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# Persistent and Relative Toxicity of Different Insecticides Against *Coccidohystrix insolita* (Green) Infesting Pigeonpea*

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The mealybug, *Coccidohystrix insolita* (Green) (Homoptera : Pseudococcidae) has been found seriously infesting pigeonpea crop in isolated patches in the Saurashtra region of Gujarat State. The pest commonly known as brinjal mealybug and has been reported by Chaudhuri (1976) and Nair and Nair (1977) attacking brinjal. It has also been reported feeding on pigeonpea in Gujarat (Patel *et al.*, 1985; Bhalani, 1990). Since no information is available regarding residual persistence and relative toxicity of insecticides against *C. insolita,* an attempt was made to investigate the same.

A field-cum-laboratory experiment was conducted to evaluate residual persistent toxicity of 12 insecticides for this pest on pigenpea crop. Three rows of pigeonpea crop (5 m long) were sprayed with different insecticides (Table 1). The spraying was done @ 800 l/ha with the help of knapsack sprayer. The leaves from respective treatments were brought to the laboratory 1 hour after spraying and at 1, 3, 7, 9, 11 and 13 days intervals. They were placed individually in Petri dish (9.0 cm x 9.0 cm) having moist germination paper. Twenty-five third instar nymphs of mealybug were released into each Petri dish containing the treated leaves of pigeanpea and each set was repeated thrice. Observations on the mortality were recorded 48 hr after the release. The per cent mortality was corrected by using Abbott's formula (Abbott, 1925). The zero and cent per cent values were removed by using the formula 1/4 n x 100 and (1-1/4 n ) 100, respectively (Bartlett, 1947). The data thus obtained were angularly transformed and subjected to statistical analysis. Persistent toxicity (PT) and residual persistent toxicity (RPT) for each insecticide was worked out as suggested by Sarup *et al.* (1970).

For finding out relative toxicity if different insecticides against third instar nymphs of *C. insolita,* six graded concentrations viz., 0.03, 0.015, 0.0075, 0.00375, 0.00188 and 0.00094 per cent for dichlorvos, malathion, methyl parathion, triazophos and quinalphos; 0.4, 0.2, 0.1, 0.05, 0.025 and 0.0125 per cent for mint oil, neemark and neemgaurdi 0.02, 0.01, 0.005, 0.0025, 0.00125 and 0.00063 per cent for phosphamidon; 0.04, 0.02, 0.01, 0.005, 0.0025 and 0.00125 per cent for nicotine sulphate and 0.07, 0.035, 0.0175, 0.0088 0.0044 and 0.0022 per cent for endosulfan were prepared from commercial formulations of the insecticides except mint oil and were used for this investigation. Each concentration was applied @3 ml per potted pigeonpea plant of 21 days

