

MORPHOLOGICAL OBSERVATIONS OF AMPHORA THUMENSIS (MAYER) A. CL. USING LIGHT AND SCANNING
ELECTRON MICROSCOPY *

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During studies of the benthic microflora of northern Lake Michigan, a small diatom was often seen which has been assigned to the genus Amphora by some researchers and to the genus Cymbella by others. The diatom was originally described as Amphora coffeiformis var. thumensis by Mayer in 1919. It has been reported as a rarely occurring member of fossil and recent floras from Europe and Asia since the 1930's, and the generic position has often been discussed but not resolved. Cleve-Euler transferred the status of Mayer's taxon to Amphora thumensis in 1932. In 1933, Krasske ignored the earlier name and called this same diatom Cymbella parvula. Hustedt, the most active and highly regarded modern diatomist, became convinced that this diatom should be placed within Cymbella, and most investigators follow his ideas today. All previous investigations have utilized only light microscopy.

This diatom accounted for up to 2% of the diatom assemblage taken from natural substrates in Grand Traverse Bay, Lake Michigan. These samples were initially observed under high resolution brightfield optics (N.A. 1.32), and the taxon in question immediately appeared to belong to the genus Amphora. Key characteristics visible with light microscopy include frustular shape, arched valves, raphe structure, and multiple bands between the 2 valves of each frustule.

Samples rich in this Amphora were acid cleaned, air dried onto stubs, sputter coated with gold, and examined in a Hitachi HHS-2R and an ISI MiniSEM. Examination with SEM confirms the placement within Amphora, and the distinguishing generic characteristics (Ref. 1) are more clearly represented. The frustule is sector-shaped in transverse section, and the valve faces are not parallel (Fig. 3). Each valve is arched, with the dorsal mantle much deeper than the ventral mantle (Figs. 1-4). The proximal ends of the external raphe branches are moderately dorsally deflected; the distal ends are more strongly dorsally deflected (Figs. 1,3). Two features are seen in A. thumensis which have been shown for the few Amphora taxa previously studied with SEM (Ref. 2). These are a longitudinal costa separating the striae on the valve face from those on the dorsal mantle (Figs. 1,4) and an internal projection between the proximal raphe ends (Fig. 2). The crucial systematic characteristic of multiple bands between the valves, and the finely ornamented structure of these bands, is also evident (Figs. 3,4).

REFERENCES

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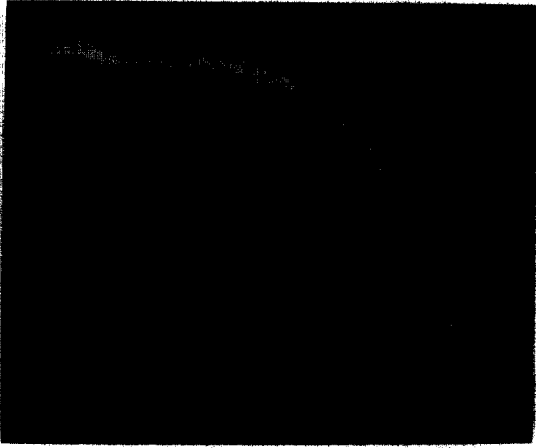


Fig. 1 External valve view. Note longitudinal costa (arrow) and dorsally deflected terminal raphe ends.

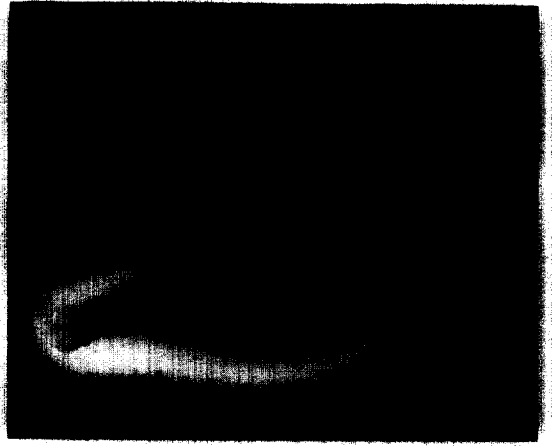


Fig. 2 Internal valve view. Note projection between proximal raphe ends (arrow) and differing heights of valve mantles.

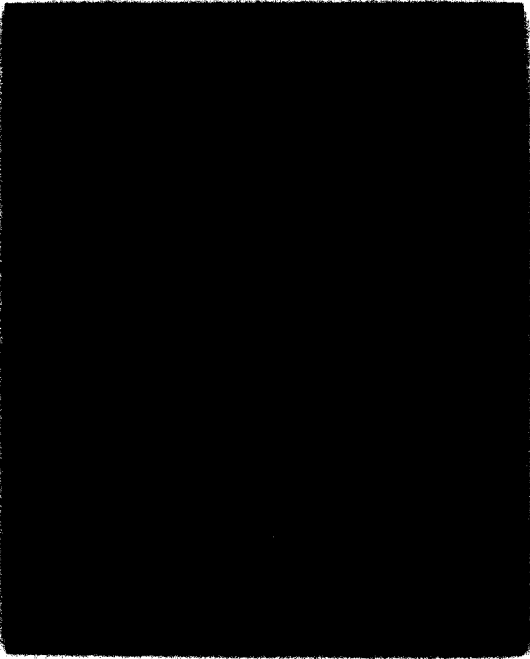


Fig. 3 Ventral girdle view. Note frustule shape and multiple bands.

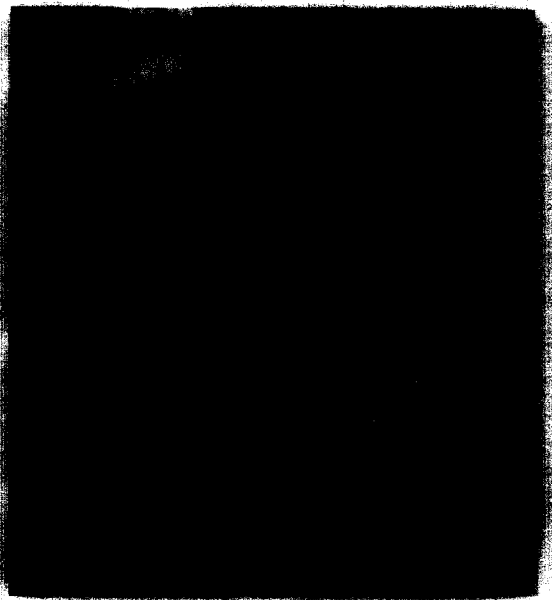


Fig. 4 Dorsal girdle view. Note multiple ornamented bands and large dorsal mantles.