Thesis Title Quantitative Changes in Gibberellin-like Substances in Stem Apex of Lychee cv. Hong-Huay prior to Flowering

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Abstract

The studies on quantitative changes in gibberellin-like substances in stem apex of lychee cv. Hong-Huay prior to flowering was carried out during January 1995 to March 1996, starting with the study on response of lettuce cultivars to gibberellin-like substances by means of lettuce hypocotyl bioassay (LHB). Factorial 4X4 in completely randomized design of 10 replications was used. Factor A was 4 cultivars of lettuce i.e. Dresser, Alpen, Duxie S-5 and Grand Rapid and factor B was 4 levels of GA_3 (Kyowa) concentrations i.e. $1x10^{-3}$, $1x10^{-2}$, $1x10^{-1}$ and 1 ppm. It was found that the length of lettuce hypocotyls increased with the GA_3 (Kyowa) concentrations, and Dresser was the most responded. Interaction was found between cultivars and GA_3 (Kyowa) concentrations. Each cultivar responded to GA_3 (Kyowa) concentrations differently.

Standard curves of gibberellin-like substance quantification by the method of LHB were performed in the completely randomized design The treatments were 5 levels of GA_3 (Kyowa) concentration i.e. $1x10^{-4}$, $1x10^{-3}$, $1x10^{-2}$, $1x10^{-1}$ and 1 ppm. There were 10 replications and each experimental unit contained 10 seedlings. It was found that the minimum detectable of GA_3 (Kyowa) was $1x10^{-3}$ ppm.

The linear regression responses of Dresser lettuce were found between $1x10^{-3}$-1 ppm of the GA_3 (Kyowa) concentration. The equation of the standard curve was $y = -0.79235 + 0.00344x$ ($r = 0.9070$, $P < 0.0000$, $n = 40$) where y referred to GA_3 (Kyowa) concentrations (ppm) and x referred to incremental percentages of the hypocotyl length. The ranges of x wrer 230.62-521.03 percent

The effects of sampling dates for standard curve quantification (72 days interval) were investigated but no difference was found.

An analysis of lychee shoot apex for determination of gibberellin-like substance activities in different R_f zones of the chromatogram was conducted in completely randomized design. Since 11 R_f zones were the treatments and 7 replications were performed with ten seedlings. It was found that the gibberellin activities were found in R_f 0.2-0.5 with the amount of gibberellin-like substances being 0.289, 0.263, 0.321 and 0.215 μg GA_3 (Kyowa) equivalent /g f. wt.

Quantitative changes in gibberellin-like substances prior to flowering in stem apex of 4-5 years old lychee tree cv. Hong-Huay were studied from November 1995 to March 1996. The samples were taken from the orchard of Chiang Mai Land Development Station, Mae Rim district, Chiang Mai, Thailand. Six replications of randomized completely block design was employed. The treatment was the number of week as 0, 1, 2, 3 and 4 prior to flowering (panicle emergence). It was found that activities of gibberellin-like substances in the 4th week prior to flowering was high while the decrease was found in the 3rd week and remained constant until the 2nd week, then decreased to minimum in the 1st week through the time of flowering.