

CEPHALOPOD PREY OF TWO SKATE AND FIVE SHARK SPECIES CAUGHT BY LONGLINE IN THE EASTERN IONIAN

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Abstract

The cephalopod component in the stomach content of 5 shark (*Centrophorus granulosus*, *Etmopterus spinax*, *Scyliorhinus canicula*, *Squalus acanthias*, *S. blainvillei*) and 2 skate species (*Raja clavata*, *R. oxyrinchus*) caught during experimental fishing with bottom long-lines over depths 385-800m, was investigated. Cephalopod remains occurred at over 20% of non-empty stomachs for examined species. Eight cephalopod species, belonging to 5 families have been identified, including 5 oegopsid squids, 2 octopods and 1 sepiolid.

Keywords: *Deep waters, Cephalopods, Elasmobranchii, Ionian Sea*

Understanding of the food-web structure and functioning is essential for an ecosystem-based management of fisheries, presupposing the knowledge of component key species, their spatio-temporal, abundance and interactions in a certain ecosystem of which the fisheries resource is a part.

Cephalopods are frequently found in the diet of both pelagic and demersal species of elasmobranchs, accounting for about 80% of the diet of some teuthophagus species and consumed in large quantities even by species characterized as generalist predators. Despite the underlined significance of cephalopods in the diet of several marine species from the Mediterranean Sea, data on the cephalopod prey specific composition are still poor [1]. The present study is aiming to contribute to the identification of key cephalopod species in the food-web at the north-eastern Ionian upper slope.

Specimen of examined elasmobranchs were collected during experimental fishing with bottom long-lines carried out off south-western coasts of Cephalonia Island in 2010, within the framework of the E.U. project CoralFISH (<http://www.eusem.com/body/CE/EUproj/CE21.htm>). Cephalopod beaks sorted out from stomach and intestine contents were assigned to species based on comparison with beaks of the IMBRIW-HCMR reference collection. Lower/upper rostral lengths (LRL, URL) and lower/upper hood lengths (LHL, UHL) of beaks from decapod and octopod cephalopods respectively, were measured to the nearest 0.01 mm on the digital images. To reconstruct mantle length (ML) of cephalopod prey individuals, equations previously published or developed in IMBRIW-HCMR were used.

Tab. 1. Elasmobranch predator species: Total length (TL) range, number of specimen with non- empty stomachs and percentage of non-empty stomachs in which cephalopod remains occurred.

Predator Code	Predator Species name	TL range (mm)	No non-empty stomachs	Cephalopod occurrence %
(A)	<i>Centrophorus granulosus</i>	750-910	5	40
(B)	<i>Etmopterus spinax</i>	270-393	16	19
(C)	<i>Raja clavata</i>	514-550	2	50
(D)	<i>Raja oxyrinchus</i>	750-980	10	30
(E)	<i>Scyliorhinus canicula</i>	460	1	
(F)	<i>Squalus acanthias</i>	785-930	10	40
(G)	<i>Squalus blainvillei</i>	357-780	75	27

Cephalopod remains were found in 34 of the 119 non-empty stomachs, representing over the 20% of stomachs analysed by predator species (Table 1). Identified beaks belonged to mesopelagic and benthopelagic cephalopod species (Table 2) and occurred at over 20% of non-empty stomachs for examined species (Table 1).

Heteroteuthis dispar was the most frequently preyed species, consumed by 4 predator species and being the single cephalopod species among preys of *Etmopterus spinax*. The ommastrephids *I. coindetii* and *T. eblanae* participated only in the diet of *Centrophorus granulosus*, whereas *Pyroteuthis margaritifera*

only in that of *Raja clavata*.

Tab. 2. Cephalopod prey species: Number and mantle length (ML) range of specimen identified from beak remains found among stomach contents of elasmobranch species examined.

Prey species name	ML range (mm)	Predator species code						
		(A)	(B)	(C)	(D)	(E)	(F)	(G)
<i>Abralia veranyi</i>	26-37					1		1
<i>Abraliopsis pfefferi</i>	13.4-16.3							3
<i>Pyroteuthis margaritifera</i>	30			1				
<i>Illex coindetii</i>	162	1						
<i>Todaropsis eblanae</i>	117	1						
<i>Heteroteuthis dispar</i>	17-21		3		6	4		5
<i>Pteroctopus tetracirrhus</i>	44-71				2			
<i>Scaevurgus unircirrhus</i>	22.6-38.5						1	2

Heteroteuthis dispar, although very rarely caught by bottom trawl seems to be quite abundant over the upper slope of the Mediterranean Sea, as it is among the most frequently found cephalopods so in the diet of demersal chondrichthyans [2,3], large pelagic fish [4,5] and dolphins [6] as in among catches of experimental mesopelagic trawls and macroplankton devices [7,8].

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