

SHORT COMMUNICATIONS

## New Records of Three Deep-Sea Fishes: *Diaphus rafinesquei* (Myctophidae), *Lobianchia gemellarii* (Myctophidae), and *Notolepis rissoi* (Paralepididae) from the Aegean Sea (Turkish Coast)

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### INTRODUCTION

The Aegean Sea connects the Black Sea through the Turkish Straits and the Sea of Marmara to the Mediterranean basin. Since it is under the influence of these two large and differing water bodies, it has distinct oceanographic and ecological conditions. A current review on the fish species diversity in Turkey's seas listed 362 species belonging to 114 families in the Aegean Sea (Mater *et al.*, 2002). Papaconstantinou (1988) reported 377 species from the Aegean Sea in the checklist of marine fishes of Greece. Two new species, *Petromyzon marinus* Linnaeus, 1758 (Economidis *et al.*, 1999) and *Pteragogus pelycus* Randall, 1981 (Corsini and Economidis, 1999), which were not included in these two major reviews from two sides of the Aegean Sea, were also recently added to the Aegean ichthyofauna.

The earliest records of the mesopelagic fishes in the Aegean Sea date back to the pioneering work of the Danish oceanographers onboard R/V *Thor* between 1908 and 1910. During these oceanographic expeditions, numerous species from Myctophidae were found in the Aegean Sea by Taning (1918): *Benthoosema glaciale* (Reinhardt, 1837), *Ceratoscopelus maderensis* (Lowe, 1839), *Diaphus holti* (Taning, 1918), *Gonichthys coccoi* (Cocco, 1829), *Hygophum benoiti* (Cocco, 1838), *Lampanyctus pusillus* (Johnson, 1890), *Lobianchia dofleini* (Zugmayer, 1911), *Myctophum punctatum* (Rafinesque, 1810), and *Symbolophorus veranyi* (Moreau, 1888). Subsequent studies added only a couple of new myctophid species to the Aegean Sea ichthyofauna: *Lampanyctus crocodiles* (Risso, 1810) (Kaya, 1993) and *Diaphus metopoclampus* (Kaya and Bilecenoglu, 2000).

Four species from another mesopelagic family (Paralepididae) were also recorded for the first time in the Aegean Sea during the same Danish expeditions between 1908 and 1910 (Ege, 1930): *Lestidiops jay-*

*akari* (Boulenger, 1889), *Lestidiops sphyrenoides* (Risso, 1820), *Notolepis rissoi* (Bonaparte, 1840), and *Paralepis speciosa* Bellotti, 1878. However, until now, the occurrence of any of these four species along Turkey's Aegean Sea Coast had not been confirmed.

This paper aims to document the occurrence of two previously unrecorded species (*Diaphus rafinesquei* and *Lobianchia gemellarii*) in the southern Aegean Sea. It also presents the first record of *Notolepis rissoi* from the northern Aegean Sea.

