Diatom-based ecoregions of Korean coastal water and its diagnostic indicator

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Abstract

Diatoms are a globally successful and eukaryotic photosynthetic group with an ornamented silica external wall. The relationship between their thecal diversity and habitat means that diatoms can be used as bioindicators to characterize the aquatic environment. To estimate the differential distribution and diversity of diatom assemblages along the coastal line, we collected phytoplankton samples from 114 coastal sites of South Korean waters. We applied the unweighted pair-group technique using the arithmetic averages clustering method to cluster the sampling sites—apart from those where the biota consisted of other groups, such as dinoflagellates—into four ecoregions: Yellow Sea (YS), Southern Sea (SS), Southern East Sea (SES), and Northern East Sea (NES). Indicator species analysis in each ecoregion led to the selection of tychoplanktonic, chain-forming, stalk-forming, and psychrophilic indicator diatoms, each of which represented a planktonic lifestyle associated with one of the four ecoregions. This study shows the diatom community to serve as bioindicators of Korean coastal water ecoregions, and the subsequent seasonal survey will provide a starting point for the improved understanding of Korean diatom-based ecoregions, in both time and space.