The National Marine Biological
Analytical Quality Control Scheme

Fish Ring Test Bulletin - F_RT06
revised

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RING TEST DETAILS

Fish Ring Test #06

Type/Contents - General

Circulated – 04/02/2013

Completion Date – 05/04/2013

Number of Participating Laboratories - 18

Number of Results Received – 21*

*Multiple data entries per laboratory permitted

Summary of Differences

Specimen	Genus	Species	Taxonomic errors for 21 returns	
			Genus	Species
FRT0601	*Lampetra*	*fluviatilis*	2	2
FRT0602	*Sprattus*	*sprattus*	0	0
FRT0603	*Scomber*	*spp.*	0	0
FRT0604	*Ammodytes*	*marinus*	2	15
FRT0605	*Blicca*	*bjoerkna*	4	4
FRT0606	*Limanda*	*limanda*	2	2
FRT0607	*Osmerus*	*eperlanus*	0	0
FRT0608	*Hyperoplus*	*lanceolatus*	0	2
FRT0609	*Ammodytes*	*tobianus*	3	5
FRT0610	*Clupea*	*harengus*	2	2
FRT0611	*Chelidonichthys*	*lucerna*	2	3
FRT0612	*Rutilus*	*rutilus*	0	0
FRT0613	*Sardina*	*pilchardus*	1	1
FRT0614	*Arnoglossus*	*laterna*	4	4
FRT0615	*Dicentrarchus*	*labrax*	0	0
		Total differences	22	40
		Average differences /lab.	1.05	1.90

Synonyms and spelling errors are not included.

Table 1. The identification of fauna made by participating laboratories for F_RT06 (arranged by specimen). Names are given only where different from the AQC identification.

	F_RT0601	F_RT0602	F_RT0603	F_RT0604	F_RT0605
Taxon	*Lampetra fluviatilis*	*Sprattus sprattus*	*Scomber spp.*	*Ammodytes marinus*	*Blicca bjoerkna*
LB1901	- -	- -	- *scombrus*	- *tobianus*	*Rutilus rutilus*
LB1902	- -	- -	- *colias*	- -	- -
LB1903	- -	- -	- *scombrus*	- *tobianus*	*[Abramis]* -
LB1904	- -	- -	- *colias*	- *tobianus*	- -
LB1905	- -	- -	- [*scomber*]	- *tobianus*	- -
LB1906	*Petromyzon marinus*	- -	- *scombrus*	- *tobianus*	- -
LB1907a	- -	- -	- *colias*	- *tobianus*	- -
LB1907b	- -	- -	- *scombrus*	- *tobianus*	- -
LB1907c	- -	- -	- *scombrus*	- *tobianus*	*[Abramis]* -
LB1936a	- -	- *[spratus]*	- *scombrus*	- *tobianus*	*[Abramis]* -
LB1936b	- -	- *[tobianus]*	- *scombrus*	- *tobianus*	*[Abramis]* -
LB1937	- -	[*Spratus spratus*]	- [*scomber*]	*Hyperoplus lanceolatus*	- -
LB1938	*Petromyzon marinus*	- -	- *scombrus*	- -	*[Abramis]* -
LB1939	- -	- -	- *scombrus*	- *tobianus*	*Abramis brama*
LB1940	- -	- -	- *japonicus*	- -	*[Abramis]* -
LB1941	- -	- -	- *scombrus*	- -	- -
LB1942	- -	- -	- *scombrus*	*Gymnammodytes semisquamatus*	- -
LB1943	- -	- -	- *scombrus*	- *tobianus*	*[Abramis]* -
LB1944	- -	- -	- *scombrus*	- *tobianus*	*Scardinius erythrophthalmus*
LB1945	- -	- -	- *japonicus*	- -	*[Abramis]* -
LB1946	- -	- -	- *japonicus*	- -	*Abramis brama*

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.
Those names submitted for F_RT603 are not counted.

Table 1. The identification of fauna made by participating laboratories for F_RT06 (arranged by specimen). Names are given only where different from the AQC identification.

