E216 Purification and Characterization of Extracellular Invertase from the Hypocotyls of Mung Bean (*Phaseolus radiatus* L.)

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The biochemical characteristics of an extracellular invertase (β-D-fructofuranoside fructohydrolase, EC 3.2.1.26) purified from the hypocotyls of mung bean (Phaseolus radiatus L.) were investigated. The enzyme was purified to apparent homogeneity by ammonium sulfate fractionation and sequential chromatography over diethylaminoethyl (DEAE)-cellulose anion exchange, concanavalin (Con) A-sepharose affinity and sephadex G-200. The overall purification was about 77-fold with a recovery of about 11%. The finally purified enzyme exhibited a specific activity of about 113 μmol of glucose produced mg^{-1} protein min^{-1} at pH 5.0. The enzyme appeared to be a glycoprotein containing N-linked high mannose oligosaccharide chains on the basis of its ability to interact specifically with the immobilized Con A. The enzyme had a K_m for sucrose of 3.4 mM at pH 5.0 and its pH optimum of 4.0. The enzyme showed highest enzyme activity with sucrose as substrate, but the activity was slightly measured with cellobiose. No activity was measured with raffinose, maltose and lactose. These results indicate the extracellular invertase is a β-fructofuranosidase.

E217 Role of Plant Hormones in the Senescing Detached Leaves of *Phaseolus vulgaris*

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The changes of chlorophyll-protein complexes that are associated with leaves senescence in *Phaseolus vulgaris* were investigated. Chlorophyll content was gradually decreased after 2 day of leaves senescence, on the contrary, Chl a/b ratio was slightly increased along with senescence period. The loss of chlorophyll that is characteristic of leaves senescence accompanied by degradation of chlorophyll-protein complexes. PSI holocomplex containing LHCI apoproteins was rapidly decreased after 2 day of senescence period. On the other hand, reaction center (RC)-core complex was steadily increased in the early stages of senescence, and then degradation of RC-core complex was appeared to occur after 6 day of leaves senescence. As disassembly of trimeric LHCII progressed, there was a steady increase in the amount of small complexes including monomeric LHCII apoproteins. Exogenous application of BA seems to be involved in the regulation of leaves senescence. This conclusion was based on the observations that BA application delayed loss of chlorophyll content and disassembly of chlorophyll-protein complexes, compared to control. But exogenous application of GA_3 promoted loss of chlorophyll content and disassembly of chlorophyll-protein complexes.