Introduction

This study was carried out to contribute to the knowledge of freshwater algae of Turkey. To benefit from the algae in lakes, ponds, dam reservoirs and rivers, it is necessary to study the taxonomy of freshwater systems. Algae are the source of oxygen in aquatic systems, are the main autochthonous primary producers and are used in determining water pollution levels.

The Sarýyar dam reservoir (SDR) is on the border of the provinces of Ankara and Eskißehir, two of the large cities in Turkey. The SDR is between the longitudes of 30° 45' 36" E and 31° 45' 36" E and at a latitude of 40° 03' 00" N, in central Turkey (Figure 1).

The total length of the SDR is 63 km. The maximum water depth of the reservoir at the high supply level is 90 m. The water volume is 1.900 x 10^6 m^3 and the surface area is 84 km^2 (Anonymous, 1992).

The SDR is supplied by the Sakarya River, the Aladağ Stream, the Kirmir Stream and the Gürleyik Stream. Of these, the Sakarya River is industrially polluted (Atiç, 1997) while both the Aladağ and Gürleyik streams are unpolluted. The SDR was constructed mainly for hydroelectric power generation.

Material and Methods

Seven stations were chosen in different areas of the reservoir. The samples were taken from these seven stations between March 1996 and June 1997. Phytoplankton samples were taken horizontally both from the surface and from 10 m, 20 m and 50 m depths by plankton net with a pore diameter of 55 µm.

These samples were brought to the laboratory and 100 ml was mixed with 4 ml of a solution prepared by mixing 1 l alcohol, 1 l glycerine and 1 l formaldehyde (36%) (Hecky & Kiling, 1987), and examined microscopically. Identification of algae samples was carried out by examination under a research microscope; they were then photographed.
Results

The total number of algal species of the SDR is 195. Cyanobacteria: 35, Chlorophyta: 74, Bacillariophyta: 70, Rhodophyta: two, Pyrrophyta: four, Heterokontophyta: four, Euglenophyta: six. Only new records are listed in this paper.

Divisio: Cyanobacteria
Classis: Cyanophyceae
Ordo: Nostocales
Familia: Nostocaceae
Genus: Anabaena Bory 1822
A. circinealis Rabenh. var. macrospora (Witr.) De Toni (Figure 2-a.) (Prescott, 1975).

Cells 6-8 µm in diameter, heterocysts 7.8-10 µm in diameter, occur in a long chain.

Divisio: Chlorophyta
Classis: Chlorophyceae
Ordo: Chlorococcales
Familia: Chlorellaceae
Genus: Schizochlamys A.Braun 1849.
S. gelatinosa A.Braun (Figure 2-b.) (Parra & Gonzales, 1978).

Cells 10 µm in diameter; sometimes cells rounded, in a group of two or four. Colonies usually have long pseudoflagella and float at the surface.

Ordo: Oedogoniales
Familia: Oedogoniaceae
Genus: Oedogonium Link 1820.
O. inclusum Hirn. (Figure 2-c.) (Prescott, 1975).
Vegetative cells cylindrical or somewhat capitellate 10-12 µm in diameter. 33-62 µm long. Antheridia not observed. Oospores ellipsoid; filling the oogonia laterally. Attached to overhang on macrophytes.

Ordo: Chlorococcales
Familia: Chlorococcales
Genus: Dictyosphaerium Naegeli 1849.
D. pulchellum Wood. var. ovatum Korshikov (Figure 2-d.) (Korshikov, 1987).
Basic form in the oval or slightly ovoid cells attached to the stalks by a narrow end. Colony 70 µm in diameter, cells 8 µm in diameter.

Genus: Treubaria Bernard 1908.
T. setigerum (Archer) G.M.Sm. (Figure 2-e.) (Prescott, 1975).
Cells triangular and flattened in surface view, the angles broadly rounded and then produced to form a long
tapering spine, cells 7-9 µm in diameter, spines 12-15 µm long.


*L. ocellata* Korshikov (Syn: *Characium ocellum* Korsh.) (Figure 2-f.) (Korshikov, 1987).

Cells narrow fusiform, straight, posteriorly with a thin spine appendage, the lobes of which separate in different directions. Cells up to 45 µm long and 5 µm wide.

**Genus: Ankistrodesmus** Corda 1838.

*A. longissimus* (Lemm.) Wille. var. *acicularis* (Chod) Brunth. (Figure 2-g.) (Korshikov, 1987).

Cells shorter than 210 µm, usually 60-180 µm long, young cells from 10 µ, with one to several pyrenoids. Cells 2.5-6.5 µm in diameter.

**Familia: Scenedesmaceae**

**Genus: Tetrastrum** Chodat 1895.

*T. triacanthum* Korshikov (Figure 2-h.) (Korshikov, 1987).

Coenobia rhomboid, 16 µm long. Cells with three massive spines, the middle one long, up to twice the length of the cell and two short lateral ones. Chromatophore with a pyrenoid.

**Genus: Scenedesmus** Meyen 1828.

*S. acuminatus* (Lagerh.) Chod. var. *biseriatus* Reinsch (Figure 2-i.) (Korshikov, 1987).

