

Integrated insights into the biology and management of painted bug (*Bagrada hilaris*) on mustard

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Abstract

The bagrada bug, *Bagrada hilaris* (Burmeister), also called the painted bug, is native to Africa. It became first said within the county of Los Angeles, California. *Bagrada hilaris* can be burdened with the same searching harlequin bug, *Murgantia histrionica* (Hahn), that's massive during the United States. It has additionally been burdened with ladybird beetles (Family: Coccinellidae). The bagrada bug is a true bug within the order Hemiptera, and extra in particular is a stink bug within the family Pentatomidae. It has grown to be an extreme agricultural pest within the southwestern United States.

Mustard crop is being broadly promoted as a matter of crop diversification and substantial emphasis is being laid on saving the crop from insect pests as scientists are constantly striving their quality for the betterment of the excellent of the produce of the crop. These studies become carried out to decide the efficacy of various pesticides towards the mustard aphid which reasons substantial yield losses in Brassicaceae. Study become carried out for the duration of crop season 2016-17 the use of RCBD layout with three replications, information has been recorded at unique advocated time intervals. Maximum mortality of mustard aphid become due to Advantage (98.70%) observed via way of means of Plenum (96.60%), Oshin (87.10%), and Pirate (49.60%). Advantage and Plenum represented least differentiated mortality probabilities even as outcomes of Pirate remedy confirmed a probable indication of resistance improvement in bugs towards this precise insecticide.

Keywords: *Bagrada hilaris*, Brassicaceae, *Murgantia histrionica*

Introduction

Mustard (*Brassica nigra* [Linn.] Koch) is an important oilseed crop belonging to the family *Brassicaceae*, widely cultivated during the Rabi season. Its green leaves and stems are consumed as vegetables and used as fodder, being rich in proteins, minerals, and vitamins A and C. Mustard seeds contain 32–42% oil, which is mainly used for edible purposes but also finds applications in soap making, skin care, and as a lubricant. After oil extraction, the residual seed cake serves as valuable livestock fodder and mulch.

In India, nearly 50 insect species have been reported to infest mustard crops. Among them, the painted bug, *Bagrada hilaris* (Burmeister) (Hemiptera: Pentatomidae), is considered the most serious pest of cruciferous crops, both in India and globally. It is a destructive pest of rapeseed and mustard, attacking crops from the seedling stage to harvest. The insect remains active throughout the year and infests various crucifers during winter, causing extensive damage. Severe infestations at the seedling stage may kill young plants, leading to stunted growth and poor establishment. Reported crop losses due to *B. hilaris* infestation at the seedling stage range from 26.8% to

70.8%, with corresponding reductions of up to 30.1% in seed yield and 3.4% in oil content.

Biology and Description

Adult painted bugs are shield-shaped, measuring about 5–7 mm in length and 3–4 mm in width. Females are generally larger than males. Adults are black with distinct red and yellow markings on the body, which make them easily recognizable. Females lay eggs singly or in small clusters, often close together. A single female can lay more than 100 eggs during her lifetime. The eggs are initially opaque white to light reddish and hatch in about 3–4 days under favorable temperature conditions.

The nymphal development comprises five instars. Newly emerged nymphs are bright red with darker (black) markings on the pronotum, head, legs, and antennae. The abdomen remains reddish but gradually develops black bands and white spots as they mature. Later instars become darker, exhibiting light to deep red markings on the body, before molting into adults.



Fig 1: Male and female Painted bug



Fig 2: Eggs of Painted bug

Damage

The painted bug, *Bagrada hilaris*, is a serious pest of cruciferous crops, particularly mustard. Both nymphs and adults use their needle-like mouthparts to pierce plant tissues and suck sap from leaves, flowers, and developing pods. This feeding activity causes gradual wilting and drying of affected parts.

At the seedling stage, damage is severe, as sap feeding leads to stunted growth and plant death. Leaves of young plants often develop white patches at feeding sites. Depending on the plant species, age, and plant part attacked, the symptoms include leaf spotting, wilting, stunting, death of stem tips, excessive branching from the crown, and in severe cases, death of the entire plant.



Fig 3: Damage caused by Painted bug

Management Techniques

Monitoring

In the early stages of infestation, careful monitoring and scouting are essential. Farmers should inspect the base of cotyledons and young leaves, especially during warmer parts of the day, as painted bugs are most active in high temperatures. Early detection allows timely interventions and reduces the risk of widespread crop loss.

Cultural and Mechanical Methods

- Use of resistant varieties
- Planting of trap crops to divert pest infestation
- Manual removal and destruction of insects

Synthetic Pesticides

For immediate protection, fast-acting contact insecticides can be applied. For long-term control, systemic insecticides such as organophosphates and carbamates are more effective. Some recommended chemical options include:

- Bifenthrin
- Methomyl
- Chlorpyrifos
- Dinotefuran
- Malathion

Botanicals

Plant-derived products provide an eco-friendly and cost-effective option for small-scale farmers who may not afford synthetic pesticides. Oils and plant extracts can be processed locally and used effectively against *Bagrada hilaris*. Commonly used botanicals include:

- Neem (*Azadirachta indica*)
- Garlic (*Allium sativum*)
- Opium poppy (*Papaver somniferum*)
- Eucalyptus (*Eucalyptus spp.*)
- Turmeric (*Curcuma longa*)
- Lemongrass (*Cymbopogon citratus*)

Conclusion

The painted bug, *Bagrada hilaris*, is a highly destructive pest of mustard and other cruciferous crops. Although multiple management methods are available, the most effective strategy is the adoption of Integrated Pest Management (IPM). IPM not only reduces pest populations but also minimizes environmental contamination, ensuring sustainable crop production.

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