

***EPINEPHELUS COIOIDES* (ACTINOPTERYGII: PERCIFORMES: SERRANIDAE)—  
A NEW LESSEPSIAN MIGRANT IN THE MEDITERRANEAN COAST OF TURKEY**

Mehmet GÖKOĞLU<sup>1</sup> and Yaşar ÖZVAROL<sup>\*2</sup>

<sup>1</sup>*Aquaculture Department, Faculty of Fisheries, Akdeniz University, Antalya, Turkey*

<sup>2</sup>*Fisheries Department, Faculty of Fisheries, Akdeniz University, Antalya, Turkey*

Gökoğlu M., Özvarol Y. 2015. *Epinephelus coioides* (Actinopterygii: Perciformes: Serranidae)—a new Lessepsian migrant in the Mediterranean coast of Turkey. *Acta Ichthyol. Piscat.* 45 (3): 307–309.

**Abstract.** A single specimen of orange-spotted grouper, *Epinephelus coioides* (Hamilton, 1822), was collected by a fish trap at depth of 7 m, on 2 November 2014, in the port of Antalya, Turkey. The fish was examined and its metric and meristic features are provided and the specimen is illustrated. The presently reported new finding constitutes the fourth Mediterranean record of *E. coioides*.

**Keywords:** fish, Lessepsian species, orange-spotted, grouper, range expansion, new country record

The Lessepsian migration, otherwise known as Erythrean invasion, is a continuous process marine species transfer across the Suez Canal, between the Red Sea and the Mediterranean Sea (Por 1978). The majority of documented cases of such migration indicate an influx of organisms from the Red Sea to the Mediterranean and rarely in the opposite direction.

The orange-spotted grouper, *Epinephelus coioides* (Hamilton, 1822), is a member of the family Serranidae (see Randall et al. 1997). Its distribution range stretches from the Red Sea through Persian Gulf, Réunion, Mauritius, India, Andaman Islands, Palau, Fiji, Singapore, Hong Kong, Taiwan, the Philippines, to Australia, to eastern and central Pacific (Heemstra and Randall 1993, Froese and Pauly 2014). On global markets *Epinephelus coioides* is a common and expensive fish and its economic importance is considerable (Sumaila et al. 2007). Its main food items are small fishes, shrimps, and crabs. Females mature at 25 to 30 cm of total length (2 or 3 years old), and their sexual transition occurs as a length of 55 to 75 cm (Froese and Pauly 2014). The eggs are pelagic. It is caught with hooks, line, traps, trawls, and with lift nets (Heemstra and Randall 2001).

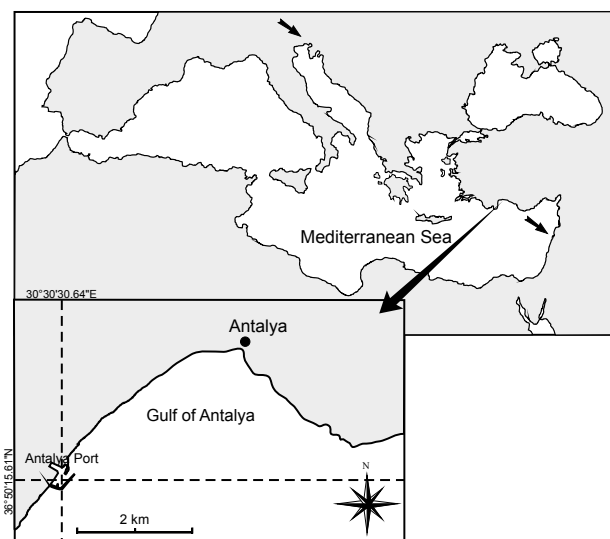
SERRANIDAE

*Epinephelus coioides* (Hamilton, 1822)

**Material examined.** A single specimen of *Epinephelus coioides* was caught in a fish trap at a depth of 7 m, on 2 November 2014, in the port of Antalya, Turkey (Fig. 1). The specimen was preserved in 4% formalin and deposited at the Fish Museum, Fisheries Faculty, Akdeniz Uni-

versity, Antalya, Turkey (ID: 206). Identification of the species was carried out according to Heemstra and Randall (2001) and the validity of the name was verified based on FishBase (Froese and Pauly 2014).