	F_RT0606	F_RT0607	F_RT0608	F_RT0609	F_RT0610
Taxon	*Limanda limanda*	*Osmerus eperlanus*	*Hyperoplus lanceolatus*	*Ammodytes tobianus*	*Clupea harengus*
LB1901	- -	- -	- -	- -	- -
LB1902	- -	- -	- -	- -	- -
LB1903	- -	- -	- -	- -	- -
LB1904	- -	- -	- -	- -	*Sardina pilchardus*
LB1905	- -	- -	- -	*- marinus*	*Sardina pilchardus*
LB1906	- -	- -	- -	- -	- -
LB1907a	- -	- -	- -	*- marinus*	- -
LB1907b	- -	- -	*- immaculatus*	- -	- -
LB1907c	- -	- -	*- immaculatus*	- -	- -
LB1936a	- -	- -	- -	*Hyperoplus immaculatus*	- -
LB1936b	- -	- -	- -	*Hyperoplus lanceolatus*	- -
LB1937	- -	*- [eperlanu]*	- -	- -	- -
LB1938	- -	- -	- -	- -	- -
LB1939	*Pleuronectes platessa*	- -	- -	- -	- -
LB1940	- -	- -	- -	- -	- -
LB1941	- -	- -	- -	- -	- -
LB1942	- -	- -	- -	- -	- -
LB1943	*Hippoglossoides platessoides*	- -	- -	*Hyperoplus immaculatus*	- -
LB1944	- -	- -	- -	- -	- -
LB1945	- -	- -	- -	- -	- -
LB1946	- -	- -	- -	- -	- -

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Table 1. The identification of fauna made by participating laboratories for F_RT06 (arranged by specimen). Names are given only where different from the AQC identification.

	F_RT0611	F_RT0612	F_RT0613	F_RT0614	F_RT0615
Taxon	***Chelidonichthys lucerna***	***Rutilus rutilus***	***Sardina pilchardus***	***Arnoglossus laterna***	***Dicentrarchus labrax***
LB1901	*- cuculus*	- -	- -	*Scophthalmus rhombus*	- -
LB1902	- -	- -	- -	- -	- -
LB1903	*Aspitrigla cuculus*	- -	- -	- -	- -
LB1904	- -	- -	- -	- -	- -
LB1905	*[Trigla]*	- -	- -	- -	- -
LB1906	- -	- -	- -	- -	- -
LB1907a	*[Trigla]*	- -	- -	- -	- -
LB1907b	*[Trigla]*	- -	- -	- -	- -
LB1907c	*- [lucernus]*	- -	- -	- -	- -
LB1936a	*- [lucernus]*	- -	- -	- -	- -
LB1936b	*Aspitrigla cuculus*	- -	- -	- -	- -
LB1937	*- [lucernus]*	- -	- -	*Lepidorhombus whiffiagnus**	- -
LB1938	*- [lucernus]*	- -	*Alora alora*	*Lepidorhombus whittiagonis**	- -
LB1939	- -	- -	- -	*Phrynorhombus norvegicus*	- -
LB1940	*[Trigla]*	- -	- -	- -	- -
LB1941	*[Trigla]*	- -	- -	- -	- -
LB1942	*- [lucernus]*	- -	- -	- -	- -
LB1943	*- [lucernus]*	- -	- -	- -	- -
LB1944	*- [lucernus]*	- -	- -	- -	- -
LB1945	- -	- -	- -	- -	- -
LB1946	*[Trigla]*	- -	- -	- -	- -

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Those names submitted for F_RT603 are not counted.

Table 2. The identification of fauna made by participating laboratories for F_RT06 (arranged by participant). Names are given only where different from AQC identification.

	Taxon	LB1901	LB1902	LB1903	LB1904
F_RT0601	*Lampetra fluviatilis*	- -	- -	- -	- -
F_RT0602	*Sprattus sprattus*	- -	- -	- -	- -
F_RT0603	*Scomber spp.*	*- scombrus*	*- colias*	*- scombrus*	*- colias*
F_RT0604	*Ammodytes marinus*	*- tobianus*	- -	*- tobianus*	*- tobianus*
F_RT0605	*Blicca bjoerkna*	*Rutilus rutilus*	- -	*[Abramis] -*	- -
F_RT0606	*Limanda limanda*	- -	- -	- -	- -
F_RT0607	*Osmerus eperlanus*	- -	- -	- -	- -
F_RT0608	*Hyperoplus lanceolatus*	- -	- -	- -	- -
F_RT0609	*Ammodytes tobianus*	- -	- -	- -	- -
F_RT0610	*Clupea harengus*	- -	- -	- -	*Sardina pilchardus*
F_RT0611	*Chelidonichthys lucerna*	*- cuculus*	- -	*Aspitrigla cuculus*	- -
F_RT0612	*Rutilus rutilus*	- -	- -	- -	- -
F_RT0613	*Sardina pilchardus*	- -	- -	- -	- -
F_RT0614	*Arnoglossus laterna*	*Scophthalmus rhombus*	- -	- -	- -
F_RT0615	*Dicentrarchus labrax*	- -	- -	- -	- -

