

CHAPTER VII

SUGGESTIONS AND FUTURE WORKS

Here, we have described the degradation pathway of 4-chloroaniline by three newly bacterial isolates. The degradation pathway of 4-chloroaniline by these isolates were suggested although the intermediate could not be detected. However, the determination of enzymes involving in 4-chloroaniline degradation was investigated to facilitate pathway identification. The results illustrated that all of the isolates degraded 4-chloroaniline *via* a modified *ortho*-cleavage pathway. To clarify this finding, the detection of intermediate should be performed, if any. Study in molecular level will also demonstrate if the degradation pathway is controlled by plasmid-encoed gene or chromosomally-encoded gene.

The addition of nutrients used in this study enhanced the degradation of 4-chloroaniline depending on type of microorganism. Other conditions should be further studied to improve degradation effect.

The application of biological treatments of 4-chloroaniline such as natural attenuation, biostimulation and bioaugmentation can be further investigated based on laboratory scale. The information of biological treatments in natural attenuation, biostimulation and bioaugmentation can be used to enhance the potential in larger scale of bioremediation in *in situ* and *ex situ* treatment. The application of bioremediation of aniline and chloroaniline contaminated sites which have been studied so far was concluded in Table 2.4, Chapter 2.