

The Main Communities of the Turkish Black Sea

I. Review of Studies of the Plankton of the Turkish Black Sea Coast

Bayrakdar (1994) studied the abundance, species diversity and horizontal and vertical distribution of phytoplankton ($>55\mu\text{m}$) along the Turkish Black Sea Exclusive Economic Zone and on the north-western shelf area of the Black Sea. The author recorded 48 centric and 14 pennate diatoms, 79 dinoflagellate species and a few species from other taxa, including 11 Tintinnides (Protozoa).

Ergun (1994) studied the distribution of five dominant calanoid copepod species in the Turkish Black Sea Exclusive Economic Zone, including detailed analysis of the numerical abundance, biomass, length distribution and composition of *Calanus ponticus*, *Acartia clausi*, *Pseudocalanus elongatus*, *Centropages kroyeri* and *Paracalanus parvus*.

In a detailed ecological study of plankton Benli (1987) examined plankton distribution in the southern Black Sea and its effects on particle flux, including an analysis of seasonal changes in the species composition of phyto- and protozooplankton. He reported 44 diatom, 49 dinoflagellate and 11 Tintinnid species (Protozoa) as well as one silicoflagellate and one coccolith species.

Uysal (1987 and 1993) studied the plankton in the coastal waters of the Turkish Black Sea. He reported 18 centric and four pennate diatoms in the south-western Black Sea. In a more detailed study, he examined the species composition and spatial distribution of plankton along the Turkish Black Sea coast. The target groups were diatoms (48 centric and 55 pennate

species), dinoflagellates (52 species), some species of Chlorophyta (12 species), Cyanophyta (3 species), Chrysophyta (2 species) and Ciliata (6 species).

Feyzioğlu (1990) studied the plankton of the Turkish Black Sea around Trabzon-Sürmene both qualitatively and quantitatively. Of the total 101 species recorded, 59 were Bacillariophyta, 36 Dinoflagellatae, one Euglenacea, one Silicoflagellata, one Cyanophyta and three Tintinnoidae.

The early works of Demir (1954, 1955 and 1959) dealt mainly with the zooplankton of the Black Sea and reported the presence of pelagic Cladoceran and Copepod species belonging to Pontellidae and Parapontellidae in the southern Black Sea. He recorded three Copepod species, namely *Anomalocera patersonii*, *Pontella mediterranea* and *Labidocera brunescens*, in the southern Black Sea.

Karacam and Düzgüneş (1990) studied the monthly changes in the composition of phytoplankton near Trabzon, recording 17 diatom and 12 dinoflagellate species.

Mutlu *et al.* (1994) studied the distribution of the new invader *Mnemiopsis* sp. and the resident *Aurelia aurita* and *Pleurobrachia pileus* populations in the Black Sea in the years 1991-1993.

Aubert *et al.* (1990) identified major phytoplanktonic groups on a long transect from the Aegean Sea passing through the Dardanelles, the Marmara Sea and up the Bosphorus to the Black Sea, while studying the transport of pollutants.

Şahin (1992) studied the freshwater diatom flora around Trabzon. Algal samples were collected from six different streams (Söğütlü, Degirmendere, Kalafa, Karadere, Sürmene, Solaklı) and one lake (Uzungöl) near Trabzon in August, September, October and November 1989. He identified 40 Bacillariophyta taxa. *Navicula*, *Cymbella* and *Gomphonema* were the most abundant species. *Ceratoneis arcus* Kütz. was found in all the stations but *Meridion circulare* (Grey) Ag., which is an epiphytic diatom, was only recorded in Lake Uzun.

Gündüz (1991) studied the Cladoceran species of the coastal lagoon Bafra Balık Gölü (Balık Gölü-Uzun Göl) in 1986-1988, recording a total of 17 Cladocera species.

Gönülol and Çomak (1993) studied the phytoplankton of Bafra Balık Gölleri (Balık Gölü, Uzun Göl), identifying 57 Chlorophyta taxa, of which 42 were Chlorococcales and 10 Desmidiaceae.

