CONTRIBUTION TO THE DIETARY ANALYSIS OF THE SQUID *ILLEX COINDETII* (CEPHALOPODA, OMMASTREPHIDAE) AT THERMAIKOS GULF (NORTH AEGEAN-GREECE)

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Abstract
The dietary analysis of the squid *Illex coindetii* was carried out at Thermaikos Gulf. Samples were collected seasonally by bottom trawl during one permitted fishing period. The species preyed mostly on crustaceans, cephalopods and fishes. The composition of its diet differed according to the season and the animal's sex and size. Female and large-sized individuals preferably consumed crustaceans. Similar results have been reported from *I. coindetii* populations at the same geographic area, but the dietary composition of the squid is different at other Mediterranean populations. These results reveal the increase variability of the species' trophic habits.
Keywords: Diet, Cephalopods, Aegean Sea

Introduction
The squid *Illex coindetii* (Verany, 1839) is an Atlanto-Mediterranean species, inhabiting various soft substratum types, mostly muddy bottoms, with a broad vertical distribution, from shallow waters up to 1000 m depth [1, 2]. The species is very common throughout the Mediterranean and in several areas of the Aegean Sea [1]. Due to its commercial interest and also to its wide range of distribution, there are many studies about the species' biology, fisheries and natural stock management [2]. In particular, the diet of the squid has been described revealing significant differences according to the geographic area, the sex, the season and the size of the animal [2]. Therefore, the present study aims at describing the trophic habits of *I. coindetii* at Thermaikos Gulf, by presenting preliminary data about the influence of sex, season and mantle length to its diet.

Materials and Methods
The study was carried out at Thermaikos Gulf (north Aegean Sea, Eastern Mediterranean). Seasonal samples were collected using commercial bottom trawl, during one permitted fishing period (October 2005 to April 2006). 21 hauls were carried out (mesh size of the net: 40 mm) at depth ranging from 32 to 96 m. All the collected squids were measured for mantle length and their stomach content was examined. The trophic level of the squid [3] and two trophic indices ([4], [5]) were estimated: the frequency of occurrence, F and the percentage of prey, P, calculated as follows $F=n*100/N_s$ and $P=n_1*100/N_p$, where n= number of stomachs containing a certain prey, N_s= total number of stomachs examined, n_1= total number of individuals of a certain prey andN_p= total number of prey items. According to N values, prey categories were distinguished as preferential (N>50%), secondary (10%<N<50%) and occasional (N<10%) [3, 4]. ANOVA analysis was used to test for the effects of sex, season and size to the stomach content of the squids.

Results and Discussions
In general, 200 specimens of *I. coindetii* were collected, almost exclusively in daytime, and examined. According to the calculated indices, these squids prayed preferably on crustaceans (F=29.5%, N=54,13%), cephalopods (F=13%, N=23,85%) and fishes (F=12%, N=22,02%), whereas a significant percentage of squids presented empty stomachs (up to 50%). The percentage of each food item is given at Table 1. The trophic level of *I. coindetii* was estimated at 3.94 (S.E=0.59). ANOVA results showed that prey composition differed among seasons, sex, and size (P<0.05). Large sized individuals and females consumed increased amount of all three food items. With respect to the seasonal differences, the consumption of Crustacea decreased in autumn, whereas that of Cephalopoda and Pisces increased in spring.

Tab. 1. Ratio of stomach content of Illex coidetii by sex, season and size (ML=mantle length of cuttlefish)

Stomach content	Percentage of prey (%)						
	Male	Female	Autum	Winter	Spring	ML≤69,3	ML>69,3
crustaceans	25.7	33.3	20.4	33.8	32.1	24.8	34.7
cephalopods	10.9	15.1	11.1	5.9	20.5	9.5	16.8
pisces	8.9	15.1	9.3	11.8	14.1	8.6	15.8
Empty	55.1	63.7	66.7	61.8	52.6	64.8	53.7

The above results conform to other studies conducted at the north Aegean Sea [1]. In contrast, the main prey items at the western Mediterranean populations of the squid are fishes, followed by crustaceans and to a much lesser extent, cephalopods [2]. Also, at these areas the predominance of fishes over crustaceans is higher in spring and autumn than in winter. At the present study a very high percentage of cephalopods in prey composition was observed. This result may be attributed to the relatively small size of the collected squids, since cephalopods are considered as occasional prey for *I. coindetii*, being consumed mostly by juveniles [1, 2]. It seems therefore, that the species can utilize a variety of food items, according to prey availability, size, sex and season.

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