k17 Acritarchs < possible Late Proterozoic guide fossils >

Sic et Non, ca. 1130, by Peter Abelard (1079-1142): Uncover knowledge by debating the 'Yes and No' of a proposition.[1]

Acritarchs are more or less spherical microfossils (with diameters *greater* than the less than 10-micron diameters common of living bacteria). Those that have a diameter of 20 to 120 microns resemble marine unicellular-algae known as dinoflagellates that grow single-layer thick coats during a resting stage in their life cycle.[2] Modern dinoflagellates that must winter become so encysted and drop to the floor of the ocean or lake and then, when conditions allow, crack open, emerge and leave their encystments behind to resume free-swimming lifestyles.[3] However, the name acritarch (Gk. *akritos*: undecided, confused) reminds that included can be other planktonic algal protists, green algae, and red algae. What is fossilized is a thick cell-wall and an empty interior.[4]

Only a few smooth-walled forms of acritarchs are found in the latest part of the Hadrynian. However, prior to the time of Hadrynian glacials, a flurry of diversification is recorded for acritarchs in wide variety of sediments. As such, some of their species, round, or radiate, and variously ornamented with spines, ridges, and papillae, have the potential to be guide fossils for the earliest part of Hadrynian strata. Indeed, only in the interval 800-950 Ma did exceptionally large acritarchs (acanthomorphs) exist which measure hundreds of micrometers in diameter. In an exceptionally well preserved condition, in 0.8 Gy sediments in Victoria Island, Canada, 30 acritarch species have been found; the largest have a 180 micron diameter.[5]

Acritarchs are rare in rocks older than 0.9 Gy. Simple forms occur in the 1.0 Gy Beck Springs Dolomite, southeastern California. The oldest identified acritarchs date 1.4-1.6 Gy (early Middle Proterozoic). ❑

(***Figure k16.1*** cont.) geometry of the laminations. The extension of this scheme to other areas is hampered by the difficulty of adequately sampling such, often, large clumsymaking objects for laboratory petrographic analysis. Also there is little assurance that the different forms are not more a record of changing ecological conditions on wandering Paleosiberia (and so not worldwide) rather than an evolution of the microorganisms involved.