

A CHECKLIST OF THE BLENNIOID FISHES (TELEOSTEI, BLENNIOIDEI) OCCURRING IN PORTUGUESE WATERS

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ARQUIPÉLAGO



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Twenty species of blenniid fishes have been cited from Portuguese waters. A survey of the published literature and personal observations by the authors allowed to confirm the presence of eighteen species: *Clinitrachus argentatus*, *Labrisomus nuchipinnis*, *Tripterygion delaisi*, *Blennius ocellaris*, *Coryphoblennius galerita*, *Lipophrys canevae*, *L. dalmatinus*, *L. pholis*, *L. trigloides*, *Parablennius gattorugine*, *P. pilicornis*, *P. rouxi*, *P. ruber*, *P. incognitus*, *P. sanguinolentus-parvicornis*, *Salaria fluviatilis*, *S. pavo* and *Ophioblennius atlanticus*. A check-list is provided with information on the geographic distribution of the confirmed occurrences of blenniid species in Portuguese waters.

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Foram citadas para águas portuguesas vinte espécies de peixes Bleniídeos. Um exame crítico da literatura e observações pessoais permitiram confirmar a existência de dezoito espécies: *Clinitrachus argentatus*, *Labrisomus nuchipinnis*, *Tripterygion delaisi*, *Blennius ocellaris*, *Coryphoblennius galerita*, *Lipophrys canevae*, *L. dalmatinus*, *L. pholis*, *L. trigloides*, *Parablennius gattorugine*, *P. pilicornis*, *P. rouxi*, *P. ruber*, *P. incognitus*, *P. sanguinolentus-parvicornis*, *Salaria fluviatilis*, *S. pavo* and *Ophioblennius atlanticus*. Apresenta-se uma lista das espécies confirmadas para as Costas Portuguesas, com informações sobre a distribuição geográfica das ocorrências conhecidas.

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INTRODUCTION

The last comprehensive survey of the Portuguese marine ichthyofauna was published by ALBUQUERQUE (1954-56). Since then many species have been reported from Portuguese waters. In the meantime the views on the taxonomy of many fish groups have changed substantially. Thus, updated checklists of different fish groups are needed. The publication of "Check-list of the Fishes of the North Eastern Atlantic and of the Mediterranean (Ciofnam)" (HUREAU & al. 1979)

and "Fishes of the North-eastern Atlantic and the Mediterranean (FNAM)" (WHITEHEAD & al. 1986) have helped to improve this situation but their wide geographical scope did not lend itself to detailed revision of local faunal data. Thus, a comprehensive faunal list of the marine fishes of Portugal is urgently needed.

In the case of blenniid fishes, several species present in our study area were not mentioned in FNAM and the distribution provided for others does not agree with the literature reviewed in this paper. Since the work of ALBUQUERQUE (1954-

56), six new species have been added to the Portuguese fauna, and several new occurrences of previously reported species have modified our understanding of their distribution in Portugal. On the other hand, a profound revision of the tribe Blenniini was published by BATH (1977) and followed by several comments and up-datings (BATH 1978, 1982; ZANDER 1978; BOCK & ZANDER 1986; BATH & WIRTZ 1989). An important revision on the eastern Atlantic and Mediterranean tripterygiids was also provided by WIRTZ (1980).

The present checklist up-dates the information on the distribution of blennioid fishes in Portuguese waters. For each species a list of synonyms used in previous papers on the Portuguese fauna is provided in order to help with the interpretation of the entire available literature. Species descriptions are not provided since they are easily available in the literature (BATH 1977; WIRTZ & ZANDER 1986; ZANDER 1986a, b). An identification key for the blenniids and tripterygiids of Portugal was published by ALMEIDA (1985). Data on the ecology, ethology and life-history of blennioids from Portugal were published elsewhere and can be found in our list of references.

We are aware that the research effort in different areas of the Portuguese coast has varied considerably. Thus, the distributional data presented here must be regarded with caution. In particular the sub-littoral fauna of the north-west coast of mainland Portugal is in great need of study. A preliminary zoogeographical analysis of the blennioid fauna of Portugal will be published elsewhere.

MATERIAL AND METHODS

Study area

In this paper we have covered three different geographical areas: mainland Portugal, the Azorean archipelago and the Madeiran archipelago. These three areas were included in the lusitanian zoogeographical province by BRIGGS (1974).

Data sources

Data on the occurrence and distribution of each species were collected from the literature and personal observations by the authors (see Table I and Fig.1). In the analysis of the published data care

was taken to differentiate clearly between primary and secondary sources, and only occurrences confirmed from primary sources were retained. As primary sources we considered papers where material was directly observed by the authors and its geographical origin clearly stated.

Synonymy

In checking primary sources especially the earlier papers, we were confronted with several synonyms for each valid species. Thus the interpretation of data followed the synonymy presented by WHEELER (1973a), BATH (1977, 1990a) and WIRTZ (1980). In some cases old descriptions of unidentified specimens were assigned to a valid species either by reexamination of the material or by the presence of clearly diagnostic features in the published descriptions.

Taxonomic criteria

At the family level the classification of NELSON (1984) was adopted. Concerning the tribes of the family Blenniidae we followed SPRINGER (1968) with the modification proposed by BOCK & ZANDER (1986), who separate the previously recognized tribe Blenniini into two new tribes: Blenniini and Parablenniini. At the generic level we followed BATH (1977, 1982) with the exception of the genus *Paralipophrys* for which the arguments proposed by BOCK & ZANDER (1986) were accepted leading to its inclusion in the genus *Lipophrys*. We did not adopt the view of BOCK & ZANDER (1986) concerning the genus *Salaria* for reasons that will be presented elsewhere.

List of citations

Each entry in the list below corresponds to a valid species. For each species a list of synonyms is provided and the known citations are listed chronologically. For each citation the area to which it refers is indicated (P= mainland Portugal; A= the Azorean archipelago; M= the Madeiran archipelago). Secondary sources are also listed, marked with an (*). For each valid species the first record for each area is presented. When considered useful, a short comment on the data is included.

Table 1
List of known occurrences of Blenniod species in Portuguese Waters.

Loc.	C.arg.	L.nuc.	T.del.	B.oce.	C.gal.	L.can.	L.dal.	L.pho.	L.tri.	P.gat.
A				69				9,49,69,73		10,49,69
B								73		69,73
C								73		
D										69
E								69,93		69,93
F								69		69
G					69,74			69,73,74		69,74
H					21			21	21	21,66,69
I										10,49
J								54		54
K								69		54,69,94
L								69		
M								69,93		69
N					54			69	54	
O								54,69	54	54
P			RO,EG,AA		54			AA	AA	54,AA
Q					5,21			21	21	21
R					5					
S								35,69		
T					18,21			18,21	18,21	18,21
U	49			10	5,49,72,AA			10,37,49,72	AA	49
V								72		
W			15,AA	49	18,21			18,21,48,	18,21	18,21,48,49
X								54,69		
Y			RO,EG		RO,EG	RO,EG		4,7,8		
Z	49							35,69		42,69,72
AA										69
AB										AA
AC					AA	AA		48,AA		48,AA
AD			15					48,49		34,48,AA
AE			15				17			
AF					21			21	21	21,AA
AG	21		AA	49		15				
AH				54	54				54	54
AI					AA	15			AA	AA
AJ					AA	AA		AA		AA
AK	13									
AL						50				50
AM										
AN										
AO		90,101	46,51,58,59, 60,70,100,AA		23,25,43,46, 51,58,59,60, 96			23,51,58,59, 60	45,46,51,58, 61	
AP			14		14			14	14	
AQ			AA							
AR										
AS			52,75,76,AA	RS	16,19,75			19,87,76	16,19,76	
AT			AA,RS		RS			RS	RS	
AU			AA,RS		RS					
AV			AA,52		16			AA,52	16,52	
AW			RS		RS			RS		
AX			52,103,AA, RS	83	103,RS			RS	RS	
AY								RS	RS	
AZ			RS		RS			RS		
BA					RS			RS		
BB			RS		RS			RS	RS	

References, as well as personal observations, regarding sites where species occurred are given. References were numbered (see corresponding section) and only the numbers are given. In the case of the Azores and Madeira we have only mentioned the islands and not the precise locations of the occurrences because many citations mentioned only the island. Although the tributaries of Guadiana river are not represented *S. fluviatilis* occurs in many locations of the Guadiana basin (Fig. 1). Letters represent locations (see Fig. 1, where sites and abbreviations are given); numbers stand for references.

Table 1 (cont.)

