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Fish Ring Test Bulletin

F-RT08

2014/2015

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RING TEST DETAILS

Fish Ring Test #08

Type/Contents - General

Circulated – 03/02/2014

Completion Date – 06/02/2015

Number of Participating Laboratories - 16

Number of Results Received – 17*

*Multiple data entries per laboratory permitted

Table 1. The summary of differences shown for each specimen.

Specimen	Genus	Species	Taxonomic errors for 17 returns	
			Genus	Species
FRT0801	*Clupea*	*harengus*	1	1
FRT0802	*Dicentrarchus*	*labrax*	0	0
FRT0803	*Callionymus*	*lyra*	0	2
FRT0804	*Trisopterus*	*luscus*	0	4
FRT0805	*Pleuronectes*	*platessa*	6	6
FRT0806	*Agonus*	*cataphractus*	0	0
FRT0807	*Cottus*	*gobio*	6	6
FRT0808	*Lepidorhombus*	*whiffiagonis*	1	2
FRT0809	*Scomberesox*	*saurus*	0	0
FRT0810	*Oncorhynchus*	*mykiss*	3	3
FRT0811	*Coregonus*	*autumnalis*	0	1
FRT0812	*Sprattus*	*sprattus*	3	3
FRT0813	*Clupea*	*harengus*	0	0
FRT0814	*Salmo*	*trutta*	1	1
FRT0815	*Merlangius*	*merlangus*	0	0
		Total differences	21	29
		Average differences /lab.	1.2	1.7

Synonyms and spelling errors are not included.

Table 2. The identification of fauna made by participating laboratories for F_RT08 (arranged by participant). Names are given only where different from AQC identification.

	Taxon	LB2102	LB2103	LB2104	LB2106	LB2107
F_RT0801	*Clupea harengus*	- -	- -	- -	- -	- -
F_RT0802	*Dicentrarchus labrax*	- -	- -	- -	- -	- -
F_RT0803	*Callionymus lyra*	- -	- -	- -	- -	- -
F_RT0804	*Trisopterus luscus*	- -	*- minutus*	- -	- -	- -
F_RT0805	*Pleuronectes platessa*	- -	- -	*Platichthys flesus*	- -	*Platichthys flesus*
F_RT0806	*Agonus cataphractus*	- -	- -	- -	- -	- -
F_RT0807	*Cottus gobio*	- -	- -	*Gobius niger*	- -	- -
F_RT0808	*Lepidorhombus whiffiagonis*	- -	- -	- -	- -	- -
F_RT0809	*Scomberesox saurus*	- -	- -	- -	- -	- -
F_RT0810	*Oncorhynchus mykiss*	- -	*Salmo trutta*	- -	*Salmo salar*	- -
F_RT0811	*Coregonus autumnalis*	- -	- -	- -	- -	- -
F_RT0812	*Sprattus sprattus*	- -	- -	*Sardina pilchardus*	- -	- -
F_RT0813	*Clupea harengus*	- -	- -	- -	- -	- -
F_RT0814	*Salmo trutta*	- -	- -	- -	- -	- -
F_RT0815	*Merlangius merlangus*	- -	- -	- -	- -	- -

	Taxon	LB2108	LB2109	LB2110	LB2111	LB2112
F_RT0801	*Clupea harengus*	- -	- -	- -	*Alosa fallax*	- -
F_RT0802	*Dicentrarchus labrax*	- -	- -	- -	- -	- -
F_RT0803	*Callionymus lyra*	- -	- -	- -	- -	- -
F_RT0804	*Trisopterus luscus*	- -	- -	- -	- -	*- minutus*
F_RT0805	*Pleuronectes platessa*	- -	- -	- -	*Microstomus kitt*	*Microstomus kitt*
F_RT0806	*Agonus cataphractus*	- -	- -	- -	- -	- -
F_RT0807	*Cottus gobio*	- -	*Gobius paganellus*	- -	*Lipophrys pholis*	*Callionymus lyra*
F_RT0808	*Lepidorhombus whiffiagonis*	- -	- -	- -	- -	- -
F_RT0809	*Scomberesox saurus*	- -	- -	- -	- -	- -
F_RT0810	*Oncorhynchus mykiss*	- -	- -	- -	- -	- -
F_RT0811	*Coregonus autumnalis*	- -	- -	- -	- -	- -
F_RT0812	*Sprattus sprattus*	*Sardina pilchardus*	- -	- -	- -	- -
F_RT0813	*Clupea harengus*	- -	- -	- -	- -	*Sardina pilchardus*
F_RT0814	*Salmo trutta*	- -	- -	- -	- -	- -
F_RT0815	*Merlangius merlangus*	- -	- -	- -	- -	- -

