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***CENTROLABRUS CAERULEUS* SP. NOV., A LONG UNRECOGNIZED  
SPECIES OF MARINE FISH (TELEOSTEI, LABRIDAE)  
FROM THE AZORES**

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With 1 figure and 1 table

**ABSTRACT.** A new species of *Centrolabrus*, *C. caeruleus* sp. nov. (Teleostei, Labridae) is described from the Azores. This species was long thought to be identical with *C. trutta* (LOWE, 1833), the other macaronesian species of the genus, but differs from it in size, meristics and male nuptial coloration. *C. caeruleus* sp. nov. attains a larger size than *C. trutta*, has higher modal counts of rays (dorsal fin 26 *versus* 25, anal fin 14 *versus* 13) and of scales on the lateral line (33-34 *versus* 31-32), and the males are dark blue instead of bright green.

**RESUMO.** Descreve-se para os Açores uma nova espécie de *Centrolabrus*, *C. caeruleus* sp. nov. (Teleostei, Labridae). Esta espécie foi durante muito tempo confundida com *C. trutta* (LOWE, 1833), a outra espécie macaronésica do género, mas distingue-se desta pelo tamanho, pela merística e pela coloração nupcial dos machos. *C. caeruleus* sp. nov. atinge tamanhos superiores a *C. Trutta*, tem um maior número modal de raios (26 *versus* 25 na barbatana dorsal e 14 *versus* 13 na barbatana anal) e de escamas na linha lateral (33-34 *versus* 31-32) e os machos são azul escuro em vez de verde brilhante.

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## INTRODUCTION

*Centrolabrus* GÜNTHER, 1862 is an eastern Atlantic genus with two species recognized so far: *C. exoletus* (LINNAEUS, 1758) and *C. trutta* (LOWE, 1833). *C. exoletus* is a northern species, found from Norway and Greenland southward to Portugal; *C. trutta* is recorded for the Azores, Madeira and the Canaries (BAUCHOT & QUIGNARD, 1973; QUIGNARD & PRAS, 1986; GOMON & FORSYTH, 1990), with one unconfirmed record from Cape Verde (ROCHEBRUNE, 1882). The presence of this latter species in the Mediterranean was admitted by QUIGNARD & PRAS (1986) based on three specimens from Banyuls, France. I have examined those specimens and concluded that the determination is incorrect. Two of them (LA CIId 556, Banyuls, 2.VIII.67) have the colour pattern and meristics of *Symphodus melanocercus*, except that they have 4 (instead of 3) spines in the anal fin. The other specimen (LA CIId 514, Banyuls, Cap l' Abeille, 25 m, 28.VI.67) is most likely a *C. exoletus*, although with only 16 (instead of 18-20) spines in the dorsal fin and 29 (instead of 30-35) lateral line scales. If this determination is correct, this is the first record of this species on the Mediterranean. *C. trutta* remains, therefore, a strictly Macaronesian species.

LOWE (1833) in the description of *C. trutta* from Madeira stated that it was green, with spots, scales with a median dark spot, dark vertical bars, dark spot on caudal peduncle, 5 spines in the anal fin, and the following meristics: D XVII+8, P 15, V I+5, A V+8, C 15. Later (LOWE, 1837) he added to this description the presence of 2-3 spots in the anal and 4 spots in the dorsal fins, and erected a variety, *unicolour*, which was green, almost spotless, and qualified as very rare.