Loc.	<i>P.pil.</i>	<i>P.rou.</i>	<i>P.rub.</i>	<i>P.ten.</i>	<i>P.inc.</i>	<i>P.san.</i>	<i>S.flu.</i>	<i>S.pav.</i>	<i>O.a.atl.</i>
A									
B									
C									
D			69						
E									
F									
G				74				74	
H									
I									
J									
K									
L									
M									
N									
O									
P	AA		AA						
Q									
R									
S									
T									
U	6,49,AA	AA	AA						
V								35	
W									
X	6,17	15							
Y					RO,EG				
Z	42							35	
AA								AA	
AB									
AC	AA								
AD	AA	15	AA						
AE	17	15	34	34				34	
AF									
AG					21				
AH	17	AA			17				
AI									
AJ	17				AA			AA	
AK								AA	
AL								65	
AM	50							3,50	
AN							2		
AO			46,58,60,AA			23,38,43,45, 46,51,58,59, 60 AA			43,51,58,59, 60,91,AA
AP									AA
AQ									AA
AR									108,AA
AS			11,16,19,52, 76,83 16,RS		16,75,76	16,19,77,80, 81,82,84,85 RS			16,52,75,76
AT			16,RS		RS	RS			16,AA,RS
AU			16,RS			RS			16,AA,RS
AV			11,16,52		16	16,52			16,52,78
AW					67,68,RS	RS			RS
AX			11,16,52,103, RS		16,103,RS	105,RS			16,52,78,103, AA,RS
AY			RS			RS			RS
AZ			RS			RS			RS
BA			RS		RS	RS			RS
BB			RS		RS	RS			RS

Letters within cells refer to personal observations by the authors: (RO) R.F. Oliveira; (VA) V.C. Almada; (AA) A.J. Almeida; (RS) R.S. Santos; (EG) E.J. Gonçalves. Abbreviations of species names are as follows: (*C.arg*) *Clinitrachus argentatus*; (*L.nuc.*) *Labrisomus nuchipinnis*; (*T.del*) *Tripterygion delaisi*; (*B.oce.*) *Blennius ocellaris*; (*C.gal.*) *Coryphoblennius galerita*; (*L.can.*) *Lipophrys canevae*; (*L.dal.*) *L. dalmatinus*; (*L.pho*) *L. pholis*; (*L.tri*) *L. trigloides*; (*P.gat*) *Parablennius gattorugine*; (*P.pil.*) *P. pilicornis*; (*P.rou.*) *P. rouxi*; (*P.rub.*) *P. ruber*; (*P.ten.*) *P. tentacularis*; (*P.inc.*) *P. incognitus*; (*P.san.*) *P. sanguinolentus-parvicornis*; (*S.flu*) *Salaria fluviatilis*; (*S.pav.*) *S. pavo*; (*O.a.atl.*) *Ophioblennius atlanticus atlanticus*.

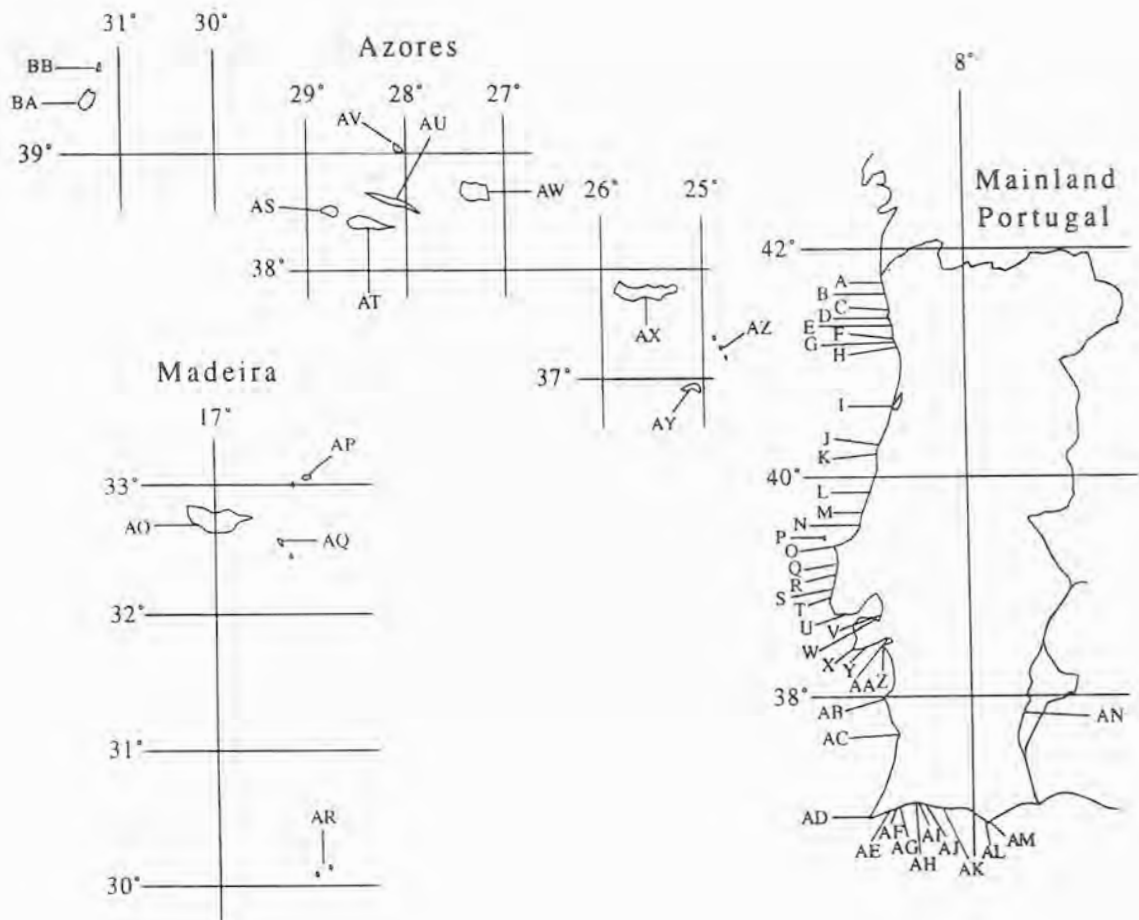


Fig. 1 - Map of the known occurrences of blennioids in Portuguese waters. Each location is represented by a letter: (A) Vila Praia de Âncora; (B) Viana do Castelo; (C) Apúlia; (D) A-Ver-o-Mar; (E) Póvoa do Varzim; (F) Leça da Palmeira; (G) Matosinhos; (H) Porto; (I) Aveiro; (J) Cabo Mondego; (K) Buarcos-Figueira da Foz; (L) S. Pedro de Muel; (M) Nazaré; (N) S. Martinho do Porto; (O) Peniche; (P) Berlenga island; (Q) Praia da Consolação; (R) Praia de Stº Cruz; (S) Ericeira; (T) Magoito; (U) Cascais-Estoril; (V) Montijo; (W) Alfeite; (X) Sesimbra-Espichel; (Y) Arrábida; (Z) Setúbal; (AA) Caldeira de Tróia; (AB) Sines; (AC) Vila Nova de Milfontes; (AD) Sagres; (AE) Lagos; (AF) João de Arens; (AG) Praia do Vau; (AH) Portimão; (AI) Praia da Rocha; (AJ) Carvoeiro; (AK) Armação de Pera; (AL) Faro; (AM) Culatra; (AN) Guadiana river; (AO) Madeira; (AP) Porto Santo; (AQ) Desertas; (AR) Selvagens; (AS) Faial; (AT) Pico; (AU) S. Jorge; (AV) Graciosa; (AW) Terceira; (AX) S. Miguel; (AY) Stª Maria; (AZ) Formigas Islets; (BA) Flores; (BB) Corvo.

RESULTS

In the survey of the literature we found citations of 20 blennioid species in Portuguese waters. In Table 1 we list the valid species cited for each area considered in this paper. Since FNAM is now the standard list of fishes for our study area we decided to mark in Table 2 the occurrences cited by FNAM in order to facilitate the comparison of the two lists.

CLINIDAE

Clinitrachus argentatus (Risso, 1810)

Cristiceps testudinarius: GONÇALVES 1941, p.82 (P); ALBUQUERQUE 1954-56 (*), p.815 (P).

Clinitrachus argentatus: WHEELER 1973a (*), p.530 (P); ALMEIDA 1986, p.2 (P); WIRTZ & ZANDER 1986 (*), p.1117 (P); ARRUDA 1990, p.321 (P).

First record: P= GONÇALVES 1941.

LABRISOMIDAE

Labrisomus nuchipinnis (Quoy & Gaimard, 1824)

Labrisomus nuchipinnis: SPRINGER 1958, p.429 (M).

First record: M= SPRINGER 1958.

