



# NMBQQC

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\_RT12**

2018/2019

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Key features distinguishing mis-identified specimens in F\_RT12 (pp.11)

## RING TEST DETAILS

Fish Ring Test #12

Type/Contents –Small-sized and young estuarine fish

Circulated –03/12/2018

Completion Date –18/01/2019

Number of Participating Laboratories –12

Number of Results Received –12

Table 1. Summary of taxonomic differences in F\_RT12 (for further details see Table 2).

Specimen	Genus	Species	Taxon. differences for 12 returns	
			Genus	Species
F_RT1201	<i>Solea</i>	<i>solea</i>	2	2
F_RT1202	<i>Limanda</i>	<i>limanda</i>	1	1
F_RT1203	<i>Clupea</i>	<i>harengus</i>	1	1
F_RT1204	<i>Sprattus</i>	<i>sprattus</i>	1	1
F_RT1205	<i>Dicentrarchus</i>	<i>labrax</i>	0	0
F_RT1206	<i>Osmerus</i>	<i>eperlanus</i>	0	0
F_RT1207	<i>Atherina</i>	<i>presbyter</i>	0	0
F_RT1208	<i>Eutrigla</i>	<i>gurnardus</i>	0	0
F_RT1209	<i>Merlangius</i>	<i>merlangus</i>	0	0
F_RT1210	<i>Trisopterus</i>	<i>minutus</i>	0	1
F_RT1211	<i>Trisopterus</i>	<i>luscus</i>	0	0
F_RT1212	<i>Gadus</i>	<i>morhua</i>	1	1
F_RT1213	<i>Pomatoschistus</i>	<i>minutus</i>	0	2
F_RT1214	<i>Pomatoschistus</i>	<i>lozanoi</i>	1	8
F_RT1215	<i>Pomatoschistus</i>	<i>microps</i>	2	5
		<b>Total differences</b>	<b>9</b>	<b>22</b>
		<b>Average differences /lab.</b>	<b>0.75</b>	<b>1.83</b>

Synonyms or spelling errors are not included.

Table 2. Differences of identification in F\_RT12, sorted by specimens.

	F_RT1201	F_RT1202	F_RT1203	F_RT1204	F_RT1205	F_RT1206
Taxon	<i>Solea solea</i>	<i>Limanda limanda</i>	<i>Clupea harengus</i>	<i>Sprattus sprattus</i>	<i>Dicentrarchus labrax</i>	<i>Osmerus eperlanus</i>
LB2502	--	--	- [herengus]	--	--	--
LB2505	--	--	--	--	--	--
LB2514	--	--	--	--	--	--
LB2516	--	--	--	--	--	--
LB2517	--	--	<i>Sprattus sprattus</i>	<i>Clupea harengus</i>	--	--
LB2518	--	--	--	--	--	--
LB2519	--	--	--	--	--	--
LB2520	<i>Buglossidium luteum</i>	<i>Pleuronectes platessa</i>	--	--	--	--
LB2521	<i>Buglossidium luteum</i>	--	--	--	--	--
LB2522	--	--	--	--	--	--
LB2523	--	--	--	--	--	--
LB2524	--	--	- [herengus]	--	--	--

Table 2. Differences of identification in F\_RT12, sorted by specimens.

Taxon	F_RT1207	F_RT1208	F_RT1209	F_RT1210	F_RT1211	F_RT1212
	<i>Atherina presbyter</i>	<i>Eutrigla gurnardus</i>	<i>Merlangius merlangus</i>	<i>Trisopterus minutus</i>	<i>Trisopterus luscus</i>	<i>Gadus morhua</i>
LB2502	--	--	--	--	--	--
LB2505	--	--	--	--	--	--
LB2514	--	--	--	--	--	--
LB2516	--	--	--	--	--	--
LB2517	--	--	--	- <i>luscus</i>	--	--
LB2518	--	--	--	--	--	--
LB2519	--	[ <i>Eutrigla</i> ] -	--	--	--	--
LB2520	--	--	--	--	--	<i>Melanogrammus aeglefinus</i>
LB2521	--	--	--	--	--	--
LB2522	--	--	--	--	--	--
LB2523	--	--	--	--	--	--
LB2524	--	--	--	--	--	--

Table 2. Differences of identification in F\_RT12, sorted by specimens.

	F_RT1213	F_RT1214	F_RT1215
Taxon	<i>Pomatoschistus minutus</i>	<i>Pomatoschistus lozanoi</i>	<i>Pomatoschistus microps</i>
LB2502	--	- <i>minutus</i>	--
LB2505	--	- <i>microps</i>	- <i>minutus</i>
LB2514	--	- <i>microps</i>	- <i>pictus</i>
LB2516	--	--	--
LB2517	--	--	--
LB2518	- <i>microps</i>	- <i>minutus</i>	<i>Gobius niger</i>
LB2519	--	- <i>microps</i>	<i>Gobius niger</i>
LB2520	--	--	--
LB2521	- <i>microps</i>	<i>Aphia minuta</i>	- <i>minutus</i>
LB2522	--	--	--
LB2523	--	- <i>minutus</i>	--
LB2524	--	- <i>minutus</i>	--

Graph 1. Number of taxonomic differences in F\_RT12 per laboratory (for further details see Table 3).

