PRELIMINARY DATA ON THE TROPHIC INTERACTIONS BETWEEN *SCYLIORHINUS CANICULA* (SCYLIORHINIDAE) AND *RAJA CLAVATA* (RAJIDAE) IN THE CENTRAL-WESTERN MEDITERRANEAN

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Abstract
Preliminary data on the diet and trophic competition between *Scyliorhinus canicula* and *Raja clavata*, caught in the seas surrounding Sardinia (central-western Mediterranean),during trawl surveys carried out from 2005 to 2008 are given. The low values of Levin and Shannon-Weaver indexes showed that these two species are specialized predators. The ontogenetic analysis of the diet showed different predatory patterns.
Keywords: Diet, Western Mediterranean, Biodiversity, Competition

Introduction
The Scyliorhinidae *Scyliorhinus canicula* L., 1758 and the Rajidae *Raja clavata* L., 1758 are certainly included among the most common selachian species caught by trawl in the italian seas [1]. Despite this relative abundance, not much is known about the trophic interactions between these two species occupying the same depth ranges. The aim of this work is to add further data on this item through the analysis of the levels of trophic competition between the two selachians.

Materials and Methods
A total of 541 specimens (299 of *R. cavata* and 242 of *S. canicula* respectively) were caught at depths between 40 and 660 m, during trawl surveys carried out from 2005 to 2008 in the seas surrounding Sardinia (central-western Mediterranean). In order to examine the diet of each species, %Cn, %F, %W and %I.R.I. were calculated. The diet breadth was studied through the indexes of Levin (Bi) [2] and Shannon–Weaver (H') [3]; Morisita's simplified index (C) [2] and multidimensional scaling (MDS) [4] were also used in order to determine the intra and interspecific competition. The prey categories responsible for the groupings derived from the MDS were identified by SIMPER test [5]. The ontogenetic variation of the diet was also performed on three size classes (small, medium and large).

Results and Discussion
Despite the high variety of preys, the low values of Bi and H' (Bi = 0.46 and H' = 2.27 for *S. canicula*, and Bi = 0.44 and H' = 2.20, for *R. clavata*), showed a stenophagous alimentary behaviour. In *S. canicula* 44 prey categories, assembled in 7 main groups (Crustacea, Osteichthyes, Cephalopoda, Polychaeta, Cnidaria, Tunicata, Echinodermata) were found. Crustacea (%Cn = 67, %I.R.I. = 77.9), and particularly Decapoda (%Cn = 34, %I.R.I. = 70), Mysidacea (%Cn = 26, %I.R.I. = 13) and Euphausiacea (%Cn = 28, %I.R.I. = 14) dominated the diet, while Osteichthyes and Cephalopoda were the most important secondary preys. A total of 95 prey categories were identified in the stomachs of *R. clavata*, grouped into 10 main groups (Crustacea, Osteichthyes, Chondrichthyes, Cephalopoda, Gastropoda, Foraminifera, Polychaeta, Cnidaria, Tunicata, Echinodermata). Crustacea (% Cn = 77, %I.R.I. = 69), and particularly Decapoda (%Cn = 28, %I.R.I. = 73) and Mysidacea (%Cn = 32, %I.R.I. = 16), represented the most predated items. Osteichthyes were secondary preys. In both species the diet is influenced by size. Diet of juvenile *R. clavata* was centred on small Crustacea (mainly Mysidacea, Decapoda and Amphipoda), substituted by Osteichthyes (principally *Glossanodon leioglossus*) and larger Decapoda (*Solenocera membranacea*) in the medium and large size classes. In *S. canicula*, the stenophagy decreased during the ontogenetic development. Smaller individuals feed mainly on Euphausiacea, while Decapoda increased in importance during the growth. Morisita's index showed relatively high levels of intraspecific competition in all the *S. canicula* size groups (C= 0.78, 0.61 and 0.86 among SC1-SC2 SC1-SC3 and SC2-SC3 respectively) and only among medium and large specimens in *R. clavata* (C= 0.89); interspecific competition was relevant only among juveniles *R. clavata* and the first two *S. canicula* groups (C values near 0.70), due to the consumption of Crustacea, and among medium *R. clavata* and large *S. canicula* (C = 0.75), due to Crustacea and Osteichthyes. These results were confirmed by the MDS analysis, with the only exception of small *S. canicula* which formed an isolated group, due to the high presence of Euphausiacea in their diet (SIMPER test). Despite of the same depth range occupied, the two species showed different alimentary patterns. Considering their K type life strategies, these particular predatory behavior should probably be adopted in order to minimize trophic competition, facilitating the species' survival. Further studies will be useful to clarify these statements.

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