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Catatan Penelitian (Research Note)
Production of Seedling of *Carica papaya* L. by *Carica parviplora* (A.DC) Solms. Interspecific Hybrids Using Embryo Rescue

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ABSTRACT

A method of embryo rescue to produce seedlings of Carica papaya x Carica parviflora (A. DC) Solms. interspecific hybrids has been developed. Liquid medium of 0.5 Murashige and Skoog nutrients containing kinetin (0.25 μM) and NAA (0.25 μM) was the best medium to germinate the hybrids and produced the biggest leaf area index of the hybrids. Liquid medium of 0.5 MS nutrients containing kinetin (1.0 μM) and NAA (0.25 μM) produced the highest number of leaves of the hybrids, and produced the longest length of hypocotyl of the hybrids.

Key words : Carica papaya L., Carica parviplora (A.DC) Solms, Interspecific hybrids, Embryo rescue

INTRODUCTION

Carica parviflora (A. DC.) Solms is a wild relative of papaya which has pink flowers and small green fruit with pink ridges which, unlike papaya are inedible (Badillo, 1971). Interspecific hybrids of papaya x *C. parviflora* (A. DC.) Solms. may have novel ornamental value since they are likely to produce attractive pink-red flowers (a trait from *C. parviflora* (A. DC.) Solms.) and bigger and perhaps edible fruit (a trait from *C. papaya* L.) (Drew, personal communication).

Mekako and Nakasone (1975) reported that the success of wide hybridization using *Carica* spp is dependent, in part on the species used in the cross and the need for the plants to be in excellent health prior to the hybridization attempt. When a warm growth temperature and a low soil moisture conditions led to cross failure. Furthermore, Manshardt and Wenslaff (1989) found that the genotype of the female parent used for the hybridization attempt had a significant effect on the degree of success. Only those cultivars that could adequately nourish the developing embrio could be succesfully used as the female parent. By taking these concepts into mind successful crosses have been obtained between papaya and *C. monoica, C. parviflora, C.* pubescens, *C. quercifolia* and *C. stipulata*, while in only one case (papaya by *C. parviflora*) did the female genotype not matter. Eventhough papaya x *C. parviflora* (A DC.) Solms hybrids have been produced, very little viable seed was produced and this could not be converted into plants. Attempts to graft the hybrids shoots onto papaya root stock mature hybrid plants of papaya x *C. parviflora* has not been previously achieved.

To obtain the highest possible number of hybrid plants, it is important to understand the flora biology of both parents to be involved in the cross. For example, female flowers of *C. parviflora* (A. DC.) Solms. take 27 days to develop from bud emergence to anthesis while female flowers of papaya take 45 to 47 days to undertake the same changes. In addition, flowers of *C. parviflora* (A. DC.) Solms. undergo daily anthesis shortly after 6 am, reaching a peak between 8 and 10 am while papaya on the other hand undergo anthesis between 8 and 9 am. If these features of the floral biology are not taken into account then it is obvious that the crosses will fail (Mekako and Nakasone, 1975).

Earlier studies have shown that if hybrid zygotic embryos developed from crosses involving papaya and *C. parviflora* (A. DC) Solms. were not isolated before they had become 120 days old they would die in the fruit. Even when embryo rescue is used to save these hybrid embryos there is still a problem getting these immature structures to germinate (Mekako and Nakasone, 1975). An embryo rescue system has been developed for papaya x *C. cauliflora* Jacq. hybrids (Manshardt and Wenslaff, 1989). This system used basal MS nutrients containing BA (0.8 μM), NAA (2.6 μM) and agar (0,8%). More recently, Magdalita (1997) developed an improved technique using 0.5 De Forssard

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