### MATERIAL AND METHODS

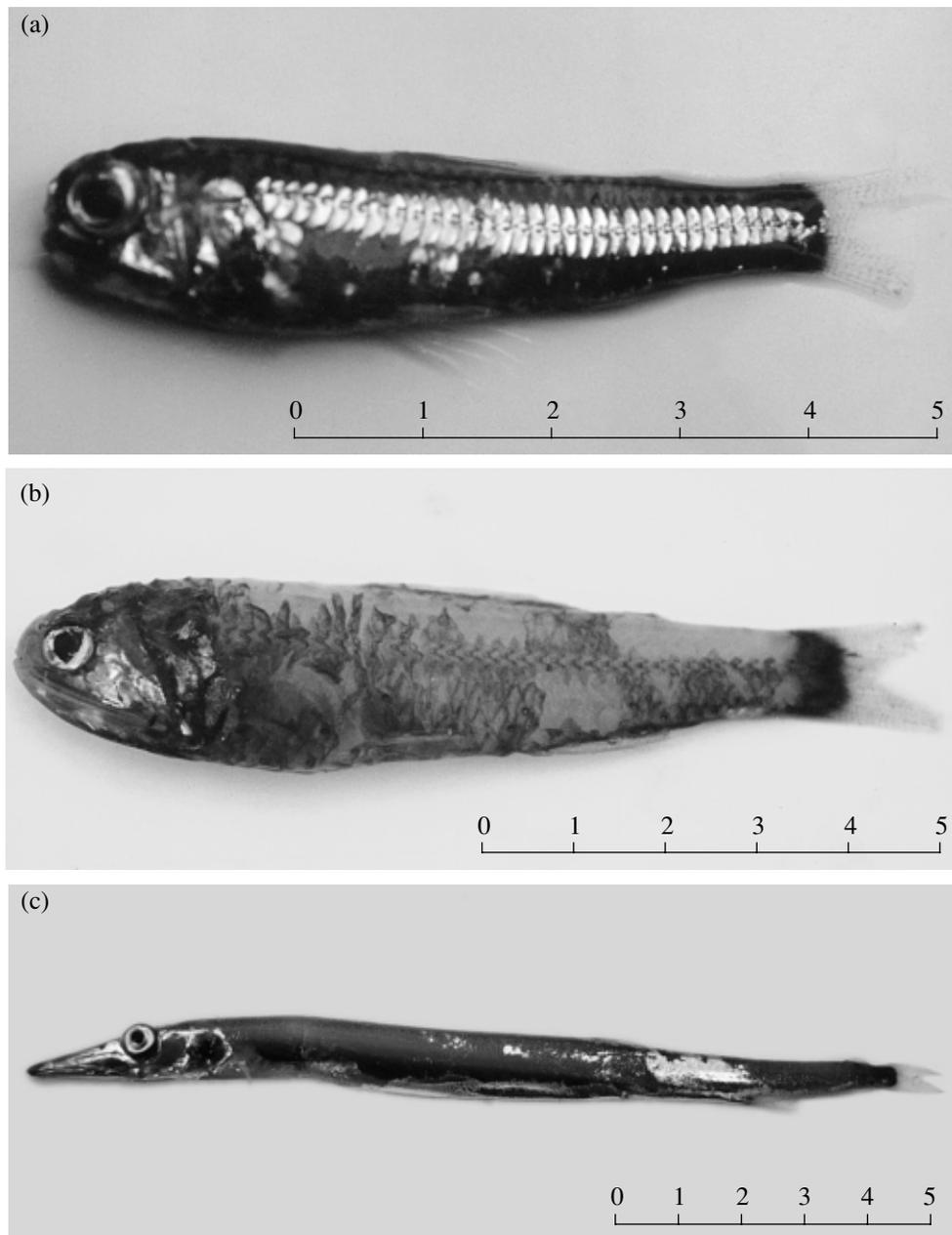
Specimens presented in this study were collected with a Mediterranean type high opening bottom trawl during ecological research surveys in the Bays of Saros and Gökova, which are located in the northern and southeastern Aegean Sea, respectively. The surveys were conducted onboard R/V *K. Piri Reis*, operated by Dokuz Eylül University on May 10–25, 2001. The trawl was equipped with a 22-mm mesh size net (knot-to-knot) at the cod-end. Hauls were towed at a cruising speed of 2.5 knots for 30 minutes. Following the determination of the morphometric characters and measurements, the sampled specimens were fixed in 6% formalin and later preserved in 70% ethyl alcohol. A digital caliper with an accuracy of 0.1 mm was used for morphometric measurements. The specimens used for identification have been deposited in the collection of Ege University (ZDEU) in Izmir.

