NMBAQC

NE Atlantic Marine Biological Analytical Quality Control Scheme

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Ring Test Bulletin – RTB#64

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RING TEST DETAILS

Ring Test #64 (Year 29)

Type/Contents – Targeted, Peracarida excluding amphipods

Circulated – 13/01/23

Results deadline – 17/03/23

Number of Subscribing Laboratories – 23

Number of Participating Laboratories – 20

Number of Results Received – 21*

*multiple data entries per laboratory permitted

Summary of differences

Specimen	Genus	Species	Condition / Size / Sex	Total differences for 21 returns	
				Genus	Species
RT6401	*Eudorella*	*truncatula*	good, medium, female	1	3
RT6402	*Pseudocuma*	*longicorne*	good, medium, male	6	6
RT6403	*Lekanesphaera*	*levii*	fair, medium	1	9
RT6404	*Tanaopsis*	*graciloides*	good, medium	4	4
RT6405	*Eurydice*	*pulchra*	good, small	0	0
RT6406	*Cumella*	*pygmaea*	good, medium, female	0	0
RT6407	*Gnathia*	*oxyuraea*	good, medium, male	0	0
RT6408	*Tanaissus*	*danica*	fair, medium	4	6
RT6409	*Cyathura*	*carinata*	good, medium	0	0
RT6410	*Bodotria*	*scorpioides*	good, medium, male	2	6
RT6411	*Apseudopsis*	*latreillii*	good, medium	2	2
RT6412	*Tanaissus*	*lilljeborgi*	fair, medium	1	1
RT6413	*Gastrosaccus*	*spinifer*	fair, medium	2	2
RT6414	*Iphinoe*	*trispinosa*	good, medium, female	0	0
RT6415	*Pseudocuma*	*longicorne*	good, medium, female	3	3
RT6416	*Vaunthompsonia*	*cristata*	good, medium, female	3	3
RT6417	*Asellus*	*aquaticus*	fair, medium	5	5
RT6418	*Idotea*	*granulosa*	good, medium	0	3
RT6419	*Bodotria*	*scorpioides*	good, medium, female	0	4
RT6420	*Leucon*	*nasica*	good, medium, immature male	0	2
RT6421	*Lekanesphaera*	*rugicauda*	fair, medium	0	2
RT6422	*Diastylis*	*bradyi*	fair, medium, female	0	2
RT6423	*Paragnathia*	*formica*	fair, medium, male	2	2
RT6424	*Lamprops*	*fasciatus*	good, medium, female	0	0
RT6425	*Pseudarachna*	*hirsuta*	fair, medium	3	3
			Total differences	39	68
			Average differences /lab.	1.9	3.2

Figure 1. The number of differences from the AQC identification of specimens distributed in RT64 for each of the participating laboratories. Arranged in order of increasing number of differences (by specific followed by generic errors).

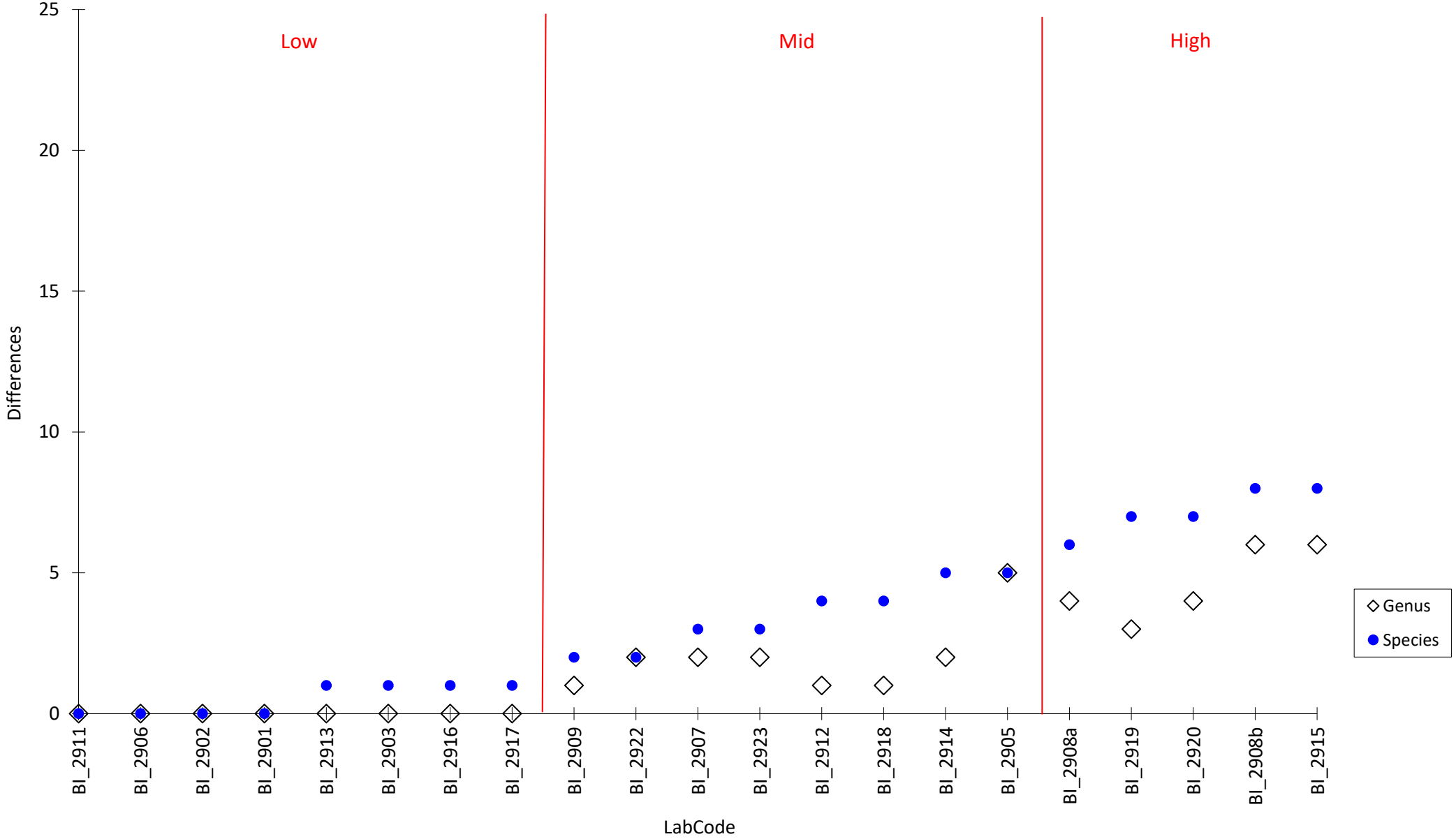


Table 1. The identification of fauna made by participating laboratories for RT64 (arranged by specimen). Names are given only where different from the AQC identification.

	RT6401	RT6402	RT6403	RT6404	RT6405	RT6406	RT6407	RT6408	RT6409	RT6410
Taxon	*Eudorella truncatula*	*Pseudocuma longicorne*	*Lekanesphaera levii*	*Tanaopsis graciloides*	*Eurydice pulchra*	*Cumella pygmaea*	*Gnathia oxyuraea*	*Tanaissus danica*	*Cyathura carinata*	*Bodotria scorpioides*
BI_2902	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_2903	- -	- -	- monodi	- -	- -	- -	- -	- -	- -	- -
BI_2905	- -	[Pseudocuma (Pseudocuma)] -	- -	- -	- [affinis]	[Cumella (Cumella)] -	- -	Leptognathia paramanca	- -	Cumopsis goodsir
BI_2906	- -	[Pseudocuma (Pseudocuma)] -	- -	- -	- -	[Cumella (Cumella)] -	- -	- -	- -	- -
BI_2907	- -	Monopseudocuma gilsoni	- -	- -	- -	- -	- -	- -	- -	- arenosa
BI_2908a	- [truncata]	- -	- monodi	Typhlotanais brevicornis	- -	- -	- -	Araphura brevimanus	- -	- -
BI_2908b	Leptostylis macrura	- -	- monodi	Akanthophoreus gracilis	- -	- -	- -	Araphura brevimanus	- -	- -
BI_2909	- -	- -	- monodi	- -	- -	- -	- -	- -	- -	- -
BI_2911	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_2912	- -	Monopseudocuma gilsoni	- monodi	- -	- -	- -	- -	- -	- -	- arenosa
BI_2913	- -	- -	- -	- -	- -	- -	- -	- -	- -	- arenosa
BI_2914	- emarginata	Monopseudocuma gilsoni	- -	- -	- -	- -	- -	- -	- -	- -
BI_2915	- -	Monopseudocuma gilsoni	Sphaeroma serratum	Paratanais rigidus	- -	- -	- -	- lilljeborgi	- -	Eocuma dollfusi
BI_2916	- -	- -	- -	- -	- [affinis]	- -	- -	- -	- -	- -
BI_2918	- -	- -	- monodi	- -	- -	- -	- -	- -	- -	- -
BI_2919	- -	[Pseudocuma (Pseudocuma)] -	- rugicauda	Leptognathia breviremis	- -	[Cumella (Cumella)] -	- -	- lilljeborgi	- -	- arenosa
BI_2920	- hirsuta	[Pseudocuma (Pseudocuma)] -	- -	- [laticaudata]	- -	[Cumella (Cumella)] -	- -	Parakanthophoreus longiremis	- -	- -
BI_2922	- -	Monopseudocuma gilsoni	- -	- -	- -	- -	- -	- -	- -	- -

