

Bio-Efficacy of Basella Alba Seed Powder on *Tribolium Castaneum* Infesting Barley



Nidhi Srivastava

Abstract: 2nd day 39% mortality was observed by 2 gms treatment 30% by 3 gms and 60% by 4 gms and 70% no mortality on control. ON 3rd day 1gm had 35% and 2 gms had 48%, 3 gms had 95%, there was no mortality in control. Again on the 4th day the mortality 40% and 59% were recorded by exposure to 1 gm and 2 gms respectively. The successive day count showed higher mortality in all the treatments. On the 5th day 1 gm had 48% and 2 gms had 64% mortality was recorded. On the 6th day 1 gm brought 62% mortality and 2 gms brought 73% mortality and 7th day had 1 gm had 73% and 2 gms had 76% mortality was observed. The final data was noticed on 8th day. It was 76% and 89% in 1 gm and 2 gms concentration respectively.

Keywords: Beetles, Mortality, Basella alba, Tribolium castaneum

I. INTRODUCTION

The cereals Barley is most important crop of India and serves a major source of food grain. It is grown in 1.75 lac hectares of land with an annual production of 21.82 metric tonnes (2009-2010) Uttar Pradesh is a Barley growing region, having 9 lac hectares of are with 11.23 lac metric tonnes production. Out of the total of the grains 7% is stored traditionally by the farmers for their own consumption, seed and wages and rest above 20% surplus food grains are handed over to traders and Government in agencies in our country. Through, Barley crop is relatively safe from insect pest in field but suffers considerably more during storage. It is highly prone to ravages by array of stored grain pests under different climatic conditions of our country. Barley grain losses are known to the extent of 10 to 19% during storage by the pests not only in terms of quantity, but also in quality of the good grains. The qualitative losses are attribute to change in chemical components of grains. Barley grains are known to be damage by numbers of insect-pests viz. Tribolium Castaneum Herbst, sitophilus oryzae L, Rhizopertha dominicafab, Trogoderma granarium. Everts, Sitotroga cerealella and Corcyra cephalonica st. in storage (Mathur and Upadhyay (2000) of the Tribolium Castaneum Herbst has been found as a major dominant pests, which causes severe damage to Barley grain in storage. It also feeds on maize, sorghum, rice, barley, dry fruits, coconut etc, in different parts of India.

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In India, Barley is essentially a poor men's crop and used primarily as human food in the form of chapti Sattu etc, and as concentrate for much animals. In addition, certain other by-products are also prepared from barley grain. Several insect-pests have been reported to be associated with Barley in the storage. Among them red flour beetle is of cosmopolitan in importance, attributing about 50% loss in weight in storage. Its larvae are internal feeder and cause a serious loss to cereals, affecting the quality as well as quality of the grains.

II. MATERIALS & METHODS

The test insect *Tribolium Castaneum* Herbst is a serious pest, causing enormous quantitative and qualitative losses to various stored cereals. The collection of adults for mass rearing was made from local granaries of Naubasta Mandi, Kanpur. The insect, thus collected were carefully examined for their taxonomic characters. Further the mass rearing for breeding of individuals was carried out on the barley grains in plain glass jars of 2 kg capacity and mouth of glass jars were covered with muslin cloth and tied with the help of rubber bands. The glass jars were kept at the room temperature in Entomological laboratory till the emergence of fresh adults. The Newly emerged 1st to 5 days old adults were taken as parental population thought the course of study. The pest were under taken department of Zoology (Entomology) D.A.V. P.G. College, Kanpur. Newly emerged 1-5 days old adults were separated. In case of males, the rostrum is distinctly shorter and wider than that of females in which it is distinctly longer and narrower. Six differences were observed with the help of hand lens in laboratory through out the course of investigations. The following varieties were obtained from Rabi Cereal Research Station, C.S. Azad University of Agriculture and Technology, Kanpur. The representative samples of each variety were taken as test material. K-898, K-551, K-603, K-851, Jyoti, Jagrati, K-139, K-889, Manjula, K-329, K-508, K-822, K-927, K-890 and K-713. The various experiments were carried out under controlled conditions at 75% relative humidity and 27°C temperature. Mating, Pre-oviposition and oviposition 5 pair of newly emerged male and female beetles isolated from the stock culture, were introduced in the tubes of 10x4 cm size, containing 30g conditioned grains of each variety, selected at random. The mouth of each tubes was covered with perforated polythene paper and tied with rubber band to prevent the escape of beetles. All the tubes were kept in desiccators at 75% relative humidity and 27°C temperature.



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The experiment was replication thrice. Observation of mating, preoviposition and oviposition period were recorded from each variety.

III. RESULTS & DISCUSSIONS

1 gm eliminated 20% beetles within 24 hours. In addition of 35% mortality was noticed on the 3rd day. 40% on the 4th day, 48% on the 5th day, and 62% on the 6th day, 73% on the 7th day and 76% on the 8th day mortality was noticed. 2nd day 39% mortality was observed by 2 gms treatment 30% by 3 gms and 60% by 4 gms and 70% no mortality on control. ON 3rd day 1gm had 35% and 2 gms had 48%, 3 gms had 95%, there was no mortality in control. Again on the 4th day the mortality 40% and 59% were recorded by exposure to 1 gm and 2 gms respectively. The successive day count showed higher mortality in all the treatments. On the 5th day 1 gm had 48% and 2 gms had 64% mortality was recorded. On the 6th day 1 gm brought 62% mortality and 2 gms brought 73% mortality and 7th day had 1 gm had 73% and 2 gms had 76% mortality was observed. The final data was noticed on 8th day. It was 76% and 89% in 1 gm and 2 gms concentration respectively. (Table 1). Similar results are also found by Bhatnagar, A. (1998), Broadley, R.H. (1984). Seasonal incidence and Parasitism of *Heliothis* Sp. (Lepidoptera : Pyralidae) larvae in South Queensland Sunflower, Diraviam, J. et. al. (1993), Lal, S.S. (1981), Mahto, Y. (1990), Mishra, B.A., et. al. (1992), M.M. H. Khan (2019). Effect of temperature and relative humidity on the population dynamics of brinjal and tomato infesting whitefly, *Bemisia tabaci*, Patel, C.C., and Koshiya, D.J. (1997), Pimpale, T.D. and Summanwar, A.S. (1983), Sekhon, B.S. and Singh, S. (1985). Effect of temperature, relative humidity and rainfall on the population build up of cotton jassid, Sethi, G.R., et. al. (1979), Singh, K.M. and Singh, R.N. (1977), Yumamura K, et. al. (2006) and Zhang S, et. al. (2014).

Table 1: Effect of Basella alba seed powder on *Tribolium Castaneum*.

Doses	Durations						
	2 nd Day	3 rd Day	4 th Day	5 th Day	6 th Day	7 th Day	8 th Day
1 gm	20%	35%	40%	48%	62%	73%	76%
2 gm	39%	48%	59%	64%	69%	82%	89%
3 gm	60%	95%	--	--	--	--	--
4 gm	70%	98%	100%	--	--	--	--
Control	--	--	--	--	--	--	--

Figures in parentheses are transformed value.

* Based on 5 observations

IV. CONCLUSION

The effect of Basella alba powder was recorded in the case of larval development of the *Tribolium Castaneum* barley. The impact of toxicity was much more in larva than in adults. The mortality and emergence of larval are as shown above in result and discussion. Observation has a significant result in the development of insects that can be checked by powder of seeds of Basella alba plant. The use of plant products is the least harmful for mankind and animals.

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