

## Ecophysiological Studies on Growth and Enlargement of Tubers in Yams(*Dioscorea* spp)

### Ⅲ . Detection of activity of the endogenous substances in microtuber test

※ Kwang Jin Chang, Mitsuru Hayashi (Kagoshima Univ. Japan)

The shortening of the day length the main factor causing the growth and enlargement of tubers in yams (*Dioscorea alata* L.). This implied the possibility that the growth and enlargement of tubers might be regulated by the qualitative and quantitative change in endogenous growth substances resulted from the variation in the environmental factors.

Using a bioassay for tuber enlargement activity, which was carried out with culture of microtuber of nodal stem segments *in vitro*, the endogenous substances was detected from leaves of yam (*D. alata* L.) treated under the short and the long day length condition.

Tuber enlargement activity was found in both the aqueous and ethyl acetate phase of extract obtained from leaves in yams. Those activities increased under the short day length, whereas not increased under the long day length.

Guided by bioassay, the active substances in the ethyl acetate phase were purified by charcoal adsorption chromatography. The result obtained indicated that the 40% ethanol fraction contained the most prominent tuber enlargement activity.

In seasonal changes of the leaves, tuber enlargement activity remained almost constant during summer (June-Augst), but after, the middle of September, the activity increased gradually and then reached a maximum in early October.

Jasmonic acid (JA) was isolated with the guidance of microtuber test and identified by gas chromatography. The level of endogenous JA in the leaves of plants was more than  $290\mu$  g/kg at the 10 day length.

These results seem evidences for the occurrence of tuber enlargement activity which is formed in leaves under the short days and transmitted to under ground part to induce growth and enlargement of tuber.