NMBAQC

NE Atlantic Marine Biological Analytical Quality Control Scheme

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Fish Ring Test Bulletin – FRT14

9th March 2021

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MODULE / EXERCISE DETAILS

Module:	**Fish Ring Test (FRT)**
Exercises:	**FRT14**
Specimens and Images Circulated:	**30th November 2020**
Data Submission Deadline:	**29th January 2021**
Number of Subscribing Laboratories:	**8**
Number of Submissions Received:	**10***

***multiple data entries per laboratory permitted**

Table1. Summary of differences

Specimen	Genus	Species	Total differences for 10 returns	
			Genus	Species
F-RT1401	*Limanda*	*limanda*	**0**	**0**
F-RT1402	*Sprattus*	*sprattus*	**1**	**1**
F-RT1403	*Pomatoschistus*	*microps*	**0**	**2**
F-RT1404	*Pomatoschistus*	*minutus*	**0**	**2**
F-RT1405	*Agonus*	*cataphractus*	**0**	**0**
F-RT1406	*Dicentrarchus*	*labrax*	**0**	**0**
F-RT1407	*Merlangius*	*merlangus*	**0**	**0**
F-RT1408	*Trachurus*	*trachurus*	**0**	**0**
F-RT1409	*Trisopterus*	*luscus*	**1**	**1**
F-RT1410	*Clupea*	*harengus*	**0**	**0**
F-RT1411	*Clupea*	*harengus*	**5**	**5**
F-RT1412	*Osmerus*	*eperlanus*	**0**	**0**
F-RT1413	*Ammodytes*	*tobianus*	**1**	**2**
F-RT1414	*Rutilus*	*rutilus*	**0**	**0**
F-RT1415	*Scomber*	*scombrus*	**0**	**0**
		Total differences	**8**	**13**
		Average differences / lab.	**0.8**	**1.3**

