



Contribution to the Occurrence and Distribution of *Dysidea fragilis* (Porifera: Demospongiae: Dysideidae) in the Black Sea Coast of Turkey

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Abstract

Knowledge on the sponge fauna of the Black sea coast of Turkey is scarce, and only a total of 18 species have been reported so far. In the present study, *Dysidea fragilis* specimens were collected between 19 and 25 m depth off the coast of Sinop Peninsula in the central Black Sea coast of Turkey. Obtained individuals from the research area showed that the distribution area of *D. fragilis* expanded from the west Black Sea (pre-phosphoric region) to the central Black Sea (off the coast of Sinop Peninsula).

Keywords: Biodiversity; Sponge; *Dysidea fragilis*; Black Sea

Introduction

Sponges (Phylum: Porifera) are a diverse taxon of benthic sessile aquatic animals of great ecological, commercial, and biopharmaceutical importance. Substrate type, stability, continuity, water depth, water quality, movement and food availability have been identified as factors influencing distribution and abundance of sponge species [1]. On subtidal rocky substrates, distribution and abundance of sponge species have been demonstrated to be influenced by water movement, depth, turbidity, inclination, and other aspects of bottom topography, as well as the stability and continuity of the substrate [2]. A checklist of sponges (Porifera) along the coast of Turkey has been published by Topaloğlu B [3] and a total of 131 species belonging to 46 families have been reported in Turkey (82 species in the Aegean Sea, 63 species in the Sea of Marmara, 51 in the Levantine Sea and 13 in the Black Sea). Later, three more species were reported in the

Black Sea as new records for the marine fauna of Turkey [4]. Knowledge on the sponge fauna of the Black Sea coast of Turkey is still scarce, with only recorded 18 species Turkey [3-6]. Knowledge on the occurrences of *Dysidea fragilis* (Montagu, 1818) (Porifera: Demospongia: Dysideidae) in the western Black Sea coast was reported by Bačescu M et al. [5] and Topaloğlu B et al. [6]. In this study, the occurrence and distribution of *D. fragilis* was recorded for the first time in the central Black Sea and the distribution area was reviewed for the Black Sea.

Materials and Methods

Sponge specimens were collected between 19 and 25 m depth off the coast of Sinop Peninsula in the central Black Sea coast of Turkey (Figure 1). Specimens were collected using a turbot gillnet between 18-27 November 2019 during two surveys [coordinate: (41°96'24.75"N 35°11' 43.84"E

- 41°97'85.93"N 35°12' 06.62"E) and (41°96'11.19"N 35°10'90.18"N - 41°97'59.28"N 35°11'62.60"E)]. The identification of sponges is difficult due to their unique morphological traits and intra-specific variability in shape and colour. Therefore, proper identification often requires collection and microscopic examination of their skeleton. Moreover, many observable morphological characters can be used to aid in sponge identification including overall shape,

distribution of surface pores, colour, texture, size, etc. and also knowledge of other non-morphological characteristics, such as the ecological traits of the different species can be useful in sponge identification [7]. The collected sponge specimens were identified using morphological and non-morphological features suggested by FAO [7]. The specimen presented here is deposited at the Museum of the Faculty of Fisheries, Sinop University.

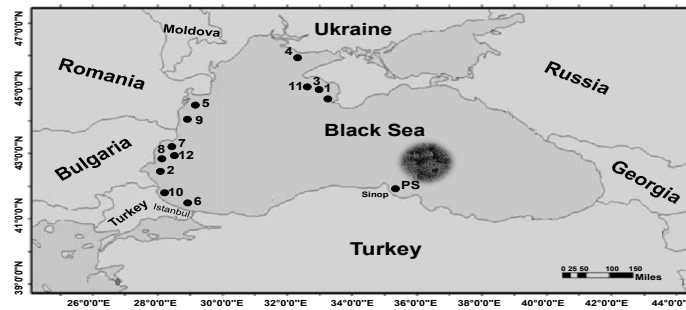


Figure 1: Occurrences of *Dysidea fragilis* (Montagu, 1818) in the different areas of the Black Sea coast. 1: [8], 2: [9], 3: [10], 4-6: [5], 7: [11], 8: [12], 9: [13], 10: [6], 11: [14], 12: [15], PS: Present study.

