

Identification and characterization of potentially algal-lytic marine bacteria strongly associated with the toxic dinoflagellate *Alexandrium catenella*

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The toxic dinoflagellate *Alexandrium catenella* isolated from fjords in Southern Chile produces several analogues of saxitoxin and has been associated with outbreaks of paralytic shellfish poisoning. Three bacterial strains, which remained in close association with this dinoflagellate in culture, were isolated by inoculating the dinoflagellate onto marine agar. The phenotypically different cultivable bacterial colonies were purified. Their genetic identification was done by polymerase chain reaction amplification of the 16S rRNA genes. Partial sequence analysis suggested that the most probable affiliations were to two bacterial phyla: Proteobacteria and the Cytophaga group. The molecular identification was complemented by morphological data and biochemical profiling. The three bacterial species, when grown separately from phytoplankton cells in high-nutrient media, released algal-lytic compounds together with aminopeptidase, lipase, glucosaminidase, and alkaline phosphatase. When the sa