	Taxon	LB1905	LB1906	LB1907a	LB1907b
F_RT0601	*Lampetra fluviatilis*	- -	*Petromyzon marinus*	- -	- -
F_RT0602	*Sprattus sprattus*	- -	- -	- -	- -
F_RT0603	*Scomber spp.*	*- [scomber]*	*- scombrus*	*- colias*	*- scombrus*
F_RT0604	*Ammodytes marinus*	*- tobianus*	*- tobianus*	*- tobianus*	*- tobianus*
F_RT0605	*Blicca bjoerkna*	- -	- -	- -	- -
F_RT0606	*Limanda limanda*	- -	- -	- -	- -
F_RT0607	*Osmerus eperlanus*	- -	- -	- -	- -
F_RT0608	*Hyperoplus lanceolatus*	- -	- -	- -	*- immaculatus*
F_RT0609	*Ammodytes tobianus*	*- marinus*	- -	*- marinus*	- -
F_RT0610	*Clupea harengus*	*Sardina pilchardus*	- -	- -	- -
F_RT0611	*Chelidonichthys lucerna*	*[Trigla] -*	- -	*[Trigla] -*	*[Trigla] -*
F_RT0612	*Rutilus rutilus*	- -	- -	- -	- -
F_RT0613	*Sardina pilchardus*	- -	- -	- -	- -
F_RT0614	*Arnoglossus laterna*	- -	- -	- -	- -
F_RT0615	*Dicentrarchus labrax*	- -	- -	- -	- -

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Table 2. The identification of fauna made by participating laboratories for F_RT06 (arranged by participant). Names are given only where different from AQC identification.

	Taxon	LB1907c	LB1936a	LB1936b	LB1937
F_RT0601	*Lampetra fluviatilis*	- -	- -	- -	- -
F_RT0602	*Sprattus sprattus*	- -	- [spratus]	- [spratus]	[Spratus spratus]
F_RT0603	*Scomber spp.*	- scombrus	- scombrus	-scombrus	- [scomber]
F_RT0604	*Ammodytes marinus*	- tobianus	- tobianus	- tobianus	Hyperoplus lanceolatus
F_RT0605	*Blicca bjoerkna*	[Abramis] -	[Abramis] -	[Abramis] -	- -
F_RT0606	*Limanda limanda*	- -	- -	- -	- -
F_RT0607	*Osmerus eperlanus*	- -	- -	- -	- [eperlanu]
F_RT0608	*Hyperoplus lanceolatus*	- immaculatus	- -	- -	- -
F_RT0609	*Ammodytes tobianus*	- -	Hyperoplus immaculatus	Hyperoplus lanceolatus	- -
F_RT0610	*Clupea harengus*	- -	- -	- -	- -
F_RT0611	*Chelidonichthys lucerna*	- [lucernus]	- [lucernus]	Aspitrigla cuculus	- [lucernus]
F_RT0612	*Rutilus rutilus*	- -	- -	- -	- -
F_RT0613	*Sardina pilchardus*	- -	- -	- -	- -
F_RT0614	*Arnoglossus laterna*	- -	- -	- -	Lepidorhombus whiffiagnus*
F_RT0615	*Dicentrarchus labrax*	- -	- -	- -	- -

