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Preliminary results on feeding habits of the invasive fish *Fistularia commersonii* (Ruppell, 1862) in the coast of Benghazi, Libya

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Highlights

- **The feeding habits of the invasive fish Fistularia commersonii in the coast of Benghazi were studied by investigating the natural diet of monthly collected specimens.**
- **Generally, the food items found in the examined stomachs were grouped into six categories namely fish, crustacean, mollusca, empty stomach, digested matter, and other.**
- **The first group found in large quantities was Fish (87%) of total food composition. Sand grains, and the unidentified matter was 5% of total food composition followed by digested matter (4%), crustacean (2%), mollusca (1%) and an empty stomach (2%).**

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ABSTRACT

The feeding habits of the exotic fish *Fistularia commersonii* off the coast of Benghazi, Libya were investigated. A total of 189 specimens were collected throughout the year of 2012-2013. The mean total length (TL) and mean weight was 99.08±6.45cm and 545.33±116 g, respectively. The condition factor (K) ranged between 0.7 and 0.8. Fish were found in large quantities (87%) in the stomach of the bluespotted cornetfish. While crustaceans (2%) and mollusks (1%). The results showed also that *F. commersonii* feeds on prey from diverse habitats as well as depths.

1. Introduction

Although the Suez Canal was constructed to provide a better trade route between Europe and the Far East countries, it truly initiated an ecological disturbance between two totally different bodies of water which are the Red Sea and the Mediterranean Sea. From that point on numerous marine species were introduced into the Mediterranean Sea, this introduction was termed lessepsian migration after the engineer Ferdinand de Lesseps (Por 1978, 1990) who designed the canal. The bluespotted cornetfish, *Fistularia commersonii* (Ruppell, 1862), is a great example of the fish species taking part in the migration process from the Red Sea to the Mediterranean Sea. The first report of *F. commersonii* was in the year of 2000, off the coast of Israel (Golani 2000, Elbaraasi *et al.* 2014). Since this initial report, it has become a comparatively common fish in the Mediterranean Sea. It recorded for the first time in Libya by the year of 2007 (Elbaraasi & Elsilini, 2009; Shakman and Kinzelbach, 2007).

It is flattened from the ventral side; the dorsal and anal fins are opposite to each other. The caudal fin is forked, with very elongated and filament middle rays (Deidun and Germana 2011). It is green dorsally and silvery white ventrally, with two blue stripes of blue spots on the back. The head (consisting of a protracted, tubular snout) constitutes more than one-third of the entire body length, ending in a small mouth.

F. commersonii is a benthopelag species with tropical and subtropical distribution (Froese and Pauly 2010). It lives either solitary or in schools (Fischer and Bianchi 1984, Nakamura *et al.* 2003, Karachle *et al.* 2004). It founds in many different habitats, such as rocky, reef, muddy and sandy bottoms also in seaweed meadows to mixed environments (Bilecenoglu *et al.* 2002, Garibaldi and Orsi-Relini 2008, Kara and Oudjane 2009, somadakis *et al.* 2009).

The diet composition of *F. commersonii* in the Mediterranean has rarely been studied. However, it is carnivorous, seeking food over reefs and seagrass beds, as well as benthic fish and sometimes shrimps (Golani 2000). It feeds on bottom-living, water column dwelling local fishes like *Atherina sp.* and native populations of economic importance mainly *Spicara smaris* and *Mullus surmulentus* (Corsini *et al.* 2002). The prey families known are grouped as either pelagic fish or bottom-dwelling reef fish (Takeuchi *et al.* 2001). The objective of this study is to provide essential information on the feeding habits of *F. commersonii* on the Libyan coast off Benghazi during some months of the year of research.

2. Materials and methods:

The bluespotted cornetfish, *Fistularia commersonii* Samples (Fig. 1) were collected by fishermen using commercial fishing vessels along the coast of Benghazi, Libya (Fig. 2). A total of 189 individuals were sampled monthly from November 2012 to October 2013, taking into account the absence of samples in some months. Fish Samples, after that, were transferred in ice to the Aquaculture and Fisheries lab, Zoology Department, Benghazi University.

