

Physiological studies of acidophilic and salt tolerant green alga. Its growth characteristics and metal tolerance.

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Summary

An acidophilic and salt tolerant green alga, Chlamydomonas sp. was isolated from acidic saline lake in South Australia. An axenic and clonal culture was obtained by picking and washing single cells with a micropipet.

This strain grew best at concentrations of NaCl between 15 and 20%. There was no growth at 0% though it could grow even at saturated concentration. The intracellular content of glycerol of cells growing in 15% NaCl was constant during growth and higher than that of cells in 5% NaCl. These results suggests that the same mechanism involved in the osmotic regulation in salt tolerant Dunaliella is mediated in this strain.

In a synthetic medium containing 15% NaCl, the upper limit of growth was pH 7, lowest limit pH 1.5 and optimum at pH 3-4.

Chlamydomonas sp. demonstrated high tolerance to some heavy-metal such as zinc, mercury and cadmium. The cells were grown in the medium containing 20  $\mu\text{M}$  Cd and exposed to 100  $\mu\text{M}$  Cd for 2 days before harvesting. The crude cell-free extract contained two times higher Cd than particulate and was subjected to gel filtration chromatography. The elution profile displaced the UV-absorbing peak containing Cd as well as sulfhydryl groups. These results indicates the occurrence of Cd-binding peptide (phytocheratin) in the Cd-treated cells.