**Short description.** Body elongate with large head and mouth. Skin colour with 5 irregular, oblique, dark bars; many of small brownish orange or reddish brown spots on whole body (Fig. 2).



**Fig. 1.** Map of the area where orange-spotted grouper, *Epinephelus coioides* was collected

\* Correspondence: Dr. Yaşar ÖZVAROL, Su Ürünleri Fakültesi, Akdeniz Üniversitesi, TR 07059 Antalya, Turkey, phone: (+90) 5396328616, fax: (+90) 2422262013, e-mail: (YO) ozvarol@akdeniz.edu.tr, (MG) gokoglu@akdeniz.edu.tr.

The fish had a total length of 56 cm and weighed 2945 g. Metric and meristic measurements of the specimen are given in Table 1.

**Remarks.** Until recently there have been seven groupers recorded in Turkey: *Epinephelus aeneus* (Geoffroy Saint-Hilaire, 1817); *Epinephelus caninus* (Valenciennes, 1843); *Epinephelus marginatus* (Lowe, 1834); *Epinephelus costae* (Steindachner, 1878); *Hyporthodus haifensis* (Ben-Tuvia, 1953); *Mycteroperca rubra* (Bloch, 1793); and *Polyprion americanus* (Bloch et Schneider, 1801) (Özvarol and Gökoğlu 2015). The presently reported new record increases the number of Turkish groupers up to 8. According to unpublished data of Gökoğlu and Özvarol, Lessepsian fish species in the Gulf of Antalya increased to 51.

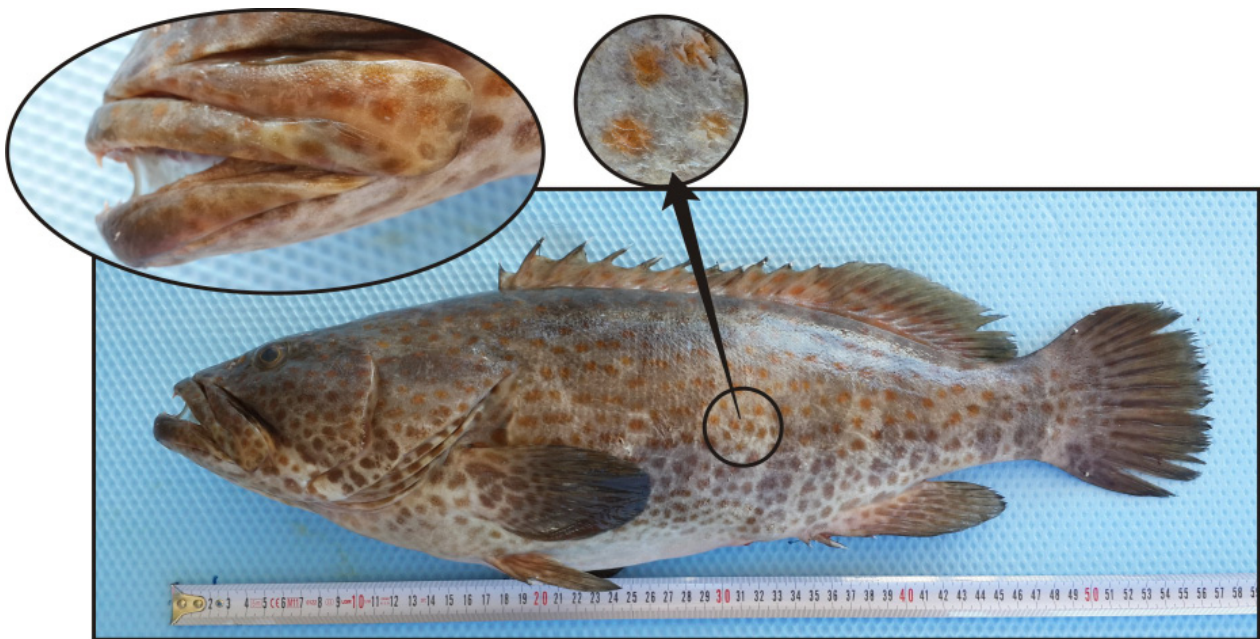
The main characteristic *Epinephelus coioides* is the presence of orange or reddish brown spots on head and body. The characteristics of orange-spotted grouper described by us, are consistent with the description provided by Parenti and Bressi (2001).