Names in [ ] are not counted as an error. [ ] indicate a synonym or a spelling error.
* indicates a spelling error in addition to a taxonomic error.

Table 2. The identification of fauna made by participating laboratories for F_RT08 (arranged by participant). Names are given only where different from AQC identification.

	Taxon	LB2114	LB2116A	LB2116B	LB2117
F_RT0801	*Clupea harengus*	- -	- -	- -	- -
F_RT0802	*Dicentrarchus labrax*	- -	- -	- -	- -
F_RT0803	*Callionymus lyra*	*- reticulatus*	*- maculatus*	- -	- -
F_RT0804	*Trisopterus luscus*	*- minutus*	- -	- -	- -
F_RT0805	*Pleuronectes platessa*	*Platichthys flesus*	*Platichthys flesus*	- -	- -
F_RT0806	*Agonus cataphractus*	- -	- -	- -	- -
F_RT0807	*Cottus gobio*	*Gobius paganellus*	- -	- -	*Myoxocephalus scorpius*
F_RT0808	*Lepidorhombus whiffiagonis*	*Limanda limanda*	- -	- -	- -
F_RT0809	*Scomberesox saurus*	- -	- -	- -	- -
F_RT0810	*Oncorhynchus mykiss*	- -	- -	- -	- -
F_RT0811	*Coregonus autumnalis*	*- albula*	- -	- -	- -
F_RT0812	*Sprattus sprattus*	- -	- -	- -	- -
F_RT0813	*Clupea harengus*	- -	- -	- -	- -
F_RT0814	*Salmo trutta*	- -	- -	- -	- -
F_RT0815	*Merlangius merlangus*	- -	- -	- -	- -

	Taxon	LB2125	LB2126	LB2127
F_RT0801	*Clupea harengus*	- -	- -	- -
F_RT0802	*Dicentrarchus labrax*	- -	- -	- -
F_RT0803	*Callionymus lyra*	- -	- -	- -
F_RT0804	*Trisopterus luscus*	- -	*- minutus*	- -
F_RT0805	*Pleuronectes platessa*	- -	- -	- -
F_RT0806	*Agonus cataphractus*	- -	- -	- -
F_RT0807	*Cottus gobio*	- -	- -	- -
F_RT0808	*Lepidorhombus whiffiagonis*	- -	- -	*Lepidorhombus boscii*
F_RT0809	*Scomberesox saurus*	- -	- -	- -
F_RT0810	*Oncorhynchus mykiss*	*Salmo trutta*	- -	- -
F_RT0811	*Coregonus autumnalis*	- -	- -	- -
F_RT0812	*Sprattus sprattus*	- -	- -	- -
F_RT0813	*Clupea harengus*	- -	- -	- -
F_RT0814	*Salmo trutta*	*Oncorhynchus mykiss*	- -	- -
F_RT0815	*Merlangius merlangus*	- -	- -	- -

Names in [ ] are not counted as an error. [ ] indicate a synonym or a spelling error.
* indicates a spelling error in addition to a taxonomic error.

Table 3. The identification of fish made by participating laboratories for F_RT08 (arranged by specimen). Names are given only where different from the AQC identification.