Comments: The presence of this species in the island of Madeira was recently confirmed by M. Biscoito (Museu Municipal do Funchal, personal communication). Its presence in that island is also given by WIRTZ & HELLINGER (1987: Abb. 2)

TRIPTERYGIIDAE

Tripterygion delaisi Cadenat & Blache, 1971

Tripterygion nasus: LOWE 1839, p.83 (M), 1837(1841), p.185 (M), 1839(1842), p.9 (M); GÜNTHER 1861, p.276 (M); NORONHA & SARMENTO 1934, p.102 (M).

Tripterygion melanurum: COLLETT 1897b, p.11 (A).

Tripterygion tripteronotus: FOWLER 1936 (*), p.1036 (M); MAUL 1948 (*), p.155 (M); NORONHA & SARMENTO 1948 (*), p.97 (M); ALBUQUERQUE 1954-56 (*), p.816 (M); WHEELER 1973b (*), p.531 (M).

Tripterygion xanthosoma: WOOD & WILLIAMS 1973, p.67 (A); ALMEIDA & GOMES 1978, p.16 (P).

Tripterygion delaisi: WIRTZ 1980, p.85 (M); ZANDER 1986b (*), p.1119 (P,M); PATZNER & al. 1992 (A).

First records: P= ALMEIDA & GOMES 1978; A= WOOD & WILLIAMS 1973; M= LOWE 1839.

Comments: Although the specimens from Madeira were identified as *T. tripteronotus*, WIRTZ (1980) examined the material from Madeira and concluded that they belonged to *T. delaisi*. Except for one single specimen (WIRTZ & HELLINGER 1987) collected on the Atlantic coast of northern Morocco, all the known occurrences of *T. tripteronotus* are in the Mediterranean sea.

BLENNIIDAE

Tribe Blenniini

Blennius ocellaris Linnaeus, 1758

Blennius ocellaris: REGAN 1903, p.348 (A); NOBRE 1935, p.135 (P); GONÇALVES 1941, p.83 (P); HELLING 1943, p.66 (P); ALBUQUERQUE 1954-56 (*), p.808 (P,A); BATH 1973 (*), p.519 (P); ALMEIDA 1981, p.6 (P); HELDEN & WIRTZ 1985, p.200 (P); ZANDER 1986a (*), p.1098 (P); SANTOS 1987 (*), p.353 (A).

First records: P= NOBRE 1935; A= REGAN 1903.

Comments: Despite the absence of published primary citations in recent years for the Azores, P. Wirtz (personal communication) observed this species at Horta (Faial) in 1990, and we (RSS) confirmed this finding, posteriorly, on several occasions.

Tribe Parablenniini

Coryphoblennius galerita (Linnaeus, 1758)

Blennius artedii: VALENCIENNES in CUVIER & VALENCIENNES 1836, p.231 (M); LOWE 1839, p.83 (M), 1839(1842), p.9 (M).

Blennius inaequalis: LOWE 1837 (1841), p.185 (M).

Blennius galerita: GÜNTHER 1861, p.222 (M); Von MARTENS 1867, p.393 (M); OSÓRIO 1896, p.154 (P); COLLETT 1897a, p.44 (A), 1897b, p.10 (A); VIEIRA 1900 (*), p.155 (P); SEABRA 1911 (*), p.164 (P); FOWLER 1936 (*), p.1045 (M); GONÇALVES 1941, p.83 (P); HELLING

Table 2

Distribution of blennioid species cited for Portuguese waters. Symbols are as follows: 1 = present; 0 = absent; ? = questionable citation; (!) exceptional occurrence; (+) = occurrence to this area referred by FNAME.

SPECIES	MAINLAND	AZORES	MADEIRA
<i>Clinitrachus argentatus</i>	1(+)	0	0
<i>Labrisomus nuchipinnis</i>	0	0	1
<i>Tripterygion delaisi</i>	1(+)	1	1(+)
<i>Blennius ocellaris</i>	1(+)	1	0
<i>Coryphoblennius galerita</i>	1(+)	1(+)	1(+)
<i>Lipophrys canevae</i>	1(+)	0	0
<i>Lipophrys dalmatinus</i>	1(+)	0	0
<i>Lipophrys pholis</i>	1(+)	1	1(+)
<i>Lipophrys trigloides</i>	1(+)	1	1(+)
<i>Parablennius gattorugine</i>	1(+)	0	0
<i>Parablennius pilicornis</i>	1(+)	0	0
<i>Parablennius rouxi</i>	1(+)	0	0
<i>Parablennius ruber</i>	1	1(+)	1(+)
<i>Parablennius tentacularis</i>	?(+)	0	0
<i>Parablennius incognitus</i>	1(+)	1	1
<i>Parablennius sang./parv.</i>	1(+)	1(+)	1(+)
<i>Hypoleurochilus</i> sp.	0	!	0
<i>Salaria fluviatilis</i>	1	0	0
<i>Salaria pavo</i>	1(+)	0	0
<i>Ophioblennius a. atlanticus</i>	0	1	1

1943, p.65 (P); MAUL 1948 (*), p.155 (M); NORONHA & SARMENTO 1948 (*), p.96 (M).

Salarias symplocus: HILGENDORF 1888a, p.79 (A), 1888b, p.209 (A).

Blennius montagu: OSÓRIO 1888, p.174 (P); VIEIRA 1900 (*), p.155 (P); NOBRE 1935 (*), p.138 (P).

Coryphoblennius galerita: ALBUQUERQUE 1954-56 (*), p.812 (P,A,M); BATH 1973 (*), p.526 (P); WOOD & WILLIAMS 1973, p.67 (A); BATH 1977, p.182 (M), 1979, p.319 (M); ARRUDA 1979a, p.329-333 (P), 1979b, p.14 (A), 1980, p.340 (P,A); GOMES & ALMEIDA 1979, p.325 (P); ALMEIDA 1981, p.6 (P); CARVALHO 1982, pp.31-43 (P); ALMADA & al. 1983, pp.166 (P); ALMEIDA & HARMELIN-VIVIEN 1983 p.44 (A); ZANDER 1986a (*), p.1098 (P,A,M); SANTOS 1987, p. 353 (A); ARRUDA 1990, p.321 (P); PATZNER & al. 1992 (P); ALMEIDA (in press) (M).

First records: P= OSÓRIO 1888; A= HILGENDORF 1888a; M= VALENCIENNES 1836.

Comments: This species was referred to as *B. inaequalis* (LOWE 1837-41), a synonym for *Salaria fluviatilis* (BATH 1977). In a subsequent paper LOWE (1839) corrected his previous identification to *B. artedii* which is a synonym of *C. galerita*, and the description corresponds in fact to this species.

Lipophrys canevae (Vinciguerra, 1880)

Blennius canevae: ALMEIDA & GOMES 1978, p.14 (P).

Lipophrys canevae: ZANDER 1986a (*), p.1102 (P); GONÇALVES 1990, p.33 (P); ALMADA & al. 1992 (P).

First record: P= ALMEIDA & GOMES 1978.

Lipophrys dalmatinus (Steindachner & Kolombatovic, 1883)

Blennius dalmatinus: ALMEIDA & al. 1980, p.239 (P); ZANDER 1986a (*), p.1102 (P).

First record: P= ALMEIDA & al. 1980.

Lipophrys pholis (Linnaeus, 1758)

Pholis laevis: LOWE 1839, p.83 (M), 1837(1841), p.185 (M), 1839(1842), p.9 (M).

Pholis bufo: LOWE 1843, p.87 (M).

Blennius bufo: GÜNTHER 1861, p.562 (M); FOWLER 1936 (*), p.1047 (M); MAUL 1948 (*), p.155 (M); NORONHA & SARMENTO 1948 (*), p.96 (M); ALBUQUERQUE 1954-56 (*), p.811 (M); BATH 1973 (*), p.520 (A,M).

Blennius pholis: CAPELLO 1880, p.24 (P); OSÓRIO 1888, p.175 (P); VIEIRA 1893, p.6 (P); OSÓRIO 1895, p.263 (P), 1896, p.154 (P); VIEIRA 1897, p.175 (P); SEABRA 1911 (*), p.164 (P); NOBRE 1935, p.137 (P); GONÇALVES 1941, p.84 (P); HELLING 1943, p.66 (P); MAUL 1948 (*), p.155 (M); NORONHA & SARMENTO 1948 (*), p.96 (M); ALBUQUERQUE 1954-56 (*), p.809 (P,M); BATH 1973 (*), p.523 (P,M); GOMES & ALMEIDA 1979, p.325 (P); HARMELIN & HARMELIN-VIVIEN 1979, p.6 (A); ALMEIDA 1981, p.8 (P); CARVALHO 1982, p.31-43 (P); SANTOS & al. 1989, pp. 623-632 (P).