For each specimen, the total length (TL) were calculated to the closest cm and total weight (BW) to 0.1 gr. For feeding habit investigation, the stomachs were dissected out, and the food was preserved in 5% formaldehyde for further study. The analysis of food

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contents within the digestive tract was done by recording the degree of stomach fullness. The stomachs were classified as gorged, full, three-quarter full, half full, quarter full, trace and empty depends upon the degree of fullness and consequently, the amount of food contained in them converted to a percentage (Bapal and Bal, 1958).

Fig. 1. Samples of the blue spotted cornetfish, *Fistularia commersonii.*

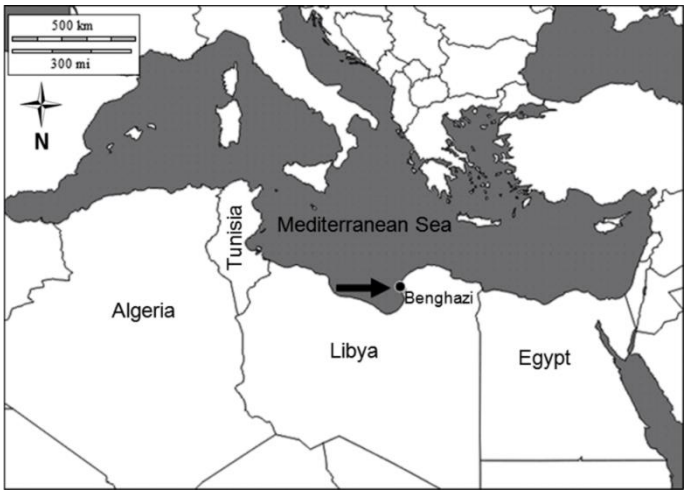

Fig. 2. Map showing the location of sampling *F. commersonii* in the coast of Benghazi, Libya.

The condition factor (K) was calculated according to Pauly, 1983 by the formula:

$$K = 100w / L^3$$

Where W= weight (g), L= Total length (cm).

3. Results and Discussions

Total length (TL) of bluespotted cornetfish collected during this study ranged from 55.0 to 198.5 cm with mean TL of 99.08±6.45cm (mean±SD), weight of bluespotted cornetfish collected during this study ranged from 179 to 1032 g with mean weight 545.33±116 g (mean±SD). However, the biggest individual inspected (198.5 cm, TL) is in accordance with greatest sizes recorded from the Mediterranean in past investigations (Kalogirou *et al.*, 2007; Bariche *et al.*, 2009, Bariche and Kajajian 2012). The calculated values of Condition factor (K) of bluespotted cornetfish off the coast of Benghazi ranged between 0.7 and 0.8. However, the mean value of K in April was 0.7±0.01, in May was 0.7±0.01, in June was 0.7±0.02, in August was 0.7±0.01, in September was 0.8±0.01, and finally in November was 0.7±0.01. Furthermore, the condition of fishes is influenced by gonadal development, feeding activity and several other factors (Doddamani *et al.*, 2001). In the present investigation, comparing K bluespotted cornetfish collected from Benghazi showed that there were no differences in condition factor during the year, which may explain that the population off Benghazi coast living in same conditions of food availability.

The various food items recorded from the stomach of the bluespotted cornetfish during the study period are presented in (Fig. 3). Generally, the food items found in the examined stomachs were grouped into six categories namely fish, crustacean, mollusca, empty stomach, digested matter, and other. The first group found in large quantities was Fish (87%) of total food composition. Thus, it forms the major food items in the stomach. However, other matter (which include sand grains, and the unidentified matter was 5% of total food composition followed by digested matter (4%), crustacean (2%), mollusc (1%) and an empty stomach (2%).