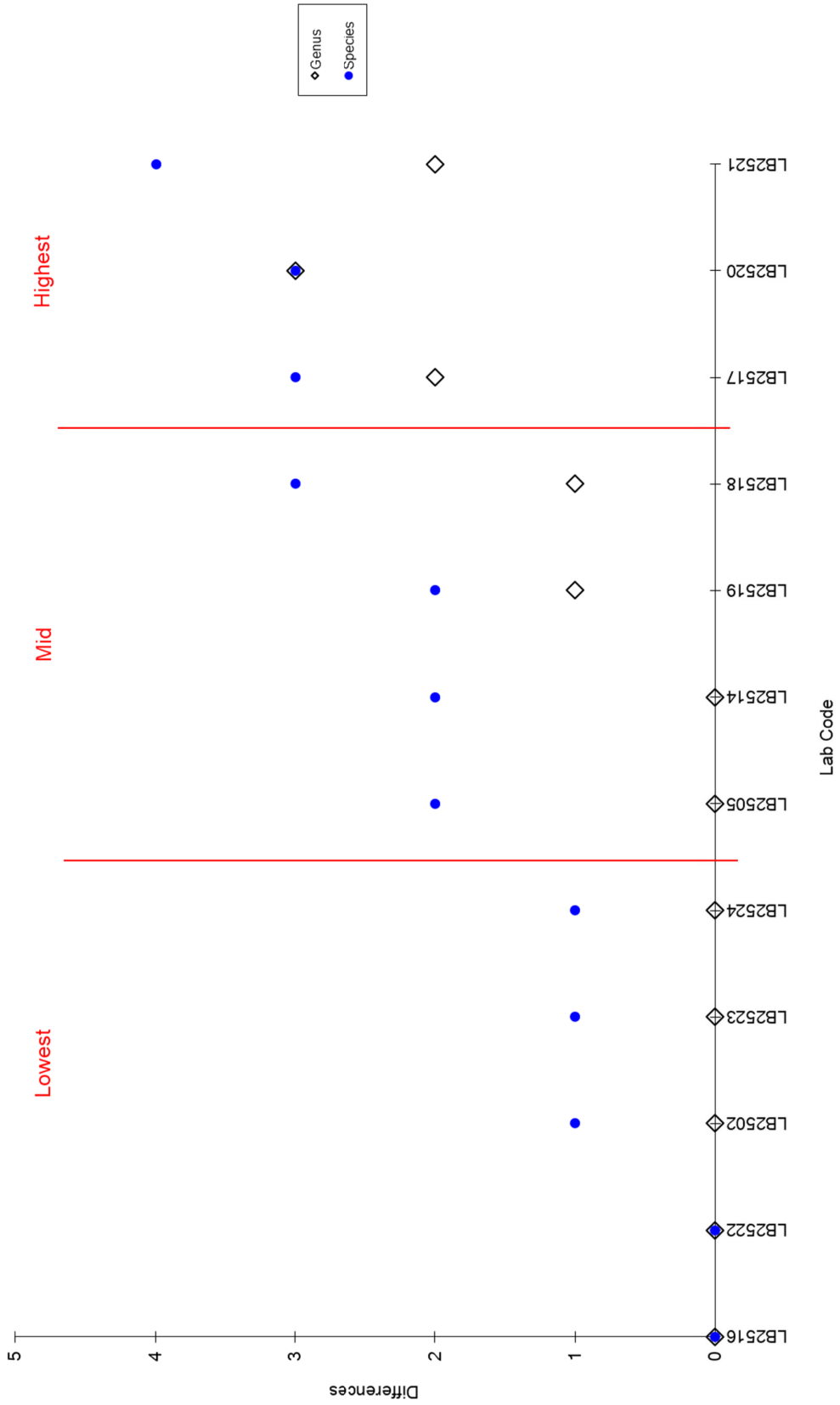


Table 3. Differences of identification in F\_RT12, sorted by laboratory.

	Taxon	LB2502	LB2505	LB2514	LB2516	LB2517
F_RT1201	<i>Solea solea</i>	--	--	--	--	--
F_RT1202	<i>Limanda limanda</i>	--	--	--	--	--
F_RT1203	<i>Clupea harengus</i>	- [harengus]	--	--	--	<i>Sprattus sprattus</i>
F_RT1204	<i>Sprattus sprattus</i>	--	--	--	--	<i>Clupea harengus</i>
F_RT1205	<i>Dicentrarchus labrax</i>	--	--	--	--	--
F_RT1206	<i>Osmerus eperlanus</i>	--	--	--	--	--
F_RT1207	<i>Atherina presbyter</i>	--	--	--	--	--
F_RT1208	<i>Eutrigla gurnardus</i>	--	--	--	--	--
F_RT1209	<i>Merlangius merlangus</i>	--	--	--	--	--
F_RT1210	<i>Trisopterus minutus</i>	--	--	--	--	- <i>luscus</i>
F_RT1211	<i>Trisopterus luscus</i>	--	--	--	--	--
F_RT1212	<i>Gadus morhua</i>	--	--	--	--	--
F_RT1213	<i>Pomatoschistus minutus</i>	--	--	--	--	--
F_RT1214	<i>Pomatoschistus lozanoi</i>	- <i>minutus</i>	- <i>microps</i>	- <i>microps</i>	--	--
F_RT1215	<i>Pomatoschistus microps</i>	--	- <i>minutus</i>	- <i>pictus</i>	--	--

	Taxon	LB2518	LB2519	LB2520	LB2521	LB2522
F_RT1201	<i>Solea solea</i>	--	--	<i>Buglossidium luteum</i>	<i>Buglossidium luteum</i>	--
F_RT1202	<i>Limanda limanda</i>	--	--	<i>Pleuronectes platessa</i>	--	--
F_RT1203	<i>Clupea harengus</i>	--	--	--	--	--
F_RT1204	<i>Sprattus sprattus</i>	--	--	--	--	--
F_RT1205	<i>Dicentrarchus labrax</i>	--	--	--	--	--
F_RT1206	<i>Osmerus eperlanus</i>	--	--	--	--	--
F_RT1207	<i>Atherina presbyter</i>	--	--	--	--	--
F_RT1208	<i>Eutrigla gurnardus</i>	--	[ <i>Eutrigla</i> ] -	--	--	--
F_RT1209	<i>Merlangius merlangus</i>	--	--	--	--	--
F_RT1210	<i>Trisopterus minutus</i>	--	--	--	--	--
F_RT1211	<i>Trisopterus luscus</i>	--	--	--	--	--
F_RT1212	<i>Gadus morhua</i>	--	--	<i>Melanogrammus aeglefinus</i>	--	--
F_RT1213	<i>Pomatoschistus minutus</i>	- <i>microps</i>	--	--	- <i>microps</i>	--
F_RT1214	<i>Pomatoschistus lozanoi</i>	- <i>minutus</i>	- <i>microps</i>	--	<i>Aphia minuta</i>	--
F_RT1215	<i>Pomatoschistus microps</i>	<i>Gobius niger</i>	<i>Gobius niger</i>	--	- <i>minutus</i>	--



Table 3. Differences of identification in F\_RT12, sorted by laboratory.

