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외생 Ethylene에 의한 ACC Oxidase 활성증가에 미치는 Ca^{2+} 과 Protein Kinase, Phosphatase 억제제의 영향

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암소에서 6일간 키운 완두(*Pisum sativum* L.) seedling의 첫번째 절간 절편에 10ppm의 ethylene을 24시간 동안 처리한 결과, ACC oxidase의 활성이 대조구에 비해 약 4배 증가하였으며, ethylene 작용 억제제인 norbornadiene에 의해 그 효과가 억제되었다. 이러한 ethylene의 작용이 calcium에 의해 매개되는지를 알아보기 위해 calcium chelating agent인 EGTA와 calcium channel blocker인 lanthanum를 각각 ethylene과 함께 처리한 결과, 2.5mM의 EGTA와 1mM의 lanthanum은 ethylene에 의해 증가되는 ACC oxidase의 활성을 각각 40%와 70% 억제하였다. 또 ethylene의 작용에 단백질 인산화 상태의 변화가 관여하는가를 알아보기로 protein kinase 억제제인 1-(5-isoquinolinesulfonyl)-2-methylpiperazine(H-7)과 staurosporine, phosphatase 억제제인 sodium vanadate와 okadaic acid를 각각 ethylene과 함께 처리하였는데, staurosporine은 ethylene에 의해 증가되는 ACC oxidase의 활성에 영향을 주지 않았고 H-7은 500 μ M에서 70%의 억제효과를 나타내었으며, 0.1mM의 sodium vanadate와 50nM의 okadaic acid는 60% 정도 억제하였다.

E209

Effect of Phenolic Compounds on Enzymes Related to Glycine Max Putrescine Metabolism

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Enzymatic activities related to putrescine metabolism were observed under various conditions. ADC(arginine decarboxylase, EC 4.1.19) activity was followed by that of ODC(ornithine decarboxylase, EC 4.1.1.17) in the early stage of cell division. Among phenolic compounds, ferulic acid was observed to inhibit ADC and ODC whereas it elevated SAMDC(S-adenosylmethionine decarboxylase, EC 4.1.1.50) *in vitro*. Such results were also found *in vivo*, suggesting that the decreased amount of putrescine was due to the enzymatic activities. However, ferulic acid tended to elevate SAMDC activity but inhibit ADC and ODC, respectively. Such results seem to be closely related to decrease in putrescine. In case of anoxia, activities of ADC and DAO reduced but ODC increased and putrescine also elevated. In addition, phenolic compounds were also observed to retard seed germination and growth even at low concentration ranging from 10^{-4} M to 10^{-5} M. Tentative as results are, such retardation inhibition seems to be decrease in putrescine amount.