Table 1. The identification of fauna made by participating laboratories for RT64 (arranged by specimen). Names are given only where different from the AQC identification.

	RT6411	RT6412	RT6413	RT6414	RT6415	RT6416	RT6417	RT6418	RT6419
Taxon	*Apseudopsis latreillii*	*Tanaissus lilljeborgi*	*Gastrosaccus spinifer*	*Iphinoe trispinosa*	*Pseudocuma longicorne*	*Vaunthompsonia cristata*	*Asellus aquaticus*	*Idotea granulosa*	*Bodotria scorpioides*
BI_2902	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_2903	[Apseudes] -	- -	- -	- -	- -	- -	- -	- -	- -
BI_2905	- -	- -	- -	- -	Monopseudocuma gilsoni	- -	Janira maculosa	- -	- -
BI_2906	- [latreilli]	- -	- -	- -	[Pseudocuma (Pseudocuma)] -	- -	[Asellus (Asellus)] -	- -	- -
BI_2907	- -	- -	- -	- -	Monopseudocuma gilsoni	- -	- -	- -	- -
BI_2908a	Apseudes talpa	- -	Praunus inermis	- -	- -	- -	- -	- pelagica	- -
BI_2908b	- -	- -	- -	- -	- -	Iphinoe serrata	Idotea neglecta	- -	- pulchella
BI_2909	[Apseudes] -	- -	- -	- -	[Pseudocuma (Pseudocuma)] -	Bathycuma brevirostre	[Asellus (Asellus)] -	- -	- -
BI_2911	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_2912	- -	- -	- -	- -	- -	- -	- -	- -	- -
BI_2913	- [latreilii]	- -	- -	- -	- -	- -	- -	- -	- -
BI_2914	- -	- -	- -	- -	- [longicornis]	- -	Ianiropsis breviremis	- pelagica	- -
BI_2915	[Apseudes] -	- -	Praunus inermis	- -	- -	- -	Proasellus meridianus meridianus	- -	- arenosa
BI_2916	- -	- -	- -	- -	- -	- -	- -	- pelagica	- -
BI_2918	- -	- -	- -	- -	- -	- -	- -	- -	- arenosa
BI_2919	- -	Tanaopsis graciloides	- -	- -	Monopseudocuma gilsoni	- -	[Asellus (Asellus)] -	- -	- -
BI_2920	Apseudes spinosus	- -	- -	- -	[Pseudocuma (Pseudocuma)] -	Leucon (Leucon) nasica	Proasellus coxalis	- -	- -
BI_2922	- -	- -	- -	- -	- -	- -	- -	- -	- -

Table 1. The identification of fauna made by participating laboratories for RT64 (arranged by specimen). Names are given only where different from the AQC identification.

	RT6420	RT6421	RT6422	RT6423	RT6424	RT6425
Taxon	*Leucon nasica*	*Lekanesphaera rugicauda*	*Diastylis bradyi*	*Paragnathia formica*	*Lamprops fasciatus*	*Pseudarachna hirsuta*
BI_2902	- -	- -	- -	- -	- -	- -
BI_2903	- -	- -	- -	- -	- -	- -
BI_2905	[Leucon (Leucon)] -	- -	- -	- -	- -	Munna kroyeri
BI_2906	[Leucon (Leucon)] -	- -	- -	- -	- -	- -
BI_2907	- -	- -	- -	- -	- -	- -
BI_2908a	- -	- -	- -	- -	- [fasciata]	- -
BI_2908b	- -	- -	- -	Gnathia dentata	- -	- -
BI_2909	[Leucon (Leucon)] -	- -	- -	- -	- -	- -
BI_2911	- -	- -	- -	- -	- -	- -
BI_2912	- -	- -	- laevis	- -	- -	- -
BI_2913	- -	- -	- -	- -	- [fasciata]	- -
BI_2914	- -	- weilli	- -	- -	- -	- -
BI_2915	- -	- -	- -	- -	- -	- -
BI_2916	- -	- -	- -	- -	- -	- -
BI_2918	- afeni	- -	- -	Gnathia maxillaris	- -	- -
BI_2919	[Leucon (Leucon)] -	- -	- laevis	- -	- -	- -
BI_2920	[Leucon (Leucon)] acutirostris	- hookeri	- -	- -	- -	- -
BI_2922	- -	- -	- -	- -	- -	Munna limicola

Table 2. The identification of fauna made by participating laboratories for RT64 (arranged by participant). Names are given only where different from the AQC identification.

	Taxon	BI_2901	BI_2902	BI_2903	BI_2905	BI_2906	BI_2907	BI_2908a
RT6401	*Eudorella truncatula*	- -	- -	- -	- -	- -	- -	- [truncata]
RT6402	*Pseudocuma longicorne*	[Pseudocuma (Pseudocuma)] -	- -	- -	[Pseudocuma (Pseudocuma)] -	[Pseudocuma (Pseudocuma)] -	Monopseudocuma gilsoni	- -
RT6403	*Lekanesphaera levii*	- -	- -	- monodi	- -	- -	- -	- monodi
RT6404	*Tanaopsis graciloides*	- -	- -	- -	- -	- -	- -	Typhlotanais brevicornis
RT6405	*Eurydice pulchra*	- -	- -	- -	- [affinis]	- -	- -	- -
RT6406	*Cumella pygmaea*	[Cumella (Cumella)] -	- -	- -	[Cumella (Cumella)] -	[Cumella (Cumella)] -	- -	- -
RT6407	*Gnathia oxyuraea*	- -	- -	- -	- -	- -	- -	- -
RT6408	*Tanaissus danica*	- -	- -	- -	Leptognathia paramanca	- -	- -	Araphura brevimanus
RT6409	*Cyathura carinata*	- -	- -	- -	- -	- -	- -	- -
RT6410	*Bodotria scorpioides*	- -	- -	- -	Cumopsis goodsir	- -	- arenosa	- -
RT6411	*Apseudopsis latreillii*	- -	- -	[Apseudes] -	- -	- [latreilli]	- -	Apseudes talpa
RT6412	*Tanaissus lilljeborgi*	- -	- -	- -	- -	- -	- -	- -
RT6413	*Gastrosaccus spinifer*	- -	- -	- -	- -	- -	- -	Praunus inermis
RT6414	*Iphinoe trispinosa*	- -	- -	- -	- -	- -	- -	- -
RT6415	*Pseudocuma longicorne*	[Pseudocuma (Pseudocuma)] -	- -	- -	Monopseudocuma gilsoni	[Pseudocuma (Pseudocuma)] -	Monopseudocuma gilsoni	- -
RT6416	*Vaunthompsonia cristata*	- -	- -	- -	- -	- -	- -	- -
RT6417	*Asellus aquaticus*	[Asellus (Asellus)] -	- -	- -	Janira maculosa	[Asellus (Asellus)] -	- -	- -
RT6418	*Idotea granulosa*	- -	- -	- -	- -	- -	- -	- pelagica
RT6419	*Bodotria scorpioides*	- -	- -	- -	- -	- -	- -	- -
RT6420	*Leucon nasica*	- -	- -	- -	[Leucon (Leucon)] -	[Leucon (Leucon)] -	- -	- -
RT6421	*Lekanesphaera rugicauda*	- -	- -	- -	- -	- -	- -	- -
RT6422	*Diastylis bradyi*	- -	- -	- -	- -	- -	- -	- -
RT6423	*Paragnathia formica*	- -	- -	- -	- -	- -	- -	- -
RT6424	*Lamprops fasciatus*	- -	- -	- -	- -	- -	- -	- [fasciata]
RT6425	*Pseudarachna hirsuta*	- -	- -	- -	Munna kroyeri	- -	- -	- -

Table 2. The identification of fauna made by participating laboratories for RT64 (arranged by participant). Names are given only where different from the AQC identification.