	F_RT0801	F_RT0802	F_RT0803	F_RT0804
Taxon	*Clupea harengus*	*Dicentrarchus labrax*	*Callionymus lyra*	*Trisopterus luscus*
LB2102	- -	- -	- -	- -
LB2103	- -	- -	- -	*- minutus*
LB2104	- -	- -	- -	- -
LB2106	- -	- -	- -	- -
LB2107	- -	- -	- -	- -
LB2108	- -	- -	- -	- -
LB2109	- -	- -	- -	- -
LB2110	- -	- -	- -	- -
LB2111	*Alosa fallax*	- -	- -	- -
LB2112	- -	- -	- -	*- minutus*
LB2114	- -	- -	*- reticulatus*	*- minutus*
LB2116A	- -	- -	*- maculatus*	- -
LB2116B	- -	- -	- -	- -
LB2117	- -	- -	- -	- -
LB2125	- -	- -	- -	- -
LB2126	- -	- -	- -	*- minutus*
LB2127	- -	- -	- -	- -

Table 3. The identification of fish made by participating laboratories for F_RT08 (arranged by specimen). Names are given only where different from the AQC identification.

	F_RT0805	F_RT0806	F_RT0807	F_RT0808	F_RT0809
Taxon	*Pleuronectes platessa*	*Agonus cataphractus*	*Cottus gobio*	*Lepidorhombus whiffiagonis*	*Scomberesox saurus*
LB2102	- -	- -	- -	- -	- -
LB2103	- -	- -	- -	- -	- -
LB2104	*Platichthys flesus*	- -	*Gobius niger*	- -	- -
LB2106	- -	- -	- -	- -	- -
LB2107	*Platichthys flesus*	- -	- -	- -	- -
LB2108	- -	- -	- -	- -	- -
LB2109	- -	- -	*Gobius paganellus*	- -	- -
LB2110	- -	- -	- -	- -	- -
LB2111	*Microstomus kitt*	- -	*Lipophrys pholis*	- -	- -
LB2112	*Microstomus kitt*	- -	*Callionymus lyra*	- -	- -
LB2114	*Platichthys flesus*	- -	*Gobius paganellus*	*Limanda limanda*	- -
LB2116A	*Platichthys flesus*	- -	- -	- -	- -
LB2116B	- -	- -	- -	- -	- -
LB2117	- -	- -	*Myoxocephalus scorpius*	- -	- -
LB2125	- -	- -	- -	- -	- -
LB2126	- -	- -	- -	- -	- -
LB2127	- -	- -	- -	*- boscii*	- -

Table 3. The identification of fish made by participating laboratories for F_RT08 (arranged by specimen). Names are given only where different from the AQC identification.

	F_RT0810	F_RT0811	F_RT0812	F_RT0813	F_RT0814	F_RT0815
Taxon	*Oncorhynchus mykiss*	*Coregonus autumnalis*	*Sprattus sprattus*	*Clupea harengus*	*Salmo trutta*	*Merlangius merlangus*
LB2102	- -	- -	- -	- -	- -	- -
LB2103	*Salmo trutta*	- -	- -	- -	- -	- -
LB2104	- -	- -	*Sardina pilchardus*	- -	- -	- -
LB2106	*Salmo salar*	- -	- -	- -	- -	- -
LB2107	- -	- -	- -	*- [herengus]*	- -	- -
LB2108	- -	- -	*Sardina pilchardus*	- -	- -	- -
LB2109	- -	- -	- -	- -	- -	- -
LB2110	- -	- -	- -	- -	- -	- -
LB2111	- -	- -	- -	- -	- -	- -
LB2112	- -	- -	- -	*Sardina pilchardus*	- -	- -
LB2114	- -	*- albula*	- -	- -	- -	- -
LB2116A	- -	- -	- -	- -	- -	- -
LB2116B	- -	- -	- -	- -	- -	- -
LB2117	- -	- -	- -	- -	- -	- -
LB2125	*Salmo trutta*	- -	- -	- -	*Oncorhynchus mykiss*	- -
LB2126	- -	- -	- -	- -	- -	- -
LB2127	- -	- -	- -	- -	- -	- -

