

Aureobasidium pullulans, and *Escherichia coli*. The ECO showed strong germicidal effects against all strains except *S. aureus* at 1000ppm level, but the IVO showed just fungistatic and bacteriostatic effect. The extracts of each medicine also showed insecticidal effects against *Sitophilus oryzae* L., *Lyctus linearis* GOZE, and *Reticulitermes spertus kyushuensis* Morimoto. Contact and fumigant toxicities to adult insects were determined. The main constitute of volatile components, anethole among 20 components from IVO and eugenol among 9 components from ECO were identified.

E223 Characterization of Transgenic Potato (*Solanum tuberosum* L.) tubers with Sink Metabolism-related gene

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The aims of these studies were to use tubers from transgenic lines of potato (*Solanum tuberosum* cv. desiree and cv. superior) containing increased amounts of AGPase and decreased acid invertase to understand the role of this enzyme in the control of starch synthesis. To develop the tuber-specific and amyloplast-specific expression vector, we constructed vectors of PBI/PAT/TP under the controls of patatin promoter and transit peptide-coding region. Potato stem segments were transformed by *Agrobacterium* strain C58C1 containing sense rice AGP(PBI/RAGP) and antisense potato acid invertase (PBI/INV) vectors. We obtained 7 transformed lines with PBI/INV and 3 transformed lines with PBI/RAGP through NPT^{II} sequences analysis by PCR.

E224 Effect of Brassinazole on the Ethylene Production and Gravicurvature in Primary Roots of Maize

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Brassinosteroids (BR) is widely distributed in plants, and they are possibly biosynthesized in all parts of plant organs. It has been known that some triazole derivatives are good inhibitors for BR biosynthesis. Brassinazole (Brz) has been known a potent inhibitor in the BR biosynthesis, because it has a tertiary hydroxy group on the carbon adjacent to the carbon where a triazole ring attached. The treatment of Brz stimulated the IAA-induced ethylene production and the activity of ACC oxidase in the range from 1 nM to 0.1 μ M in primary roots of maize. Gravitostimulated curvature was stimulated in roots pretreated with 0.1 μ M Brz for 1 hr compared to that of control during 8 hr. We will discuss the action of the Brz in the physiological role connected with the BR biosynthesis pathway.

E225 Action of Brassinosteroid on the Ethylene Production in Primary Roots of Maize

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Brassinosteroids (BR) are a family of over 40 naturally occurring plant steroid hormones found in a wide variety of plant species. Brassinolide (BL) is the active component of BR and has a diverse variety of physiological responses including cell elongation, reduced root elongation, leaf bending and epinasty. Based on the facts that BR stimulated the IAA-induced ethylene production in maize roots in the range from 1 nM to 0.1 μ M, we examined the effect of BR on both ACC oxidase (ACO) and ACC synthase (ACS) activity.

BR stimulated the activities of ACO and ACS as it increased the ethylene production in primary roots of maize. Furthermore, ACC contents in the root segment were increased by the treatment of BR. These data conformed that BR might act on the conversion step of ACC to ethylene.

E226 Characterization of the Flavonoids in the Callus Derived from the Excarp of Grape

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Grape (*Vitis labruscana* cv. Kyoho) fruits harvested in August were cultured in B5 medium with 0.1 mg/L 2,4-D and 0.2 mg/L BAP to induce calli from the skins. By subculturing the calli, we could isolate anthocyanins-producing callus. For identification of the flavonoids in this callus, we performed 2-D TLC, HPLC and UV spectral analyses. One flavonoid compound, isolated from exocarp-derived callus, was characterized as a glycosylated derivative of the flavonol quercetin.

E227 Effect of Malformins on the Conversion of ACC to Ethylene in Mung Bean Hypocotyl Segments

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Malformin A1 (*cyclo*-D-Cys-D-Cys-L-Val-D-Leu-L-Ile), a fungal cyclic pentapeptide toxin from *Aspergillus niger*, was purified from the malformin complexes and used to reveal its physiological roles in plants. Using

hypocotyl segments of 2.5 day-old mung bean seedlings, we examined how affects the biosynthesis of ethylene, particularly in the final catalytic step from ACC (1-aminocyclopropane-1-carboxylic acid) to ethylene. Malformin A1 stimulated the ACC-induced ethylene production at 10^{-7} M, whereas suppressed it at 10^{-6} M and 10^{-5} M. After the malformin A1 treatment, both *in vivo* ACC-oxidase (ACO) activity and ACO1 transcript level were altered accordingly with the change of the ACC-induced ethylene production. Recently, we have purified malformin A2 (*cyclo*-D-Cys-D-Cys-L-Val-D-Leu-L-Val) and compared its biological activity with that of malformin A1.

E228 Catalytic and Immunological Comparison of Two Isoperoxidases from Scented-Geranium Callus.

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A strong cationic isoperoxidase, designated C3, and a weak anionic isoperoxidase, designated A1, from scented-geranium callus were purified by ion exchange chromatography and gel filtration to apparent homogeneity. C3 and A1 isoperoxidase were glycoproteins having molecular weights of approximately 58 kDa and 42.5 kDa as determined by SDS-PAGE, respectively. The native molecular weights of C3 and A1 isoperoxidase estimated by Sephadex G-150 gel filtration were 58 kDa and 44 kDa, respectively. Moreover, the pI values of C3 and A1 were 9.1 and 4.0, respectively. Catalytic comparisons of these two isoperoxidases in terms of Km values against various substrates were performed. Immunological studies involving Ouchterlony double diffusion experiments will also be presented in this investigation.