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**Presence of *Marphysa disjuncta* (Polychaeta: Eunicidae) in the Mediterranean Sea**

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**Abstract**

*An individual belonging to the eunicid polychaete species Marphysa disjuncta Hartman, 1961 was collected on muddy substratum at 100 m deep in Fethiye Bay (Levantine Sea, Eastern Mediterranean). This species is new to the Mediterranean fauna. It closely resembles to Marphysa bellii, a native species, but it lacks compound falcigers and has unidentate subacicular hooks. This species has only been reported from the Eastern and Western Pacific Ocean and could have been introduced to the Mediterranean Sea via ballast waters of vessels.*

**Keywords:** *Marphysa disjuncta*; alien species; Eunicidae; Polychaeta; Fethiye Bay; Mediterranean.

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**Introduction**

The genus *Marphysa* Quatrefages, 1865 has 5 occipital antennae and no peristomial cirri (FAUCHALD, 1970). Chaetal types on parapodia include limbate and pectinate chaete, compound falcigers, compound spinigers and subacicular hooks. This genus was artificially divided into 5 groups by FAUCHALD (1970) who used the chaetal types; (a) without composite chaetae; (b) only with composite spinigers; (c) only with composite falcigers; (d) with both composite falcigers and spinigers; (e) composite chaetae not observed. FAUCHALD (1970) also used the branchial distribution on the body as a taxonomic character and distinguished two subgroups; in the first group,

branchiae are limited to the anterior region of the body, while in the second they are placed on the posterior region.

Almost 60 species belonging to the genus *Marphysa* have been reported worldwide (author's database). *Marphysa bellii* Audouin and Milne Edwards, 1834, *M. fallax* Marion and Bobretzky, 1875, *M. kinbergi* McIntosh (1910) and *M. sanguinea* (Montagu, 1815) have been reported from the Mediterranean Sea to date. All these species, except for *M. kinbergi*, were found along the Turkish coasts (RULLIER, 1963; ERGEN, 1976; ERGEN & ÇINAR, 1997; ÇINAR & ERGEN, 1998, 1999; KURT SAHIN & ÇINAR, 2009).

The benthic material was collected from Fethiye Bay in the course of the TUBITAK

funded project (104Y065), carried out during the period September-October 2005, in order to identify and map the zoobenthic communities along the southern coast of Turkey. This material revealed an eunicid species new to the Mediterranean fauna, *Marphysa disjuncta* Hartman, 1961.

The present paper aims to re-describe this species based on a single individual from the Eastern Mediterranean and to provide habitat information.

### Material and Methods

The benthic material was collected on muddy substratum at 100 m depth [station G34 (36°38'25" N-29°03'40" E)] in October 2005 in Fethiye Bay (Fig. 1). Benthic material was collected using a Van Veen grab, sampling an area of 0.1 m<sup>2</sup>. Samples were sieved through 0.5 mm mesh and the retained material was placed in separate

jars containing 4% seawater formaldehyde solution. In the laboratory, samples were rinsed in fresh water and sorted to higher taxa under a stereomicroscope, and preserved in 70% ethanol.

Biometrical measurements of the specimen such as the body length, the width of chaetiger 10, and the distal part of spinigers were evaluated. All measurements were made using an ocular micrometer. The photographs of the species were taken by a digital camera (Olympus, Camedia, C7070) attached to stereo and compound microscopes. The specimen of *M. disjuncta* is deposited at the Museum of Faculty of Fisheries, Ege University (ESFM), Turkey.

### Results and Discussion

*Marphysa disjuncta* Hartman, 1961

*Marphysa disjuncta* HARTMAN, 1961:



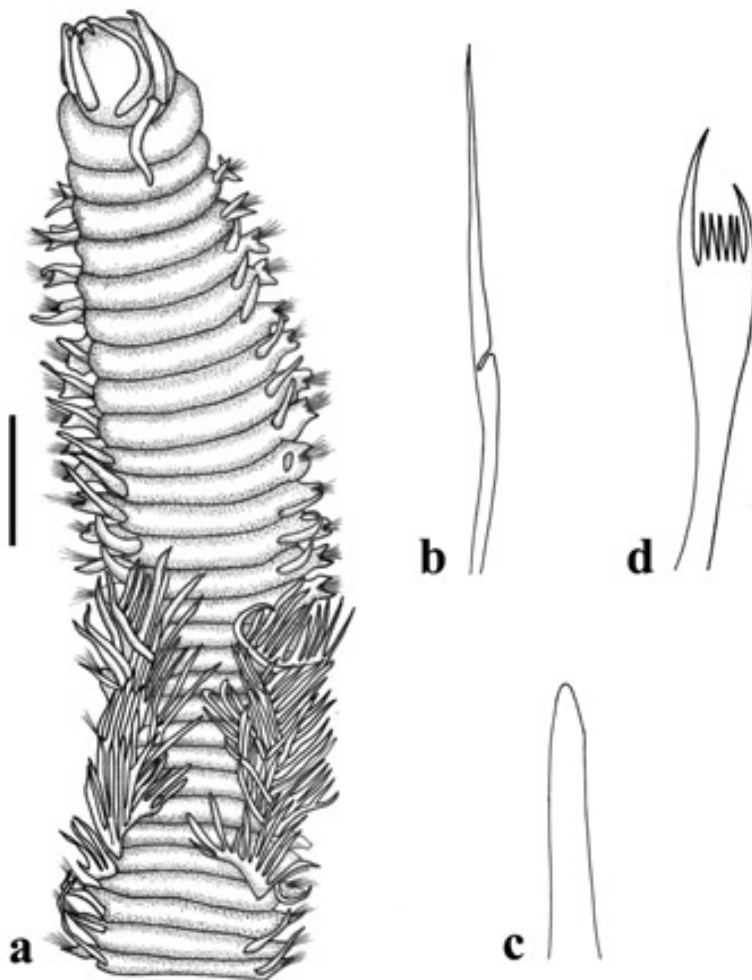
Fig. 1: Map of sampling area.

