

NEW RECORDS OF *DIDOGOBIOUS SPLECHTNAI* (GOBIIDAE) FROM THE TYRRHENIAN AND NORTHERN ADRIATIC SEA

by

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RÉSUMÉ. - Nouveaux signalements de *Didogobius splechnai* (Gobiidae) en mer Tyrrhénienne et dans le nord de l'Adriatique.

En 1995, Ahnelt et Patzner décrivent un nouveau gobie, *Didogobius splechnai*, de la Méditerranée occidentale (Ibiza, Îles Baléares, Espagne). Il était considéré alors comme une espèce très cryptique inféodée aux sédiments fins des fonds de grottes sous-marines. En 1999, ce gobie a été observé en Méditerranée centrale, sur les côtes de l'île de Lampedusa au sud-ouest de la Sicile. En juillet 2000 et juin 2001, deux spécimens de ce gobie sont capturés sur les côtes de l'île d'Elbe (mer Tyrrhénienne) et de Croatie, près de Pula, dans le nord de l'Adriatique. Ces spécimens sont décrits, et l'écologie de l'espèce est discutée.

Key words. - Gobiidae - *Didogobius splechnai* - MED - Northern Adriatic Sea - Tyrrhenian Sea - New records.

In the last few years, several field studies have yielded descriptions of new cryptobenthic gobiid species, even in such a well-investigated sea as the Mediterranean (Miller, 1992; Ahnelt and Patzner, 1995; Kovačić and Miller, 2000). This underlines the importance of careful *in situ* observations especially along rocky coasts, which exhibit numerous different microhabitats. Cryptobenthic fish can only be recorded using specific collecting methods that rely on SCUBA technique. Such studies enlarge our knowledge about the distribution range of already known cryptic gobiids and can reveal a frequent occurrence of species originally thought to be rare. For example, *Didogobius schlieweni* Miller, 1992 was recently found in the western Mediterranean (Ballesta *et al.*, 1998), which is far from the place of its original description in the northern Adriatic Sea (Miller, 1992). This study presents similar results for the congeneric species *Didogobius splechnai* Ahnelt and Patzner, 1995. A few years after its discovery in the western Mediterranean Sea, Island of Ibiza, Spain (Ahnelt and Patzner, 1995), this cave-dwelling gobiid fish was also found in the central Mediterranean at the Island of Lampedusa, south-west of Sicily (Stefanni, 1999). The present records in 2000 and 2001 extend the known distribution area to the Tyrrhenian and the northern Adriatic Sea (Fig. 1).

MATERIAL AND METHODS

Specimens. - NMW (Museum of Natural History Vienna) 94580: Tyrrhenian Sea, Italy, Island of Elba, Golfo di Vitticio near Capo d'Enfolia; subadult; SL 12.6 mm; 9 Jul. 2000, leg. Patzner. NMW 94581: Adriatic Sea, Croatia, near Pula; subadult; SL 13.3 mm; 3 Jun. 2001, leg. Herler. Both specimens were collected by SCUBA-diving with hand nets after careful application of quinaldine (diluted with 15 parts ethyl alcohol). For abbreviations of morphometrics, meristic values and lateral line system see Ahnelt *et al.* (1998).

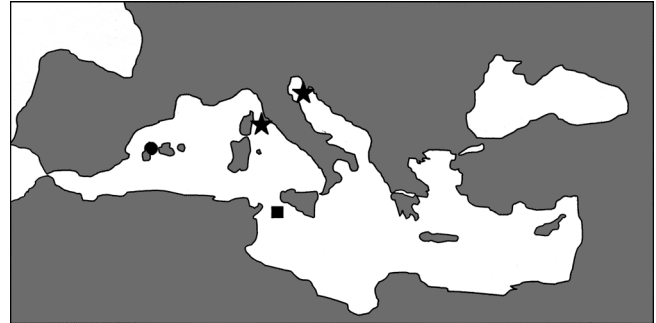


Figure 1. - Known distribution range of *Didogobius splechnai* in the Mediterranean Sea.

● = Island of Ibiza, Balears, Spain (Ahnelt and Patzner, 1995);
■ = Island of Lampedusa, Italy (Stefanni, 1999);
★ = Recent findings at the Island of Elba, Italy (RAP, this study), Island of Sardinia (Isola Tavolara), Italy (JH, this study) and at Pula, Croatia (JH, this study).

RESULTS

Identification

Due to the distinct body coloration pattern and the typical microhabitat selection involving small holes at the base of cave walls, the specimens were identifiable *in situ* immediately upon discovery. For detailed morphological description, one specimen was collected from each region. All specimens were found in the very dark rear of caves and were only detectable using artificial light. All showed the typical brown head and the three brown vertical bars with white interspaces on the trunk. The fish usually rest on the bottom close to an entrance of a nearby hole.

