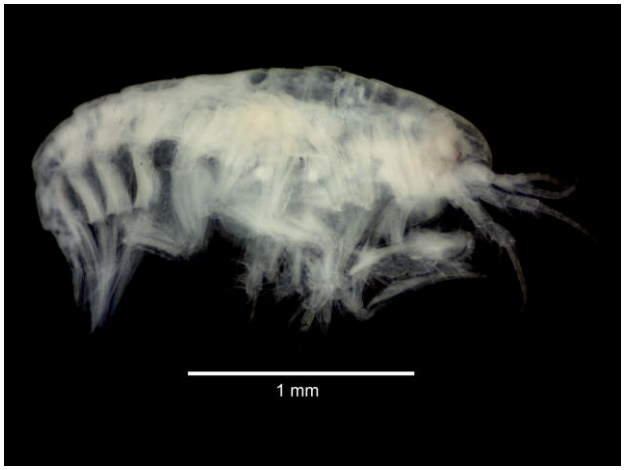


Fig. 17b. *Pontocrates arenarius* (P2236, 60545) – L

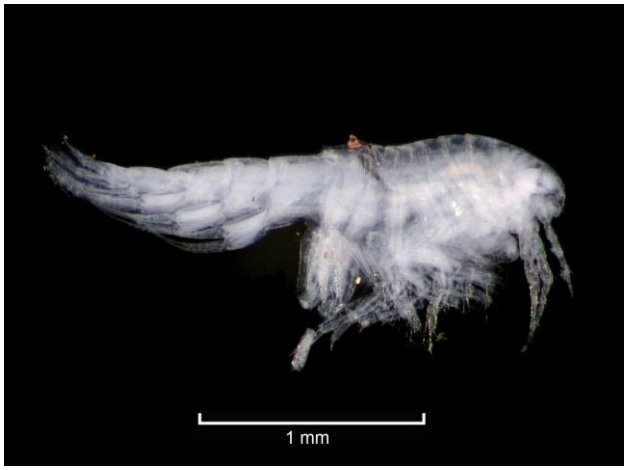


Fig. 17c. *Pontocrates norvegicus* (P9209, 72889) – L

Fig. 17d. *Pontocrates arcticus* (P9317, 74357) – L

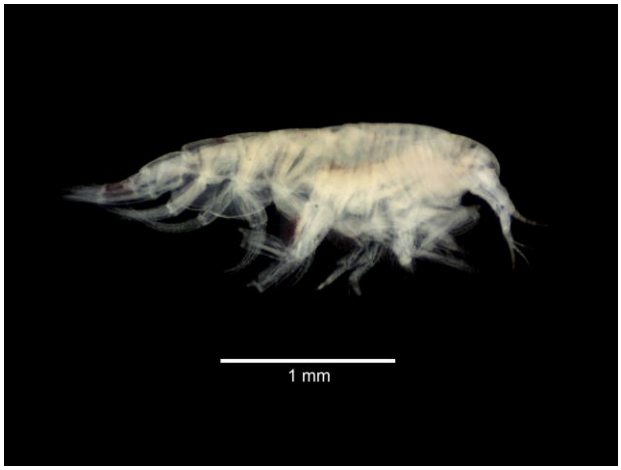


Fig. 17e. *Pontocrates altamarinus* (P3115, 62403) – L

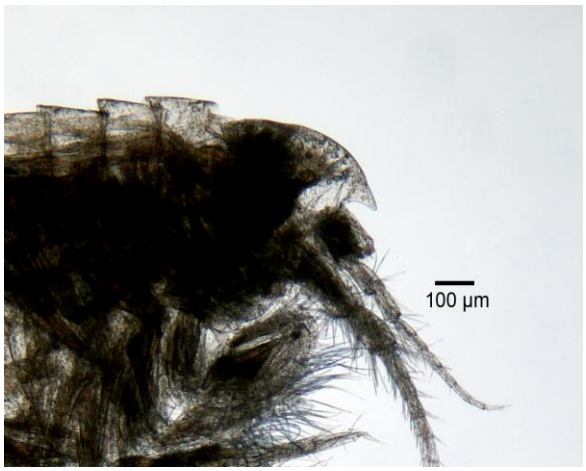


Fig. 17f. *Pontocrates moorei* (RT6817; 2406, 60780) – L, anterior

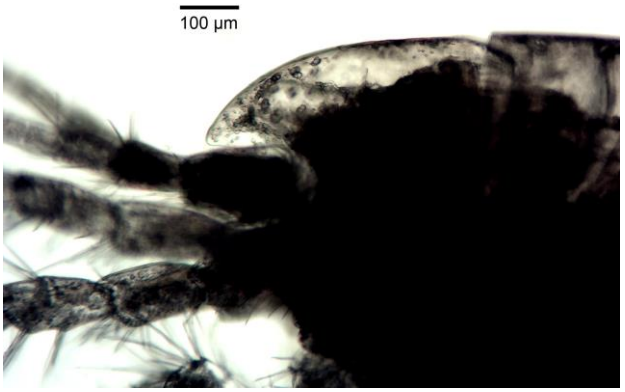


Fig. 17g. *Pontocrates arenarius* (P2236, 60545) – L, anterior

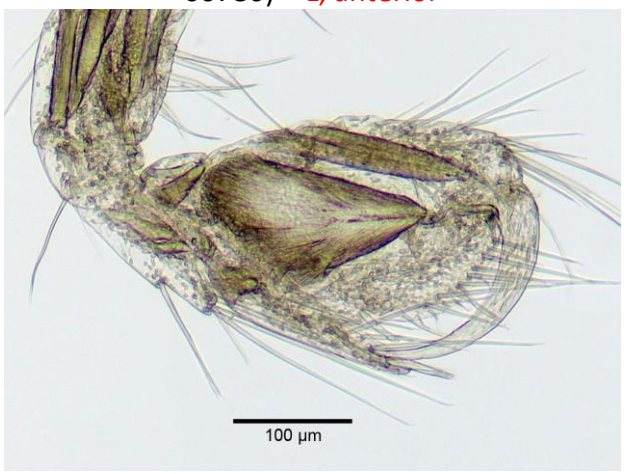


Fig. 17h. *Pontocrates moorei* (RT6817; 2406, 60780) – G1

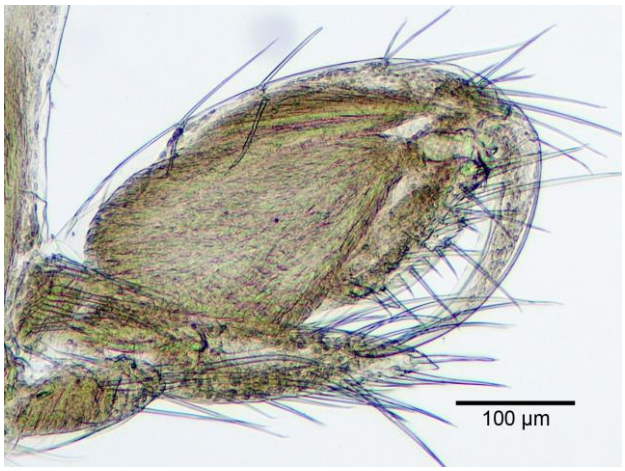


Fig. 17i. *Pontocrates norvegicus* (P9209, 72889) – G1

Fig. 17j. *Pontocrates arcticus* (P9317, 74357) – G1

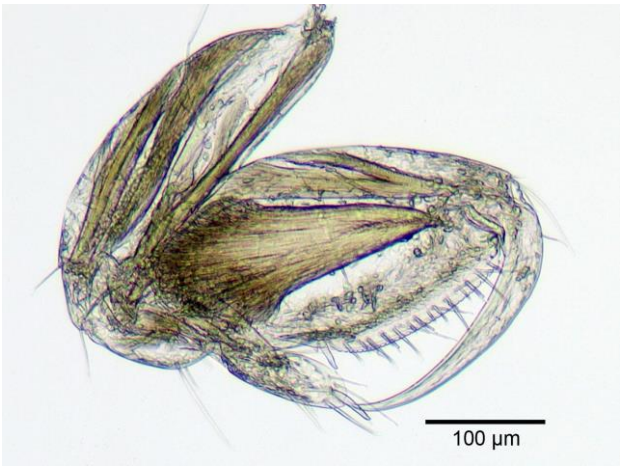


Fig. 17k. *Pontocrates altamarinus* (P3115, 62403) – G1

RT6818 – *Adontorhina similis* Barry & McCormack, 2007 (Figures 18a, 18c)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Lower Shelf). Geography: North Sea. Condition: Good. Size: Medium, 1-2 mm. Specimens from three samples. Previously conflated with (SD sp.) *Thyasira (Mendicula) pygmaea* (Verrill & Bush, 1898); described and distinguished from *M. pygmaea*, including UK waters in 2007.

Fig. 18a. *Adontorhina similis* (RT6818; 4266, 64131) – L

One generic and specific difference: Lab 10 identified as *Mendicula pygmaea* (Figures 18b, 18d) (which lacks granules on the hinge plate).

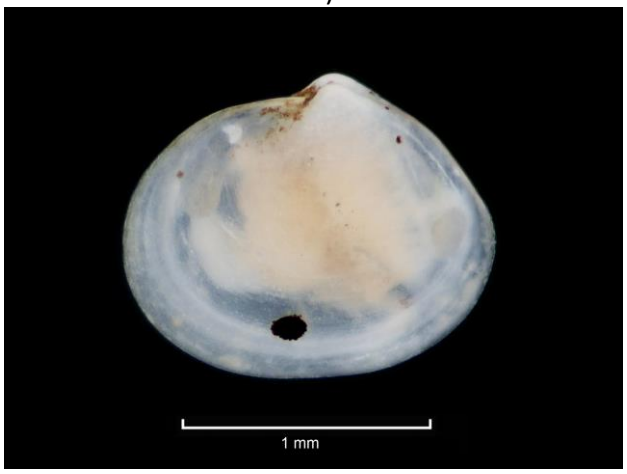


Fig. 18b. *Mendicula pygmaea*? (P15352, 77825) – L

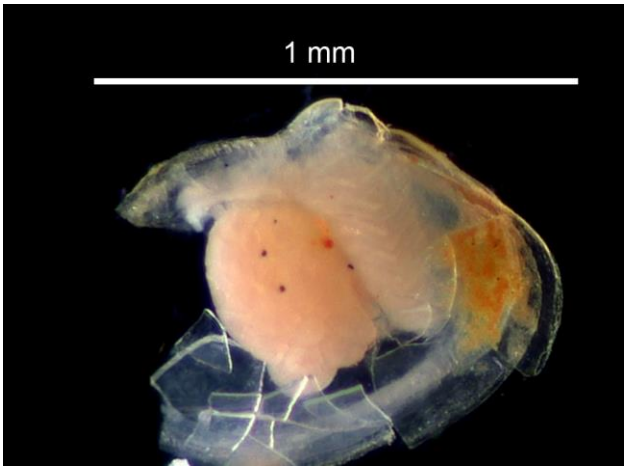


Fig. 18c. *Adontorhina similis* (RT6818; 4266, 64130) – L, hinge

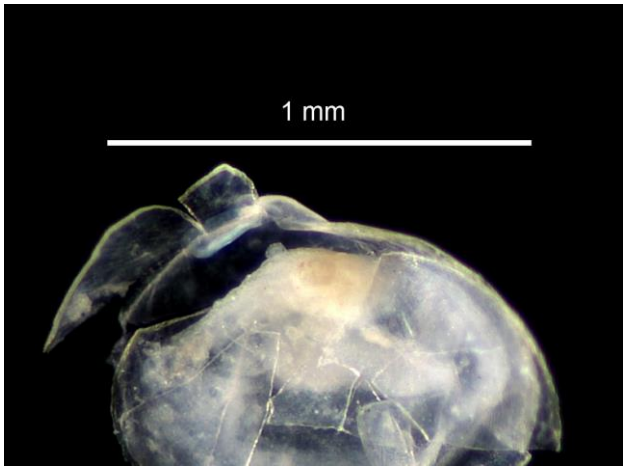


Fig. 18d. *Mendicula pygmaea*? (P15352, 77825) – L, hinge

RT6819 – *Branchiura sowerbyi* Beddard, 1892 (Figures 19a, 19i)

Substratum: Diamicton. Salinity: Low (Oligohaline). Depth: Infralittoral. Geography: southeast England. Condition: Fair. Size: Small. All specimens from one sample. Excluded from SD, probably as considered freshwater (reaches oligohaline waters); described from UK waters, recognised as non-native in 2007.

