

**AN INVESTIGATION ON FISHES OF BANDIRMA BAY
(SEA OF MARMARA)**

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ABSTRACT

This investigation was carried out for the determination of fish species living in Bandırma Bay (Sea of Marmara). Morphometric and meristic characters of fishes caught by trawl and various nets in Bandırma Bay in the years of 1998-1999 were examined and some morphological, ecological properties, and local names of 34 determined species are given.

Key Words: Fish Species, Systematic, Bandırma Bay

**BANDIRMA KÖRFEZİ (MARMARA DENİZİ) BALIKLARI ÜZERİNE BİR
ARAŞTIRMA**

ÖZET

Bu araştırma Bandırma Körfezi (Marmara Denizi)'nde yaşayan balık türlerini belirlemek amacıyla yapılmıştır. 1998-1999 yılları arasında körfez içinde trol ve çeşitli ağlar ile yakalanan balıkların morfometrik ve meristik karakterleri incelenmiş ve saptanan 34 türün bazı morfolojik, ekolojik özellikleri, ve yerel isimleri verilmiştir.

Anahtar Kelimeler: Balık türleri, Sistematik, Bandırma Körfezi

1. INTRODUCTION

Research on the sea fauna along the coasts of Turkey was initiated by foreign researchers at the beginning of the 20th century and entered an intensive stage with Turkish researchers in the 1940s. However, the fish fauna of Turkish seas has still not been fully determined. Of these researchers, Tortonese (1) listed 300 species. Papaconstantinou and Tsimenids (2) listed 33 species. Papaconstantinou (3) listed the most of 447 species for Aegean Sea. Slastenenko (4) listed 200 species for Sea of Marmara and 189 species for Black Sea. Tortonese (1) reported 540 fish species in whole of Mediterranean. Demetropoulos and Neocleous (5) gave a list of fishes for Cyprus area. Whitehead et al. (6) reported 1256 species of North-Eastern Atlantic, Mediterranean Sea and the Sea of Marmara in three volumes. Fischer et al. (7) reported 118 fish families for Mediterranean Sea. Golani (8) gave a list of 405 fish species belonging to 125 family of which 32 new records to the eastern Levant.

Some taxonomic investigations by Turkish scientists are following as: Akşiray (9-10) made description key of 360 fish species from Turkish Seas and later listed 454 fish species. Geldiay (11) reported 295 species for Aegean Sea. Mater and Kaya (12) investigated systematic and morphometric characters of Gobiidae family at Izmir Bay. Kaya and Mater (13) reported three new gobies for Turkish Seas. Kaya et al. (14) reported a new fish species first seen along the coast of Aegean Sea of Turkey. Unsal (15) investigated 6

species belonging to Triglidae family at the Sea of Marmara. Unsal and Oral (16) reported 3 species belonging to Bothidae family at the Sea of Marmara. Basusta and Erdem (17) gave a list of fish species for Iskenderun Bay. Torcu and Aka (18) determined 68 species as new records for Edremit Bay. Torcu et al., (19) determined 49 fish species with a new record for Turkish Republic of northern Cyprus. Meric (20) gave some fishes on the continental slope of the Sea of Marmara with five new species. Mater and Meric (21) gave a list of marine fishes of Turkey. Meric et al., (22) reported three new species for the Sea of Marmara. Rare three elasmobranchii species and their distributions in the Sea of Marmara are given by Uysal et al. (23). S. Eryılmaz (24-25) reported 13 cartilaginous fishes and 49 bony fishes for the southern parts of the Sea of Marmara, respectively. Eryılmaz (26) reported 92 fish species from Bozcaada Island. Karakulak et al., (27) examined the species composition of catch, species diversity and estimation of the abundance of the commercial species and the average biomass of the demersal fish stocks of the northern parts of the Sea of Marmara, while Bök et al., (28) investigated demersal fish stocks and gave length frequency distributions of 4 demersal marine species with high catches and economic value in the southern parts of the Sea of Marmara. Mater et al., (29) gave taxonomical information on the recent status of marine fishes inhabiting Turkish Seas.

2. MATERIAL AND METHOD

The fish samples were collected by trawl and local gears from Bandırma Bay in 1998-1999 (Fig.1), The obtained samples were washed up with fresh water immediately; after identifications, they were kept in percentage 70% of alcohol or 4% of formaldehyde solutions. Among morphometric measurements, disc length (DL), disc width (DW), total length (TL), head length (HL), eye diameter (ED), body depth (BD) were taken with a dial caliper of 0.05 mm accuracy. Meristic counting [dorsal fin rays (D), anal fin rays (A), pelvic fin rays (V), pectoral fin rays (P), and lateral line scales (LI.)] were performed under binocular microscope.