81-83: pl. 10, Figures 1-3; HARTMAN, 1968: 729-730: Figures 1-3; FAUCHALD, 1970: 60-61; MIURA, 1977b: 71-73: Figure 5.

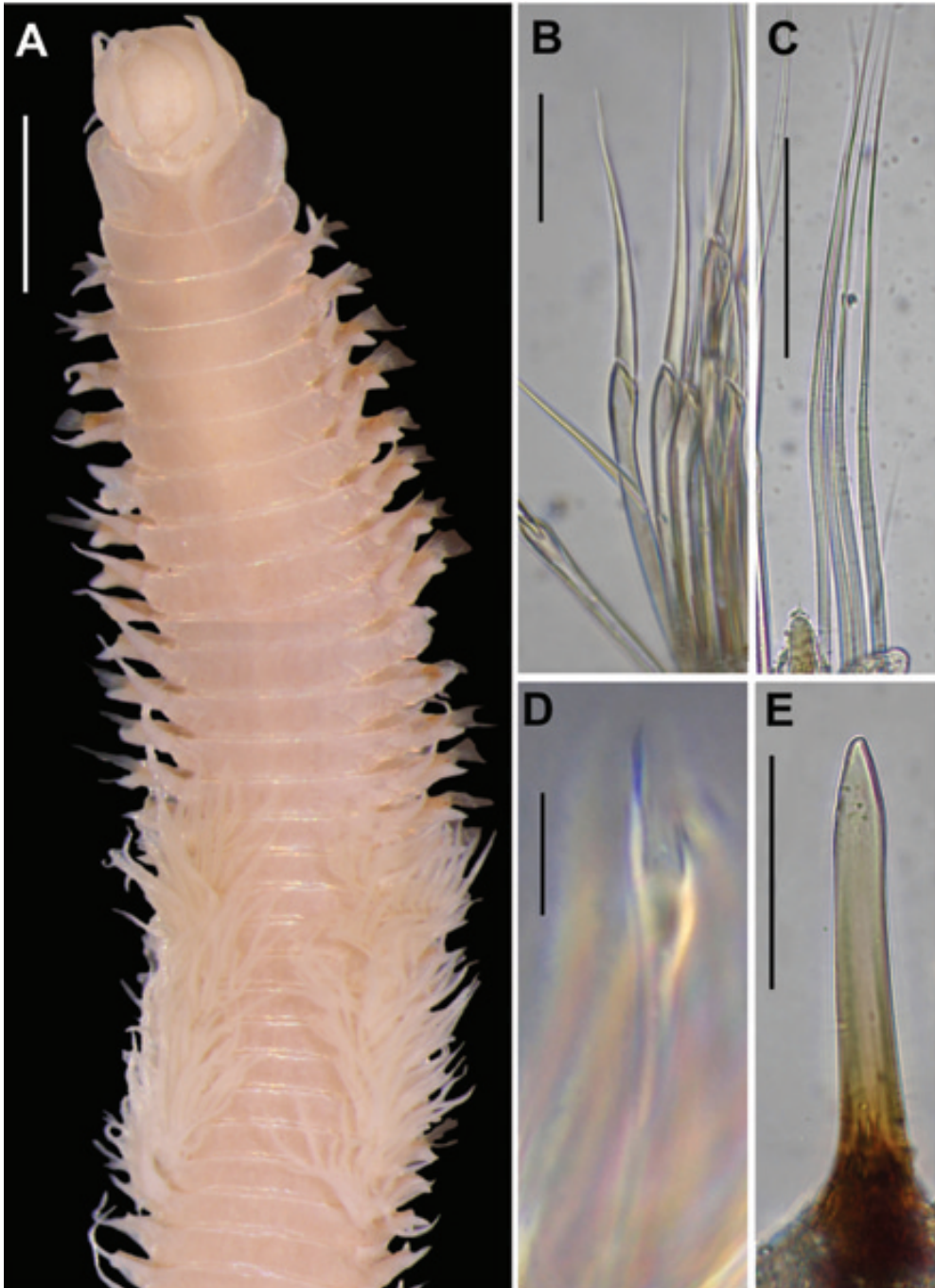
*Material examined:* ESFM-POL/2005-3039; G34, 1 specimen.

