

Bean Plataspid: *Megacopta cribraria* (Fabricius) (Insecta: Hemiptera: Heteroptera: Plataspidae)¹

Ashley Poplin and Amanda Hodges²

Introduction

The bean plataspid, *Megacopta cribraria* (Fabricius), also known as the kudzu bug, lablab bug, and globular stink bug, is native to Asia. The bean plataspid was first reported in the United States in October 2009 (Eger et al. 2010). Before its detection, species of the family Plataspidae were not known to be in the Western Hemisphere. Aggregations were first detected on the outside of houses and surrounding vegetation in Georgia. Currently, the distribution of the bean plataspid in the US includes six southeastern states.



Figure 1. Adult bean plataspids, *Megacopta cribraria* (Fabricius), on a building in Georgia, USA. Notice the enlarged, truncated scutellum covering the wings.

Credits: Daniel R. Suiter, University of Georgia, <http://www.bugwood.org>

DNA data confirmed that the introduction of the bean plataspid to the United States occurred from a single female lineage originating in Japan (Jenkins and Eaton 2011). DNA from two endosymbionts (organisms that live within another organism) found in bean plataspids in the United States confirmed that the same endosymbionts are found in *Megacopta* sp. in Japan. The two endosymbionts are *Candidatus* Ishikawaella capsulata (gamma-proteobacterium in Enterobacteriales) and *Wolbachia* (alpha-proteobacterium in Rickettsiales) (Jenkins and Eaton 2011).

In Japan, there are two similar *Megacopta* species: *Megacopta punctatissima* and *Megacopta cribraria*. Older literature suggested that *Megacopta punctatissima* was a variety of *Megacopta cribraria*, but they are now recognized as two species (Eger et al. 2010). *Megacopta punctatissima* is a pest of soybean in mainland Japan. However, *Megacopta cribraria* is found on Japanese islands and is not known to be an agricultural pest there. These two species have the same morphological characteristics but do not possess the same gut symbiotic bacteria. The symbiotic bacteria of *Megacopta punctatissima* allows for digestion of legumes whereas the symbiotic bacteria of *Megacopta cribraria* does not. In the United States, bean plataspid populations possess gut symbiotic bacteria capable of breaking down legumes and are a pest of soybean and other legumes. Despite differences in behavior and symbiotic bacteria, the identification of *Megacopta cribraria* in the United States is

1. This document is EENY527, one of a series of the Department of Entomology and Nematology; UF/IFAS Extension. Original publication date June 2012. Revised April 2013 and September 2016. Reviewed July 2020. Visit the EDIS website at <https://edis.ifas.ufl.edu>. This document is also available on the Featured Creatures website at <https://entnemdept.ufl.edu/creatures/>.

2. Ashley Poplin, graduate student; and Amanda Hodges, SPDN assistant director in entomology and training/education; Department of Entomology and Nematology, UF/IFAS Extension, Gainesville, FL 32611.

confirmed by molecular characteristics previously reported in native regions.

Synonymy

Cimex cribraria Fabricius 1798

Tetyra cribraria Fabricius 1803

Thyreocoris cribrarius [sic] Burmeister 1835

Coptosoma cribrarius Fabricius 1843

Coptosoma xanthochlora Walker 1867

Megacopta cribraria Hsiao and Ren 1977

Distribution

Before the introduction of the bean plataspid to the United States, species of the family Plataspidae were confined to the Old World (Europe, Africa, and Asia). The native distribution of the bean plataspid includes Australia, China, India, Indonesia, Japan, Korea, Malaysia, Myanmar, New Caledonia, Pakistan, Sri Lanka, Taiwan, Thailand, and Vietnam (Eger et al. 2010).

During October 2009, specimens and photos of the bean plataspid from infested homes were submitted from various locations across northeast Georgia. The specimens and photos were identified by morphological characteristics and molecular, DNA-based diagnosis. After the initial discovery, the bean plataspid was reported from nine counties in northeast Georgia (Suiter et al. 2010b). By the following year, the bean plataspid was reported from 80 counties in Georgia and 16 counties from South Carolina (Jenkins and Eaton 2011). Currently, the bean plataspid is reported in the following states: Alabama, northern Florida, Georgia, South Carolina, North Carolina, and southern Virginia.