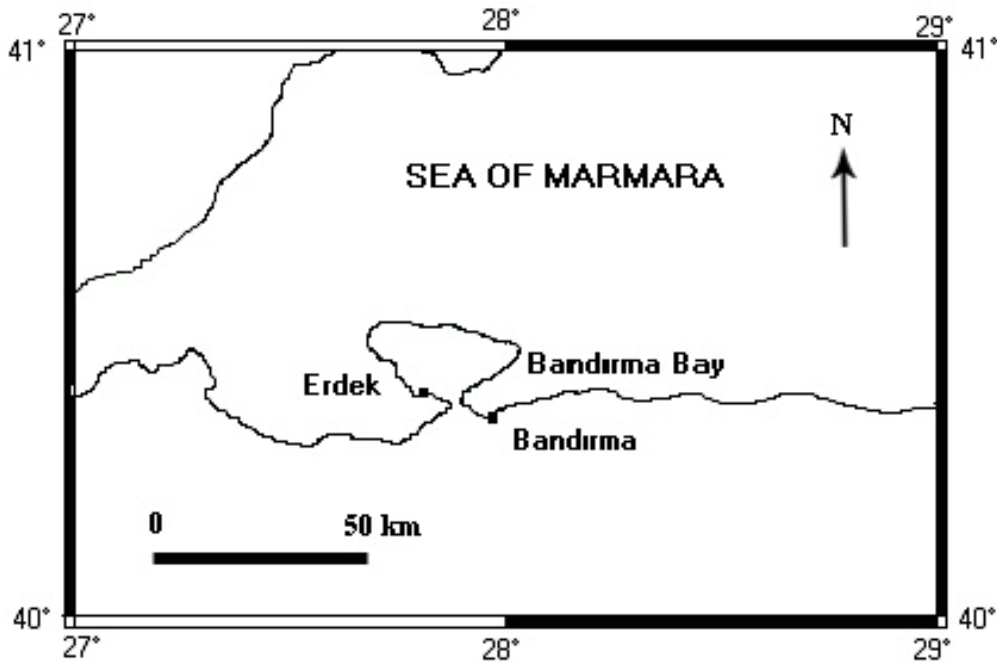


Fig. 1. Sampling area

3. RESULTS

A total of 34 species belonging to 2 classis, 9 ordo, 27 familia, 33 genus were collected. Systematic categories are given by following of Whitehead et al., (6), Golani (8).

Distribution: Atlanto-Mediterranean species (A-M),
Cosmopolitan species (C),
Endemic species for Mediterranean (M)

Phylum: Chordata

Subphylum: Vertebrata

Superclassis: Gnathostomata

Classis: Selachii (Chondrichthyes)

Ordo: Pleurotremata

Fam: SQUALIDAE

***Squalus acanthias* Linnaeus, 1758**-Spur dog (C)

Common synonym: None.

Local name: Mahmuzlu camgöz (n:1)

Morphological Characters:

TL/BD: 4.7; TL/HL: 2.68; BD/HL: 0.5; HL/ED: 10.0; HL/MB: 3.1

Ecological Characters:

Habitat: Benthic on soft bottoms, from 10 m. to about 200 m, rarely to 950 m.

Fam: TRIAKIDAE

***Mustelus asterias* Cloquet, 1821**-Starry smoothhound (A-M)

Common synonym: None.

Local name: Köpekbaliğı (n: 1)

Morphological Characters:

TL/BD: 11.6; TL/HL: 5.6; BD/HL: 0.5; HL/ED: 9.2; HL/MB: 3.7

Ecological Characters:

Habitat: Coastal demersal species, usually above 150 m.

Ordo: Hypotremata

Fam: RAJIDAE

***Raja clavata* Linnaeus, 1758**-Thornback ray (C)

Common synonym: None

Local name: Vatoz (n: 1)

Morphological Characters:

TL/DW: 1.50; DW/DL: 1.28

Ecological Characters:

Habitat: Benthic, from inshore waters to about 300 m.

Class: Osteichthyes

Ordo: Isospondyli (Clupeiformes)

Fam: CLUPEIDAE

***Sardina pilchardus* (Walbaum, 1792)**- European pilchard (A-M)

Common synonym: *Clupea pilchardus* Walbaum, 1792

Sardina pilchardus sardina (Walbaum, 1792)

Arengus minor Carnide, 1788

Local name: Sardalya (n: 8)

Morphological Characters:

D: 16-17; A: 17-21; V: 8; P: 16

TL/BD: 6.0; TL/HL: 4.82; BD/HL: 0.82; HL/ED: 3.81

Ecological Characters:

Habitat: Coastal pelagic, at 25-55 m by day and 15-35 m by night.