	Taxon	LB1938	LB1939	LB1940	LB1941
F_RT0601	*Lampetra fluviatilis*	Petromyzon marinus	- -	- -	- -
F_RT0602	*Sprattus sprattus*	- -	- -	- -	- -
F_RT0603	*Scomber spp.*	- scombrus	- scombrus	- japonicus	- scombrus
F_RT0604	*Ammodytes marinus*	- -	- tobianus	- -	- -
F_RT0605	*Blicca bjoerkna*	[Abramis] -	Abramis brama	[Abramis] -	- -
F_RT0606	*Limanda limanda*	- -	Pleuronectes platessa	- -	- -
F_RT0607	*Osmerus eperlanus*	- -	- -	- -	- -
F_RT0608	*Hyperoplus lanceolatus*	- -	- -	- -	- -
F_RT0609	*Ammodytes tobianus*	- -	- -	- -	- -
F_RT0610	*Clupea harengus*	- -	- -	- -	- -
F_RT0611	*Chelidonichthys lucerna*	- [lucernus]	- -	[Trigla] -	[Trigla] -
F_RT0612	*Rutilus rutilus*	- -	- -	- -	- -
F_RT0613	*Sardina pilchardus*	Alora alora	- -	- -	- -
F_RT0614	*Arnoglossus laterna*	Lepidorhombus whittiagonis*	Phrynorhombus norvegicus	- -	- -
F_RT0615	*Dicentrarchus labrax*	- -	- -	- -	- -

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* indicates a spelling error in addition to a taxonomic error.
Those names submitted for F_RT603 are not counted.

Table 2. The identification of fauna made by participating laboratories for F_RT06 (arranged by participant). Names are given only where different from AQC identification.

	Taxon	LB1942	LB1943
F_RT0601	*Lampetra fluviatilis*	- -	- -
F_RT0602	*Sprattus sprattus*	- -	- -
F_RT0603	*Scomber spp.*	*- scombrus*	*- scombrus*
F_RT0604	*Ammodytes marinus*	*Gymnammodytes semisquamatus*	*- tobianus*
F_RT0605	*Blicca bjoerkna*	- -	*[Abramis] -*
F_RT0606	*Limanda limanda*	- -	*Hippoglossoides platessoides*
F_RT0607	*Osmerus eperlanus*	- -	- -
F_RT0608	*Hyperoplus lanceolatus*	- -	- -
F_RT0609	*Ammodytes tobianus*	- -	*Hyperoplus immaculatus*
F_RT0610	*Clupea harengus*	- -	- -
F_RT0611	*Chelidonichthys lucerna*	*- [lucernus]*	*- [lucernus]*
F_RT0612	*Rutilus rutilus*	- -	- -
F_RT0613	*Sardina pilchardus*	- -	- -
F_RT0614	*Arnoglossus laterna*	- -	- -
F_RT0615	*Dicentrarchus labrax*	- -	- -

	Taxon	LB1944	LB1945	LB1946
F_RT0601	*Lampetra fluviatilis*	- -	- -	- -
F_RT0602	*Sprattus sprattus*	- -	- -	- -
F_RT0603	*Scomber spp.*	*- scombrus*	*- japonicus*	*- japonicus*
F_RT0604	*Ammodytes marinus*	*- tobianus*	- -	- -
F_RT0605	*Blicca bjoerkna*	*Scardinius erythrophthalmus*	*[Abramis] -*	*Abramis brama*
F_RT0606	*Limanda limanda*	- -	- -	- -
F_RT0607	*Osmerus eperlanus*	- -	- -	- -
F_RT0608	*Hyperoplus lanceolatus*	- -	- -	- -
F_RT0609	*Ammodytes tobianus*	- -	- -	- -
F_RT0610	*Clupea harengus*	- -	- -	- -
F_RT0611	*Chelidonichthys lucerna*	*- [lucernus]*	- -	*[Trigla] -*
F_RT0612	*Rutilus rutilus*	- -	- -	- -
F_RT0613	*Sardina pilchardus*	- -	- -	- -
F_RT0614	*Arnoglossus laterna*	- -	- -	- -
F_RT0615	*Dicentrarchus labrax*	- -	- -	- -

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.

Those names submitted for F_RT603 are not counted.

