Biodiesel production from Jatropha curcas : A critical review

Abstract

The fuel crisis and environmental concerns, mainly due to global warming, have led researchers to consider the importance of biofuels such as biodiesel. Vegetable oils, which are too viscous to be used directly in engines, are converted into their corresponding methyl or ethyl esters by a process called transesterification. With the recent debates on "food versus fuel," non-edible oils, such as Jatropha curcas, are emerging as one of the main contenders for biodiesel production. Much research is still needed to explore and realize the full potential of a green fuel from J. curcas. Upcoming projects and plantations of Jatropha in countries such as India, Malaysia, and Indonesia suggest a promising future for this plant as a potential biodiesel feedstock. Many of the drawbacks associated with chemical catalysts can be overcome by using lipases for enzymatic transesterification. The high cost of lipases can be overcome, to a certain extent, by immobilization techniques. This article reviews the importance of the J. curcas plant and describes existing research conducted on Jatropha biodiesel production. The article highlights areas where further research is required and relevance of designing an immobilized lipase for biodiesel production is discussed.