

Title	Intergeneric hybridization between <i>Jatropha curcas</i> L. and <i>Ricinus communis</i> L., through <i>in vivo</i> and <i>in vitro</i> pollination techniques	
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ABSTRACT

Jatropha curcas ($2n=2x=22$) and *R. communis* ($2n=2x=20$) are becoming commercially important plant species as their oil rich seeds can be processed into a substitute for diesel. Hybridization between *R. communis* and *J. curcas* could potentially produces the hybrid with characteristic such as short plant type, early maturity, determinate inflorescence, high oil quality and productivity/year competitive with oil palm. The pollen grain of *J. curcas* (96 μm) was 3 times bigger than *R. communis* (32 μm). *Jatropha curcas* was introduced as the female parent plant as determined by pollen grains and ovule size. The *in vivo* pollination test resulted 100% of flowers in the field being aborted within an average of 10 days after pollination. Pollen germination and normal growth of the pollen tube were observed in 48 h after pollination but failed to set the seed more than 2 weeks. This indicates that the *in vivo* pollination was due to a lack of pre-zygotic barrier. *In vitro* pollination with cultures in MS medium and the addition of 0.125 mg L⁻¹ benzyladenine (BA), singly or combined with 0.125 mg L⁻¹ 1-naphthaleneaceticacid (NAA) can prolong the zygote life for up to 57 days. This study showed the *in vitro* techniques may provide a feasible method in order to obtain new intergeneric plants.

Additionally, the oil content of *J. curcas* showed the strong correlation with the seed weight. However, negative correlation was observed in *R. communis*. The commercial *R. communis* with a small seed size has higher oil content than the wild-type. The percentage of oil content of *J. curcas* toxic, *J. curcas* nontoxic, *R. communis* commercial and *R. communis* wild-type (A) was 53.03%, 39.47%, 27.03% and 23.25%, respectively. Oleic acid (39-40%) and linoleic acid (35-37%) were predominant of the fatty acid composition in *J. curcas*. *Ricinus communis* wild-type (A) showed higher ricinoleic acid (89%) than the commercial type (79%).

Keywords: *Jatropha curcas*, *Ricinus communis*, pollen grain, intergeneric hybridization, post fertilization barriers, pre fertilization barriers, oil content.

