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## A note on the diet of five deep-sea fishes from the North-eastern Aegean Sea

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*Stomach contents of five deep-sea fish species caught off the north-western coast of  
Turkey (NE Aegean Sea) were examined. Crustaceans comprised a significant proportion of  
the identified prey items.*

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**Key words:** NE Aegean Sea, deep-sea fish, food habits

### INTRODUCTION

The deep-sea fish species of NE Aegean Sea (off the coast of Turkey) have been studied by DEMİR (1958), KAYA (1993), KAYA and ÖZAYDIN (1996) and ÜNSAL and KABASAKAL (1998). The diets of most species have not been described, with the exception of *Capros aper* (KAYA and ÖZAYDIN, 1996). During the trawling surveys carried out in the NE Aegean Sea by the Faculty of Fisheries, between August 1997 and November 1997, five deep-sea fish species were collected. A preliminary description of their diets is given in this paper.

## MATERIAL AND METHODS

Samples were collected from NE Aegean Sea (Fig.1.) at depths between 150 and 360 m, by means of an otter trawl with a cod-end mesh opening of 22 mm from knot to knot. Standard lengths (SL) of all specimens were measured to the nearest 0.05 mm, stomach contents were removed and stored in 5 percent formaldehyde for subsequent examination. Prey items found in the stomach contents were identified to the lowest possible taxon and counted. Index of frequency 'F' and percentage of number 'Cn' of each prey item were computed using the following formulae (HUREAU, 1970):

$$F = n / N$$

$$Cn = (N_i * 100) / N_p$$

where,  $n$  is the number of stomachs containing a certain prey item, and  $N$  is the total number of the examined stomachs;  $N_i$  is the number of the individuals of prey  $i$ , and  $N_p$  is the total number of the examined preys.

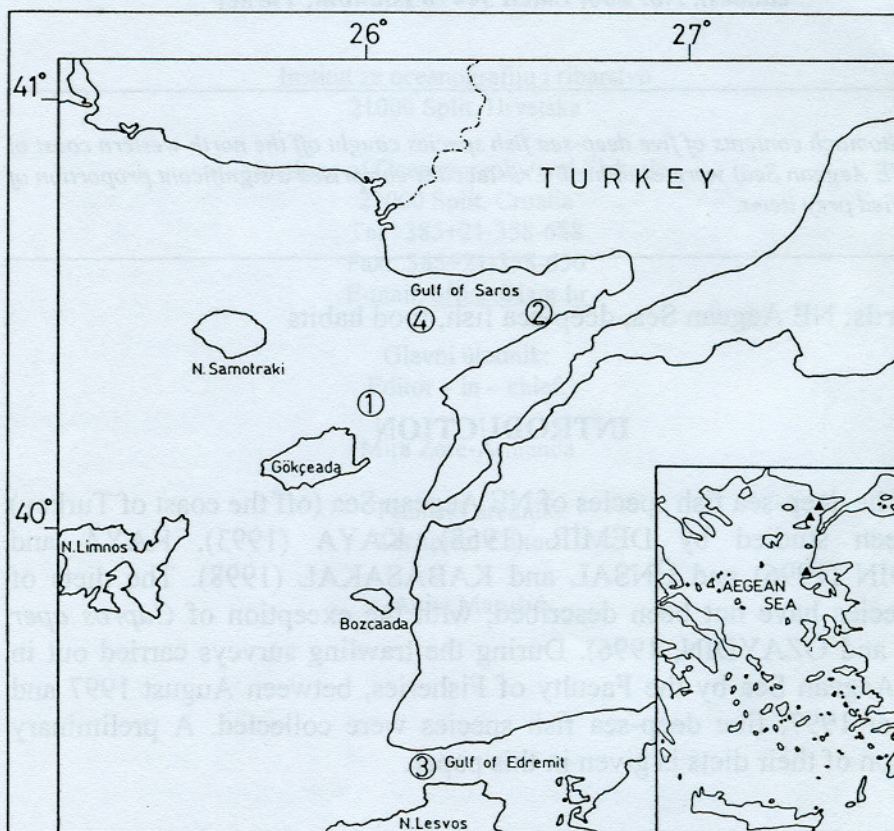


Fig 1. Sampling stations (numbered circles) where deep-sea fish species were caught. Dark triangles on the small map indicate the approximate locations of the sampling stations.

Table 1. Number and size of each fish species sampled, as well as depth and location of sampling etc.

SPECIES	No. of fish	Station number	Depth (m)	Locality	Mean SL and range (mm)	Stomach analysis	
						No. examined	No. with food
CHLOROPHTHALMIDAE <i>Chlorophthalmus agassizii</i> BONAPARTE, 1840	15	1	360	40°17'13"N 26°00'50"E	70.66 (55.35-81.2)	15	10
MACROURIDAE <i>Coelorhynchus coelorhynchus</i> (RISSO, 1810)	33	2	347	40°27'00"N 26°23'45"E	177.51 (131-242)	33	30
GADIDAE <i>Gadiculus argenteus argenteus</i> GUICHENOT, 1850	17	3	300	39°24'57"N 25°57'36"E	81.43 (69-90.15)	17	12
MORIDAE <i>Gadella maraldi</i> (RISSO, 1810)	2	4	150	40°28'58"N 26°10'30"E	191 (176-206)	2	1
TRACHICHTHYIDAE <i>Hoplostethus mediterraneus</i> CUVIER, 1829	11	1	360	40°17'13"N 26°00'50"E	63.79 (52.2-105.4)	11	3

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Table 2. The diets of *C. agassizii*, *C. coelorhynchus*, *G. argenteus argenteus* and *H. mediterraneus*. 'F' is the index of frequency, and 'Cn' is the percentage by number of each prey item.

