

P69

A Study on the Contents of Heavy Metals in Fish of Andong and Imha Reservoir

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The content of the heavy metals in the *Opsariichthys bidens*, *Hemibarbus labeo*, *Cyprinus carpio*, *Hemiculter eigenmanni* and *Culter brevicauda* in Andong and Imha reservoir were determined. The samples of the fishes were collected from slices of raw fish in shops, during 2005 to 2006. The contents of cadmium (Cd), chrome (Cr), copper (Cu), lead (Pb) and zinc (Zn) were measured by the atomic spectrophotometer (AAS) in the gill, kidney, bone, scales, and muscle part. The mean contents of heavy metals in Andong and Imha reservoir fish was 0.316 ppm, 0.209 ppm for Cd, 0.456 ppm, 0.275 ppm for Cr, 0.181 ppm, 0.118 ppm for Cu, 0.290 ppm, 0.235 ppm for Pb, 34.40 ppm, 30.159 ppm for Zn, respectively. Of the heavy metal detected in tissue, Cr, Cu, Pb and Zn were detected highly in bone, Cd in kidney. The Cd, Cr and Pb content of the Andong reservoir in the *C. brevicauda* was Cd (0.568 ppm), Cr (0.754 ppm), Pb (0.391 ppm) which was higher than other fishes. But the Cu and Zn content of the Imha reservoir in the *C. brevicauda* had Cu (0.031 ppm), Zn (18.685 ppm) to the lower level. The level of the heavy metals in the samples was negligible, which could be endogenous.

Key words: Heavy metal, fish, tissue, reservoir

P70

Regulation of the Expression of ACC Synthase and ACC Oxidase Genes by Cytokinin (N⁶-benzylaminopurine) in the Primary Roots of Maize.

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We examined the role of cytokinin, BA (N⁶-benzylaminopurine), as a regulator of ACC synthase and ACC oxidase gene expression in the primary root of maize. First, We measured the ethylene biosynthesis with 10⁻⁶ M and 10⁻⁴ M BA in root segments. To confirm the action of BA on the regulation step of ethylene biosynthesis, we measured the activity and gene expression level of ethylene biosynthesis regulating enzymes such as ACC oxidase (ACO) and ACC synthase (ACS). The ethylene production was stimulated about 165% of control by 10⁻⁴ M BA for 8 hr. BA stimulated the ethylene production in a concentration dependent manner. The data were supported by the facts that the ACS activity was increased by the treatment of BA. Furthermore, ACO activity was somewhat increased by the treatment of BA. Two ACS genes (ZmACS2 and ZmACS7) and two ACO genes (ZmACO35 and ZmACO20) were showed different expression according to the time. The transcription levels of ZmACS2 and ZmACO35 were increased at early time such as the first 3 hr. However, it did not differ significantly increased after 3 hr. On the other hand, ZmACS7 and ZmACO20 did not affect the gene expression level at early time. According to these data, we suggested that cytokinin might act at early time on both the conversion step of AdoMet to ACC and ACC to ethylene to increase the ethylene production. In conclusion, cytokinin might stimulate ethylene production via regulation of ACS and ACO gene expression in maize root segments.

Key words: ACC synthase, ACC oxidase, Cytokinin