



NMQC

NE Atlantic Marine Biological Analytical Quality Control Scheme

The NE Atlantic Marine Biological
Analytical Quality Control Scheme

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Fish Ring Test Bulletin

F-RT10

2016/2017

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Thomson Unicmarine Ltd.
Date of Issue: March 2017

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RING TEST DETAILS

Fish Ring Test #10

Type/Contents –General

Circulated –04/12/2016

Completion Date –03/02/2017

Number of Participating Laboratories –15

Number of Results Received –14

Table 1. Summary of taxonomic differences shown in identifications from participating laboratories for the tenth fish ring test FRT_10 (for further details see Table 2).

Specimen	Genus	Species	Taxonomic errors for 14 returns	
			Genus	Species
FRT1001	<i>Scomber</i>	<i>scombrus</i>	0	0
FRT1002	<i>Sardina</i>	<i>pilchardus</i>	2	2
FRT1003	<i>Dicentrarchus</i>	<i>labrax</i>	0	0
FRT1004	<i>Mullus</i>	<i>surmuletus</i>	0	0
FRT1005	<i>Trachurus</i>	<i>trachurus/mediterraneus</i>	--	--
FRT1006	<i>Osmerus</i>	<i>eperlanus</i>	1	1
FRT1007	<i>Platichthys</i>	<i>flesus</i>	1	1
FRT1008	<i>Clupea</i>	<i>harengus</i>	1	1
FRT1009	<i>Syngnathus</i>	<i>rostellatus</i>	0	1
FRT1010	<i>Pomatoschistus</i>	<i>minutus</i>	0	1
FRT1011	<i>Merlangius</i>	<i>merlangus</i>	0	0
FRT1012	<i>Callionymus</i>	<i>lyra</i>	0	0
FRT1013	<i>Sprattus</i>	<i>sprattus</i>	0	0
FRT1014	<i>Trisopterus</i>	<i>luscus</i>	0	0
FRT1015	<i>Rutilus</i>	<i>rutilus</i>	1	1
		Total differences	6	8
		Average differences /lab.	0.4	0.6

Synonyms and spelling errors are not included.

Table 2. Differences of identifications made by participating laboratories for the tenth fish ring test: FRT_10, sorted by specimens. Names are given only where different from the AQC identification.

Taxon	F_RT1001	F_RT1002	F_RT1003	F_RT1004	F_RT0805	F_RT1006
	<i>Scomber scombrus</i>	<i>Sardina pilchardus</i>	<i>Dicentrarchus labrax</i>	<i>Mullus surmuletus</i>	<i>Trachurus</i> <i>trachurus/mediterraneus</i>	<i>Osmerus</i> <i>eperlanus</i>
LB2301	--	--	--	--	--	<i>Atherina presbyter</i>
LB2302	--	--	--	--	--	--
LB2305	--	--	--	--	--	--
LB2306	--	--	--	--	--	--
LB2309	--	--	--	--	--	--
LB2318	--	--	--	--	--	--
LB2319	<i>Non-participant</i>	<i>Non-participant</i>	<i>Non-participant</i>	<i>Non-participant</i>	<i>Non-participant</i>	<i>Non-participant</i>
LB2320	--	--	--	--	[<i>Trachurus</i> <i>mediterraneus</i>]	--
LB2321	--	--	--	--	--	--
LB2322	--	<i>Alosa fallax</i>	--	--	--	--
LB2323	--	--	--	--	--	--
LB2324	--	--	--	--	[<i>Trachurus</i> <i>mediterraneus</i>]	--
LB2325	--	--	--	--	--	--
LB2326	--	--	--	--	--	--
LB2327	--	<i>Alosa fallax</i>	--	--	--	--

Table 2. Differences of identifications made by participating laboratories for the tenth fish ring test: FRT_10, sorted by specimens. Names are given only where different from the AQC identification.