	Taxon	LB2523	LB2524
F_RT1201	<i>Solea solea</i>	--	--
F_RT1202	<i>Limanda limanda</i>	--	--
F_RT1203	<i>Clupea harengus</i>	--	- [heregus]
F_RT1204	<i>Sprattus sprattus</i>	--	--
F_RT1205	<i>Dicentrarchus labrax</i>	--	--
F_RT1206	<i>Osmerus eperlanus</i>	--	--
F_RT1207	<i>Atherina presbyter</i>	--	--
F_RT1208	<i>Eutrigla gurnardus</i>	--	--
F_RT1209	<i>Merlangius merlangus</i>	--	--
F_RT1210	<i>Trisopterus minutus</i>	--	--
F_RT1211	<i>Trisopterus luscus</i>	--	--
F_RT1212	<i>Gadus morhua</i>	--	--
F_RT1213	<i>Pomatoschistus minutus</i>	--	--
F_RT1214	<i>Pomatoschistus lozanoi</i>	- minutus	- minutus
F_RT1215	<i>Pomatoschistus microps</i>	--	--

## Summary of literature used for specimens in F\_RT12

### Participants

Henderson 2015  
Kay & Dipper 2009  
Kovačić 2008.  
Maitland & Herdson 2009  
Miller, P.J. 2011a  
Miller, P.J. 2011b  
Pombo, Elliott & Rebelo 2005  
Wheeler 1969  
Wheeler 1978  
Whitehead *et al.* 1984-1986

Fishbase <http://www.fishbase.org/>  
WORMS <http://www.marinespecies.org/>

### PISCES Conservation Ltd.

Henderson 2015  
Wheeler 1969

## **Fish ring test F\_RT12: 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 Unicmarine Ltd.

All photographs in the following paragraph are in lateral view (L). The sizes given in brackets are average length for specimens sent to participants.

### **Habitats**

Amphidromous: migrating between salt and fresh water at some stage other than a breeding cycle

Anadromous: migrating up rivers from the sea to spawn

Benthopelagic: occurs both near the sea floor and in the water column

Demersal: occurs on or near to the sea floor

Neritic: occurs within the shallow part of the sea near a coast and overlying the continental shelf

Oceanodromous: migrating within the seas only

Pelagic: occurs primarily in the water column

### **Substrata**

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**

High: Occurs in fully marine habitats

Mixed: Occurs in fully marine and transitional waters

Reduced: Occurs primarily in estuarine and transitional waters

### **Depth**

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.

### **Specimens**

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

## Fish ring test F\_RT12: Specimens

### F\_RT1201 – *Solea solea* (Sole / Dover sole)



Figure 1 (F\_RT1201) – L (length 90 mm)

Habitat: Demersal / oceanodromous  
Substrate: Mixed  
Salinity: Mixed  
Depth: Shallow sublittoral / circalittoral  
Geographic source: South-west England

4 taxonomic differences recorded:  
Labs 2520 and 2521 identified as *Buglossidium luteum*

### F\_RT1202 – *Limanda limanda* (Dab)



Figure 2 (F\_RT1202) – L (length 65 mm)

Habitat: Demersal / oceanodromous  
Substrate: Mixed  
Salinity: Mixed  
Depth: Circalittoral  
Geographic source: South-west England

2 taxonomic differences recorded:  
Lab 2520 identified as *Pleuronectes platessa*

### F\_RT1203 – *Clupea harengus* (Herring)



Figure 3 (F\_RT1203) – L (length 95 mm)

Habitat: Benthopelagic / oceanodromous.  
Substrate: Mixed  
Salinity: High  
Depth: Shallow sublittoral to deep-water.  
Geographic source: South-west England.

2 taxonomic differences recorded:  
Lab 2517 identified as *Sprattus sprattus*.

### F\_RT1204 – *Sprattus sprattus* (Sprat)



Figure 4 (F\_RT1204) – L (length 100 mm)

Habitat: Pelagic-neritic / oceanodromous  
Substrate: Mixed  
Salinity: High  
Depth: Shallow sublittoral to circalittoral  
Geographic source: South-west England

2 taxonomic differences recorded:  
Lab 2517 identified as *Clupea harengus*

**F RT1205 – *Dicentrarchus labrax* (Bass)**



Figure 5 (F\_RT1205) – L (length 95 mm)

Habitat: Demersal / oceanodromous.  
Substrate: Mixed  
Salinity: Mixed  
Depth: Shallow sublittoral to circalittoral  
Geographic source: South-east England

No differences recorded.

**F RT1206 – *Osmerus eperlanus* (Smelt / Cucumber smelt)**



Figure 6 (F\_RT1206) – L (length 80 mm)

Habitat: Pelagic-neritic / anadromous  
Substrate: Mixed  
Salinity: Mixed  
Depth: Shallow sublittoral to circalittoral  
Geographic source: South-east England

No differences recorded.

**F RT1207 – *Atherina presbyter* (Sand smelt)**



Figure 7 (F\_RT1207) – L (length 85 mm)

Habitat: Pelagic-neritic / oceanodromous  
Substrate: Sand  
Salinity: Reduced  
Depth: Shallow sublittoral  
Geographic source: Southern England

No differences recorded.

**F RT1208 – *Eutripla gurnardus* (Grey gurnard)**



Figure 8 (F\_RT1208) – L (length 100 mm)

Habitat: Demersal  
Substrate: Sand / rock  
Salinity: Mixed  
Depth: Shallow sublittoral to circalittoral  
Geographic source: Bristol Channel

No differences recorded.

