

Membrane-surface liquid culture of marine blue-green algae

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Summary

For aerobes like molds, membrane-surface liquid culture, abbreviated MSLC, has been shown to give excellent results of fermentation in comparison with ordinary liquid cultures. This is because the MSLC allows organisms to grow on a porous membrane set on the surface of a liquid medium so that they can keep contact with air. In this study, the MSLC was applied to cultivate blue-green algae such as *Oscillatoria*, *Nostoc*, and *Anabaena*, aiming at enhancing their ability to fix nitrogen. It is known that the selection of the porous membrane is a point for successful cultivation by the MSLC. To study the effect of mass transfer through the membrane on the growth rate of the blue-green algae, diffusion coefficients for glucose in several membranes of different materials and pore sizes were measured. When the pore size of membrane was around 0.2 μm , the diffusion coefficient for glucose in the membrane was at least one third of that for glucose in aqueous solution. Thus the effect of mass transfer through the porous membranes was considered to be negligible. Most of the blue-green algae tested were found to be well cultivated by the MSLC irrespective of the type of membrane used. Furthermore, the MSLC was shown to give better cultivation of the blue-green algae than a static liquid culture.