	F_RT1007	F_RT1008	F_RT1009	F_RT1010	F_RT1011	F_RT1012
<i>Taxon</i>	<i>Platichthys flesus</i>	<i>Clupea harengus</i>	<i>Syngnathus rostellatus</i>	<i>Pomatoschistus minutus</i>	<i>Merlangius merlangus</i>	<i>Callionymus lyra</i>
LB2301	--	--	--	--	--	--
LB2302	--	<i>Sprattus sprattus</i>	--	--	--	--
LB2305	--	--	--	--	--	--
LB2306	--	--	--	--	--	--
LB2309	--	--	--	--	--	--
LB2318	--	--	--	<i>Pomatoschistus microps</i>	--	--
LB2319	<i>Non-participant</i>	<i>Non-participant</i>	<i>Non-participant</i>	<i>Non-participant</i>	<i>Non-participant</i>	<i>Non-participant</i>
LB2320	--	--	--	--	--	--
LB2321	--	--	--	--	--	--
LB2322	<i>Lepidorhombus whiffiagonis</i>	--	<i>Syngnathus acus</i>	--	--	--
LB2323	--	--	--	--	--	--
LB2324	--	--	--	--	--	--
LB2325	--	--	--	--	--	--
LB2326	--	--	--	--	--	--
LB2327	--	--	--	--	--	--

Table 2. Differences of identifications made by participating laboratories for the tenth fish ring test: FRT_10, sorted by specimens. Names are given only where different from the AQC identification.

<i>Taxon</i>	F_RT1013	F_RT1014	F_RT1015
	<i>Sprattus sprattus</i>	<i>Trisopterus luscus</i>	<i>Rutilus rutilus</i>
LB2301	--	--	--
LB2302	--	--	--
LB2305	--	--	--
LB2306	--	--	--
LB2309	--	--	--
LB2318	--	--	--
LB2319	<i>Non-participant</i>	<i>Non-participant</i>	<i>Non-participant</i>
LB2320	--	--	--
LB2321	--	--	--
LB2322	--	--	--
LB2323	--	--	--
LB2324	--	--	--
LB2325	--	--	<i>Blicca bjoerkna</i>
LB2326	--	--	--
LB2327	--	--	--

Figure 1. The number of taxonomic differences from the AQC identification of specimens distributed in F_RT10 for each of the participating laboratories. Arranged in order of increasing number of differences (for further details see Table 3).