**F RT1209 – *Merlangius merlangus* (Whiting)**



Figure 9 (F\_RT1209) – L (length 120 mm)

Habitat: Benthopelagic / oceanodromous  
Substrate: Sand  
Salinity: Mixed  
Depth: Shallow sublittoral to circalittoral  
Geographic source: Southern England

No differences recorded.

**F RT1210 – *Trisopterus minutus* (Poor cod)**



Figure 10 (F\_RT1210) – L (length 80 mm)

Habitat: Benthopelagic  
Substrate: Mud / sand  
Salinity: Full  
Depth: Shallow sublittoral to circalittoral  
Geographic source: Bristol Channel

1 taxonomic difference recorded:  
Lab 2517 identified as *T. luscus*.

**F RT1211 – *Trisopterus luscus* (Pout / Pouting / Bib)**



Figure 11 (F\_RT1211) – L (length 140 mm)

Habitat: Benthopelagic / oceanodromous  
Substrate: Mud / sand  
Salinity: Mixed  
Depth: Sublittoral to circalittoral  
Geographic source: Bristol Channel

No differences recorded.

**F RT1212 – *Gadus morhua* (Cod)**



Figure 12 (F\_RT1212) – L (length 100 mm)

Habitat: Benthopelagic / oceanodromous  
Substrate: Mixed  
Salinity: Mixed  
Depth: Shallow sublittoral to deep-water  
Geographic source: Bristol Channel

2 taxonomic differences recorded:  
Lab 2520 identified as *Melanogrammus aeglefinus*.

**F RT1213 – *Pomatoschistus minutus* (Sand goby)**



Figure 13 (F\_RT1213) – L (length 70 mm)

Habitat: Demersal / amphidromous  
Substrate: Mixed  
Salinity: Mixed.  
Depth: Shallow sublittoral to circalittoral  
Geographic source: Southern England

2 taxonomic differences recorded:  
Labs 2518 and 2521 identified as *P. microps*.



**F RT1214 – Pomatoschistus lozanoi (Lozano's goby)**



Figure 14 (F\_RT1214) – L (length 55 mm)

Habitat: Demersal  
Substrate: Sand  
Salinity: Mixed  
Depth: Shallow sublittoral to circalittoral  
Geographic source: Southern England

9 taxonomic differences recorded:  
Labs 2502, 2518, 2523 and 2524 identified as *P. minutus*,  
Labs 2505, 2514 and 2519 identified as *P. microps*,  
Lab 2521 identified as *Aphia minuta*.

**F RT1215 – Pomatoschistus microps (Common goby)**



Figure 15 (F\_RT1215) – L (length 50 mm)

Habitat: Demersal / amphidromous  
Substrate: Mud / sand  
Salinity: Reduced  
Depth: Shallow sublittoral  
Geographic source: Southern England

7 taxonomic differences recorded:  
Labs 2505 and 2521 identified as *P. minutus*,  
Lab 2514 identified as *P. pictus*,  
Labs 2518 and 2519 identified as *Gobius niger*.

**References**

- Henderson P. 2015. Identification Guide to the Inshore Fish of the British Isles. Pisces Conservation Limited, Pennington.
- Kay P. & Dipper F. 2009. A Field Guide to the Marine Fishes of Wales and adjacent waters. Marine Wildlife, Llanfairfechan.
- Kovačić M. 2008. The key for identification of Gobiidae (Pisces: Perciformes) in the Adriatic Sea. *Acta Adriatica* 49(3): 245–254.
- Maitland P.S. & Herdson D. 2009. Key to the Marine and Freshwater Fishes of Britain and Ireland. Environment Agency.
- Miller P.J. 2011a. Gobies of the British Isles (Teleostei: Gobiidae). pp 1-23. NMBAQC April 2011 Fish ID Workshop.
- Miller P.J. 2011b. Key to Gobies of the British Isles. pp 1-5. NMBAQC April 2011 Fish ID Workshop.
- Pombo L., Elliott M. & Rebelo E. 2005. Ecology, age and growth of *Atherina boyeri* and *Atherina presbyter* in the Ria de Aveiro, Portugal. *Cybium* 29(1): 47–55.
- 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. & Tortonese E. (eds). 1984-1986. Fishes of the North-eastern Atlantic and the Mediterranean. Vols. 1-3. UNESCO, Paris.

**Databases**

Fishbase <http://www.fishbase.org/>

World Register of Marine Species (WoRMS) <http://www.marinespecies.org/>

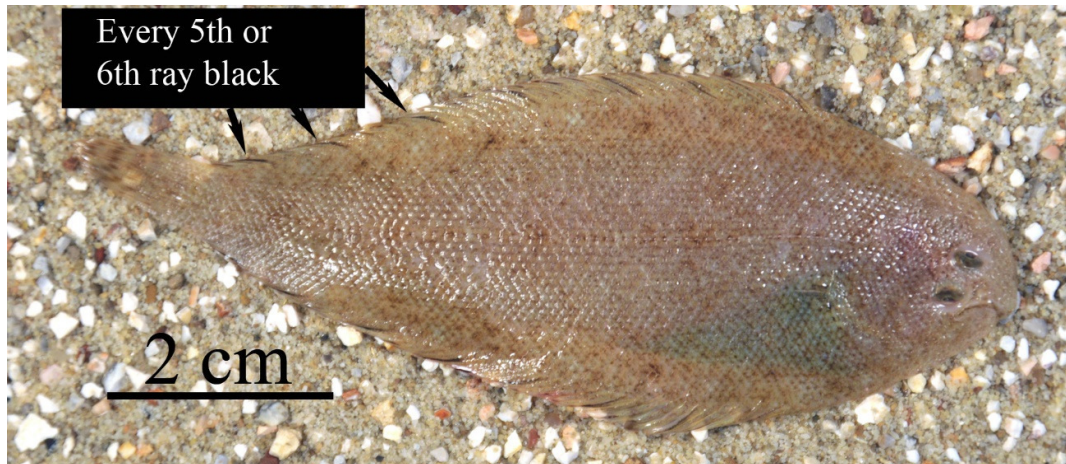
## Key features distinguishing mis-identified specimens in F\_RT12

### 1 Sole (*Solea solea*) / Solenette (*Buglossidium luteum*)

Apart from size (solenette up to 130 mm, sole up to 600 mm or more), the chief distinguishing features are: (a) the sole has a black mark on its pectoral fin, not present in the solenette; (b) the scales of the sole are smaller and less conspicuous than those of the solenette, and (c) every 5<sup>th</sup> or 6<sup>th</sup> fin ray on the dorsal and anal fins of the solenette are black.