Lipophrys pholis: BATH 1977, p.192 (M); ARRUDA 1979a, pp.329-330 (P), 1979b, p.25 (A), 1980, p.340 (P,A); ZANDER 1986a (*), p.1104 (P,M); SANTOS 1987, p.353 (A); SANTOS & ALMADA 1988b, p.180 (P,A); SANTOS & al. 1988, 9pp. (P,A); ALMADA & al. 1990a, pp.913-916 (P), 1990b, pp.27-36 (P); ARRUDA 1990, p.321 (P); PATZNER & al. 1992 (A); ALMADA & al. 1992 (P); ALMEIDA in press (M).

First records: P= CAPELLO 1880; A= ARRUDA 1979b; M= LOWE 1839.

Comments: The Azorean population of *L. pholis* differs from that of the mainland both in size and the distribution of several meristic characters (SANTOS & ALMADA 1988b; SANTOS & al. 1988).

Lipophrys trigloides (Valenciennes, 1836)

Blennius trigloides: LOWE 1839, p.83 (M); GÜNTHER 1861, p.227 (M); FOWLER 1923, p.35 (M), 1936, p.1048 (M); HELLING 1943, p.67 (P); MAUL 1948 (*), p.155 (M); NORONHA & SARMENTO 1948 (*), p.97 (M); ALBUQUERQUE 1954-56 (*), p.810 (P,M); BATH 1973 (*), p.525 (P,M); HARMELIN & HARMELIN-VIVIEN 1979,

p.6 (A); CARVALHO 1982, pp. 31-43 (P); ALMEIDA & HARMELIN-VIVIEN 1983, p.44 (A).

Pholis trigloides: LOWE 1843, p.87 (M).

Paralipophrys trigloides: ARRUDA 1979a, p.329-330 (P), 1979b, p.16 (A), 1980, p.340 (P,A), 1990, p.321 (P); BATH 1990a (*), p.911 (M); ALMEIDA in press (M).

Lipophrys trigloides: ZANDER 1986a (*), p.1105 (P,M); SANTOS 1987, p. 353 (A); PATZNER & al. 1992 (A).

First records: P= HELLING 1943; A= ARRUDA 1979; M= LOWE 1839.

Parablennius incognitus (Bath, 1968)

Blennius inaequalis: NOBRE 1924, p.64 (A), 1930, p.50 (A); ALBUQUERQUE 1954-56 (*), p.806 (A).

Blennius incognitus: WOOD & WILLIAMS 1973, p.67 (A); ALMEIDA & al. 1980, p.238 (P); ALMEIDA & HARMELIN-VIVIEN 1983, p.41 (A); PORTEIRO & SANTOS 1988, p.163 (A).

Parablennius incognitus: ZANDER 1986a (*), p.1107 (P); SANTOS 1987, p. 353 (A); ARRUDA 1990, p.321 (P); BATH 1990a (*), p.909 (M); PATZNER & al. 1992 (A).

? *Blennius verruckeni*: WOOD & WILLIAMS 1973, p.66 (A).

First records: P= ALMEIDA & al. 1980; A= NOBRE 1924; M= BATH 1990a (after a letter from G.E. Maul, 1974).

Comments: NOBRE (1924, 1930) identified as *Blennius inaequalis* some specimens collected at Terceira island (Azores). The author mentioned that the criteria used for this identification were those provided by CARUS (1893). An examination of the original work (CARUS 1893) shows that *B. inaequalis* was a synonym of *B. canestrini*, which is also, apparently, a synonym of *Parablennius incognitus* (cited by BATH 1977 with a question mark). Recent examinations of specimens in The Natural History Museum, London, carried out by the authors, revealed that the specimens identified as ? *B. verruckeni* by WOOD & WILLIAMS 1966, were females of *P. incognitus*.

Parablennius gattorugine (Linnaeus, 1758)

Blennius gattorugine: CAPELLO 1867a, p.226 (P), 1867b, p.231 (P), 1880, p.24 (P); OSÓRIO 1888, p.174 (P), 1895, p.263 (P), 1896, p.154 (P); NOBRE 1897, p.59 (P); VIEIRA 1893, p.8 (P), 1897, p.175 (P); SEABRA 1911 (*), p.163 (P);

NOBRE 1935, p.130 (P); GONÇALVES 1941, p.82 (P); HELLING 1943, p.66 (P); ALBUQUERQUE 1954-56 (*), p.803 (P); BATH 1973 (*), p.521 (P); GOMES & ALMEIDA 1979, p.325 (P); ALMEIDA 1981, p.3 (P); CUNHA & PENEDA 1985, p.31 (P).

Parablennius gattorugine: ARRUDA 1979a, p.329-330 (P), 1980, p.340 (P); ZANDER 1986a (*), p.1106 (P); ARRUDA 1990, p.321 (P); GONÇALVES 1990, p.33 (P).

First record: P= CAPELLO 1867a.

Comments: Although older papers reported this species for the Azores and Madeira islands, ALMEIDA (1979, 1982), examining fish collected from the Azores and specimens from the Museu Municipal do Funchal (Madeira), concluded that the occurrences given must be reinterpreted as belonging to *P. ruber*, and that *P. gattorugine* is present only in the mainland.

Parablennius pilicornis (Cuvier, 1829)

Blennius sp.: CAPELLO 1867a, p.227 (P); GONÇALVES 1941, p.84.

Blennius pilicornis: ALMEIDA & al. 1980, p.235 (P); ALMEIDA 1981, p.9 (P); CUNHA & PENEDA 1985, p.31 (P).

Parablennius pilicornis: ZANDER 1986a (*), p.1108 (P); ALMADA & al. 1987, pp.261-280 (P); GONÇALVES 1990, p.33 (P).

First record: P= CAPELLO 1867a.

Comments: *P. pilicornis* was first cited as occurring in Portuguese waters by ALMEIDA & al. (1980). The same author (ALMEIDA 1981) re-examining the specimens described by GONÇALVES (1941) as *Blennius* sp. found that they belong to *P. pilicornis*. A reinterpretation of the description of *Blennius* sp. by CAPELLO (1867a) leads us to the conclusion that this specimen also belong to this species.

Parablennius rouxi (Cocco, 1833)

Blennius rouxi: ALMEIDA & GOMES 1978, p.12 (P).

Parablennius rouxi: ZANDER 1986a (*), p.1109 (P).

First record: P= ALMEIDA & GOMES 1978.

Parablennius ruber (Valenciennes, 1836)

Blennius gattorugine: LOWE 1839, p.83 (M), 1839(1842), p.9 (M); REGAN 1903, p.348 (A);

FOWLER 1936, p.1041 (M); MAUL 1948 (*), p.155 (M); NORONHA & SARMENTO 1948 (*), p.96 (M); COLLINS 1954 (*), p. 29 (A); BATH 1973 (*), p.521 (A,M).

Blennius ruber: CAPELLO 1867a, p.226 (P), 1867b, p.231 (P), 1880, p.24 (P); SEABRA 1911 (*), p.163 (P); NOBRE 1935, p.131 (P); ALMEIDA 1979 (P); HARMELIN & HARMELIN-VIVIEN 1979, p.6 (A); ALMEIDA 1982, p.35-40 (A,M); ALMEIDA & HARMELIN-VIVIEN 1983, p.41 (A).

Blennius sp. nov. 1: WOOD & WILLIAMS 1973, p.66 (A); ARRUDA 1979b, p.28 (A), 1980, p.340 (A).

Parablennius ruber: ZANDER 1986a (*), p.1110 (A,M); SANTOS 1987, p.353-376 (A); PATZNER & al. 1992 (A).

First records: P= CAPELLO 1867a; A= REGAN 1903; M= LOWE 1839.

Comments: As mentioned above, all the known material from the Azores and Madeira previously identified as *P. gattorugine* must be classified as *P. ruber*. ALMEIDA (1979, 1982) showed that both species are present in the mainland.

Except for the old citations (VALENCIENNES 1836 and MOREAU referred by ALMEIDA 1979), *P. ruber* is only mentioned as being observed in Portuguese waters. This is probably due to the recent date of the revalidation of the species (ALMEIDA 1979, 1982; BATH 1982). An analysis of data from other populations that have been considered as *P. gattorugine* is urgently needed to establish the distribution of *P. ruber*.

Parablennius sanguinolentus (Pallas, 1811)/*P. parvicornis* (Valenciennes, 1836)

Blennius parvicornis: VALENCIENNES 1836, p.257 (M); LOWE 1839, p.83 (M), 1837(1841), p.185 (M), 1839(1842), p.93 (M), 1843, p.86 (M); BATH 1973 (*), p.522 (M).

Blennius palmicornis: LOWE 1839, p.83 (M), 1837(1841), p.185 (M), 1839(1842), p.9 (M); FOWLER 1923, p.35 (M).