Cells arranged alternately, dimensions within the limits of the basic form, apical cells are concave, cells 3-6 µm in diameter, 15-35 µm long.
S. opoliensis Richter var. abundans Printz. (Figure 3-a.) (Korshikov, 1987).

Coenobium of four cells arranged linearly, cells 10-13 µm long, marginal cells straight or slightly concave, other sides convex with one additional spine arising from the centre.

S. opoliensis Richter var. contacta Prescott (Figure 3-b.) (Prescott, 1975).

Coenobium consisting of four naviculoid cells arranged in a single series adjoined along 3/4 of the length of their lateral walls, 6-8 µm in diameter, 20-24 µm long. Spine on terminal cells, either one or two at each pole.

Genus: Actinastrum Lagerh. 1882.

Ac. gracillum G.M.Sm. (Figure 3-c.) (Prescott, 1975).

Cells cylindrical, with very slightly narrowed to abruptly truncate poles, 1.7-3 µm in diameter, 14-21 µm long, colonies 30-45 µ in diameter, forming colonies of individuals with the long axes of the cells radiating in all planes from a common centre.

Genus: Dimorphococcus A.Braun 1849.
D. lunatus A.Braun (Figure 3-d.) (Korshikov, 1987).

Cells elongate oval, slightly cylindrical cell ends broadly rounded, Chromatophore with one pyrenoid. Cells up to 8 by 14 µm long.

Ordo: Desmidiales

Familia: Closteriaceae

Genus: Closterium Nitzch ex. Rafs. 1848
Cl. ralfsii Breb. var. hybridum Rabenh. (Figure 3-e.) (Lind & Brook, 1980).

Cells narrow and long, 25-40 µm in diameter and 300-450 µm long, much less convex cell wall is yellowish to dark brownish, cell appearing somewhat fusiform.

Cl. setaceum Ehr. (Figure 3-f.) (Dillard, 1990).

Cells 0.7-2.5 µm in diameter, 150-600 µm long almost straight, fusiform at the midregion, rather abruptly attenuated to form rostrate extensions to the
incurved, truncate apices, cell wall is colourless or brownish, chloroplast with 2-3 pyrenoids.

**Divisio: Euglenophyta**
**Classis: Euglenophyceae**
**Ordo: Euglenales**
**Familia: Euglanaceae**
**Genus: Trachelomonas** Ehrenberg 1835.

*T. armata* (Ehr.) Stein (Figure 3-g.) (Pestalozzi, 1955).

Cells broadly ovate, 22-25 µm in diameter, 38-40 µm long, including spines, two chromatophores with one pyrenoid. Flagellar opening with or without a collar.

*T. armata* (Ehr.) Stein var. *longispina* (Playf.) Deflandre (Figure 3-h.) (Prescott, 1975).

Cells broadly ovate, 30-31 µm in diameter, 41-48 µm long, flagellum aperture without a collar, but with a circle of erect spines at margin.

*T. lacustris* Drezeppolski var. *lacustris* Yamagishi & Akijama (Figure 3-i.) (Yamagishi, 1987).

Cells cylindrical, golden yellow-brown, cells 12-16.5 µm diameter, 26-30 µm long. The lateral margins almost parallel, broadly rounded both posteriorly and anteriorly.

**Divisio: Heterokontophyta**
**Classis: Chrysophyceae**
**Ordo: Ochromonadales**
**Familia: Lepochromanodoideae**
**Genus: Paraphysomonas** De Saedelecer 1930.

*P. vestita* (Stokes) De Saedelecer (Figure 3-k.) (Oguni et al., 1987).

Cells non-photosynthetic and spherical, 7.7-11.5 µm in diameter, spines very thin and colourless, 5-10 µm long, all over the cell surface.

**Discussion**

The species listed in the Results from the SDR phytoplankton have not been recorded so far in Turkey (Gönül & Öztürk, 1996). The division Chlorophyta contains the most (14) species. The Chlorophyta were reported to be widespread in the lakes of America and Britain (Dillard, 1990; Verch & Blinn, 1971; Sommerfeld, 1975; Moss, 1995). The division Cyanobacteria was represented by one species, which was reported to be located in the mesotrophic lakes of Europe (Lund & Lund, 1995). Three *Trachelomonas* species belonging to the division Euglenophyta were found in the SDR. They are generally found in aquatic areas rich in nutrients (Yamagishi, 1987; Desikachary, 1959). *Paraphysomonas vestita* of the division Heterokontophyta (Hoek van den et al., 1995, 1997) are also found to be widespread in the inland waters of the Ongul Islands and in the vicinity of Antarctica (Oguni et al., 1987).

In terms of species diversity, Cyanophyta, Chlorophyta, Euglenophyta and Heterokontophyta were most common in the Manisa-Marmara Lake (Cirik, 1982, 1983, 1984), Hazar Lake (Elazığ) (Șen, 1988) and Hafik Lake (Sivas) (Kılıç & Dere, 1988). They were widespread in lakes around Ankara (Aykulu et al., 1983; Gönül & Aykulu, 1984; Aykulu & Obali, 1981) and also in Mogan Lake (Obali, 1984).

**References**