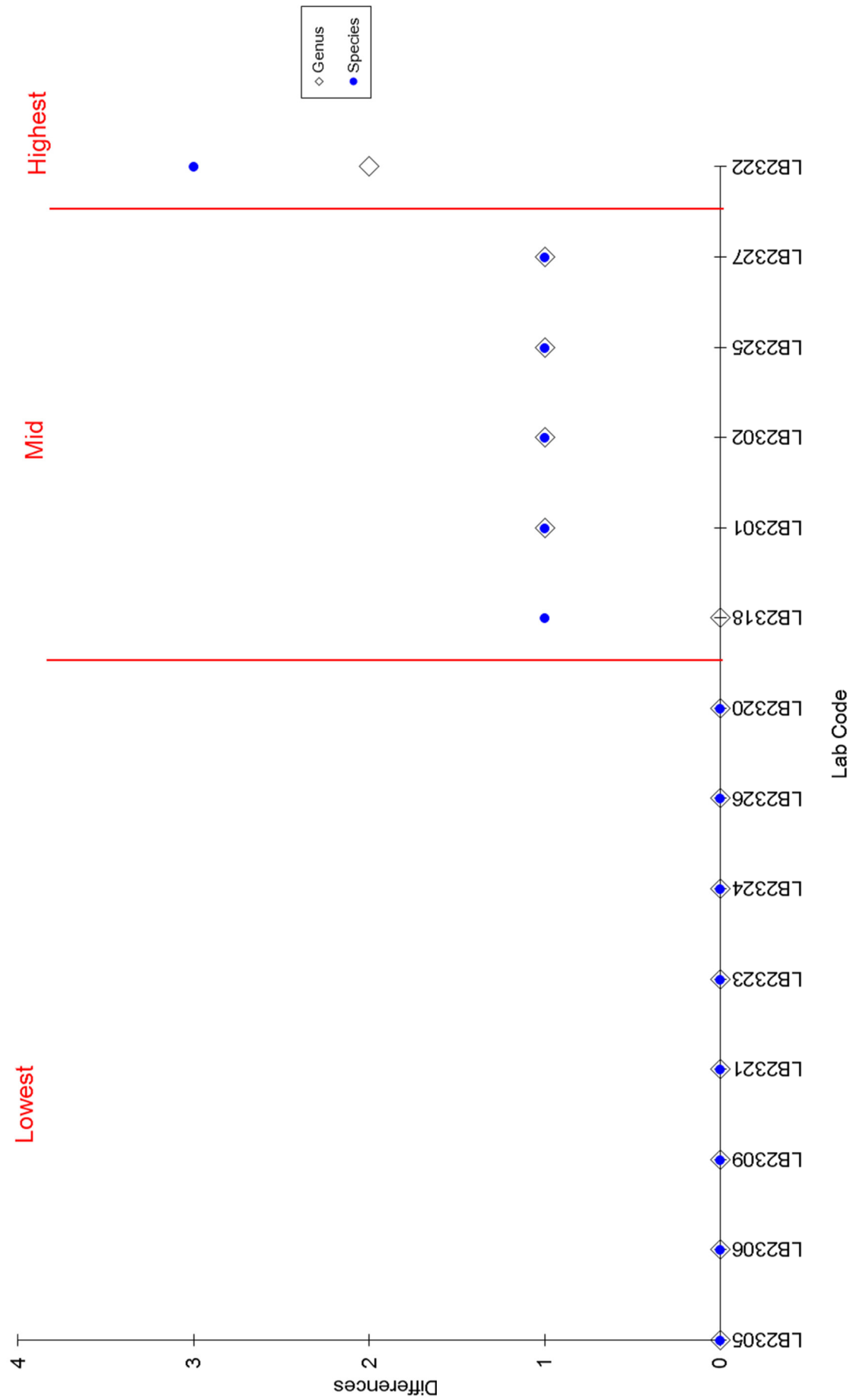


Table 3. Differences of identifications made by participating laboratories for the tenth fish ring test: FRT_10, sorted by participating laboratories. Names are only given where different from AQC identification.

	Taxon	LB2301	LB2302	LB2305	LB2306	LB2309
F_RT1001	<i>Scomber scombrus</i>	--	--	--	--	--
F_RT1002	<i>Sardina pilchardus</i>	--	--	--	--	--
F_RT1003	<i>Dicentrarchus labrax</i>	--	--	--	--	--
F_RT1004	<i>Mullus surmuletus</i>	--	--	--	--	--
F_RT1005	<i>Trachurus trachurus/mediterraneus</i>	--	--	--	--	--
F_RT1006	<i>Osmerus epeiranius</i>	<i>Atherina presbyter</i>	--	--	--	--
F_RT1007	<i>Platichthys flesus</i>	--	--	--	--	--
F_RT1008	<i>Clupea harengus</i>	--	<i>Sprattus sprattus</i>	--	--	--
F_RT1009	<i>Syngnathus rostellatus</i>	--	--	--	--	--
F_RT1010	<i>Pomatoschistus minutus</i>	--	--	--	--	--
F_RT1011	<i>Merlangius merlangus</i>	--	--	--	--	--
F_RT1012	<i>Callionymus lyra</i>	--	--	--	--	--
F_RT1013	<i>Sprattus sprattus</i>	--	--	--	--	--
F_RT1014	<i>Trisopterus luscus</i>	--	--	--	--	--
F_RT1015	<i>Rutilus rutilus</i>	--	--	--	--	--

	Taxon	LB2318	LB2319	LB2320	LB2321	LB2322
F_RT1001	<i>Scomber scombrus</i>	--	<i>Non-participant</i>	--	--	--
F_RT1002	<i>Sardina pilchardus</i>	--	<i>Non-participant</i>	--	--	<i>Alosa fallax</i>
F_RT1003	<i>Dicentrarchus labrax</i>	--	<i>Non-participant</i>	--	--	--
F_RT1004	<i>Mullus surmuletus</i>	--	<i>Non-participant</i>	--	--	--
F_RT1005	<i>Trachurus trachurus/mediterraneus</i>	--	<i>Non-participant</i>	- [<i>mediterraneus</i>]	--	- [<i>itracurus</i>]
F_RT1006	<i>Osmerus epeiranius</i>	--	<i>Non-participant</i>	--	--	--
F_RT1007	<i>Platichthys flesus</i>	--	<i>Non-participant</i>	--	--	<i>Lepidorhombus whiffiagonis</i>
F_RT1008	<i>Clupea harengus</i>	--	<i>Non-participant</i>	--	--	--
F_RT1009	<i>Syngnathus rostellatus</i>	--	<i>Non-participant</i>	--	--	- <i>acus</i>
F_RT1010	<i>Pomatoschistus minutus</i>	- <i>microps</i>	<i>Non-participant</i>	--	--	--
F_RT1011	<i>Merlangius merlangus</i>	--	<i>Non-participant</i>	--	--	--
F_RT1012	<i>Callionymus lyra</i>	--	<i>Non-participant</i>	--	--	--
F_RT1013	<i>Sprattus sprattus</i>	--	<i>Non-participant</i>	--	--	--
F_RT1014	<i>Trisopterus luscus</i>	--	<i>Non-participant</i>	--	--	--
F_RT1015	<i>Rutilus rutilus</i>	--	<i>Non-participant</i>	--	--	--

