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Characteristics of Antifreeze Proteins(AFPs) Induced in *Protaetia brevitarsis* during Low Temperature Acclimation

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Induction of two antifreeze proteins(AFPs) was conducted during low temperature acclimation at 0°C for 10 days in the overwintering larva of *Protaetia brevitarsis*, and some physicochemical characteristics of these proteins were investigated.

Low temperature acclimation caused not only inducement of AFPs but also increase of antifreeze activity in haemolymph. As the results from electrophoretic analysis of AFPs purified through ion exchange chromatography, gel filtration and electrophoretic elution, these proteins were confirmed to be glycoprotein(pI 5.8) with M.W. 320 kDa(AFP-1) and M.W. 240 kDa(AFP-2), respectively. These proteins were tetramer(AFP-1) and trimer(AFP-2) composed of a single subunit(80 kDa). The high contents of lysine and histidine are common to their amino acid composition, and relatively high contents of hydrophilic amino acids(Asp, Glu, Lys, Asn, Gln, Arg, Ser, Thr) were characterized in these proteins, showing similarity with antifreeze proteins from other insects. Electrophoretic analysis, immunodiffusion and Western blotting of proteins from intestine, Malpighian tubule and fat body indicated that these proteins are presented in these organs, too.

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Purification and Quantification of α_1 Antitrypsin in Rat Serum : Profile in Rat After Low and High Dose Co^{60} γ -irradiation

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Rat plasma was fractionated on Zn, Cu-imminodiacetic acid sepharose column. Affinity chromatography on IDA sepharose had proved to be efficient method for crude fractionation of rat plasma. Pure α_1 -antitrypsin was isolated by subsequent affinity chromatography on blue sepharose column and ion exchange chromatography, DEAE sepharose column. Using anti- α_1 -antitrypsin antibody, competitive enzyme linked immunosorbent assay(ELISA) has been developed to measure α_1 -antitrypsin. We investigated the change in concentration of α_1 -antitrypsin in rat at various times after whole body Co^{60} γ -irradiation(0.01, 0.05, 0.1, 1.0, 2.0, 3.0 Gy). The concentration of normal rat α_1 -antitrypsin was measured to be 2.3 g/L. In the 0.1 Gy irradiated rat, serum α_1 -antitrypsin was 100-200% higher as compared to controls, 96 hours after irradiation. In the 1.0, 2.0, 3.0 Gy irradiated rat, serum α_1 -antitrypsin increased by 400%. The concentration of α_1 -antitrypsin remained significantly different from control values 240 hours after exposure. No changes were observed in the group exposed to 0.01, 0.05 Gy.