

**Effect of NaCl Concentration on Activities of Enzymes Related to
Oxygen Metabolism in a Halo-Tolerant Lactic Acid Bacterium**

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S u m m a r y

A salt-tolerant lactic acid bacterium, Pediococcus halophilus, plays a significant role in the brewing of soy sauce. This bacterium is a typically facultative anaerobic bacterium. Therefore, there are few studies on the oxygen metabolism in P. halophilus cells grown under aerobic conditions. In this work, effects of salt concentration of culture broth and oxygen supply on activities of enzymes related to oxygen metabolism in the cells were studied.

Under anaerobic conditions, the bacterium produced more than 1.7 mole of lactic acid from 1 mole of glucose consumed. However, the production of acetic acid was observed in an aerobic culture. The change of sugar metabolism by existence of oxygen was experimentally confirmed. Activities of superoxide dismutase (SOD) and NADH oxidase, enzymes related to oxygen metabolism, per protein of cell-free extracts prepared from the anaerobically grown cells were as high as those prepared from the aerobically grown ones. There was no or little influence of oxygen on production of SOD and NADH oxidase by the cells. However, specific activities per protein of SOD and NADH oxidase were gradually decreased with increasing salt concentration of culture broth.

The optimum pH of oxygen consumption rate by the resting cells was 7 to 8. The oxygen consumption rate by the resting cells prepared from an aerobic culture was faster than that from an anaerobic culture. Especially, the oxygen consumption rate by the resting cells prepared from the culture without salt was remarkably higher as compared with those from the culture with salt.