	Taxon	BI_2908b	BI_2909	BI_2911	BI_2912	BI_2913	BI_2914	BI_2915
RT6401	*Eudorella truncatula*	Leptostylis macrura	- -	- -	- -	- -	- emarginata	- -
RT6402	*Pseudocuma longicorne*	- -	- -	- -	Monopseudocuma gilsoni	- -	Monopseudocuma gilsoni	Monopseudocuma gilsoni
RT6403	*Lekanesphaera levii*	- monodi	- monodi	- -	- monodi	- -	- -	Sphaeroma serratum
RT6404	*Tanaopsis graciloides*	Akanthophoreus gracilis	- -	- -	- -	- -	- -	Paratanais rigidus
RT6405	*Eurydice pulchra*	- -	- -	- -	- -	- -	- -	- -
RT6406	*Cumella pygmaea*	- -	- -	- -	- -	- -	- -	- -
RT6407	*Gnathia oxyuraea*	- -	- -	- -	- -	- -	- -	- -
RT6408	*Tanaissus danica*	Araphura brevimanus	- -	- -	- -	- -	- -	- lilljeborgi
RT6409	*Cyathura carinata*	- -	- -	- -	- -	- -	- -	- -
RT6410	*Bodotria scorpioides*	- -	- -	- -	- arenosa	- arenosa	- -	Eocuma dollfusi
RT6411	*Apseudopsis latreillii*	- -	[Apseudes] -	- -	- -	- [latreilii]	- -	[Apseudes] -
RT6412	*Tanaissus lilljeborgi*	- -	- -	- -	- -	- -	- -	- -
RT6413	*Gastrosaccus spinifer*	- -	- -	- -	- -	- -	- -	Praunus inermis
RT6414	*Iphinoe trispinosa*	- -	- -	- -	- -	- -	- -	- -
RT6415	*Pseudocuma longicorne*	- -	[Pseudocuma (Pseudocuma)] -	- -	- -	- -	- [longicornis]	- -
RT6416	*Vaunthompsonia cristata*	Iphinoe serrata	Bathycuma brevirostre	- -	- -	- -	- -	- -
RT6417	*Asellus aquaticus*	Idotea neglecta	[Asellus (Asellus)] -	- -	- -	- -	Ianiropsis breviremis	Proasellus meridianus meridianus
RT6418	*Idotea granulosa*	- -	- -	- -	- -	- -	- pelagica	- -
RT6419	*Bodotria scorpioides*	- pulchella	- -	- -	- -	- -	- -	- arenosa
RT6420	*Leucon nasica*	- -	[Leucon (Leucon)] -	- -	- -	- -	- -	- -
RT6421	*Lekanesphaera rugicauda*	- -	- -	- -	- -	- -	- weilli	- -
RT6422	*Diastylis bradyi*	- -	- -	- -	- laevis	- -	- -	- -
RT6423	*Paragnathia formica*	Gnathia dentata	- -	- -	- -	- -	- -	- -
RT6424	*Lamprops fasciatus*	- -	- -	- -	- -	- [fasciata]	- -	- -
RT6425	*Pseudarachna hirsuta*	- -	- -	- -	- -	- -	- -	- -

Table 2. The identification of fauna made by participating laboratories for RT64 (arranged by participant). Names are given only where different from the AQC identification.

	Taxon	BI_2916	BI_2917	BI_2918	BI_2919	BI_2920	BI_2922	BI_2923
RT6401	*Eudorella truncatula*	- -	- -	- -	- -	- hirsuta	- -	- -
RT6402	*Pseudocuma longicorne*	- -	- -	- -	[Pseudocuma (Pseudocuma)] -	[Pseudocuma (Pseudocuma)] -	Monopseudocuma gilsoni	Monopseudocuma gilsoni
RT6403	*Lekanesphaera levii*	- -	- monodi	- monodi	- rugicauda	- -	- -	- -
RT6404	*Tanaopsis graciloides*	- -	- -	- -	Leptognathia breviremis	- [laticaudata]	- -	- -
RT6405	*Eurydice pulchra*	- [affinis]	- [affinis]	- -	- -	- -	- -	- -
RT6406	*Cumella pygmaea*	- -	- -	- -	[Cumella (Cumella)] -	[Cumella (Cumella)] -	- -	[Cumella (Cumella)] -
RT6407	*Gnathia oxyuraea*	- -	- -	- -	- -	- -	- -	- -
RT6408	*Tanaissus danica*	- -	- -	- -	- lilljeborgi	Parakanthophoreus longiremis	- -	- -
RT6409	*Cyathura carinata*	- -	- -	- -	- -	- -	- -	- -
RT6410	*Bodotria scorpioides*	- -	- -	- -	- arenosa	- -	- -	- -
RT6411	*Apseudopsis latreillii*	- -	- -	- -	- -	Apseudes spinosus	- -	- -
RT6412	*Tanaissus lilljeborgi*	- -	- -	- -	Tanaopsis graciloides	- -	- -	- -
RT6413	*Gastrosaccus spinifer*	- -	- -	- -	- -	- -	- -	- -
RT6414	*Iphinoe trispinosa*	- -	- -	- -	- -	- -	- -	- -
RT6415	*Pseudocuma longicorne*	- -	- -	- -	Monopseudocuma gilsoni	[Pseudocuma (Pseudocuma)] -	- -	[Pseudocuma (Pseudocuma)] -
RT6416	*Vaunthompsonia cristata*	- -	- -	- -	- -	Leucon (Leucon) nasica	- -	- -
RT6417	*Asellus aquaticus*	- -	- -	- -	[Asellus (Asellus)] -	Proasellus coxalis	- -	[Asellus (Asellus)] -
RT6418	*Idotea granulosa*	- pelagica	- -	- -	- -	- -	- -	- -
RT6419	*Bodotria scorpioides*	- -	- -	- arenosa	- -	- -	- -	- arenosa
RT6420	*Leucon nasica*	- -	- -	- afeni	[Leucon (Leucon)] -	[Leucon (Leucon)] acutirostris	- -	[Leucon (Leucon)] -
RT6421	*Lekanesphaera rugicauda*	- -	- -	- -	- -	- hookeri	- -	- -
RT6422	*Diastylis bradyi*	- -	- -	- -	- laevis	- -	- -	- -
RT6423	*Paragnathia formica*	- -	- -	Gnathia maxillaris	- -	- -	- -	- -
RT6424	*Lamprops fasciatus*	- -	- -	- -	- -	- -	- -	- -
RT6425	*Pseudarachna hirsuta*	- -	- -	- -	- -	- -	Munna limicola	Munna limicola

Specimen Images and Detailed Breakdown of Identifications

RT64 was targeted on Crustacea Peracarida, excluding Amphipoda (mainly Cumacea, Isopoda and Tanaidacea, with one Mysida). The specimen details below each species name include substratum, depth and geography, in standardised categories, as circulated to participants with the specimens. They also include basic categories of condition, size and (for species with clear sexual dimorphism) sex, together with the number of samples used to find enough material for the circulation (each species circulation was from a single project and area). The Ring Test included four species never previously sent. There were also several species anticipated to change our understanding of the fauna. These included insights to help with the development of a taxonomic discrimination protocol, as detailed under family headings in the discussion section below.

LabCodes are abbreviated in this report to exclude the Scheme year, *e.g.* BI_2901 = Lab 01. An additional terminal character has been added within each LabCode (small case sequential letters) to permit multiple data entries from each laboratory, *i.e.* two participants from laboratory 01 would be coded as Lab 01a & Lab 01b. For details of your LabCode please contact your Scheme representative or APEM Ltd.
(Figure codes: A=anterior; P=posterior; L=lateral; D=dorsal; V=ventral). The codes in brackets following the species names below the figures are sample identification codes to allow tracking of sources of specimens.

