CHAPTER V

Summary

1. The biosynthetic pathway of glycine betaine in *A. halophytica* occurred by a two-step oxidation of choline, via an intermediate betaine aldehyde.

(choline ⟶ betaine aldehyde ⟶ glycine betaine)

2. [^{14}C] choline, [^{14}C] ethanolamine, and [^{14}C] glycine were precursors that could be converted to [^{14}C] glycine betaine. The rate of conversion of these precursors to glycine betaine was higher in salt- stressed than in control cells.

3. In salt-stressed cells, glycine betaine accumulation and biosynthesis were higher than control cells. The growth rate of *A. halophytica*, however, was decreased when the cells were grown under high osmolarity.

4. The activity of choline dehydrogenase, which was mainly localized in membrane fraction, was increased when *A. halophytica* was grown under high osmolarity.

5. The high external salinity induced the increase in the specific activity of choline dehydrogenase in *A. halophytica*.