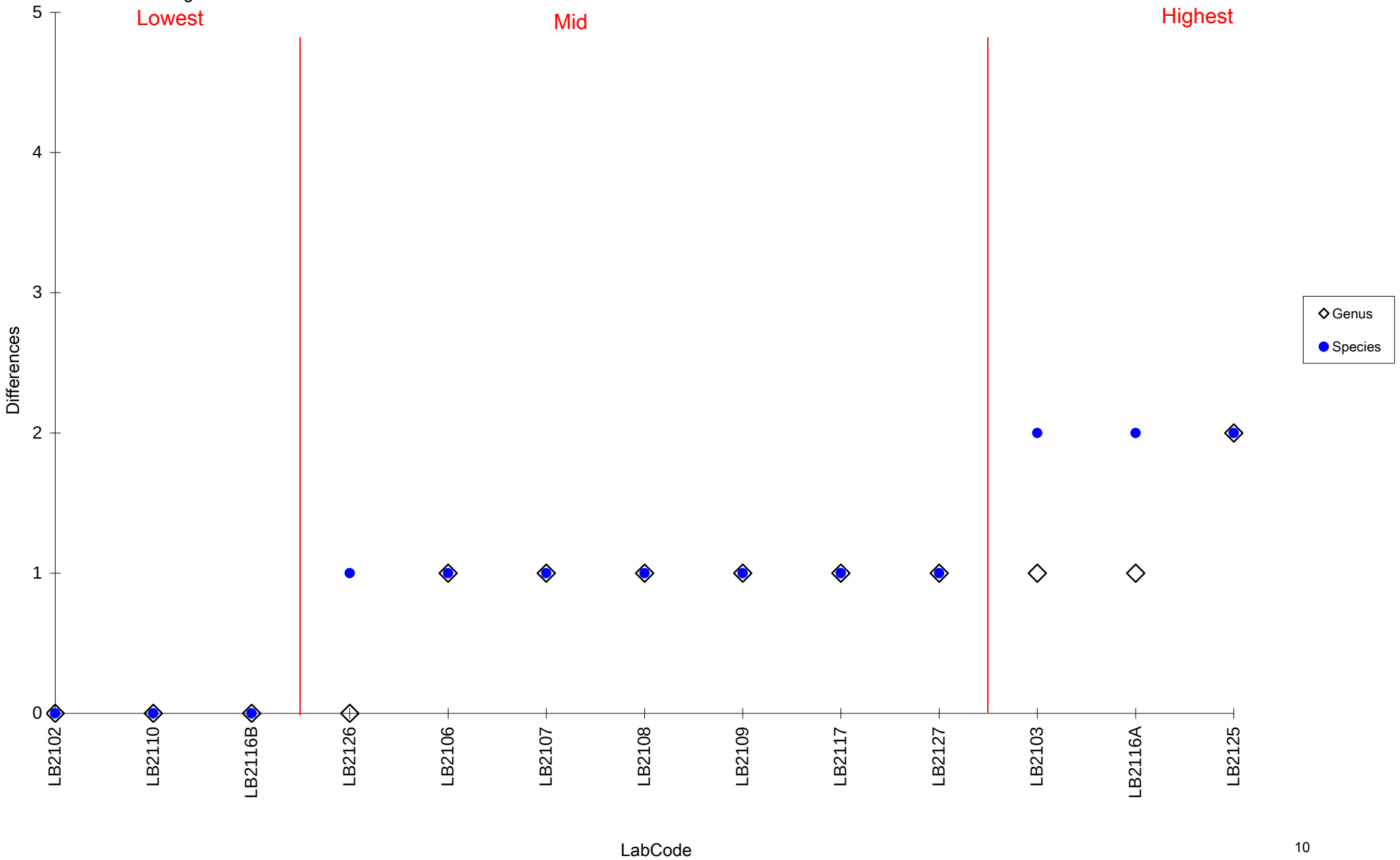
Table 4. Literature used by participants for F_RT08 specimens.