RT6401 – *Eudorella truncatula* (Bate, 1856) (Figure 1a)

Substratum: Mud. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: north of Ireland. Condition: Good. Size: Medium. Sex: Female. All specimens from one sample.

Fig. 1a. *Eudorella truncatula* (RT6401; 65317) – L (female)

One generic and three specific differences: Lab 20 identified as *Eudorella hirsuta* (Figure 1b) (which has numerous hairs on the upper part of the carapace); Lab 14 identified as *Eudorella emarginata* (Figure 1c) (which has a larger tooth below the sinus at the front of the carapace); Lab 08B identified as *Leptostylis macrura* (no material available, Figure 1d shows *L. villosa*) (which has an independent telson).

Fig. 1b. *Eudorella hirsuta* (P2131, 60079) – L (female)

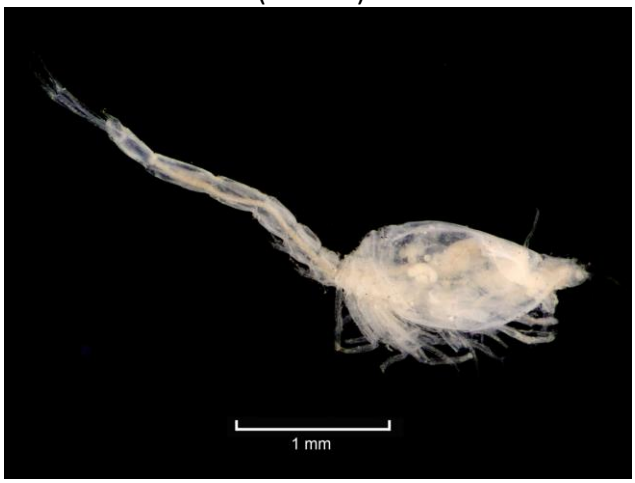


Fig. 1c. *Eudorella emarginata* (413646, 42968) – L (female)

Fig. 1d. *Leptostylis villosa* (P4272, 64856) – L (female)

RT6402 – *Pseudocuma longicorne* (Bate, 1858) (Figure 2a)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: north of Ireland. Condition: Good. Size: Medium. Sex: Male. Specimens from four samples.

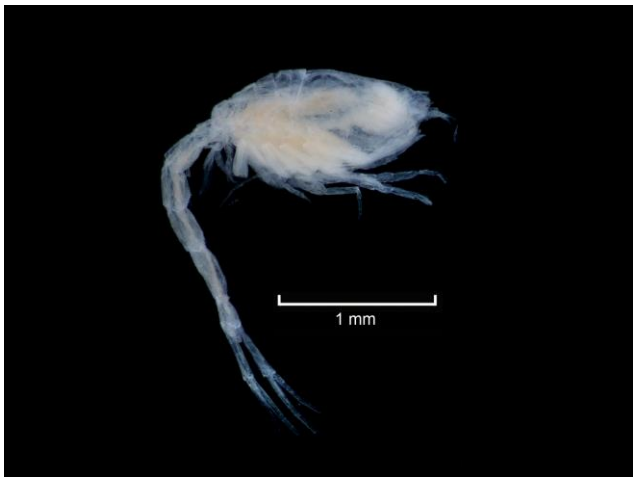


Fig. 2a. *Pseudocuma longicorne* (RT6402; 58702) – L (male)

Six generic and specific differences: Labs 07, 12, 14, 15, 22 and 23 identified as *Monopseudocuma gilsoni* (Figure 2b) (which lacks the small second pleopod).

Fig. 2b. *Monopseudocuma gilsoni* (412692, 39534) – L (male)

RT6403 – *Lekanesphaera levii* (Argano & Ponticelli, 1981) (Figure 3a)

Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Intertidal. Geography: southeast England. Condition: Fair. Size: Medium. Specimens from three samples.

Fig. 3a. *Lekanesphaera levii* (RT6403; 64216) – D

Nine specific differences: Labs 03, 08A, 08B, 09, 12, 15, 17, 18 and 19 identified as *Lekanesphaera monodi* (no material available) (a Mediterranean species that formerly included *L. levii*, in which the uropod rami extend well beyond the pleotelson).

RT6404 – *Tanaopsis graciloides* (Lilljeborg, 1864) (Figure 4a)

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

Fig. 4a. *Tanaopsis graciloides* (RT6404; 65209) – D

Four generic and specific differences: Lab 15 identified as *Paratanais rigidus* (no material available) (which is described as having single-articled uropod rami); Lab 19 identified as *Leptognathia breviremis* (Figure 4b); Lab 08A identified as *Typhlotanais brevicornis* (no material available, Figure 4c shows *T. aequiremis*) Lab 08B identified as *Akanthophoreus gracilis* (Figure 8c) (all of which have a simple claw point to the propodus).

Lab 20 identified as *Tanaopsis laticaudata*; this Mediterranean species is currently considered possibly distinct from *T. graciloides* (see Bamber et al., 2009) but, as distinguishing features are not yet defined, is treated as synonymous for the purposes of this exercise.

Fig. 4b. *Leptognathia breviremis* (P4264, 64716) – D

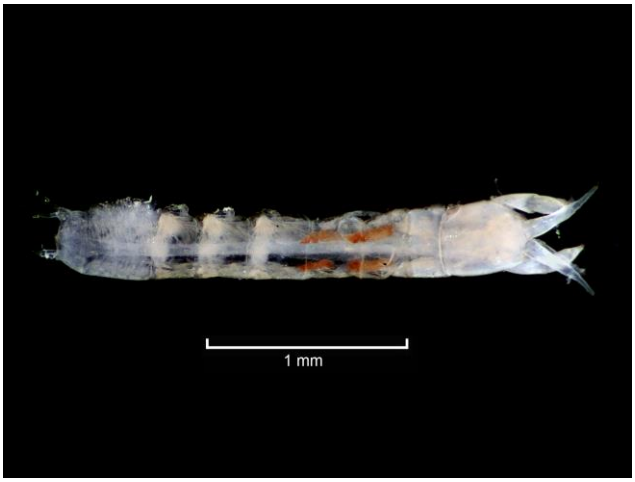


Fig. 4c. *Typhlotanais aequiremis* (413646, 42946) – D

RT6405 – *Eurydice pulchra* Leach, 1815 (Figures 5a, 5b)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Infralittoral. Geography: southwest England. Condition: Good. Size: Small. Specimens from two samples.

Fig. 5a. *Eurydice pulchra* (RT6405; 7790) – D

No generic or specific differences.

Labs 05, 16 and 17 identified as *Eurydice affinis* (Figures 5c-d) (which lacks a sharply produced somite on pereonite 6). As the specimen sent to Lab 17 was a misplaced example of this species, we have accepted identifications of *E. affinis* as potentially correct.

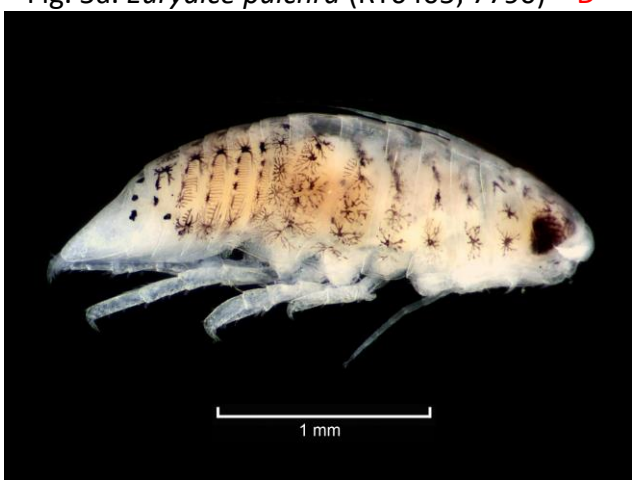


Fig. 5b. *Eurydice pulchra* (RT6405; 7790) – L

Fig. 5c. *Eurydice affinis* (414389, 56777) – L

Fig. 5d. *Eurydice affinis* (414389, 56777) – D

RT6406 – *Cumella pygmaea* G.O. Sars, 1865 (Figure 6a)

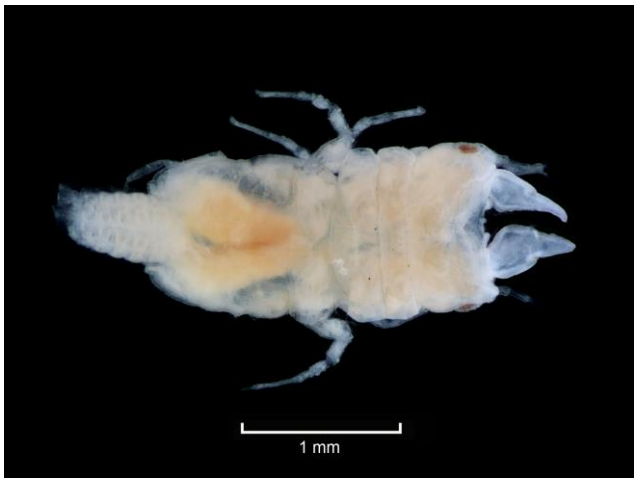
Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Infralittoral. Geography: southeast England. Condition: Good. Size: Medium. Sex: Female. All specimens from one sample.

