

Scanning electron microscope studies of dinoflagellates: an illuminating experience

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The increasingly sophisticated understanding of dinoflagellate cyst morphology has led to a revolution in the phylogenetic classification of this group of organisms. Elucidation of some of the subtle variations using the light microscope is becoming increasingly difficult. Fortunately, the Scanning Electron Microscope (SEM) is providing some of the answers. The advantage of the SEM is that it allows instant differentiation of the two surfaces of a dinoflagellate cyst, so that previously unsuspected tabulations are now revealed. An example is the species *Samlandia chlamydophora*, whose tabulation can be conclusively demonstrated as cribroperidinioidean, a subfamily of the gonyaulacaleans. Other studies are providing new insights into details of sur-

face ornamentation and the excystment aperture, commonly termed the archeopyle. SEM studies of one group of Paleogene dinoflagellates, the wetzelielloideans, has helped in the development of a morphostratigraphy divorced from the previous subjective classification. This approach provides more reliable, detailed biostratigraphic control in the Eocene-Oligocene and, hence, leads to a more concise delineation of the sequence stratigraphy of offshore eastern Canada. Thus, rather than being a piece of esoteric equipment, the SEM is becoming an essential asset in the continuing utilization of dinoflagellates for detailed biostratigraphic and palaeoecological interpretations.