

Research Note

Effect of leaf extract of *Jatropha curcas* on growth and development of Bihar hairy caterpillar, *Spilarctia obliqua*, Walker

■ K.K. SHARMA

*Department of Plant Pathology, College of Agriculture, G.B. Pant University of Agriculture and Technology, PANTNAGAR (UTTARAKHAND) INDIA

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*Corresponding author: abhay@23p@yahoo.com

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The Bihar hairy caterpillar, *Spilarctia obliqua* Walker, is a sporadic pest and is widely distributed. In India, it is very serious in Bihar, Madhya Pradesh, Uttar Pradesh and Punjab as a polyphagous pest, particularly of sesamum, urd, mung, linseed, mustard, sunflower and some vegetables (Atwal and Dhaliwal, 2002). The insecticides have been found very promising in suppressing this pest, but their use results in the development of high degree of resistance in insects. In the recent past, the use of indigenous plant materials has acquired an important position as component of IPM, as they are comparatively safer to mammals due to their rapid bio degradable nature (Fazal, 2003, Hiremath and Ahn, 1997). *Jatropha curcas* L. (Euphorbiaceae) is an important medicinal plant and also known to possess nematicidal and insecticidal properties (Arnubio *et al.* 2006). Considering the polyphagous nature and economic importance of the pest present study was, therefore, taken up with a view to assess locally, available species of *Jatropha* (*J. curcas*) for its insecticidal property and effect on growth and development of *S. obliqua*.

Jatropha curcas leaves were collected from M.R.D.C. (Medicinal Research and Development Centre), G.B. Pant University of Agriculture and Technology, Pantnagar campus. Leaf extracts were prepared by dipping the leaves in acetone and then drying.

The required concentrations were made by diluting the extracts with water (Alamgir *et al.* 2003). Five concentrations viz., T₁ = 0.625 per cent, T₂ = 1.25 per cent, T₃ = 2.50 per cent, T₄ = 5.00 per cent and T₅ = 10.00 per cent, and control (T₆ only

water) were taken for treatment. Laboratory reared 7-day old larvae of *S. obliqua* were used for the experiment. Each treatment consisted with ten numbers of larvae and replicated thrice. The larvae were kept in a plastic container of 2 litres capacity and covered with muslin cloth to prevent the escape of the larvae. The larvae were fed with treated castor leaves. The leaves were treated by dipping in the solution of extract. Observations were taken on every alternate day. The data were recorded on initial larval weight, larval weight gain at different intervals, larval per cent mortality, pupal weight, per cent pupation and per cent adult emergence. Experiment was carried out in Department of Entomology, G.B. Pant University of Agriculture and Technology, Pantnagar.

The larval weight gain presented in Table 1 reveals that there is no significant difference in larval weight gain among different treatments. Larval mortality was recorded as 20.00, 20.00, 30.00, 33.33, 20.00 and 13.33 per cent in T₁, T₂, T₃, T₄, T₅ and T₆, respectively. Pupal weight (Table 2), however, showed significant difference among treatments. The highest pupal weight was recorded in control (0.516 g) followed by T₂ (0.464 g) and T₁ (0.448 g) which were significantly higher than that of T₃ (0.402 g), T₄ (0.415 g) and T₅ (0.344 g). Per cent pupation were recorded as 33.33, 26.66, 33.33, 36.66, 30.00 and 60.00 per cent, respectively in T₁, T₂, T₃, T₄, T₅ and T₆. Per cent adult emergence was 50.00, 53.33, 40.00, 43.33, 43.33 and 58.33 per cent in T₁, T₂, T₃, T₄, T₅ and T₆, respectively (Table 1). It can be concluded from the experiment that, though, the leaf extract of *Jatropha curcas* reduced the pupal weight, yet it did not

Table 1: Effect of *Jatropha curcas* on growth and development of *Spilarctia obliqua*, Walker

Treatments	Larval weight (g)						Pupal weight (g)
	Initial	48 hr	96 hr	144 hr	192 hr	240 hr	
T ₁ = 0.625%	0.083	0.173	0.0228	0.367	0.593	0.669	0.448
T ₂ = 1.25%	0.085	0.160	0.243	0.345	0.644	0.678	0.464
T ₃ = 2.50%	0.072	0.119	0.198	0.304	0.577	0.623	0.402
T ₄ = 5.00%	0.073	0.125	0.189	0.318	0.561	0.662	0.415
T ₅ = 10.00%	0.071	0.144	0.246	0.358	0.580	0.709	0.344
T ₆ = Control	0.082	0.159	0.228	0.302	0.557	0.693	0.516
C.D. (P = 0.05)	0.016	0.059	0.062	0.179	0.190	0.089	0.084

Table 2 : Per cent larval mortality, pupation and adult emergence of *S. obliqua*

Treatments	% Larval mortality	% Pupation	% Adult emergence
T ₁ = 0.625%	20.00	33.33	50.00
T ₂ = 1.25%	20.00	26.66	53.33
T ₃ = 2.50%	30.00	33.33	40.00
T ₄ = 5.00%	33.33	36.66	43.33
T ₅ = 10.00%	20.00	30.00	43.33
T ₆ = Control	13.33	60.00	58.33
C.D. (P = 0.05)	1.89	1.43	1.83

affect the adult emergence. So, *Jatropha curcas*, leaf extracts have effect on overall growth and development of *S. obliqua*. *Jatropha* leaf and its implication has toxicity, including flavanoids (e.g. apigenin, isovitexin, vitexin) and diterpenoids (e.g. jatrophone). These findings are accordance with Kupchan *et al.* (1970), Erkmén and Özcan (2003) and Singh *et al.* (2001).

It can be concluded from the experiment that *Jatropha curcas* leaf extracts have adverse effect on growth and development of *S. obliqua*. However, higher concentration may be applied for further confirmation. So, it can be used as a component in IPM programme to control this pest.

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