The first specimen of *Epinephelus coioides* in the Mediterranean Sea was recorded by Ben-Tuvia and Lourie (1969), who collected it off the coast of Israel. This fish was, however, erroneously identified as "*Epinephelus tauvina*" which was latter determined by Heemstra and Golani (1993). After that additional new specimens were recorded in Haifa Bay by Heemstra (1991) and Adriatic Sea by Parenti and Bressi (2001). The presently reported new finding constitutes the fourth Mediterranean record of *E. coioides*.

**Table 1**

Morphometric and meristic counts of orange-spotted grouper, *Epinephelus coioides*

	Parameter	Value
Meristic counts	Dorsal fin spines	XI
	Dorsal fin soft rays	8
	Total pectoral fin rays	18
	Anal fin spines	III
	Anal fin soft rays	8
Morphometric measurements [mm]	<i>W</i> [g]	2945
	Standard length	489
	Total length	560
	Body depth	143
	Caudal-peduncle depth	55
	Predorsal length	175
	Preanal length	325
	Caudal-fin length	86
	Head length	183
	Pectoral fin length	94
	Pelvic fin length	70
	Eye diameter	17
	Snout length	55
	Interorbital width	40
	Supermaxilla length	62
Upper lips length	60	
Upper lips width	20	



**Fig. 2.** Orange-spotted grouper, *Epinephelus coioides*, caught in the port of Antalya, November 2014; Two insets showing: a close-up a the jaw and brownish-orange-reddish spots on the body

## ACKNOWLEDGES

The authors would like to thank to fishermen Mr Çağrı ÇATAK and Mr Ahmet TELÇELİK for providing the specimen.

## REFERENCES

- Ben-Tuvia A., Lourie A.** 1969. A Red Sea grouper *Epinephelus tauvina* caught on the Mediterranean coast of Israel. *Israel Journal of Zoology* **18**: 245–247.
- Froese R., Pauly D.** (eds.) 2014. FishBase. [version 08/2014] <http://www.fishbase.org>
- Heemstra P.C.** 1991. A taxonomic revision of the eastern Atlantic groupers (Pisces: Serranidae). *Boletim do Museu Municipal do Funchal* **43** (226): 5–71.
- Heemstra P.C., Golani D.** 1993. Clarification of the Indo-Pacific groupers (Pisces: Serranidae) in the Mediterranean Sea. *Israel Journal of Zoology* **39** (4): 381–390. DOI: 10.1080/00212210.1993.10688729
- Heemstra P.C., Randall J.E.** 1993. Groupers of the world (Family Serranidae, Subfamily Epinephelinae). An annotated and illustrated catalogue of the grouper, rockcod, hind, coral grouper and lyretail species known to date. *FAO Fisheries Synopsis No. 125*. Vol. 16.
- Heemstra P.C., Randall J.E.** 2001. Serranidae, groupers and seabasses (also soapfishes, anthiines, etc.). Pp. 2442–2548. *In*: Carpenter K.E., Niem W.H. (eds.) *FAO species identification guide for fishery purposes. The living marine resources of the Western Central Pacific*. Vol. 4. Bony fishes part 2 (Mugilidae to Carangidae). *FAO, Rome*.
- Özvarol Y., Gökoğlu M.** 2015. Length–weight relationship of *Hyporthodus haifensis* and *Mycteroperca rubra* (Pisces; Serranidae) from the north-eastern Mediterranean Sea, Turkey. *Journal of Applied Ichthyology*. DOI: 10.1111/jai.12837
- Parenti P., Bressi N.** 2001. First record of the orange-spotted grouper, *Epinephelus coioides* (Perciformes: Serranidae) in the northern Adriatic Sea. *Cybium* **25** (3): 281–284.
- Por F.D.** 1978. Lessepsian migration. *Ecological Studies* Vol. 23. Springer Verlag, Berlin–Heidelberg–New York.
- Randall J.E., Allen G.R., Steene R.C.** 1997. *Fishes of the Great Barrier Reef and Coral Sea*. 2nd edn. Crawford House Publishing, Bathurst, NSW, Australia.
- Sumaila U.R., Marsden A.D., Watson R., Pauly D.** 2007. A global ex-vessel fish price database: Construction and applications. *Journal of Bioeconomics* **9** (1): 39–51. DOI: 10.1007/s10818-007-9015-4

Received: 14 October 2014

Accepted: 22 February 2015

Published electronically: 30 September 2015