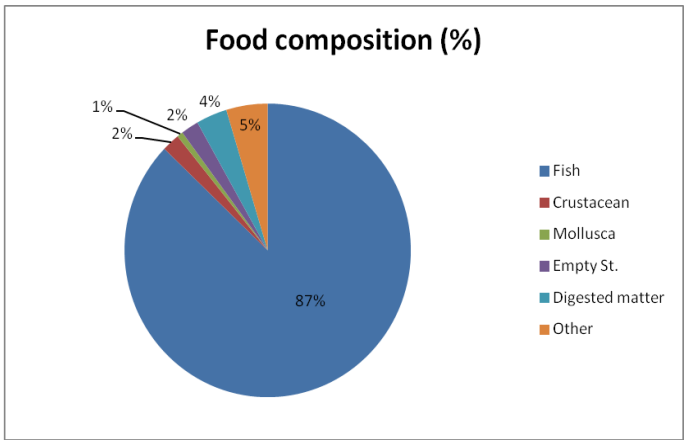

Fig. 3. The average percentage of main food items in the stomach of *Fistularia commersonii* in the coast off Benghazi, Libya.

The variation in percentage composition of food items in *Fistularia commersonii* during different months are shown in (Fig. 4). It revealed that the percentage composition of different food items varied in different months according to their availability and preference of fish. However, fish was the main food composition for all months. Furthermore, In April, fish was 81% of total food composition, crustacean was 2%, mollusca was 1%, empty stomach was 4%, digested matter 8%, and other was 4%.

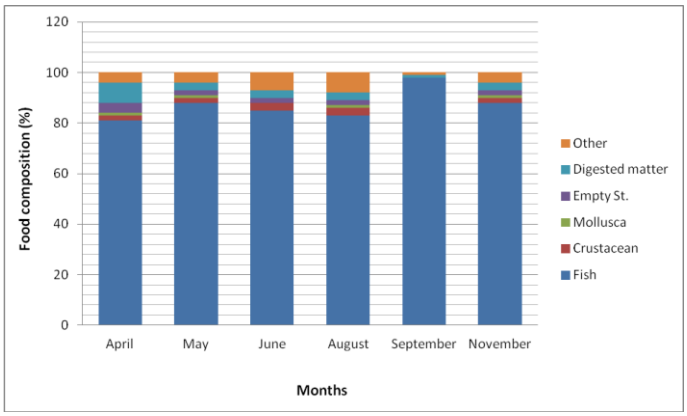

Fig. 4. Monthly variation of food composition of *Fistularia commersonii* in the coast of Benghazi, Libya.

In May, fish was 88% of total food composition, the crustacean was 2%, mollusca was 1%, empty stomach was 2%, digested matter 3%, and the other was 4%. In June, fish was 85% of total food composition, the crustacean was 3%, mollusca was 0%, empty stomach was 2%, digested matter 3%, and the other was 7%. In August, fish was 83% of total food composition, crustacean was 3%, mollusca was 1%, the empty stomach was 2%, digested matter 3%, and other was 8%. In September, fish was 98% of total food composition, crustacean was 0%, mollusca was 0%, the empty stomach was 0%, digested matter 1%, and the other was 1%. In

November, fish was 88% of total food composition, crustacean was 2%, mollusca was 1%, an empty stomach was 2%, digested matter 3%, and the other was 4%.

Feeding habits influence on the length of the gut of fishes. Moreover, carnivore fishes commonly have a stomach with a short and less straight gut. This can be as a result of the meat gets digested more simply, whereby herbivores fishes the gut is long and extremely whorled as a result of the vegetable food take longer for digestion (Bond 1996, Moyle and Cech 2000). In the present species, the alimentary canal is short; hence, the stomach was only considered in this study. The analysis of stomach content of bluespotted cornetfish from Benghazi coast revealed that these species consume a variety of bony fish as food items in this region of Libya. Differences within the dominance of various food classes are often attributed to their accessibility and also the environment wherever the fish lived at a selected time. Prevalence of crustacean and mollusks even in little proportion is maybe because of the abounding of them throughout this time. They additionally indicate a bottom-feeding tendency. Incidence of sand grains throughout the study period with comparatively low quantities indicates that sand could also be taken by accident (Kalogirou *et al*. 2007).

4. Conclusion

The bluespotted cornetfish in Benghazi coast became abundant lately which might be dangerous to many indigenes fish species that have commercial importance in the fishery sector, therefore, more studies need to be done in the future to understand the life history of this species along the coast of Libya.

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