

Allelopathic effect of different accessions of *Jatropha curcas* on field crops in Bundelkhand Region (U.P.) India

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ABSTRACT

Allelopathic effect of three accessions of *Jatropha curcas* on four field crops viz. *Triticum aestivum*, *Raphanus sativus*, *Linum usitatissimum* and *Lens esculenta* through bioassay was studied in laboratory. The level of inhibition of aqueous leaf extract of *J. curcas* varied with its accessions and type of tested field crops. The tolerance of the crops was in order of *Lens esculenta* > *T. aestivum* > *Raphanus sativus* > *Linum usitatissimum*. Invariably, maximum inhibition was observed in the higher concentrations of aqueous extract.

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KEY WORDS : Allelopathy, Field crops, *Jatropha curcas*, Leaf aqueous extract.**Introduction**

In agroecosystem crop inhibitions in association with trees are not uncommon. Such inhibitions are primarily caused by shade effect as well as belowground (root zone) competition for nutrients and water. In some cases inhibitory effects may also result from allelochemicals secreted by component tree species. The phytotoxic substances exuded by trees retard the germination and growth of weed and crop species^{9,11}. Chemicals released by plants might be beneficial or detrimental to the growth of receptor plants¹⁰. Now a days *Jatropha curcas* is getting much attention due to its suitability as oil yielding crop which can serve as an alternative source of biofuel. As land is a limited resource, research is in progress to incorporate this species in agroforestry system to get the dual benefit (oil as well as crop yield). *J. curcas* has short gestation period, hardy in nature with high quality oil content. It's oil is close to cottonseed and better than rapeseed, groundnut and sunflower, which gives no pollution, when burnt⁴. Of late *J. curcas* is getting a momentum as a biofuel tree species, which can be raised as block plantation or intercropped with food crops. Stem extracts of *J. curcas* contain phytochemicals like saponin, tannins, glycoside, alkaloids

and flavonoids of phenolic nature³. The present study was carried out to find the allelopathic effect, if any from the leaf extract of *J. curcas* accessions on four field crops viz. *Triticum aestivum* (wheat), *Raphanus sativus* (Mooli), *Linum usitatissimum* (Alsi) and *Lens esculenta* (Masur).

Materials and Methods

The seeds of *Jatropha curcas* accessions namely NRCJ-2, NRCJ-12 and NRCJ-82 were obtained from National Research Centre for Agro-forestry (NRCAF) Jhansi and grown during 2011 in Bohadpur Govt. Agriculture Farm (BGAF) at Orai (U.P.) located at an elevation of 141.6 m above the mean sea level (msl) and 25° 59' N latitude and 79° 37' E longitude. The study consisted of three factors : (i) three accessions of *Jatropha curcas* viz. NRCJ-2, NRCJ—12 and NRCJ-82, (ii) three concentrations viz. 1%, 3% and 5% of leaf extracts besides control, (iii) four tested crops viz. wheat (*Triticum aestivum* L.) var. WH-147, Mooli (*Raphanus sativus*) var. Kashi sweta, Alsi (*Linum usitatissimum*) var. Garima and Masur (*Lens esculenta*), var. K-75. Fresh leaves from 3 accessions of *J. curcas* (5 years old) were collected from the experimental farm of BGAF, Orai. The materials of each category were air dried under shade for 3 days,

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