Morphology

In general, the morphometric and meristic data as well as the lateral line system (Tab. I) of the two collected specimens resemble those from the Balearic Island of Ibiza, described in detail by Ahnelt and Patzner (1995) and Herler *et al.* (1999a). The two collected specimens are juveniles and the head canals are therefore not fully developed. They completely lack the preopercular canal but show its two primary neuromasts on each side of the head. The anterior oculoscapular canals comprise paired pores σ and ω , whereas the interorbit is still an open groove between pores λ and κ . Posterior parts of the canals are not yet invaginated. The primary neuromasts are superficial and visible. Trunk neuromast rows (left body side) are found as ld 1 (3 papillae in NMW 94580; 1 in NMW 94581), ld 2 (2;1), ld 3 (3;4), lv 1 (3;3), lv 2 (3;3), lv 3 (3;3) and ltm-rows (21 with 1-4; 1-5 papillae). The three typical longitudinal neuromast rows on the caudal fin are present in both specimens but not complete due to damage to the fins. The typical coloration is a brown head and three broad brown trunk bars running transverse across the body below the first and second dorsal

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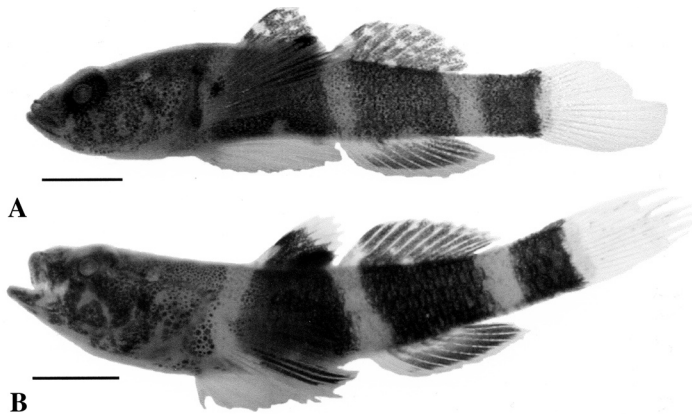


Figure 2. - Two specimens of *Didogobius splechnai* from the Mediterranean Sea. **A:** NMW 94580 - subadult; SL 12.6 mm; Island of Elba, Italy, 9 July 2000, legit RAP. **B:** NMW 94581 - subadult; SL 13.3 mm; Pula, Croatia, 3 June 2001, legit JH. Scale bar = 2 mm.

fin and at the posterior part of the caudal peduncle, with whitish interspaces (Fig. 2). At the end of the first dorsal fin a distinct dark spot is visible in both specimens. On the ventral part of the pectoral fins black markings extend from the centre of the fins to the tips. A dark spot at the upper base of the pectorals is only evident in the specimen from Elba. The other specimen merely bears a few melanophores grouped there.

Ecology

The specimens were found in the innermost areas of caves with a narrow access to the back, positioned on the fine sediment bottom. The habitat choices of *D. splechnai* in the northern Adriatic Sea and at Sardinia were very similar. At Pula, Croatia, *D. splechnai* was found at 11 m depth in two caves with the dimensions of 1.2 m width x 1 m height x 2 m depth and 0.8 m x 0.3 m x 0.8 m, where one specimen was caught. The ceilings and walls of these caves were inhabited by *Corcyrogobius liechtensteini*, which has also been found living sympatrically with *D. splechnai* at the Island of Ibiza. The specimens observed at the north-eastern coast of Sardinia (Isola Tavolara) were found at 16m depth in a big cave measuring 6 m x 4 m x 7 m. This large cave contained many specimens (approx. one individual per square metre). The typical habitat choice at the Island of Elba remains to be determined, because only one specimen was found in an unusual habitat, a small cave among the rhizomes of *Posidonia oceanica* in 4.5 m depth.