Gönülol and Arslan (1992) studied the algal flora of the İncesu Stream, Samsun, identifying 150 phytoplankton, epipelagic, epilimnetic, epiphytic Bacillariophyta, Chlorophyta, Cyanophyta and Euglenophyta taxa. Bacillariophyta predominated, while Chlorophyta, Cyanophyta and Euglenophyta species were subdominant. Species of *Achnanthes*, *Amphora*, *Navicula*, *Nitzschia* and *Synedra* were abundant among epipelagic algae. In the epilimnetic and epiphytic algae there were large quantities of *Cocconeis*, *Cymbella* and *Gomphonema*.

Gönülol (1991) studied the composition and seasonal variations of the benthic algal flora of Balık Gölleri (Balık Gölü, Uzun Göl) between May 1989 and December 1990. The benthic algal flora consisted of 246 taxa, including Bacillariophyta, Chlorophyta, Cryptophyta, Cyanophyta, Dinophyta, Euglenophyta and Xanthophyta. Bacillariophyta were dominant with Cyanophyta subdominant on sediments. The most common species were: *Amphora ovalis*, *A.*

pediculus, *Cocconeis pediculus*, *C. placentula*, *Navicula cryptocephala*, *Nitzschia palea*, *Anabaena sedowii*, *Aphanizomenon flos-aqua* and *Oscillatoria*. A rich algal flora consisted of typical epiphytic and epilithic diatom species. Full lists of phytoplankton, zooplankton, macrophyte species are given in Annex 1 - Tables 1, 2 and 3 respectively.

The first studies of marine macroscopic algae were conducted by Handel-Mazetti (1907). 14 algae species were recorded on the Turkish Black Sea coast. Güner (1986) found 82 macroscopic algae species, including 56 Rhodophyta, 15 Pheophyta, nine Chlorophyta and two Charophyta species. Güven *et al.* (1991) reviewed algal studies in the Black Sea between 1898 and 1990.

There have been a small number of studies of the benthic algae population in the Sinop Inceburun zone of the Turkish Black Sea. Cirik and Cihangir (1987) reported 31 species, of which 20 species were Rhodophyta, six Chlorophyta, four Pheophyta and one marine phaeograme. The Rhodophyta species included: *Gelidium crinale*, *Gelidium latifolium*, *Lithothamnium lenormandi*, *Pseudolithophyllum orbiculatum*, *Corallina elongata*, *Corallina granifera*, *Jania rubens*, *Peyssonnelia squamaria*, *P. rubra*, *Glacilaria verrucosa*, *Hypnea musciformis*, *Phylliphora nervosa*, *Antithamnion cruciatum*, *Ceramium diaphanum*, *C. rubrum*, *C. ciliatum*, *Nitophyllum punctatum*, *Laurencia paniculata*, *Polysiphonia denudata* and *Herposiphonia tenelle*. The Pheophyta algae comprised: *Sphecelaria cirossa*, *Cladostephos verticillatus*, *Cystoseira barbata* and *C. sp.* The chlorophyta algae included: *Lactuca*, *Enteromorpha intestinalis*, *E. linza*, *Cladophora coelothrix*, *C. glomerata* and *C. sp.* However, *Zostera noltii* was the only sea grass found in the area.

II. Review of Studies of Turkish Black Sea Coastal Benthic Communities

Deveciyan (1926) reported several fish and invertebrate species from the Turkish Black Sea. Later Kocataş and Katagan (1980) reported 41 Amphipoda species from 14 families along the Turkish Black Sea coast, including: one Ampeliscidae, three Amphithoidae, two Aoridae, two Calliopidae, six Corophiidae, one Dexamidae, one Eupliantidae, four Gammaridae, one Haustoriidae, three Ischyroceridae, one Oedicerotidae, one Stenothoidea, nine Talitridae and six Caprellidae.

Bacescu (1959) and Zenkevich (1963) reported more than 60 Mediterranean benthic forms in the Bosphorus region of the Black Sea at depths of 38-94 m and included: two Cnidaria, eight Echinodermata, 11 molluscs, six Annelidae and seven crustacea.

Rullier (1963) reported 118 Polychaeta species in the Bosphorus and 170 in the Black Sea, namely: 11 Aphroditidae, 18 Synidae, 11 Nereidae, eight Nephtidae, 22 Eunicidae, 10 Spionidae, six Cirratulidae, eight Maldanidae, 11 Capitellidae and 12 Terebellidae.

Caspers (1968) investigated the benthic macrofauna in the Bosphorus and 12 stations off the Bosphorus junction of the Black Sea, recording two mollusc species, one echinoderm,