Blennius sanguinolentus: GÜNTHER 1861, p.218 (M); HILGENDORF 1888b, p.208 (A); COLLETT 1890, p.222 (M), 1897a, p.45 (A), p.95 (M); REGAN 1903, p.348 (A); FOWLER 1936, p.1040 (M); MAUL 1948 (*), p.155 (M); NORONHA & SARMENTO 1948 (*), p.96 (M); ALBUQUERQUE 1954-56 (*), p.802 (A,M); COLLINS 1954 (*), p.197 (A); BATH 1973 (*), p.524 (P); ALMEIDA & HARMELIN-VIVIEN 1983, p.42 (A); SANTOS 1985a, pp.1-46 (A), 1985b, pp.119-146 (A),

1985c, pp.147-172 (A); SANTOS & ALMADA 1988a, pp.421-447 (A); SANTOS 1989, pp.293-310 (A); SANTOS & al. 1989, pp.623-632 (A).

Pictiblennius parvicornis: BATH 1977, p.206 (M)

Pictiblennius sanguinolentus: ARRUDA 1979, p.11 (A), 1980, p.340 (A).

Blennius basileus: HARMELIN & HARMELIN-VIVIEN 1979, p.6 (A).

Parablennius parvicornis: ZANDER 1979, p.470 (A,M), 1986a (*), p.1108 (A,M); BATH 1990a (*), p.910 (M), 1990b, pp.52-54 (A,M); PATZNER & al. 1992 (A).

Parablennius sanguinolentus: ZANDER 1986a (*), p.1110 (P), SANTOS 1989, p. 293-310 (A); PATZNER & al. 1992 (A).

First references: A= REGAN 1903; M= VALENCIENNES 1836.

Comments: There are considerable problems in the identification of these blenniids from Madeira and Azores, cited in the literature either as *P. sanguinolentus* or as *P. parvicornis*. BATH (1977) considered both species as valid. ARRUDA (1979b) noted considerable differences between the fishes of Azores and Madeira and proposed the recognition of two subspecies of *P. sanguinolentus*. ZANDER (1979) using the criteria proposed by BAUCHOT (1966) to differentiate between the two species, considered that specimens from the Azores were *P. parvicornis*. However, he noted that they shared other traits with *P. sanguinolentus* from the Mediterranean. ALMEIDA & HARMELIN-VIVIEN (1983), observing fishes from the Azores, classified them as *P. sanguinolentus* and considered *P. parvicornis* synonym of that species. BATH (1990b) includes the Azores in the distribution range of *P. parvicornis* but did not mentioned material collected there. Thus the taxonomic status of these fishes in the Atlantic islands, specially in the Azores, still needs clarification. In the present paper it was decided to retain the two names to outline the uncertainties of the subject. It is also important to stress that although BATH (1973) and ZANDER (1986) reported *P. sanguinolentus* for mainland Portugal, we have not found any published report for that area. However, we have recently found a population of this species at Arrábida (western Portuguese coast). Although HARMELIN & HARMELIN-VIVIEN (1979) cited the occurrence of *B. basileus* at the Azores in a preliminary report, this misidentification was

corrected in a subsequent paper (ALMEIDA & HARMELIN-VIVIEN 1983).

Parablennius tentacularis (Brünnich, 1768)

Blennius tentacularis: CAPELLO 1867b, p.231 (P), 1880, p.25 (P); OSÓRIO 1896, p.154 (P); VIEIRA 1900 (*), p.155 (P); SEABRA 1911 (*), p.163 (P); NOBRE 1935 (*), p.136 (P); BATH 1973 (*), p.525 (P).

Parablennius tentacularis: ZANDER 1986a (*), p.1110 (P).

First record: P= CAPELLO 1867b.

Comments: ALMEIDA (1985) doubted the existence of this species in Portugal for the following reasons: (i) there is no recent citation for Portugal; (ii) he could not find any specimen of this species in Portuguese collections; (iii) the known references for the occurrence of this species in our waters are very old and could not be verified because the original specimens were not available.

Since then, after many hundreds of hours of diving and fish-collecting in the different areas, none of the authors have found *P. tentacularis*. In addition, the species is absent both from the Galician coast (DEVASA-REGUEIRO & al. 1979) and from the Atlantic coast of southern Spain (NIETO 1991). An examination of the primary sources revealed that none of the authors provided descriptions of the specimens nor the criteria used for their identification. We assume that the species is absent from our study area, as apparently did ALBUQUERQUE (1954-56) who did not include it in her book.

Salapia fluviatilis ASSO, 1810

Blennius cagnota: REIS 1924, p. 98 (P) (cited by NOBRE 1935).

Blennius vulgaris: NOBRE 1935 (*), p.139 (P).

Blennius fluviatilis: ALBUQUERQUE 1954-56 (*), p.806 (P); ALMAÇA 1965, p.36 (P); GARCIA de JALON & al. 1989 (*), p.91 (P).

First record: P= REIS 1924 (cited by NOBRE 1935).

Comments: Although there are only two primary sources referring the occurrence of *S. fluviatilis* in the Guadiana basin the species is regularly caught when fish-collecting in this area (J.A. Gomes, personal communication). The National Museum of Natural History (Lisbon) possesses specimens col-

lected in several tributaries of the Guadiana river (Prof. Carlos Almaça, Museu Bocage, Lisboa, personal communication).

Salaria pavo (Risso, 1810)

Blennius pavo: CAPELLO 1867b, p.231 (P), 1880, p.24 (P); NOBRE 1895, p.232 (P); OSÓRIO 1896, p.154 (P); VIEIRA 1900 (*), p.155 (P); SEABRA 1911 (*), p.164 (P); NOBRE 1935, p.133 (P); GONÇALVES 1941, p.83 (P); ALBUQUERQUE 1954-56 (*), p.807 (P); BATH 1973 (*), p.523 (P); ALMEIDA 1981, p.5 (P); SANTOS & al. 1989, pp.623-632 (P).

Salaria pavo: ZANDER 1986a (*), p.1104 (P) ALMADA 1989 (P); GONÇALVES 1990, pp.1-187 (P).

First record: P= CAPELLO 1867b.

Hypleurochilus sp.

Blennius fucorum: VALENCIENNES in CUVIER & VALENCIENNES 1836, p.263-265 (A); GÜNTHER 1861, p.212 (A); FOWLER 1936 (*), p.1043 (A).

? *Blennius oceanicus*: VALENCIENNES in CUVIER & VALENCIENNES 1836, p.265 (open Atlantic, 29°N, 50°W).

Parablennius fucorum: BATH 1977, p.197-198 (A), 1990a, p.908 (A).

First record: A= VALENCIENNES 1836.

Comments: CUVIER & VALENCIENNES (1836) described *B. fucorum* based on a specimen captured 80 miles south of the Azores on rafting algae. Another specimen was collected in similar circumstances at 29°N, 50°W and was assigned by CUVIER & VALENCIENNES (1836) to *B. oceanicus*. BATH (1977) considered the two specimens to belong to the genus *Parablennius*. In his recent revision of the genus *Parablennius* on the African coasts, where a key is provided for the whole genus, *P. fucorum* is not included. Hans Bath (personal communication) informed us that the specimen, *B. fucorum* VALENCIENNES 1836, belongs to the complex of *Hypleurochilus geminatus*. An exact assignment of *B. fucorum* to a species of the genus *Hypleurochilus* Gill, 1861 is not yet possible. *B. fucorum* is an American species accidentally transported by rafting algae.

Tribe Salariaiini

Ophioblennius atlanticus atlanticus (Valenciennes in Cuv. & Val., 1836)

Blennophis webbi: GÜNTHER 1861, p.259 (M).

Salarias atlanticus: VALENCIENNES in CUVIER & VALENCIENNES 1836, p.321 (M); LOWE 1839, p.83 (M), 1837(1841), p.185 (M), 1839(1842), p.9 (M); GÜNTHER 1861, p.242 (M); ZUGMAYER 1911, p.114 (M).

Rupiscartes atlanticus: FOWLER 1936 (*), p.1049 (M); MAUL 1948 (*), p.155 (M); NORONHA & SARMENTO 1948 (*), p.96 (M).

Ophioblennius webbi: MAUL 1948 (*), p.155 (M); ALBUQUERQUE 1954-56 (*), p.799 (M).

Scartichthys atlanticus: ALBUQUERQUE 1954-56 (*), p.813 (M).

Rupiscartes sp.: COLLINS 1954 (*), p.29 (A).

Ophioblennius atlanticus atlanticus: SPRINGER 1962, p.432 (M); WOOD & WILLIAMS 1973, p.67 (A); HARMELIN & HARMELIN-VIVIEN 1979, p.6 (A); RÉ & ALMEIDA 1981, p.41-52 (A); ALMEIDA & HARMELIN-VIVIEN 1983, p.41 (A); SANTOS 1987, p.353 (A); PATZNER & al. 1992 (A).