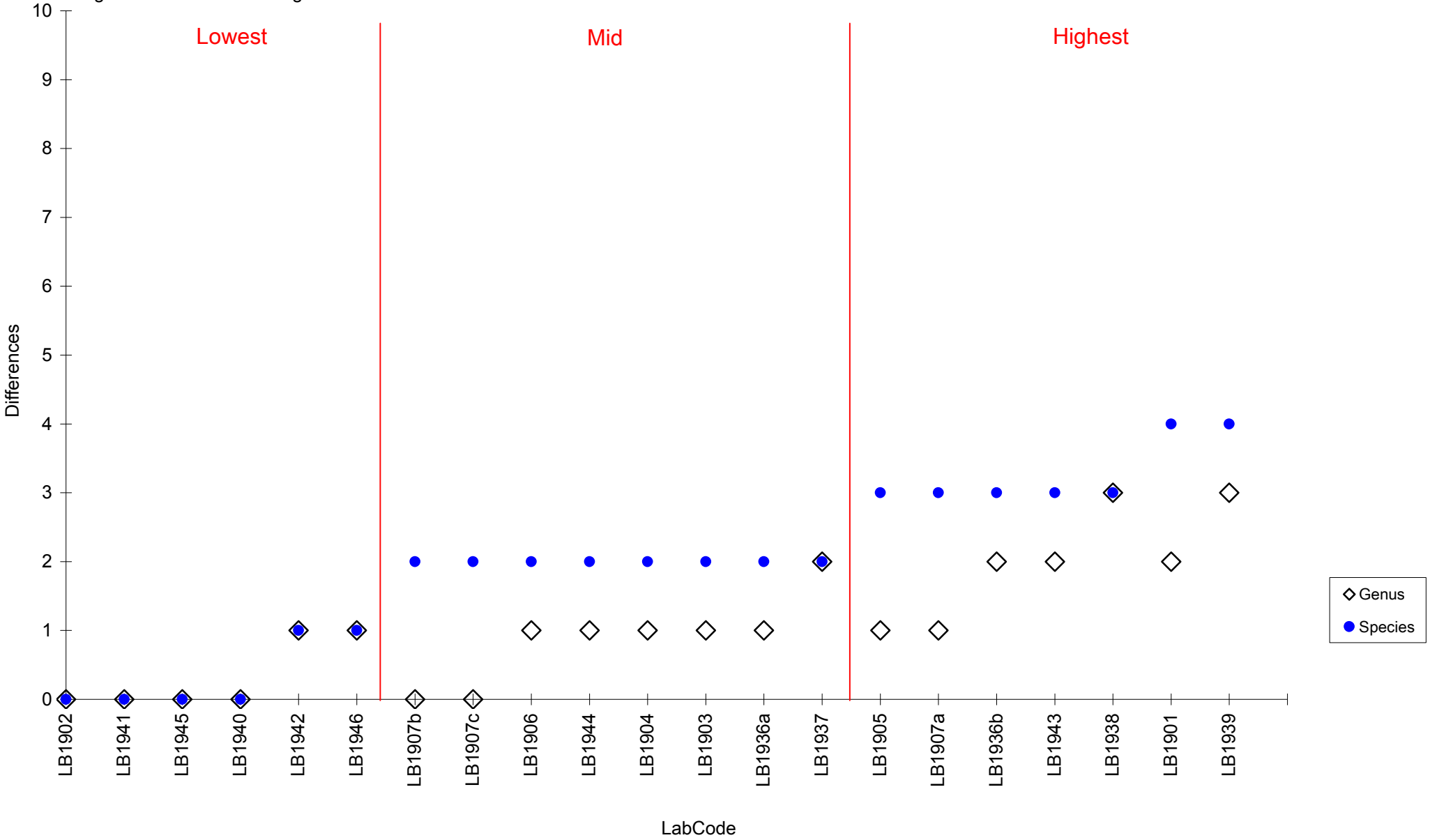
Table 3. Literature cited by participants for F_RT06 specimens.

Specimen	Literature Cited for F_RT06 Identification
F_RT0601	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0602	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0603	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0604	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0605	Wheeler 1969, Maitland 2004, Maitland and Herdson 2009
F_RT0606	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0607	Wheeler 1969, Maitland and Herdson 2009
F_RT0608	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0609	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0610	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0611	Wheeler 1969, Maitland and Herdson 2009
F_RT0612	Wheeler 1969, Maitland 2004, Maitland and Herdson 2009
F_RT0613	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009
F_RT0614	Wheeler 1969, Lythgoe and Lythgoe1971, Maitland and Herdson 2009
F_RT0615	Wheeler 1969, Wheeler 1978, Maitland and Herdson 2009

Table 4. Literature used by TUM per specimen for F_RT06.

