

Research Note

NEW REPORT OF A LEAF BEETLE PEST FROM NORTH AMERICA IN PUERTO RICO: *DIABROTICA BALTEATA* LE CONTE (COLEOPTERA: CHRYSOMELIDAE) AND ITS CHEMICAL CONTROL^{1,2}

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J. Agric. Univ. P.R. 92(1-2):119-122 (2008)

This research note reports the finding of *Diabrotica balteata* Le Conte (1865) (Coleoptera: Chrysomelidae) in Puerto Rico. First specimens were collected at the Lajas Agricultural Experiment Station (AES) (18°01'52"N and 67°04'33"W) 31 May 2006 from 'calabaza' (tropical pumpkin) plants (*Cucurbita moschata* Duchesne & Poir.). Adult specimens were sent to specialists Dr. E. Riley (Texas A&M) and Dr. S. Clark (Brigham Young University) for confirmation of identity. Voucher specimens are deposited at the Río Piedras AES Museum of Entomology and Tropical Biodiversity (P.R. Acc. No. 18-06).

Further collections have established the presence of this pest in Cabo Rojo and Guánica in southwestern Puerto Rico. In addition to being found in 'calabaza', adults have been collected while feeding on spiny amaranth (*Amaranthus spinosus* L.), watermelon (*Citrullus lanatus* (Thunb.) Matsum & Nakai), corn (*Zea mays* L.), mucuna (*Mucuna deerlingiana* (Bort) Merr.), black-eyed peas (*Vigna unguiculata* (L.) Walp.) and common beans (*Phaseolus vulgaris* L.). In cucurbits, feeding damage by adults seems to be confined to flowers, all of which concurs with observations elsewhere (Valverde et al., 1995).

Description: Adults are from 5 to 6 mm long, non-metallic grass green with five yellow spots in each elytron (Figure 1a). Antennae are dark except for first two segments. Head is reddish brown. Ventrally, head and metathorax are dark brown; prothorax green; mesothorax and abdomen light brown or yellow green. Male last ventrite abdomen is truncate, a characteristic typical of lupinine galerucines (Riley et al., 2002). Adults of *D. balteata* are easily recognizable from the native *Diabrotica graminea* Baly by their characteristic elytral spots, their lighter greenish color, and their smaller size. Both species are highly polyphagous with similar adult host ranges, and their larvae are damaging root feeders (Saba, 1970; Wolcott, 1948). *Diabrotica balteata* is also easily separated from other common local lupelines by the absence of vittae (*Acalymma* spp.), and by its greenish color, as opposed to reddish or orange in *Ceratoma ruficornis* (Olivier).

¹Manuscript submitted to the Editorial Board 13 September 2007.

²This research was funded, in part, by USDA/CSREES Tropical Subtropical Agricultural Research Special Grants Project TSTAR-94: "Screening tropical pumpkin and related spp. for melonworm resistance", by AES project C-415 "Insect Biodiversity in Puerto Rico" and by the USDA/CSREES Southern Pest Detection Network (SPDN) University of Puerto Rico Agricultural Experiment Station project Z-173. The authors want to thank anonymous reviewers and Drs. Riley and Clark for kindly identifying our specimens.

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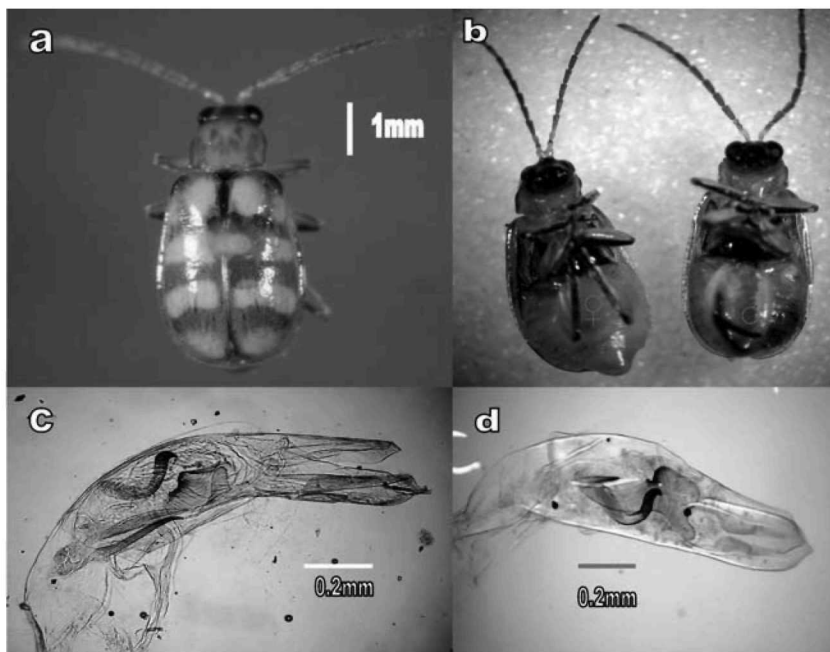


FIGURE 1. *Diabrotica balteata*. (a) dorsal view; (b) adult female (left) and male (right), ventral view; (c) aedeagus and sac, lateral view; (d) aedeagus and sac, dorsal view.

