

Suravadee Kitchakarn 2007: Isolation Screening and Characterization of Thermotolerant Glutamic Acid – Producing *Corynebacterium* Isolated in Thailand. Master of Science (Microbiology), Major Field: Microbiology, Department of Microbiology. Thesis Advisor: Assistant Professor Savitr Trakulnaleamsai, Ph.D. 209 pages.

Glutamic acid – producing *Corynebacterium* were isolated from 279 samples of soil and avian feces in Thailand by enrichment in D2 broth supplemented with nalidixic acid and  $\text{NaN}_3$ . Based on morphological, physiological, biochemical characteristics and 16S rDNA sequencing, 41 isolates were identified as *C. glutamicum* that most isolates were from soil contaminated with chicken feces (44.6%) and 6 isolates were identified as *C. ammoniagenes* and isolated from bird feces (5.1%). Comparison of morphological and biochemical characteristics of isolated *C. glutamicum* and *C. ammoniagenes* found that both species were different in colony color, cell size, acid production from sucrose and MR test. Studies on DNA fingerprint using ARDRA technique by restriction digestion with *HhaI* and *HaeIII* showed that restriction pattern obtained with *HaeIII* enabled to distinguish 2 types of species, *C. glutamicum* and *C. ammoniagenes*.

Screening of *Corynebacterium* for the thermotolerant strains which could grow above  $40^\circ\text{C}$  was carried out. Six isolates of *C. glutamicum*: C304, CS204, CS254, CS255, CS274 and DS50; 3 isolates of *C. ammoniagenes*: B97, CS215 and CS224 were selected. On the basis of growth and glutamic acid production, the optimum temperature of their growth were  $35\text{-}37^\circ\text{C}$ . *C. glutamicum* CS254, CS255 and CS274 could grow up to  $43^\circ\text{C}$ , giving specific growth rate ( $\mu$ ) 0.28, 0.27 and  $0.27\text{ h}^{-1}$ , respectively, whereas *C. glutamicum* DS50 could produce glutamic acid at  $40\text{-}42^\circ\text{C}$ . For *C. ammoniagenes*, B97 could grow up to  $42^\circ\text{C}$ , giving  $\mu\ 0.27\text{ h}^{-1}$ . However, glutamic acid in the culture medium of *C. ammoniagenes* was not detected. The results from this study could provide useful information on biochemical characterization and complete the taxonomic data in the database for identification, especially, *C. ammoniagenes*. In addition, selected thermotolerant strains could be potential strains for improving of glutamic acid production.

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Thesis Advisor's signature