

MOLLUSCS AS FOOD SOURCES FOR SOME FISHES IN THE TURKISH AEGEAN SEA: A SYNTHESIS

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Abstract

Diet composition studies conducted in fishes contribute to the interpretation of the food chain in aquatic ecosystems. In this study, molluscs as a prey of fishes, have been dealing for the first time with a different approach to determine the importance of this group invertebrate in the diet composition of the fishes. With this purpose, totally 20 fish species distributed along the Turkish Aegean coast and previously studied for the diet composition were compared among them, regarding the index of relative importance percentage (IRI%) of molluscs. Among the subjected in the present study taxa, *Chimaera monstrosa* (IRI%=16.00) and *Belone belone* (IRI%=13.88) are the species mainly preferring molluscs, while in the diet composition of *Sardina pilchardus*, and *Scomber japonicus* the part of molluscs was in trace amounts (IRI ≤0.01).

Keywords: *Fishes, Mollusca, Food webs, Aegean Sea*

The total number of fish species reported from the Turkish seas is 512, of which 449 species are distributed in the Aegean Sea followed by the Levantine Sea (441 species), the Sea of Marmara (257 species) and the Black Sea (154 species) [1]. With its special ecological and geomorphological features, the Aegean Sea is an important feeding, breeding and growth area for many fishes, where inhabiting 88% of the species known to be distributed in the Turkish seas. The results of stomach content analyses of different fishes distributed in the Aegean Sea showed that many species are feeding especially on crustaceans and molluscs. Based on an exhaustive literature survey, we especially tried to delineate the importance of molluscs as a potential prey for fishes. Among the invertebrate taxa, the phylum Mollusca is one of the richest group, including about 50,000 marine living species in worldwide [2]. They are mostly benthic organisms inhabiting various habitats up to abyssal depths. In a recently published study, 1065 mollusc species were reported from the Turkish coasts, of which 825 species are known to be distributed along the Turkish Aegean coast [3]. Although the high species richness and wide distribution of molluscs in marine environments, the knowledge on their role in the Aegean Sea trophodynamics are very few. So it is the purpose of our study to compile the molluscs prey groups of the some fishes distributed along the Turkish coast of the Aegean Sea, and it would be the first attempt to summarize the available information about the molluscs as prey. A total of 20 fish species (5 species within 5 families of the classis Chondrichthyes and 15 species within 11 families of the classis Ostreichtyes) distributed in the Aegean Sea (Table 1 and 2), and for which were stated molluscs are prey, have been dealing with the present study. Some indices have been used to quantify the importance of different prey items in the diets of the investigated species. The main food items were identified using the index of relative importance $IRI = F\% * (N\% + W\%)$. The index was expressed as $IRI\% = (IRI / \sum IRI) * 100$. Among the subjected in the present study, *Chimaera monstrosa* Linnaeus, 1758 (IRI%=16.00) [4] and *Belone belone* (Linnaeus, 1761) (IRI%=13.88) [5] were found to be the most molluscs preferred species, while in the diet composition of *Sardina pilchardus* (Walbaum, 1792), *Syngnathus acus* Linnaeus, 1758 and *Scomber japonicus* Houttuyn, 1782 (Ostreichtyes) the part of molluscs was in trace amounts (IRI ≤0.01).

Tab. 1. Prey groups of cartilaginous fishes distributed along the Aegean Sea coast of Turkey (IRI% = Index of Relative Importance percentage)

Family/ Species	Prey groups	Mollusca (IRI%)
Scyliorhinidae <i>Galeus melastomus</i> Rafinesque, 1810	Decapoda, Cephalopoda, Gadidae, Macrouridae	2.98
Triakidae <i>Mustelus mustelus</i> (Linnaeus, 1758)	Polychaeta, Crustacea, Cephalopoda, Teleostei	2.20
Squalidae <i>Squalus blainvillei</i> (Risso, 1827)	Natantia, Cephalopoda, Cnidaria, Echinodermata, Argentinidae, Gadidae	10.27
Rajidae <i>Raja clavata</i> Linnaeus, 1758	Polychaeta, Mysidacea, Brachyura, Cephalopoda, Scyliorhinidae, Clupeiformes, Gadiformes, Gobiidae, Pleuronectiformes	0.37
Chimaeridae <i>Chimaera monstrosa</i> Linnaeus, 1758	Bryozoa, Cnidaria, Brachyura, Bivalvia, Gastropoda, Cephalopoda, Tunicata, Teleostei	16.00

