ATTRACTANCY OF GRANULAR INSECTICIDES FOR LAND SNAIL (*HELIX ASPERSA*, GASTROPODA, MOLLUSCA)

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Abstract: *Granular insecticides Temik 10%, Thiodan 3%, Diazinon 14%, Disyston 15% and NaCl were tried as attractants for snails feeding on juniper seedlings. Among them Temik was the most effective, which attracted and killed 99 snails released at a distance of 1-2 metres in 120 hours. Thiodan, Diazinon and Disyston also attracted and killed few snails but NaCl did not act as attractant.*

Introduction: Land snails and slugs cause damage in vegetable gardens, fruit orchards, green houses, nurseries and agricultural fields. Their presence on the walls and paths in the parks, nurseries, gardens and houses is also a source of annoyance for the people. In green houses snails attack the young seedlings and more succulent parts of plants. They leave a trail of mucous over such plants and other things that are not actually attacked, thus making them unsightly and in case of ornamentals reducing their sale value. In gardens this pest is frequently abundant causing serious losses to crops. It nibbles here and there making the plants unmarketable. Certain snails have been reported as injurious to trees in citrus groves in USA. In some localities hedges have been kept in a state of partial defoliation for years by feeding of snails. Mushroom, green beans, stored potatoes, citrus trees, flowers, leafy vegetables and forage are attacked by snails.

Keeping in view the importance the authors tried some granular insecticides for their attraction and killing.

Review of Literature: Roth *et al.* 1973 found Methyl Bromide and other fumigants effective against a snail *Helicella.* In laboratory test Brown *et al* (1974) described the effect of crude oil pollution on sand beach snail, *Bullia* sp. They found well defined stress symptoms at sub-lethal concentrations and at higher doses they paralyse before death ensues. They also found the low concentration as fatal when oil came in contact with the animal. Spielman *et al* (1973) reported Endod a butanol extract of soap berry plant *Phytolacca dodecandra* (endod) as a molluscicide. Muraleedharan *et al* (1977) graded Baylucid relatively more effective than $CuSo_4$ and sodium pentachlorophenate against fresh water snails under laboratory condition. Crowell (1968) described that chlorinated hydrocarbans and organo-phosphatic pesticides have little or no toxicity against slugs and snails but carbamates exhibited outstanding activity against them. Tarezynski and Szepelski (1969) found 5% $CuSo_4$ as an effective control agent against snails

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when aerially sprayed over large pastures. Gul and Chaudhry (1979) have found Baylucid and Breston effective against land snail *Helix aspersa*. No work on the attractancy of land snails to chemicals has been reported so far.

Materials and Methods: To test the efficacy of Temik, Thiodan, Disyston, and Diazinon granules and Sodium chloride powder, 20 snails were released over each chemical spread on a laboratory table. Snails were found dead in case of each chemical but most of the snails gathered over Temik granules and ran away from sodium chloride showing the attractancy and repellancy of both the chemicals. In order to confirm the attractive and repulsive action of each granular insecticide, Temik 10%, Thidoan 3%, Disyston 15%, Diazinon 14% and NaCl were spread over plots, each measuring 40 x 30 cm at the rate of 225 gms per plot. The experiment was laid out on randomized split plot design in juniper seed beds in the Silvicultural Research Garden, Pakistan Forest Institute, Peshawar, where enough population of the snail, *Helix aspersa* was available. There were five replications of each treatment. In order to record the extent of attractancy of molluscicide and their range of effectiveness 100 marked snails were released at a a distance of one and two metres all around the experimental site. Snails attracted to various insecticides were recorded 24, 48, 72, 96 and 120 hours after treatment.

Another experiment was conducted to test the extent of attraction afforded by these granules from various distances. 15 snails were released on two sides of each type of granule at distances of 2, 5, 10 and 15 metres from the granules. The snails released at each distance were differently marked for identification.

Results and Discussion: The observations on the attractancy and mortality of snails caused by various chemicals at different intervals are tabulated below.

Chemicals	24 hours	48 hours	72 hours	96 hours	120 hours	Total
Temik	16	21	29	19	14	99
Thiodan	0	3	4	2	2	11
Diazinon	0	1	3	2	5	11
Disyston	0	0	1	2	2	5
NaCl	0	0	0	0	0	0
Check	0	0	0	0	0	0

The attractancy of land snail, *Helix aspersa* to chemicals for the purpose of killing them was confirmed. Temik 10% proved to be the most effective attractant and molluscicide for the snails. Thiodan, Diazinon and Disyston also attracted few snails. Not a single snail was found in check or in the plots treated with NaCl.

The range of attractancy of these granules to the snails was recorded upto 72 hours and the data are presented below:

Granular Chemical	No. of snails attracted upto 72 hours from distances of			
	2 m	5 m	10 m	15 m
Temik	16	12	0	0
Thiodan	1	2	0	0
Disyston	3	2	0	0
Diazinon	0	1	0	0

Temik attracted 53% snails from a distance of two metres and 40% from 5 metres. There was no attraction of snails beyond 5 metres. The other chemicals also attracted upto 10% snails from a distance of 2 and 5 metres.

It is therefore concluded that nurseries, vegetables and other crops can be protected from the ravages of the land snail, *Helix aspersa* by placing temik granules over plastic sheets in the affected area at 8-10 metres interval to attrack and kill all the snails from the surroundings. when done with, the granules can be removed from the site. This treatement is not liable to affect the terrestrial or sub-terranian fauna hence is safer to the environment.

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