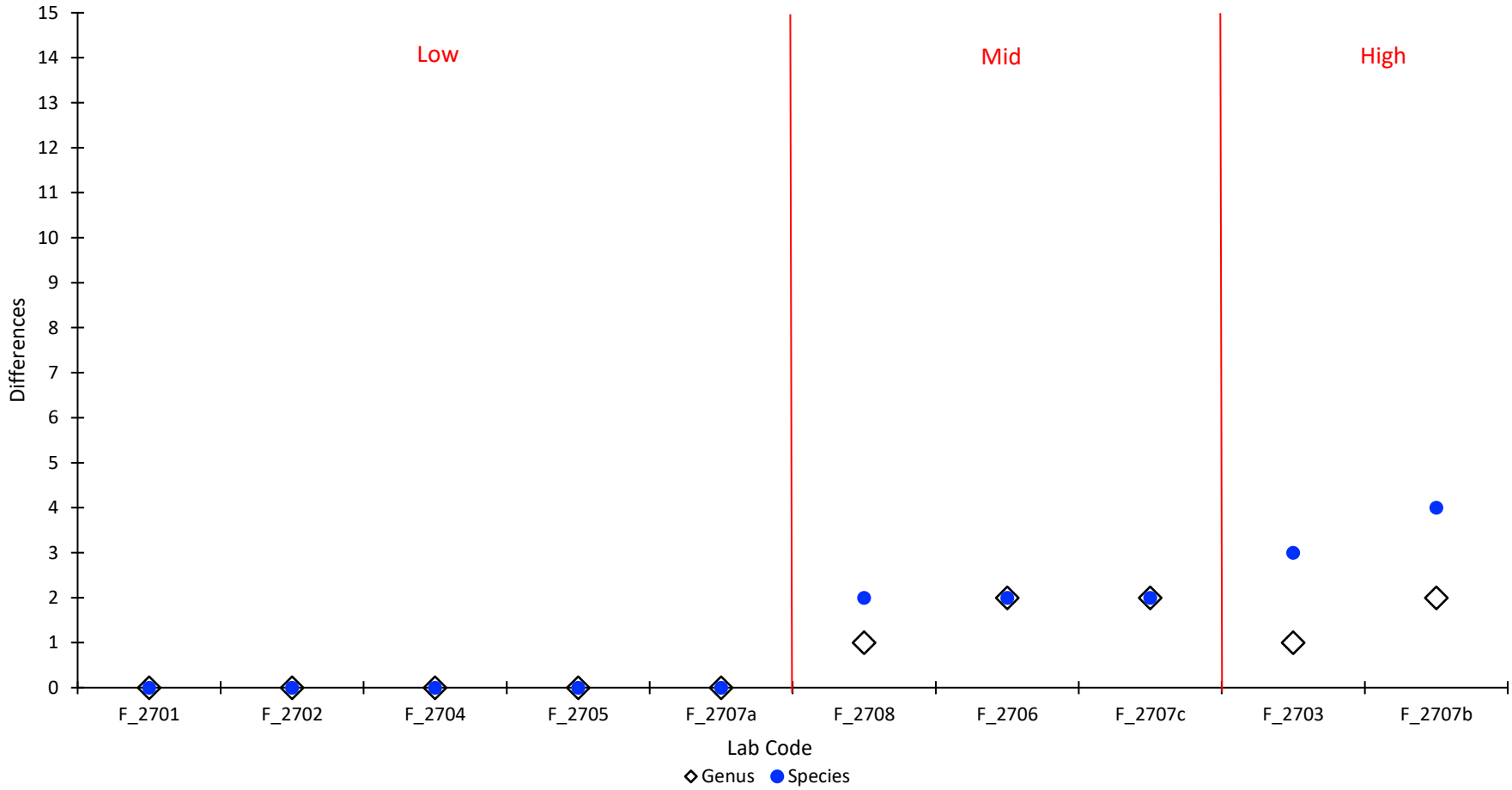

Figure 1. The number of differences from the AQC identification of specimens distributed in FRT14 for each of the participating laboratories. Arranged in order of increasing number of differences by specific (blue filled circles) followed by generic (open diamond) errors.

Table 2. The identification of specimens made by participating laboratories for FRT14 (arranged by specimen). Names are given only where different from the AQC identification.

	F-RT1401	F-RT1402	F-RT1403	F-RT1404	F-RT1405
Taxon	*Limanda limanda*	*Sprattus sprattus*	*Pomatoschistus microps*	*Pomatoschistus minutus*	*Agonus cataphractus*
F_2701	- -	- -	- -	- -	- -
F_2702	- -	- -	- -	- -	- -
F_2703	- -	- -	- *minutus*	- *microps*	- -
F_2704	- -	- -	- -	- -	- -
F_2705	- -	- -	- -	- [*lozanoi*]	- -
F_2706	- -	- -	- -	- -	- -
F_2707a	- -	- -	- -	- -	- -
F_2707b	- -	- -	- *minutus*	- *microps*	- -
F_2707c	- -	*Clupea harengus*	- -	- -	- -
F_2708	- -	- -	- -	- -	- -

	F-RT1406	F-RT1407	F-RT1408	F-RT1409	F-RT1410
Taxon	***Dicentrarchus labrax***	***Merlangius merlangus***	***Trachurus trachurus***	***Trisopterus luscus***	***Clupea harengus***
F_2701	--	--	--	--	--
F_2702	--	--	--	--	--
F_2703	--	--	--	--	--
F_2704	--	--	--	--	--
F_2705	--	--	--	--	--
F_2706	--	--	--	--	--
F_2707a	--	--	--	--	--
F_2707b	--	--	--	*Gadus morhua*	--
F_2707c	--	--	--	--	--
F_2708	--	--	--	--	--

	F-RT1411	F-RT1412	F-RT1413	F-RT1414	F-RT1415
Taxon	***Clupea harengus***	***Osmerus eperlanus***	***Ammodytes tobianus***	***Rutilus rutilus***	***Scomber scombrus***
F_2701	- -	- -	- -	- -	- -
F_2702	- -	- -	- -	- -	- -
F_2703	*Sprattus sprattus*	- -	- -	- -	- -
F_2704	- -	- -	- -	- -	- -
F_2705	- -	- -	- -	- -	- -
F_2706	*Sprattus sprattus*	- -	*Hyperoplus lanceolatus*	- -	- -
F_2707a	- -	- -	- -	- -	- -
F_2707b	*Sprattus sprattus*	- -	- -	- -	- -
F_2707c	*Sprattus sprattus*	- -	- -	- -	- -
F_2708	*Sprattus sprattus*	- -	- spp.	- -	- -

Specimen images and detailed breakdown of identifications

Participating laboratories were asked to identify to species level the 15 specimens that were supplied with images and the basic habitat and geographic details from where they were collected. Participants could also submit notes on their identifications, confidence level and details of literature used.

FRT14 was not a targeted ring test and most species included are commonly caught in routine monitoring surveys. Some specimens were relatively small but could still be expected to be caught using standard monitoring methods (e.g. seine netting).

LabCodes are abbreviated in this report to exclude the Scheme year, i.e. LB2705 = Lab 05. An additional terminal character has been added to the LabCode (small case sequential letters) to differentiate multiple data entries from the same laboratory, *i.e*. two participants from laboratory 01 would be coded as Lab 01a and Lab 01b. For details of your LabCode please contact your Scheme representative or APEM Ltd.

Figured FRT specimens are selected from the circulation series as typical of the size and condition range circulated. Where possible, figured specimens of other species have been selected to be of similar size as the FRT specimen with which they have been compared.

F-RT1401 – *Limanda limanda* (Linnaeus, 1758)

Substratum: Mixed. Salinity: High. Depth: Circalittoral (Upper Shelf). Geography: Blackwater Estuary. Condition: Good. Size: 40–60 mm.

No generic or specific differences.

Fig 1a. *Limanda limanda* (FRT1401)

F-RT1402 – *Sprattus sprattus* (Linnaeus, 1758)

Substratum: Pelagic. Salinity: High. Depth: Circalittoral (Upper Shelf). Geography: Blackwater Estuary. Condition: Fair. Size: 45–55 mm.

