CHAPTER V

CONCLUSIONS

1. CGTase from thermotolerant *Paenibacillus* RB01 was purified to homogeneity on SDS-PAGE with the purification fold of 47.5 and the yield obtained was 35%. Final specific activity was 7268 Units/mg.
2. The increase in specific dextrinizing activity corresponded to the increase in the CD-product as determined by CD-TCE method.
3. The molecular weight of purified CGTase in the native form was 45 kDa while the denature form was 65 kDa.
4. By isoelectric focusing, two major bands were found at pI of 5.2 and 5.3 with one minor band at 5.1.
5. This CGTase was a glycoprotein when detected with PAS staining.
6. Optimum pH and temperature for cyclization reaction were at pH 7.0 and 70 $^{\circ}$C.
7. The enzyme was stable at pH 7-9 and temperature of 45-55 $^{\circ}$C within 60 min.
8. The enzyme was specific for substrates with α-1,4 glycosidic bonds, with minimum of 3 glucose units.
9. Thermostability at 70 $^{\circ}$C was increased when 6% soluble starch was present.
10. Tryptophan was the most important residue for enzyme catalysis at the active site, while histidine and carboxylic amino acids were also involved.
11. The turnover numbers (k_{cat}) of the enzyme with natural CDs were higher than those of modified CD.
12. The enzyme catalyzed the conversion of starch to CDs with a ratio of α- : β- : γ-CD of 1.0 : 1.8 : 0.4.
13. The result from urea-induced denaturation suggests that the isoforms pattern of CGTase did not arise from differnt tertiary structure of protein.