Specimen	Literature Cited for F_RT08 Identification
F_RT0801	Wheeler 1969, Wheeler 1978, Maitland 2004, Maitland and Herdson 2009
F_RT0802	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0803	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0804	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0805	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0806	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0807	Online www.Fishbase.org; Lythgoe and Lythgoe1971
F_RT0808	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0809	Wheeler 1969, Wheeler 1978, Maitland 2004, Maitland and Herdson 2009
F_RT0810	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0811	Wheeler 1969, Maitland and Herdson 2009
F_RT0812	Wheeler 1969, Maitland and Herdson 2009
F_RT0813	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0814	Wheeler 1969, Maitland 2004, Maitland and Herdson 2009
F_RT0815	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009

Table 5. Literature used by TUM for F_RT08 specimens

Specimen	Literature Cited for F_RT07 Identification (errors corrected)
F_RT0801	Wheeler 1978
F_RT0802	Maitland and Herdson 2009 (EA fish ID)
F_RT0803	Maitland and Herdson 2009 (EA fish ID), Wheeler 1978,
F_RT0804	Wheeler 1978
F_RT0805	Wheeler 1978
F_RT0806	Wheeler 1978
F_RT0807	Online www.Fishbase.org; Lythgoe and Lythgoe1971; Maitland and Herdson 2009
F_RT0808	Wheeler 1978
F_RT0809	Maitland and Herdson 2009 (EA fish ID)
F_RT0810	Maitland and Herdson 2009 (EA fish ID)
F_RT0811	Maitland and Herdson 2009 (EA fish ID)
F_RT0812	Wheeler 1978
F_RT0813	Wheeler 1978
F_RT0814	Maitland and Herdson 2009 (EA fish ID)
F_RT0815	Wheeler 1978

Figure 1. The number of taxonomic differences from the AQC identification of specimens distributed in F_RT08 for each of the participating laboratories. Arranged in order of increasing number of differences.



Differences exclude Synonyms and spelling errors.

Specimen Images and Detailed Breakdown of Identifications

The common names provided include those stated in FishBase (http://www.fishbase.org/search.php) first, followed by other commonly used names, where appropriate. An additional terminal character has been added within each LabCode (small case sequential letters) to denote multiple data entries from each laboratory, *i.e.* two participants from laboratory 2101 would be coded as Lab 2101a and Lab 2101b. For details of your LabCode please contact your Scheme representative or Thomson Unicomarine Ltd.

(Figure view codes: A=anterior; P=posterior; L=lateral; D=dorsal; V=ventral)

F_RT0801 – *Clupea harengus* (Herring) (Figure 1a, 1b and 1c)

Figure 1a (F_RT0801) – *L*

Substratum: Sand. Salinity: High.
Depth: Benthopelagic / Oceanodromous.
Geography: S.W. England

Figure 1b (F_RT0801) – *D*

One generic difference and one specific difference recorded.

Laboratory 2111 identified as *Alosa fallax* which has a notch in the midline of the jaw and radiating ridges on the gill covers. Anal fin ray count is 18 – 23 whereas for *Clupea harengus* it is 16 – 18.

Figure 1b shows the jaw of *C. harengus* which has no notch in the midline.

Figure 1c shows the gill cover without radiating ridges.

Figure 1c (F_RT0801) – *L*

F_RT0802 – *Dicentrarchus labrax* (Bass) (Figure 2)

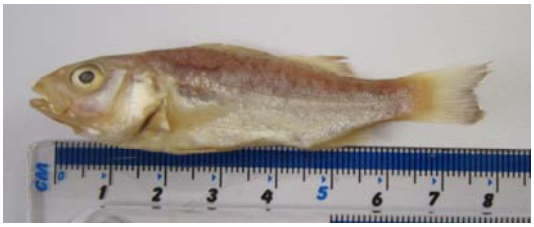


Figure 2 (F_RT0801) – *L*

Substratum: Mixed. Salinity: High.
Depth: Dermersal / Oceanodromous.
Geography: Brixham.

No differences recorded.

F_RT0803 – *Callionymus lyra* (Common Dragonet) (Figure 3a and 3b)

Figure 3a (F_RT0803) - L

Substratum: Sand. Salinity: Full.
Depth: Demersal. Geography: East Anglia.