One generic and specific difference. Lab 07c identified as *Clupea harengus* (Fig 11a) which has more scales along the belly between the throat and pelvic fins and between the pelvic fins and vent (27–30 and 13–16 for *C. harengus*; 21–23 and 11–12 for *S. sprattus*).

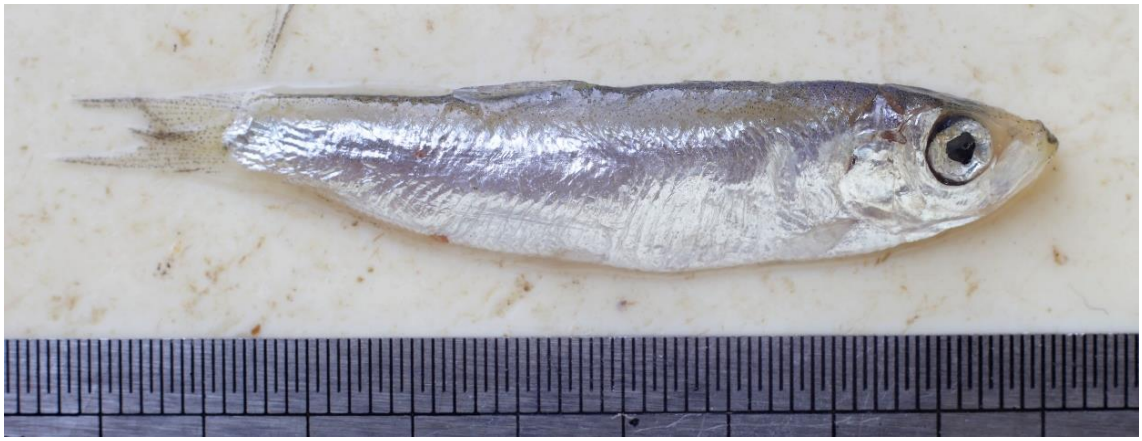

Fig 2a. *Sprattus sprattus* (FRT1402)

F-RT1403 – *Pomatoschistus microps* (Krøyer, 1838)

Substratum: Mixed. Salinity: Reduced. Depth: Intertidal. Geography: Blackwater Estuary. Condition: Fair. Size: 40–45 mm.

Two generic and specific differences. Labs 03 and 07b identified as *Pomatoschistus minutus* (Fig 4a) which has smaller scales (55–58 in lateral series) and branchiostegal membrane that attaches to the anterior half of the isthmus.

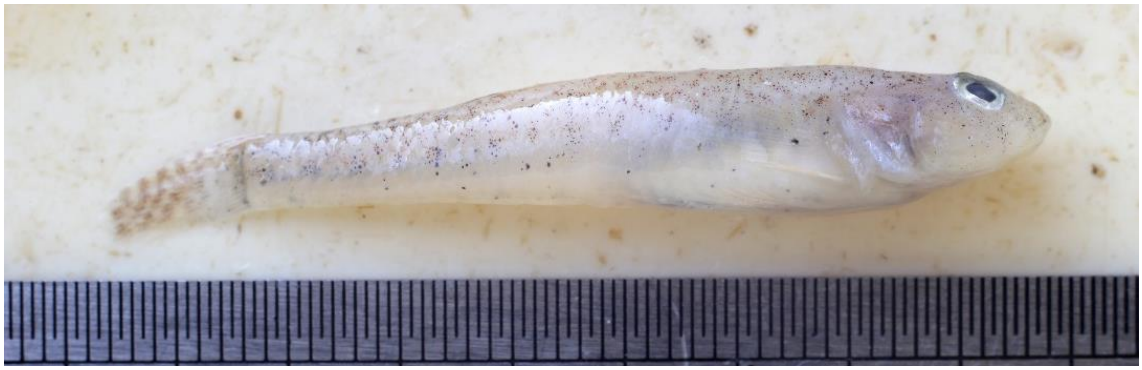

Fig 3a. *Pomatoschistus microps* (FRT1403)

F-RT1404 – *Pomatoschistus minutus* (Pallas, 1770)

Substratum: Mixed. Salinity: Reduced. Depth: Intertidal. Geography: Blackwater Estuary. Condition: Fair. Size: 45–60 mm.

Two generic and specific differences. Labs 03 and 07b identified as *Pomatoschistus microps* (Fig 3a) which has larger scales (39–52 in lateral series) and branchiostegal membrane that attaches to the posterior of the isthmus.

Lab 05 identified as *Pomatoschistus lozanoi* which can be distinguished from *P. minutus* using the transverse rows of sensory papillae, *P. lozanoi* having two rows other than *cp* descending through row *d* (see FRT#13 bulletin for further details). In the interest of distributing fresh (frozen) specimens for FRT14 sensory papillae were only checked for specimens in the batch that were not distributed. We have therefore not included this as a specific error.