PREY ITEMS	<i>C. agassizii</i>		<i>C. coelorhynchus</i>		<i>G. argenteus argenteus</i>		<i>H. mediterraneus</i>	
	F	Cn	F	Cn	F	Cn	F	Cn
Polychaeta								
Nereid sp.			0.06	0.9				
Unidentified			0.03	0.45				
Gastropoda								
Unidentified			0.03	0.45				
Amphipoda								
<i>Ampelisca</i> sp.			0.06	0.9				
<i>Dexamine spiniventris</i>			0.03	0.45				
Unidentified	0.13	6.66	0.45	10.85				
Isopoda								
<i>Cirolana</i> sp.							0.18	5.66
Unidentified							0.09	1.88
Decapoda								
<i>Parapenaeus longirostris</i>			0.03	0.45			0.09	1.88
<i>Munida</i> sp.							0.09	1.88
<i>Pilumnus</i> sp.			0.06	1.35				
Crustacean fragments	0.13	2.22	0.72	10.85	0.35	12.72	0.27	84.9
Pisces								
Myctophidae					0.11	3.63	0.18	3.77
Macrouridae					0.05	1.81		
Unidentified	0.06	2.22						
Unidentified tissue	0.66	88.88	1	57.91	0.70	81.81		
No. of full stomachs	10		30		12		3	
No. of prey items	45		221		55		53	
Sediments and stones			0.13	3.16				

## RESULTS

The five species of deep-sea fishes collected are listed in Table 1. together with information on their numbers, depth of capture and standard length. The single full stomach of *Gadella maraldi* (206 mm SL) contained the remains of teleosts, 5 otoliths and 6 amphipods. The analysis of the diets of *Chlorophthalmus agassizii*, *Coelorhynchus coelorhynchus*, *Gadiculus argenteus argenteus* and *Hoplostethus mediterraneus* are given in Table 2. Identified prey items of the diets of *C. agassizii*, *C. coelorhynchus*, *G. argenteus argenteus* and *H. mediterraneus* were dominated by crustacean remains. The examined stomachs of *C. agassizii* and *C. coelorhynchus* contained remarkable amounts of amphipods. Isopods were found only in the stomach contents of *H. mediterraneus*, and polychaetes and gastropods were found only in *C. coelorhynchus*.

## DISCUSSION

Feeding ecology of gadiform fishes have been studied by MACPHERSON (1978), GEISTDOERFER (1979) and HUREAU *et al.* (1979). According to MACPHERSON (1978) the diet of *G. argenteus argenteus* consisted mainly of crustaceans (particularly copepods, amphipods, euphausiaceans and decapods) and fish, in the western Mediterranean. Crustacea comprised a significant proportion of the prey items found in the stomach contents of the examined specimens of *G. argenteus argenteus*, as well as fish (unidentified Myctophidae and Macrouridae) were also present in the stomachs. The diet of *C. coelorhynchus* has a preference for benthic crustaceans, polychaetes and fish (GEISTDOERFER, 1979), however, no fish remains were observed in the stomach contents of our study material. *C. coelorhynchus* exhibited the most diverse diet composition among the five examined fish species (Table 2). According to SULAK (1984) and MAUL (1986), the diet of *C. agassizii* is consisted mainly of bottom-dwelling invertebrates and of *H. mediterraneus* consisted of crustacea. Of the identified prey items crustacea comprised a significant proportion in the stomach contents of both species (Table 2). However, fish remains were also found in the examined stomach contents of *C. agassizii* and *H. mediterraneus*. Available data on the food habits of *G. maraldi* is insufficient (COHEN, 1986), and the stomach of the single examined individual in the present study contained mostly remains of teleosts and amphipods. Despite their benthic habit, it could be stated that the fish do not appear to be feeding opportunistically because no evidence of feeding on molluscs and polychaetes which are abundant in and on the

sediments of the area investigated (only 1 operculum of a prosobranch gastropod was observed in the stomach contents of *C. coelorhynchus*, as well as small amounts of polychaetes were found in the stomach contents of the same fish).

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# Bilješke o ishrani petero dubokomorskih riba sjevernoistočnog Egejskog mora

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## SAŽETAK

Analiziran je sadržaj želudaca petero dubokomorskih riba ulovljenih u sjevernoistočnim otvorenim vodama Turske (NE Egejsko more). Crustacea su sačinjavali znatan dio plijena.

## INTRODUCTION

The deep-sea fish species of the Aegean Sea (off the coast of Turkey) have been studied by DEMİRCİ and KAYA (1991), KAYA and ÖZAYDIN (1996) and ÜNSAL and KABASAKAL (1998). The diets of most species have not been described, with the exception of *Capros aper* (KAYA and ÖZAYDIN, 1996). During the trawling surveys carried out in the NE Aegean Sea by the Faculty of Fisheries, between August 1997 and November 1997, five deep-sea fish species were collected. A preliminary description of their diets is given in this paper.

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