Sole



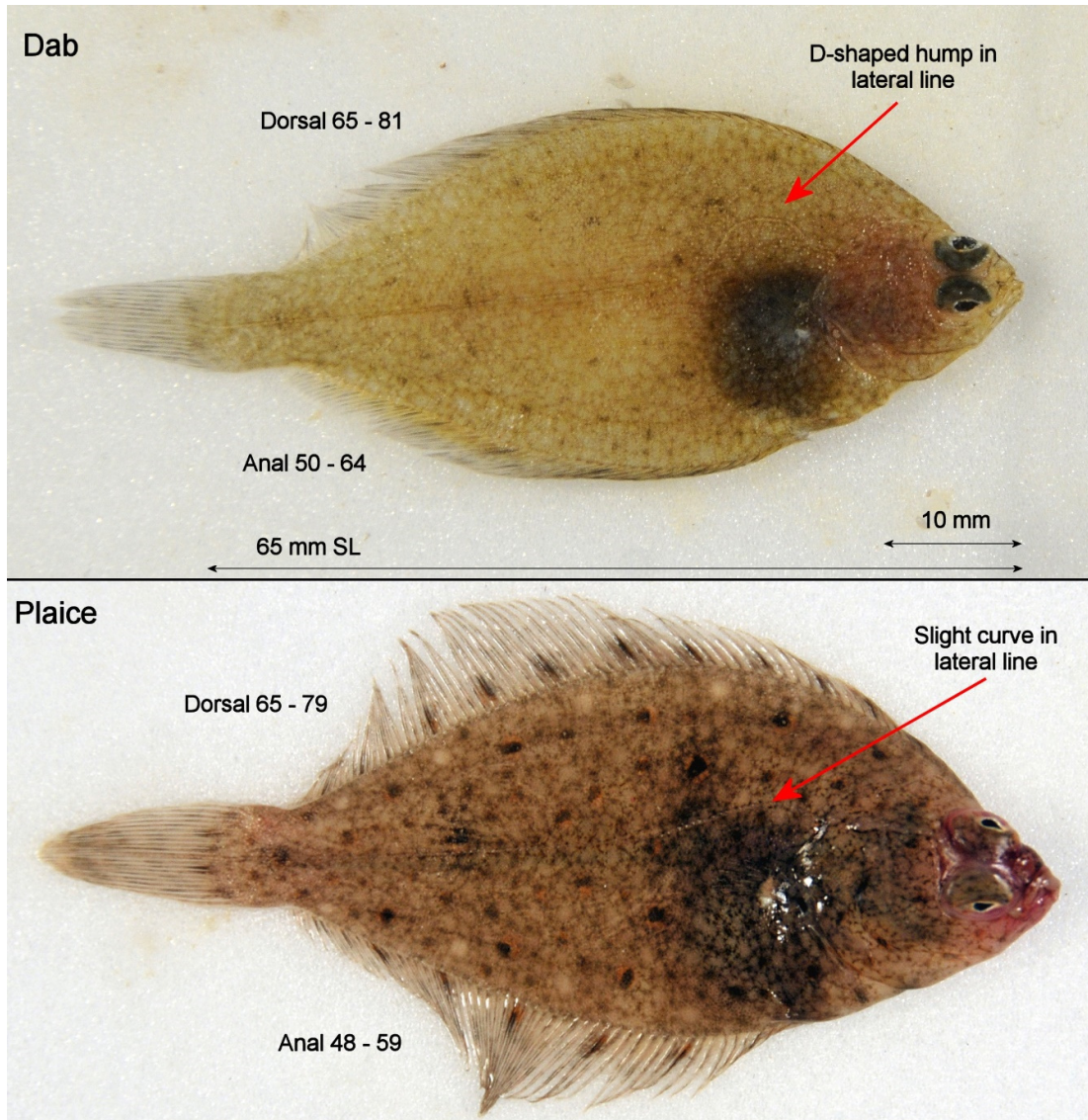
Solenette





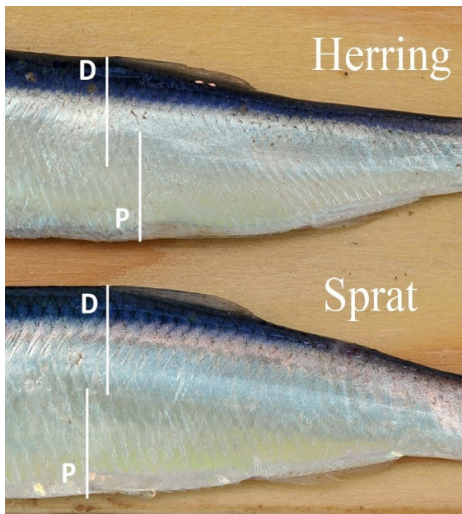
## 2 Dab (*Limanda limanda*) / Plaice (*Pleuronectes platessa*)

Juvenile specimens of these two species are similar in outline and colour and so may be confused at first glance. The chief difference is that the dab has a pronounced D-shaped curve in the lateral line above the pectoral fin. The plaice has only a shallow curve around the pectoral fin. It also has a series of bony knobs where the lateral line meets the head. Other differences include the amount of spotting or mottling - the plaice is usually more marked - and the size of the eyes: the dab has generally more prominent eyes. These differences may not, however, be particularly evident in juvenile specimens.