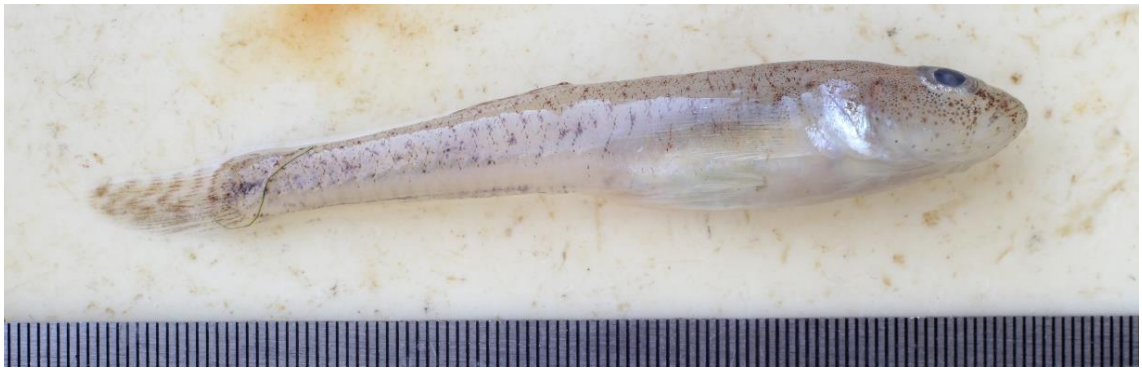

Fig 4a. *Pomatoschistus minutus* (FRT1404)

Fig 4b. *Pomatoschistus lozanoi* (preserved specimen), scale bar 1 cm, reversed (FRT1312)

F-RT1405 – *Agonus cataphractus* (Linnaeus, 1758)

Substratum: Mixed. Salinity: High. Depth: Circalittoral (Upper Shelf). Geography: Blackwater Estuary. Condition: Good. Size: 90–105 mm.

No generic or specific differences.

Fig 5a. *Agonus cataphractus* (FRT1405)

F-RT1406 – *Dicentrarchus labrax* (Linnaeus, 1758)

Substratum: Mixed. Salinity: High. Depth: Circalittoral (Upper Shelf). Geography: Blackwater Estuary. Condition: Good. Size: 85–95 mm.

No generic or specific differences.

Fig 6a. *Dicentrarchus labrax* (FRT1406)

F-RT1407 - *Merlangius merlangus* (Linnaeus, 1758)

Substratum: Mixed. Salinity: High. Depth: Circalittoral (Upper Shelf). Geography: Blackwater Estuary. Condition: Good. Size: 220–240 mm.

No generic or specific differences.

Fig 7a. *Merlangius merlangus* (FRT1407)

F-RT1408 – *Trachurus trachurus* (Linnaeus, 1758)

Substratum: Mixed. Salinity: High. Depth: Circalittoral (Upper Shelf). Geography: Blackwater Estuary. Condition: Good. Size: 230–250 mm.

No generic or specific differences.

Fig 8a. *Trachurus trachurus* (FRT1408)

F-RT1409 – *Trisopterus luscus* (Linnaeus, 1758)

Substratum: Mixed. Salinity: High. Depth: Circalittoral (Upper Shelf). Geography: Blackwater Estuary. Condition: Good. Size: 170–190 mm.

One generic and specific difference. Lab 07b identified as *Gadus morhua* (Fig 9b) which has the origin of the first anal fin behind or beneath the interspace between first and second dorsal fin. *G. morhua* also has a conspicuously light-coloured lateral line with a smooth curve above the pectoral fin.

Fig 9a. *Trisopterus luscus* (FRT1409)

Fig 9b. *Gadus morhua,* reversed (Blackwater Estuary)

F-RT1410 – *Clupea harengus* Linnaeus, 1758

Substratum: Pelagic. Salinity: High. Depth: Circalittoral (Upper Shelf). Geography: Scotland. Condition: Good. Size: 240–250 mm.

No generic or specific differences recorded.

Fig 10a. *Clupea harengus* (FRT1410)

F-RT1411 - *Clupea harengus* Linnaeus, 1758

Substratum: Pelagic. Salinity: High. Depth: Circalittoral (Upper Shelf). Geography: Blackwater Estuary. Condition: Fair. Size: 45–50 mm.

Five generic and specific differences. Labs 03, 06, 07b, 07c and 08 identified as *Sprattus sprattus* (Fig 2a) which has fewer scales along the belly between the throat and pelvic fin and between the pelvic fin and vent (27–30 and 13–16 for *C. harengus*; 21–23 and 11–12 for *S. sprattus*).