First records: A= WOOD & WILLIAMS 1973; M= VALENCIENNES 1836.

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REFERENCES

- (1) ALBUQUERQUE, R.M. 1954-56. Peixes de Portugal e ilhas adjacentes. Chaves para a sua determinação. - *Portugaliae Acta Biologica* (B) 5: 1-1164.
- (2) ALMAÇA, C. 1965. Contribution à la connaissance des poissons des eaux intérieures du Portugal. - *Arquivos do Museu Bocage*, 2ª Série, 1(2): 9-39.
- (3) ALMADA, V.C. 1989. Eco-etologia de *Salaria pavo* Risso, 1810 (Pisces: Blenniidae) no Parque Natural da Ria Formosa. Relatório do S.N.P.R.C.N. (Ms), Lisboa.

- (4) ALMADA, V.C., E.N. BARATA, E.J. GONÇALVES & R.F. DE OLIVEIRA 1990a. On the breeding season of *Lipophrys pholis* (Pisces: Blenniidae) at Arrábida, Portugal. - *Journal of the Marine Biological Association of the U.K.* 70(4): 913-916.
- (5) ALMADA, V., J. DÓRES, A. PINHEIRO, M. PINHEIRO & R.S. SANTOS 1983. Contribuição para o estudo do comportamento de *Coryphoblennius galerita* (L.) (Pisces: Blenniidae). - *Memórias do Museu do Mar*, sér. zool. 2(24): 1-165.
- (6) ALMADA, V., G. GARCIA & R.S. SANTOS 1987. Padrões de actividade e estrutura dos territórios dos machos parentais de *Parablennius pilicornis* Cuvier (Pisces: Blenniidae) da costa portuguesa. - *Análise Psicológica* 5(2): 261-280.
- (7) ALMADA, V.C., R.F. DE OLIVEIRA, E.N. BARATA, E.J. GONÇALVES, & A.P. RITO 1990b. Field observations on the behaviour of the breeding males of *Lipophrys pholis* (Pisces: Blenniidae). - *Portugaliae Zoologica* 1(4): 27-36.
- (8) ALMADA, V.C., E.J. GONÇALVES, R.F. DE OLIVEIRA & E.N. BARATA 1992. Some features of the territories in the breeding males of the intertidal blenny *Lipophrys pholis* (Pisces: Blenniidae). - *Journal of the Marine Biological Association of the U.K.* 72(1): 187-197.
- (9) ALMEIDA, A.J. 1979. Revalidation of *Blennius ruber* Valenciennes, 1836 (Pisces: Blenniidae). Communication presented at the III European Ichthyological Congress, Warsaw 1979.: 3pp.
- (10) ALMEIDA, A.J. 1981. Revision des poissons Blennidés de la collection de l'Aquário Vasco da Gama (Pisces: Blenniidae). - *Relatório de Actividades do Aquário Vasco da Gama* 8: 1-11.
- (11) ALMEIDA, A.J. 1982. Sur la présence de *Blennius ruber* Valenciennes, 1836 aux Açores (Pisces: Blenniidae). - *Cybius* 6(2): 35-40.
- (12) ALMEIDA, A.J. 1985. Clef pour la détermination des Blenniidae et Tripterygiidae marin du Portugal Continental, Açores et Madère. - *Bocagiana* 87:1-9.
- (13) ALMEIDA, A.J. 1986. Présence des poissons *Syngnathus rostellatus* (Syngnathidae), *Clinitrachus argentatus* (Clinidae) et *Sphaeroides spengleri* (Tetraodontidae) sur la côte du Portugal. - *Ciência Biológica* (Ecology & Systematics) 6(1/2): 1-7.
- (14) ALMEIDA, A.J. (in press). Littoral fish fauna of Porto Santo Island following the "Aragon" oil spill. - *Boletim do Museu Municipal do Funchal*.
- (15) ALMEIDA, A.J. & J.A. GOMES 1978. Quelques poissons nouveaux pour la faune du Portugal (Pisces: Apogonidae; Gobiidae; Blenniidae; Tripterygiidae). - *Memórias do Museu do Mar*, sér. zool. 1(2): 1-23.
- (16) ALMEIDA, A.J. & M. HARMELIN-VIVIEN 1983. Quelques notes sur des Blennidés observées et capturées aux Açores en 1979 (Pisces: Blenniidae). - *Cybius* 7(1): 39-45.
- (17) ALMEIDA, A.J., J.A. GOMES & P. RÉ 1980. Trois Blenniidae nouveaux pour la faune du Portugal (Pisces: Perciformes). - *Tethys* 9(3): 235-241.
- (18) ARRUDA, L.M. 1979a. Specific composition and relative abundance of intertidal fish fauna at two places on the portuguese coast (Sesimbra and Magoito, 1977-78). - *Arquivos do Museu Bocage*, 2ª Ser. 6(20): 325-342.
- (19) ARRUDA, L.M. 1979b. On the study of a sample of fish captured in the tidal range at Azores. - *Buletin da Sociedade Portuguesa de Ciências Naturais* 19: 5-36.
- (20) ARRUDA, L.M. 1980. On the adjustment of the Motomura's model to populations of intertidal fish on the Portuguese and Azorean coasts. - *Arquivos do Museu Bocage* 7(19): 339-348.
- (21) ARRUDA, L.M. 1990. Population structures of fish in the intertidal ranges of the Portuguese coasts. - *Vie et Milieu* 40(4): 319-323.
- (22) BATH, H. 1973. Blenniidae - Pp. 519-527 in: Hureau J.C. & Th. Monod (Eds). *Check-list of the fishes of the North-eastern Atlantic and of the Mediterranean (CLOFAM)*, Volume 1. UNESCO, Paris.
- (23) BATH, H. 1977. Revision der Blenniini (Pisces: Blenniidae). - *Senckenbergiana biologica* 57(4/6): 167-234.
- (24) BATH, H. 1978. Ergänzungen zur revision der Blenniini mit zwei neuen gattungen (Pisces: Blenniidae). - *Senckenbergiana biologica* 59(3/4): 183-190.
- (25) BATH, H. 1979. Geographische variation der Körperfärbung und flossenformel von *Coryphoblennius galerita* (Linnaeus 1758) (Pisces: Blenniidae). - *Senckenbergiana biologica* 59(5/6): 317-324.
- (26) BATH, H. 1982. Beitrag zur revalidation von *Parablennius ruber* (Valenciennes 1836) mit kritischen bemerkungen zur gültigkeit der Gattung *Pictiblennius* Whitley 1930 (Pisces: Blenniidae). - *Senckenbergiana biologica* 62(4/6): 211-224.
- (27) BATH, H. 1990a. Blenniidae. Pp. 905-915 in: Quéro, J.C., J.C. Hureau, C. Karrer, A. Post & L. Saldanha (Eds). *Check-list of the fishes of the eastern tropical Atlantic (CLOFETA)*, Volume 2. JNICT, Lisboa.
- (28) BATH, H. 1990b. Taxonomie und verbreitung von *Parablennius* Ribeiro 1915 an der W-Küste Afrikas und den Kapverdischen inseln mit revalidation von *P. verryckenii* (Poll 1959) und beschreibung drei neuer arten. - *Senckenbergiana biologica* 70(1/3): 15-69.
- (29) BATH, H. & P. WIRTZ 1989. *Spaniblennius clandestinus* n.g., n.sp. der tribus Blenniini von W-Afrika

