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A PRELIMINARY REPORT ON THE ALGAL SPECIES PRESENTLY FOUND IN UTAH LAKE

William J. Harding[1]

Introduction

Utah Lake is a shallow, desert lake which has undergone a number of changes in its biology and hydrology through water control and other misuse during the past 100 years. It is interesting to note that although Utah Lake is one of the largest freshwater lakes in the western states, few published reports have appeared which deal with the algal flora. Tanner and his associates established the first research station on the Lake in 1926, which operated for many years. Tanner (1930, 1931) published a list of algal species found in the lake as part of a general biological survey. Within this list is found the only diatom genera recorded to date. Snow (1931), made a comprehensive study of the littoral algae, representing the most recent and accurate information available.

These earlier studies were concerned with the benthic and littoral algae and not the planktonic forms, evidenced by the species reported and the methods of collection. As a result, many of the plants listed herein have not been previously reported. This preliminary study is the first in a series to update and contribute to the known algal flora of Utah Lake.

For the following species a few descriptive notes, interesting observations and ecological data where deemed warranted are given and with some exceptions, each is illustrated. Material upon which this study is based is deposited in the private collection of the author.

Gratitude is expressed to Brigham Young University Research Division, The Central Utah Conservancy District, Geneva Works of United States Steel, Utah County Commissioners, and the Utah State Division of Health, who financially supported this project.

List Of Algal Species

Cyanophyta

Anabaena spiroides. var. *crassa* Lemmermann Pl. 1, Fig. 3.

Trichomes solitary, spirally twisted, and planktonic. The cells are spherical; heterocysts subspherical. Abundant throughout the lake, being very numerous during the late summer; appearing in blooms with *A. flosaquae*, *C. hirondinella*, and *M. aeruginosa*.

Microcystis aeroginosa Kuetz.

An ovate, spherical colony of numerous spherical cells which are much crowded within a gelatinous matrix. Common in Utah Lake,

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becoming especially abundant during late summer. Found most often around the Provo Harbor and Powell's slough areas.

Aphanizomenon flos-aquae (L.) Ralfs Pl. 1, Fig. 2, 3.

Trichomes parallel, tapering at both ends; united in bundles or flakes to form marcoscopic colonies. Heterocysts are oblong or cyndrical and scattered in the midregion of the trichome. This plant was a frequent component of water blooms. It occurred alone or in accompaniment with *Microcystis aeruginosa* and *Anabaena spiroides*. The occurrence of this species is so consistently related to hard water lakes usually with a high nitrogen and carbonate content that it may be used as an index organism.

Chlorophyta

Pandorina morum (Muell.) Bory Pl. 1, Fig. 4.

Colony ovate or obovoid, composed of 8-16-(32) globose or pyriform cells compactly arranged and enclosed by a common gelatinous envelope. Common among the dense growths of plankton in shallow water during the summer months.

Eudorina elegans Ehrenberg Pl. 1, Fig. 6.

Colony spherical or ovate with 16-32 cells evenly disposed within a gelatinous envelope, or arranged in transverse series. The cells are usually lying near the periphery of the envelope. Two long flagella are present. Common in the euplankton during the summer months.

Ulothrix zonata (Weber & Mohr) Kuetz. Pl. 2, Fig. 4.

Filament attached, usually long and stout, variable in diameter in the same plant mass. Cells short, or elongate-cylindric; cell walls thick. Chloroplast a complete circular band in the midregion of the cell. Common in late spring when the water is still cool.

Cladophora glomerata (L.) Kuetz. Pl. 2, Fig. 8.

C. glomerata became very abundant during the summer months in the shallow waters of Lincoln Beach, Bird Island, and around the Provo Boat Harbor, these being places offering suitable substrate for solid attachment.

Chlorococcum infusionum (Schrank) Meneghini Pl. 1, Fig. 5.

Cells spherical, solitary or in small clumps, variable in size within the same plant mass; cells 15-45 μ in diameter. Ordinarily found in submerged substrates or attached to the legs of zooplankton.

Dictyosphaerium Ehrenbergianum Naegeli Pl. 2, Fig. 12.