*Description:* An incomplete individual, 21.3 mm long, 1.3 mm wide, with 74 chaetigers. Body cylindrical, light pink colored (Figs 2a, 3a). Prostomium rounded, with 5 antennae

without articulations. Prostomium (0.73 mm) nearly as long as peristomium (0.70 mm). Peristomium cylindrical with distinct rings; anterior ring (0.4 mm) longer than posterior (0.3 mm). Peristomial cirri absent. Antennae placed in a horseshoe shape, longer than prostomium, equal in thickness, increasing in length from AI to AIII. Eyes absent. Maxillary formula: MI (1+1), MII



**Fig. 2:** *Marphysa disjuncta* (ESFM-POL/2005-3039), **a.** Dorsal view of the anterior part of the body, **b.** Compound spiniger (chaetiger 9), **c.** Subacicular hook (chaetiger 50), **d.** Pectinate chaeta (chaetiger 50) (scale bar; a: 1 mm; b: 25  $\mu$ m; c: 30  $\mu$ m; d: 9  $\mu$ m).



**Fig. 3:** *Marphysa disjuncta* (ESFM-POL/2005-3039), **a.** Dorsal view of the anterior part of the body, **b.** Compound spinigers (chaetiger 9), **c.** Limbate chaetae (chaetiger 9), **d.** Pectinate chaeta (chaetiger 50), **e.** Subacicular hook (chaetiger 50) (scale bars; **a:** 1 mm; **b:** 20  $\mu$ m; **c:** 40  $\mu$ m; **d:** 10  $\mu$ m).

(5+6), MIII (7+0), MIV (3+6), MV (1+1). Branchiae pectinate, from chaetiger 14 to 24, longer than dorsal cirri; 9 filaments on chaetiger 14, up to 12 on chaetiger 20, stems tapering; filaments tapering, similar in size and thickness. Dorsal cirri cylindrical in anterior parapodia; elongated and spindle shaped in median parapodia. Anterior ventral cirri conical, median ventral cirri flattened. Superior chaetae including 2-6 limbate and 2-3 pectinate chaetae; inferior chaetae including 4-10 compound heterogomph spinigers. Limbate chaetae slender, marginally smooth (Fig. 3c); pectinate chaetae heterodont, marginal teeth longer than others, shafts narrow, thin, with 7-9 teeth (Figs 2d, 3d), present on post branchial segments; compound spinigers with smooth and tapering blade, approximately 110  $\mu\text{m}$  long (Figs 2b, 3b); shafts inflated. Compound and pseudocompound falcigers absent. Aciculae black, single per parapodium, tapering, distally blunt. Subacicular hooks brown with light tips, unidentate (Figs 2c, 3e), first present from chaetiger 30.

*Remarks.* *Marphysa disjuncta* morphologically resembles *M. bellii* and *M. kinbergi* as these species have pectinate branchiae limited to the anterior part of the body. However, *Marphysa disjuncta* mainly differs from *M. bellii* in that the former has only compound spinigers and unidentate subacicular hooks but the latter has compound spinigers, falcigers and bidentate subacicular hooks. The Atlantic species *M. kinbergi* also has only compound spinigers on parapodia but it is distinguished from *M. disjuncta* by some important features; *M. disjuncta* has maximally 15 pairs of branchiae (maximally 20 pairs in *M. kinbergi*) and smooth tips of the shafts of the compound spinigers (distinctly serrated in *M. kinbergi*).

The specimen of *M. disjuncta* found in Fethiye Bay closely resembles the origi-

nal and subsequent descriptions of the species. The Mediterranean specimen has no eyes, however, HARTMAN (1961) and MIURA (1977) mentioned a pair of large oval-shaped spots on prostomium resembling eyes. This difference could be a result of using ethanol as preservative. Additional specimens need to be examined to check whether the Mediterranean population of this species has eyes or not. The maxillary formula of the Mediterranean specimen is closely identical to the Californian specimens described by HARTMAN (1961).

*Ecology.* *Marphysa disjuncta* was found on muddy substratum at 100 m depth in Fethiye Bay. This species was previously reported on fine green silt to sticky mud at 50-100 m depths in the southern California (Eastern Pacific Ocean) by HARTMAN (1961). It also occurs on soft bottoms in the San Cristóbal Bay (Baja California) as reported by FAUCHALD (1970) and from Kagoshima Bay (Western Pacific Ocean) by MIURA (1977).

*Distribution.* This species was previously reported from the Eastern and Western Pacific Ocean (HARTMAN, 1961, 1968; FAUCHALD, 1970; MIURA, 1977). This species is being newly reported from the Mediterranean Sea. The presence of this tropical species from the Pacific Ocean in the Mediterranean Sea is interesting and it could have been introduced to the area by ballast waters of ships. Due to its proximity to the Suez Canal and its large international harbors, the southern coast of Turkey is known to have been colonized by species introduced by ships and Red Sea immigrants (ÇINAR, 2006, 2009; ZENETOS *et al.*, 2008).

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