

Diatom 25: 8-14 (和文)

大塚泰介 : DAIPo (付着珪藻群集に基づく有機汚濁指数) が指標するものは明らかになったか

Taisuke Ohtsuka: What does DAIPo (Diatom Assemblage Index to organic water pollution) indicate ?

Abstract

DAIPo (Diatom Assemblage Index to organic water pollution) indicates the approximate position on the coenocline of Japanese freshwater periphytic diatoms, because it is based on an ordination technique for extensive data of such diatom assemblages. As it is established without employing environmental parameters, the environmental conditions which it indicates are unclear and disputable despite being regarded as an index of saprobity. It is very difficult to estimate saprobity in situ because it relates to the strength of organic matter decomposition. It cannot be fully represented, moreover, by a single environmental parameter such as BOD or dissolved oxygen. Since saprobity is related to multiple environmental factors, multiple regression analysis or related statistical methods are theoretically effective to elucidate what DAIPo indicates, if it indeed indicates saprobity. Such analyses hitherto showed that DAIPo could not be reduced to any single environmental parameter which is usually measured. It was also suggested that phosphorus concentration and oxygenic condition affected DAIPo. Although these analyses usually displayed strong effect of electric conductivity on DAIPo, it is probably false effect due to the measurement error of the other environmental parameters. Usually DAIPo is lower in summer than in winter. It suggests the nature of the saprobic index, because higher temperature causes faster organic matter decomposition and low capacity of dissolved oxygen, and as a result, it becomes more hypoxic under dark conditions. Confirming what DAIPo indicates, therefore, needs further studies concerning environmental parameters which are apparently related to saprobity but have been ignored, such as daily minimum dissolved oxygen. Because *Achnanthes japonica* and *Nitzschia palea* were fixed as endpoints for the ordination to classify diatom species into three groups, DAIPo is also possibly affected by their ecological characters rather than just the reaction to organic pollution.

Key index words: DAIPo (Diatom Assemblage Index to organic water pollution), environmental parameters, multiple regression analysis, oxygenic condition, saprobity