Colony ovoid, composed of ellipsoidal cells with one or two parietal or cup-like chloroplasts, cells attached in groups of 2 or 4 at the ends of fine, branched strands. Found in the plankton around the Provo River and Harbor during the summer.

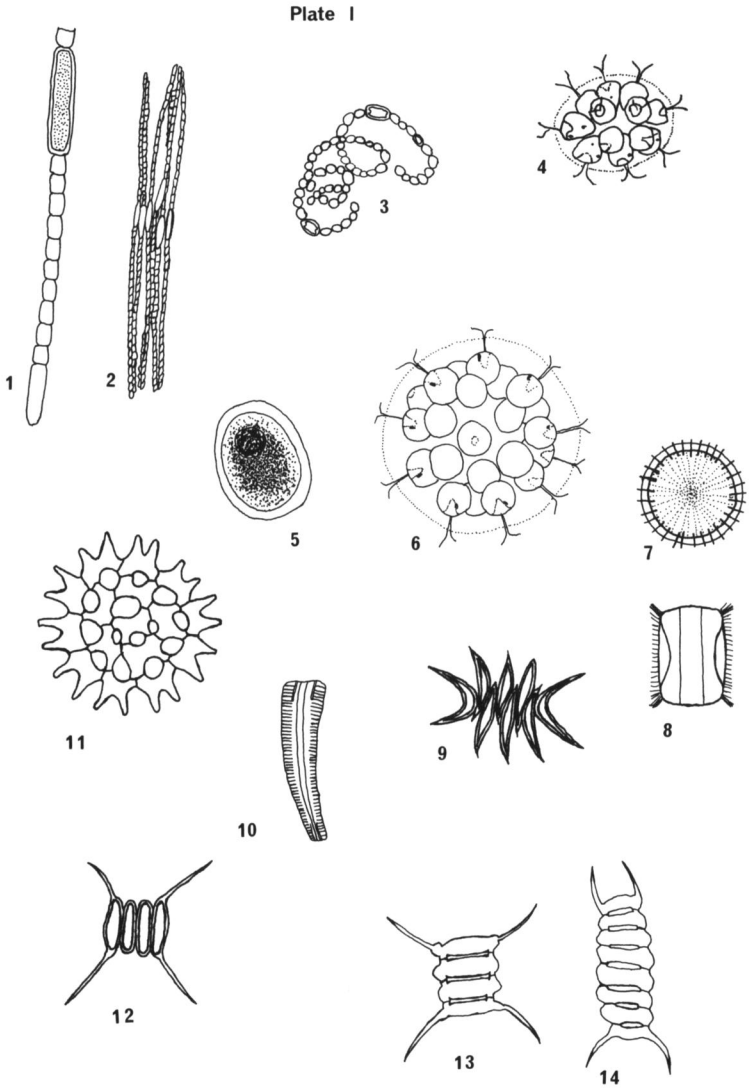

Plate 1

Figs. 1-2, *Aphanizomenon flos-aquae* (L.) Ralfs.; 3, *Anabaena spiroides* var. *crassa* Lemmermann; 4, *Pandorina morum* (Muell.) Bory; 5, *Chlorococcum infusionum* (Schrank) Meneghini; 6, *Eudorina elegans* Ehrenberg; 7-8, *Stephanodiscus niagrae* Ehr.: 7, valve view; 8, girdle view; 9, *Scenedesmus dimorphus* (Turp.) Kuetzing; 10, *Rhinosphenia curvata* (Kutz.) Grun.; 11, *Pediastrum duplex* var. *clathratum* (A. Braum) *Lagerheim;* 12, *Scenedesmus quadricauda* (Turp.) Kuetzing; 13-14, *Scenedesmus perforatus* Lemmermann.

Pediastrum duplex var. *clathratum* (A. Braum) Lagerheim Pl. 1, Fig. 11.

Colony with larger perforations that in the typical form; walls with deep emarginations; apices of lobes of peripheral cells truncate; cells 12-20 μ in diameter. This alga was very common during the latter part of the year (from June to December) and was generally distributed throughout the lake.

Scenedesmus dimorphus (Turp.) Kuetz. Pl. 1, Fig. 9.