### 3 Sprat (*Sprattus sprattus*) / Herring (*Clupea harengus*)

Apart from size (sprat maximum = around 130 mm), key features distinguishing these two species are the relative position of the pelvic and dorsal fins, the size of the eye in relation to the head, and the sharpness of the keel below the gills. In a sprat, the front of the dorsal fin is roughly in line with the front of the pelvic fin, or even set a little behind. In a herring, the pelvic fin is set back posterior of the dorsal fin (1<sup>st</sup> image). A herring has a larger eye, by comparison, than a sprat (2<sup>nd</sup> image). Finally, if a finger is rubbed along the keel of the fish, below the gill and eye, towards the front, the herring feels smooth, whereas the sprat has sharp scales along the keel.



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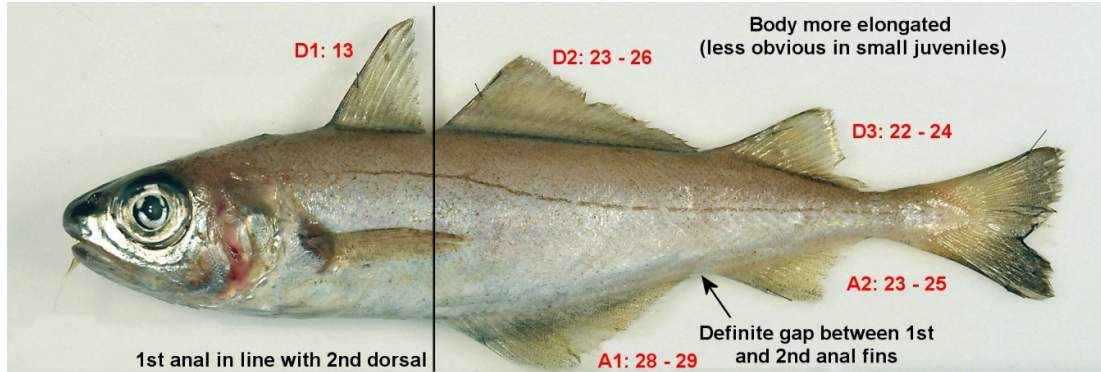
[pisces@pisces-conservation.com](mailto:pisces@pisces-conservation.com)  
[www.irchouse.demon.co.uk](http://www.irchouse.demon.co.uk)  
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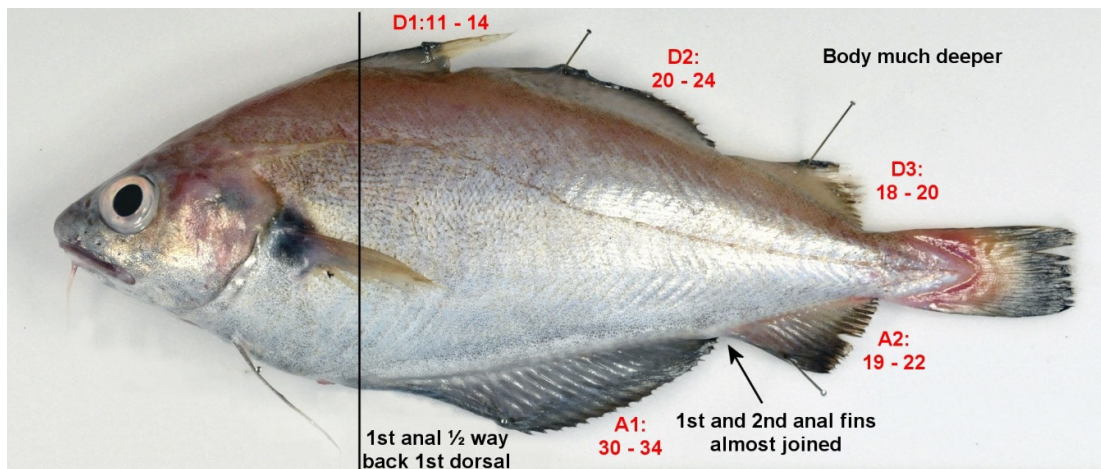


**4 Poor cod (*Trisopterus minutus*) / Pout (*T. luscus*)**

In very small specimens, these are difficult to distinguish. However, at the size of the specimens supplied, it is relatively straight forward. The poor cod has, overall, a shallower body than the pout. In the pout, the two anal fins are more or less attached, so if the first anal fin is pulled forward towards the head, the second anal fin will move. In the poor cod, the two fins are more separated, and so the second anal fin will not move. In the poor cod, the front of the first anal fin is roughly in line with the front of the second dorsal fin. In the pout, the first anal fin is about halfway back the first dorsal fin.



Poor cod



Pout



## 5 Cod (*Gadus morhua*) / Haddock (*Melanogrammus aeglefinus*)

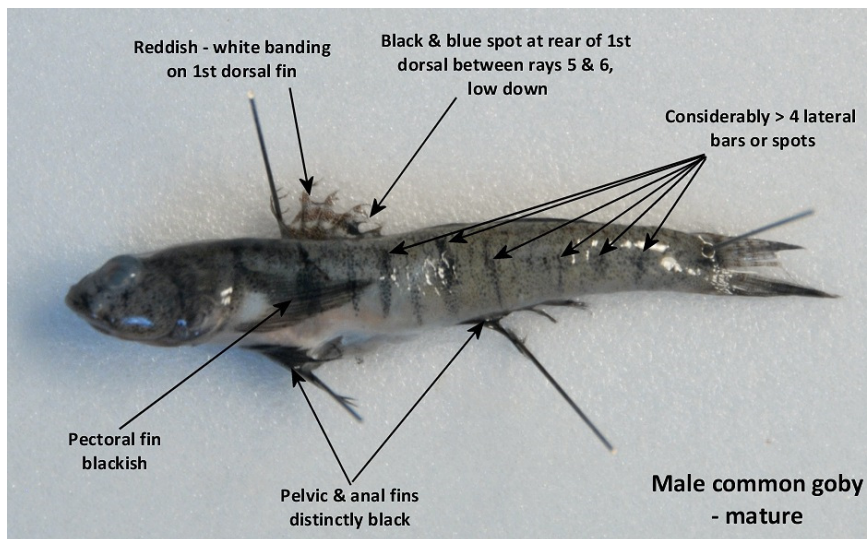
Chief differences between the two species are (a) the cod has a long chin barbel, whereas that of the haddock is short; (b) the cod has a white lateral line between darker stripes, while the haddock's lateral line is black, and (c) the haddock has a dark blotch on each side above the pectoral fin. The haddock's 1<sup>st</sup> dorsal fin is also more sharply triangular in shape than the cod's.





