

Pest Alert

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Florida Department of Agriculture and Consumer Services
Division of Plant Industry

Bagrada bug (*Bagrada hilaris*) (Hemiptera: Pentatomidae) an Exotic Pest of Cruciferae Established in the Western USA

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INTRODUCTION: Bagrada bugs, *Bagrada hilaris* (Burmeister) (= *B. cruciferarum* Kirkaldy) showed up for the first time in the USA in California in June 2008. Since then, they have become more widespread in Southern California and have expanded their range into Arizona, where they are reported to be significant pests (Palumbo and Natwick 2010). Although Bagrada bugs are pests of Cruciferae, they are able to feed on other plants (Hill 1983).

DESCRIPTION: Bagrada bugs look very similar to the common harlequin bugs, *Murgantia histrionica* (Hahn) (Fig. 1), but are considerably smaller. The two species have similar biology. Look for small bugs about 3/16 of an inch long. The bugs are dark with a characteristic pattern of longitudinal lines. Nymphs are mainly dark with pale to dark red markings. Harlequin bugs, which are widespread in the USA, have a different pattern with perpendicular orange stripes. Both species can be found in large numbers on Cruciferae.

BIOLOGY: The bugs can complete several generations per year, depending on temperature (Hill 1983). Eggs are laid on seed pods, foliage, or soil surrounding young plants. Nymphs can be reared on India mustard seedlings. The egg stage lasts 3-6.2 days, depending on temperature. There are five nymphal instars. First – fourth instar immatures are orange after molting, but they darken with age. The fifth instar resembles the adult. The entire life cycle in the laboratory was completed in 38-65 days, depending on temperature. The average fecundity per female is 95 (range 36-173) eggs.

HOSTS: The main hosts of bagrada bugs are plants in the family Cruciferae, but they can infest other plants. Gupta and Gupta (1970) reported that at the Haryana Agricultural University, Hissar (northwest of New Dehli, India), the bugs were serious pests of pearl millet (*Pennisetum typhoides* (Burm.f.) Stapf & C.E. Hubb). All the cultivars of pearl millet were attacked. Some cultivars in a 60-cultivar trial were totally destroyed. The bugs also attacked green gram (*Phaseolus aureus* Roxb.) and black gram (*Phaseolus mungol* Roxb.). The infestation in variety plots had to be controlled. The bug also attacked the ratoon sugarcane crop (*Saccharum officinarum* L.), especially near the borders of the fields. There are reports of bagrada bugs as pests of maize (*Zea mays* L.) in Uttar Pradesh, India (Rizvi *et al.* 1986) and wheat (*Triticum aestivum* L.) in South Africa (Aalbersberg *et al.* 1989) and Madhya Pradesh, India (Rawat and Singh 1980). In South Africa, the bagrada bug infestation compromised the use of radish (*Raphanus sativus* L.) as a nurse crop for parasites of Russian wheat aphid (*Diuraphis noxia* (Mordvilko)), but the bug population subsided when the radishes were removed. In India, both adults and nymphs occurred on wheat (Aalbersberg *et al.* 1989). Only adults are shown in the photos. Adults apparently can feed on developing kernels, which would cause direct damage (Rawat and Singh 1980). Colazza *et al.* (2004) reported that bagrada bugs are pests of caper (*Capparis spinosa* L.) in Italy. In Arizona (Palumbo and Natwick 2010), adult bugs were found on lettuce, spinach, cantaloupes, sugarbeet and watermelons (*Citrullus lunatus* (Thunb.) Matsum. & Nakai), but there was no observed damage. Theoretically, the bugs could hitchhike on these plants, which can sustain adults but probably are not reproductive hosts.



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Adam H. Putnam, Commissioner



Figure 1. Bagrada bug (left) and harlequin bug (right). Bars represent 1 mm. Photographs courtesy of Joseph E. Eger, Dow AgroSciences.

ECONOMIC IMPORTANCE: This species is a major pest of cruciferous crops in the Old World and is reported to be a major pest in California and Arizona (Palumbo and Natwick 2010). In Arizona, they attacked both direct-seeded and transplanted broccoflower, broccoli, cabbage, cauliflower, Chinese cabbage, kale, collards (all *Brassica oleracea* L.), radish, rutabaga (*Brassica napus* L. var. *napobrassica* (L.) Rchb.), arugula (*Eruca vesicaria* (L.)), turnip (*Brassica napus* L.) and mustard (*Brassica juncea* (L.) Czern.) (Palumbo and Natwick 2010). Bagrada bugs are particularly damaging to small plants, which can wilt and desiccate. The bugs also can kill the apical meristem (Palumbo and Natwick 2010). Sometimes damaged cabbage and cauliflower plants did not produce marketable heads. Broccoli growers estimated 15-30% losses. The bugs overwintered on diakon (*Raphanus sativus* L. cv. 'longipinnatus') and turnip crops (Palumbo and Natwick 2010). In 2007, a serious outbreak in Kenya caused wide-spread losses (Anonymous 2007). India mustard (*Brassica juncea* (L.) Czern.) is planted in the fall as an oil seed crop in northern India (Lal and Singh 1993). Bagrada bugs attacked the young plants in the fall of 1992 and destroyed many fields. An outbreak on maize also was reported with 25-140 (presumably adult) bugs found per leaf. In Himachal Pradesh (India), the bug is a serious pest of cauliflower grown for seed (Verma *et al.* 1993).

NATURAL ENEMIES: There are several egg parasitoids reported, including some in the family Scellionidae (Ghosal *et al.* 2005; Mani and Sharma 1982). There also are tachinid parasites in the genus *Alophora* that emerge from the adult bugs (Crosskey 1976, Rakshpal 1950, 1954). Curiously, Rakshpal (1954) reported that the sex of the bug determines the sex of the tachinid parasitoid: male parasites come from male bugs, and female parasites come from female bugs.

DISTRIBUTION: South Asia, Middle East, Europe, East Africa, and USA (California and Arizona).

FLORIDA DISTRIBUTION: Not yet known to occur.

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