Table 3. Differences of identifications made by participating laboratories for the tenth fish ring test: FRT_10, sorted by participating laboratories. Names are only given where different from AQC identification.

	Taxon	LB2323	LB2324	LB2325	LB2326
F_RT1001	<i>Scomber scombrus</i>	--	--	--	--
F_RT1002	<i>Sardina pilchardus</i>	--	--	--	--
F_RT1003	<i>Dicentrarchus labrax</i>	--	--	--	--
F_RT1004	<i>Mullus surmuletus</i>	--	--	--	--
F_RT1005	<i>Trachurus trachurus/mediterraneus</i>	--	- [mediterraneus]	--	--
F_RT1006	<i>Osmerus eperlanus</i>	--	--	--	--
F_RT1007	<i>Platichthys flesus</i>	--	--	--	--
F_RT1008	<i>Clupea harengus</i>	--	--	--	--
F_RT1009	<i>Syngnathus rostellatus</i>	--	--	--	--
F_RT1010	<i>Pomatoschistus minutus</i>	--	--	--	--
F_RT1011	<i>Merlangius merlangus</i>	--	--	--	--
F_RT1012	<i>Callionymus lyra</i>	--	--	--	--
F_RT1013	<i>Sprattus sprattus</i>	--	--	--	--
F_RT1014	<i>Trisopterus luscus</i>	--	--	--	--
F_RT1015	<i>Rutilus rutilus</i>	--	--	<i>Blicca bjoerkna</i>	--

	Taxon	LB2327
F_RT1001	<i>Scomber scombrus</i>	--
F_RT1002	<i>Sardina pilchardus</i>	<i>Alosa fallax</i>
F_RT1003	<i>Dicentrarchus labrax</i>	--
F_RT1004	<i>Mullus surmuletus</i>	--
F_RT1005	<i>Trachurus trachurus/mediterraneus</i>	--
F_RT1006	<i>Osmerus eperlanus</i>	--
F_RT1007	<i>Platichthys flesus</i>	--
F_RT1008	<i>Clupea harengus</i>	--
F_RT1009	<i>Syngnathus rostellatus</i>	[<i>Syngnathus</i>] -
F_RT1010	<i>Pomatoschistus minutus</i>	--
F_RT1011	<i>Merlangius merlangus</i>	--
F_RT1012	<i>Callionymus lyra</i>	--
F_RT1013	<i>Sprattus sprattus</i>	--
F_RT1014	<i>Trisopterus luscus</i>	--
F_RT1015	<i>Rutilus rutilus</i>	--

Table 4. Literature used by participants when identifying ring test specimens (F_RT10).

Specimen	F_RT														
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Henderson (2015)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Kay & Dipper (2009)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lythgoe (1991)					*										
Maitland & Herdson (2009)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Miller & Loates (2001)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Wheeler (1969)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Wheeler (1978)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Wheeler (1998)															*
Whitehead <i>et al.</i> (1984 - 1986)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fishbase http://www.fishbase.org/	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
WORMS http://www.marinespecies.org/	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Table 5. Literature used by TUM when identifying ring test specimens (F_RT10).