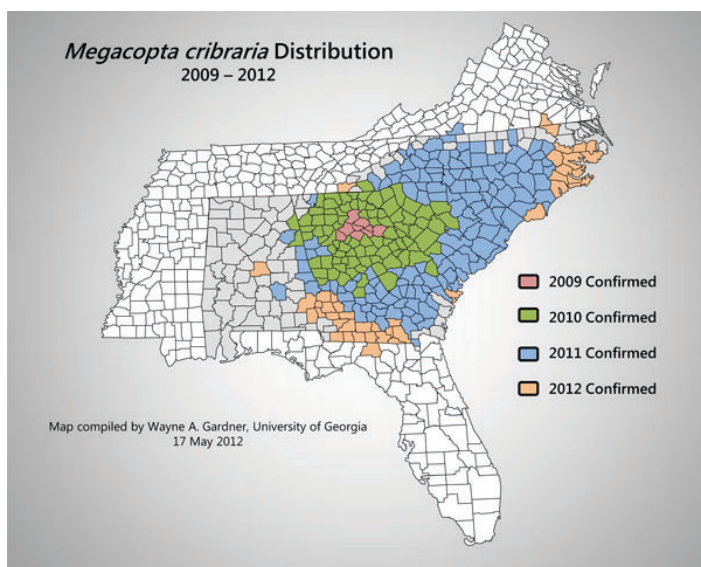


Figure 2. The current distribution of the bean plataspid, *Megacopta cribraria* (Fabricius), in the United States as of May 2012.

Credits: Wayne A. Gardner, University of Georgia

Description

Adults

The adults are small (3.5–6 mm) with a rounded oblong shape and live 23 to 77 days. The dorsal side of the insect is covered in numerous dark punctations and is typically light brown to olive green in color. The scutellum (posterior plate along the dorsal side of the thorax) is enlarged and covers the forewings and most of the abdomen—this is characteristic of plataspids, as well as scutellerids (shield-back bugs) and thyreocorids. More common stink bugs tend to have a triangular shaped scutellum. The scutellum is also truncated with a flattened posterior end, a characteristic unique to this species when compared to other stink bugs in North America. The most distinguishing characteristics of the bean plataspid include its size, two-segmented tarsi, and enlarged, truncated scutellum (Eger et al. 2010).

Eggs

Each egg mass has 26 to 274 eggs. The eggs tend to be a pale salmon color with dark bands intermediately spaced in a horizontal direction. The eggs are elongate and have a truncated ring of rugged projections at one end. Along with the eggs, females also deposit dark capsules underneath the eggs. These dark capsules are filled with endosymbionts (bacteria) that immature insects consume for nutritional development.



Figure 3. Egg mass of the bean plataspid, *Megacopta cribraria* (Fabricius), in a laboratory setting. Note the dark regions in the middle where the two rows of eggs meet—these dark regions are filled with endosymbionts.

Credits: Paul Smith, University of Georgia, www.bugwood.org.

Nymphs

This species has five nymphal instars. Each nymphal instar takes two to 56 days to develop. Nymphs have a hairy appearance and vary in color but tend to be pale orange, olive green, or light brown.



Figure 4. Multiple early instar nymphs of the bean plataspid, *Megacopta cribraria* (Fabricius), on kudzu, *Pueraria montana* var. *lobata* (Willd.) Maesen & S. Almeida.

Credits: John Ruberson, University of Georgia, <http://www.bugwood.org>

Life Cycle

In its native habitat, there are up to three generations of the bean plataspid per year (Eger et al. 2010, Halbert and Eger 2010). The insect colonizes from April to July, forming large mating aggregations, and continues to be present until October. However, the bean plataspid may be active all year in warmer climates (Eger et al. 2010). As they go through reproductive diapause, adults overwinter on nearby buildings and structures, leaf litter, or under the bark of trees.

Hosts

The primary hosts of *Megacopta cribraria* in its native regions are legumes (Fabaceae): mainly soybean, *Glycine max* Merrill; kudzu, *Pueraria montana* var. *lobata* (Willd.) Ohwi; and lablab bean, *Lablab purpureus* (Linnaeus) Sweet. *Megacopta cribraria* is reported to develop only on soybean and kudzu in the United States. The adults and nymphs feed on the leaves, stem, flower, and pod of the host plant (Eger et al. 2010, Jenkins and Eaton 2011).