Specimen	Literature Cited for F_RT06 Identification (errors corrected)
F_RT0601	Kay and Dipper 2009.
F_RT0602	Hayward & Ryland1995.
F_RT0603	Maitland and Herdson 2009 (EA fish ID), Lythgoe and Lythgoe 1991
F_RT0604	Wheeler 1978, Hayward & Ryland 1995
F_RT0605	Maitland 2004, Maitland and Herdson 2009 (EA fish ID)
F_RT0606	Maitland 2004
F_RT0607	Wheeler 1978
F_RT0608	Wheeler 1978
F_RT0609	Wheeler 1978
F_RT0610	Maitland and Herdson 2009 (EA fish ID), Wheeler 1978.
F_RT0611	Maitland and Herdson 2009 (EA fish ID), Kay and Dipper 2009.
F_RT0612	Maitland 2004
F_RT0613	Maitland and Herdson 2009 (EA fish ID)
F_RT0614	Maitland and Herdson 2009 (EA fish ID),
F_RT0615	Maitland and Herdson 2009 (EA fish ID), Hayward & Ryland 1995, Kay and Dipper 2009

Figure 1. The number of differences from the AQC identification of specimens (excluding synonyms) distributed in F_RT06 for each of the participating laboratories. Arranged in order of increasing number of differences.



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 1901 would be coded as Lab 1901a and Lab 1901b. 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_RT0601 – *Lampetra fluviatilis* (River lamprey) (Figure 1)

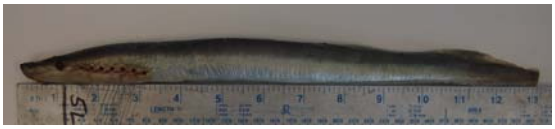


Figure 1 (F_RT0601) - L

Substratum: Mixed. Salinity: Low. Depth: Infralittoral. Geography: East Anglia. Condition: Good.

Two generic and two specific differences:
Labs 1906 and 1938 identified as *Petromyzon marinus* (which has numerous small teeth that are arranged in many circular rows and has a heavily mottled colour on the back).

F_RT0602 – *Sprattus sprattus* (Sprat) (Figure 2)

Figure 2 (F_RT0602) – L

Substratum: Mixed. Salinity: Full. Depth: Circalittoral. Geography: S.W. England. Condition: Good.

No differences recorded.

Lab 1937 incorrectly spelt the genus and labs 1936a, 1936b and 1937 incorrectly spelt the species.

F_RT0603 – *Scomber* sp. (Mackerel) (Figure 3a and 3b)

Figure 3a (F_RT0603) – L

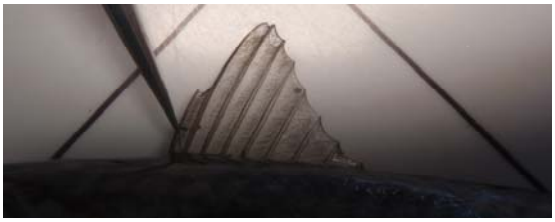


Figure 3b (F_RT0603) – L

Substratum: Mixed. Salinity: High. Depth: Infralittoral. Geography: Cornwall. Condition: Good.

A mixture of mackerel species were sent out in the Ring Test: *Scomber scombrus* and *Scomber colias* / *Scomber japonicus*. Each laboratory received just one specimen.

S. scombrus (Figure 3a) typically has its first dorsal fin consisting of 11 - 13 slender spines. Markings on the back are brilliant blue-green with black curving lines. These lines can be irregular and sometimes broken into spots and curves. The lower sides and belly are white with pinkish and gold reflections in colour but unmarked. It is common in the North Atlantic.

The recognition of species within the Genus *Scomber* has been somewhat controversial over the years. However, recent studies show, that *S. colias* and *S. japonicus* were significantly grouped in distinct lineages within the *Scomber* cluster, indicating that they are 2 separate species.

S. colias and *S. japonicus* both have 9 – 10 spines in their first dorsal fin (Figure 3b). The markings of *S. colias* alter slightly with the wavy dark lines that extend to the sides fainter against the blue-green. The lower sides and belly are silvery white with an iridescent flush and numerous rounded dusky spots on the side. *S. japonicus* can have a belly that is marked by wavy lines and spots but can also be unmarked.

S. colias is common in the Atlantic with a head 3 -3.5 times larger than the body length whereas *S. japonicus* is common in the North Pacific.