No generic or specific differences recorded.

Fig. 6a. *Cumella pygmaea* (RT6406; 57856) – L

RT6407 – *Gnathia oxyuraea* (Lilljeborg, 1855) (Figure 7a)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: north of Ireland. Condition: Good. Size: Medium. Sex: Male. Specimens from three samples.



No generic or specific differences recorded.

Fig. 7a. *Gnathia oxyuraea* (RT6407; 65256) – D (male)

RT6408 – *Tanaissus danica* (Hansen, 1910) (Figure 8a)

Substratum: Mud. Salinity: Full (Euhaline). Depth: Infralittoral. Geography: North Sea. Condition: Fair. Size: Medium. Specimens from six samples.

Fig. 8a. *Tanaissus danica* (RT6408; 8710) – D

Six generic and specific differences: Lab 05 identified as *Leptognathia paramanca* (Figure 8b) (which has uniramous uropods); Lab 20 identified as *Parakanthophoreus longiremis* (no material available, Figure 8c shows *Akanthophoreus gracilis*) (which has a shorter cephalothorax); Labs 15 and 18 identified as *Tanaissus lilljeborgi* (Figure 12a) (in which the pleon is much longer than pereonites 5 and 6 combined); Labs 08A and 08B identified as *Araphura brevimanus* (Figure 8b) (which has uropod exopodites as simple points continuous with the basis).

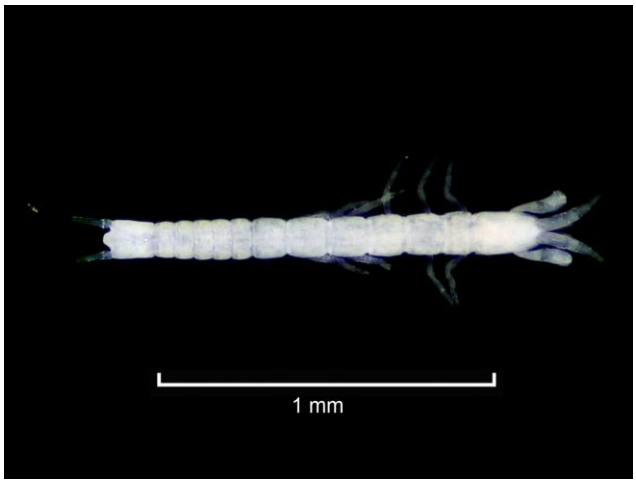


Fig. 8b. *Leptognathia paramanca* (412692, 39381) – D

Fig. 8c. *Akanthophoreus gracilis* (P1341.1, 58718) – D

Fig. 8d. *Araphura brevimanus* (413644, 42979) – D

RT6409 – *Cyathura carinata* (Krøyer, 1847) (Figure 9a)

Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Intertidal. Geography: southwest England. Condition: Good. Size: Medium. Specimens from two samples.

Fig. 9a. *Cyathura carinata* (RT6409; 8817) – L

No generic or specific differences recorded.

RT6410 – *Bodotria scorpioides* (Montagu, 1804) (Figure 10a)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: southeast England. Condition: Good. Size: Medium. Sex: Male. Specimens from three samples.

Fig. 10a. *Bodotria scorpioides* (RT6410; 54828) – L (male)

Two generic and six specific differences: Lab 15 identified as *Eocuma dolfusi* (Figures 10b; 10e) (which has a large lateral spines on the carapace and the uropod peduncle shorter than the rami); Lab 05 identified as *Cumopsis goodsir* (Figure 10c) (which has two pairs of lateral carapace ridges); Labs 07, 12, 13 and 18 identified as *Bodotria arenosa* (Figure 10d) (which has an undivided uropodal endopod).

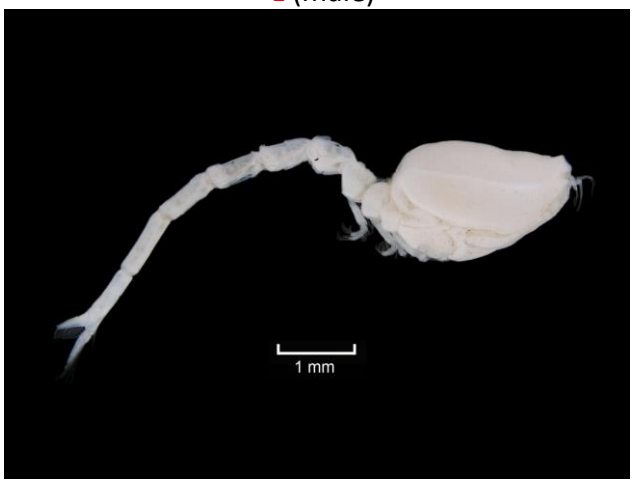


Fig. 10b. *Eocuma dolfusi* (S. Shalla loan) – L

Fig. 10c. *Cumopsis goodsir* (P3115, 62403) – L

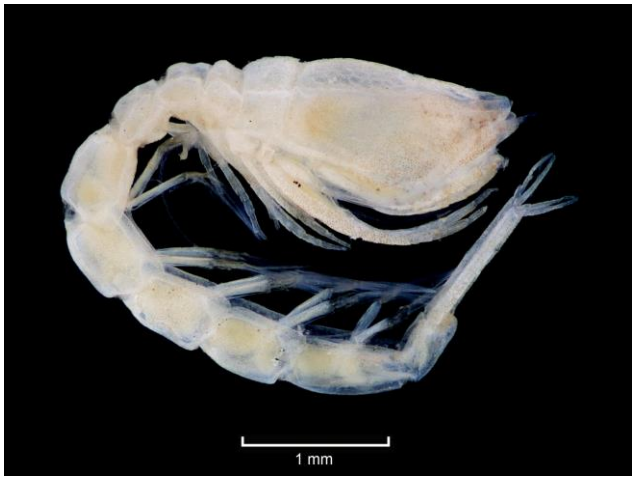


Fig. 10d. *Bodotria arenosa* (414120, 55198) – L (male)

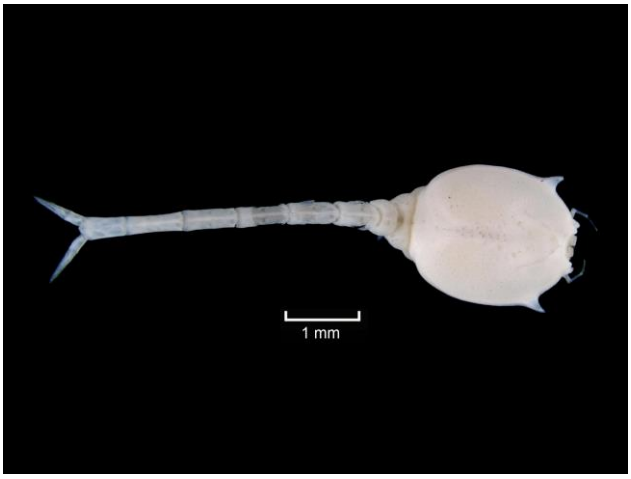


Fig. 10e. *Eocuma dolfusi* (S. Shalla loan) – D

RT6411 – *Apseudopsis latreillii* (Milne Edwards, 1828) (Figure 11a)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Infralittoral. Geography: southwest England. Condition: Good. Size: Medium. All specimens from one sample.