Tab. 2. Prey groups of bony fishes distributed along the Aegean Sea coast of Turkey (IRI% = Index of Relative Importance percentage)

Family/ Species	Prey groups	Mollusca (IRI%)
Clupeidae <i>Sardina pilchardus</i> (Walbaum, 1792)	Polychaeta, Copepoda, Pteropoda, Appendicularia, Thaliacea	≤0.01
Clupeidae <i>Sardinella aurata</i> Valenciennes, 1847	Polychaeta, Malacostraca, Copepoda, Cirripedia, Bivalvia, Pteropoda, Chaetognatha, Tunicata, Teleostei	0.44
Engraulidae <i>Engraulis encrasicolus</i> (Linnaeus, 1758)	Siphonophora, Polychaeta, Cladocera, Copepoda, Cirripedia, Ostracoda, Malacostraca, Appendicularia, Gastropoda, Bivalvia, Thaliacea, Teleostei	3.88
Chlorophthalmidae <i>Chlorophthalmus agassizi</i> Bonaparte, 1840	Foraminifera, Copepoda, Malacostraca, Sepioidae, Chaetognatha, Teleostei	0.09
Belonidae <i>Belone belone</i> (Linnaeus, 1761)	Polychaeta, Cladocera, Copepoda, Cirripedia, Ostracoda, Malacostraca, Pteropoda, Thaliacea, Belonidae, Clupeidae, Maenidae, Gryllidae, Formicidae, Diptera	13.88
Syngnathidae <i>Hippocampus hippocampus</i> (Linnaeus, 1758)	Copepoda, Ostracoda, Cladocera, Malacostraca, Pycnogonida, Bivalvia, Teleostei	5.68
<i>Hippocampus guttulatus</i> Cuvier, 1829	Copepoda, Malacostraca, Pycnogonida, Gastropoda, Bivalvia, Teleostei	1.35
<i>Nerophis ophidion</i> (Linnaeus, 1758)	Copepoda, Ostracoda, Cirripedia, Malacostraca, Gastropoda, Cnidaria	12.63* (10%)
<i>Syngnathus acus</i> Linnaeus, 1758	Ostracoda, Copepoda, Malacostraca, Cirripedia, Gastropoda, Bivalvia, Echinodermata, Insecta	≤0.01
Carangidae <i>Trachurus mediterraneus</i> (Steindachner, 1868)	Polychaeta, Ostracoda, Copepoda, Cladocera, Malacostraca, Gastropoda, Bivalvia, Cephalopoda, Chaetognatha, Teleostei	6.35
<i>Trachurus trachurus</i> (Linnaeus, 1758)	Polychaeta, Ostracoda, Copepoda, Cladocera, Malacostraca, Gastropoda, Bivalvia, Cephalopoda, Chaetognatha, Teleostei	0.07
Sparidae <i>Dentex maroccanus</i> Valenciennes, 1830	Malacostraca, Ostracoda, Copepoda, Pteropoda, Gastropoda, Bivalvia, Teleostei	8.39
Scomberidae <i>Scomber japonicus</i> Houttuyn, 1782	Hydrotzoa, Polychaeta, Cladocera, Ostracoda, Cirripedia, Malacostraca, Gastropoda, Opisthobranchia, Bivalvia, Cephalopoda, Chaetognatha, Thaliacea, Teleostei	≤0.01
Citharidae <i>Citharus linguatula</i> (Linnaeus, 1758)	Polychaeta, Copepoda, Malacostraca, Cephalopoda, Teleostei	0.13

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