Fig. 19a. *Branchiura sowerbyi* (RT6819; 4634, 65636) – L

Fourteen generic and specific differences: Lab 23 identified as *Aulodrilus pluriseta* (Figures 19b, 19j) (which has more distinctly bifid ventral chaetae); Labs 17 and 20 identified as *Potamothrix bavaricus* (Figures 19c, 19k); Labs 13 and 19 identified as *Tubifex tubifex* (Figures 19d, 19l) (both of which have pectinate chaetae); Lab 03 identified as *Heterodrilus subtilis* (Figures 19e, 19m) (which has divergent chaetal teeth); Lab 09 identified as *Tubificoides amplivasatus* (Figure 19f) (which has a granulated body wall); Lab 18 identified as *Tubificoides insularis* (Figure 19g); Lab 11 identified as *Tubificoides scoticus* (no material available); Labs 05, 06, 10, 16 and 21 identified as *Tubificoides parapectinatus* (Figure 19h) (all of which have a papillated body wall).

Fig. 19b. *Aulodrilus pluriseta* (P536_57643) – L

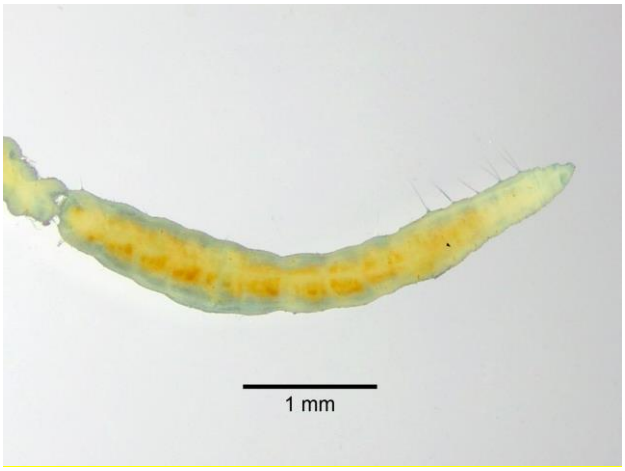


Fig. 19c. *Potamothrix bavaricus* (P5181, 66002) – L

Fig. 19d. *Tubifex tubifex* (P1601.1, 59117) – L

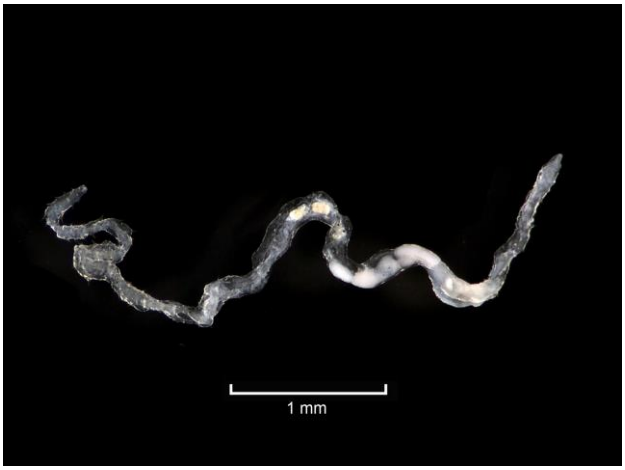


Fig. 19e. *Heterodrilus subtilis* (412693, 7094) – L

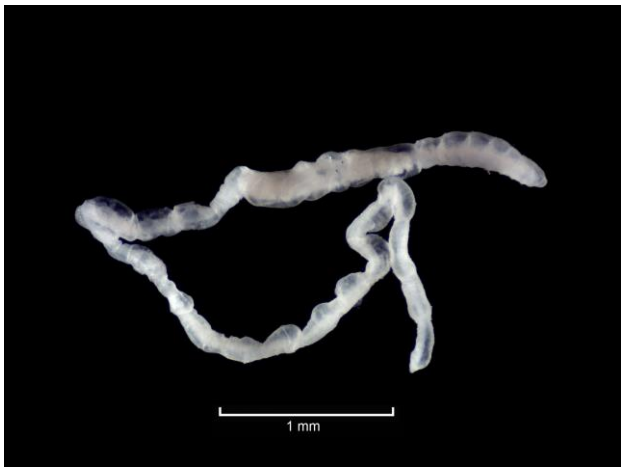


Fig. 19f. *Tubificoides amplivasatus* (RT5601; 412202, 4744) – L

Fig. 19g. *Tubificoides insularis* (414268, 55629) – L

Fig. 19h. *Tubificoides parapectinatus* (Veerse meer 416284) – L

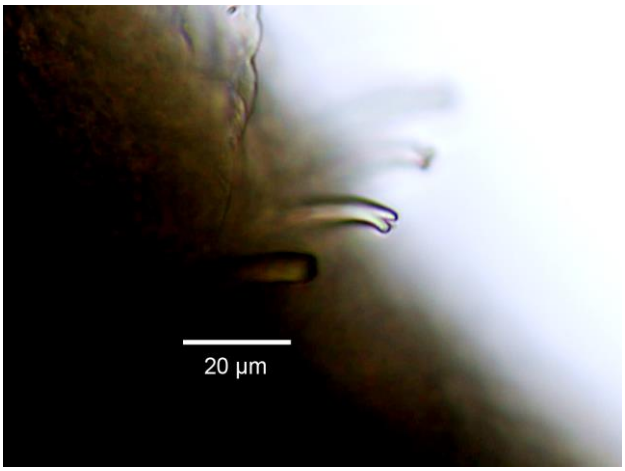


Fig. 19i. *Branchiura sowerbyi* (RT6819; 4634, 65636) – ventral chaetae

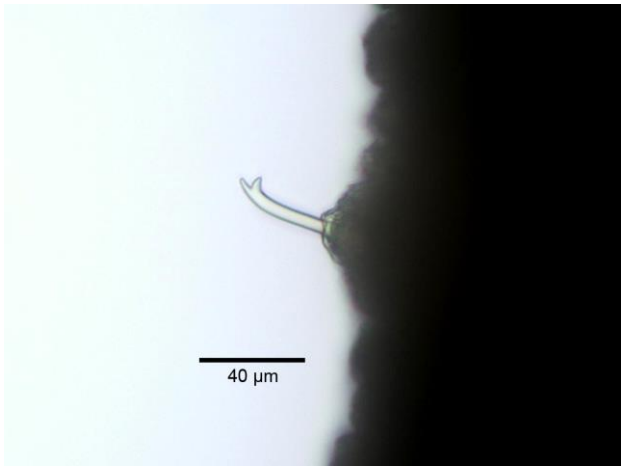


Fig. 19j. *Aulodrilus pluriseta* (P536_57643) – ventral bifid chaeta

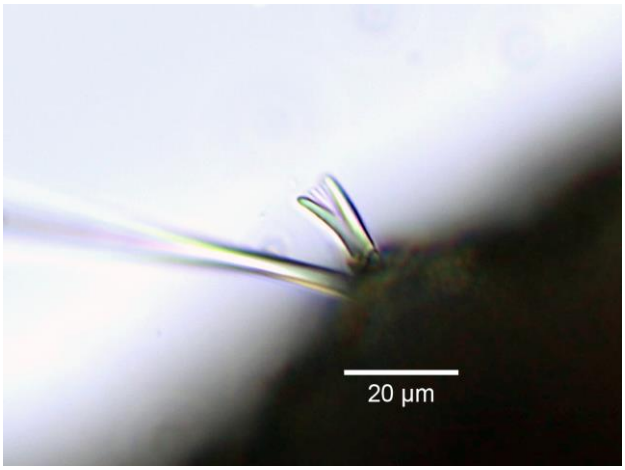


Fig. 19k. *Potamothrix bavaricus* (P5181, 66002) anterior dorsal pectinate chaeta

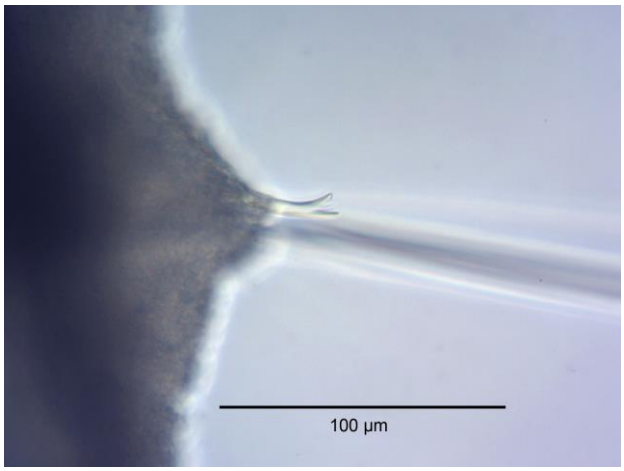


Fig. 19l. *Tubifex tubifex* (P1601.1, 59117) – anterior dorsal pectinate chaeta

Fig. 19m. *Heterodrilus subtilis* (412693, 7094) – ventral chaeta

RT6820 – *Pseudopolydora nordica* Radashevsky, 2021 (Figures 20a, 20b 20e)

Substratum: Mud. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: north of Ireland. Condition: Fair. Size: Small. All specimens from one sample. Previously conflated with (SD sp., listed with 'cf.') *Pseudopolydora paucibranchiata* (Okuda, 1937); described and distinguished from *P. paucibranchiata*, including UK waters in 2021; true *P. paucibranchiata* have also since been found in UK waters.

Fig. 20a. *Pseudopolydora nordica* (RT6820; 4162.1, 65204) – D

Three specific differences: Labs 03 and 10 identified as *Pseudopolydora paucibranchiata* (Figures 20c, 20f) (which has an occipital antenna); Lab 11 identified as *Pseudopolydora pulchra* (Figures 20d, 20g) (which has an incised prostomium).

Fig. 20b. *Pseudopolydora nordica* (RT6820; 4162.1, 65204) – D

Fig. 20c. *Pseudopolydora paucibranchiata* (P7508, 70890) – D

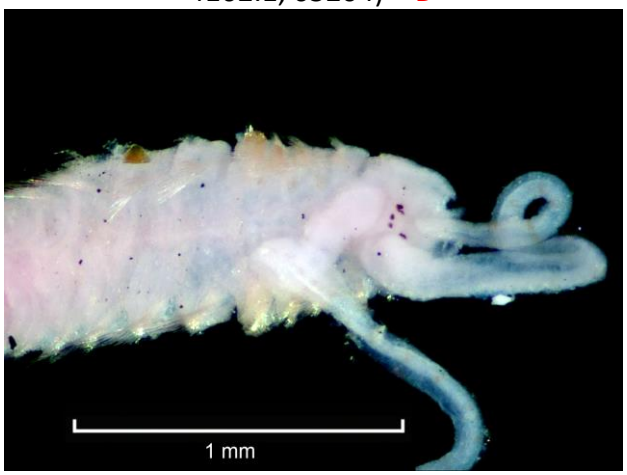


Fig. 20d. *Pseudopolydora pulchra* (P9552, 72516) – D

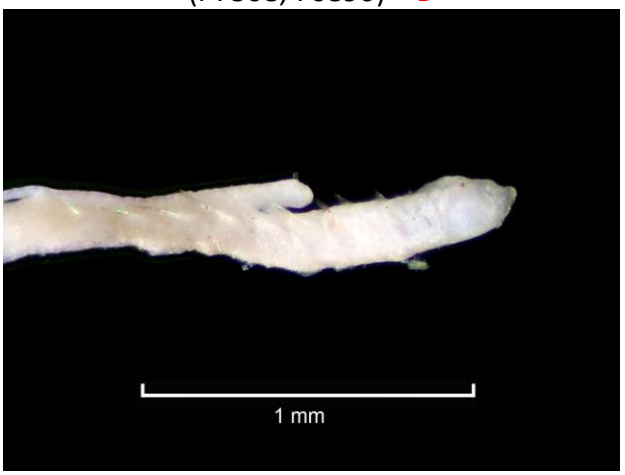


Fig. 20e. *Pseudopolydora nordica* (RT6820; 4162.1, 65204) – L

Fig. 20f. *Pseudopolydora paucibranchiata* (P7508, 70890) – L

Fig. 20g. *Pseudopolydora pulchra* (P9552, 72516) – L

RT6821 – *Uncispio reesi* Darbyshire & Mackie, 2011 (Figure 21a)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Lower Shelf). Geography: North Sea. Condition: Fair. Size: Small. All specimens from one sample. Not in SD, family listed as not yet recorded in UK; species described, from UK waters, in 2011.

Fig. 21a. *Uncispio reesi* (RT6821; 4264, 64113) – D

Six generic and specific differences: Lab 10 identified as *Poecilochaetus serpens* (Figure 21b) (which has flask-shaped dorsal cirri); Labs 03 and 21 identified as *Trochochaeta multisetosa* (Figure 21c) (which has a more strongly projecting prostomium and parapodia); Lab 18 identified as *Atherospio disticha* (Figures 21d, 21e) (which has modified chaetae on chaetigers 4 and 5).