Specimen	Literature Cited for F_RT10 Identification (errors corrected)
F_RT1001	Maitland and Herdson 2009 (EA fish ID)
F_RT1002	Maitland and Herdson 2009 (EA fish ID)
F_RT1003	Maitland and Herdson 2009 (EA fish ID)
F_RT1004	Maitland and Herdson 2009 (EA fish ID)
F_RT1005	Maitland and Herdson 2009 (EA fish ID), Lythgoe 1991 (Fishes of the Sea)
F_RT1006	Maitland and Herdson 2009 (EA fish ID)
F_RT1007	Maitland and Herdson 2009 (EA fish ID)
F_RT1008	Maitland and Herdson 2009 (EA fish ID)
F_RT1009	Maitland and Herdson 2009 (EA fish ID)
F_RT1010	Maitland and Herdson 2009 (EA fish ID)
F_RT1011	Maitland and Herdson 2009 (EA fish ID)
F_RT1012	Maitland and Herdson 2009 (EA fish ID)
F_RT1013	Maitland and Herdson 2009 (EA fish ID)
F_RT1014	Maitland and Herdson 2009 (EA fish ID)
F_RT1015	Maitland and Herdson 2009 (EA fish ID)

Fish ring tests: General information

Participants were asked to provide common names, as they are required for general reports, however differences in common names are not used for scoring. For details of your LabCode please contact your Scheme representative or Thomson Unicomarine Ltd.

The following coding is used for photographs:

Lateral view of whole specimen L

Dorsal view of whole of specimen D

Ventral view of whole specimen V

Lateral view of head H

The habitats are defined as follows:

Pelagic: Occurs primarily in the water column

Demersal: Occurs on or near to the sea floor

Bentho-pelagic: Occurs both near the sea floor and in the water column

Substrata are defined as follows:

Mixed: Occurs on a variety of sediment types

Sand: Occurs primarily on sandy sediments

Rock: Occurs primarily on rocky grounds

Mud: Occurs primarily on muddy sediments

NA: No substratum is defined for pelagic species

Salinity regimes are defined as follows:

High: Occurs in fully marine habitats

Mixed: Occurs in fully marine and transitional waters

Reduced: Occurs primarily in estuarine and transitional waters

Depth regimes are defined as follows:

Shallow sublittoral: Occurs primarily in coastal waters <20 m deep, including intertidal habitats

Circalittoral: Occurs primarily in shelf seas to depths of 200 m

Deep-water: Occurs primarily in waters depths >200 m

Geographic origin refers to the region where the actual specimens were sourced from.

Ring test specimens: images and identifications (F-RT10)

F_RT1001 – *Scomber scombrus* (Mackerel) (Figure 1)



Figure 1 (F_RT1001) – L

Habitat: Pelagic
Substrate: NA
Salinity: High
Depth: Shallow sublittoral and circalittoral
Geographic source: South East England

No differences recorded.

F_RT1002 *Sardina pilchardus* (Pilchard) (Figure 2a and 2b)



Figure 2a (F_RT1002) – L

Habitat: Pelagic
Substrate: NA
Salinity: High
Depth: Shallow sublittoral and circalittoral
Geographic source: South East England

Two generic differences and two specific differences recorded.



Figure 2b (F_RT1002) – L

Laboratories 2322 and 2327 identified this specimen as *Alosa fallax* which has a notch in the mid-line of the upper jaw, and has a more compressed body than *S. pilchardus*. This compressed body has sharp keels where the scales form distinct teeth. *A. fallax* does possess ridges on the gill covers, however, these are fainter than the more prominent ridges seen in *S. pilchardus*.

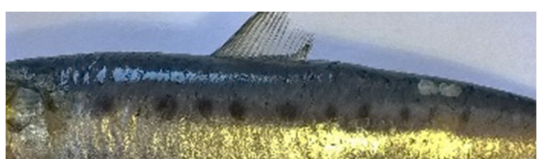


Figure 2c (F_RT1002) – L

Dusky spots are typically pronounced in *S. pilchardus* (Figure 2c), but are not a diagnostic characteristic by themselves, as such spots can be present in *A. fallax*.

S. pilchardus has a pelvic fin origin positioned behind the dorsal fin origin. It lacks a sharply scaled body and the last anal fin rays

are elongate.

S. pilchardus has a dorsal ray count of 17– 18 and an anal fin ray count of 17– 18, whereas *A. fallax* has fin ray counts of 18– 21 and 19– 23.

