

SCUBA OBSERVATIONS REVEAL A WIDER DISTRIBUTION RANGE FOR *THOROGOBIUS MACROLEPIS* (TELEOSTEI: GOBIIDAE)

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ABSTRACT

The Mediterranean Sea endemic goby Thorogobius macrolepis was observed during scuba dives at three localities along the Aegean Sea and one locality at the northern Levant coast of Turkey, increasing the currently available knowledge on the distribution of this species. This is the first record of T. macrolepis from the central and northern Aegean Sea, while the single observation from Kekova region substantiates its occurrence at the Levant basin.

Key words: *Thorogobius macrolepis*, Gobiidae, Aegean Sea, Mediterranean Sea

OSSERVAZIONI SUBACQUEE RIVELANO UNA ZONA DI DISTRIBUZIONE PIÙ AMPIA PER *THOROGOBIUS MACROLEPIS* (TELEOSTEI: GOBIIDAE)

SINTESI

Il Ghiozzo gattopardo Thorogobius macrolepis, endemico del mar Mediterraneo, è stato osservato durante le immersioni subacquee effettuate in tre località lungo le coste del mar Egeo e una località lungo la costa settentrionale della Turchia nel mar di Levante, aumentando le conoscenze attualmente disponibili sulla distribuzione di questa specie. Le segnalazioni di T. macrolepis riportate sono le prime per il mar Egeo centrale e settentrionale, mentre l'unica osservazione nella regione di Kekova ne dimostra la presenza nel bacino del mar di Levante.

Parole chiave: *Thorogobius macrolepis*, Gobiidae, mar Egeo, mar Mediterraneo

INTRODUCTION

Despite of their high species diversity, gobies are one of the most scarcely known taxa along the Mediterranean coastline. A recent research has shown that the disparity of Mediterranean gobiid distribution is most likely due to unequal sampling efforts exerted, rather than to actual numerical rarity of the species (Kovačić *et al.*, 2012). The traditional fishery methods are often useless for collecting particular goby species because of their small sizes and mostly cryptic life styles, so they are generally unexplored even in well studied areas. With the increased use of scuba and underwater photography techniques, many goby species became more visible than before, enhancing to better understand their actual zoogeographical affinities (Colombo & Langaneck,



Fig. 1: *Thorogobius macrolepis* individual with an approximate total length of 4.0 cm observed at Karaburun Peninsula, central Aegean Sea (above). An immediate escape behaviour was observed upon approach by the diver (below) (Photos: M. Bilecenoglu).

Sl. 1: Osebek 4,0 cm dolgega velesuskastega glavača, opazovanega ob polotoku Karaburun v osrednjem Egejskem morju (zgoraj). Ko se mu je potapljač približal, je sunkovito pobegnil (spodaj) (Foto: M. Bilecenoglu).

2013). Positive identification of gobies is mainly based on the exhaustive examination of head canal pores and papillae rows of the lateral line system (Kovačić, 2008a), although accurate *in situ* determination to species level is also possible based on the unique colour patterns of some gobies (Francour *et al.*, 2007). *Thorogobius macrolepis* is one of those goby species with unmistakable body coloration that has recently been observed at several localities along the Turkish coasts and reported herein for the first time from central and northern Aegean Sea shores.

MATERIAL AND METHODS

During a marine biodiversity study carried out at the Ayvalik Islands Nature Park (Edremit Bay, north Aegean Sea) between August and October 2012, one specimen per site of *Thorogobius macrolepis* (Kolombatović, 1891) were observed in two adjacent localities (39.4098667°-026.7138139° and 39.4185944°-026.7289750°, at depths of 30 and 43 m, respectively). Habitats at both sites were coralligenous, the deeper one being characterized by the existence of two coral species (*Eunicella cavolini* and *Paramuricea clavata*).

The species was later observed at the Karaburun Peninsula (outer section of Izmir Bay, central Aegean Sea, October 2013, 38.6592139°-026.5092750°) within a small cave at a depth of about 25 m, in the Sigacik Bay (southern Aegean Sea, December 2014, 38.1240083°-026.8207972°), where the depth was about 30 m, and at 24 m on the western coast of the Sicak Peninsula (Kekova, Antalya, northern Levant Sea, July 2014, 36.140318°-029.762748°), on a rocky bottom encircled by a patch of sand. At each locality mentioned above, only a single specimen of *T. macrolepis* was observed,

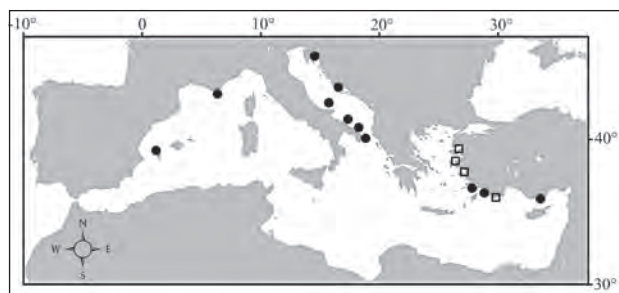


Fig. 2: Updated distribution of *Thorogobius macrolepis* in the Mediterranean Sea (previous records indicated with full dots following Ahnelt & Kovačić (1997), Guidetti *et al.* (2006) and Francour *et al.* (2007); open squares denote new locality records).

Sl. 2: Dopolnjeno območje razširjenosti velesuskastega glavača v Sredozemskem morju (predhodne najdbe Ahnelt & Kovačić (1997), Guidetti *et al.* (2006) in Francour *et al.* (2007) so označene s polnimi krogi; kvadratki pa označujejo podatke na novih lokalitetah).

while we were not able to capture any specimens. Underwater photographs are available only for the species observed at the Karaburun Peninsula (Fig. 1).