VALENCIENNES (1839) described *Acantholabrus viridis* from the Canaries, with the following characteristics: green colour, with yellow tones on the tail and soft portions of dorsal and anal fins, D XVII+9, A IV (one specimen with 5) + 9, C 13, P 14, V I+5. Later (VALENCIENNES, 1843) he separated the specimens with only 4 anal spines into another species, *A. romeritus*. In this work *A. viridis* was redefined as follows: uniform green, a faded black spot behind the eye, a paler spot at the base of the last dorsal rays, anal dark green, ventral less so, dorsal even paler, caudal and pectoral yellowish, D XVII+8, A V+8, C 13, P 13, V I+5. Two specimens of *A. romeritus* were also described: (a) D XVI+9, A IV+9, C 13, P 15, V I+5, green, darker green on the back, dorsal, anal and pelvic fins bright green, greenish caudal, yellow pectoral; (b) colours lighter than the previous specimen, two brown bands, one along the back, under the dorsal fin, and another along the lateral line; 8-10 brown lines across the flanks; unpaired fins paler, as well as the pelvics. Finally, a third species, *A. romerus*, was described, separated from the others by a sharper snout, smaller teeth and different colour pattern. The preserved specimen had many brown spots on the scales, placed in groups so as to make a marbled network on the body; dorsal and anal with the same spots; pectorals and pelvics with no spots; a dark spot each side of the tail, D XVII+8, A V+8, C 13, P 15, V I+5.

GÜNTHER (1862) created the genus *Centrolabrus* and synonymized *A. viridis* and *A. romerus* with *C. trutta*, giving the following description: D XVII+8, A V+8, lateral line 34,

transv. line 3 1/2, 11; back with two interrupted cross bars; a dark spot behind the orbit; sometimes a spot on the root of the caudal fin. This author maintained the taxa *romeritus*, stating that it was “probably identical with *C. trutta*”, and noting the following characteristics: D XVI+9, A IV+9; brownish-green, sometimes with indistinct darker longitudinal streaks. Recent authors are unanimous in considering all the above taxa to be synonym of *C. trutta* (e.g. BAUCHOT, 1963; BAUCHOT & QUIGNARD, 1973; QUIGNARD & PRAS, 1986; GOMON & FORSYTH, 1990).

The first record of a *Centrolabrus* from the Azores was that of the French malacologist DROUËT (1861), who identified his specimens as *A. romerus*. The next record is that of HILGENDORF (1888) who, like all the following authors (see synonymy below) assumed that the Azorean *Centrolabrus* was identical with the Madeiran one. However, a detailed examination of specimens from the Azores revealed meristic, metric, and colour differences with specimens from both Madeira and the Canary Islands. These differences have led me to believe that the Azorean *Centrolabrus* deserves the status of a different species.

## METHODS

Measurements (in mm) and counts were made according to HUBBS & LAGLER (1964). Some of the measurements used by QUIGNARD (1966) are included, for comparison purposes. Last soft ray of anal and dorsal fins is bifid and was counted as one.

Abbreviations: JLBSII, RUSI - J.L.B. Smith Institute of Ichthyology, Grahamstown; LA - Laboratoire Arago, Banyuls; NHM - Natural History Museum, London; MCM - Museu Carlos Machado, Ponta Delgada; MMF - Museu Municipal do Funchal; MNHN - Muséum National d'Histoire Naturelle, Paris; TL - total length; SL - standard length.

### *Centrolabrus caeruleus* sp. nov.

(Fig. 1, a-b)

#### Synonymy

*Acantholabrus romerus*: DROUËT (1861): 135.

*Centrolabrus trutta*: HILGENDORF (1888): 210; REGAN (1903): 347; FOWLER (1936): 961, 1312; COLLINS (1954): 25; ALBUQUERQUE (1954-56): 782; ARRUDA (1979): 8, 21; (1980): 339; ARRUDA *et al.* (1992): 268; PATZNER *et al.* (1992): 106; BAUCHOT & QUIGNARD (1973): 430-431; QUIGNARD & PRAS (1986): 923; GOMON & FORSYTH (1990): 871; SANTOS *et al.* (1994): ; WIRTZ (1994): 104-105; AZEVEDO (1995): 51; PORTEIRO *et al.* (1996): 27-28.

## MATERIAL

### *Centrolabrus caeruleus*

Holotype: MCM 777, 195 mm SL, Baixa da Moaçor, Ponta Delgada, São Miguel Island, 18-20 m depth, coll. J. Azevedo, 8.V.95.