Labs 05 and 06 identified as Polychaeta; it is recommended that laboratories attempt species level identification of all specimens.

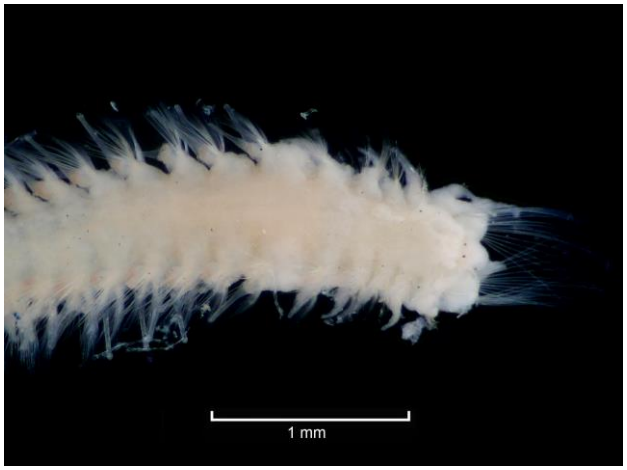


Fig. 21b. *Poecilochaetus serpens* (P7503, 70849) – D

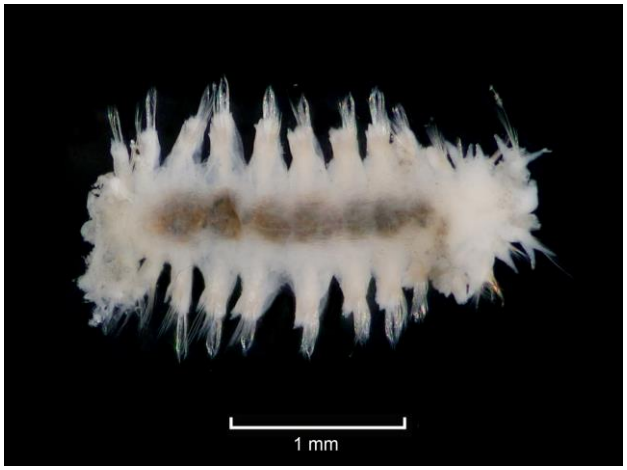


Fig. 21c. *Trochochaeta multisetosa* (P2046, 60001) – D

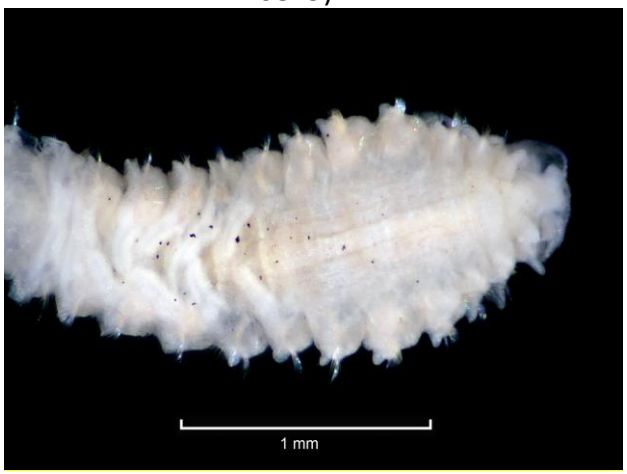


Fig. 21d. *Atherospio disticha* (P9317, 74326) – D

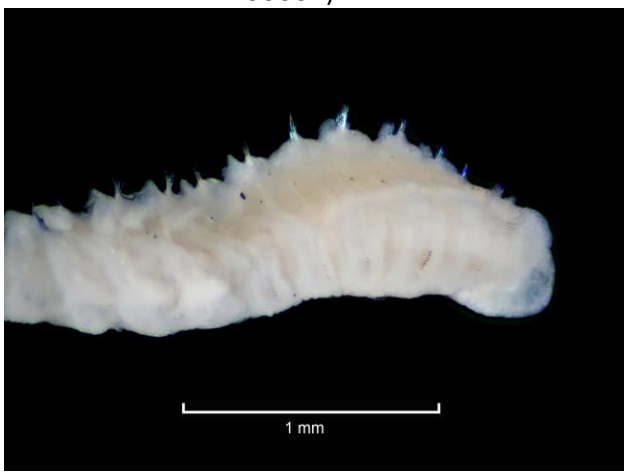


Fig. 21e. *Atherospio disticha* (P9317, 74326) – L

RT6822 – *Mytilopsis leucophaeata* (Conrad, 1831) (Figures 22a, 22d)

Substratum: Diamicton. Salinity: Low (Oligohaline). Depth: Infralittoral. Geography: southeast England. Condition: Fair, shells only. Size: Medium, 10-13 mm. All specimens from one sample. Not in SD list, though noted as an exotic of uncertain status in the introduction to Mollusca; non-native species recognised in UK waters in 1998.

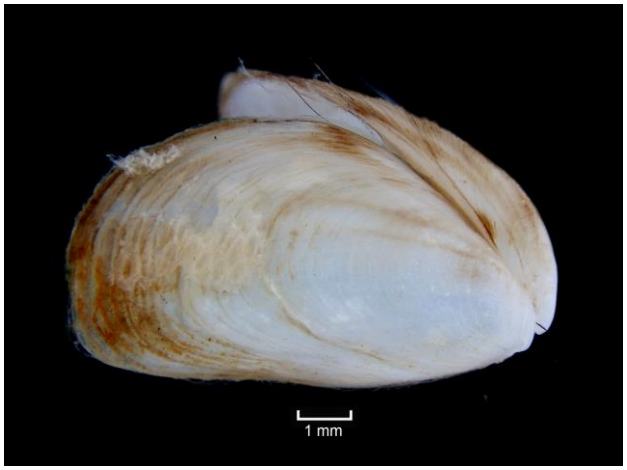


Fig. 22a. *Mytilopsis leucophaeata* (RT6822; 3212, 63264) – L

Three generic and specific differences: Lab 01 identified as *Mytilus edulis* (Figures 22b, 22e); Lab 18 identified as *Dreissena polymorpha* (Figures 22c, 22f); Lab 16 identified as *Dreissena bugensis* (no material available) (all of which lack a tooth on the inner dorsal edge of the septum).

Labs 19 and 22 spelled the specific name '*leucophaeta*'.

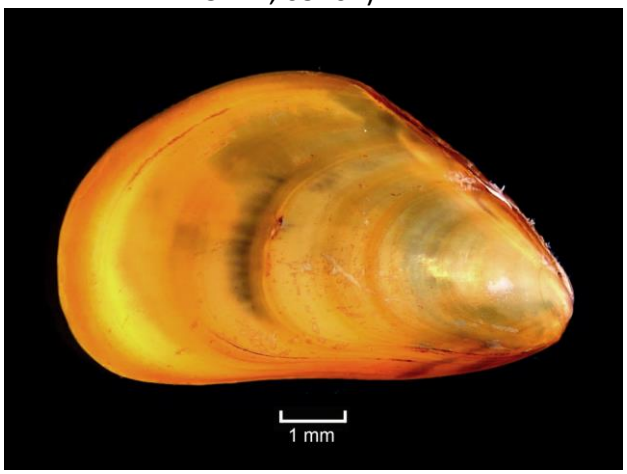


Fig. 22b. *Mytilus edulis* (P3593.1, 63494) – L

Fig. 22c. *Dreissena polymorpha* (P4634, 65637) – L

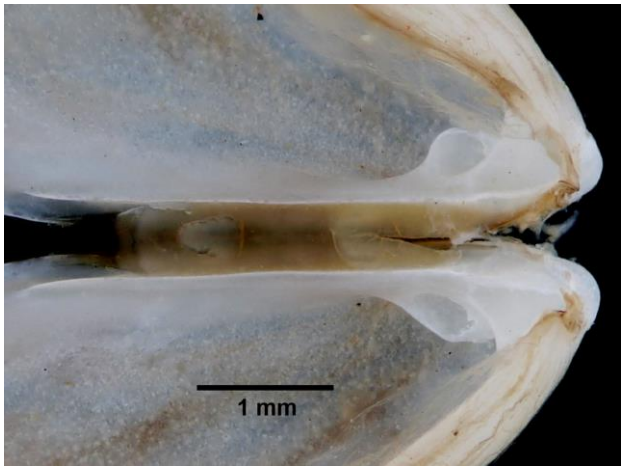


Fig. 22d. *Mytilopsis leucophaeata* (RT6822; 3212, 63264) – internal

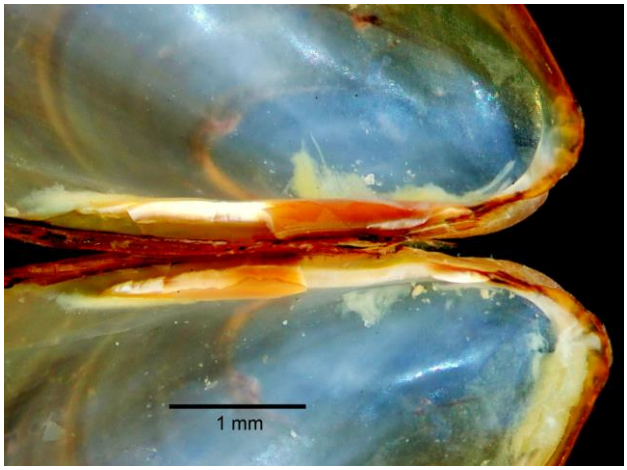


Fig. 22e. *Mytilus edulis* (P3593.1, 63494) – internal

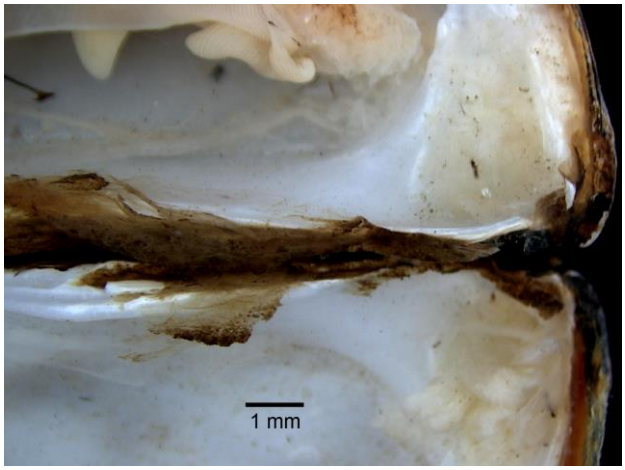


Fig. 22f. *Dreissena polymorpha* (P4634, 65637) – internal

RT6823 – *Nannoniscoides angulatus* Hansen, 1916 (Figure 23a)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Bathyal. Geography: Atlantic margin. Condition: Fair. Size: Small. Specimens from fifteen samples. Excluded from SD, probably as found only below 200m.

Fig. 23a. *Nannoniscoides angulatus* (RT6823; 15352, 77762) – D

Eight generic and specific differences: Labs 09 and 21 identified as *Eugerda tenuimana* (Figure 23b); Labs 10 and 18 identified as *Paramunna bilobata* (Figure 23c); Lab 03 identified as *Joeropsis brevicornis* (Figure 23d shows *Janira maculosa*) (all of which lack a pair of high, thick keels along the top of the head).

Labs 05 and 16 identified as Nannoniscidae; Lab 06 identified as Janiridae; it is recommended that laboratories attempt species level identification of all specimens. Lab 11 spelled the generic name '*Nannoiscoides*'.

Fig. 23b. *Eugerda tenuimana* (P4267, 64609) – D

Fig. 23c. *Paramunna bilobata* (412399_5965) – D

Fig. 23d. *Janira maculosa* (P2188.03, 63698) – D

RT6824 – *Syllis pontxioi* San Martín & López, 2000 (Figures 24a, 24e)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: southeast England. Condition: Good, proboscis out. Size: Medium. Specimens from six samples. Not in SD, '*Typosyllis*' noted as "very confused"; recognised in UK waters as 'sp. G' by 1990, named at 2012 workshop, records not yet published.

