B203 Comparision of nitrogenase activity in nodules and nitrogen content between *Alnus hirsuta* and *Elaeagnus umbellata.*

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Nitrogenase activity (acetylene reduction activity, ARA) of nodules and nitrogen content of each organ were compared between *Alnus hirsuta* and *Elaeagnus umbellata.* These are actinorhizal nodule bearing, nonlegume dinitrogen fixing trees common in temperate deciduous forests of Korea. The nitrogenase activity from perennial nodules of two species showed two peaks with summer depression with high precipitation during growing season. The nitrogenase activity of nodules was limited by soil nitrogen content in mature *A. hirsuta*, but not in mature *E. umbellata.* I was observed that the low temperature in spring and autumn greatly limited the nitrogenase activity of nodule both in *A. hirsuta* and *E. umbellata*, and especially the structural change of nodules in *A. hirsuta* occurred during winter. The nitrogen content was deserved in a decreasing in leaf, nodule, root and stem of *A. hirsuta*, and in nodule, leaf, root and stem of *E. umbellata.* The nitrogen content of root and nodules in *E. umbellata* was 2-3 times higher than that in *A. hirsuta*, suggesting that in *E. umbellata* more nitrogen compounds fixed by nitrogenase are accumulated in roots and nodules.

B301 **Degradation of 4-Chlorobenzoic Acid by *Pseudomonas* sp. Strain S-47 and Cloning of Its Degrading Gene Cluster**

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A bacterial strain of S-47 capable of degrading 4-chlorobenzoic acid (4CBA) was isolated from the wastewater of industrial complex in Ulsan, and was identified as *Pseudomonas* sp.. This *Pseudomonas* sp. S-47 strain could use various aromatic compounds, such as 4-chlorobiphenyl, biphenyl, 3-chlorobenzoate, 2,4-dichlorobenzoate, 4CBA, etc., as the sole carbon and energy sources. In particular, the strain showed strong degradation activity to 4CBA and derivatives of catechol. We proposed that *Pseudomonas* sp. S-47 converts 4CBA to 4-chlorocatechol via 1,2-dihydro-4-chlorobenzoate, and further degrades to 2-hydroxy-penta-2,4-dienoate via 5-chloro-2-hydroxymuconic semialdehyde by benzene-ring cleavage and then dechlorination. By cloning of 4CBA-degrading genes using cosmid pWE15 as a vector into *E. coli* LE392, the clone of pCS1 harboring 40 kb-fragment insert was obtained. The subclone pCS101 harboring *Bam*HI-fragment of pCS1 was constructed, and then pCS201 and pCS202 were constructed by ligating the 15 kb- and 4 kb-fragment of pCS101 with pUC18, respectivley. All of the clones showed degradation activity for 4CBA.