It should be noted that iridescent colours on the sides and belly fade quickly after death

F_RT0604 – *Ammodytes marinus* (Lesser Sand-eel) (Figure 4)

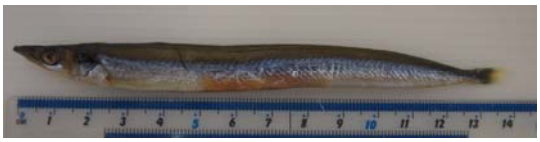


Figure 4 (F_RT0604) - L

Substratum: Sand. Salinity: Full. Depth: Circalittoral. Geography: Cornwall. Condition: Fair.

Two generic and fifteen specific differences were recorded. Labs 1901, 1903, 1904, 1905, 1906, 1907a, 1907b, 1907c, 1936a, 1936b, 1939, 1943 and 1944 all identified as *A. tobianus* (which has belly scales in a tight chevron arrangement and scales present at the base of each tail fin lobe).

Lab 1937 identified as *Hyperoplus lanceolatus* (which has a dark spot situated on the side of the snout and has two teeth in the roof of the mouth. It does not have a protractible jaw but the lower jaw extends well beyond the upper. The shallow fold of skin on each side of the belly reaches one third of the anal fin length).

Lab 1942 identified as *Gymnammodytes semisquamatus* (which has its lateral line pores open at the end of short canals. These run at right angles to the lateral line. Two canals are positioned below the lateral line).

F_RT0605 – *Blicca bjoerkna* (Silver bream) (Figure 5)

Figure 5 (F_RT0605) - L

Substratum: Mixed. Salinity: Low. Depth: Infralittoral. Geography: East Anglia. Condition: Good.

Four generic and four specific differences:

Labs 1939 and 1946 identified as *Abramis brama* (where the distance between the tip of the snout and eye is usually more than the diameter of the eye).

Lab 1901 identified as *Rutilus rutilus* (which has red/orange eyes).

Lab 1944 identified as *Scardinius erythrophthalmus* (which has 40 – 43 scales along the lateral line and the front of the dorsal fin is positioned distinctly behind the base of the pelvic fins).

Labs 1903, 1907c, 1936a, 1936b, 1938, 1940, 1943 and 1945 recorded the synonym as *Abramis bjoerkna*.

F_RT0606 – *Limanda limanda* (Dab) (Figure 6)

Figure 6 (F_RT0606) – L (right-eyed side)

Substratum: Sand. Salinity: High. Depth: Infralittoral. Geography: East Anglia. Condition: Fair.

Two generic and two specific differences: Lab 1939 identified as *Pleuronectes platessa* (which does not have a pronounced curved lateral line).

Lab 1943 identified as *Hippoglossoides platessoides* (which has a straight lateral line and a slender body).

F_RT0607 – *Osmerus eperlanus* (Smelt) (Figure 7)

Figure 7 (F_RT0607) - L

Substratum: Mixed. Salinity: Full. Depth: Circalittoral. Geography: S.W. England. Condition: Good.

No differences were recorded.

F_RT0608 – *Hyperoplus lanceolatus* (Greater Sandeel) (Figure 8)

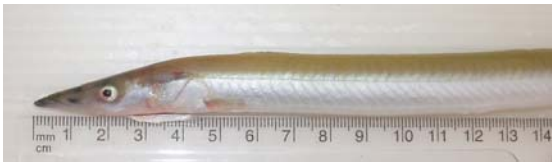


Figure 8 (F_RT0608) - L

Substratum: Sand. Salinity: Full. Depth: Circalittoral. Geography: Cornwall. Condition: Good.

Two specific differences: Labs 1907b and 1907c identified as *A. immaculatus* (synonym of *Hyperoplus immaculatus* which lacks a dark spot on the side of the snout. The shallow fold of skin on the belly extends to the tail whereas in *H. lanceolatus*, it extends to one third of the length of the anal fin).

F_RT0609 – *Ammodytes tobianus* (Lesser sand-eel) (Figure 9)

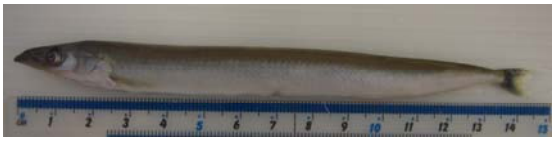


Figure 9 (F_RT0609) - L

Substratum: Sand. Salinity: Full. Depth: Circalittoral. Geography: S.W. England. Condition: Good.