## 6 Common goby (*Pomatoschistus microps*) / Sand goby (*P. minutus*)

While these two species can be distinguished using the patterns of papillae, see (7) below, there are other features, especially in adult males, which allow easier identification. Firstly, if details of the origin of the specimen are available, the common goby is more likely to occur in lowered-salinity waters. Secondly, while males of both species have spots on the 1<sup>st</sup> dorsal fin, the spot on the common goby is low down, close to the base of the fin, while in the sand goby the spot is on the upper edge of the fin. The male common goby may have considerably more barring on the flanks, and the pectoral, pelvic and anal fins may be blackish. On the sand goby, if bars on the flanks are present, they will not be >4, and not be so dark as in the common goby. The common goby is also a smaller species; 50 – 60 mm maximum, and common adult size of 40 – 50 mm, whereas sand gobies can be 60 – 70 mm or greater.



Male sand goby – note the position of the dorsal fin mark.



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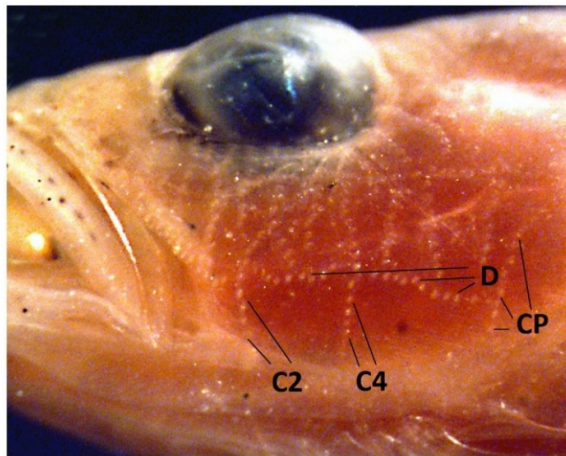
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## 7 Lozano's goby (*Pomatoschistus lozanoi*) / Sand goby (*P. minutus*)

These are two closely-related and very similar species, which are unlikely to be distinguished in the field. The chief distinguishing feature is the pattern of rows of sensory papillae on the cheek, below the eye. In *P. minutus*, there are no vertical ('C') rows of papillae extending below the 'D' row; in *P. lozanoi*, rows C2, C4 and CP extend below the D row – as in the diagram below. In fixed specimens, these rows can often be revealed by staining with iodine solution, as described in Henderson (2015)<sup>1</sup> – from where the following image is taken. Please refer to the full diagram on p. 183 for illustrations of the other species.



Photograph of *P. lozanoi* showing the typical pattern of C rows which extend below the horizontal D row on each cheek. The specimen was photographed after fixing in formalin and staining with iodine solution.

Iodine solution is not a permanent stain, but is useful to quickly visualise the papillae

<sup>1</sup> Henderson, P.A. (2015). *Identification Guide to the Inshore Fish of the British Isles*. p. 183. Pisces Conservation Ltd.



**8 Lozano's goby (*Pomatoschistus lozanoi*) / Common goby  
(*Pomatoschistus microps*)**

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See the distinguishing features for (6) and (7) above.

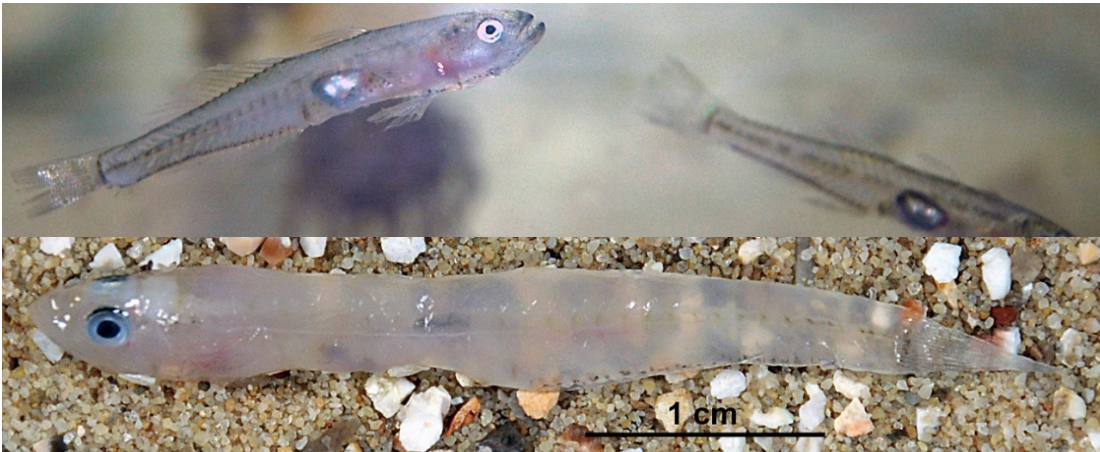


## 9 Lozano's goby (*Pomatoschistus lozanoi*) / Transparent goby (*Aphia minuta*)

The most noticeable difference when the two species are alive is transparency; the transparent goby is completely transparent except for the swim bladder. When dead, it fades to whitish, but is still somewhat transparent. Lozano's goby has a rounded body, while that of the transparent goby is a little laterally flattened. Lozano's goby (and the others in the sand goby complex) have eyes positioned on top of the head, as predominantly bottom-living species; the transparent goby is pelagic, with eyes positioned more on either side of the head. Other differences include the number of fin rays in the first dorsal fin (6 in the sand goby complex, 5 in *A. minuta*).



Sand goby complex.