A colonial alga composed of 4 to 8 fusiform cells arranged in a single or alternating series; the inner cells with straight, sharp apices. Common in still water around the Provo River and Harbor from July to September.

Scenedesmus perforatus Lemmermann Pl. 1, Fig. 13, 14.

Cells subrectangular with convex end walls and concave lateral walls, thus forming biconvex intercellular spaces. The end cells bear a single long curved spine at each pole arising from the corner. The outer lateral walls of the end cells straight or umbenate. Found around the Provo River and Harbor area from July to September.

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Scenedesmus quadricauda (Turp.) Kuetz. Pl. 1, Fig. 12

Colony consisting of 2-4-8 oblong cylindric cells usually in 1 series. The outer cells have a long curved spine at each pole; inner cells without spines. Common and widely distributed throughout the summer.

Selenastrum Gracile Reinsch

Colonies of 8-64 sickle-shaped cells in irregular arrangement, but with the convex surfaces opposed; apices of the cells sharply pointed; chloroplast a parietal plate among the convex wall, without a pyrenoid. Cells 3-5 μ in diameter, 19-28 μ between apieces. Found in the tychoplankton around the Provo River and Harbor area during late summer.

Botryococcus Braunii Kuetz. Pl. 2, Fig. 7.

Cells ellipsoid, radiately arranged at the periphery of irreguarly shaped usually dark-colored masses of mucilage. Chloroplast a think, or dense, parietal net with one pyrenoid covering only a portion of the wall. Cells 3-6 μ in diameter, 6-12 μ long. Common and often abundant during the winter.

Closteriopsis longissima var. *tropica* West and West Pl. 2, Fig. 1.

