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**PMB05**  Effects of Temperature and Solvents on the Stability of Algicidal Agent Prodigiosin
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To develop prodigiosin as a biological control agent against Chattonella antiqua, a harmful alga that can cause red tides, selection of an organic solvent for prodigiosin extraction from culture broth and a test to determine the stability of prodigiosin were performed. Prodigiosin was extracted using nine solvents, and extracts were analyzed by LC-MS. Acetone was selected as the best organic solvent because of its high extraction efficiency and less process time. Stability tests for prodigiosin were performed at various temperatures, and algicidal activity against C. antiqua was also tested. Ultimately, more than 98% stability was sustained after 30 days at 4°C, and less than 30% stability was maintained after 30 days at 37°C. More than 5–14% of the algicidal activity of prodigiosin extracted with acetone was sustained at each temperature, when compared with the prodigiosin extracted with ethanol. Although prodigiosin was kept for 30 days in an optimum organic solvent, the stability of prodigiosin was safely maintained and algicidal activity was sustained at low temperatures such as 4°C. Considering these results, we know that acetone was a very useful extraction agent for the extraction of prodigiosin as a biological control agent.

**Keywords:** Prodigiosin, Algicidal activity, Red tide

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**PMB06**  Exo-type alginase lyase from a newly isolated marine bacterium Sphingomonas sp. MJ-3
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A marine bacterium possessing alginase-degrading activity was isolated from brown seaweed soup liquefied by salted and fermented anchovy, previously. The bacterium was designated to Sphingomonas sp. Strain MJ-3 based on 16S-23S ITS region sequences, biochemical characteristics and cellular fatty acid composition analysis. A novel alginase lyase gene was overexpressed in E. coli BL21 (DE3). The MJ-3 alginase lyase protein shared below 27.0% sequence identity with exolytic alginase lyase, A1-IV of Sphingomonas sp. A1. The time-dependent degradation of alginase by MJ-3 alginase lyase was analyzed by high-field 1H nuclear magnetic resonance (NMR) spectroscopy, using an ECX-NMR 400Hz JEOL spectrometer (JEOL, USA). Based on the results of FPLC, TLC and NMR, the recombinant MJ-3 alginase lyase is determined to be an exolytic alginase lyase that can degrade the alginate into alginate monosaccharides. Acknowledgement: This work was supported by New & Renewable Energy R&D program (2009020090020) and Korea Institute for Advancement in Technology (KIAT) through the Workforce Development Program in Strategic Technology under the Korea Ministry of Knowledge Economy (KME).

**Keywords:** Exolytic lyase, Sphingomonas sp. MJ-3, heparinase-like protein, alginate monosaccharides

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**PMB07**  Study the Growth of Marine Diatom Navicula sp in Natural Sea Water in Laboratory Conditions.
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Diatoms are single celled algae that make silica shells (frustules) with nanoscale features imbedded within two-dimensional pore arrays. Living diatom itself metabolically insert nano-structured titanium dioxide into its surface. Navicula sp. (H1271) form Korean culture bank (KMMCC) was cultured in natural sea water supplemented with f/2 nutrient s in the photo bio reactor. In stage I, diatom cells grown up on dissolved silicon until silicon starvation was achieved. In stage II, soluble titanium and silicon were continuously fed to the silicon starved cell suspension (10^6 cells /ml) for 10 hrs. The feeding rate of titanium was designed to circumvent the precipitation of titinate in the liquid medium, and feeding rate of silicon was designed to sustain one cell division. The addition of titanium to the culture had no detrimental effect on the cell growth and preserved the frustule morphology. Intact frustule was prepared from harvest and analyzed for titanium using SEM, TEM, EDS and XRD analysis.

**Keywords:** diatom, frustule, phytoplankton, cell culture, TiO2

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**PMB08**  Enhanced Production of Heteropolysaccharide-7 by Beijerinckia indica HS-2001 from Sucrose Using Response Surface Methodology
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Heteropolysaccharide-7 (PS-7) is a possible alternative to xanthan or gellan due to its properties and potential applications. Sucrose was developed as a carbon source for production of PS-7 by Beijerinckia indica HS-2001 to overcome catabolite repression against glucose. The optimal carbon source and inoculum size for the production of PS-7 by B. indica HS-2001 were found to be sucrose and 5.0% (v/v). The optimal agitation speed and aeration rate for cell growth of B. indica HS-2001 were 495 rpm and 1.8vvm using response surface methodology (RSM), whereas those for the production of PS-7 were 440 rpm and 1.2 vvm. The optimal inner pressure for cell growth of B. indica HS-2001 in a 100 L bioreactor was 0.02 MPa, whereas that for the production of PS-7 was 0.04 MPa. The production of PS-7 by B. indica HS-2001 from 30.0 g/L sucrose with an optimized inner pressure was 10.20 g/L, which was 1.32 times higher than that without inner pressure in a 100 L bioreactor. The maximal production of PS-7 under optimal conditions was 1.55 times higher than that before optimization.

**Keywords:** Heteropolysaccharide-7, Beijerinckia indica HS-2001, Response Surface Method