Paratypes: RUSI 57803, 251 mm TL, São Vicente harbour, Capelas, São Miguel

Island, 10 m depth, coll. João Brum & Fernando Sousa, 20.VII.96; RUSI 57804, 173 mm TL, Baixa da Moaçor, Ponta Delgada, São Miguel Island, 7 m depth, coll. José M. N. Azevedo, 15.VII.95; NHM 1981.2.2, 87-93, 9 specimens (spm.), 51-221 mm TL, rock pool, Pópulo, São Miguel, EXUL Collection, Univ. London, coll. E. Wood, VIII.1973; MCM 580, 168 mm SL, Lagoa, São Miguel Island, 10 m depth, coll. P.C. Heemstra and J.M.N. Azevedo, 26.XI.89; MCM 699, 120 mm SL, Vila do Porto harbour, Santa Maria Island, coll. P.C. Heemstra and J.M.N. Azevedo, 10.VI.90; MCM 708, 179 mm SL, Formigas islets, 14-16 m depth, coll. P.C. Heemstra, 6.VI.90; MCM 719, 2 spm., 90-94 mm SL, Praia Formosa, tidepools, Santa Maria Island, coll. P.C. Heemstra & L.M. Arruda, 14.VI.90; MCM 765, 205 mm SL, São Roque islet, Ponta Delgada, São Miguel Island, coll. J.M.N. Azevedo, 12.IV.95; MCM 772, 148 mm SL, Baixa da Moaçor, Ponta Delgada, São Miguel Island, 18-20 m depth, coll. J. M. N. Azevedo, 27.IV.95; MCM 773, 168 mm SL, same locality, depth and coll., 29.V.95; MCM 774, 3 spm., 140-170 mm SL, same locality, 7 m depth, coll. Txema & Hélio Dias, 26.V.95; MCM 775, 4 spm., 134-162 mm SL, same locality, 18 m depth, coll. J.M.N. Azevedo, 19.IV.95; MCM 776, 3 spm., 160-168 mm SL, same locality, 18-20 m depth, coll. J.M.N. Azevedo, 27.IV.95; MCM 952, 2 spm., 183, 212 mm SL, Recife da cadeia, Ponta Delgada, São Miguel Island, 10 m depth, coll. João Brum, 5.V.98; MNHN, 1998-484, 203 mm TL, S. Vicente harbour, Capelas, São Miguel Island, 10 m depth, coll. João Brum & Fernando Sousa, 20.VII.96; MNHN, 1998-485, 207 mm TL, Baixa da Moaçor, Ponta Delgada, São Miguel Island, 7 m depth, coll. José M. N. Azevedo, 19.IV.95; MMF 29360, 205 mm SL, same locality and depth, coll. Txema, Hélio Dias, 26.V.95; MMF 29361, 191 mm TL, same locality and depth, coll. José M.N. Azevedo, 15.VII.95.

Other material examined: NHM 1962.6.25, 19, 1 specimen, 214 mm TL, Azores, coll. G. Chapman, no date; MCM 821.1-2, 120, 130 mm SL, Baixa da Moaçor, Ponta Delgada, São Miguel Island, 7 m depth, coll. José M.N. Azevedo, 15.VII.95; MCM 823, 112 mm TL, Santa Iria harbour, Ribeirinha, São Miguel Island, 11 m depth, coll. José M.N. Azevedo, 15.X.92; MCM 947, 2 spm., 148, 174 mm SL, Recife da cadeia, Ponta Delgada, São Miguel Island, 5 m depth, coll. José M. N. Azevedo, 12.III.95; MCM 948, 13 spm., 82-251 mm TL, same loc., depth and coll.; MCM 949, 11 spm., 80-240 mm TL, same loc., depth and coll.; MCM 953, 2 spm., 116, 136 mm SL, Santa Iria harbour, Ribeirinha, São Miguel Island, 11 m depth, coll. José M.N. Azevedo & João Brum, 10.XI.89.