DISCUSSION

In the Mediterranean Sea, many cryptobenthic gobiids have been found at several places only in low numbers (Miller, 1992; Kovačić, 1997; Ahnelt *et al.*, 1998; Ballesta *et al.*, 1998; Stefanni, 1999). Furthermore, most distribution ranges enclose just a few collection sites. The actual distribution area of these species can only be interpolated between them. Because of their extreme cryptic behaviour, specimens are difficult to access and their abundance is therefore usually underestimated. Specific studies may reveal a greater abundance of species that were initially thought to be rare (Herler *et al.*, 1999b, Herler and Patzner, pers. obs.). *D. splechnai* can occur in remarkable abundance within suitable habitats, which are medium- and large-sized caves with a bottom consisting of very fine sediments. The microhabitat selection involving small holes along the base of the cave walls was confirmed through observations at Ibiza and Sardinia in the western Mediterranean Sea and at Pula in the northern Adriatic Sea. In contrast, the specimen from Elba was caught by coincidence in an atypical habitat - a small cave in a seagrass meadow. Single speci-

mens apparently also inhabit small caves and cave-like habitats (Stefanni, 1999). Larger populations of this species can be observed in big caves with several square metres of bottom area, which provide sufficient space (Herler *et al.*, 1999b). Several attempts to collect *D. splechnai* within suitable habitats in the Kvarner area of the northern Adriatic Sea over the last few years have failed (Herler and Patzner, pers. obs.). Now the final discovery at Pula, Croatia demonstrates that *D. splechnai* is not restricted to the western basin of the Mediterranean Sea.

In general, the morphology of the two specimens conforms with the material from the Island of Ibiza. Nevertheless, the morphometric values for body depth, head and caudal fin length and eye diameter do not resemble those of western Mediterranean specimens (compare with Herler *et al.*, 1999a). These values differ because of the immaturity of the recently collected specimens. Due to the large eyes, the interorbit is much narrower in juvenile specimens. In both specimens, the development of the head sensory canals in relation to the standard length is the same as described by Herler *et al.* (1999a). The body coloration of all populations is very uniform. The dark spot at the dorsal origin of the pectoral fin, as mentioned for the material from the Island of Lampedusa by Stefanni (1999), is also found in specimens from the Islands of Ibiza (Herler *et al.*, 1999a) and Elba (this study).

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Table I. - Morphometrics, meristic values and number of head neuromasts of two specimens of *Didogobius splechnai* recently found at the Island of Elba, Italy (NMW 94580) and Pula, Croatia (NMW 94581). * = primary neuromasts of lacking preopercular canal. ** = primary neuromasts of reduced posterior oculoscapular canal.

Head neuromasts (left; right)					
Indiv.	Elba	Pula	Indiv.	Elba	Pula
PO			OS		
r	2;2	3;3	x1	6;6	2;4
s1	3;3	3;3	x2	2;2	1;1
s2	2;1	2;2	z	5;5	4;2
s3	3;3	2;2	q	2;2	1;1
c2	5;6	5;4	y	1;1	1;1
c1	3;3	2;2	tr	1;1	2;2
c2	3;4	4;3	u**	2;2	1;2
c1	2;2	1;1	as1	3;3	2;2
SO			as2	3;3	2;2
1	5;5	5;6	as3	3;4	3;3
2	5;5	4;4	la1	1;1	1;1
3/4	5;4	4;4	la2	1;1	1;1
5	7;6	6;5	OP		
6s	4;3	4;3	ot	12;12	14;13
6i	6;8	7;8	os	5;5	5;5
7	1;1	1;1	oi	4;4	4;3
b	7;7	7;7	AD		
d	14;14	12;14	n	5;5	4;3
PM			g	6;6	3;3
e	29;27	27;25	o	2;2	3;3
i	14;15	15;15	m	1;1	1;1
f	7;7	6;6	h	4;4	3;3
por*	2;2	2;2			

Morphometrics		
Indiv.	Elba	Pula
Sex	subadult	subadult
SL	12.60	13.30
% SL		
H	36.2	35.2
Hw	17.3	16.7
SN/D1	42.6	42.1
SN/D2	59.8	58.6
SN/AN	59.5	57.6
SN/A	63.5	61.8
SN/V	34.1	34.2
CP	21.4	21.8
D1b	11.7	11.9
D2b	23.3	24.3
Ab	17.8	19.5
Cl	32.5	28.1
Pl	32.5	30.5
V1	30.2	28.6
Vd	20.6	20.2
Ad	19.0	18.8
Aw	10.6	9.9
CPd	11.9	12.0
V/AN	26.0	27.6

Morphometrics		
Indiv.	Elba	Pula
% CP		
CPd	61.5	59.8
% H		
SN	22.4	22.4
E	28.1	28.0
PO	53.1	53.4
CHd	19.3	17.1
Hw	47.8	47.4
UJ	30.7	29.7
% E		
I	14.1	16.8
% V/AN		
V1	118.9	103.8

Meristic values		
Indiv.	Elba	Pula
D1	VI	VI
D2	I/9	I/10
A	I/9	I/9
C	d	d
P	15	15
V	I/5+I/5	I/5+I/5
LL	30	29
TR	9	9

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