CONCLUSIONS

Introduction of transposon (pTnMod-OGm) into DS-4 through triparental mating was not successful. This might be due to the complexity of DS-4 cell membrane and fragile conjugation pili. Diparental mating of DS-8 and E. coli S17-1 (pJFF350) resulted in transconjugants at frequency of approximately $5 \times 10^{-7}$ to $2 \times 10^{-4}$. However, Southern hybridization showed the resulting benzoate minus mutants were not caused by the Omegon-Km insertion. It seemed that pleiotrophic mutation might take place.
GENERAL CONCLUSIONS

In this study, we conclude that the ability to degrade benzoate in anoxygenic photosynthetic bacteria (APB) might be common within the group. We found that all nine isolated anoxygenic photosynthetic bacteria could grow in gentisate. The ability to grow in this monocyclic aromatic compound was firstly reported. This finding added to a previously large number of well-known aromatic compounds that can be metabolized anaerobically. Along with their diverse metabolic activities and their widespread distribution in nature make this group of bacteria an excellent candidate for potential anaerobic bioremediation of aromatic compounds. Based on their 16S rRNA genes analysis, the APB isolates (DS-1, DS-4, and Cas-13) were closely related *Rhodopseudomonas palustris*. DS-8, the aerobic monocyclic aromatic degrading strain was identified as *Serratia marcescens*. It could metabolize monocyclic aromatic compounds including benzoate, gentisate, salysilate, and phenol. This strain demonstrated excellent swarming activity. The ability of this species to grow in those monocyclic aromatic compounds was firstly reported.

The next research for utilization of aerobic and anaerobic bioremediation purposes should be emphasized on co-culture of these two different groups of degrading bacteria, since aerobic and anaerobic condition can be found concurrently in the environment. Omegon-Km could not be used to generate transposition mutagenesis in *Serratia marcescens* DS-8, since this transposable element showed site-preference.