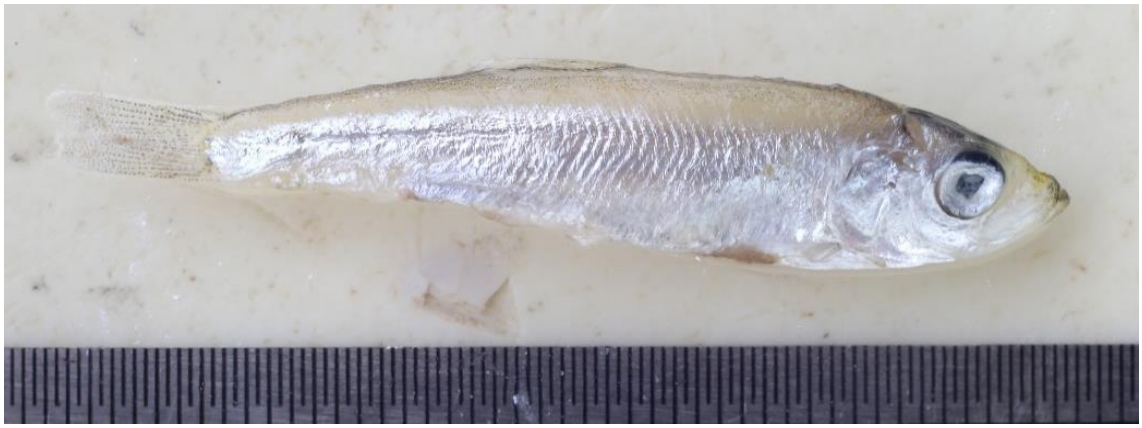

Fig 11a. *Clupea harengus* (FRT1411)

F-RT1312 – *Osmerus eperlanus* (Linnaeus, 1758)

Substratum: Mixed. Salinity: High. Depth: Circalittoral (Upper Shelf). Geography: Thames Estuary. Condition: Good. Size: 180–190 mm.

No generic or specific differences recorded.

Fig 12a. *Osmerus eperlanus* (FRT1412)

F-RT1413 – *Ammodytes tobianus* Linnaeus, 1758

Substratum: Sand. Salinity: High. Depth: Circalittoral (Upper Shelf). Geography: Cornwall. Condition: Good. Size: 110–120 mm.

One generic and two specific differences. Lab 06 identified as *Hyperoplus lanceolatus* which has a non-protrusible jaw and a large bifid tooth in the roof of the mouth (Fig 13b, right). *Ammodytes tobianus* has a protrusible jaw and no 'teeth' on the roof of the mouth. Lab 08 identified as *Ammodytes* spp. (comment – "*Lesser or Raitt sandeel*"), *A. marinus* lacks scales on the base of the tail fin lobes and the belly scales are in irregular rows (see FRT#13 bulletin for further details).

Fig 13a. *Ammodytes tobianus* (FRT1413)

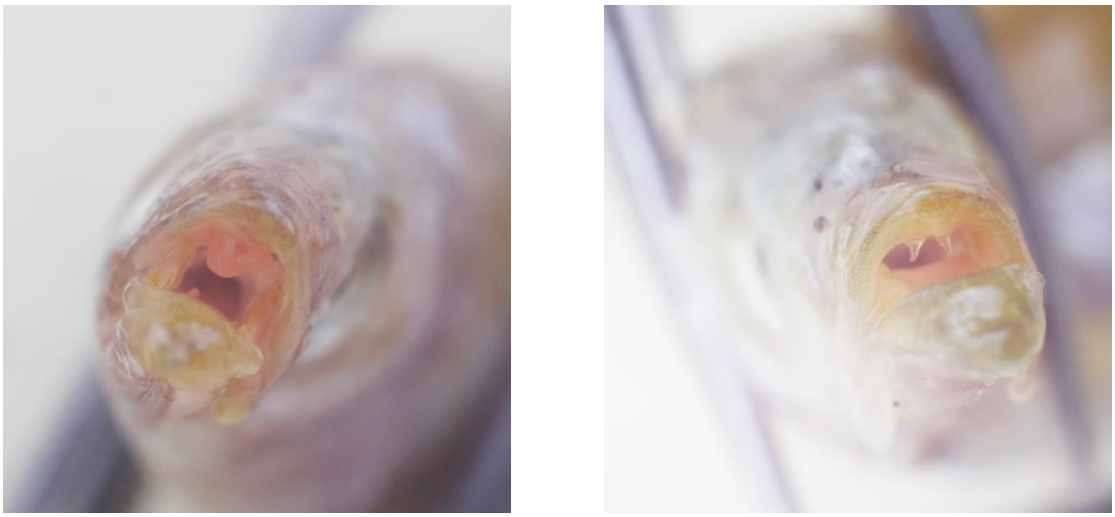

Fig 13b. Comparison of *A. tobianus* (left) with no 'teeth' on the palate and *H. lanceolatus* (right) with a bifid 'tooth' (FRT1413)

F-RT1414 – *Rutilus rutilus* (Linnaeus, 1758)

Substratum: Mixed. Salinity: Low. Depth: Fluvial. Geography: Ireland. Condition: Good. Size: 190–200 mm.

No generic or specific differences recorded.

Fig 14a. *Rutilus rutilus* (FRT1414)

F-RT1415 – *Scomber scombrus* Linnaeus, 1758

Substratum: Pelagic. Salinity: High. Depth: Circalittoral (Upper Shelf). Geography: Cornwall. Condition: Good. Size: 270–290 mm.

No generic or specific differences recorded.

Fig 15a. *Scomber scombrus* (FRT1415)

Taxonomic discrepancies and confidence level

Synonyms

The World Register of Marine Species (WoRMS) and FishBase were used for currently valid species names. All participants submitted currently valid scientific names. One specimen was identified to genus level with the species (plural) abbreviation 'spp.'. Participants are asked to identify each specimen to species level and return results forms with species names, uncertain identifications can be indicated through use of the confidence level column.

