

FIRST RECORD OF THE BERMUDA SEA CHUB, *KYPHOSUS SALTATRIX* (ACTINOPTERYGII: PERCIFORMES: KYPHOSIDAE), IN THE COASTAL WATERS OF LIBYA

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Abstract. In this paper, we report the first record of Bermuda sea chub, *Kyphosus saltatrix* (Linnaeus, 1758) caught off the coast of Benghazi, Libya. Its occurrence adds to the increasing rate of detections of this species in the south of the Mediterranean during the last decade.

Keywords: *Kyphosus saltatrix*, Benghazi, Libyan coast, Occurrence, Mediterranean

The family Kyphosidae is composed of approximately 45 species, all of which inhabit mainly the Atlantic-, Indian, and Pacific Oceans (Nelson 2006, Froese and Pauly 2013).

Bermuda sea chub, *Kyphosus saltatrix* (Linnaeus, 1758), is a relatively common species in the western Atlantic, ranging from Massachusetts (USA) southward throughout the Gulf of Mexico and the Caribbean, down to south-eastern Brazil (Sgano 1978, Wheeler 1985). However, it seems a fairly rare species in the north-eastern Atlantic, although present along the west coast of Africa, from Morocco with sporadic occurrences to at least the Gulf of Guinea and the coast of Angola (Sgano 1981, Tortonese 1986, Desoutter 1990). This species is rarely found in the Mediterranean, with only few occurrences reported: three records off the Ligurian-, Tyrrhenian-, and Adriatic coasts of Italy (Desoutter 1973, Tortonese 1986) and another record off Mallorca Island, western Mediterranean (Merella et al. 1998), off Saint Tropez, south east France (Francour and Mouine 2008). The most recent record was given from the Ionian Sea (western Greece) based on a single specimen caught during 2011 (Kiparissis et al. 2012). In North Africa, some specimens were recorded as well—in Algeria (Hemida et al. 2004) and in Tunisia (Hattour 2006, Lelong 2012).

The Bermuda sea chub *Kyphosus saltatrix* inhabits shallow waters ranging from 1 to 30 m depth, over turtle grass, sandy or rocky bottoms, and around coral reefs (Sgano 1978, Wheeler 1985, Tortonese 1986, Carpenter 2002) and sometimes offshore in deeper waters (Wheeler 1985). The young are commonly found below or among floating *Sargassum* weeds (Sgano 1978, Wheeler 1985, Tortonese 1986). They are often called rudderfish because they associate with floating

objects (namely driftwood) and also following ships (Wheeler 1985, Carpenter 2002). It feeds primarily on benthic macroalgae, but also takes small crustaceans and molluscs associated with the algae (Sgano 1981, Wheeler 1985, Tortonese 1986, Carpenter 2002).

The presently described specimen of *Kyphosus saltatrix* (Fig. 1) was caught on 15 November 2010 off the coast of Benghazi, Libya (southern Mediterranean), by spearfishing at approximately 7 m depth, close to the sea Port of Benghazi (32°06'N, 20°03'E). Water temperature at the day of capture was 18°C. The fish was frozen by the fisherman. Once in the laboratory, the specimen was photographed, identified, and has been deposited in the Natural Museum of the Zoology Department, Faculty of Science, Benghazi University, Benghazi, Libya. The main morphometric (Table 1) and meristic (Table 2) data are shown in, which are in agreement with data reported by other authors who described *K. saltatrix* (see Sgano 1978, 1981, Tortonese 1986, Carpenter 2002, Canas et al. 2005, Nelson 2006, Froese and Pauly 2013). The specimen was a female with 47.5 cm total length (TL) and it weighed 1630 g. It is oval in shape with a small mouth full of incisiform, hockeystick shaped teeth.

The capture of this specimen of Bermuda sea chub off the Benghazi coast is the first record in Libyan waters and the fourth finding reported from the North-African coast (southern Mediterranean), which confirms the spread of this species along the North-African coast (Lelong 2012). This occurrence could mainly be attributed to the global phenomenon of seawater warming that allows species of tropical and subtropical origin to enter and establish in the Mediterranean Sea (Golani et al. 2002). Furthermore,

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Fig. 1. Specimen of *Kyphosus saltatrix* captured in Libyan waters

Table 1
Morphological data for the specimen
of *Kyphosus saltatrix* caught in Libyan waters

Parameter	Value [g]	Value [mm]	Relative value [% of SL]
Total length (TL)		475	—
Fork length (FL)		431	—
Standard length (SL)		385	100
Head length (HL)		99	25.71
Head depth aeoOp		130	33.76
Head depth aeoOr		75	19.48
Head width aOp		60	15.58
Eye diameter		20	5.19
Pre-orbital length		30	7.79
Post-orbital length		52	13.50
Body width aDO		45	11.68
Body width aAO		35	9.09
Body height		160	41.55
Pre-dorsal length		155	40.25
Pre-anal length		245	63.63
Caudal peduncle length		70	18.18
Dorsal fin base length		200	51.94
Pectoral fin length		70	18.18
Pectoral fin base length		21	5.45
Pelvic fin length		57	14.80
Pelvic fin base length		16	4.15
Anal fin base length		89	23.11
Caudal fin height		155	40.25
Caudal fin length		95	24.63
Total weight	1630		
Gutted mass weight	1400		

aeoOp = at end of operculum, aeoOr = at end of orbit, aOp = at operculum, aDO = at dorsal origin, aAO = at anal origin.

K. saltatrix is probably a species, tolerating a wide range of seawater temperatures (Canas et al. 2005).

Additionally, ports of big coastal cities are exposed to alien species as a consequence of shipping traffic (Farrapeira et al. 2007). Port of Benghazi receives hundreds of ships annually from other regions of Libya and from all over the world and it is possible that some fish are becoming unintentional “stowaways”. One of the options for such “refugees” would be to travel between the fouling organisms covering the submerged parts of a ship. In such case the ship’s hull would function as an artificial reef providing not only adequate shelter against predators but also supplying an important food source through colonizing benthic macroalgae. (Canas et al. 2005, Silvano and Güth et al. 2006, Farrapeira et al. 2007). The more likely and already confirmed option, however, for the displacement of marine organisms including fish would be travelling inside the ballast tanks of ships (Pearce 2013). The ballast

Table 2
Meristic data for the specimen
of *Kyphosus saltatrix* caught in Libyan waters

Meristic data	Counts
Dorsal fin spines + rays	XI + 12
Anal fin spines + rays	III + 11
Pectoral fin rays	18
Pelvic fin rays	I + 5
Caudal fin rays	18
Pored scales in lateral line	60
Scale rows above lateral line	12
Scale rows below lateral line	22
Gill rakers on 1st arch	7 + 17
Incisor-like teeth on upper jaw	40
Incisor like teeth on lower jaw	42

waters decidedly represent a serious vector for introduction of new species, which could have potential effect on ecosystem, particularly if those species succeed in establishing self-sustaining populations (Dulčić et al. 2010). The capture of this *Kyphosus saltatrix* specimen in a location off Benghazi Coast could possibly also be associated with the high abundance of macroalgae, constituting an attractive food source for this species. However, the stomach of this specimen was completely filled by *Sargassum* spp. macroalgae that are largely increasing in the area of capture, in association with small crustaceans and molluscs. This observation is in agreement with Clements and Choat (1997), who report that kyphosids appear to be strict herbivores that can derive adequate nutrition from algae with low levels of easily assimilable energy.

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