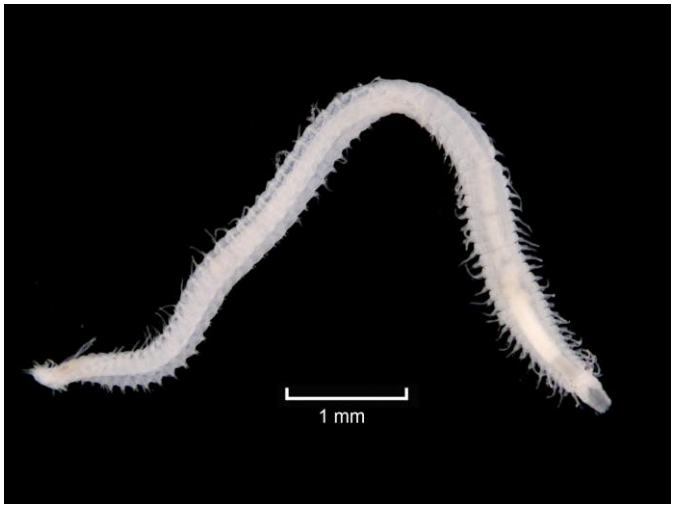


Fig. 24a. *Syllis pontxioi* (RT6824; 9615, 72817) – D

Seven specific differences: Lab 20 identified as *Syllis licheri* (Figures 24b, 24f) (which has unidentate posterior chaetal blades); Lab 10 identified as *Syllis hyalina* (Figures 24c, 24g) (which has shorter posterior chaetal blades); Labs 05, 06 and 18 identified as *Syllis pulvinata* (no material available) (which has longer dorsal cirri and two dorsal glands on the segments following the proventriculus); Lab 04 identified as *Syllis vittata* (no material available); Lab 09 identified as *Syllis variegata* (Figure 24d) (both of which have a distinct pigment pattern).

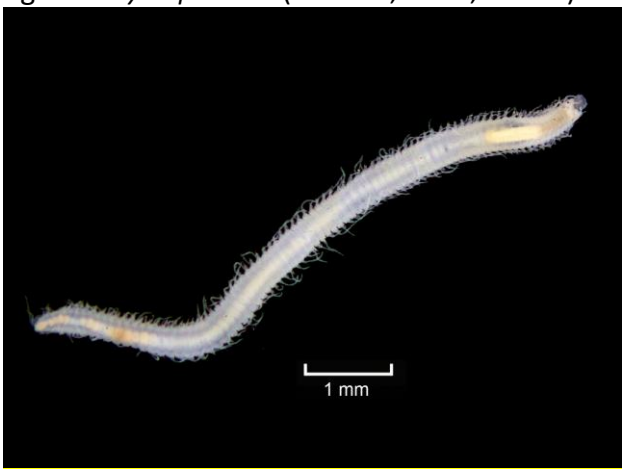


Fig. 24b. *Syllis licheri* (41532, 42615) – D

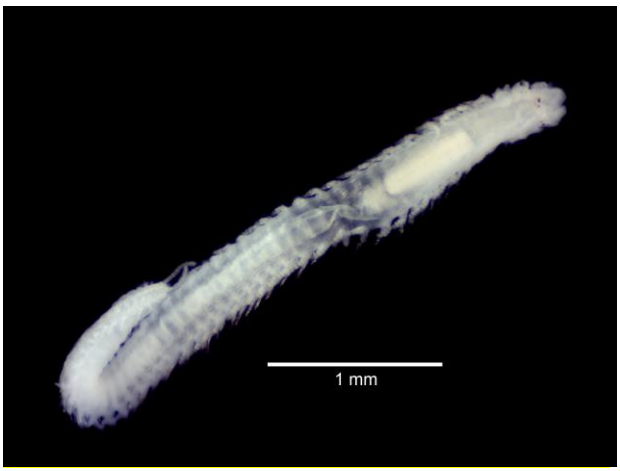


Fig. 24c. *Syllis hyalina* (RT4804; 410587) – D

Fig. 24d. *Syllis variegata* (413531, 54766) – D

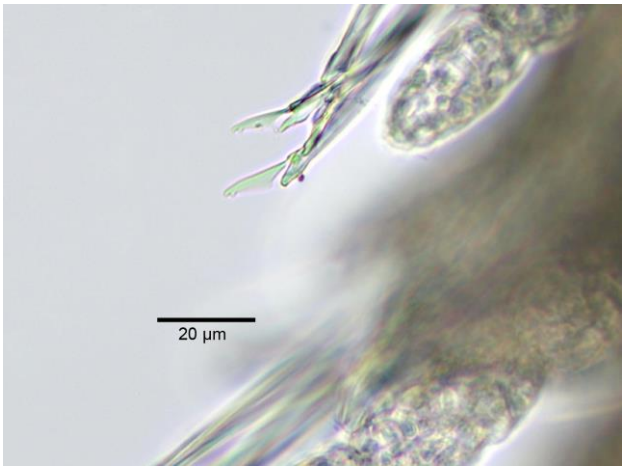


Fig. 24e. *Syllis pontxioi* (RT6824; 9615, 72817) – posterior chaetae

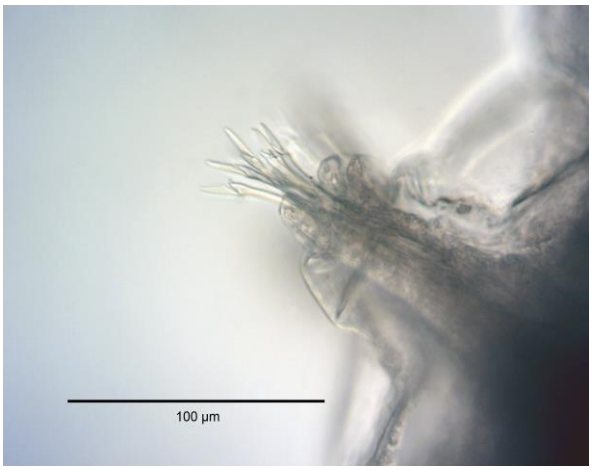


Fig. 24f. *Syllis licheri* (413150, 40935) – posterior chaetae

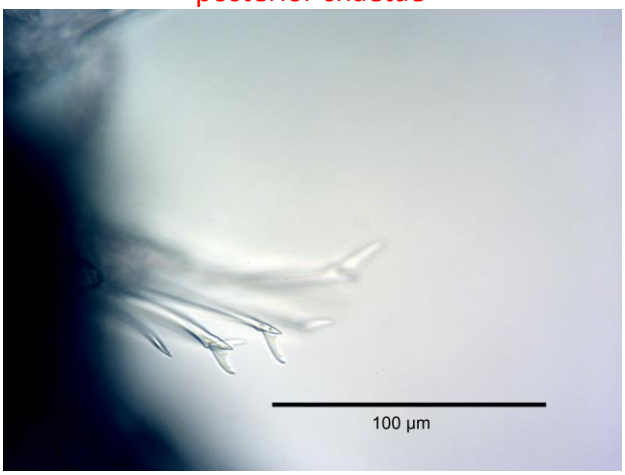


Fig. 24g. *Syllis hyalina* (BI2105, 04) – posterior chaetae

RT6825 – *Rapana venosa* (Valenciennes, 1846) (Figure 25a)

Substratum: Diamicton. Salinity: Reduced (Mesohaline). Depth: Infralittoral. Geography: Romania. Condition: Good. Size: Medium, 30-60 mm. All specimens from one sample. Not in SD list, though noted as an exotic of uncertain status in the introduction to Mollusca; non-native species first found in UK waters in 2005 but not considered established.

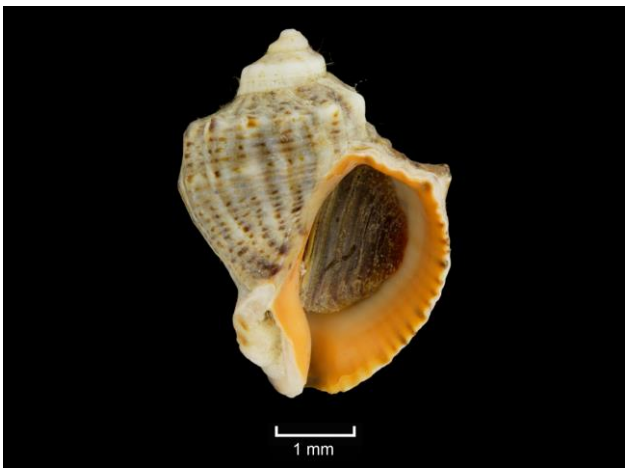


Fig. 25a. *Rapana venosa* (RT6825; TW, Constanţa) – V

No generic or specific differences recorded.

Breakdown of Results by Laboratory

Differences recorded at genus and species level for each of the participating laboratories are summarised in Table 3. The laboratories are ordered by increasing number of differences at species level. An arbitrary division of laboratories into three bands (Low, Mid and High) based on the number of differences at species level is shown in Figure 26. The results are not used to assess the performance of a laboratory and the graph with categories for numbers of identification differences (Figure 26) is provided for interest only.

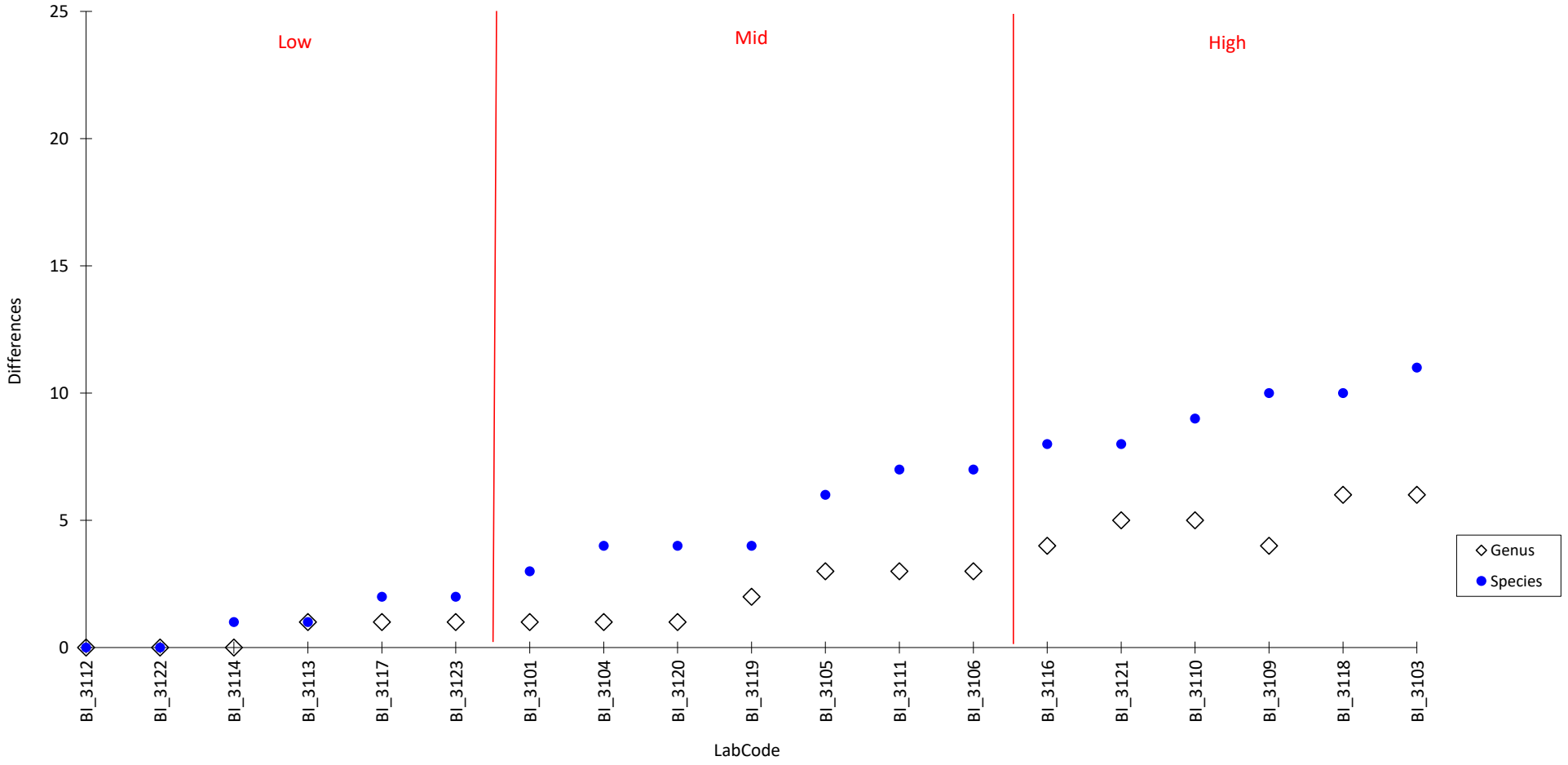
Table 3. The identification of fauna made by participating laboratories for RT68 (arranged by participant). Names are given only where different from the AQC identification.