Fig. 11a. *Apseudopsis latreillii* (RT6411; 6911) – D

Two generic and specific differences: Lab 20 identified as *Apseudes spinosus* (Figure 11b) (which has an acutely pointed rostrum and medio-ventral spines on the pereon and pleon); Lab 08A identified as *Apseudes talpa* (Figure 11c) (which has convergent rostrum margins).

Labs 09 and 17 named the synonym *Apseudes latreillii*.

Fig. 11b. *Apseudes spinosus* (P4269, 63822) – D

Fig. 11c. *Apseudes talpa* (413273, 41901) – D

RT6412 – *Tanaissus lilljeborgi* (Stebbing, 1891) (Figures 12a; 12b)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Infralittoral. Geography: southeast England. Condition: Fair. Size: Medium. All specimens from one sample.

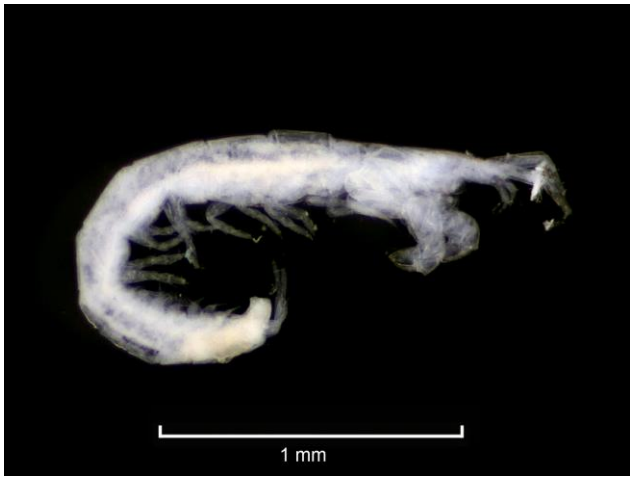


Fig. 12a. *Tanaissus lilljeborgi* (RT6412; 55609) – L

One generic and specific difference: Lab 19 identified as *Tanaopsis graciloides* (Figure 04a) (which has a bidentate cheliped propodus).

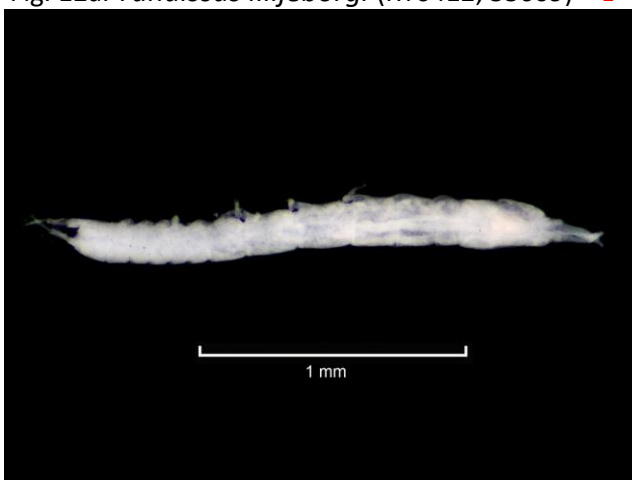


Fig. 12b. *Tanaissus lilljeborgi* (RT6412; 55609) – D

RT6413 – *Gastrosaccus spinifer* (Goës, 1864) (Figure 13a)

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

Fig. 13a. *Gastrosaccus spinifer* (RT6413; 57687) – L

Two generic and specific differences: Labs 08A, and 15 identified as *Praunus inermis* (Figure 13b) (which has no spine on the posterior dorsal margin of the fifth abdominal segment).

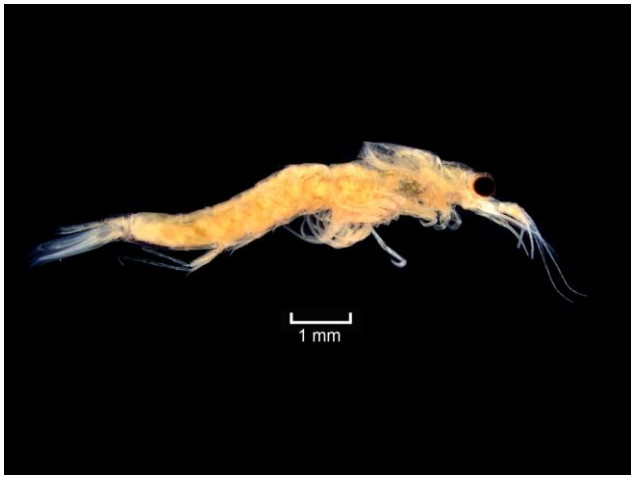


Fig. 13b. *Praunus inermis* (412693, 39519) – L

RT6414 – *Iphinoe trispinosa* (Goodsir, 1843) (Figure 14a)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: southwest England. Condition: Good. Size: Medium. Sex: Female. Specimens from three samples.

Fig. 14a. *Iphinoe trispinosa* (RT6414; 57459) – L (female)

No generic or specific differences recorded.

RT6415 – *Pseudocuma longicorne* (Bate, 1858) (Figure 15a)

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

Fig. 15a. *Pseudocuma longicorne* (RT6415; 58708) – L (female)

Three generic and specific differences: Labs 05, 07 and 19 identified as *Monopseudocuma gilsoni* (Figure 15b) (in which the uropod peduncle is as long as the endopod).

Fig. 15b. *Monopseudocuma gilsoni* (412692, 39534) – L (female)

RT6416 – *Vaunthompsonia cristata* Bate, 1858 (Figure 16a)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: north of Ireland. Condition: Good. Size: Medium. Sex: Female. Specimens from five samples.

Fig. 16a. *Vaunthompsonia cristata* (RT6416 ; 58680) – L (female)

Three generic and specific differences: Lab 08B identified as *Iphinoe serrata* (Figure 16b) (which has exopods on pereopod 1 only); Lab 09 identified as *Bathycuma brevirostre* (Figure 16c) (which lacks eyes and has pseudorostral lobes reaching beyond the ocular lobe); Lab 20 identified as *Leucon nasica* (Figure 20a) (which has a longer pseudorostrum).

Fig. 16b. *Iphinoe serrata* (P529, 58004) – L (female)

Fig. 16c. *Bathycuma brevirostre* (S. Shalla loan) – L (female)

RT6417 – *Asellus aquaticus* (Linnaeus, 1758) (Figure 17a)

Substratum: Diamicton. Salinity: Low (Oligohaline). Depth: Infralittoral. Geography: southeast England. Condition: Fair. Size: Medium. Specimens from three samples.

Fig. 17a. *Asellus aquaticus* (RT6417; 57654) – D

Five generic and specific differences: Lab 05 identified as *Janira maculosa* (Figure 17b); Lab 14 identified as *Ianiropsis breviremis* (no material available) (which has shorter antennae and more regularly convex pleotelson margins); Lab 15 identified as *Proasellus meridianus* (Figure 17c shows a possible *Proasellus* sp.); Lab 20 identified as *Proasellus coxalis* (both of which lack a spur of dark pigment between the eyes); Lab 08B identified as *Idotea neglecta* (Figure 17d) (which has ventral uropods).

Fig. 17b. *Janira maculosa* (P529_59174) – D

Fig. 17c. *Proasellus* sp.? (412525, 8328) – D

Fig. 17d. *Idotea neglecta* (P3767, 63328) – D

RT6418 – *Idotea granulosa* Rathke, 1843 (Figure 18a)

Substratum: Floral turf. Salinity: Full (Euhaline). Depth: Infralittoral. Geography: northern Scotland. Condition: Good. Size: Medium. Specimens from two samples.

Fig. 18a. *Idotea granulosa* (RT6418; 56115) – D

Three specific differences: Labs 08A, 14 and 16 identified as *Idotea pelagica* (Figure 18b) (which has regularly convex sides to the pleotelson and a less pronounced median process).

