

DIET OF THORNBACK RAY (*RAJA CLAVATA* LINNAEUS, 1758) IN SAROS BAY (THE NORTH AEGEAN SEA)

Cigdem Yigin^{1*} and Ali Ismen¹

¹ Çanakkale Onsekiz Mart University, Fisheries Faculty, Department of Fishing and Processing Technolog - cyigin@hotmail.com

Abstract

Food composition of thornback ray (*Raja clavata*) was studied in Saros Bay (North Aegean Sea). A total of 121 thornback ray were caught and examined. Stomach samples from 68 females (10,7-88 cm TL) and 53 males (14-76 cm TL) were examined. Of the stomachs examined, 116 (96%) were full and 5 (4%) empty. A total of 511 prey items, belonging to 6 prey taxa, were counted. Crustacea were the most important component in the diet of *R. clavata* with IRI% of 74.78. Other main prey items found in the stomachs were pisces (IRI%=18.59), nematoda (IRI%=5.98), cephalopoda (IRI%=0.08), annelida (IRI%=0.03) and mollusca (IRI%=0.01).

Keywords: Diet, Elasmobranchii, Aegean Sea

Introduction

Elasmobranch fishes are among the top predators in the marine environment and thus play an important role in marine ecosystems, potentially regulating, through predation, the size and dynamics of their prey populations [4]. The aim of this study was to examine the feeding habits of thornback ray caught in Saros Bay (The North Aegean Sea).

analyzed using the percentage frequency of occurrence (F%), numerical percentage (N%), percentage by weight (W%), the index of relative importance (IRI), and percent of IRI (IRI%) for each prey type [1,2].

Results

Stomach samples from 68 females (10.7-88 cm TL) and 53 males (14-76 cm TL) were examined. Of the 121 stomachs examined, 116 (96%) were full and 5 (4%) empty. A total of 511 prey individuals was identified (Table 1), crustacea were the most important component in the diet of *R. clavata* with IRI% of 74.78. Pisces were second in importance, IRI% of 18.59. Besides nematoda, cephalopoda, annelida and mollusca with IRI% of 5.98, 0.08, 0.03 and 0.01 respectively were minor prey. As compared with IRI% values between sexes, there were not significantly difference in composition of the diet of male and female thornback rays ($P = 0.801$).

Discussion

The nature of the ingested food depends, first on the morphology and feeding behavior of the fish, and secondly, on the composition and amount of food available. The flat body and ventral mouth of the skates suggest a benthic feeding habit [3]. In this study, the results demonstrated that *R. clavata* feed on benthic prey items, variations in the Index of Relative Importance (IRI%) among the prey groups showed that crustaceans were the most important component in the thornback ray.

References

- 1 - Cortés E., 1997. A critical review of methods of studying fish feeding based on analysis of stomach contents: application to elasmobranch fishes. *Can. J. Fish. Aquat. Sci.* 54: 726-738.
- 2 - Hyslop E.J., 1980. Stomach content analysis – a review of methods and their application. *J. Fish. Biol.* 17, 411-429.
- 3 - Moyle, P.B. and Cech-Jr. J. J., 2004. Fishes: An Introduction to Ichthyology - fifth edition. Upper Saddle River, NJ: Prentice-Hall, Inc.
- 4 - Navia A.F., Mejía-Falla P.A. and Giraldo A., 2007. Feeding ecology of elasmobranch fishes in coastal waters of the Colombian Eastern Tropical Pacific. *BMC Ecology*, 7:8,1-10.

