Endosperm Culture of *Jatropha curcas* L.

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ABSTRACT

Endosperm culture of *Jatropha curcas* L. or physic nut is an interesting method, but no previous studies have been reported. Endosperm explants were cultured on Murashige and Skoog media supplemented with 30 g/L sucrose and various concentrations of 2,4-dichlorophenoxyacetic acid (2,4–D), 1-Äínaphthaleneacetic acid (NAA) and indole-3-butyric acid (IBA) i.e. 0, 5 and 10 µM, and kept under darkness for 45 days. The results showed that the highest percentage of callus induction was found on the medium supplemented with 10 µM NAA (100%) followed by 10 µM 2,4–D (92%) and 10 µM IBA (86%). However, no callus was observed in the control medium and medium supplemented with 5 µM 2,4–D, NAA and IBA. In addition, the largest compact yellow callus was found on the medium with 10 µM 2,4–D and NAA while small yellowish callus was found on the medium with 10 µM IBA. In further study, friable callus derived from endosperm were used for suspension culture. Growth rate of suspended cells and percentage of oil content during growth period were measured. The results revealed that endosperm cells could grow and could produce oil. The suspended cells grow rapidly during 10–15 days of culture and gave the maximum percentage of oil content 16.08% (w/v) at 15 days of culture then decreased to 4% on the last day of culture (40 days).

Key words: *Jatropha curcas* L., Callus induction, Endosperm culture

INTRODUCTION

*Jatropha curcas* L. or physic nut, is a shrub plant found in tropical area. In recent years, this plant has received an extensive attention as an energy plant, because of its seed oil content. However, it still has some limitations, i.e. difficult harvest and low yield.

Polyploids are reported to have some advantage over diploids. In case of oil crops, they show better grain filling, high oil content, enhanced photosynthetic ability, delayed maturity and increased biomass (Li et al., 1999). Generally, triploids are raised by crossing tetraploids with a diploid parents. Endosperm culture is an alternate way to produce the triploid plant. The objectives of this studies were to find out a formulation of medium that could be used to induce callus from the endosperm and to study the possibility to produce oil from endosperm suspended cells *in vitro*.

MATERIALS AND METHODS

Plant materials

Mature seeds of physic nut were harvested from Mae Hia Agricultural Research and Training Centre, Faculty of Agriculture, Chiang Mai University, in August 2009.

Seeds sterilization and initiation

Mature seeds of physic nut were washed under running tap water about 15 minutes to remove soils and other contaminants on the outer surface of seed coats. After that, the seeds were thoroughly rinsed in 70% (v/v) ethanol for 1 minute and then were washed three times in sterilized distilled water. Additionally, the seeds were surface sterilized with mercuric chloride (HgCl₂) 0.1% (w/v)