#### *Centrolabrus trutta*

Madeira: MMF 108/109, 93, 141 mm SL, Funchal market, no date; MMF 2801, 157 mm SL, no data, prob. Madeira; MMF 3249/3250, 155, 150 mm SL, Funchal market, 7.VIII.1951; MMF 3750, 150 mm SL, Funchal market, 2.VII.1953; MMF 3768, 158 mm SL, Funchal market, 18.VI.1953; MMF 4500, 141 mm SL, Funchal market, 2.VII.1953; MMF 4535, 140 mm SL, Funchal market, 19.VII.1953; MMF 6191, 109 mm SL, Funchal market, 24.VIII.1955; NHM 1953.11.1, 233-235, 3 spm., 128-171 mm TL, Funchal market, coll. D.W. Tucker, VIII-IX.1953; NHM 1984.3.6, 39-60, 28 spm., 36-125 mm TL, Ponta dos Reis Magos, Caniço, coll. A.C. Wheler, 30.VII.1975; MCM 769, 3 spm., 77-103 mm SL, Reis Magos, line

fishing, 29.III.95; MCM 950, 7 spm., 170-201 mm TL, Reis Magos, 5 m depth, coll. João Brum, 21.IV.98; MCM 951, 7 spm., 113-176 mm TL, same loc., depth and coll., 22.IV.98.

Canaries: NHM 1983.10.11, 77-87, 5 spm., 101-121 mm TL, coll. Capt. Totton, no date; NHM 95.11.29, 3-4, 2 spm., 179, 132 mm TL, Tenerife, coll. A.J. Arendrup, no date.

### Diagnosis

A species of *Centrolabrus* presumably endemic to the Azores and distinguishable from *C. trutta*, the other macaronesian species of this genus, by the higher modal counts of rays on the dorsal (26 *versus* 25) and anal fins (14 *versus* 13), higher number of scales on the lateral line (33-34 *versus* 31-32), by its larger size, and by the coloration of the males in the spawning season (dark blue *versus* bright green). Table 1 lists the main meristic differences between the *Centrolabrus* from the Azores and Madeira. The typical coloration of females and territorial males of *C. trutta* are shown on Fig. 1, c-d.

### Description

Meristics (modal count and range). Fin rays: D XVIII (XVII-XVIII) + 8 (8-9); A VI (V-VI) + 8 (7-9); P 14 (14-15); V I+5; C 15 (14-15). Gillrakers 14 (13-15). Scales: lateral line 34 (33-34); lateral line *sensu* QUIGNARD (1966): 37 (35-38); above lateral line 4 (4-5), below 10 (9-11).

Size (SL) of the largest specimen examined: females, 175 mm; males, 215 mm.

Measurements (average and range, in percentage of the standard length): total length 125 (123-127); standard length (*sensu* QUIGNARD, 1966) 108 (105-110); snout length 14 (12-18); eye length 5 (5-6); postorbital head length 16 (15-17); pre-dorsal length 32 (30-35); pre-pectoral length (QUIGNARD, 1966) 34 (31-35); pre-pelvic length 40 (36-42); pre-anal length 62 (58-66); dorsal fin base length 58 (55-62); anal fin base length 27 (24-30); pectoral fin length (QUIGNARD, 1966) 23 (21-25); body depth 40 (37-43); caudal peduncle length 17 (15-20); caudal peduncle least depth 16 (15-19).