Fig. 18b. *Idotea pelagica* (P2188.1, 61882) – D

RT6419 – *Bodotria scorpioides* (Montagu, 1804) (Figure 19a)

Substratum: Diamicton. Salinity: Variable (Euryhaline). Depth: Circalittoral (Upper Shelf). Geography: southeast England. Condition: Good. Size: Medium. Sex: Female. Specimens from two samples.

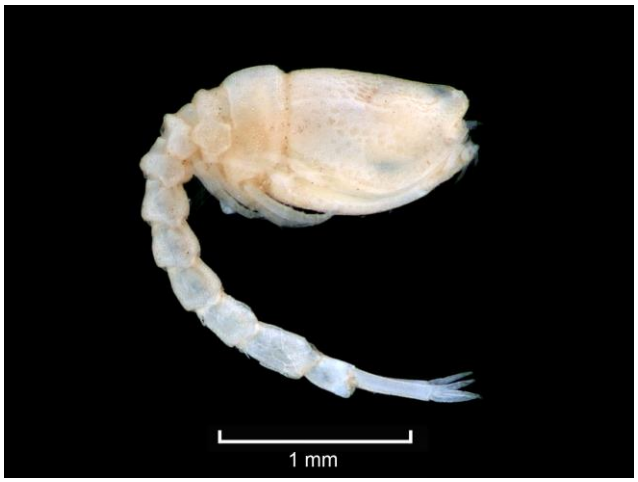


Fig. 19a. *Bodotria scorpioides* (RT6419; 54819) – L (female)

Four specific differences: Labs 15, 18 and 19 identified as *Bodotria arenosa* (Figure 19b) (which has an undivided uropodal endopod); Lab 08B identified as *Bodotria pulchella* (Figure 19c) (which has two ridges on either side of the carapace).

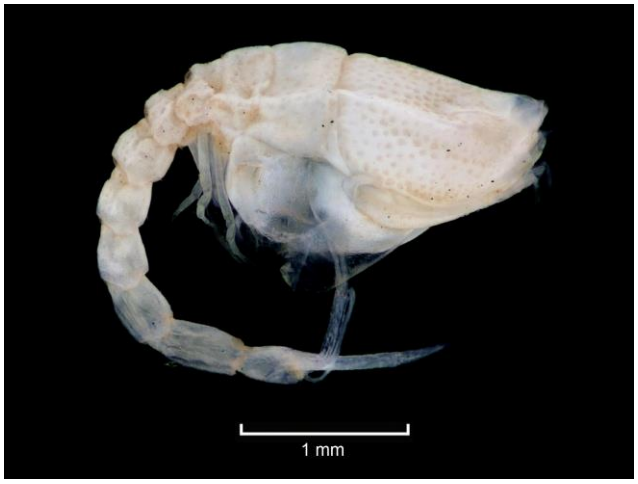


Fig. 19b. *Bodotria arenosa* (413561, 43434) – L (female)

Fig. 19c. *Bodotria pulchella* (412399, 38409) – L (female)

RT6420 – *Leucon nasica* (Krøyer, 1841) (Figures 20a)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Lower Shelf). Geography: North Sea. Condition: Good. Size: Medium. Sex: Male (immature). Specimens from six samples.

Fig. 20a. *Leucon nasica* (RT6420; 64492) – L (immature male)

Two specific differences: Lab 18 identified as *Leucon afeni* (no material available) (which has a shorter pseudorostrum); Lab 20 identified as *Leucon acutirostris* (Figure 20b) (which has a shorter dorsal crest).

Fig. 20b. *Leucon acutirostris* (S. Shalla loan) – L

RT6421 – *Lekanesphaera rugicauda* (Leach, 1814) (Figures 21a; 21b)

Substratum: Diamicton. Salinity: Low (Oligohaline). Depth: Intertidal. Geography: southeast England. Condition: Fair. Size: Medium. All specimens from one sample.

Fig. 21a. *Lekanesphaera rugicauda* (RT6421; 59940) – D

Two specific differences: Lab 20 identified as *Lekanesphaera hookeri* (Figure 21c-d) (which has two rows of tubercles on the pleotelson); Lab 14 identified as *Lekanesphaera weilli* (no material available) (which lacks a distal row of setae on the propodus of pereopod 1).

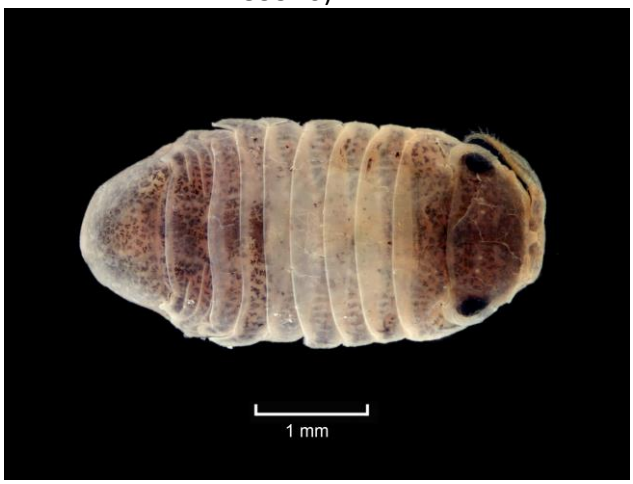


Fig. 21b. *Lekanesphaera rugicauda* (RT6421; 59940) – D, pleotelson curled

Fig. 21c. *Lekanesphaera hookeri* (P3212.2, 63264) – D, pleotelson curled

Fig. 21d. *Lekanesphaera hookeri* (P3212.2, 63264) – D

RT6422 – *Diastylis bradyi* Norman, 1879 (Figure 22a)

Substratum: Diamicton. Salinity: Full (Euhaline). Depth: Infralittoral. Geography: northeast England. Condition: Fair. Size: Medium. Sex: Female. Specimens from three samples.

Fig. 22a. *Diastylis bradyi* (RT6422; 62406) – L (female)

Two specific differences: Labs 12 and 19 identified as *Diastylis laevis* (Figure 22b) (which has the propodus of pereopod 1 less than twice as long as the dactylus).

Fig. 22b. *Diastylis laevis* (412520_39667) – L (female)

RT6423 – *Paragnathia formica* (Hesse, 1864) (Figure 23a)

Substratum: Mud. Salinity: Variable (Euryhaline). Depth: Intertidal. Geography: southeast England. Condition: Fair. Size: Medium. Sex: Male. Specimens from three samples.

Fig. 23a. *Paragnathia formica* (RT6423; 61906) – D (male)

Two generic and specific differences: Lab 18 identified as *Gnathia maxillaris* (Figure 23b); Lab 08B identified as *Gnathia dentata* (Figure 23c) (both of which have larger mandibles and a pylopod of only 2 articles).

Fig. 23b. *Gnathia maxillaris* (P5984.9, 71509) – D (male)

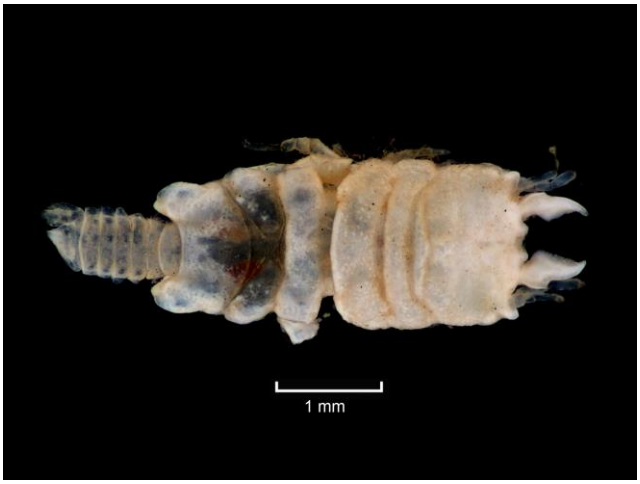


Fig. 23c. *Gnathia dentata* (412400, 38664) – D (male)

RT6424 – *Lamprops fasciatus* G.O. Sars, 1863 (Figure 24a)

Substratum: Sand. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: northern Scotland. Condition: Good, female. Size: Medium. Sex: Female. Specimens from four samples.

Fig. 24a. *Lamprops fasciatus* (RT6424; 60780) – L (female)

No generic or specific differences recorded.

RT6425 – *Pseudarachna hirsuta* (G.O. Sars, 1864) (Figure 25a)

Substratum: Mud. Salinity: Full (Euhaline). Depth: Circalittoral (Upper Shelf). Geography: north of Ireland. Condition: Fair. Size: Medium. All specimens from one sample.