Authority errors

From 150 entries only 15 specimen names were submitted with an authority (one participant). All submitted authorities were correct.

Confidence level

Confidence of identification was given for 94 entries (from 150 answers submitted), and in at least one instance confidence level was only indicated when a participant was less than confident with species level. For those given, 88% were confident with species identification, 6% genus and 5% family. Most confidence levels given were accurate or conservative (83% and 8.5% respectively), 8.5% were overconfident with the identification given.

Literature cited for FRT14 identification

Maitland & Herdson, 2009 - Key to the Marine and Freshwater Fishes of Britain and Ireland

Wheeler, 1969 - The fishes of the British Isles and North West Europe

Taxonomic and identification policy problems highlighted by this FRT

There were relatively few taxonomic errors for the specimens circulated. However, three groups of species accounted for 12 of the 13 specific errors; sand and common gobies, juvenile clupeids, and sand eels. Detailed notes on the diagnostic features used to separate juvenile clupeids and sand eels can be found in the FRT#13 bulletin, including details on the "sand goby complex" species. Listed below are some additional features to distinguish between sand and common goby, between juvenile sprat and herring, and notes and comments raised for FRT specimens.

Common and sand goby

Two participants identified specimen 3 (*P. microps*) as *P. minutus* and specimen 4 (*P. minutus*) as *P. microps*. Common goby (*P. microps*) can be initially separated from the sand goby complex relatively quickly in the field using the size of dorsal reticulation posterior of the second dorsal fin (caudal peduncle) - seen from above the dark pigment at the edge of the scales is often visible as a strong criss-cross pattern in *P. microps;* in comparison to *P. minutus* which has a fine reticulation. *P. microps* has relatively larger scales on the caudal peduncle (39–52 in lateral series) compared to *P. minutus* (55–75 in lateral series). Identification can then be confirmed further using the branchiostegal membrane; attached to the posterior of the isthmus (*P. microps*) or attached to the anterior half of the isthmus (*P. minutus*).

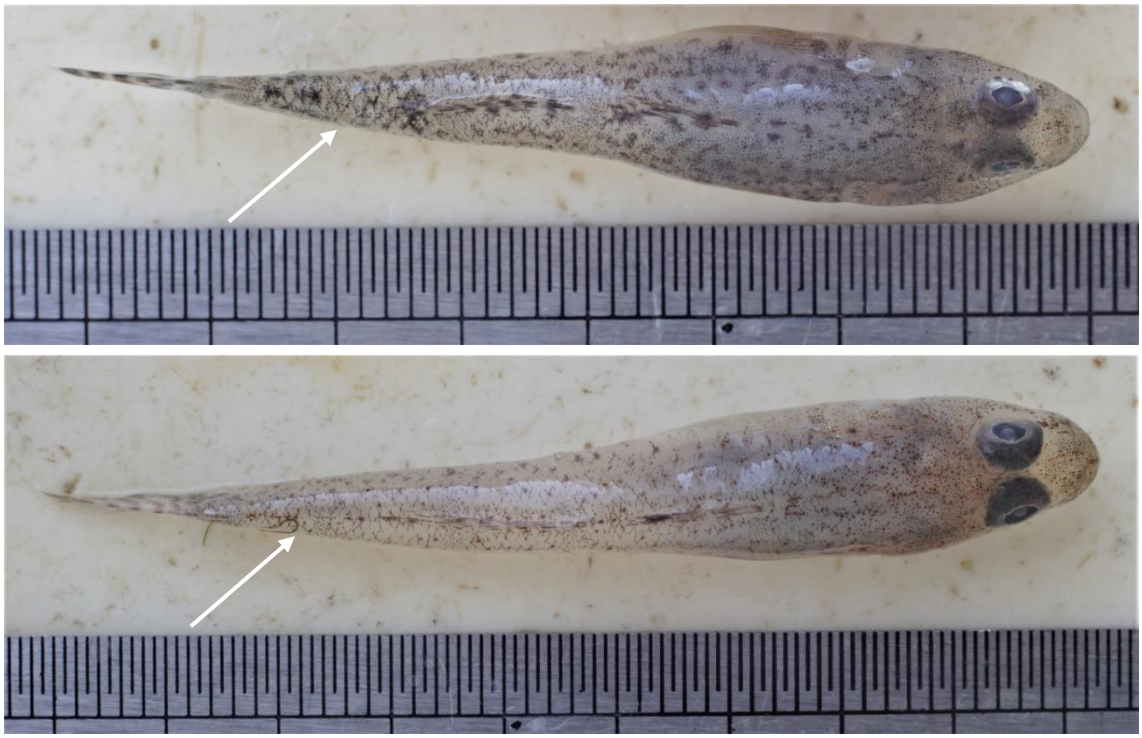

Figure 2. *Pomatoschistus microps* (top) and *Pomatoschistus minutus* (bottom); caudal peduncle reticulation arrowed (FRT1403 and FRT1404).