Two specific differences recorded.

Figure 3b (F_RT0803) - L

Laboratory 2114 identified this specimen as *Callionymus reticulatus* which has only 3 spines on the preoperculum which point up and backwards and no spine at the base. The first dorsal fin is short with 3 rays. In adult males, the last ray of the dorsal fin is branched and elongate. Dorsal fin has a black and white spot. Juveniles and females have an entirely black dorsal first dorsal fin.

Laboratory 2116a identified as *Callionymus maculatus* which has dorsal fins with two rows of alternating dark and light spots. Males have a high dorsal fin. *Callionymus lyra* males have a very elongate first ray in the first dorsal fin. Juvenile and females have uniform fin colour.

Another feature that can assist identification amongst the dragonets are the ray counts. *C. reticulatus* has 10 rays in the second dorsal fin, whereas *C. maculatus* has 9 (rarely 10) rays and *C. lyra* has 8 – 10 rays.

Figure 3b shows the four spines of the preoperculum of *Callionymus lyra*.

F_RT0804 – *Trisopterus luscus* (Bib/ Pouting) (Figure 4a, 4b and 4c)

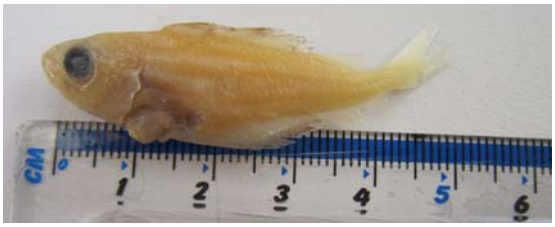


Figure 4a (F_RT0804) - L

Substratum: Mixed. Salinity: High.
Depth: Benthopelagic / Oceanodromous.
Geography: Scotland.

Four specific differences recorded.

Figure 4b (F_RT0804) - L

Laboratories 2103, 2112, 2114 and 2126 all identified as *Trisopterus minutus* which has its anal fin origin positioned beneath the space between the first and second dorsal fins or anterior to it and upper jaw that overlaps the lower jaw.

Gill raker number can be a determining factor between the two species; *T. luscus* has 14 – 22 gill rakers on the first gill arch, whereas *T. minutus* has 25 – 32.

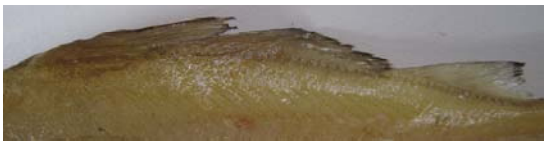


Figure 4c (F_RT0804) - L

Figure 4b shows the anal fin origin positioned under the middle of the first dorsal fin for *T. minutus*. Figure 4c shows how close each of the three dorsal fins are at their bases.

F_RT0805 – *Pleuronectes platessa* (Plaice) (Figure 5)

Figure 5a (F_RT0805) – L

Substratum: Mixed. Salinity: Reduced.
Depth: Demersal / Oceanodromous.
Geography: S.E. England

Six generic and six specific differences recorded.

Four laboratories identified as *Platichthys flesus* which has prickles along the length of the dorsal and anal fins and the lateral line.

Laboratories 2111 and 2112 identified as *Microstomus kitt* which has a broader body, smaller head (1/5 of its body length) and thicker

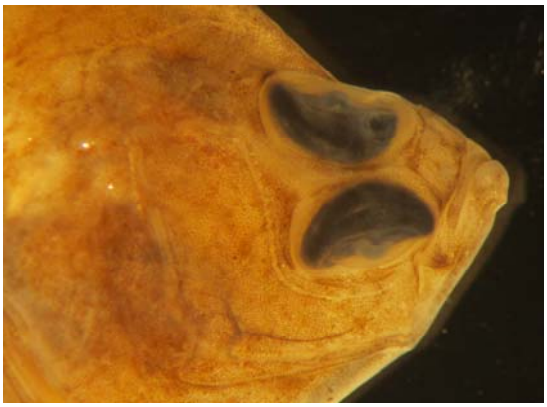


Figure 5b (F_RT0805) – L

lips. Anal fin count is 69 – 76, whereas in *P. platessa* it is 48 – 59.