- und ihre beziehungungen zur gattung *Blennius* Linnaeus 1758 (Pisces: Blenniidae). - *Senckenbergiana biologica* 69(4/6): 277-291.
- (30) BAUCHOT, M.-L. 1966. Poissons marins de l'est Atlantique tropical. téléostéens perciformes. V. Blennioidei. - *Atlantide Report* 9: 63-91.
- (31) BOCK, M. & C.D. ZANDER 1986. Osteological characters as tool for blennioid taxonomy- a generic revision of European Blenniidae (Percomorphi; Pisces). - *Zeitschrift für zoologische Systematik und Evolutionsforschung* 24(2): 138-143.
- (32) BRIGGS, J.C. 1974. *Marine Zoogeography*. McGraw-Hill, 475pp.
- (33) CAPELO, F.B. 1867a. Appendice ao catálogo dos peixes de Portugal que existem no Museu de Lisboa. - *Jornal de Sciencias mathematicas physicas e naturaes*, 1ª ser. 2: 223-228.
- (34) CAPELO, F.B. 1867b. Lista de algumas espécies de peixes colligidos ou observados na bahia de Lagos (Algarve). - *Jornal de Sciencias mathematicas physicas e naturaes*, 1ª ser. 2: 230-232.
- (35) CAPELO, F.B. 1880. Catálogo dos peixes de Portugal. - *Memórias da Academia de Sciencias de Lisboa* 6(1): 1-73.
- (36) CARUS, J.V. 1893. *Fauna Mediterraneae*. Vol. 2. E. Koch. Stuttgart, 854pp.
- (37) CARVALHO, F.P. 1982. Éthologie alimentaire de trois poissons Blenniidae de la côte portugaise. - *Boletim da Sociedade Portuguesa de Ciências Naturais*, 2ª ser. 21: 31-43.
- (38) COLLETT, R. 1890. Sur quelques poissons rapportés de Madère par le prince du Monaco. - *Bulletin de la Société de Zoologie de France* 15: 218-224.
- (39) COLLETT, R. 1897a. Poissons provenant des campagnes du yacht l'Hirondelle (1885-88). - *Résultats des Campagnes Scientifiques du Prince Albert I* 10: 1-198.
- (40) COLLETT, R. 1897b. Omen samling fiske fra Azorene, tilhoerende Museet i Ponta Delgada. - *Archiv for Mathematik og Naturvidenskab* 19: 1-17.
- (41) COLLINS, B.L. 1954. Lista de peixes dos mares dos Açores. - *Açoreana* 2: 1-40.
- (42) CUNHA, P.L. & M.C. PENEDA 1985. Colmatagem de ictiofauna na Central Térmica de Setúbal. - *Recursos Hídricos* 6(1): 23-40.
- (43) CUVIER, M. & M.A. VALENCIENNES 1836. *Histoire Naturelle des poissons*, Volume 11. Levrault. Paris, 506pp.
- (44) DEVESE-REGUEIRO, S., J.C.P. ALVÁREZ & M.R. SOLÓRZANO 1979. Contribución al estudio de los blenidos del litoral gallego (Pisces: Blenniidae). - *Brama, Boletim de la Sociedade Gallega de Historia Natural* 3(2): 55-73.
- (45) FOWLER, H.W. 1923. Fishes from Madeira, Syria, Madagascar and Victoria, Australia. - *Proceedings of the Academy of Natural Sciences of Philadelphia* 75: 33-45.
- (46) FOWLER, H.W. 1936. The marine fishes of west Africa, based on the collection of the American Museum Congo Expedition 1909-1915. - *Bulletin of the American Museum of Natural History* 70(1): 1-606.
- (47) GARCIA DE JALON, D., G. PRIETO & F. HERVELLA 1989. *Peces ibericos de agua dulce*. Agroguias Mundi-press. Madrid, 110pp.
- (48) GOMES, J.A. & A.J. ALMEIDA 1979. Notes sur l'ichtyofaune du littoral rocheux portugais - pp.317-332 in: Niell F.X. & J. Ros (Eds). - *Actas I Simposio Ibérico de Estudios de Bentos Marino*, Volume 1. INSUB, San Sebastian.
- (49) GONÇALVES, B.C. 1941. Coleção Oceanográfica de D. Carlos I. Catálogo dos peixes. - *Travaux de la Station de Biologie Marin de Lisbonne* 46: 1-108.
- (50) GONÇALVES, E.J. 1990. Eco-etologia da reprodução de *Salarias pavo* (Pisces: Blenniidae) na Ria Formosa. Relatório de Estágio. F.C.U.L. (Ms), Lisboa, 186pp.
- (51) GÜNTHER, A. 1861. *Catalogue of the Acanthopterygion fishes in the collection of the British Museum*. III. Gobiidae, Discoboli, Pediculati, Blenniidae, Labyrinthici, Mugilidae, Notochanti. British Museum (Natural History). London, 2586pp.
- (52) HARMELIN, J.-G. & M. HARMELIN-VIVIEN 1979. Poissons littoraux des Açores. Rapport préliminaire de la Mission Bio-Océanographique 1979 aux Açores (Ms), 7pp.
- (53) HELDEN, L. & P. WIRTZ 1985. A comparasion of *Blennius ocellaris* L. 1758, *B. riadourensis* Metzelaar 1919 and *B. normani* Poll 1949. - *Spixiana* 8(2): 197-217.
- (54) HELLING, H. 1943. Novo catálogo de peixes de Portugal em coleção no Museu de Zoologia da Universidade de Coimbra. - *Memórias e Estudos do Museu de Zoologia da Universidade de Coimbra*, 1ª ser. 149: 1-110.
- (55) HILGENDORF, F.M. 1888a. Eine neue Salarias-Art, welche von Herr Dr. H. Simroth bei den Açoren entdeckt wurde. - *Sitzungs-Beirichte der Gesellschaft Naturforschende Freunde zu Berlin* 5: 79.
- (56) HILGENDORF, F.M. 1888b. Die Fische der Azoren. - *Archiv für Naturgeschichte* 54: 205-215.
- (57) HUREAU, J.C. & MONOD, Th. (Eds.) 1973. *Check-list of the Fishes of the North-eastern Atlantic and of the Mediterranean (Cifnam)*, 2 Volumes. UNESCO. Paris, 683+331pp.

- (58) LOWE, R.T. 1839. A supplement to a synopsis of the fishes of Madeira. - *Proceedings of the Zoological Society of London* 7: 76-92.
- (59) LOWE, R.T. 1837(1841). A synopsis of the fishes of Madeira with the principal synonyms, portuguese names and characters of the new genera and species. - *Transactions of the Zoological Society of London* 2: 1-185.
- (60) LOWE, R.T. 1839(1842). Supplement to "A synopsis of the fishes of Madeira". - *Transactions of the Zoological Society of London* 3(1): 1-20.
- (61) LOWE, R.T. 1843. Notices of fishes newly observed or discovered in Madeira during the years 1840, 1841 and 1842. - *Proceedings of the Zoological Society of London* 11: 81-95.
- (62) MAUL, G.E. 1948. Lista sistemática dos peixes assinalados nos mares da Madeira - Pp.135-159 in: Noronha A.C. & A.A. Sarmiento. *Vertebrados da Madeira*, Volume 2, Peixes. Edição da Junta Geral do Distrito Autónomo do Funchal, Funchal.
- (63) NELSON, J.S. 1984. *Fishes of the World* (2nd edition). John Wiley & Sons. New York, 523pp.
- (64) NIETO, P. 1991. Peces intermareales de la costa suroccidental de Andalucía. Tesis doctoral, Facultad Biología, Universidade Sevilla. Sevilla, 366pp.
- (65) NOBRE, A. 1895. Notes sur les poissons de l'Algarve. - *Annaes de Sciencias Naturaes* 2: 223-232.
- (66) NOBRE, A. 1897. Trabalhos do Laboratório Marítimo de Leça da Palmeira. I. Sobre a distribuição dos organismos flutuantes na Costa do Porto. - *Annaes de Sciencias Naturaes* 4: 46-61.
- (67) NOBRE, A. 1924. Contribuições para a fauna dos Açores. - *Annaes do Instituto de Zoologia da Universidade do Porto* 1: 41-90.
- (68) NOBRE, A. 1930. *Materiais para o estudo da fauna dos Açores*. Instituto de Zoologia da Universidade do Porto. Porto, 108pp.
- (69) NOBRE, A. 1935. *Fauna marinha de Portugal. Vertebrados I*. Companhia Editora do Minho. Barcelos, 574pp.
- (70) NORONHA, A.C. & A.A. SARMENTO 1934. *Os peixes dos mares da Madeira*. Funchal, 146pp.
- (71) NORONHA, A.C. & A.A. SARMENTO 1948. *Vertebrados da Madeira, Volume 2, Peixes* (2ª edição). Edição da Junta Geral do Distrito Autónomo do Funchal. Funchal, 181pp.
- (72) OSÓRIO, B. 1888. Additamento ao catalogo dos peixes de Portugal. - *Jornal de Sciencias mathematicas physicas e naturaes*, 1ª ser. 12(47): 1-19.
- (73) OSÓRIO, B. 1895. Segundo appendice ao catálogo dos peixes de Portugal de F. Capello. - *Jornal de Sciencias mathematicas physicas e naturaes*, 2ª ser. 3: 254-269.
- (74) OSÓRIO, B. 1896. Peixes de Matosinhos. Terceiro appendice ao catálogo dos peixes de Portugal de Félix Capello. - *Jornal de Sciencias mathematicas physicas e naturaes*, 2ª ser. 4(15): 131-159.
- (75) PATZNER, R.A. & R.S. SANTOS (in press). Ecology of littoral fishes of the Azores. - *Courrier Forschungsinstitut Senckenberg*.
- (76) PATZNER, R.A., R.S. SANTOS, P. RÉ & R.D.M. NASH 1992. Littoral fishes of the Azores: An annotated checklist of fishes observed during the "Expedition Azores 1989". - *Arquipélago. Life and Earth Sciences* 10:101-111.
- (77) PORTEIRO, F. & R.S. SANTOS 1988. The embryos and larvae of *Blennius incognitus* Bath (Pisces: Blenniidae) from the Azores. - *Program of the VI European Ichthyological Congress, Budapest* 1988: 163.
- (78) RÉ, P. & A.J. ALMEIDA 1981. Observations on the biology of *Ophioblennius atlanticus atlanticus* (Valenciennes in Cuv. & Val. 1836), (Pisces: Blenniidae) from the Azores. - *Arquivos do Museu Bocage*, ser. B-Notas 1(5): 41-52.
- (79) REGAN, C.T. 1903. On a collection of fishes from the Azores. - *Annals and Magazine of Natural History*, 12, Ser.7: 344-348.
- (80) SANTOS, R.S. 1985a. Estrutura e função dos territórios em machos parentais de *Blennius sanguinolentus* Pallas (Pisces: Blenniidae). - *Memórias do Museu do Mar*, ser. zool. 3(29): 1-46.
- (81) SANTOS, R.S. 1985b. Parentais e satélites. Tácticas alternativas de acasalamento nos machos de *Blennius sanguinolentus* Pallas (Pisces: Blenniidae). - *Arquipélago. Série Ciências da Natureza* 6: 119-146.
- (82) SANTOS, R.S. 1985c. Capacidade de retorno á área vital, padrão de dispersão e organização social em *Blennius sanguinolentus* Pallas (Pisces: Blenniidae) durante a época de reprodução. - *Arquipélago. Série Ciências da Natureza* 6: 147-172.
- (83) SANTOS, R.S. 1986. Aspectos da ecologia e comportamento da fauna litoral dos Açores: I. Primeiras observações sobre o comportamento territorial e parental de *Parablennius ruber* (Valenciennes)(Pisces: Blenniidae), com uma pequena nota sobre os embriões. - *Açoreana* 6(4): 295-320.
- (84) SANTOS, R.S. 1989. Observações sobre os intervalos de desenvolvimento de *Parablennius sanguinolentus* (Pallas)(Pisces: Blenniidae) dos Açores: períodos embrionário, larvar e juvenil. - *Arquivos do Museu Bocage* 1(19): 293-310.
- (85) SANTOS, R.S. & V.C. ALMADA 1988a. Intraspecific variations in reproductive tactics in males of the rocky intertidal fish *Blennius sanguinolentus* in the Azores. Pp.421-447 in: Chelazzi, G. & M. Vannini (Eds). *Behavioural adaptation to intertidal life*.