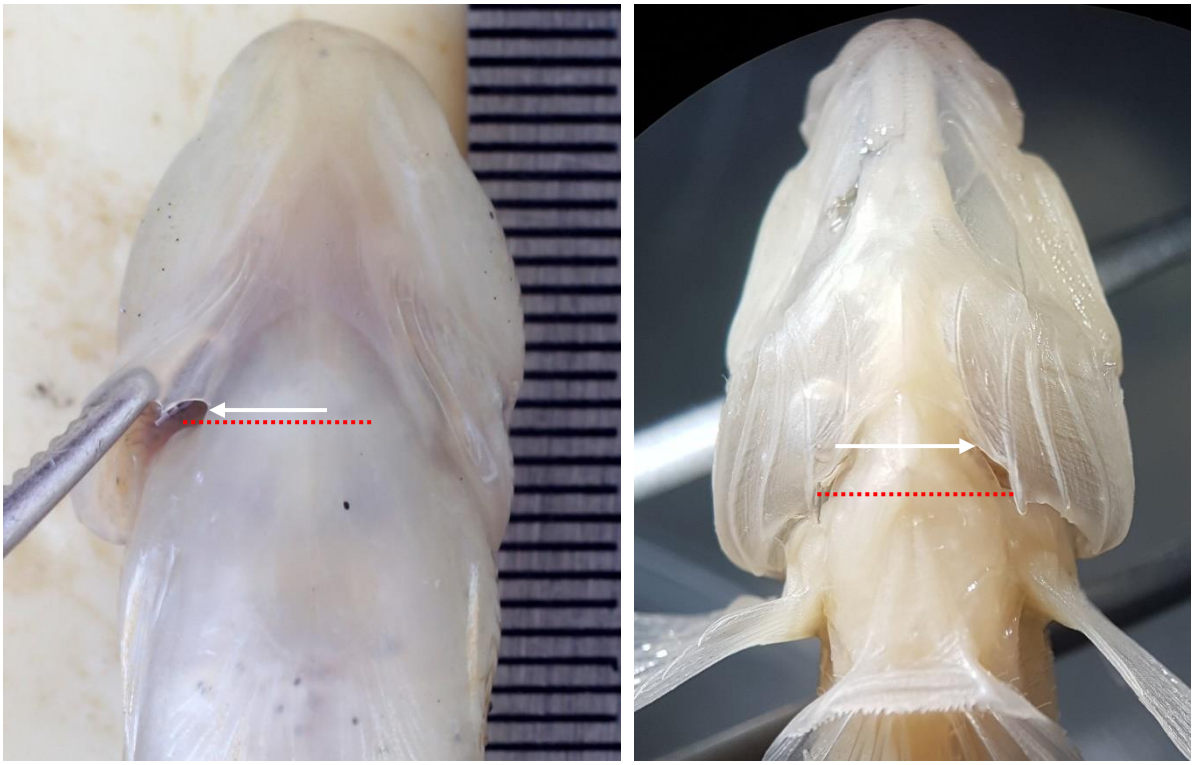

Figure 3. ***Pomatoschistus microps*** **(left) and** ***Pomatoschistus minutus*** **(preserved specimen, right); position of branchiostegal membrane attachment arrowed, posterior end of isthmus indicated in red (FRT1403 and Blackwater Estuary).**

Juvenile sprat and herring

One participant identified specimen 2 (*S. sprattus*) as *C. harengus* and five participants identified specimen 11 (*C. harengus*) as *S. sprattus*. Both specimens were of similar size (approx. 50 mm), and at this size we recommend using the scales along the belly between the throat and pelvic fins and between the pelvic fins and vent to distinguish species (27–30 and 13–16 for *C. harengus*; 21–23 and 11–12 for *S. sprattus*). Counts of belly scales can be impractical in the field and the relative position of the dorsal and pelvic fins can sometimes be inconclusive at this size, especially if specimens are damaged. An additional feature that can help distinguish the two species at this size is the depth of the body; *S. sprattus* is deepest mid-body, *C. harengus* is deepest towards the head, tapering towards the tail.