Table 1 is a list of observed hosts of *Megacopta* spp. from past literature. Although additional plants other than legumes are listed, it is not confirmed if these plants are used as developmental hosts or if individual adults were observed simply perched on these plants.

Economic Importance

In its native regions, *M. cribraria* is not an agricultural pest. However in the United States, the bean plataspid is reported to be a pest of soybean in Georgia and South Carolina. The nymphs and adults congregate in high numbers and feed on the underside of leaves and the stem of the plant. Feeding

damage results in abnormal pod development and necrotic areas on the plant.

Adults from established bean plataspid populations within the United States are reported to overwinter on light colored structures, in leaf litter and underneath the bark of trees. These insects are attracted to light colored surfaces, predominately white and yellow (Horn and Hanula 2011). Also, like stink bugs, adults tend to excrete an odor as a defense mechanism when disturbed. The defense chemical these insects secrete may stain the surface of the house, building, or vehicle where aggregation occurs.

[Click here to view an infestation of bean plataspid in Georgia.](#)



Figure 5. Infestation of adult bean plataspids, *Megacopta cribraria* (Fabricius), on soybeans, *Glycine max* (L.) Merr., in Georgia, USA. Credits: Philip Roberts, University of Georgia, <http://www.bugwood.org>

Survey and Management

Horn and Hanula (2011) are developing monitoring traps using light colors to attract adult specimens. These monitoring traps may be a good tool to survey for bean plataspid. Sweep netting and hand-picking, although time consuming, are also good methods for surveying. For more information about surveying in your area, contact your local UF/IFAS Extension agent.

Pyrethroids may be effective for temporary control. Contact your local UF/IFAS Extension agent for proper pest treatment methods.

As this insect moves from overwintering sites in search of food, the bean plataspid may become a nuisance pest in and around structures. Homeowners should ensure screening is placed over possible entries points of insects and that windows and doors are tightly sealed.



Figure 6. Infestation of adult bean plataspids, *Megacopta cribraria* (Fabricius), on corn, *Zea mays* L., near Athens, Georgia, US. A grasshopper is in the upper right corner.

Credits: Jeremy Greene, Clemson University, <http://www.bugwood.org>



Figure 7. Infestation of adult bean plataspids, *Megacopta cribraria* (Fabricius), on a house in Georgia, US. *Megacopta cribraria* have an overwintering stage during their life cycle and tend to swarm to nearby buildings prior to the overwintering period.

Credits: Daniel R. Suiter, University of Georgia, <http://www.bugwood.org>

Acknowledgements

The authors extend their appreciation to Wayne A. Gardner of the University of Georgia for his review of this publication.

Selected References

Akin S, All J, Allen C, Boerma R, Buntin D, Cardinal A, Catchot A, Chen P, Clough S, Cook D, Davis J, Dively G, Greene J, Herbert A, Herbert J, Heitholt J, Jones W, Leonard R, Lorenz G, Miranda L, Musser F, Reed T, Reisig D, Roberts P, Smith R, Stewart S, Way M. (May 2011). [A strategy for prioritizing research goals and outreach plans to reduce soybean production losses caused by stink bugs and related insect pests](#). SoyBase and the Soybean Breeder's Toolbox. (13 February 2023)

Eger Jr JE, Ames LM, Suiter DR, Jenkins TM, Rider DA, Halbert SE. 2010. Occurrence of the Old World bug *Megacopta cribraria* (Fabricius) (Heteroptera: Plataspidae) in Georgia: A serious home invader and potential legume pest. *Insecta Mundi* 0121: 1–11.

FDACS. (August 2011). Field Crops. pp. 30–41, [In 2011 - Florida agriculture by the numbers](#). Florida Department of Agriculture and Consumer Services. (13 September 2016)

Halbert S, Eger Jr JE. (March 2010). [Bean plataspid, *Megacopta cribraria* \(Fabricius\) \(Hemiptera: Plataspidae\) an exotic legume pest established in Georgia](#). FDACS-Division of Plant Industry. (13 September 2016)

Horn S, Hanula JL. 2011. Influence of trap color on collection of the recently-introduced bean plataspid, *Megacopta cribraria* (Hemiptera: Plataspidae). *Journal of Entomological Science* 46: 85-87.