Figure 5b shows the rather thin lips of *Pleuronectes platessa*.

F_RT0806 – *Agonus cataphractus* (Pogge/ Hooknose) (Figure 6)

Figure 6 (F_RT0806) – L

Substratum: Sand / Mud. Salinity: Full.
Depth: Demersal. Geography: N.E. England

No differences recorded.

F_RT0807 – *Cottus gobio* (Bullhead) (Figure 7a and 7b)

Figure 7a (F_RT0807) – L

Substratum: Gravel. Salinity: Low.
Depth: Demersal. Geography: Scotland

Six generic differences and six specific differences recorded.

Figure 7b (F_RT0807) - D

Laboratory 2104 identified as *Gobius niger* which has scales and no spine on the preoperculum. It has free rays in the upper pectoral fin and an anterior nostril with a flap on the rim. Figure 7b shows the nostril structure in *Cottus gobio*.

Laboratories 2109 and 2114 identified as *Gobius paganellus* which has scales and no spine on the preoperculum. It has free rays in the upper pectoral fin and an anterior nostril with 5 or 6 finger like branches.

Figure 7c (F_RT0807) - V

Laboratory 2111 identified as *Lipophrys pholis* which has scales, a rounder body and no spine on preoperculum. Dorsal fin is uniform in height or notched.

Laboratory 2112 identified as *Callionymus lyra* which has a triangular head, long tail fin and 4 spines on the preoperculum.

Laboratory 2117 identified as *Myoxocephalus scorpius* which has a rounder head, 2 short spines on the preoperculum, a membrane from the gill cover that forms a flap under the throat and spines either side of the lateral line. Figure 7c shows the lack of flap under the throat in *Cottus gobio*.

Laboratory 2126 received a *Cottus perifretum* specimen rather than one that was *C. gobio*. Prickle distribution across the body determines these species apart, with prickles covering most of the body in *C. perifretum* (although males have reduced prickling). Laboratory 2126 was not marked down as they identified *C. perifretum* correctly.

F_RT0808 – *Lepidorhombus whiffiagonis* (Megrim) (Figure 8)

Figure 8a (F_RT0808) – L

Substratum: Soft. Salinity: Full.
Depth: Bathydemersal. Geography: Cornwall.

One generic difference and two specific differences.

Laboratory 2114 identified as *Limanda limanda* which is right eyed, *L. whiffiagonis* is left eyed with a strong curve above the pectoral fin. It also has a large head with a prominent lower jaw.

Laboratory 2127 identified as *Lepidorhombus boscii* which has two rounded dark blotches

positioned at the end of the dorsal and anal fins. Eyes are level with one another, whereas *L. whiffiagonis* has the lower eye positioned in front of the upper. Dorsal fin rays are 75 – 86 and anal rays 65 – 95 for *L. boscii*, and 85 – 94 and 64 – 74 for *L. whiffiagonis*.

F_RT0809 – *Scomberesox saurus* (Skipper) (Figure 9)

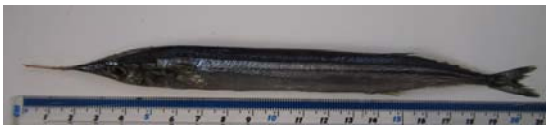


Figure 9 (F_RT0809) - L

Substratum: Mixed. Salinity: High.
Depth: Pelagic-oceanic / Oceanodromous.
Geography: E. England

No differences recorded.

F_RT0810 – *Oncorhynchus mykiss* (Rainbow Trout) (Figure 10a and 10b)

Figure 10a (F_RT0810) – L

Substratum: Mixed. Salinity: Low.
Depth: Benthopelagic. Geography: Lincolnshire

Three generic and three specific differences recorded.

Figure 10b (F_RT0810) – L

Laboratories 2103 and 2125 identified as *Salmo trutta* which has red spots on the body and lacks the iridescent pink rainbow stripe from the head to caudal base. It has 8 – 10 dorsal fin rays and 8-12 anal fin rays.