Cells long and needle-like, tapering but bluntly tipped at both

Plate II

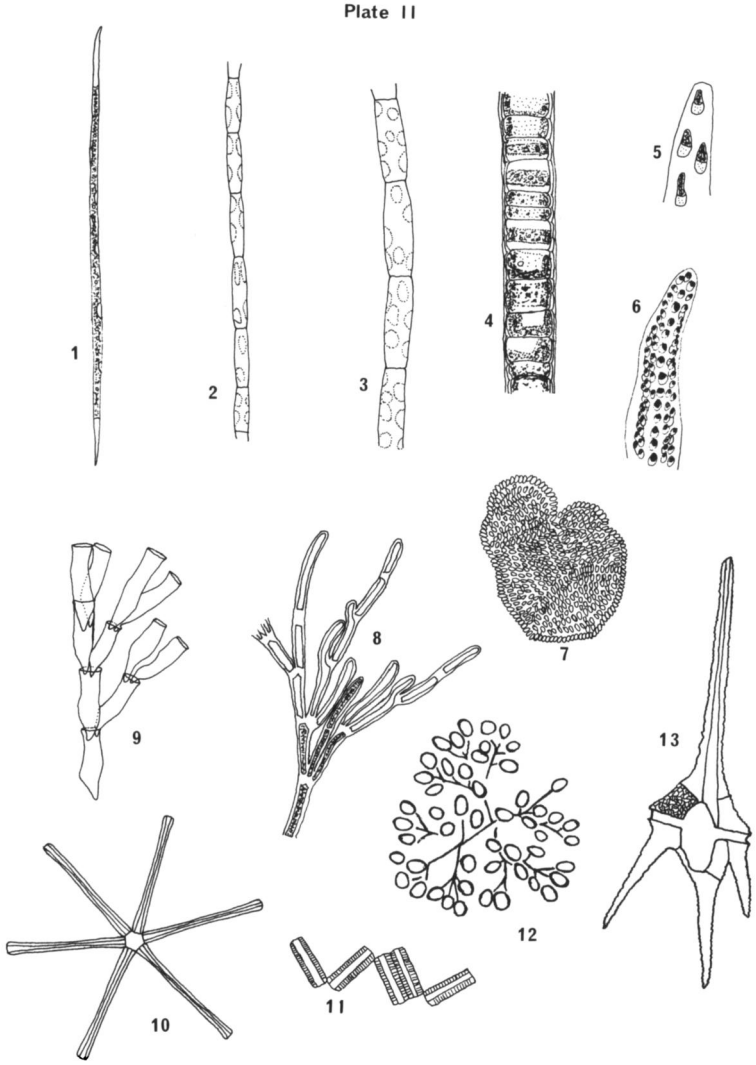

Plate 2

Figs. 1, *Closteriopsis longissimi* var. *tropica* West & West; 2, *Tribonema minus* (Wille) Hazen; 3, *Tribonema bombycinum* (C, A. Ag) Derbes & Solier; 4, *Ulotrhix zonata* (Weber & Mohr) Kuetzing; 5-6, *Hydrurus foetidus* (Vill.) Trev.; 7, *Botryococcus Braunii* Kuetzing; 8, *Cladophora glomerata* (L.) Kuetzing; 9, *Dinobryon sertularia* Ehrenberg; 10, *Asterionella formosa* Hass.; 11, *Tabellaria floccosa* (Roth) Kutz.; 12, *Dictyosphaerium Ehrenbergianum* Naegeli; 13, *Ceratium hirundinella* (O. F. Muell.).

ends; 6-7.5 μ in diameter, 225-370 μ long. Chloroplast a lobed plate extending almost the entire length of the cells and containing a row of pyrenoids. Found in euplankton during the summer months.

Pyrrhophyta

Ceratium hirundinella (O. F. Muell.) Pl. 2, Fig. 13.

C. hirundinella was one of the most common plankters throughout the lake most of the year round. It was especially abundant during the summer in Mud Lake and around the Provo River and Harbor areas.

Chrysophyta

Tribonema bombycinum (C. A. Ag.) Derbes and Solier Pl. 2, Fig. 3.

Cells with thin walls; cylindrical or slightly constricted at the cross walls. Chromotophores 4-8 small, parietal, pale yellow-green discs, sometimes in contact giving the appearance of 1 or 2 large, irregular shaped plates. Filaments usually much entangled; however, short filaments of a few cells were only found in the limnoplankton.

Tribonema minus (Wille) Hazen Pl. 2, Fig. 2.

Filaments slender, cells slightly inflated to subcylindrical, 5-6 μ wide, 23-27 μ long; chromotophores 2-4 large parietal discs, symmetrically arranged about the wall. Also found in the limnoplankton.

Dinobryon sertularia Ehrenberg Pl. 2, Fig. 9.

Free-swimming, aborescent colonies of fusiform-campanulate loricas, slightly diverging. Loricas have a blunt-pointed posterior, smooth lateral margins, convex, narrowed above the mid-region and then slightly flaring to a wide mouth. Found around the mouth of the Provo River in February.

Hydrusus foetidus (Vill.) Trev. Pl. 2, Fig. 5-6.

A gelatinous thallus profusely branched, penicillate, and brown in color. Ovoid cells, each containing a single golden-brown chromatophore that generally lies on the side of the cell toward the thallus apex. Always found attached to rocks in early spring when the water was still cold.

Stephanodiscus niagrae Ehr. Pl. 1, Fig. 7, 8.

Frustules usually discoid, sometimes cylindrical; valves circular in outline and radially punctate ;with short, rather stout spines around the perifery. May have several small discoid chromatopheres or one or two large irregularly shaped ones. Common in the euplankton during late fall and winter.

Rhicosphenia curvata (Kutz.) Grun. Pl. 1, Fig. 10.

Frustules wedge-shaped, oblanceolate, in valve view. Attached at narrower end to branching system of gelatinous stalks affixed to

submerged phanerograms. There is a single laminate chromatophore next to one side of the girdle. Found attached to other algae throughout most of the year.

Asteroinella formosa Hass. Pl. 2, Fig. 10.

Frustules linear in valve view, joined to each other at edges to form flat stellate colonies with all cells lying in approximately the same plane. Two chromatophere to a cell lying axially to each other. Common in the plankton during most of the year.

Tabellaria floccosa (Roth) Kutz. Pl. 2, Fig. 11.

Tabular cells united in free-floating zig-zag chains; frustules with numerous intercalary bands between girles. Values elongate, with an evident lateral inflation in the median portion, and slightly inflated at the poles. Common both attached and in the plankton throughout most of the year.

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