	Taxon	BI_3101	BI_3103	BI_3104	BI_3105	BI_3106	BI_3109	BI_3110	BI_3110b	BI_3111
RT6801	*Turritellinella tricarinata*	- -	- -	- -	- -	- -	- -	- -	0 0	- -
RT6802	*Hemigrapsus takanoi*	- -	- -	- -	- -	- -	- -	- -	0 0	Pachygrapsus marmoratus
RT6803	*Atherospio guillei*	- -	Dipolydora caulleryi	- -	- -	- -	Dipolydora coeca	- -	0 0	- -
RT6804	*Caprella mutica*	- -	- -	- -	- -	- -	- -	- -	0 0	Aeginina longicornis
RT6805	*Volvulella acuminata*	[Rhizorus] [acuminatus]	- -	- -	- -	- -	- -	- -	0 0	- -
RT6806	*Paucibranchia totospinata*	[Marphysa] -	Marphysa sanguinea	- bellii	- -	- -	- bellii	- -	0 0	[Paucibranchiata] -
RT6807	*Neogyptis rosea*	- -	- -	Podarkeopsis capensis	- -	- mediterranea	Podarkeopsis capensis	Gyptis propinqua	0 0	- -
RT6808	*Astrorhiza arenaria*	- -	Tubus arenarius	- -	- -	- -	- -	- -	0 0	- -
RT6809	*Syllis parapari*	- -	- cornuta	- -	- cornuta	- mercedesae	- prolifera	- -	0 0	- -
RT6810	*Hypereteone lighti*	[Eteone] longa	[Eteone] longa agg	- -	- -	- -	- foliosa	- heteropoda	0 0	- foliosa
RT6811	*Astacilla dilatata*	- [dilitata]	- -	- -	- -	- -	- -	- -	0 0	- -
RT6812	*Pholoe assimilis*	- -	- baltica	- -	- inornata	- inornata	- -	- -	0 0	- inornata
RT6813	*Laonice irinae*	- -	- bahusiensis	- -	- -	- -	- bahusiensis	- bahusiensis	0 0	- -
RT6814	*Thyasira sarsii*	- [sarsi]	- -	- -	- -	- -	- -	- -	0 0	- -
RT6815	*Caprella mutica*	- -	- -	- -	- -	- -	- -	- -	0 0	- -
RT6816	*Yoldiella propinqua*	- intermedia	- -	- -	- -	- -	- -	- -	0 0	- -
RT6817	*Pontocrates moorei*	- -	- -	- norvegicus	- -	- -	- arenarius	- -	0 0	- arcticus
RT6818	*Adontorhina similis*	- -	- -	- -	- -	- -	- -	Mendicula pygmaea	0 0	- -
RT6819	*Branchiura sowerbyi*	- -	Heterodrilus subtilis	- -	Tubificoides parapectinatus	Tubificoides parapectinatus	Tubificoides amplivasatus	Tubificoides parapectinatus	0 0	Tubificoides scoticus
RT6820	*Pseudopolydora nordica*	- -	- paucibranchiata	- -	- -	- -	- -	- paucibranchiata	0 0	- pulchra
RT6821	*Uncispio reesi*	- -	Trochochaeta multisetosa	- -	Polychaeta 0	Polychaeta 0	- -	Poecilochaetus serpens	0 0	- -
RT6822	*Mytilopsis leucophaeata*	Mytilus edulis	- -	- -	- -	- -	- -	- -	0 0	- -
RT6823	*Nannoniscoides angulatus*	- -	Joeropsis brevicornis	- -	Munnopsidae 0	Janiridae 0	Eugerda tenuimana	Paramunna bilobata	0 0	[Nannoiscoides] -
RT6824	*Syllis pontxioi*	- -	- -	- vittata	- pulvinata	- pulvinata	- variegata	- hyalina	0 0	- -
RT6825	*Rapana venosa*	[Rapena] -	- -	- -	- -	- -	- -	- -	0 0	- -

Table 3 (cont.). The identification of fauna made by participating laboratories for RT68 (arranged by participant). Names are given only where different from the AQC identification.

	Taxon	BI_3112	BI_3113	BI_3114	BI_3116	BI_3117	BI_3118	BI_3119	BI_3120	BI_3121	BI_3122	BI_3123
RT6801	Turritellinella tricarinata	--	--	--	--	--	--	--	--	[Turritellanella] -	--	--
RT6802	Hemigrapsus takanoi	--	--	--	- sanguineus	--	--	--	--	--	--	--
RT6803	Atherospio guillei	--	--	--	--	--	Scolelepis (Scolelepis) foliosus	--	--	--	--	--
RT6804	Caprella mutica	--	--	--	- linearis	--	--	--	--	--	--	--
RT6805	Volvulella acuminata	--	--	--	--	--	--	--	--	--	--	--
RT6806	Paucibranchia totospinata	--	--	- bellii	--	--	--	- bellii	- bellii	- bellii	--	- bellii
RT6807	Neogyptis rosea	--	--	--	Gyptis mackiei	--	Oxydromus flexuosus	--	--	Gyptis mackiei	--	--
RT6808	Astrorhiza arenaria	--	--	--	--	--	--	Epizoanthus papillosus	--	Epizoanthus papillosus	--	--
RT6809	Syllis parapari	--	--	--	--	--	- caeca	--	--	--	--	--
RT6810	Hypereteone lighti	--	--	--	[Eteone] suecica	- fauchaldi	- foliosa	--	- foliosa	- heteropoda	--	--
RT6811	Astacilla dilatata	--	--	--	--	--	--	--	--	--	--	--
RT6812	Pholoe assimilis	--	--	--	--	--	--	- inornata	--	--	--	--
RT6813	Laonice irinae	--	--	--	--	--	--	--	--	--	--	--
RT6814	Thyasira sarsii	--	- [sarsi]	- [sarsi]	- [sarsi]	--	--	--	--	- [sarsi]	--	- [sarsi]
RT6815	Caprella mutica	--	--	--	- septentrionalis	--	--	--	--	--	--	--
RT6816	Yoldiella propinqua	--	--	--	--	--	--	--	--	--	--	--
RT6817	Pontocrates moorei	--	--	--	--	--	- norvegicus	--	--	- altamarinus	--	--
RT6818	Adontorhina similis	--	--	--	--	--	--	--	--	--	--	--
RT6819	Branchiura sowerbyi	--	Tubifex tubifex	--	Tubificoides parapectinatus	Potamothrix bavaricus	Tubificoides insularis	Tubifex tubifex	Potamothrix bavaricus	Tubificoides parapectinatus	--	Aulodrilus pluriseta
RT6820	Pseudopolydora nordica	--	--	--	--	--	--	--	--	--	--	--
RT6821	Uncispio reesi	--	--	--	--	--	Atherospio disticha	--	--	Trochochaeta multisetosa	--	--
RT6822	Mytilopsis leucophaeata	--	--	--	Dreissena bugensis	--	Dreissena polymorpha	- [leucophaeta]	--	--	- [leucophaeta]	--
RT6823	Nannoniscoides angulatus	--	--	--	Nannoniscidae 0	--	Paramunna bilobata	--	--	Eugerda tenuimana	--	--
RT6824	Syllis pontxioi	--	--	--	--	--	- pulvinata	--	- licheri	--	--	--
RT6825	Rapana venosa	--	--	--	--	--	--	--	--	--	--	--

Figure 26. The number of differences from the AQC identification of specimens distributed in RT68 for each of the participating laboratories. Arranged in order of increasing number of differences (by specific followed by generic errors).



Theme identification attempts

RT68 introduced an option for participants to identify the target theme, which will not be revealed in future RTs before the interim report. Laboratories' theme identification attempts are listed below.

- Lab 01: Obscure or overlooked taxa.
- Lab 09: Cryptic species i.e. those that are morphologically very similar to their close relatives.
- Lab 10: ? Synonyms/name changes.
- Lab 13: Taxa that were misidentified or in species complexes.
- Lab 16: Sadism?
- Lab 17: Previously referred to as different combination.
- Lab 18: Something missing: i.e. species not in the typical "go to" keys or the characteristic typically used to ID the species, is missing.
- Lab 19: Cryptogenic & Non-native species.
- Lab 20: New: new species, new names (moved to new or different genus), new arrivals, or new records for British waters.
- Lab 21: Non-natives, recently described and species with a wide distribution (potentially all non-native!).
- Lab 22: Binomial name not in the MCS directory due to being more recently described or nomenclature change?
- Lab 23: past targeted ring tests, to celebrate the past 30 years of NMBAQC.

Lab 22 correctly identified the target theme; Lab 20 was close.

Labs 03, 04, 05, 06, 11, 12 and 14 gave no theme suggestion.

Taxonomic and Identification policy considerations highlighted by RT68

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.

The taxonomic and Identification policy considerations section was added at end of the RT54 bulletin, to include detail for which there was not enough space alongside images. 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. A draft TDP was published in 2023 (Worsfold *et al.*, 2023). TDP implications, including recommendations and historical data implications, are also included.

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.

Foraminifera

Astrorhizidae (RT6808). The draft TDP suggests genus level identification for Astrorhizidae. APEM currently count individuals for those resembling *Astrorhiza limicola* and leave at genus but record presence/absence for more irregular forms. Foraminifera are very sporadically recorded, with varying policies apparent between laboratories. The SD gives no list for 'Protozoa' but includes the higher taxon in the table of major groups. Foraminifera are now treated as a phylum in the kingdom Chromista (along with brown algae) in WoRMS; MSBIAS lists two species of *Astrorhiza*. Agglutinating species, such as Astrorhizidae may be large and significant in samples and many are identifiable using Gabel (1971). There are also non-native species (Bouchet et al., 2023). Further discussion is needed for policies. *Astrorhiza limicola* was circulated in 2022 (RT6325), with 19% error, suggesting species level may be achievable for *Astrorhiza*. ***Astrorhiza arenaria*** Carpenter in Norman, 1877 was first circulated in 2025 **(RT6808)**. Most labs identified **RT6808** correctly (16% error). Lab 23 stated they leave them at genus. The main problem is recording inconsistency both with whether the smaller forms are recorded at all and whether *Astrorhiza* are counted or recorded as 'present'.

Bouchet, V.M., Pavard, J.C., Holzmann, M., McGann, M., du Châtelet, E.A., Courleux, A., Pezy, J.P., Dauvin, J.C. & Seuront, L., 2023. The invasive Asian benthic foraminifera *Trochammina hadai* Uchio, 1962: identification of a new local in Normandy (France) and a discussion on its putative introduction pathways. *Aquatic Invasions*, 18(1), 23-38. https://doi.org/10.3391/ai.2023.18.1.103512

Gabel, B., 1971. Die Foraminiferan der Nordsee. *Helgolander wissensschaftliche Meeresuntersuchungen,* 22, 1-65.

Sigalionidae (RT6812). The draft TDP flags Sigalionidae for further work, due to taxonomic flux (changes in species recognised over time) and the different taxonomic levels used for different taxa by different labs, particularly for juveniles. The family. now includes taxa previously included in Pisionidae and Pholoidae. The details below cover only the subfamily **Pholoinae** (formerly Pholoidae). The draft TDP suggests species level identification for Pholoinae (in practice all are *Pholoe* in UK shelf waters), as currently done at APEM. The SD lists four *Pholoe*; MSBIAS lists six. It is now well-known that *Pholoe* identified using Chambers & Muir (1997), and nomenclature from the SD, will be given names that conflict with current understanding, as resolved by Petersen (1998) and Meißner et al. (2019). As the name '*Pholoe inornata*' has been used for both of the common species at different times (a particular problem, see Worsfold *et al*., 2023), APEM add 'sensu Petersen' to *Pholoe* species names for clarity. Hebog and Thomson Ecology no longer do this, as the years of confusion have passed. One of the MSBIAS species (*P. minuta*) is restricted to Arctic waters (see Meißner et al., 2017) and another (*P. anoculata*) to deep water (Hartman & Fauchald, 1971). ***Pholoe assimilis***, excluded from the SD, was circulated in 2009 (RT3720) with 50% error, 2012 (RT4203) with 13% error, 2015 (RT4907) with 25% error, 2016 (RT5121) with 36% error and 2025 **(RT6812)**. Most labs identified **RT6812** correctly (25% error), suggesting no need for change. Further discussion is needed for a solution to the wider problem of names that become applied to different species.

Chambers, S.J. & Muir, A.I., 1997. *Polychaetes: British Chrysopetaloidea, Pisionoidea & Aphroditoidea*. *Keys and notes for the identification of the species*. Synopses of the British Fauna (New Series), No. 54. Published for the Linnaean Society of London and The Estuarine and Coastal Sciences Association by Field Studies Council, Shrewsbury, 202 pp.

Hartman, O. & Fauchald, K., 1971. Deep-water benthic polychaetous annelids off New England to Bermuda and other North Atlantic Areas. Part II. *Allan Hancock Monographs in Marine Biology*, 6, 1-327.

