

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

II . Detection of activity of Plant growth regulators on growth and enlargement of microtubers of yams

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The objective of this study was to detect actions of seven kinds of plant growth regulators on growth and enlargement of microtubers in yams(*D. alata* L.). The method used in this investigation was the *in vitro* culture system for yam which we developed a new bioassay method, using *in vitro* microtuber of yam. It involves the production of microtubers from nodal stem segments.

Among growth regulators compared, 3-indoleacetic acid(IAA), kinetin, zeatin riboside (ZR), Brassinosteroids (BRs) and methyl jasmonate (JA-Mc) stimulated growth and enlargement of microtubers. Gibberellic acid (GAs) and abscisic acid (ABA), on the other hand, inhibited growth and enlargement of them.

Closer examination revealed differences in the modes of their actions. Growth increased with increasing concentration of ZR (0.1 μ M-100 μ M), but it did not respond to an increase in IAA from 1 μ M to 100 μ M. Both BRs and JA-Mc presented a positive effect on growth in lower concentration, They were, however, ineffective in higher concentration.

Both IAA and BRs stimulated root development whereas cytokinins promoted shoot growth, giving rise to shoot growth with long internodes. JA-ME did not significantly induce root and shoot growth.

Our result indicates that microtubers of yam can be used *in vitro* bioassays of plant growth regulators. In other words, the new method we applied in this study, "microtuber test", is considered to be practical enough to detect activities of the endogenous growth substances, through the experiment can be performed *in vitro*.