Three generic differences and five specific differences. Labs 1905 and 1907a identified as *A. marinus* (which does not have belly scales arranged in a tight chevron pattern).

Labs 1936a and 1943 identified as *Hyperoplus immaculatus* (which lacks a protrusible upper jaw despite the lower jaw extending beyond the lower. It has 2 teeth in the roof of the mouth).

Lab 1936b identified as *Hyperoplus lanceolatus* (which is as above for *H. immaculatus* but also has a dark spot situated on the side of the snout).

F_RT0610 – *Clupea harengus* (Herring) (Figure 10)

Figure 10 (F_RT0610) - L

Substratum: Sand. Salinity: Full. Depth: Circalittoral (lower shelf). Geography: S.W. England. Condition: Good.

Two generic and two specific differences: Lab 1904 and 1905 identified as *Sardina pilchardus* (which has a more rounded body and its gill cover has visible ridges).

F_RT0611 – *Chelidonichthys lucerna* (Tub gurnard) (Figure 11)

Figure 11 (F_RT0611) - L

Substratum: Mixed. Salinity: Full. Depth: Circalittoral. Geography: Brixham. Condition: Good.

Two generic and three specific differences: Lab 1901 identified as *C. cuculus* (which is redder in body colour, the pectoral fins do not have an outline of blue and it has a plated lateral line). Labs 1903 and 1936b identified as *Aspitrigla cuculus* (which is a synonym for *C. cuculus*).

Labs 1905, 1907a, 1907b, 1940, 1941, and 1946 recorded the synonym *Trigla lucerna*.

Labs1907c, 1936a, 1937, 1938, 1942, 1943, and 1944 misspelt the species name as *C. lucernus*.

F_RT0612 – *Rutilus rutilus* (Roach) (Figure 12)

Figure 12 (F_RT0612) - L

Substratum: Mixed. Salinity: Low. Depth: Infralittoral. Geography: Ireland. Condition: Good.

No differences were recorded.

F_RT0613 – *Sardina pilchardus* (European Pilchard) (Figure 13)

Figure 13 (F_RT0613) - L

Substratum: Mixed. Salinity: Full. Depth: Circalittoral. Geography: Ireland. Condition: Good.

One generic and one specific differences: Lab 1938 identified as *Alora alora* (which has an upper jaw that is notched; more than four dusky spots along the body, more distinct ridges on the gill cover and an un-elongated last anal ray).

F_RT0614 – *Arnoglossus laterna* (Scaldfish) (Figure 14)

Figure 14 (F_RT0614) – L (left-eyed side)

Substratum: Sand. Salinity: High. Depth: Infralittoral. Geography: Wales. Condition: Good.

Four generic and four specific differences:
Lab 1901 identified as *Scophthalmus rhombus* (which has a broader body, heavier head and broader-based pelvic fins. It looks like it has a frill as the first rays of the dorsal being are free of the fin membrane for up to half their length).

Labs 1937 and 1938 identified as *Lepidorhombus whiffiagonis* (which has unsegmented fin rays, slightly larger eyes and long-based pelvic fins and equal on both sides. *A. laterna* has a shorter pelvic fin on its blind side).

Lab 1939 identified as *Phrynorhombus norvegicus* (which has relatively larger and toothed scales on its eyed-side, a snout with a smoother profile and dorsal and anal fins that are higher up the body).

F_RT0615 – *Dicentrarchus labrax* (Sea Bass) (Figure 15)

Figure 15 (F_RT0615) - L

Substratum: Mixed. Salinity: High. Depth: Infralittoral. Geography: Brixham. Condition: Good.

No differences recorded.

References

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

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 noted 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.

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.

FishBase - http://www.fishbase.org/search.php

World Register of Marine Species - http://www.marinespecies.org/aphia.php?p=search

Specimens

You are required to return the two preserved specimens to Thomson Unicomarine Ltd (specimen 06; *Limanda limanda* and 14; *Arnoglossus laterna*) by 1st October 2013. The remaining frozen specimens can be discarded.

Please return them to the following address:

Sarah Hussey, Thomson Unicomarine Ltd., Business Centre East,
Fifth Avenue, Letchworth, Hertfordshire SG6 2TS, UK