Meißner, K., Bick, A. & Götting, M., 2017. Arctic *Pholoe* (Polychaeta, Pholoidae): when integrative taxonomy helps to sort out barcodes. *Zoological Journal of the Linnean Society*, 179, 237-262.

Meißner, K., Götting, M. & Nygren, A., 2019. Do we know who they are? On the identity of *Pholoe* (Annelida: Sigalionidae: Pholoinae) species from northern Europe. *Zoological Journal of the Linnean Society*, XX, 1-29. With 12 figures.

Petersen, M.E., 1998. *Pholoe* (Polychaeta: Pholoidae) from northern Europe: a key and notes on the nearshore species. *Journal of the Marine Biological Association of the United Kingdom*, 78(4), 1373-1376.

Phyllodocidae (RT6810). There have been several problems with Phyllodocids and the family will need to be revisited. The details below cover only the genus complex circulated in RT68: *Eteone/Hypereteone*. Members of the *Eteone longa* complex are given 'agg.' at APEM (and Fugro) but have been named as species at other laboratories. The SD divides the species included in *Eteone* in the standard identification guides (Pleijel, 1993; Pleijel & Dales, 1991) between *Eteone*, *Mysta* and *Hypereteone*. Both the SD and MSBIAS list four *Eteone*, two *Mysta* and one *Hypereteone*. *Eteone lighti* was placed in *Hypereteone* by Wilson (1998) but the genus *Hypereteone* is of uncertain validity (Pleijel, 1991) and may later be reassigned; we have retained the current WoRMS name. A species matching the description of ***Hypereteone lighti*** had been known in the U.K. since the early 2000s (recorded as '*Eteone* Type A') before publication as a non-native (Ashelby & Worsfold, 2024). It was first circulated in 2025 (**RT6810**). About half of the

returns identified **RT6810** correctly (53% error), with most naming related native species but three naming other non-European species that could be considered as potential future non-natives. The RT has hopefully highlighted *H. lighti* for future records and resolved differences from similar non-European species.

Ashelby, C.W. & Worsfold, T.M., 2024. Updated review of non-native and cryptogenic species from around the Stour and Orwell estuaries. *Cahiers de Biologie Marine*, 65, 93-108. DOI: 10.21411/CBM.A.C46E8D67

Pleijel, F., 1991. Phylogeny and classification of the Phyllodocidae (Polychaeta). *Zoologica Scripta*, 20(3), 225-261.

Pleijel, F., 1993. *Polychaeta Phyllodocidae*. Marine Invertebrates of Scandinavia, 8, Scandinavian University Press, 159pp.

Pleijel, F. & Dales, R.P., 1991. *Polychaetes - British phyllodocoideans, typhloscolecoideans and tomopteroideans. Keys and notes for the identification of the species*. Synopses of the British Fauna (New Series), No. 45. Published for The Linnean Society of London and The Estuarine and Coastal Sciences Association by Universal Book Services/Dr. W. Backhuys, Oegstgeest, The Netherlands, 202pp.

Wilson, R.S., 1988. A review of *Eteone* Savigny, 1820, *Mysta*, Malmgren, 1865 and *Hypereteone* Bergstrom, 1914 (Polychaeta: Phyllodocidae). *Memoirs of the Museum of Victoria*, 49(2), 385-431.

Hesionidae (RT6807). The draft TDP flags Hesionidae for further work, due to taxonomic flux (changes in species recognised over time) and the different taxonomic levels used for different taxa by different labs. *Podarkeopsis* are named as *P. capensis* by some (until recently including APEM) but left at genus by others (e.g. Hebog: taxonomic uncertainty); UK records may refer to *P. helgolandica*. The SD lists sixteen Hesionidae in eleven genera, excluding 'Microphthalminae', which are now considered a separate family. MSBIAS lists others and includes genus assignment changes but only those assigned to *Gyptis* are considered further below. Pleijel (1993) provided a key to European *Gyptis*, of which three were recorded from northern Europe. *Gyptis rosea* (Malm, 1874) was redescribed and transferred to the new genus *Neogyptis* by Pleijel et al. (2012). ***Neogyptis rosea*** was first circulated in 2025 **(RT6807)**. Most labs identified **RT6807** correctly (37% error). However, identifications in the *Gyptis* / *Neogyptis* group remain problematic.

Pleijel, F., 1993. Taxonomy of European species of *Amphiduros* and *Gyptis* (Polychaeta: Hesionidae). *Proceedings of the Biological Society of Washington*, 106, 158-181.

Pleijel, F., Rouse, G.W., Sundkvist, T. & Nygren, A., 2012. A partial revision of *Gyptis* (Gyptini, Ophiodrominae, Hesionidae, Aciculata, Annelida), with descriptions of a new tribe, a new genus and five new species. *Zoological Journal of the Linnean Society*, 165(3), 471-494.

Syllidae (RT6809, RT6824). The draft TDP flags this large family for further work, due to taxonomic flux (changes in species recognised over time) and the different taxonomic levels used for different taxa by different labs. Some problems were resolved through the Scheme workshops (2006, 2012), as well as through RT48, but problems remain and more work is needed. Before the NMBAQC Scheme workshops, syllids were identified using older workshop keys (Garwood, 1985; 1990), updated after the 2006 workshop (Garwood, 2006) and 2012 workshop (San Martín & Worsfold, 2015); these guides are available on the Scheme website (links in citations below. There has always been a need to refer also to other publications (especially San Martín, 2003) for additional species and illustrations. The details below cover only the genus circulated in RT68: *Syllis*. APEM

identify most *Syllis* to species but acknowledge that there are several complexes with taxonomic problems (see RT48) and add 'agg.' to some. The SD divides species currently assigned (e.g. WoRMS, MSBIAS) to *Syllis* between the genera *Syllis* (2 species, with some simple chaetae), *Typosyllis* (8 species, with compound falcigers only; noted as "very confused") and *Ehlersia* (4 species and one un-named, with some spinigers or pseudospinigers; only 2 of the listed *Ehlersia* currently in *Syllis*). MSBIAS lists twenty accepted *Syllis* species; the true number in UK waters remains unknown. Members of the *Syllis armillaris* complex are given species names (including *S. hyalina*) by some. APEM (and Hebog) now record them as *S. armillaris* agg. Some laboratories use P. Garwood's types (A, B etc.) for *Syllis*; these are converted to current nomenclature in APEM audits, with correction of *S. parapari* and *S. cornuta* records (reversed by Garwood, 2006). *Syllis parapari* San Martín & López, 2000 was first circulated in 2025 (**RT6809**). Records have been confused with *Syllis cornuta* and *S. garciai* in older data and Garwood (2006) reversed the identities of *Syllis parapari* (which is keyed to '*S. cornuta*) and *Syllis* 'species E' (which included true *S. cornuta* and *S. mauretanica* but mainly *S. garciai*). Most labs identified **RT6809** correctly (26% error) but there were identifications of *S. cornuta* (see above), *S. caeca* and *S. prolifera*. *S. caeca* was excluded from San Martín (2003) but is a Mediterranean species and included in the Scheme key (San Martín & Worsfold, 2015) as possible for UK waters but not yet recorded from here. Licher (1999) illustrates the chaetae but not the body or dorsal cirri; the chaetae have some similarity to those of *S. cornuta* (Figure 9d). *Syllis pontxioi* San Martín & López, 2000 was circulated in 2015 (RT4807), with 44% error but included some *S. licheri*, so *S. licheri* identifications were counted as correct, and in 2025 (**RT6824**). Most labs identified **RT6824** correctly but many did not (37#% error), reflecting continuing problems with *Syllis*.

Garwood P.R., 1985. *Family Syllidae*. EBWSA Errant Polychaete Workshop, Heriot-Watt University, Edinburgh, 1985, 25pp., (unpublished). https://www.nmbaqcs.org/scheme-components/invertebrates/literature-and-taxonomic-keys/garwood-1985-syllidae/

Garwood P.R., 1990. *Family Syllidae*. ECSA Polychaete Workshop, Fort Popton, April 1990, 15 pp., (unpublished). https://www.nmbaqcs.org/scheme-components/invertebrates/literature-and-taxonomic-keys/garwood-1990-syllidae/

Garwood, P.R., 2006. *Family Syllidae. Provisional guide to the identification of British species*. NMBAQC Taxonomic Workshop, Dove Marine Lab., Nov. 2006, 34pp., (unpublished). https://www.nmbaqcs.org/scheme-components/invertebrates/literature-and-taxonomic-keys/garwood-2006-syllidae/

Licher, F., 1999. Revision der Gattung *Typosyllis* Langerhans, 1879 (Polychaeta: Syllidae). Morphologie, Taxonomie und Phylogenie. *Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft*, 551, 1-336.

San Martín, G., 2003. *Annelida, Polychaeta II: Syllidae*. In: *Fauna Ibérica*, 21. Ramos, M.A. et al. (Eds). Museo Nacional de Ciencias Naturales. CSIC. Madrid, 554 pp.

San Martín, G. & Worsfold, T.M., 2015. Guide and keys for the identification of Syllidae (Annelida, Phyllodocida) from the British Isles (reported and expected species). *ZooKeys*, 488, 1-29. https://zookeys.pensoft.net/articles.php?id=4917

Eunicidae. **(RT6806).** The draft TDP flags Eunicidae for further work, due to taxonomic flux (changes in species recognised over time) and different taxonomic levels used for different taxa by different labs, mainly for juveniles. APEM separate juvenile *Eunice*, *Marphysa* and *Paucibranchia* (which had previously been included in *Marphysa*) and leave juveniles at Genus. Ocean Ecology leave all *Paucibranchia* at genus; APEM sometimes record them at species. The SD lists six *Eunice*,

three *Marphysa*, *Lysidice ninetta* and *Nematonereis unicornis*. MSBIAS adds another *Eunice*, while two are transferred to *Leodice*. *N. unicornis* is transferred to *Lysidice* and MSBIAS adds another. *Marphysa* was divided by Molina-Acevedo (2018), creating the new genus *Paucibranchia*. Recent reviews (e.g. Lavesque et al., 2020) suggest true *Marphysa* may include more UK species than the single (*M. sanguinea*) in MSBIAS but further discussion here is limited to *Paucibranchia*. MSBIAS lists four *Paucibranchia*, of which *P. totospinata*, described by Lu & Fauchald (1998), would have been identified as '*Marphysa*' *bellii* using the previous standard guide (George & Hartmann-Schröder, 1985). Pinsivy et al. (2025) described a new species and provide a key to (7) European *Paucibranchia*. We have not found definite *P. bellii* since recognition of *P. totospinata* but it should be considered possible, along with at least four other species. ***Paucibranchia totospinata*** was first circulated in 2025 **(RT6806)**. About half of returns identified **RT6806** correctly (42% error), with most differences giving *P. bellii*. Lab 23 stated they leave them at genus. The literature giving recent updates has hopefully been highlighted by this RT; the previous recognition of *P. totospinata* (Lu & Fauchald, 1998) had been missed by many labs for a time.

George, J.D. & Hartmann-Schröder, G., 1985. *Polychaetes: British Amphinomida, Spintherida and Eunicida. Keys and notes for the identification of the species*. Synopses of the British Fauna (New Series), No. 32. Published for The Linnaean Society of London and The Estuarine and Brackish-Water Sciences Association by E. J. Brill/Dr. W. Backhuys, London, Leiden, København, Köln, 221 pp.

Lavesque, N., Hutchings, P., Abe, H., Daffe, G., Gunton, L.M. & Glasby, C.J., 2020. Confirmation of the exotic status of *Marphysa victori* Lavesque, Daffe, Bonifácio & Hutchings, 2017 (Annelida) in French waters and synonymy of *Marphysa bulla* Liu, Hutchings & Kupriyanova, 2018. *Aquatic Invasions*, 15(3), 355-366. https://doi.org/10.3391/ai.2020.15.3.01

Lu, H. & Fauchald, K., 1998. *Marphysa belli* (Polychaeta: Eunicidae) and two related species, *Marphysa oculata* and *M. totospinata*, a new species, with notes on size-dependent features. *Proceedings of the Biological Society of Washington*, 111(4), 829-842, 9 figures, 1 table.

Molina-Acevedo, I.C., 2018. Morphological revision of the Subgroup 1 Fauchald, 1970 of *Marphysa* de Quatrefages, 1865 (Eunicidae: Polychaeta). *Zootaxa*, 4480(1), 1-125.

