

LATISPHAERA

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Genus LATISPHAERA n. gen.

Type species.—*Latisphaera wrightii* n. sp.

Diagnosis.—Cells spheroidal, occasionally ellipsoidal, solitary, paired, or associated in pseudofilamentous colonies and aggregates. Cells in colonial aggregates may be distorted by mutual compression and surrounded by possible sheath remnants. Cells large, ranging from 19 to 62 μm in median diameter. Surface texture of cells granular to finely reticulate. Wall thickness relatively thin for size of cell (rarely more than 1 μm). Characteristically cells possess a small dark internal spot 1.7–8.5 μm in diameter (generally less than 3 μm), or rarely rods and irregular dark areas. Reproduction apparently by vegetative division.

Etymology.—A wide spheroidal cell.

Discussion.—*Latisphaera*, largest of the unicellular algae in the Beck Spring microflora, possesses a distinctively greater diameter

than the more numerous unicells of *Maculosphaera*. Size frequencies overlap only in the 20–30 μm size range. The wide size range of *Latisphaera* may indicate a heterogeneous grouping of large unicells, a nonrandom sampling of a taxon with wide size range, or an artifact of varying postdepositional shrinkage.

Latisphaera may be compared most closely to two genera of unicellular algae described from the Bitter Springs microflora. *Phanero-sphaerops* Schopf & Blacic, assigned to the

Chroococcaceae because of apparent lack of intracellular organelles, possesses a mean diameter of 44.8 μm for two cells measured (Schopf & Blacic, 1971). *Zosterosphaera* Schopf is represented by a single specimen about 26 μm in diameter (Schopf, 1968). Undoubted unicells from the older pre-Phanerozoic are generally much smaller than *Latisphaera*. *Huroniospora* Barghoorn seldom exceeds 16 μm diameter (Barghoorn & Tyler, 1965). *Latisphaera*, is closely associated in stromatolite laminae with various unequivocal unicells and filaments, has good analogy with living algae, and possesses a degree of morphologic complexity most consistent with a biological origin.

Its large size implies that *Latisphaera* was a eucaryotic alga. Schopf & Oehler (1976) report that among living unicellular procaryotes only 6% are greater than 20 μm while 35% of unicellular procaryotes are larger than 20 μm . Procaryotic cyanophytes such as *Anacystis dimidiato* (Drouet and Daily) may have the same large size as *Latisphaera*, but they also possess prominent lamellate sheaths and lack intracellular organelles (Drouet & Daily, 1956, p. 70).

Vegetative reproduction for *Latisphaera* is suggested by the frequent occurrence of numerous closely appressed cells as pseudofilamentous chains and aggregates. Adjacent cells with flat sides appear to have undergone cell

division and remained united within a sheath-like structure (e.g., Pl. 2, fig. 9). Solitary large unicells in laminae dominated by the smaller unicells may have been transported into their resting place or represent a swarmer that grew in place.

A lack of data as to the formation of spores and the probable vegetative cell division observed presents the same dilemma in systematic replacement as with *Maculosphaera*. Affinities may be with the green Chlorococcales

or yellow-green Heterococcales. Family affinities may be with 1), a primitive, vegetatively dividing member of the Chlorococcaceae or Heterococcaceae, or 2) the Chlorosarcinaceae, the only family of either order known to have retained binary fission. Because of the possible binary fission observed, however, *Latisphaera* is here provisionally assigned to the Order Chlorococcales, Family Chlorosarcinaceae.