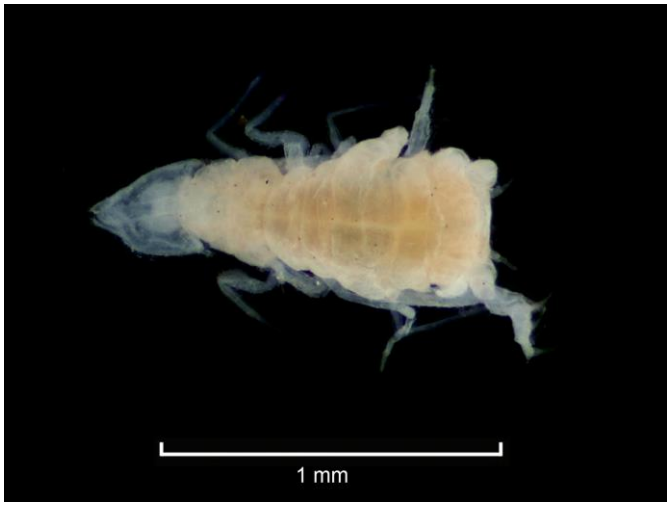


Fig. 25a. *Pseudarachna hirsuta* (RT6425; 61743) – D

Three generic and specific differences: Lab 05 identified as *Munna kroyeri* (Figure 25b shows a *Munna* sp.); Labs 22 and 23 identified as *Munna limicola* (Figure 25b: *Munna* sp.) (both of which have eyes on lateral projections).

Fig. 25b. *Munna* sp. (P2188.3, 63696) – D

Taxonomic and Identification policy considerations highlighted by RT64

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. Some notes for discussion of progress towards a taxonomic discrimination protocol are included below.

Arthropoda: Crustacea: Peracarida

Mysida

Mysidae (Specimen 13). The draft TDP suggests species identifications for adult (excluding those with larval features) mysids, as currently done at APEM, although there are often occasional specimens that must be left at family, due to missing uropods or antennal scales. As most labs correctly identified the specimen, the policy seems reasonable.

Isopoda

Gnathiidae (Specimens 07, 23). The draft TDP suggests species identifications for male gnathiids, with separation of females and juveniles, with qualifiers, at family level, as currently done at APEM. The circulated specimens were both male and most labs identified them correctly. However, there are several distinct types that could be identified as *Gnathia oxyuraea* that may represent undescribed species; a convention should be agreed for naming them.

Anthuridae (Specimen 09). The draft TDP suggests species identifications for anthurids, without qualifiers for juveniles, as currently done at APEM. There are two native inshore species and the possibility of a non-native that has recently been reported from France (Lavesque et al., 2013). Most labs identified *Cyathura carinata* correctly. However, there are other species, including NNS, that could potentially cause confusion.

Idoteidae (Specimen 18). The draft TDP previously suggested species identifications for idoteids, without qualifiers for juveniles; this was recently amended to reflect a change in APEM policy, to record juveniles below 5mm at family. The circulated specimen was medium sized and most labs identified correctly but discussion may be needed for juveniles.

Sphaeromatidae (Specimens 03, 21). The draft TDP suggests species identifications for sphaeromatids, without qualifiers for juveniles, as currently done at APEM. The taxonomy of European species included in *Sphaeroma* by Naylor (1972) was updated by Jacobs (1987). The review included placement of most British species in *Lekanesphaera*, a species from Brittany that should be checked as possible in SW England and the separation of *L. levii* from *L. monodi*, with only *L. levii* in northern Europe. Naylor & Brandt (2015) updated only the generic placements. Several labs identified the circulated *L. levii* as *L. monodi*, which is effectively a nomenclature error but the possibility of true *L. monodi* being found in British waters at some time should not be discounted.

Cirolanidae (Specimen 05). The draft TDP suggests species identifications for cirolanids, without qualifiers for juveniles, as currently done at APEM. Most labs correctly identified the circulated specimen but there were some confusions and it is often necessary to resort to older literature (*e.g.* Hansen, 1905) for *Eurydice*.

Munnopsidae (Specimen 25). The draft TDP suggests species identifications for munnopsids, without qualifiers for juveniles, as currently done at APEM. As most species are exclusively subtidal, they are not included in Naylor (1972) or Naylor & Brandt (2015), which cover only intertidal isopods. For many subtidal isopods, the best resource is still Sars (1899a). Most labs correctly identified the circulated specimen, but some named them as *Munna*, probably the most similar genus covered by Naylor & Brandt (2015).

Asellidae (Specimen 17). This family was accidentally omitted from the first draft TDP; they are mainly freshwater but sometimes extend into low salinity transitional waters. APEM currently identify asellids to species without qualifiers for juveniles. Most labs correctly identified the

circulated specimen. However, some named other, very similar, species, that may not have been considered by all.

Tanaidacea

British tanaids have mostly been identified using Holdich & Jones (1983) but there have been many species described since, or recognized from nearby areas or deeper water.

Apseudidae (Specimen 11). The draft TDP suggests species identifications for apseudids, as currently done at APEM. Most labs correctly identified the circulated specimen.

Tanaopsidae (Specimen 04). This family was accidentally omitted from the first draft TDP. It has recently been separated from Leptognathiidae, as have several other families. APEM currently identify tanaopsids to species without qualifiers for juveniles. Most labs correctly identified the circulated specimen. Most differences were for members of other, related, families. Some of the names used: *Tanaopsis laticaudata* (Sars, 1882) and *Paratanais rigidus* Bate & Westwood, 1868, were for species that are poorly known and of uncertain identity.

Tanaissuidae (Specimens 08, 12). The draft TDP suggests species identifications for tanaissuids, as currently done at APEM. Only one species is included in Holdich & Jones (1983) but *Tanaissus danica* (Specimen 08) is described in Bird (2002); another species has been described from Galicia (Esquete et al., 2015) that could potentially be found further north. Most labs correctly identified the circulated specimens and differences appeared mainly due to missed literature.

Cumacea

Cumacea had mostly been identified using Jones (1976). There was a NMBAQC workshop in 2010, followed by a Scheme guide (Shalla, 2011). Other species have been described or recognized since then and Sars (1899b) includes the best descriptions of some of the deeper water species.

Pseudocumatidae (Specimens 02, 15). The draft TDP suggests species identifications for pseudocumatids, as currently done at APEM. Most labs correctly identified the circulated specimens, although there were several uses of the similar *Monopseudocuma gilsoni*, which was redescribed by McCarthy et al. (2006); there were more differences for the male (Specimen 02), probably as the second pleopod is very small.

Diastylidae (Specimen 22). The draft TDP suggests species identifications for diastylids, with separation of juveniles at genus, if fewer than four pairs of telson spines, as currently done at APEM. Most labs correctly identified the circulated specimen despite it being very similar to another. The policy could be retained unless discussion is needed on the size criterion.

Lampropidae (Specimen 24). The draft TDP suggests species identifications for lampropids, as currently done at APEM. Most labs correctly identified the circulated specimen despite it being very similar to some others (Shalla & Bishop, 2007). The policy could be retained.

Bodotriidae (Specimens 10, 14, 16, 19). The draft TDP suggests species identifications for bodotriids, without qualifiers for juveniles, as currently done at APEM. Most labs correctly identified the circulated specimens. However, there were some difficulties with *Bodotria scorpioides* (Specimens 10 and 19), in which the articulation of the uropodal endopod may be difficult to see.

Nannastacidae (Specimen 06). The draft TDP suggests species identifications for nannastacids, without qualifiers for juveniles, as currently done at APEM. Most labs correctly identified the circulated specimen. The policy could be retained, although problems are likely with other genera.

Leuconidae (Specimens 01, 20). The draft TDP suggests species identifications for leuconids, without qualifiers for juveniles, as currently done at APEM. Most labs correctly identified the circulated specimens but new *Leucon* species were recently described (Shalla & Bishop, 2004) and one of these names was used, as was another described in Sars (1899b).

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Ring Test Specimen Return Instructions

Please return all ring test specimens by 26th May 2023. These are reference collection specimens and must be returned to our museum. Your laboratory will be ineligible for future ring tests if specimens are not returned.

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