Pinsivy, L., Lavesque, N., Daffe, G., Daramy, F. & Hutchings, P., 2025. *Paucibranchia glemareci* sp. nov. (Annelida, Eunicidae), a new species from the French Atlantic continental shelf. *ZooKeys*, 1232, 187-203. DOI: 10.3897/zookeys.1232.143944

Spionidae (RT6803, RT6813, RT6820). The draft TDP flags this large family for further work, due to taxonomic flux (changes in species recognised over time) and the different taxonomic levels used for different taxa by different labs. Many problems were resolved through the Scheme workshops (2008, 2016), as well as through RT54 (see Radashevsky, 2017), but a further update to the key is now required. The details below are divided by genus and cover only the genera circulated in RT68. APEM currently identify *Atherospio, Laonice* and *Pseudopolydora* to species but may leave small *Laonice* at genus, if more than one adult sp. has been recorded. The SD lists one species of *Atherospio*: *A. disticha* Mackie & Duff, 1986, with a note that "Additional species and new genera are currently under review". A spionid key used at the time (Mackie, 1990) included 'Genus 1' and 'Genus 2' as provisional names for certain species with modified chaetae on chaetger 5. *Polydora guillei* had been described (Laubier & Ramos, 1974) but was not understood to be the species previously recorded as 'Genus 2' until its assignment to *Atherospio* and North Sea records were published (Meißner & Bick, 2005); it was then included in Scheme workshop keys (Radashevsky, 2012; 2016). Both species are listed in MSBIAS. ***Atherospio guillei*** was first circulated in 2025 **(RT6803)**. Most labs correctly identified **RT6803** (16% error), with other genera given for the three

alternatives. The SD lists four species of *Laonice*, of which *L. bahusiensis* has been the most widely recorded. Other species are identifiable from Sikorski (2003); Sikorski et al. (2017) should be checked for deep water samples. Since Sikorski *et al.* (2021) separated *Laonice irinae*, we have seen true *L. bahusiensis* only rarely; it may be a deeper water species. MSBIAS still lists only the four *Laonice* that had been included in the SD. '*Laonice bahusiensis*' was circulated in 2017 (RT5403), with 10% error, though they would now be identified as *L. irinae*. ***Laonice irinae*** was circulated in 2024 (RT6515), with 32% error (mostly named *L. bahusiensis*) and 2025 **(RT6813)**. Most labs correctly identified **RT6813** (16% error), with all errors as *L. bahusiensis*, suggesting improved awareness since 2024. Lab 23 stated they leave them at '*Laonice bahusiensis* agg'. The SD lists three species of *Pseudopolydora*, one of which, *P. paucibranchiata*, is qualified with 'cf.', reflecting the previous key (Mackie, 1990). '*Pseudopolydora* cf. *paucibranchiata*' was circulated in 2003 (RT2117), with 21% error, '*Pseudopolydora* species A' was circulated in 2017 (RT5412), with 43% error; these would now be identified as *P. nordica* Radashevsky, 2021. True *P. paucibranchiata* is also now known from UK waters and listed in MSBIAS, though not formally published; Dutch records were published by Faasse (2016). Some Dutch specimens of *P. paucibranchiata* were circulated in 2017 (RT5425), with 29% error. ***Pseudopolydora nordica*** is now circulated as **RT6820**. Most labs correctly identified **RT6820** (16% error), suggesting improved awareness since 2017.

Faasse, M., 2016. Dispersal of the invasive tubeworms *Desdemona ornata* and *Pseudopolydora paucibranchiata* to the Netherlands (Polychaeta : Sedentaria). *Nederlandse Faunistische Mededelingen*, 46, 49-56.

Laubier, L. & Ramos, J., 1974. *Polydora guillei* sp. nov. nouvelle espèce de polychète spionidien en Mediterranée occidentale. *Vie Milieu*, 24(3), 479-486.

Mackie, A.S.Y., 1990. *Spionidae and Magelonidae*. ECSA polychaete workshop, Fort Popton, April 1990, 12pp., (unpublished).

Mackie, A.S.Y. & Duff, A.A., 1986. *Atherospio disticha* gen. et sp. nov. (Polychaeta: Spionidae) from Loch Tuirnaig, west coast of Scotland. *Ophelia*, 25, 139-146.

Meißner, K. & Bick, A., 2005. *Atherospio guillei* (Laubier and Ramos, 1974) comb. nov. (Polychaeta: Spionidae) and closest relatives. *Zoologischer Anzelger*, 244, 115-123.

Radashevsky, V.I., 2012. Spionidae (Annelida) from shallow waters around the British Islands: an identification guide for the NMBAQC Scheme with an overview of spionid morphology and biology. *Zootaxa*, 3152, 1-35.

Radashevsky, V.I., 2016. Keys to Spionidae (Annelida) species from shallow waters around the British Islands. NMBAQC 2016 taxonomic Workshop FSC Millport, 14pp. (unpublished). https://www.nmbaqcs.org/scheme-components/invertebrates/literature-and-taxonomic-keys/radashevsky-2016-keys-to-spionidae/

Radashevsky, V.I., 2017. *Identification keys and comments on the taxonomy of spionid polychaetes (Annelida: Spionidae) from the continental shelf of northern Europe*. NMBAQC Ring Test no. 54, 52pp. (unpublished). https://www.nmbaqcs.org/scheme-components/invertebrates/literature-and-taxonomic-keys/spionids-key-2017/

Radashevsky, V.I., 2021. *Pseudopolydora* (Annelida: Spionidae) from European and adjacent waters with a key to identification and description of a new species. *Marine biodiversity*, 51:31. https://link.springer.com/article/10.1007/s12526-020-01156-7

Sikorski, A.V., 2003. *Laonice* (Polychaeta, Spionidae) in the Arctic and the North Atlantic. *Sarsia*, 88, 316-345.

Sikorski, A., Gunton, L.M. & Pavlova, L., 2017. *Laonice* species (Polychaeta, Spionidae) from the Whittard Canyon (NE Atlantic) with descriptions of two new species. *Journal of the Marine Biological Association of the United Kingdom*, 97(5), 961-973. doi:10.1017/S0025315417000480

Sikorski, A.V., Radashevsky, V.I., Castelli, A., Pavlova, L.V., Nygren, A., Malyar, V.V., Borisova, P.B., Mikac, B., Rousou, M., Martin, D. & Gil, J., 2021. Revision of the *Laonice bahusiensis* complex (Annelida: Spionidae) with a description of three new species. *Zootaxa*, 4996(2), 253-283. https://doi.org/10.11646/zootaxa.4996.2.2

Uncispionidae (RT6821). The draft TDP suggests species identifications for uncispionids, without qualifiers for juveniles, as currently done at APEM, although some specimens thought not to fit perfectly with the described species have been left at genus. The SD notes 'not yet recorded for the area' against the family; MSBIAS lists only the genus; *Uncispio reesi* had been described from the Irish Sea (Darbyshire & Mackie, 2011). ***Uncispio reesi*** was first circulated in 2025 (**RT6821**). Most labs correctly identified **RT6821** correctly (32% error).

Darbyshire, T. & Mackie, A.S.Y., 2011. Review of Uncispionidae (Annelida: Polychaeta) with the description of a new species of *Uncispio*. *Italian Journal of Zoology*, 78(S1), 65-77.

Naididae (RT6819). The draft TDP flags naidids for further work, due to taxonomic flux (changes in species recognised over time) and the different taxonomic levels used for different taxa by different labs. Although a preliminary TDP has been available through the NMBAQC for Oligochaeta, some laboratories continued to record them only as 'Oligochaeta' (e.g., Thomson Ecology) and there has been a range of other records, such as 'Tubificidae' and '*Tubificoides*'. Fugro record species for others where possible. Species formerly in Tubificidae are now included in Naididae. The SD and MSBIAS both list many species and there remain many taxonomic problems, as well as inconsistencies in defining marine species. *Branchiura sowerbyi* was missing from the SD but included in MSBIAS. It is mainly found in fresh water but extends into oligohaline estuaries. It was described from London (Beddard, 1892) and later recognized as non-native, of east Asian origin (Tobias, 1972). ***Branchiura sowerbyi*** was circulated in 2006 (RT2706), with 20% error and 2025 **(RT6819)**. Most labs identified **RT6819** incorrectly (74% error), reflecting difficulties with oligochaetes generally but also that the circulated specimens were small and missing a defining feature feature (ie. a tail with gills). The anterior chaetal bundles with both hair chaeta and crotchets with reduced or absent dorsal tooth help distinguish this species.

Beddard, F.E., 1892. A new branchiate oligochaete (*Branchiura sowerbyi*). *Quarterly Journal of Microscopical Science* 33, 325-341.

Tobias, W., 1972. Ist der Schlammröhrenwurm *Branchiura sowerbyi* Beddard 1892 (Oligochaeta: Tubificidae) ein tropischer Einwanderer im Untermain. *Natur und Museum*, 102(3), 1-3.

Arthropoda

Oedicerotidae (RT6817). The draft TDP suggests species identifications for oedicerotids, without qualifiers for juveniles, as currently done at APEM, although some specimens thought not to fit perfectly with the described species and a few badly damaged specimens have been left at higher levels, mainly genus. The SD lists 16 species in 7 genera; MSBIAS lists 23 species in 13 genera. The following notes cover only the *Pontocrates / Synchelidium* group. The SD lists 3 *Pontocrates* and 2

Synchelidium; MSBIAS lists an additional *Synchelidium* but not *Pontocrates moorei*. There are UK species of *Pontocrates* that resemble *Synchelidium* in their toothed Gn2 palms. APEM (and Fugro) now name the former '*Pontocrates* species A' as *P. arcticus*, following Myers & Ashelby (2022). The species assigned to *P. arcticus* by Moore & Beare (1993) was renamed as *Pontocrates moorei*. Other laboratories have left them at genus or had other systems but naming them *Synchelidium maculatum* would be a taxonomic error and the name *Pontocrates arcticus* before 2022 would represent *P. moorei*. ***Pontocrates moorei*** was circulated in 2020 (RT5906, as *P. arcticus*), with 44% error and in 2025 (**RT6817**). Most labs identified **RT6817** correctly but there were several differences (26% error), all for other Pontocrates species, suggesting improved awareness since 2020.

Moore, P.G. & Beare, D.J., 1993. Taxonomic confusion in the genus *Pontocrates* (Crustacea: Amphipoda) and the presence of *P. arcticus* in Britain. *Journal of the Marine Biological Association of the United Kingdom*, 73(3), 609-615.

Myers, A.A. & Ashelby, C.W., 2022. A revision of the genus *Pontocrates* Boeck, 1871 (Amphipoda, Oedicerotidae) with the description of *P. moorei* sp. nov. and the re-establishment of *P. norvegicus* (Boeck, 1860). *Zootaxa*, 5115(4), 582-598. https://doi.org/10.11646/zootaxa.5115.4.8

Caprellidae (RT6804, RT6815). The draft TDP suggests species identifications for adult caprellids and for all Caprellidae other than juvenile *Caprella*; these are left at genus if they have the juvenile form (rounded, smooth head). This is the current APEM policy and was derived from the 2012 NMBAQC workshop and guide (Guerra-García, 2014). The SD lists eleven caprellid species, including nine *Caprella* spp.; MSBIAS lists sixteen caprellids, with ten *Caprella*, the recent addition being *C. mutica* Schurin, 1935. *Caprella mutica* was first recorded as a non-native in Europe from the Netherlands in 1994 but was initially described as a new species "*Caprella macho*" (Platvoet *et al*., 1995). *C. mutica* was first recognised in the UK in 2000 (Willis *et al*., 2004). Subsequently it was realised that it had been present since at least 1999, and is now widespread (O'Reilly, 2007; Cook *et al*., 2007). ***Caprella mutica*** was circulated in 2011 (RT4012), with 9% error, 2015 (RT5013), with 62% error and 2020 (RT5812), with 37% error. For RT68, medium females **(RT6804)** and males **(RT6815)** were circulated separately. Most labs identified both correctly (11% error for females, 5% error for males). The key in Guerra-García (2014) focuses on the morphology of mature males for *Caprella mutica* and does not work well for females. A good description and figures of both sexes is available in Platvoet *et al*., (1995).

Cook, E.J., Jahnke, M., Kerckhof, F., Minchin, D., Faasse, M. & Boos, K., 2007. European expansion of the introduced amphipod *Caprella mutica* Schurin 1935. *Aquatic Invasions*, 2(4), 411-421.

Guerra-García, J.M., 2014. *Caprellidea. Identification guide to British caprellids*. v3.3, NMBAQC 2012 Taxonomic Workshop, Dove Marine Laboratory, 17pp., (unpublished).

O'Reilly, M. 2007. The Japanese Macho Skeleton Shrimp (*Caprella mutica*) in the Clyde Estuary. *Glasgow Naturalist*, 24 (4), 156-157.