***Alosa caspia nordmani* Antipa, 1906-Caspian shad (M)**

Common synonym: None

Local name: Tirsi (n: 3)

Morphological Characters:

D: 17; A: 15; V: 6; P: 16

TL/BD: 6.3; TL/HL: 4.7; BD/HL: 0.7; HL/ED: 4.3

Ecological Characters:

Habitat: euryhaline, chiefly brackish waters, but entering freshwaters

Distribution: Sea of Marmara, Black Sea, Sea of Azov and Caspian

***Sprattus sprattus* (Linnaeus, 1758)-Sprat (A-M)**

Common synonym: None.

Local name: Çaçá, papalina (n: 8)

Morphological Characters:

D: 17; A: 15; P: 16; V: 7

TL/BD: 6.0; TL/HL: 4.4; BD/HL: 0.8; HL/ED: 3.8

Ecological Characters:

Habitat: Coastal pelagic, often in shallow water close to shore, sometimes tolerating very low salinities (to 4%).

Fam: ENGRAULIDAE

***Engraulis encrasicolus* (Linnaeus, 1758)-European anchovy (A-M)**

Common synonym: None.

Local name: Hamsi (n: 8)

Morphological Characters:

D: 15-18; A: 15-16

TL/BD: 7.5; TL/HL: 4.7; BD/HL: 0.06; HL/ED: 5.5

Ecological Characters: Coastal pelagic, euryhaline, even entering lagoons or estuaries.

Ordo: Synentognathi (Beloniformes)

Fam: BELONIDAE

***Belone belone gracilis* (Linnaeus, 1761)- Garfish (A-M)**

Common synonym: *Belone gracilis acus*, Risso, 1827

Local name: Zargana (n: 1)

Morphological Characters:

D: 16; A: 20; V: 6; P: 12

TL/BD: 21.9; TL/HL: 3.0; BD/HL: 0.1; HL/ED: 11.25

Ecological Characters:

Habitat: Epipelagic, neritic.

Ordo: Anacanthini (Gadiformes)

Fam: GADIDAE

***Merlangius merlangus exinus* (Nordmann, 1840)- Whiting (M)**

Common synonym: None

Local name: Mezgit (n: 4)

Morphological Characters:

D1: 13-15; D2: 18-20; D3: 19-22; A1: 30-32; A2: 21-22; V:6; P: 20

TL/BD: 5.2; TL/HL: 4.10; BD/HL: 0.70; HL/ED: 3.4

Ecological Characters:

Habitat: shallow water, rarely below 200 m, usually 30-100 m over sandy or muddy ground.

Fam: MERLUCCIDAE

***Merluccius merluccius* (Linnaeus, 1758)- Hake (A-M)**

Common synonym: None

Local name: Berlam, Bakalyaro (n: 2)

Morphological Characters:

D1: 9; D2: 37; A: 36; V: 7; P: 11

TL/BD: 6.5; TL/HL: 3.7; BD/HL: 10.6; HL/ED: 6.8

Ecological Characters:

Habitat: Midwater or at bottom, chiefly at 100-300 m.

Ordo: Zeomorphi (Zeiformes)

Fam: ZEIDAE

***Zeus faber* Linnaeus, 1758- John Dory (C)**

Common synonym: *Zeus pungio* Valenciennes, 1835

Local names: Dülger Balığı, Peygamber balığı (n: 1)

Morphological Characters:

D: IX,22; A: IV,21; V: I,7; P: 13

TL/BD: 2.5; TL/HL: 3.0; BD/HL: 1.2; HL/ED: 5.8

Ecological Characters:

Habitat: Near bottom or in midwater; mainly at 50-150 m.

Ordo: Percomorphi (Perciformes)

Fam: MORONIDAE

***Dicentrarchus labrax* (Linnaeus, 1758)- European Seabass (A-M)**

Common synonyms: *Labrax lupus* Cuvier, 1828.

Local name: Levrek (n: 1)

Morphological Characters:

D1: IX; D2: I,13; A: III,12; V: 16; P: I,5; Ll.74

TL/BD: 3.3; TL/HL: 2.9; BD/HL: 0.8; HL/ED: 3.7

Ecological Characters:

Habitat: On various kinds of bottoms, also in brackish waters and occasionally rivers.