Laboratory 2106 identified as *Salmo salar* which lacks the iridescent pink stripe from the head to the caudal base. There are 10 – 12 dorsal fin rays and usually 9 – 11 anal fin rays.

O. mykiss has 10 – 12 dorsal fin rays, 8 – 12 anal fin rays and a body lacking red spots. Figure 10b shows the characteristic pink stripe.

F_RT0811 – *Coregonus autumnalis* (Pollan) (Figure 11a and b)

Figure 11a (F_RT0811) – L

Substratum: Gravel. Salinity: Low.
Depth: Benthopelagic. Geography: Ireland

One specific difference.

Laboratory 2114 identified as *Coregonus albula* which has a superior mouth (mouth is in an upturned position).

Figure 11b (F_RT0811) - L

Figure 11b shows the terminal position of the mouth for *Coregonus autumnalis*.

F_RT0812 – *Sprattus sprattus* (Sprat) (Figure 12)

Figure 12a (F_RT0812) - L

Substratum: Mixed. Salinity: High
Depth: Pelagic-neritic / Oceanodromous.
Geography: S. W. England.

Two generic and two specific differences recorded.

Figure 12b (F_RT0812) - L

Laboratories 2104 and 2108 identified as *Sardina pilchardus* which has ridges on the gill covers. The pelvic fin origin is positioned behind the dorsal fin origin. It lacks a sharply scaled body and the last anal fin rays are elongate.

Figure 12b shows the pelvic fin origin just in front of the dorsal fin origin in *Sprattus sprattus*.

F_RT0813 – *Clupea harengus* (Herring) (Figure 13a and b)

Figure 13a (F_RT0813) - L

Substratum: Sand. Salinity: High.
Depth: Benthopelagic / Oceanodromous.
Geography: S.W. England

One generic and one specific error recorded.

Figure 13b (F_RT0813) - L

Laboratory 2112 identified as *Sardina pilchardus* which has ridges on the gill covers. The underside is faintly ridged unlike the sharply-scaled body of *C. harengus*. The dorsal fin origin is above the deepest part of the body, whereas in *C. harengus* it is positioned behind the deepest part of the body and the last anal fin rays are elongate.

Figure 13b shows the gill cover of *Clupea harengus* in which ridges are absent.

Figure 13c (F_RT0813) - L

Figure 13c shows the origin of the pelvic fin is positioned behind that of the dorsal fin which is also positioned above the deepest part of the body.

F_RT0814 – *Salmo trutta* (Brown Trout) (Figure 14a and 14b)

Figure 14a (F_RT0814) – L

Substratum: Gravel. Salinity: Reduced.
Depth: Benthopelagic. Geography: Scotland

One generic difference and one specific difference.

Laboratory 2125 identified as *Oncorhynchus mkiss* which has an iridescent pink rainbow stripe from the head to the caudal base. The

Figure 14b (F_RT0814) – L

species lacks red spots on the body, but has numerous black spots on the body and fins, especially on the adipose and tail fins. Dorsal fin ray numbers also differ; *O. mykiss* has 8 – 12, whereas *S. trutta* has 8 – 10.

Figure 14b shows the red spots on the body of *Salmo trutta*.

F_RT0815 – *Merlangius merlangus* (Whiting) (Figure 15)

Figure 15 (F_RT0815) - L

Substratum: Mixed. Salinity: High. Depth: Benthopelagic / Oceanodromous.
Geography: East Anglia

No differences were recorded.

References

Freyhof, J., Kottelat, M. & Nolte, A.W. (2005) ***Taxonomic diversity of European Cottus with description of eight new species (Teleostei: Cottidae).*** Ichthyological Exploration of Freshwaters 2005, 16: 107-172.

Hayward, P. J. & Ryland, J. S. (eds), 1995. ***Handbook of the marine fauna of North-West Europe.*** Oxford University Press, Oxford.

Henderson, P. (2014) ***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.

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.

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.

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.

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