

A MORPHOLOGICAL STUDY OF LANCEOLATE *NITZSCHIA* TAXA FROM A MIDWESTERN NORTH AMERICA RIVER SYSTEM

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Small to medium-sized rivers in the agricultural prairie region of Midwestern North America deposit nutrient-rich layers of silt over sand or gravel beds as discharge recedes following river basin runoff events. Increased light penetrates to more of the riverbed when nutrient-rich water clears and the water level lowers; this supports the growth of algal films dominated by diatoms while temperatures are cool. Changes in runoff composition and frequency occur as both climate and land-use respond to natural and human activities. The response of diatom communities in rivers to these new water quality conditions includes changed abundance and taxonomic composition. Lanceolate *Nitzschia* taxa often dominate the epipelon of these river systems, frequently spreading onto epiphytic and epilithic substrata as well. These epibenthic growths often become tycho plankton in flowing waters.

Advances in microscopy and information analysis among other technologies are enabling researchers to better describe taxonomic composition and develop better estimates of abundance. *Nitzschia* taxa with slender lanceolate forms have often been difficult to distinguish in the past. An example included in this study is *Nitzschia palea sensu lato*.

This study examined several samples rich in lanceolate *Nitzschia* individuals using methodology being developed in response to the regulatory need for better description of diatom community structure response to water quality. High-resolution light microscopy yielded digital images that were studied using computer technology to produce collages illustrating size and shape variations. These were sorted into identified and unidentified taxa. The samples were collected from the Cedar River watershed in north central Iowa USA as part of a long term study extending over the past 45 years. The results are compared with the growing body of literature describing diatoms in rivers elsewhere.