Fam: CEPOLIDAE

***Cepola rubescens* Linnaeus, 1766- Red bandfish (A-M)**

Common synonym: *Cepola macrophthalmia* Linnaeus, 1758

Local name: Kurdela Balığı (n: 1)

Morphological Characters:

D: 68; A: 59

TL/BD: 13.5; TL/HL: 10.6; BD/HL: 0.8; HL/ED: 3.1

Ecological Characters:

Habitat: Benthic on muddy and bottoms, between 15-200 m.

Fam: POMATOMIDAE

***Pomatomus saltator* (Linnaeus, 1766)- Bluefish (A-M)**

Common synonym: *Temnodon saltator* Valenciennes, 1833

Local name: Lüfer (n: 1)

Morphological Characters:

D1: VII; D2: I,26; A: II,23; V: I,5; P: I,15; Ll. 101

TL/BD: 5.12; TL/HL: 4.10; BD/HL: 0.82; HL/ED: 5.53

Ecological Characters:

Habitat: Pelagic along the continental shelf at 0-200 m.

Fam: CARANGIDAE

***Trachurus trachurus* (Linnaeus, 1758)- Atlantic horse-mackerel (A-M)**

Common synonym: *Trachurus capensis* Castelnau, 1861

Local name: Karagöz İstavrit (n: 4)

Morphological Characters:

D1: VIII; D2: I,29; A: II+I,24; V: I,5; P: 20

TL/BD: 5.55; TL/HL: 3.91; BD/HL: 0.70; HL/ED: 3.72

Ecological Characters:

Habitat: Usually over sandy bottom in 100-200 m.

Fam: MULLIDAE

***Mullus surmuletus* Linnaeus, 1758- Striped red mullet (A-M)**

Common synonym: None

Local name: Tekir (N: 5)

Morphological Characters:

D1: VII-VIII; D2: I,7-8; A: I,6-7; V: I,7; P: 16; L1. 34

TL/BD: 4.32; TL/HL: 4.24; BD/HL: 0.98; HL/ED: 3.77

Ecological Characters:

Habitat: Benthic on broken and rough ground.

Fam: SPARIDAE

***Boops boops* (Linnaeus, 1758)- Boque (A-M)**

Common synonym: *Box boops* Linnaeus, 1758

Local names: Kupes, Kupa (n: 1)

Morphological Characters:

D: XV,14; A: III,16; V: I,4; P: 15; L1. 69

TL/BD: 5.21; TL/HL: 4.80; BD/HL: 0.92; HL/ED: 2.85

Ecological Characters:

Habitat: Inshore waters, demersal or semipelagic above various bottoms, to 200 m or 300 m.

***Dentex macrophthalmus* (Bloch, 1791)- Large-eye dentex (A-M)**

Common synonym: None.

Local name: İrigözsınagrit balığı (n: 1)

Morphological Characters:

D: XII,12; A: III,8; L1. 55

TL/BD: 3.3; TL/HL: 4.0; BD/HL: 1.2; HL/ED: 3.3

Ecological Characters:.

Habitat: Inshore waters on rocky or muddy bottoms from 20 to 300 m.

***Diplodus vulgaris* (E. Geoffrey Saint-Hilaire, 1817)- Common two-banded sea bream (A-M)**

Common synonym: None.

Local name: Karagöz (n: 2)

Morphological Characters:

D: XI,13; A: III,12; V: I,5; P: 13; L1. 53

TL/BD: 3.1; TL/HL: 4.0; BD/HL: 1.1; HL/ED: 3.5

Ecological Characters:.

Habitat: Littoral waters on rocky or sandy bottoms to 90 m.

Fam: CENTRACANTHIDAE

***Spicara flexuosa* Rafinesque, 1810- Garizzo (M)**

Common synonyms: *Smaris chryselis* Valenciennes, 1830

Smaris gagarella Valenciennes, 1830

Local name: İzmarit (n: 3)

Morphological Characters:

D: XI,12; A: III,10; P: 14; Ll. 72

TL/BD: 4.6; TL/HL: 4.39; BD/HL: 0.9; HL/ED: 3.12

Ecological Characters:

Habitat: On sand or muddy bottoms, down to about 130 m

***Spicara smaris* (Linnaeus, 1758)- Zerro (A-M)**

Common synonyms: *Sparus alcedo* Risso, 1810

Smaris vulgaris Valenciennes, 1830

Smaris gracilis Bonaparte, 1836

Smaris maurii Bonaparte, 1836

Local name: Istrangilos, İzmarit (n: 5)

Morphological Characters:

D: XI,12; A: III,9; P: 14; Ll. 76

TL/BD: 4.41; TL/HL: 4.20; BD/HL: 0.98; HL/ED: 3.31

Ecological Characters:

Habitat: *Posidonia* sp. beds and muddy bottoms at about 15-10 m.

