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Molecular characterization of a phosphate starvation-induced novel acid phosphatase from the rice, *Oryza sativa*

Yeon Jae Hur, Han Gil Lee, Eun Ji Jeon, Yun Young Lee, Jong Hun Choi,
Min Hee Nam¹, Gihwan Yi¹, Moo Young Eun² and Doh Hoon Kim

College of Natural Resources and Life Science, Dong-A University, Busan 604-714, Korea

¹Yeongnam Agricultural Research Institute, NICS, Milyang 627-803, Korea

²National Institute of Agricultural Biotechnology, Suwon 441-707, Korea

A phosphate starvation-induced acid phosphatase cDNA was cloned from the rice, *Oryza sativa*. The cDNA encoding *O. sativa* acid phosphatase (*OsACPI*) is 1100 bp long with an open reading frame of 274 amino acid residues. The deduced amino acid sequence of *OsACPI* cDNA showed 53 % identity to tomato acid phosphatase, and 46-50 % to some plant phosphatases. The enhanced expression of *OsACPI* is a specific response to Pi starvation, and it is not affected by starvation of other nutrients. The gene expression was shown to be responsive to the level of P-supply, with transcripts of *OsACPI* being most abundant in P-deprived shoot and root, respectively. The *OsACPI* cDNA was expressed as a 30-kDa polypeptide in baculovirus-infected insect Sf9 cells. In addition, the *OsACPI* gene was introduced into *Arabidopsis* via *Agrobacterium*-mediated transformation. The functional expression of *OsACPI* gene in the transgenic *Arabidopsis* lines was confirmed by Northern blot and Western blot analyses and phosphatase activity assay. These results suggest that the *OsACPI* gene can be used to develop new transgenic dicotyledonous plants able to adapt to Pi-deficient condition.

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Antioxidant and Antitumor activity of Edible Mushroom Mycelium

Kim, Man Chul and Heo Moon Soo*

Faculty of Applied Marine Science, Cheju National University

For the research of the natural physical active materials, this study was carried out to investigate the antioxidative and antitumor effects of mushroom mycelium cultural extract (MMCE) materials. Mushroom mycelium was grown in a defined culture medium and the culture extracts were examined for antioxidant and antitumor activity. Myceliums of *Phellinus linteus*, *Cordyceps militaris*, *Coriolus versicolor*, *Sparassia crispa*, *Agaricus blazei*, *Inonotus obliquus*, *Lentinus edodes*, *Hericium erinacium*, *Gonoderma lucidum* in synthesis medium were incubated in a shaking incubator for 7~15 days. The MMCE showed higher superoxide radical scavenging activity over the commercial antioxidants, such as BHA and BHT. All of the extracts showed dose dependent superoxide radical scavenging activity. The hydroxyl radical scavenging activities of some extractions were higher than all the commercial antioxidants (not shown data). However, the scavenging ability of BHA was 42% at 0.5 mg/ml. At 2 mg/ml, the MMCE from synthesis media scavenged hydroxyl radicals by 38~76%. Antitumor activity of the MMCE was determined by using MTT [3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl-2H-tetrazoliumbromide] colorimetric method.