### SPECIES ACCOUNTS

#### *Diaphus rafinesquei* (Cocco, 1838)

(Fig. 1a)

**Material examined:** ZDEU.P.M. 1501 (4 specimens), 79.3.0–84.1 mm SL (standard length), Gökova Bay (Start: 36°50.0' N–27°43.6' E, Finish: 36°49.9' N–



**Fig. 1.** (a) *Diaphus rafinesquei* (Cocco, 1838), (b) *Lobianchia gemellarii* (Cocco, 1838), (c) *Notolepis rissoi* Bonaparte, 1840.

27°45.0' E), May 20, 2001, daylight (Start: 17:06 EET), bottom trawl at 620 m.

**Description.** Dorsal fin rays 14; anal fin rays 14; pectoral fin rays 10; pelvic fin rays 8; lateral line scales 35. Average body depth contained 3.7 (min. 3.6, max. 3.9) times in SL; head length 4.05 (min. 3.9, max. 4.2) times in SL; dorsal fin base 4.39 (min. 4.2, max. 4.6) times in SL; anal fin base 5.32 (min. 5.1, max. 5.5) times in SL; interorbital width 2.55 (min. 2.3, max. 2.9) times in head length; eye diameter 3.54 (min. 3.3, max. 4.2) in head length; snout length 8.23 (min. 7.5, max. 9.3) in head length. Head light organs Dn and Vn

present. Detailed data on morphometric measurements of the specimens are presented in the table.

**Remarks.** *D. rafinesquei* is a high-oceanic, temperate-semisubtropical mesopelagic species which is widely distributed in the Atlantic Ocean and in most parts of the Mediterranean Sea (Nafpaktitis *et al.*, 1977; Hulley, 1984; Fisher *et al.*, 1987). This is the first report of the occurrence of this species in the Aegean Sea. Although *Diaphus* is the largest genus in the family Myctophidae, *D. rafinesquei* has only two other congeners in the Aegean Sea: one long known, *D. holti* (Taning, 1918), and one recently discovered, *D. metopoc-*

## Morphometric measurement data of the sampled specimen

Measurements	Species							
	<i>Diaphus rafinesquei</i>				<i>Lobianchia gemellarii</i>			<i>Notolepis rissoi</i>
	1	2	3	4	1	2	3	1
Specimen number	1	2	3	4	1	2	3	1
Standart length	79.30	81.10	79.88	84.11	89.20	84.85	90.06	132.50
Total weight (g)	10.9	11.8	12.7	13.3	10.9	9.3	10.9	2.4
Head length	20.29	20.42	19.35	20.13	25.39	24.24	24.82	32.48
Body depth	21.35	22.66	22.34	21.48	20.83	19.74	20.35	11.51
Predorsal distance	30.52	31.34	32.12	32.86	39.98	35.85	36.31	88.12
Dorsal fin base	18.55	18.01	18.99	18.34	20.09	18.29	19.89	4.43
Anal fin base	14.43	15.09	15.76	15.73	13.27	12.18	13.59	18.53
Eye diameter	4.83	6.04	5.87	6.12	6.12	6.88	6.67	4.73
Snout length	2.71	2.38	2.09	2.65	3.64	3.32	3.75	16.07
Interorbital width	7.95	7.13	7.72	8.79	6.36	5.09	6.32	2.78

*lampus* (Kaya and Bilecenoglu, 2000). The specimen of the latter species was also caught in Gökova Bay at 720 m (Kaya and Bilecenoglu, 2000). *D. rafinesquei* can be distinguished from *D. holti* by its higher number of gill rakers, its very large luminous scale at PLO, and its abruptly elevated AO<sub>a1</sub>, and from *D. metopoclampus* by the presence of So photophore (Nafpaktitis, 1968).

***Lobianchia gemellarii* (Cocco, 1838)**  
(Fig. 1b)

**Material examined:** ZDEU.P.M. 1601 (3 specimens), 84.50–90.06 mm SL, Gökova Bay (Start: 36°50.0' N–27°43.6' E, Finish: 36°49.9' N–27°45.0' E), May 20, 2001, daylight (Start: 17:06 EET), bottom trawl at 620 m.