Platvoet, D., De Bruyne, R.H. & Gmelig Meyling, A.W., 1995. Description of a new *Caprella*-species from the Netherlands: *Caprella macho* nov. spec. (Crustacea, Amphipoda, Caprellidea). *Bulletin Zoölogisch Museum*, 15(1), 1-4.

Willis, K.J., Cook, E.J., Lozano-Fernandez, M. & Takeuchi, I., 2004. First record of the alien caprellid amphipod, *Caprella mutica*, for the UK, *Journal of the Marine Biological Association of the United Kingdom*, 84, 1027-1028.

Arcturidae (RT6811). The draft TDP flags arcturids for further work, due to taxonomic flux (changes in species recognised over time) and the different taxonomic levels used for different taxa by different labs. APEM currently identify the two former *Arcturella* to species, without separation of juveniles but leave (other) *Astacilla* at genus. The SD lists three *Astacilla* and two *Arcturella*; *Arcturella* is synonymised into *Astacilla* in WoRMS, following Kensley *et al*. (2007) and MSBIAS lists the same five species as the SD, now all *Astacilla*. It is likely that other species exist in shallow UK waters and several more, including related, similar, genera, are known from deeper waters. ***Astacilla dilatata*** formerly *Arcturella*) was first circulated in 2025 (**RT6811**). All labs identified **RT6811** correctly (0% error). However, there are related species that could potentially cause confusion.

Kensley, B., Schotte, M. & Poore, G.C.B., 2007. New species and records of valviferan isopods (Crustacea: Isopoda: Valvifera) from the Indian Ocean. *Proceedings of the Biological Society of Washington*, 120, 429-445.

Nannoniscidae (RT6823). The draft TDP suggests species identifications for nannoniscids, without qualifiers for juveniles, as currently done at APEM. The SD excludes the family (deep water); MSBIAS lists two species in two genera; others are likely. ***Nannoniscoides angulatus*** was first circulated in 2025 (**RT6823**). About half of the labs identified **RT6823** correctly (42% error). Differences were for other genera, sometimes other families, reflecting the lack of a single reference guide for subtidal isopods. It is described in Hansen (1916), available from the Biodiversity Heritage Library.

Hansen, H.J., 1916. *Crustacea Malacostraca III: Isopoda*. The Danish Ingolf Expedition. Bianco Luno, Copenhagen, 3(5), 1-262, plates 1-16.

Varunidae (RT6802). The draft TDP suggests species identifications for varunids over 10mm (carapace width), with juveniles, (<10mm) separated at species and zoea and megalopa separated, with qualifiers, at order, as currently done at APEM. The SD treats 'Varuninae' as a subfamily of Grapsidae and lists two non-native species. MSBIAS lists five varunids, four are non-native, one represents a northward extension of known range. ***Hemigrapsus takanoi*** was distinguished from the similar *H. penicillatus* (de Haan, 1835) by Asakura & Watanabe (2005), first recorded as a UK non-native in the Colne and Medway in 2013 and 2014, respectively (Wood et al., 2015) and later confirmed as established in the Orwell (Ashelby et al., 2017). *H. takanoi* was first circulated in 2025 **(RT6802)**, as juvenile (3-4 mm carapace width) specimens, without limbs. Most labs correctly identified **(RT6802)** (11% error), with the two alternatives for closely related species.

Asakura, A. & Watanabe, S., 2005. *Hemigrapsus takanoi*, new species, a sibling species of the common Japanese intertidal crab *H. penicillatus* (Decapoda: Brachyura: Grapsoidea). *Journal of Crustacean Biology*, 25(2), 279-292.

Ashelby, C.W., Sewell, J., Rostron, J., Shrubsole, R., Child, T. & Clark, P.F., 2017. Evidence for the invasion and successful establishment of *Hemigrapsus takanoi* Asakura & Watanabe, 2005 (Decapoda, Varunidae) in Great Britain. *Crustaceana*, 90(6), 695-708.

Wood, C.A., Bishop, J.D.D., Davies, C.J., Delduca, E.L., Hatton, J.C., Herbert, R.J.H. & Clark, P.F., 2015. *Hemigrapsus takanoi* Asakura and Watanabe, 2005 (Crustacea: Decapoda: Brachyura: Grapsoidea): first records of the brush-clawed shore crab from Great Britain. *BioInvasions Records*, 4(2), 109-113.

Mollusca

Turritellidae (RT6801). The draft TDP suggests species identifications for turritellidids, with separation of juveniles, at 10 mm, at species level, as currently done at APEM. The SD lists one species: *Turritella communis* Risso, 1826. The specific name was later revised (Landau et al., 2004) to *Turritella tricarinata* (Brocchi, 1814), due to priority; the species was then assigned to a new genus (Harzhauser & Landau, 2019) to give the current name (in WoRMS): ***Turritellinella tricarinata*** (Brocchi, 1814). MSBIAS lists only *T. tricarinata* but another turritellid, *Turritella turbona* Monterosato, 1877, has been recorded from the eastern Channel (Taylor, 2022). Adult specimens of '*T. communis*' were circulated (before the nomenclature changes were noticed) in 2007 (RT3221), with 0% error, 2010 (RT3813), with 3% error and 2014 (RT4707), with 0% error. Juveniles (3-5 mm) were circulated for the current RT **(RT6801).** All labs identified **RT6801** correctly (0% error). However, confusion of juveniles with *Aclis* spp. has been noted in own samples.

Harzhauser, M. & Landau, B., 2019. Turritellidae (Gastropoda) of the Miocene Paratethys Sea with considerations about turritellid genera. *Zootaxa*, 4681(1), 1-136. DOI: 10.11646/zootaxa.4681.1.1

Landau, B.M., Marquet, R. & Grigis, M., 2004. The Early Pliocene Gastropoda (Mollusca) of Estepona, southern Spain. Part 2. Orthogastropoda, Neotaenioglossa. *Palaeontos*, 4, 1-108.

Taylor, S., 2022. Marine recorder's report 2021. *Mollusc World*, 59, 3-5.

Muricidae (RT6825). The draft TDP suggests species identifications for adult muricids, with further work needed on the separation of juveniles. APEM separate juveniles at 5mm for *Ocenebra* and *Nucella* (both recorded at species). The SD lists ten species in five genera; MSBIAS lists many more, several in error due to the inclusion of non-British records in the Unicorn database. *Rapana venosa* was excluded from the SD list but noted as an exotic of uncertain status in the introduction to Mollusca; it is a north-eastern Asian species that spread as a non-native from the Black Sea, through the Mediterranean to the French Atlantic coast and the western Atlantic (Delongueville & Scaillet, 2022); it also spread to the southern North Sea, including one from just within UK waters (Nieweg et al., 2005; Kerckhof et al., 2006). ***Rapana venosa*** was first circulated in 2025 **(RT6825).** All labs identified **RT6825** correctly (0% error).

Delongueville, C. & Scaillet, R., 2022. Le fabuleux voyage de *Rapana venosa* (Valenciennes, 1846) de l'Asie de l'Est à la Mer du Nord et aux Amériques. *NOVAPEX/Société*, 23(2), 32-37.

Kerckhof, F., Vink, R.J., Nieweg, D.C. & Post, J.N.J., 2006. The veined whelk *Rapana venosa* has reached the North Sea. *Aquatic Invasions*, 1 (1), 35-37.

Nieweg, D.C., Post, J.N.J. & Vink, R.J., 2005. *Rapana venosa* (Gastropoda: Muricidae): a new invasive species in the North Sea. *DEINSEA*, 11, 169-174.

Rhizoridae (RT6805). The draft TDP suggests species identifications for rhizorids without separation of juveniles, as currently done at APEM. The SD lists one species: *Rhizorus acuminatus* (Bruguière, 1792), which was included in Retusidae. WoRMS (and MSBIAS) now list this species as ***Volvulella acuminata*** (Bruguière, 1792) but with a note that suggests the generic assignment is unresolved. The family Rhizoridae was resurrected by Oskars et al. (2015). *Volvulella acuminata* was first circulated in 2025 **(RT6805)**. All labs identified **RT6805** correctly (0% error).

Oskars, T.R., Bouchet, P. & Malaquias, M.A., 2015. A new phylogeny of the Cephalaspidea (Gastropoda: Heterobranchia) based on expanded taxon sampling and gene markers. *Molecular Phylogenetics and Evolution*, 89, 130-150.

Yoldiidae (RT6816). The draft TDP suggests species identifications for Yoldiidae, as currently done at APEM, without separation of juveniles. The SD lists six *Yoldiella* and one *Portlandia* in 'Yoldiellinae', excluding many as deep water species. MSBIAS lists many more, in four genera. The following notes cover only *Yoldiella*. MSBIAS lists 23 *Yoldiella*, most of which are from deep water and are identifiable using Killeen & Turner (2009). ***Yoldiella propinqua*** was first circulated in 2025 (**RT6816**). Most labs identified **RT6816** correctly (5% error). However, *Yoldiella* includes many similar species and problems are more likely for smaller specimens

Killeen, I.J. & Turner, J.A., 2009. *Yoldiella* and *Portlandia* (Bivalvia) from the Faroe-Shetland Channel and Rockall Trough, Northeast Atlantic. *Journal of Conchology*, 39(6), 733-778.

Thyasiridae (RT6814, RT6818). The draft TDP suggests species identifications for thyasirids without separation of juveniles, as currently done at APEM. Many laboratories have left juvenile Thyasiridae at genus, sometimes family, and may have done the same with damaged specimens. There have been severe inconsistencies within some projects. APEM identify almost all Thyasiridae, without separation of juveniles. Fugro leave *Thyasira* and *Parathyasira* at Family below 2mm. The SD lists eight *Thyasira* species in four subgenera, all of which have since been given full genus rank; MSBIAS lists 26 species in nine genera. ***Thyasira sarsi*** was missing from the SD, although it was already known to be an indicator of drill site impacts. It was circulated in 2000 (RT1507), with 100% error, 2005 (RT2617), with 50% error, 2008 (RT3423), with 40% error, 2018 (RT5524), with 10% error and 2025 (**RT6814**). All labs correctly identified **RT6814** (0% error), showing continued improvement since the inception of the NMBAQC scheme. ***Adontorhina similis*** (**RT6818**) was described after the SD and previous records would have been conflated with *Mendicula pygmaea*, such as in the North Sea thyasirid guide (Oliver & Killeen, 2002). It was circulated in 2008 (RT3422), with 100% error, 2010 (RT3917), with 38% error, 2016 (RT5213), with 41% error and 2025 (**RT6818**). Most labs correctly identified **RT6818** (5% error), suggesting increased awareness compared to previous years.

Oliver P.G. & Killeen, I.J., 2002. The Thyasiridae (Mollusca: Bivalvia) of the British Continental shelf and North Sea Oil fields. An identification manual. *Studies in Marine Biodiversity and Systematics from the National Museum of Wales. BIOMÔR reports*, 3, 73pp.

Dreissenidae (RT6822). The draft TDP suggests species identifications for dreissenids, without qualifiers for juveniles, as currently done at APEM. The SD excludes the family (probably as mainly freshwater) but notes *Mytilopsis leucophaeata* as an 'exotic of uncertain status' in the introduction to Mollusca; MSBIAS lists two species of *Dreissena*, excluding a known non-native from the area and including a species without confirmed UK records; *Mytilopsis leucophaeata* has been recorded several times (Oliver et al., 1998; Oliver, 2015; Willing, 2015); it is a non-native from eastern North America, although it is possible that the northern populations may represent another species (Fernandes et al., 2022). ***Mytilopsis leucophaeata*** was first circulated in 2025 (**RT6822**, empty shells). Most labs correctly identified **RT6822** (16% error).

Fernandes, M.R., Salgueiro, F. & Miyahira, I.C., 2022. A global invader is possibly two: first genetic investigation of native populations of the estuarine bivalve *Mytilopsis leucophaeata* (Dreissenidae). *Estuaries and Coasts*, 45, 812-826.

Oliver, P.G., 2015. Old shell collection casts new light on an alien species. The dark false mussel (*Mytilopsis leucophaeata*) may have been in Britain as early as 1800. *Journal of Conchology*, 42(1), 63-66.

Oliver, P.G., Holmes, A.M. & Mettam, C., 1998. *Mytilopsis leucophaeata*, (Conrad, 1831) [Bivalvia: Dreissenoidea]. A species new to the British fauna. *Journal of Conchology*, 36(2), 13-18.

Willing, M.J., 2015. Two invasive bivalves, *Rangia cuneata* (G.B. Sowerby I, 1831) and *Mytilopsis leucophaeata* (Conrad, 1831), living in freshwater in Lincolnshire, eastern England. *Journal of Conchology*, 42(2), 189-192.

Acknowledgements

We are grateful to all participants who provided feedback following issue of interim results.

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