RESULTS AND DISCUSSION

Until two decades ago, the Mediterranean endemic *Thorogobius macrolepis* was known only by three specimens collected in the western Mediterranean (Balearic Islands and France) and in the Adriatic Sea (Miller *et al.*, 1973; Ahnelt & Kovačić, 1997). Later studies carried out in the Adriatic Sea indicated that the species is possibly far more common than previously thought (Guidetti *et al.*, 2006; Colombo & Langeneck, 2013), while underwater observations of Francour *et al.* (2007) expanded the known range of the species as far as to the north-eastern Levant Sea. In the present study *T. macrolepis* was recorded for the first time along the central and northern Aegean Sea coasts of Turkey, which represents a significant northerly range expansion of the species (Fig. 2). Recent observations lead us to suspect of a continuous spread of *T. macrolepis* through suitable habitats of the entire Aegean Sea sublittoral, although

occurrence of the species is not yet reported from the Aegean shores of Greece (Papaconstantinou, 2014).

The core data of the present study is solely based on scuba diving observations and just a single individual from the Karaburun Peninsula (central Aegean Sea) was photographed. Anyhow, a positive identification of *Thorogobius macrolepis* is quite possible during diversings, since this small sized goby has a unique colour pattern, characterized by having irregular orange spots on head, nape and dorsolateral region, also with 4-5 brownish blotches along the lateral midline. Among other orange spotted gobies of the Mediterranean Sea, *Gobius kolombatovici* Kovačić & Miller, 2000 has a black blotch in the first dorsal fin and a typical Y shaped pattern on the nape (Guidetti *et al.*, 2006), *Vanneaugobius dollfusi* Brownell, 1978 has a dark blotch at the D1 base between spines I and V (Kovačić, 2008b), *Gobius gasteveni* Miller, 1974 has light dots on cheek and opercle, and dark L-shaped blotch longer than broader at the origin of pectoral fins (Ahnelt *et al.*, 2011), *Lesueurigobius friesii* (Malm, 1874) has yellow/orange spots also on the caudal fin (*pers. obs.*).

The species has a distinctive habitat preference to soft sediments (pure sand, detritic coarse sand and

Tab. 1: Habitat and depth preferences of *Thorogobius macrolepis* (References: ¹Ahnelt & Patzner, 1996; ²Ahnelt & Kovačić, 1997; ³Patzner, 1999; ⁴Guidetti *et al.*, 2006; ⁵Francour *et al.*, 2007; ⁶Fischer *et al.*, 2007; ⁷Colombo & Langeneck, 2013; ⁸present study).

Tab. 1: Podatki o habitatu in globinski razširjenosti vrste *Thorogobius macrolepis* (Reference: ¹Ahnelt & Patzner, 1996; ²Ahnelt & Kovačić, 1997; ³Patzner, 1999; ⁴Guidetti *et al.*, 2006; ⁵Francour *et al.*, 2007; ⁶Fischer *et al.*, 2007; ⁷Colombo & Langeneck, 2013; ⁸pričujoče delo).

Locality/Reference	Date	Habitat	Depth (m)
W. Mediterranean (Balearic Islands, Spain) ¹	1990-1994	Sandy bottoms of rock overhangs	42
N. Adriatic (Rijeka, Croatia) ²	1994/1995	Sandy substrate near crevices with vertical rock faces; coralligenous bioceonosis	6-40
W. Mediterranean (Balearic Islands, Spain) ³	1988-1997	Caves with a sandy bottom	37-45
S. Adriatic and Ionian Seas (SE Apulia and Tremiti Archipelago, Italy) ⁴	N/A	Coarse, detritic sand at the basis of coralligenous formations	25-30
S. Aegean and N. Levant Seas (Mugla & Mersin, Turkey) ⁵	2003-2006	Sandy bottoms and sloping rock walls	20-26
W. Mediterranean (Balearic Islands, Spain) ⁶	1998-2007	Sandy bottom in the rear third of caves	37-45
N. Tyrrhenian Sea (Tuscany, Italy) ⁷	2012	Area between coralligenous shoal and sandy bottom	40
N. & C. Aegean Sea (Balıkesir & Izmir, Turkey) ⁸	2012-2014	Sandy substrate near coralligenous habitat and sloping rock walls	25-43
N. Levant Sea (Antalya, Turkey) ⁸	2014	Sandy bottom of a rocky substrate	24

small gravel) in the close vicinity of small caves, sloping rocky bottoms and coralligenous grounds (Tab. 1). We observed the species at depths ranging from 24 to 43 m, but depths of up to 60 m were recently recorded

(Glavičić & Kovačić, 2016). There was an immediate escape behaviour of the species into holes and cavities, especially when the diver tries to approach, as also mentioned by Guidetti *et al.* (2006).

POTAPLJAŠKA VZORČEVANJA ODKRIVAJO ŠIRŠE OBMOČJE RAZŠIRJENOSTI
VELELUSKASTEGA GLAVAČA *THOROGOBIOUS MACROLEPIS* (TELEOSTEI: GOBIIDAE)

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POVZETEK

Endemičnega sredozemskega glavača *Thorogobius macrolepis* so potapljači opazovali na treh lokalitetah vzdolž Egejskega morja in na eni lokaliteti na severni levantski obali v Turčiji in tako dopolnili aktualno poznavanje območja razširjenosti te vrste. Pričujoči zapis obravnava prvi podatek o pojavljanju vrste *T. macrolepis* v osrednjem in severnem Egejskem morju, medtem ko opazovanje na območju Kekova potrjuje prisotnost vrste v levantskem bazenu.

Ključne besede: *Thorogobius macrolepis*, Gobiidae, Egejsko morje, Sredozemsko morje

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