Jenkins TM, Eaton TD. 2011. Population genetic baseline of the first plataspid stink bug symbiosis (Hemiptera: Heteroptera: Plataspidae) reported in North America. *Insects* 2: 264-272.

Jenkins TM, Eaton TD, Suiter DR, Eger Jr JE, Ames LM, Buntin GD. 2010. Preliminary genetic analysis of a recently-discovered invasive true bug (Hemiptera: Heteroptera: Plataspidae) and its bacterial endosymbiont in Georgia, USA. *Journal of Entomological Science* 45: 1-2.

Suiter DR, Eger Jr JE, Gardner WA, Kemerait RC, All JN, Roberts PM, Greene JK, L. Ames M, Buntin GD, Jenkins TM, Douce GK. 2010a. Discovery and distribution of *Megacopta cribraria* (Hemiptera: Heteroptera: Plataspidae) in northeast Georgia. *Journal of Integrated Pest Management* 1: 1-4.

Suiter DR, Ames LM, Eger Jr JE, Gardner WA. (September 2010b). [Megacopta cribraria as a nuisance pest](#). Urban

Table 1. Hosts of *Megacopta* spp. (Eger et al. 2010)

Family	Common Name	Scientific Name
Acanthaceae	firecracker plant	<i>Crossandra infundibuliformis</i> (Linnaeus) Nees
Convolvulaceae	sweet potato	<i>Ipomoea batatas</i> (Linnaeus) Lamarck
Fabaceae	agathi	<i>Sesbania grandiflora</i> (Linnaeus) Pers.
Fabaceae	azuki bean	<i>Vigna angularis</i> (Willd.) Ohwi and Ohashi
Fabaceae	bean	<i>Phaseolus</i> spp.
Fabaceae	broad bean	<i>Vicia faba</i> Linnaeus
Fabaceae	Chinese milk vetch	<i>Astragalus sinicus</i> Linnaeus
Fabaceae	cluster bean	<i>Cyamopsis tetragonoloba</i> (Linnaeus) Taubert
Fabaceae	Indian beech tree	<i>Millettia pinnata</i> (Linnaeus) Pierre
Fabaceae	indigo	<i>Indigofera</i> sp.
Fabaceae	kidney bean	<i>Phaseolus vulgaris</i> Linnaeus
Fabaceae	kudzu	<i>Pueraria montanavar.lobata</i> (Willd.) Ohwi
Fabaceae	lablab bean	<i>Lablab purpureus</i> (Linnaeus) Sweet
Fabaceae	lespedeza	<i>Lespedeza cyrtobotra</i> Miquel
Fabaceae	lima bean	<i>Phaseolus lunatus</i> Linnaeus
Fabaceae	mung bean	<i>Vigna radiata</i> (Linnaeus)
Fabaceae	pigeon pea	<i>Cajanus indicus</i> Spreng
Fabaceae	soybean	<i>Glycine max</i> Merrill
Fabaceae	urd-bean	<i>Vigna mungo</i> (Linnaeus) Hepper
Fabaceae	velvet bean	<i>Mucuna pruriens</i> (Linnaeus)
Fabaceae	vetch	<i>Vicia angustifolia</i> Linnaeus
Fabaceae	wisteria	<i>Wisteria brachybotrys</i> Siebold et Zuccarini
Hydrangeaceae	deutzia	<i>Deutzia crenata</i> Siebold and Zuccarini
Malvaceae	cotton	<i>Gossypium hirsutum</i> Linnaeus
Malvaceae	jute	<i>Corchorus capsularis</i> Linnaeus
Moraceae	white mulberry	<i>Morus alba</i> Linnaeus
Oleaceae	Chinese privet	<i>Ligustrum sinense</i> Loureiro
Poaceae	rice	<i>Oryza sativa</i> Linnaeus
Poaceae	sugarcane	<i>Saccharum officinarum</i> Linnaeus
Poaceae	wheat	<i>Triticum aestivum</i> Linnaeus
Rutaceae	citrus	<i>Citrus</i> spp. Linnaeus
Solanaceae	horsenettle	<i>Solanum carolinense</i> Linnaeus
Solanaceae	potato	<i>Solanum tuberosum</i> Linnaeus