The banded cucumber beetle, *D. balteata*, is an economically important chrysomelid pest from North America. According to Saba (1970), the banded cucumber beetle is endemic to southern Arizona and Texas, but has aggressively spread throughout the southern United States, southward to Colombia and Cuba. Specimens from Hispaniola, collected by Dr. A. Pantoja, are deposited in the AES Museum of Entomology and Tropical Biodiversity thus indicating its presence on that neighboring island (unpublished).

Adult *D. balteata* feed on a very large variety of host plants, which include over 20 plant families, with pronounced feeding and oviposition preferences for economically important families, such as Cucurbitaceae, Convolvulaceae, Solanaceae, Leguminosae, Rosaceae, Cruciferae, and Compositae (Saba, 1970; Jackson et al., 2005). Adults are attracted to the blossoms of many cucurbit species, where they feed on nectar, pollen, flowers, and developing fruits (Hesler, 1998; Jackson et al., 2005). According to Capinera (1999), all parts of the plant are injured. Damage may occur on foliage, blossoms, silk, kernels, the plant crown, and roots. Larvae feed only on plant roots. The most frequent injuries are defoliation by adults, and root feeding on plant seedlings by larvae. Serious injury results from larval feeding on sweet potato roots, where larval feeding has been associated with increased incidence and severity of *Fusarium* wilt (Capinera, 1999). The pest is also an important vector of plant viruses in beans and peppers (Granillo et al., 1975; Valverde et al., 1995).

Control: We conducted preliminary tests to ascertain the efficacy of registered pesticides on *D. balteata* at the Lajas AES. Eight-week-old *Cucurbita moschata* line, 'PR

TABLE 1.—*Number of Diabrotica balteata adults per 20 sweeps per treatment on Cucurbita moschata (line 'PR shortvine') plots. Means followed by the same letter are not significantly different at $p \leq 0.05$ using Tukey's Studentized Range test.*

Treatment	Mean \pm S.E.	Group
permethrin	7.4 \pm 1.2	a
methomyl	10.2 \pm 1.2	ab
Pyrellin	12.6 \pm 0.9	bc
<i>B.t.</i> control	17.2 \pm 1.8	cd
azadirachtin	18.4 \pm 1.5	d

shortvine' plants were sprayed with permethrin (0.5 kg/ha); methomyl (0.5 kg/ha); azadirachtin (70% clarified hydrophobic extract of neem oil at 1.46 L/ha); Pyrellin EC⁶ (0.6% pyrethrins, 0.5% rotenone at 1.75 L/ha); and Dipel DF (*Bacillus thuringiensis* var. *kurstaki* at 1.2 kg/ha), which served as a control. This last pesticide was necessary to control melonworm *Diaphania hyalinata* L., a prevalent and serious pest of cucurbits in Puerto Rico. Treatments were arranged in a randomized complete block design with three replicate plots per pesticide. Each replicate plot consisted of two adjacent 18.3-m rows with approximately 120 plants per plot. To reduce the possibility of drift, we separated replicates by at least 9 m. A Solo 425 backpack sprayer (4.14 \times 10⁵ Pa) was used to apply chemicals.

Plots were sampled at 24 h, 72 h, and seven days after application. Sampling consisted of sweeping the plot lengthwise (20 sweeps) with a standard 38-cm net, between 10:00 and 11:00 am. The number of *D. balteata* adults within the sample was ascertained by counting, and beetles were returned to the plot immediately afterwards. The pesticide efficacy experiment was replicated within the same plots two weeks after the first application. ANOVA was used for testing differences between means. No significant differences were found among replications ($F = 2.96$; $p > 0.05$), or among sampling dates ($F = 0.24$; $p > 0.05$). Permethrin was the most effective pesticide tested, followed by methomyl and Pyrellin. Table 1 illustrates the results.

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⁶Mention of commercial products does not constitute an endorsement by the University of Puerto Rico or by the authors.

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