Tab. 1. List of the species identified in *R. clavata* stomach contents

| SPECIES | %N | %W | %F | %IRI |
|-----------------------------|-------|-------|--------|-------|
| ANNELIDA | | | | |
| Unidentified polychaeta | 0.40 | 0.82 | 0.90 | 0.03 |
| NEMATODA | | | | |
| Unidentified nematoda | 10.80 | 0.03 | 19.00 | 5.98 |
| MOLLUSCA | | | | |
| Unidentified gastropoda | 0.20 | 0.02 | 0.90 | 0.01 |
| CEPHALOPODA | | | | |
| Eledone moschata | 0.20 | 0.07 | 0.90 | 0.01 |
| Loligo sp. | 0.40 | 1.08 | 1.70 | 0.07 |
| Total | 0.60 | 1.15 | 2.60 | 0.08 |
| CRUSTACEA | | | | |
| Isopoda | | | | |
| Cymatodiparazitic isopod | 1.80 | 0.12 | 2.60 | 0.14 |
| Unidentified isopod | 0.60 | 0.05 | 1.70 | 0.03 |
| Decapoda | | | | |
| Unidentified decapod | 0.20 | 0.00 | 0.90 | 0.01 |
| Natantia | | | | |
| Alpheus glaber | 1.00 | 0.45 | 3.40 | 0.14 |
| Crangonidae | 0.20 | 0.03 | 0.90 | 0.01 |
| Caridea | 1.80 | 0.39 | 6.00 | 0.38 |
| Solenocera membranacea | 1.00 | 0.42 | 3.40 | 0.14 |
| Plesionika sp. | 1.20 | 0.36 | 4.30 | 0.19 |
| Plesionika giglioli | 0.40 | 0.19 | 1.70 | 0.03 |
| Parapenaeus longirostris | 5.10 | 3.97 | 16.40 | 4.34 |
| Processa sp. | 0.40 | 0.04 | 1.70 | 0.02 |
| Unidentified natantia | 1.20 | 0.15 | 4.30 | 0.17 |
| Processa novellii | 0.20 | 0.01 | 0.90 | 0.01 |
| Aegean cataphractus | 0.20 | 0.02 | 0.90 | 0.01 |
| Psephenae sivaldo | 0.20 | 0.01 | 0.90 | 0.01 |
| Trechypenaeus curvirostris | 0.80 | 0.21 | 1.70 | 0.05 |
| Anomura | | | | |
| Gaetea bolivari | 0.40 | 0.01 | 0.90 | 0.01 |
| Munida sp. | 0.40 | 0.04 | 0.90 | 0.01 |
| Mecurura Reptantia | | | | |
| Unidentified thalassinidae | 0.20 | 0.06 | 0.90 | 0.01 |
| Scyllarus sp. | 0.40 | 0.16 | 1.70 | 0.03 |
| Stomatopoda | | | | |
| Squilla mantis | 0.80 | 3.94 | 3.40 | 0.48 |
| Brachyura | | | | |
| Unidentified brachyura | 1.20 | 1.46 | 4.30 | 0.33 |
| Liocarcinus depurator | 3.90 | 3.47 | 10.30 | 2.23 |
| Gonopsis rhomboides | 36.80 | 14.65 | 43.10 | 64.81 |
| Athya cyclops rotundatus | 2.70 | 1.05 | 4.30 | 0.45 |
| Ebulla sp. | 0.20 | 0.47 | 0.90 | 0.02 |
| Liocarcinus pusillus | 0.20 | 0.13 | 0.90 | 0.01 |
| Ebulla granulosa | 0.20 | 0.22 | 0.90 | 0.01 |
| Monodactylus couchii | 2.20 | 0.42 | 6.90 | 0.52 |
| Anapagurus laevis | 1.00 | 0.53 | 0.90 | 0.04 |
| Megalopa laevis | 1.20 | 0.00 | 0.90 | 0.03 |
| Medorippe lanata | 0.20 | 0.08 | 0.90 | 0.01 |
| Microcaslope minor | 1.00 | 0.34 | 1.70 | 0.07 |
| Total | 69.30 | 33.45 | 135.50 | 74.78 |
| PISCES | | | | |
| Mullus barbatus barbatus | 5.30 | 31.95 | 12.90 | 14.07 |
| Pagellus bogaraveo | 1.00 | 5.02 | 4.30 | 0.76 |
| Merluccius merluccius | 1.00 | 7.50 | 3.40 | 0.85 |
| Serranus hepatus | 0.60 | 1.77 | 2.60 | 0.18 |
| Pagellus acarne | 0.20 | 0.89 | 0.90 | 0.03 |
| Arnoglossus laterna | 0.20 | 1.33 | 0.90 | 0.04 |
| Spicara smaris | 0.40 | 2.28 | 1.70 | 0.13 |
| Engraulis encrasicolus | 5.90 | 7.89 | 2.60 | 1.04 |
| Gadomus argenteus argenteus | 0.40 | 0.62 | 0.90 | 0.03 |
| Symphurus nigrescens | 0.20 | 0.85 | 0.90 | 0.03 |
| Unidentified fish | 2.20 | 4.17 | 7.80 | 1.43 |
| Total | 17.40 | 64.27 | 38.90 | 18.59 |
| DIGESTED MATERIAL | | | | |
| | 2.00 | 0.29 | 8.60 | 0.57 |

Material and Methods

Specimens were collected by using commercial trawl between February 2005 and December 2006 in the Saros Bay. The trawling was done daytime and nighttime at depths ranging from 0 to 500 m. In the laboratory, identification of ingested prey was carried out to the level of species. Stomach content was