

Experimental Evaluation of 10 Ecotypes of Toxic and Non-Toxic *Jatropha curcas* as Raw Material to Produce Biodiesel in Morelos State, Mexico

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Abstract : *Jatropha curcas* is a perennial oleaginous plant that is currently considered an energy crop with high potential as an environmentally sustainable biofuel. During the last decades, research in biofuels has grown in tropical and subtropical regions in Latin America. However, as far we know, there are no reports on the growth and yield patterns of *Jatropha curcas* under the specific agro climatic scenarios of the State of Morelos, Mexico. This study presents the results of 52 months monitoring of 10 toxic and non-toxic ecotypes of *Jatropha curcas* (E1M, E2M, E3M, E4M, E5M, E6O, E7O, E8O, E9C, E10C) in an experimental plantation with minimum watering and fertilization resources. The main objective is to identify the ecotypes with the highest potential as biodiesel raw material in the select region, by developing experimental information. Specifically, we monitored biophysical and growth parameters, including plant survival and seed production (at the end of month 52), to study the performance of each ecotype and to establish differences among the variables of morphological growth, net seed oil content, and toxicity. To analyze the morphological growth, a statistical approach to the biophysical parameters was used; the net seed oil content -80 to 192 kg/ha- was estimated with the first harvest; and the toxicity was evaluated by examining the phorbol ester concentration ($\mu\text{g/L}$) in the oil extracted from the seeds. The comparison and selection of ecotypes was performed through a methodology developed based on the normalization of results. We identified four outstanding ecotypes (E1M, E2M, E3M, and E4M) that can be used to establish *Jatropha curcas* as energy crops in the state of Morelos for feasible agro-industrial production of biodiesel and other products related to the use of biomass.

Keywords : biodiesel production, *Jatropha curcas*, seed oil content, toxic and non-toxic ecotypes

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