Results and Discussion

The general appearance of the *Dysidea fragilis* (Montagu, 1818) individuals sampled from the study area is shown in Figure 2. The samples are of cushion-like to massive-lobose forms, less than 8 cm across with a smooth, and consulate surface. All samples are of greenish colour and did not smell. The projections are lighter in colour than the main surface. The oscula are scattered and variable in size. There was no noticeable contraction. The individuals were found on muddy grounds as well as attached to algae and mollusk

shells (Figure 3). It is the first time; *D. fragilis* is recorded in the central Black Sea coast of Turkey. Along the Turkish coast of the Black Sea, 18 species have been encountered in three studies conducted in the pre-phosphoric region [5], off igneada [6] on the western Black Sea coast of Turkey and near the opening of Kızılırmak River on the central Black Sea coast of Turkey [4] (Table 1). The individuals obtained from the research area showed that the distribution area of *D. fragilis* expanded from the west Black Sea (pre-phosphoric region) to the central Black Sea (off the coast of Sinop Peninsula).



Figure 2: Obtained *Dysidea fragilis* (Montagu, 1818) specimen off the coast of Sinop Peninsula in the Black Sea, Turkey.



Figure 3: Obtained *Dysidea fragilis* (Montagu, 1818) specimens on mollusk species off the coast of Sinop Peninsula in the Black Sea, Turkey.

	Regions	Ref.
Phylum: PORIFERA		
Class: CALCAREA		
Family: Sycettidae		
Species: <i>Sycon ciliatum</i> (Fabricius, 1780)	A	[5]
Species: <i>Sycon setosum</i> Schmidt, 1862	A	[5]
Species: <i>Sycon tuba</i> Lendenfeld, 1891	A	[5]
Class: DEMOSPONGIAE		
Family: Suberitidae		
Species: <i>Suberites carnosus</i> (Johnston, 1842)	A	[5]
Species: <i>Suberites domuncula</i> (Olivi, 1792)	A,B	[5, 6]
Family: Chalinidae		
Species: <i>Haliclona alba</i> (Schmidt, 1862)	A	[5]
Species: <i>Haliclona (Reniera) aquaeductus</i> (Schmidt, 1862)	A	[5]
Species: <i>Haliclona (Reniera) cratera</i> (Schmidt, 1862)	A	[5]
Species: <i>Haliclona (Rhizoniera) grossa</i> (Schmidt, 1864)	A	[5]
Species: <i>Chalinula renieroides</i> Schmidt, 1868	C	[4]
Species: <i>Haliclona (Halichoelona) fulva</i> (Topsent, 1893)	C	[4]
Species: <i>Haliclona (Rhizoniera) rosea</i> (Bowerbank, 1866)	C	[4]
Family: Hymedesmiidae		
Species: <i>Hymedesmia (Hymedesmia) pansa</i> Bowerbank, 1882	C	[4]
Family: Irciniidae		
Species: <i>Ircinia variabilis</i> (Schmidt, 1862)	C	[4]
Family: Tedaniidae		
Species: <i>Tedania (Tedania) anhelans</i> (Lieberkühn, 1859)	A	[5]
Family: Dysideidae		

Species: <i>Dysidea fragilis</i> (Montagu, 1818)	A,B,D	[5,6,PS]
Family: Spongiidae		
Species: <i>Spongia (Spongia) officinalis</i> Linnaeus, 1759	A	[5]
Family: Halisarcidae		
Species: <i>Halisarca dujardini</i> Jonston, 1842	A	[5]
A: pre-phosphoric region (western Black Sea), B: off İğneada (western Black Sea), C: near the opening of Kızılırmak River (center Black Sea), D: off the coast of Sinop Peninsula (center Black Sea). PS: Present study.		

Table 1: Reported sponge species along the Black Sea coast of Turkey.

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