THESIS TITLE: EFFECT OF COLCHICINE ON SEED AND SHOOT DIFFERENTIATION OF *Citrus reticurata* Blanco *IN VITRO*

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ABSTRACT

The experiments were carried out at the Department of Horticulture, Faculty of Agriculture, Khon Kaen University during August 1997 to May 1998 to investigate the effect of *in vitro* colchicine chemical upon the changes in growth, biochemical, anatomical and morphological characteristics of *Citrus reticurata* Blanco. The experiment consisted of two parts i.e. Part I was designed to investigate the effect of *in vitro* colchicine on shoot of *C. reticurata* Blanco from seedlings. This experiment was laid in a factorial experiment in Completely Randomized Design with 10 replications. That is 3 concentration levels of colchicine and 4-duration of time were used. They were: 0.1, 0.3, and 0.5 % and 1, 2, 4 and 8 hours, respectively. Part II was designed to investigate the effect of colchicine on seeds of *C. reticurata* Blanco. The concentration levels being used were 0.1, 0.3, and 0.5 % and the duration of time being used were 6, 12, and 24 hours.

The results showed that with shoot development at 11 weeks of age. shoots of the seedlings of *C. reticurata* Blanco received colchicine produced smaller amount of growth on shoot initiation. number of leaves. height and root development than those with the application of no colchicine. There was a clear trend on shoot development i.e. those received colchicine produced more long roots than those without. Morphological characters of leaves of those treated with colchicine were the decrease in stomata thickness. the enlargement of stomata aperture while cortex was expanded with little change on vascular bundles of stem. There were some amounts of substrates in roots at the same time the amount of chlorophyll tends to decrease. Furthermore. seedlings those cultured from leaves produced thicker leaf layers with larger expended leaves and stems became stout. Chromosome number was increased with the number of $2n = 4x = 36$.

The results on the effect of colchicine at 14 weeks of age of *C. riticurata* Blanco seedlings grown from seeds revealed that seedlings treated with colchicine produced abnormal seedlings. The majority of seedlings were unable to produce epicotyl while that of the hypocotyl became swollen and some portion was unable to develop roots. In addition. there were some seedlings that produced large rounded and expanded leaves with dark green appearance. Colchicine has some small effects on leaf area index. specific leaf area. number of leaves. leaf area and root length whilst the higher concentration and longer treated duration tend to decrease such characters including height of the seedlings. The density of stomata of seedlings treated at 24 hours in all levels of concentration produced the least i.e. lesser than those treated for 6 and 12 hours. Number of chromosomes of those abnormal seedlings increased enormously but the size was relatively small with uncountable number.