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TABLE 1

**Toxicity of some insecticides against *C. insolita* on pigeonpea.**

| Treatment | Concentration (%) | Corrected per cent mortality of C. insolita at different days after spray | | | P | T | PT | RPT | LC 50 | Fiducial limits | Relative toxicity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1hr | 7 days | 13 days | | | | | | | |
| Dichlorvos | 0.04 | 84.23 (98.99) | 27.48 (21.29) | 5.74 (1.00) | 9 | 44.28 | 398.54 | 0.4972 | 0.013646 | +0.020835 -0.008935 | 0.7171 |
| Malathion | 0.05 | 84.23 (98.99) | 31.90 (27.92) | 5.74 (1.00) | 11 | 41.93 | 461.25 | 0.5755 | 0.013155 | +0.020107 -0.008607 | 0.7438 |
| Methyl parathion | 0.05 | 84.23 (98.99) | 29.32 (23.98) | 5.74 (1.00) | 11 | 37.80 | 415.85 | 0.5188 | 0.013394 | +0.020667 -0.008681 | 0.7306 |
| Monocrotophos | 0.04 | 64.40 (81.33) | 39.99 (41.30) | 9.60 (2.78) | 13 | 49.33 | 641.21 | 0.8000 | 0.016568 | +0.026604 -0.010319 | 0.5906 |
| Phosphamidon | 0.03 | 49.20 (57.30) | 38.43 (38.63) | 11.53 (3.99) | 13 | 43.13 | 560.72 | 0.6995 | 0.028421 | +0.038489 -0.020987 | 0.3443 |
| Triazophos | 0.04 | 84.23 (98.99) | 50.75 (59.97) | 13.16 (5.18) | 13 | 61.65 | 801.50 | 1.0000 | 0.011501 | +0.016873 -0.007840 | 0.8508 |
| Quinalphos | 0.05 | 84.23 (98.99) | 39.99 (41.30) | 7.67 (1.78) | 13 | 52.05 | 675.65 | 0.8442 | 0.009785 | +0.014525 -0.006592 | 1.0000 |
| Endosulfan | 0.07 | 39.99 (41.30) | 20.08 (11.79) | 5.74 (1.00) | 9 | 25.56 | 230.01 | 0.2869 | 0.082761 | +0.100847 -0.067919 | 0.1182 |
| Mint oil | 0.50 | 64.40 (81.33) | 18.98 (10.58) | 5.74 (1.00) | 9 | 40.26 | 362.37 | 0.4521 | 0.337397 | +0.546031 -0.208481 | 0.0290 |
| Neemark | 0.50 | 69.88 (88.17) | 20.08 (11.79) | 5.74 (1.00) | 11 | 36.44 | 400.86 | 0.50010 | 0.201113 | +0.296179 -0.136561 | 0.0487 |
| Neemgaurd | 0.50 | 58.90 (73.32) | 23.57 (15.99) | 5.74 (1.00) | 11 | 35.60 | 391.60 | 0.4885 | 0.266255 | +0.414590 -0.170993 | 0.0368 |
| Nicotine sulphate | 0.05 | 57.19 (70.64) | 11.53 (3.99) | 5.74 (1.00) | 7 | 31.16 | 218.15 | 0.2722 | 0.026359 | +0.039051 -0.017793 | 0.3712 |
| S. Em. ± | | 0.89 | 0.99 | 0.86 | | | | | | | |
| C. D. at 5% | | 2.62 | 2.91 | 2.53 | | | | | | | |
| C. V. % | | 2.25 | 5.86 | 20.40 | | | | | | | |

Figures in parentheses are retransformed values.

old with the help of Potter's spraying tower at a constant pressure of 1.76 kg/cm2. The treated plants were dried. The nymphs were then released from the laboratory culture. The plants were covered with glass chimney having top end covered with muslin cloth. Each treatment was replicated thrice. The mortality counts were recorded 48 hr after the spray. Data were corrected by using Abbott's fromula (Abbott, 1925). The mortallity data were subjected to probit analysis (Busvine, 1971). Toxicity ratio of a insecticide was computed according to Jotwani *et al.* (1971).

Triazophos (0.04%) was the only insecticide which was found toxic upto 7 days, recorded 60 per cent nymphal mortality. On the basis of RPT values, the order of persistence toxicity was triazophos > quinalphos > monocrotophos > phosphamidon. Looking to the consistency of the results triazophos, quinalphos, monocrotophos and phosphamidon were found most effective both in respect of mortality of the pest as well as prolonged persistence. Basu and Pramanik (1968) reported phosphamidon (0.01%) as effective insecticide against *C. insolita* on brinjal which persisted for 15 days.

Quinalphos (LC 50 = 0.009785) was found to be the most toxic insecticide against this pest (Table 1). Triazophos (LC 50 = 0.011501) was found slightly less toxic than quinalphos (LC 50 = 0.009785). The dichlorvos, monocrotophos were less toxic than the quinalphos and they gave relative toxicity values 0.7171, 0.7306, 0.7438 and 0.5906, respectively. Endosulfan in synthetic insecticides and mint oil in botanical materials were found to be the least toxic.

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