Fam: LABRIDAE

***Symphodus roissali* (Risso, 1810)- Langaneu (A-M)**

Common synonym: *Symphodus*(*Crenilabrus*) *quinquemaculatus* (non Bloch, 1797) Risso, 1826

Local name: Çırçır, Ot Balığı (N: 3)

Morphological Characters:

D: XIV,10; A: III,9; V: I,5; Ll. 32

TL/BD: 3.5; TL/HL: 2.8; BD/HL: 1.3; HL/ED: 4.4

Ecological Characters:

Habitat: Littoral, mainly near rocks and eel-grass beds (1-30 m).

Fam: TRACHINIDAE

***Trachinus draco* Linnaeus, 1758- Greater weever (A-M)**

Common synonym: None.

Local name: Trakonya (n: 1)

Morphological Characters:

D: VI; D2: 29; A: II,29; V: I,5; Ll. 78

TL/BD: 6.2; TL/HL: 4.3; BD/HL: 0.76; HL/ED: 5.30

Ecological Characters:

Habitat: Littoral and benthic.

Fam: SCOMBRIDAE

***Scomber japonicus* Houttuyn, 1782- Chub mackerel (C)**

Common synonym: *Pneumatophorus colias* (Gmelin, 1788)

Scomber colias Gmelin, 1788

Pneumatopharus colias (Gmelin, 1789)

Scomber pneumatopharus Delaroche, 1809

Local name: Kolyoz (n: 2)

Diagnostic Characters:

D1: VIII-X; D2: 12; A: 11-12; AP: 5; DP: 5; V: 7-8; P: 16-17

TL/BD: 5.8; TL/HL: 4.3; BD/HL: 1.2; HL/ED: 3.0

Ecological Characters:

Habitat: Epipelagic or mesodemersal in depths to 250-300 m.

***Scomber scombrus* Linnaeus, 1758-** Atlantic mackarel (A-M)

Common synonym: None.

Local name: Uskumru (n: 14)

Morphological Characters:

D1: XI-XIII; D2: 11; DP: 5; AP: 5; A: 11-12; V: 7; P: 17

TL/BD: 6.5; TL/HL: 4.2; BD/HL: 0.67; HL/ED: 4.8

Ecological Characters:

Habitat: Epipelagic or mesodemersal in depths to 200-250 m.

Fam: URANOSCOPIDAE

***Uranoscopus scaber* Linnaeus, 1758-** Stargazer (A-M)

Common synonym: None.

Local name: Tiryaki Balığı, kurbağa Balığı (n: 1)

Morphological Characters:

D1: III; D2: 13; A: I,12; V: 5

TL/BD: 6.2; TL/HL: 3.2; BD/HL: 0.62; HL/ED: 8.78

Ecological Characters:

Habitat: Benthic species, on sandy or muddy bottoms.

Fam: GOBIIDAE

***Zosterisessor ophiocephalus* (Pallas, 1811)-** Grass goby (M)

Common synonym: None.

Local name: saz kayabalığı (n: 1)

Morphological Characters:

D1: VI; D2: I,15; A: I,14

TL/BD: 5.2; TL/HL: 4.1; BD/HL: 0.8; HL/ED: 4.8

Ecological Characters:

Habitat: inshore brackish water of estuaries And lagoons, in and near holes among grass roots on mud substrates

Fam: MUGILIDAE

***Liza aurata* (Risso, 1810)-** Golden grey mullet (A-M)

Common synonym: *Mugil auratus* of authors

Local name: Altınbaş Kefal, Miksinarya (n: 1)

Morphological Characters:

D1: IV; D2: I,8; A: II,9; V: I,6

TL/BD: 5.3; TL/HL: 4.9; BD/HL: 0.9; HL/ED: 4.7

Ecological Characters:

Habitat: Pelagic, usually inshore, entering lagoons and estuaries.

Ordo: Atheriniformes

Fam: ATHERINIDAE

***Atherina boyeri* Risso, 1810 (A-M)**

Common synonym: None

Local names: Gümüş Balığı (n: 4)

Morphological Characters:

D1: VIII, D2, I,10; A: I,12; V: 6

TL/BD: 8.40; TL/HL: 5.5; BD/HL: 0.6; HL/ED: 3.3

Ecological Characters:

Habitat: Pelagic, littoral, often near shore.