F_RT1003 –*Dicentrarchus labrax* (Sea Bass) (Figure 3)



Figure 3 (F_RT1003) – L

Habitat: Benthic-pelagic
Substrate: Mixed
Salinity: Mixed
Depth: Circalittoral
Geographic source: South East England

No differences recorded.

F_RT1004 –*Mullus surmuletus* (Striped Red Mullet) (Figure 4)



Figure 4 (F_RT1004) – L

Habitat: Demersal
Substrate: Mixed
Salinity: Full (mixed)
Depth: Shallow sublittoral and circalittoral
Geographic source: South East England

No differences recorded.

F_RT1005 –*Trachurus trachurus* (Horse Mackerel) (Figure 5a and 5b)

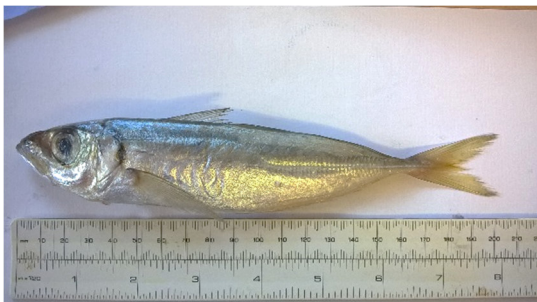


Figure 5a (F_RT1005) – L

Habitat: Pelagic
Substrate: NA
Salinity: Full (mixed)
Depth: Shallow sublittoral and circalittoral
Geographic source: South West England

No differences recorded.

Note: Laboratory 2320 received a specimen 05 which was originally identified by TUM as

Trachurus trachurus and Lab 2320 identified as *Trachurus mediterraneus*. TUM agreed with this identification upon re-examination of the specimen. Each lab was then asked to re-examine their specimen 05. Lab 2324 also identified as *Trachurus mediterraneus*. All other labs identified their specimen 05 as *Trachurus trachurus*. Results for this specimen were not included in analysis due to lack of consistency of specimens provided to labs.

Both species appear quite similar. However, there are a few characteristics you can look at to differentiate the two. *T. trachurus* possesses a scale count along the lateral line of 69-79, while *T. mediterraneus* possesses 78-92. The body shape of *T. mediterraneus* is more flattened laterally than *T. trachurus*. The secondary sensory canal along the dorsal fins ends at the first few rays of the second dorsal fin in *T. mediterraneus*, whereas in *T. trachurus* this line ends towards the rear of the second dorsal fin (Lythgoe, 1991).

F_RT1006 –*Osmerus eperlanus* (Smelt) (Figure 6a and 6b)



Figure 6a (F_RT1006) – L

Habitat: Benthopelagic

Substrate: Mixed

Salinity: Mixed

Depth: Shallow sublittoral

Geographic source: Southern England

One generic difference and one specific difference recorded.



Laboratory 2301 identified as *Atherina presbyter* which has a second dorsal fin with fin rays instead of the rayless adipose fin seen in *O. eperlanus*. The position of the pectoral fins also differs; in *A. presbyter* they are positioned higher on the body

Figure 6b (F_RT1006) – L

more towards the dorsal half of the body rather than ventral half as seen in *O. eperlanus*. The snout profile also differs between the two species; *O. eperlanus* is elongated and the edge of the jaws reaching behind the eye. In *A. presbyter*, the snout is blunt with a small and oblique mouth.

Additional note: *Osmerus eperlanus* have a faint smell of cucumber when freshly caught.

F_RT1007 –*Platichthys flesus* (Flounder) (Figures 7a and 7b)

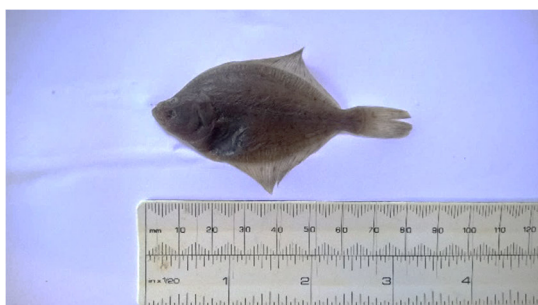


Figure 7a (F_RT1007) – L

Habitat: Demersal
Substrate: Sand
Salinity: Reduced
Depth: Shallow sublittoral and circalittoral
Geographic source: South East England

One generic difference and one specific difference recorded.