Transparent goby





## 10 Common goby (*Pomatoschistus microps*) / Painted goby (*P. pictus*)

*P. pictus* is a small goby of a similar size to the common goby. A number of features distinguish the two species:

- *P. pictus* has a series of 4 black blotches along the flank which characteristically appear as paired dots. *P. microps* is dotted along the flank, but the dots are more numerous, and do not all appear paired.
- *P. pictus*, in fresh specimens at least, appears more colourful than *P. microps*, with red-brown tones on the upper sides and patches of yellow and orange around the belly and head.
- *P. pictus* has 1 or 2 rows of black dots on the 1<sup>st</sup> and 2<sup>nd</sup> dorsal fins, as well whitish and reddish banding. The black dots are present in both sexes. While *P. microps* might have banding patterns on the dorsal fins, the black dots are absent, except for a single black dot between the last 2 fin rays of the 1<sup>st</sup> dorsal.



*P. pictus*, live specimen, showing 4 paired blotches along the flank, and bright colouration.

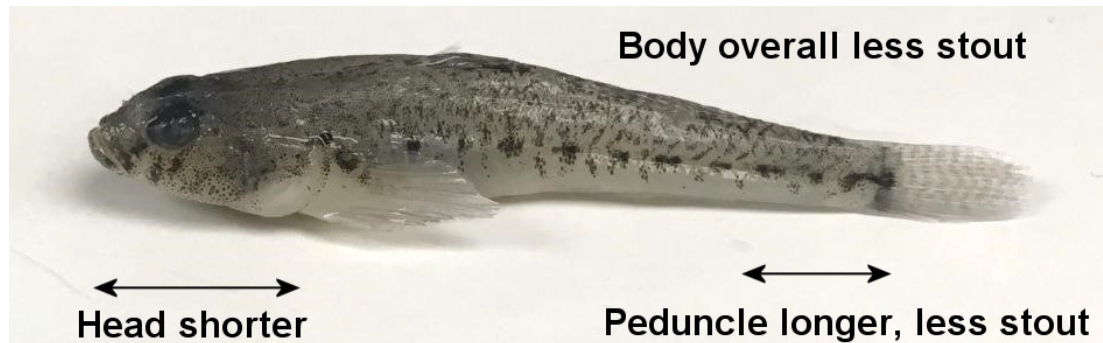


*P. microps*, image from participating lab, showing greater number of blotches along the flank, not all of which are paired, as well as vertical barring.

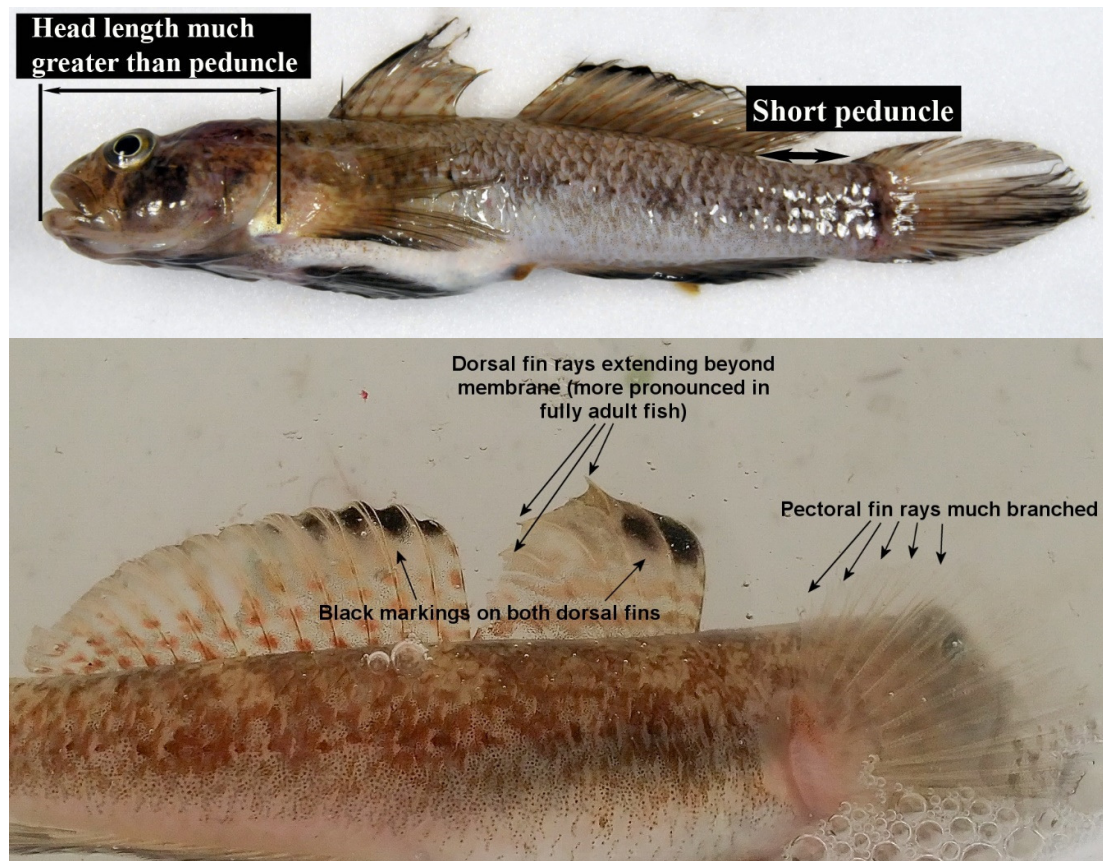


### 11 Common goby (*Pomatoschistus microps*) / Black goby (*Gobius niger*)

The black goby is potentially a much larger fish than the common goby (max. 150 mm, as opposed to 40 – 50 mm), has a proportionally shorter and stouter caudal peduncle, and is overall much heavier-bodied. In the black goby, the fin rays of the 1<sup>st</sup> dorsal fin are extended beyond the fin membrane, and in adults may form long tendrils. Again in the black goby, the upper rays of the pectoral fin are much branched, and free of the fin membrane.



Common goby, *P. microps*, image from participating lab, reversed.



Black goby