Ordo: Scleroparei (Scorpaeniformes)

Fam: SCORPAENIDAE

***Scorpaena porcus* Linnaeus, 1758-** Black scorpion fish (A-M)

Common synonym: *Cottus massiliasis* Gmelin, 1788

Scorpaena roseassa Lacepede, 1848

Local name: İskorpit (n: 3)

Morphological Characters:

D1: XII,9; A: III,6; V: I,5; P: 16

TL/BD: 3.3; TL/HL: 2.7; BD/HL: 0.8; HL/ED: 4.1

Ecological Characters:

Habitat: Benthic littoral species common among rocks and algae; may be found to 800 m.

Fam: TRIGLIDAE

***Chelidonichthys lucernus* (Linnaeus, 1758)-** Tub gurnard (A-M)

Common synonyms: *Trigla lucerna* Linnaeus, 1758

Trigla hirundo (nec Linnaeus): Bloch, 1785

Trigla corvus Risso, 1810

Trigla corax Bonaparte, 1834

Local name: Kırlangıç Balığı (n: 2)

Morphological Characters:

D1: VIII-IX; D2: 15-16; A: 15-16; V: I,5

TL/BD: 5.7; TL/HL: 3.6; BD/HL: 0.6; HL/ED: 5.8

Ecological Characters:

Habitat: Sand, muddy sand or gravel bottoms from about 20 to 300 m depth.

***Trigla lyra* Linnaeus, 1758-** Piper gurnard (A-M)

Common synonym: None.

Local names: Kırlangıç, Öksüz (n: 1)

Morphological Characters:

D1: IX; D2: 16; A: 15; V: I,5

TL/BD: 5.6; TL/HL: 3.4; BD/HL: 0.64; HL/ED: 4.3

Ecological Characters:

Habitat: Mud, gravel and rock bottoms from about 10 to 700 m.

Ordo: Heterosomata (Pleuronectiformes)

Fam: SCOPHTHALMIDAE

***Scophthalmus rhombus* (Linnaeus, 1758)-** Brill (A-M)

Common synonym: *Rhombus laevis* Turton, 1802

Local name: Dişi Kalkan, Çivisiz Kalkan (N: 1)

Morphological Characters:

D: 75; A: 57; V: 5; P: 12

TL/BD: 2.22; TL/HL: 3.58; BD/HL: 1.53; HL/ED: 5.5

Ecological Characters:

Habitat: On sandy bottoms on the shallow part of the continental shelf.

Fam: SOLEIDAE

***Solea lascaris* (Risso, 1810)-** Snouted sole (M)

Common synonym: *Solea nasuta* (Pallas, 1814)

Local name: Dil Balığı (n: 1)

Morphological Characters:

D: 69; A: 57; V: 3; P: 9, Ll. 115

TL/BD: 2.2; TL/HL: 4.0; BD/HL: 1.8; HL/ED: 5.3

Ecological Characters:

Habitat: Benthic on sand in shallow waters.

4. DISCUSSION

Slastenenko (4) reported 5 species of cartilaginous fish belonging to 4 families living in the Sea of Marmara. Aksiray (9-10) reported 61 species of cartilaginous fish belonging to 18 families lived in the seas surrounding Turkey. Meric (20) determined 8 cartilaginous fish species which were previously recorded in the Sea of Marmara while S. Eryılmaz (24) reported 13 cartilaginous fishes including *S. canicula*, *S. acanthias*, and *R. clavata* for the southern parts of the Sea of Marmara. Meric (20) encountered 16 bony fishes which were previously recorded in the Sea of Marmara. Of these mentioned above, *M. merluccius*, *T. trachurus* and *T. lyra* were also caught from Bandırma Bay. Mater and Meric (21) mentioned 190 fish species in the Sea of Marmara. Bilecenoglu et al. (30) reported 249 fish species in the Sea of Marmara which 180 belong to Atlanto-Mediterranean, 26 to Cosmopolitan, 42 to Mediterranean zoogeographical regions. Of the determined 34 fish species in this study, 25 are Atlanto-Mediterranean, 4 are Cosmopolitan and 5 are Mediterranean.

On the other hand, in this study, 34 species belonging to 24 families were identified mentioning morphological and ecological properties, and local names. So, a total of 34 fish species are known from the Sea of Marmara including *S. acanthias*, *M. asterias* and *R. clavata* given by Fischer et al. (7), and Mater and Meric (21) for Turkish Seas, S. Eryılmaz (24) in the south of the Sea of Marmara, and Karakulak et al., (27) in the north of Sea of Marmara.