**Description.** Dorsal fin rays 17; anal fin rays 14; pectoral fin rays 12; pelvic fin rays 10; lateral line scales 36. Average body depth contained 4.34 (min. 4.28, max. 4.43) times in SL; head length 3.55 (min. 3.50, max. 3.63) times in SL; dorsal fin base 4.54 (min. 4.44, max. 4.64) times in SL; anal fin base 6.77 (min. 6.63, max. 6.97) times in SL; interorbital width 4.23 (min. 3.93, max. 4.76) times in head length; eye diameter 3.80 (min. 3.52, max. 4.15) times in head length; snout length 6.97 (min. 6.62, max. 7.30) times in head length. Head light organ Dn present on head. Detailed data on morphometric measurements of the specimens are presented in the table.

**Remarks.** *L. gemellarii* is a high-oceanic, tropical-subtropical mesopelagic species which is widely distributed in the tropical and temperate waters of the Pacific, Indian, and Atlantic oceans and the eastern Mediterranean Sea (Nafpaktitis, 1968; Nafpaktitis *et al.*, 1977; Hulley, 1984). This is the first record of its occurrence in the Aegean Sea. The genus *Lobianchia*

consists of only two species. The other species, *L. dofleini*, is also found in the Aegean Sea (Taning, 1918; Nafpaktitis *et al.*, 1977; Kaya, 1993), and more abundant and common myctophid fish, throughout the entire Mediterranean Sea (Nafpaktitis *et al.*, 1977; Hulley, 1984; Fisher *et al.*, 1987). These two species have a very similar morphology. However, *L. gemellarii* can be distinguished from its congener by its evenly spaced Prc, higher number of AOp and of dorsal rays, low VLO, and, especially, Pol and arrangement of SAO (Nafpaktitis, 1968). The size range of all *L. gemellarii* specimens sampled in this study was larger than the typically reported maximum size of 60 mm for this species by Nafpaktitis *et al.* (1977) and Hulley (1984). However, the same authors note that, outside spawning areas, specimens of *L. gemellarii* up to a size of 100 mm can be occasionally encountered. These expatriate specimens also often lack luminous caudal glands (Nafpaktitis *et al.*, 1977; Hulley, 1984). The sampled specimens in this study had only some traces of luminous glands in their supracaudal region. No trace of any scalelike structure was detected in their infracaudal region.

***Notolepis rissoi* Bonaparte, 1840**  
(Fig. 1c)

**Material examined:** ZDEU.P.M. 1401, 1 specimen, 132.5 mm SL, Saros Bay (Start: 40°20.2' N–26°55.0' E, Finish: 40°20.5' N–26°56.2' E), May 14, 2001, daylight (Start: 18:00 EET), bottom trawl at 630 m.

**Description.** Dorsal fin rays 9; anal fin rays 30; pectoral fin rays 12; pelvic fin rays 9; lateral line scales 62. Body depth contained 11.5 times in SL; head length 4.1 times in SL; dorsal fin base 29.9 times in SL; anal fin base 7.2 times in SL; interorbital width 11.7 times in

head length; eye diameter 6.9 times in head length; snout length 2 times in head length. Morphometric measurement data of the specimen are presented in the table.

**Remarks.** *N. rissoi* is a mesopelagic species which is widely distributed in the tropical, temperate, and boreal regions of the world's major oceans and in the western and central Mediterranean Sea (Tortonese, 1970; Post, 1984). This species was first recorded by Ege (1930) from the southeastern Aegean Sea around the Dodecanese Islands. This is the first report of occurrence of *N. rissoi* in the northern Aegean Sea and also the first record of this species in the Turkish ichthyofauna. The present specimen extends the distribution of this species in the Mediterranean Sea up to the northern Aegean Sea.

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