DEVELOPMENT OF THE ANTHER CULTURE TECHNOLOGY FOR CAPSICUM (*Capsicum annuum* L.) USING BREEDING LINE 1782 AND VARIETY LANKA YELLOW WAX

BY

R.H.M.S.V.RAJAKARUNA

FACULTY OF AGRICULTURE

EASTERN UNIVERSITY

SRI LANKA

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ABSTRACT

The plant breeding programs can be accelerated through double haploid plant production of capsicum. One of the easier ways to produce double haploid plants is anther culture. This experiment was carried out to induce anther callus of *Capsicum annuum* L. breeding line (1782) and for the comparison of its behavior in callus induction procedure, a recommended variety of *Capsicum annuum* L., Lanka Yellow Wax (LYW) was selected. It is a locally available *Capsicum* variety. Four callus induction media were used as treatments for Complete Randomized Factorial Design. Anthers were selected based on microscopic observation. Anthers of *Capsicum annuum* L. in late uninucleate stage and early binucleate stage could induce callus formation. The four callus induction media included MS basal medium and different concentrations of hormones 2,4-D (1 mg /L) with BA (2 mg/L), 2,4-D (2 mg/L) with BA (2 mg/L), BA (2.5 mg/L) with 2,4-D (2 mg/L) and BA (3 mg/L) with 2,4-D (2 mg/L). The cultured anthers were incubated in dark for 14 days at 25 ^{0}C for anther callus induction. Data were collected in number of anthers planted and number of calli produced by anthers. Contamination of callus was high in medium 4 (30%) and low (20%) in other media. After the callus induction, selected calli were transferred into a regeneration medium, which included MS basal medium with 1 mg/L IAA and 5 mg/L BAP. Regenerating cultures were incubated 16 hrs. in light and 8 hrs. dark conditions at 25 ^{0}C and observations were taken for calli growth, appearance and greening of calli. Medium 1, medium 3 had significant effect on anther callus induction especially than medium 2 and medium 4. The swollen percentage of anthers, induced callus percentage were high and the time taken to callus induction was minimum and also the size observed in produced callus were high in medium 3 than other callus induction media. However,

medium 1 and 3 performed in same manner for callus induction for both 1782 and LYW varieties but highest performance showed by medium 3. In 1782 breeding line and LYW variety comparison, it was found that LYW variety was better than 1782 breeding line and had a significant ($P<0.05$) effect on anther callus induction. The callus induction percentage of 1782 was 59.629% and it was lower than LYW (83.875%). There was no significant interaction effect between treatment factor and variety factor according to GLM procedure with CRD Factorial Design. Regeneration medium (5 mg/L BAP with 1mg/L IAA) in which calli were grown needs to be improved with different concentrations of those hormones. Best performance at selected regeneration medium was showed by the callus which grown in medium 3 and 1782 breeding line performed well than LYW variety at regeneration procedure. In the regeneration medium, calli behaved in different ways. White crystalline calli responded well to the regeneration medium and calli enlargement and, greening at later stage was observed. Light brown coloured calli did not show enlargement and, greening like in crystal calli. Presterilization of flower buds prior to the general surface sterilization procedure is a successful approach in preventing microbial contamination of culture plate, instead of spraying alcohol, dipping in alcohol for few minutes is preferable to avoid burning of flower buds. Most preferable surface sterilization method was method 2 (using 50% Daconil (Chlorothalonil) with 70% alcohol). This anther callus induction technology can be used as a convenient method to induce calli in *C. annuum* L.

Key words: *Anther culture, Callus induction, Capsicum, MS,2,4-D, BA*

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