From Soleidae, *S. nasuta* is synonymized under *S. lascaris* at a worked named “A taxonomic reappraisal of the Atlanto-Mediterranean soles *Solea solea*, *S. senegalensis* and *S. lascaris*” by Ben Tuvia (31). *S. canicula*, *M. merluccius*, *T. trachurus*, and *T. lyra* were informed to be the most abundant by means of occurrence incidences (32), while *S. canicula*, *R. clavata*, *M. merluccius*, *T. trachurus*, *T. lyra*, *S. vulgaris* were shown to be more common in Sea of Marmara (28). *S. rhombus*, *C. lucernus*, *A. boyeri*, *L. aurata*, *Z. ophiocephalus*, *S. japonicus*, *S. roissali*, *D. vulgaris*, *D. macrophthalmus*, *B. boops*, *D. labrax*, *B. belone gracilis*, *A. caspia nordmani* obtained in the present study were not caught in the south of the Sea of the Marmara (25).

Whitehead et al. (6) have not mentioned any spiny rays for Clupeidae family, but S. Eryılmaz (25) has given spiny fin rays. Thus, the characteristics of fin rays of *S. sprattus* and *S. pilchardus* examined in the present study do not confirm the previous literature from the Sea of Marmara (25).

For *M. merluccius* of the family Merlucciidae, the number of first dorsal fin rays has been given as 8-11 by Fischer et al. (7), 9-11 by Slastenenko (4), and 9-11 by Tortonese (1), 8-10 by S. Eryılmaz (25). In the present study, the number of first dorsal fin rays was found to be 9. Whitehead et al. (6), Fischer et al. (7) and S. Eryılmaz (25) have given the number of second dorsal fin rays have given 35-40. In the present study, the number of second dorsal fin rays was found to be 37. Our findings confirm the relevant literature.

For *M. merlangius* of the family Gadidae, the number of second dorsal fin rays has been given as 16-20; the number of the first anal fin rays as 27-32 by Slastenenko (4); the number of first dorsal fin rays as 12-15; the number of the first anal fin rays as 33-9 by Fischer et al. (7); the number of second dorsal fin rays as 16-19; the number of the third dorsal fin rays as 18-22, and the number of first anal fin rays as 28-32 by Tortonese (1); the number of the first dorsal fin rays as 13-16, and the number of first anal fin rays as 25-32 by S. Eryılmaz (25). In the present study, the number of the first dorsal fin rays was found to be 13-15, the

number of the second dorsal fin rays as 18-20, the number of the third dorsal fin rays as 19-22, and the number of first anal fin rays as 30-32. Our results confirm the relevant literature.

For *B. belone gracilis* of the family Belonidae, the number of dorsal fin rays has been given as 16-20; the number of the anal fin rays as 19-23 by Whitehead et al. (6) and Fischer et al. (7). In the present study, the number of dorsal fin rays was found to be 16 while the number of the anal fin rays was found to be 20. Our results confirm the previous literature.

For *Z. faber* of the family Zeidae, the number of dorsal fin rays has been given as 21-25; the number of the anal fin rays as 20-24 by Whitehead et al. (6) and Fischer et al. (7). In the present study, the number of dorsal fin rays was found to be 22 and the number of the anal fin rays was found to be 21. The findings confirm the relevant literature.

For *D. labrax* of the family Moronidae, the number of second dorsal fin rays has been given as 12-13; the number of the anal fin rays as 10-12 by Whitehead et al. (6) and Fischer et al. (7). The number of lateral line scales has been given as 52-74 by Whitehead et al. (6) and Fischer et al. (7). Our results confirm the previous literature.

For *P. saltator* of the family Pomatomidae, the number of second dorsal fin rays has been given as 23-28; the number of the anal fin rays as 23-27 by Whitehead et al. (6) and Fischer et al. (7), while S. Eryılmaz (25) has given the number of second dorsal fin rays as 22-25 and the number of anal fin rays as 24-25. In the present study, the number of the second dorsal fin rays was found to be 26, the number of the second dorsal fin rays as 24-25. The number of lateral line scales has been given as 95-106 by Fischer et al. (7); 95-96 by S. Eryılmaz (25). In one sample examined, the number of lateral line scales was found to be as 101. Thus, it can be seen that the findings in the present study are different from in the relevant literature by S. Eryılmaz (25).

For *M. surmuletus* of the family Mullidae, the number of lateral line scales has been given as 33-37 by Whitehead et al. (6) and Fischer et al. (7); 33-36 by S. Eryılmaz (25). In 5 samples examined, the number of lateral line scales was found to be 34. The findings in the present study confirm the relevant literature.

For *B. boops* of the family Sparidae, the number of lateral line scales has been given as 69-80 by Whitehead et al. (6) and Fischer et al. (7). In the one sample examined, the number of lateral line scales was found to be 69. Our result confirms the previous literature.