Figure 7b (F_RT1007) – L

Laboratory 2322 identified as *Lepidorhombus whiffiagonis* which has a more slender body shape than that of *P. flesus* which appears 'diamond-shaped.' *P. flesus* has a relatively small head and eyes (Figure 7b) compared to that of *L. whiffiagonis* which has a prominent lower jaw and large eyes.

Additionally, *P. flesus* have sharp prickles along the edge of the dorsal and anal fin rays. *L. whiffiagonis* possesses 64-74 anal fin rays, whereas *P. flesus* possesses 35-46.

Additional note: *P. flesus* are typically a right eyed species but are also frequently flipped so the eyes and coloration are present on the left side.

F_RT1008 –*Clupea harengus* (Herring) (Figure 8)

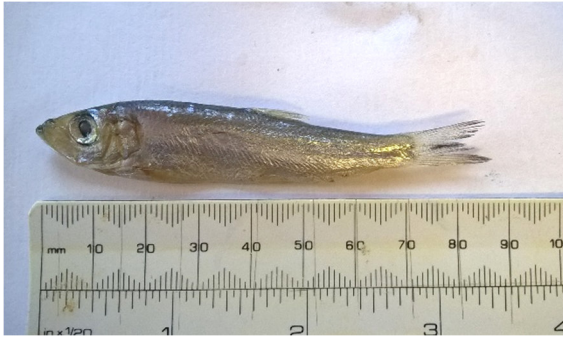


Figure 8 (F_RT1008) – L

Habitat: Pelagic
Substrate: NA
Salinity: High
Depth: Shallow sublittoral and circalittoral
Geographic source: South West England

One generic difference and one specific difference recorded.

Laboratory 2302 identified as *Sprattus sprattus* which has a dorsal fin origin behind the pelvic fin base. *C. harengus* has a dorsal fin origin in front of the pelvic fin origin.

Both species have a belly with a toothed keel although the scale counts differ. *S. sprattus* has 21-23 scales from the throat to pelvic fin origin and 11-12 from pelvic fin base to vent, whereas *C. harengus* has scale counts of 27-30 and 11-12 respectively.

F_RT1009 –*Syngnathus rostellatus* (Lesser Pipefish) (Figure 9a and 9b)



Figure 9a (F_RT1009) – L

Habitat: Demersal
Substrate: Sand
Salinity: Reduced
Depth: Shallow sublittoral
Geographic source: Southern England

One specific difference recorded.

Laboratory 2322 identified as *Syngnathus acus* however, the specimen lacked a conspicuous hump along the nape (Figure 9b).

Additionally, the snout of *S. acus* is long, greater than half the length of the head as opposed to *S. rostellatus* with a snout length less than half the length of the head.



S. rostellatus possesses 13-17 abdominal rings and 37-42 tail rings whereas *S. acus* possesses 17-21 abdominal rings and 39-43 tail rings.

Figure 9b (F_RT1009) – L

F_RT1010 –*Pomatoschistus minutus* (Sand Goby) (Figure 10a and 10b)



Habitat: Demersal
 Substrate: Sand
 Salinity: High
 Depth: Shallow sublittoral
 Geographic source: Northern Europe

One specific difference recorded.

Figure 10a (F_RT1010) – L



Laboratory 2318 identified this specimen as *Pomatoschistus microps* which lack scales on the nape and breast. For *P. minutus*, scales are present in both of these areas.

For *P. minutus*, the anterior membrane on the pelvic disc will have small villi present on the edge, whereas in *P. microps* this membrane lacks villi and instead will have a scalloped edge.

Figure 10b (F_RT1010) – D

P. minutus has a scale count along the lateral line of 58-70 and *P. microps* possess 39-52.

F_RT1011 –*Merlangius merlangus* (Whiting) (Figure 11)



Habitat: Demersal
Substrate: Mixed
Salinity: High
Depth: Circalittoral
Geographic source: Northern Europe

No differences recorded.

Figure 11 (F_RT1011) - L

F_RT1012 –*Callionymus lyra* (Common Dragonet) (Figures 12a and 12b)



Habitat: Demersal
Substrate: Sand
Salinity: High
Depth: Circalittoral
Geographic source: Northern Europe

No differences recorded.