Colour. Females: brownish green background, darker above, lighter ventrally. Checkered pattern of small dark brown spots on the body. This pattern is specially marked along the lateral line and above it, on the dorsal contour of the body. Four horizontally elongated spots are usually visible, followed by a fifth one on the dorsal side of the caudal peduncle, encompassing the end of the dorsal fin. This pattern is reflected on 5 and 3 corresponding spots, respectively on the dorsal and anal fins. The anteriormost of these spots is sometimes less visible. One large spot near the end of the caudal peduncle, below the lateral line. Brown lines bordering the base of the pectoral and caudal fins and from eye to below the mouth. Pectoral and pelvic fins light green to yellowish, almost spotless. Males: dark blue-greenish background, blue tone especially marked on the reproductive season. Darker blue or black spots and lines corresponding to those of the females, although usually much less distinct. Pectoral and pelvic fins a lighter blue. On preserved specimens, the green/blue background gradually turns light brown, but the pattern of spots remains visible.

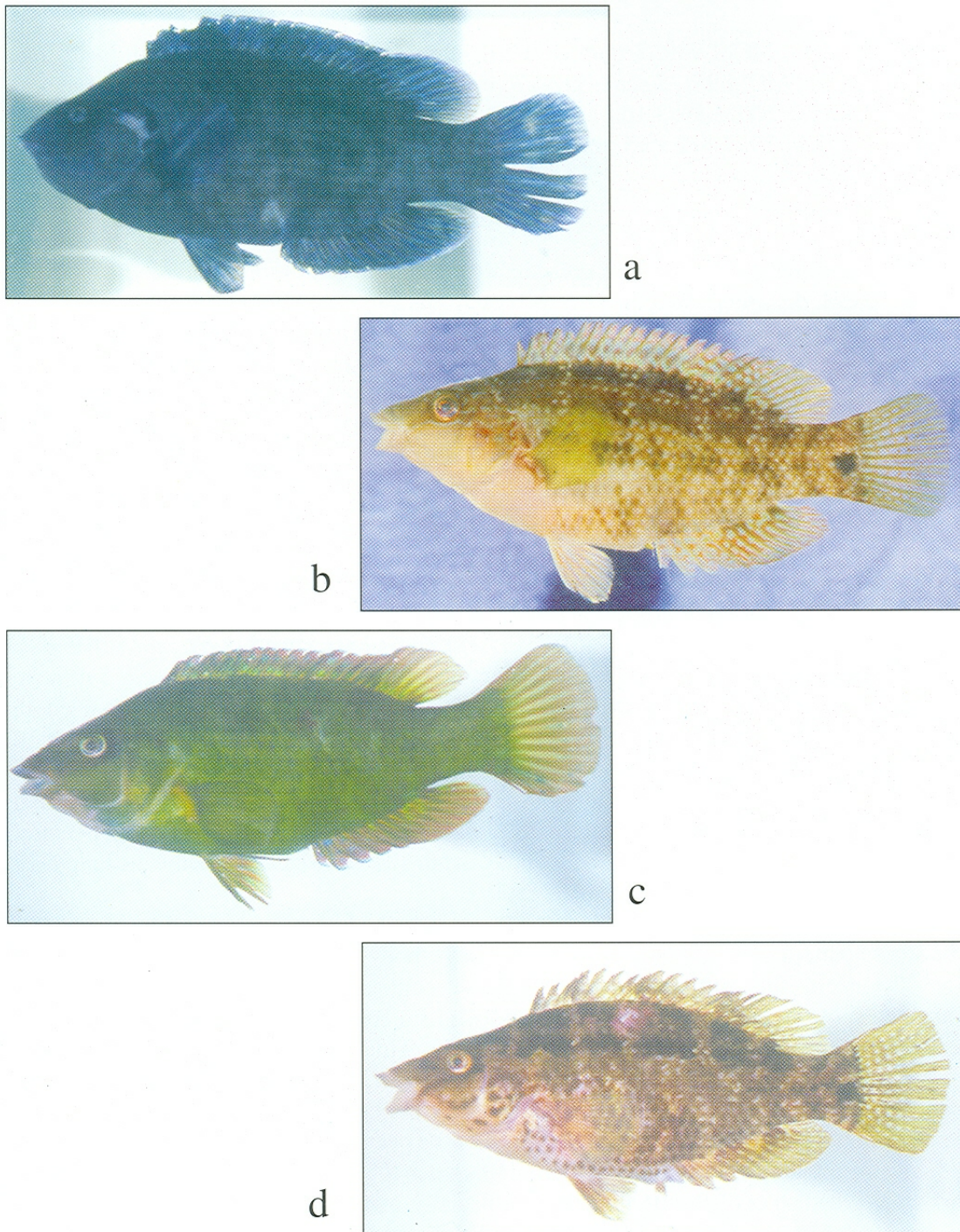


Fig. 1 - *Centrolabrus caeruleus* sp. nov., male, MCM 952, 183 mm SL (a) and female, MCM 699, 120 mm SL (b); *C. trutta*, male, MCM 950, 170 mm TL (c) and female, MCM 951, 131 mm TL (d).

**TABLE 1** - Main meristic and metric differences between the *Centrolabrus* from the Azores (AZO) and Madeira (MAD).

	AZO	MAD
<b>Maximum SL (mm)</b>		
female	180	137
male	215	147
<b>Dorsal fin rays</b>		
XVI+8		4
XVI+9		1
XVII+8	1	44
XVII+9	4	3
XVIII+7		1
XVIII+8	48	1
XVIII+9	4	
<b>Anal fin rays</b>		
IV+9		2
V+7	1	1
V+8	3	47
V+9	13	1
VI+7	5	1
VI+8	33	
<b>Gill rakers</b>		
12		2
13	7	10
14	11	5
15	2	4
16		1
<b>Lateral line (l.l.) scales</b>		
31		5
32		11
33	20	1
34	25	
<b>Scales above l.l.</b>		
3		55
4	52	
5	1	

## Distribution

This is one of the most common littoral species of the Azores, being present in all the islands (pers. obs.). It can be found in intertidal pools and in the subtidal down to about 30 meters, although it is more common in the upper 5-15 meters depth.

## Etymology

The name *caeruleus*- blue - was chosen because of the distinctive nuptial coloration of the males.