- NATO ASI Series. Ser. A: Life Sciences, vol.151. Plenum Press, New York.
- (86) SANTOS, R.S. & V.C. ALMADA 1988b. Taxonomic status and ecology of the giant race of *Lipophrys pholis* in the Azores. - *Program of the VI European Ichthyological Congress, Budapest 1988*: 180.
- (87) SANTOS, R.S., V.C. ALMADA & A.I. SANTOS 1988. A morphometric comparison of the giant race of *Lipophrys pholis* from the Azores with a population from Portugal. Communication presented at the VI European Ichthyological Congress, Budapest 1988 (Ms): 6pp.
- (88) SANTOS, R.S., V.C. ALMADA & A.I. SANTOS 1989. Field experiments and observations on homing and territoriality in intertidal blennies - pp.623-632 in: Blanchard, R.J., P.F. Brain, D.C. Blanchard & S. Parmigiani (Eds). *Ethoexperimental approaches to the study of behaviour*. NATO ASI Series. Ser. D: Behavioural and Social Sciences, vol.48. Kluwer Academic Publishers, Dordrecht.
- (89) SEABRA, A.F. 1911. Catalogue systématique des Vertébrés du Portugal. V. Poissons. - *Bulletin de la Société Portugaise des Sciences Naturelles* 5(3): 129-224.
- (90) SPRINGER, V.G. 1958. Systematics and Zoogeography of the Clinid Fishes of the Subtribe Labrisomini Hubbs. - *Publications of the Institute of Marine Science, University of Texas* 5: 417-492.
- (91) SPRINGER, V.G. 1962. A review of the blennioid fishes of the genus *Ophioblennius* Gill. - *Copeia* 1962(2): 426-433.
- (92) SPRINGER, V.G. 1968. Osteology and classification of the fishes of the Family Blenniidae. - *U.S. National Museum - Bulletin* 284: 1-85.
- (93) VIEIRA, L. 1893. *Explorações zoológicas relativas à ictilogia marítima da praia da Nazaré e da Póvoa do Varzim*. Instituto de Coimbra. Coimbra. 13pp.
- (94) VIEIRA, L. 1898. Catálogo dos peixes de Portugal em coleção no Museu de Zoologia da Universidade de Coimbra. - *Annaes de Sciencias Naturaes* 4: 62-68, 136-142, 169-176.
- (95) VIEIRA, L. 1900. Lista alphabetica das especies de peixes de Portugal que faltam no Museu de Coimbra e são dadas como existentes no Museu Nacional de Lisboa. - *Annaes de Sciencias Naturaes* 7: 155-159.
- (96) VON MARTENS, E. 1876. *Die preussische expedition nach ost-Asien*. Zoologische Abteilung, 2 vol.
- (97) WHEELER, A. 1973a. Clinidae. Pp.530 in: Hureau, J.C. & Th. Monod (Eds). *Check-list of the fishes of the North-eastern Atlantic and of the Mediterranean (CLOFAM)*, Volume 1. UNESCO, Paris.
- (98) WHEELER, A. 1973b. Tripterygiidae. Pp.531 in: Hureau, J.C. & Th. Monod (Eds). *Check-list of the fishes of the North-eastern Atlantic and of the Mediterranean (CLOFAM)*, Volume 1. UNESCO, Paris.
- (99) WHITEHEAD, P.J.P., M.L. BAUCHOT, J.C. HUREAU, J. NIELSEN & E. TORTONESE (Eds) 1986. *Fishes of the North-eastern Atlantic and the Mediterranean (FNAM)*, 3 Volumes. UNESCO, Paris, 1473pp.
- (100) WIRTZ, P. 1980. A revision of the eastern-Atlantic Tripterygiidae (Pisces, Blennioidei) and notes on some westafrican blennioid fish. - *Cybiu*, 3^e série 11: 83-101.
- (101) WIRTZ, P. & J. HELLINGER 1987. Zur Zoogeographie der atlanto-mediterranean Blennioidea mit besonderer Berücksichtigung der Kapverdischen Inseln (Vertebrata: Pisces). - *Courier Forschungsinstitut Senckenberg* 95: 99-102.
- (102) WIRTZ, P. & C.D. ZANDER 1986. Clinidae. Pp.1117 in: Whitehead, P.J.P., M.-L. Bauchot, J.-C. Hureau, J. Nielsen & E. Tortonese (Eds). *Fishes of the North-eastern Atlantic and the Mediterranean (FNAM)*, Volume 3. UNESCO, Paris.
- (103) WOOD, E.M. & B. WILLIAMS 1973. Collection of inshore fishes and ecological notes. Azores Expedition, Report of the Exul sub Aqua club (Ms): 55-69.
- (104) ZANDER, C.D. 1978. Kritische anmerkungen zur "Revision der Blenniini (Pisces: Blenniidae)" von H. Bath (1977). - *Zeitschrift für zoologische Systematik und Evolutionsforschung* 16: 290-296.
- (105) ZANDER, C.D. 1979. Morphologische und ökologische untersuchung der schleimfische *Parablennius sanguinolentus* (Pallas, 1811) und *P. parvicornis* (Valenciennes, 1836) (Perciformes, Blenniidae). - *Mitteilugen aus den Hamburgischen Zoologischen Museum und Institut*. Hamburg. 76: 469-474.
- (106) ZANDER, C.D. 1986a. Blenniidae. -Pp.1096-1112 in: Whitehead, P.J.P., M.-L. Bauchot, J.-C. Hureau, J. Nielsen & E. Tortonese (Eds). *Fishes of the North-eastern Atlantic and the Mediterranean (FNAM)*, Volume 3. UNESCO, Paris.
- (107) ZANDER, C.D. 1986b. Tripterygiidae. -Pp.1118-1121 in: Whitehead, P.J.P., M.-L. Bauchot, J.-C. Hureau, J. Nielsen & E. Tortonese (Eds). *Fishes of the north-eastern Atlantic and the Mediterranean*, Volume 3. UNESCO, Paris.
- (108) ZUGMAYER, E. 1911. Poissons provenant des campagnes du yacht Princesse-Alice (1901-1910). - *Résultats des campagnes scientifiques du Prince du Monaco*, 35: 1-174.

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