Figure 12a (F_RT1012) - D



Figure 12b (F_RT1012) - L

F_RT1013 –*Sprattus sprattus* (Sprat) (Figure 13)



Habitat: Pelagic
Substrate: NA
Salinity: Mixed
Depth: Shallow sublittoral and circalittoral
Geographic source: Northern Europe

No differences recorded.

Figure 13 (F_RT1013) - L

F_RT1014 – *Trisopterus luscus* (Bib) (Figure 14)



Figure 14 (F_RT1014) – L

Habitat: Pelagic
Substrate: NA
Salinity: High
Depth: Circalittoral
Geographic source: Northern Europe

No differences recorded.

F_RT1015 – *Rutilus rutilus* (Roach) (Figures 15)



Figure 15 (F_RT0915) – L

Habitat: Benthopelagic
Substrate: Mixed
Salinity: Reduced (Mainly freshwater)
Depth: Shallow sublittoral
Geographic source: South West England

One generic difference and one specific difference recorded.

Laboratory 2325 identified as *Blicca bjoerkna* which has a higher dorsal profile than *R. rutilus*.

Additionally, the dorsal fin origin is above the pelvic fin base in *R. rutilus* (Figure 15). *B. bjoerkna* possesses 21-23 branched anal fin rays, whereas *R. rutilus* has 9-11.

The scale count range along the lateral line is quite similar for both species so it is difficult to use as a diagnostic characteristic. *B. bjoerkna* possesses 40-45 scales along the lateral line and *R. rutilus* possesses 42-45.

B. bjoerkna fins are dark except for the pectoral and pelvic fins which are red with grey tips. *R. rutilus* have brownish/grey fins except the pelvic and anal fins are orange/red in colour and pectoral fins have a reddish tint.

References

- Hayward, P. J. & Ryland, J. S. (eds), 1995. *Handbook of the marine fauna of North-West Europe*. Oxford University Press, Oxford.
- Henderson, P. (2015) *Identification Guide to the Inshore Fish of the British Isles*. Pisces Conservation Limited, Pennington.
- Kay, P. and Dipper F. (2009). *A Field Guide to the Marine Fishes of Wales and adjacent waters*. Marine Wildlife, Llanfairfechan.
- Louisy, P. (2015). *Europe and Mediterranean Marine Fish Identification Guide*. Ulmer.
- Lythgoe, J. and Lythgoe, G. (1971). *Fishes of the Sea: The coastal waters of the British Isles, Northern Europe and the Mediterranean*, A photographic guide in colour. Blanford Press, London.
- Lythgoe, J. N. and Lythgoe, G. I. (1991). *Fishes of the sea: the North Atlantic and Mediterranean*. Blanford, London.
- Maitland, P. S. (2004). *Keys to the freshwater fish of Britain and Ireland, with notes on their distribution and ecology*. Freshwater Biological Association (FBA).
- Maitland, P. S. and Herdson, D (2009). *Key to the Marine and Freshwater Fishes of Britain and Ireland*. Environment Agency.
- Miller, P. and Loates, M. (2001). *Collins Pocket Guide – Fish of Britain and Europe*. Collins, Glasgow.
- Quéro, J.C., Porché, P., Vayne, J.J., 2003. *Guide des poissons de l'Atlantique européen*. Paris: Delachaux et Niestlé.
- Wheeler, A., 1969. *The fishes of the British Isles and North West Europe*. Macmillan, London.
- Wheeler, A., 1978. *Key to the fishes of Northern Europe*. Warne, London.
- Wheeler, A., 1998. *Field key to the Freshwater Fishes and Lampreys of the British Isles*. Field Studies Council, Shrewsbury.
- Whitehead, P.L.P., Bauchot, M.L, Hureau, J.-C., Nielsen J. and Tortonese, E. (eds) (1984-1986) *Fishes of the North-eastern Atlantic and the Mediterranean*. Vols. 1-3. Paris: Unesco.
- FishBase - <http://www.fishbase.org/search.php>
- World Register of Marine Species - <http://www.marinespecies.org/aphia.php?p=search>
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Specimens

Laboratories are permitted to keep their specimens for inclusion to their in-house reference collections.
