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Proteolytic enzymes in coastal surface seawater: Significant activity of endopeptidases and exopeptidases

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ABSTRACT: We assayed proteolytic enzymes in coastal surface seawater using 16 types of fluorogenic substrates, including those for aminopeptidase, trypsin, elastase, and chymotrypsin. Hydrolysis rates were similar or higher for substrates of trypsin and chymotrypsin than for those of aminopeptidase. Substrates for elastase were hardly hydrolyzed. The results strongly suggest trypsin-type and chymotrypsin-type endopeptidases and aminopeptidases were present in the seawater. In most previous studies of proteolytic enzymes in aquatic environments, leucine-aminopeptidase activity measured using a fluorogenic substrate has been used as a model of proteolytic activity. From the results of this study using various peptide analog fluorogenic substrates, the significance of endopeptidases, which could play a key role in downsizing of dissolved proteins and polypeptides to oligopeptides prior to microbial respiration, was confirmed

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