For *D. macrophthalmus* of the family Sparidae, the number of lateral line scales has been given as 49-55 by Whitehead et al. (6) and Fischer et al. (7). In the one sample examined, the number of lateral line scales was also found to be 55. Our result confirms the previous literature.

For *S. flexuosa* of the family Centracanthidae, the number of lateral line scales has been given as 72-82 by Slastenenko (4); 68-73 by Tortonese (1) and Fischer et al. (7); 69-77 by S. Eryılmaz (25). In the 3 samples examined, the number of lateral line scales was found to be as 72. The body height in standard length has been given as 4.4-4.7 times by Slastenenko (4); 3-3.5 times by Fischer et al. (7), 3.35-3.78 times by S. Eryılmaz (25). It was found to be as 4.6 times in the present study. Thus, it can be seen that the ratio given by Fischer et al. (7), and S. Eryılmaz (25) are different from the relevant literature and the ratio obtained in the study.

For *S. smaris*, the number of lateral line scales has been given as 75-81 by Fischer et al. (7); 69-77 by S. Eryılmaz (25). In the 3 samples examined, the number of lateral line scales was found to be 72. The body height in standard length has been given as 4.4-4.7 times by Slastenenko (4); 3-3.5 times by Fischer et al. (7), 3.35-3.78 times by S. Eryılmaz (25). It was found as 4.6 times in the present study. Thus, it can be seen that the ratio given by

Fischer et al. (7), and S.Eryılmaz (25) are different from the relevant literature and the ratio obtained in the study.

For *C. rubescens* of the family Cepolidae, the number of dorsal fin rays has been given as 67-69 by Tortonese (1), 67-70 by Fischer (7) and 67-68 by S. Eryılmaz (25). In the present study, this was found to be 68. Our finding confirm the previous literature.

For *T. draco* of the family Trachinidae, the number of lateral line scales has been given as 80-83 by Whitehead et al. (6), Fischer et al. (7); 80-82 by S. Eryılmaz (25). In the present study, the number of lateral line scales was found to be as 78. The body height in standard length has been given as 5.65 times by S.Eryılmaz (25). The body height in total length was found as 6.2 times in the present study. Thus, it can be seen that the ratio given by Fischer et al. (7), and S.Eryılmaz (25) are different from in the relevant literature and the ratio obtained in the study. Our counts of lateral lines in present study are also different from the previous literature because of small sample size.

For *T. lyra* of the family Triglidae, the number of dorsal fin rays has been given as 15-16 by Whitehead et al. (6), Fischer et al. (7), Unsal (15), and S. Eryılmaz (25). In the present study, the number of the dorsal fin rays was found to be 16. The number of anal fin rays has been given as 16 by S. Eryılmaz (25). In the present study, the number of the anal fin rays was found to be 15. The findings in the present study confirm the relevant literature.

For *S. lascaris* of the family Soleidae, the number of lateral line scales has been given as 96-150 and 113-117 by Whitehead et al. (6), and S. Eryılmaz (25), respectively. In the present study, this was found to be 115. The number of dorsal fin rays has been given as 70-90 by Whitehead et al. (6) and 71-75 by S. Eryılmaz (25). In the present study, the number of the dorsal fin rays was found to be 70. The number of anal fin rays has been given as 58-75 by Whitehead et al. (6) and 59-61 by S. Eryılmaz (25). In this study, the number of the anal fin rays was found to be 58. The findings in the present study confirm the relevant literature except of those of S. Eryılmaz (25).

Some fish species occurring in the Aegean Sea are not reported for the Sea of Marmara (6, 7). The Aegean Sea water flows through Dardanelles into the Sea of Marmara below 20 m. depths, showing characteristics of the Mediterranean Sea with salinity of about 38-39 ‰. Black Sea waters with low salinity coming through the Bosphorus mix with the surface waters of the Sea of Marmara and meet a gradual increase in salinity. The salinity of the Black Sea waters in the northern Marmara is around 22‰ (20, 24, 25). A large number of fishes living in Aegean Sea may adapt themselves to the ecological conditions of the Sea of Marmara. It is thought that especially some deep water demersal fishes could be encountered in the continental slopes of the Sea of Marmara where trawling is performed due to the roughness of the bottom. Overfishing, wrong fishing methods and pollution in Bandırma Bay have influenced fish stocks negatively (28). For the protection of the fish stocks and increasing of catch yield, the management of shore laws, the ban of illegal fishing, the check of species and first catch length should be taken as some precautions.

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