

FOSSIL MICROPLANKTON UNDER THE MICROSCOPE; FROM XANTHIDIA TO ACRITARCHS AND DINOCYSTS. EVOLVING CONCEPTS AND EXPANDING APPLICATIONS OVER 164 YEARS.

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Fossil dinoflagellates were first recognized by Christian G. Ehrenberg around 1834; along with them were found spinose bodies whose nature was misunderstood, soon to be called Xanthidia. After a brief flurry of study in England in the 1840s, these microfossils were long neglected. When serious research was recommenced in the 1930s, it was concentrated on description rather than practical application. Only after the Second World War did serious use begin of pre-Quaternary palynomorphs as a means for sediment dating. Percipient studies by William R. Evitt resulted in recognition that some of the spiny bodies were cysts of dinoflagellates; the affinity of the others, thereafter termed acritarchs, remains controversial.

With progressive improvement in microscope equipment, more subtle features of the morphology of these microfossils have come to be recognized. They are now being used as a means for sediment dating from late Precambrian to Quaternary, with a precision that, in the Mesozoic at least, compares favourably with dating by ammonites. Indeed, they are arguably the most important microfossils in subsurface and submarine correlation, where small sample size limits the use of larger fossils and where decalcification may destroy other shells. Their distribution enables palaeoclimatic interpretation and the determination of the pattern of ocean currents in past times.