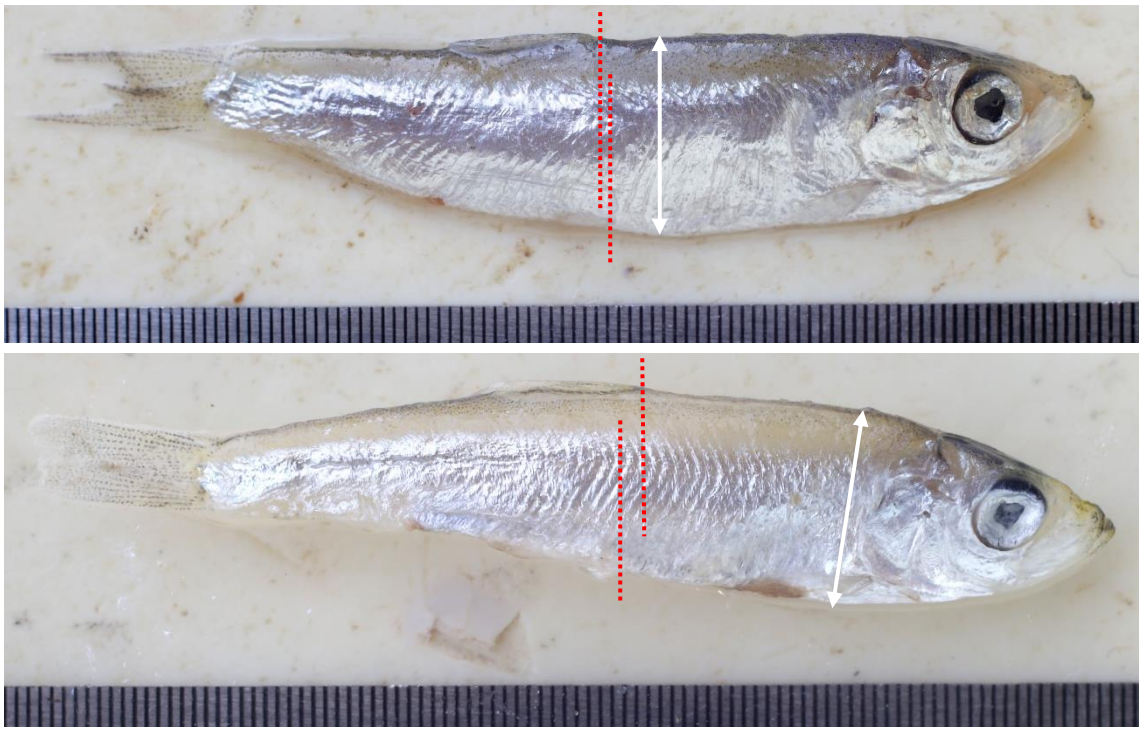

Figure 4. *Sprattus sprattus* (top) and *Clupea harengus* (bottom); deepest part of body arrowed, origins of dorsal and pelvic fins indicated in red (FRT1402 and FRT1411)

Additional specimen comments

Seven participants submitted comments relating to damaged specimens (specimens 2, 3, 4 and 11). These specimens were all relatively small and fragile and very susceptible to damage when thawed (e.g. crushed by larger specimens). To reduce the possibility of damage in future exercises any fragile specimens will be packaged separately from larger specimens. Five of the ten taxonomic errors for these specimens had a comment relating to the specimen being damaged. Nine species identifications for these specimens were correct despite comments that the specimen was damaged. If a specimen is damaged, we recommend participants refer to the photos where feasible or request a replacement to be sent if possible.

One participant commented on the uncertainty of their identification of specimen 15 (*Scomber scombrus*) due to damage of the first dorsal fin (comment – "query *S. japonicus*[1]").

[1] Whilst some fish books refer to *S. japonicus* in the North-east Atlantic, *S. japonicus* is an Indo-Pacific species. Reports of *S. japonicus* in the North-east Atlantic are now considered to relate to *Scomber colias.*

References

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Webb, C.J., 1980. Systematics of the *Pomatoschistus minutus* complex (Teleostei: Gobioidei). *Philosophical Transactions of the Ray Society London B*, 292, 201–241.

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WoRMS Editorial Board 2021. World Register of Marine Species. Available from http://www.marinespecies.org at VLIZ. Accessed 2021-01-11. doi:10.14284/170.

Index (FRT Figures)

Specimen labels

You are not required to return the specimens to APEM Ltd. A sheet of labels is provided for incorporating these specimens into in-house reference collections.

NMBAQC Scheme
Limanda limanda
Location: Blackwater Estuary
F-RT1401

NMBAQC Scheme
Dicentrarchus labrax
Location: Blackwater Estuary
F-RT1406

NMBAQC Scheme
Clupea harengus
Location: Blackwater Estuary
F-RT1411

NMBAQC Scheme
Sprattus sprattus
Location: Blackwater Estuary
F-RT1402

NMBAQC Scheme
Merlangius merlangus
Location: Blackwater Estuary
F-RT1407

NMBAQC Scheme
Osmerus eperlanus
Location: Thames Estuary
F-RT1412

NMBAQC Scheme
Pomatoschistus minutus
Location: Blackwater Estuary
F-RT1403

NMBAQC Scheme
Trachurus trachurus
Location: Blackwater Estuary
F-RT1408

NMBAQC Scheme
Ammodytes tobianus
Location: Cornwall
F-RT1413

NMBAQC Scheme
Pomatoschistus microps
Location: Blackwater Estuary
F-RT1404

NMBAQC Scheme
Trisopterus luscus
Location: Blackwater Estuary
F-RT1409

NMBAQC Scheme
Rutilus rutilus
Location: Ireland
F-RT1414

NMBAQC Scheme
Agonus cataphractus
Location: Blackwater Estuary
F-RT1405

NMBAQC Scheme
Clupea harengus
Location: Scotland
F-RT1410

NMBAQC Scheme
Scomber scombrus
Location: Cornwall
F-RT1415