## DISCUSSION

*C. exoletus* is a gonochoric species, with marked sexual dimorphism and dichromatism: males are bigger (QUIGNARD, 1966) and have a colour pattern (termed secondary) that is different from the one seen on the juveniles, females and young males (HILLDEN, 1984; MICHEL *et al.*, 1987). This same phenomenon also occurs on the macaronesian *Centrolabrus*: the primary colour pattern consists of a greenish brown background, with a marbled or checkered pattern of dark brown spots; the secondary colour pattern is characterized by a different background colour and much less distinct spots and lines. The main colour difference between *C. trutta* and *C. caeruleus* is in the background of the males: it is bright green in the Madeiran species and dark blue in the Azorean one.

The presence of different colour patterns has misled past century authors. LOWE's (1833) *C. trutta* was described from specimens with the primary colour pattern, the males being later described as a variety, *C. trutta* var. *unicolour*. From the descriptions of VALENCIENNES (1847) it is clear that *A. viridis* has the secondary colour pattern; the status of *A. romeritus* and *A. romerus* is less clear.

Up to the present, only one endemic littoral fish was known for the Azores: *Scorpaena azorica* ESCHMEYER, 1969. It was described from one single specimen collected by W. TRELEASE in 1894, with no detailed depth or locality data, and has not been reported ever since. A probable cause of the lack of endemism in the Azores fish fauna was seen by BRIGGS (1974) in the "severe drops in Pleistocene sea surface temperature that may have wiped out the older fauna. If the Azores have been repopulated within the past 12,000 years, very little evolutionary change could be expected". In this context, *C. caeruleus* may be seen as an endemic Azorean taxa, evolving by allopatric speciation from *C. trutta* (or from a common ancestor) following a post-glaciation colonization. A detailed study of the Azorean, Madeiran and Canarine populations of Macaronesian *Centrolabrus* is needed, in order to establish their relationships with each other and with *C. exoletus*.

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