Discovery and Distribution of *Megacopta cribraria* (Hemiptera: Heteroptera: Plataspidae) in Northeast Georgia


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**ABSTRACT.** In October 2009, large aggregations of *Megacopta cribraria* (F.) (Hemiptera: Plataspidae) were discovered on outside, perimeter walls of houses in northeast Georgia, prompting homeowners to contact county Extension agents and pest management professionals to learn more about the insect and to rid the premises of the nuisance. The insect was flying from nearby patches of kudzu (*Pueraria* spp.) onto houses, presumably in an attempt to locate overwintering sites. In its native Asia, one of its preferred hosts is kudzu, an invasive, leguminous vine that now grows throughout the southeastern U.S. Before discovery in Georgia, *M. cribraria* was unknown from the New World. In addition to its emergence as a nuisance pest, *M. cribraria* has been reported as a pest of numerous legume crops in Asia, including soybean, *Glycine max* Merrill. As of August 9, 2010, *M. cribraria* was known from 48 counties in northeast Georgia and 13 counties in northwest South Carolina. In late June and early July 2010, *M. cribraria* was found on soybeans in 20 of the 48 Georgia counties and five counties in South Carolina.

**Key Words:** *Megacopta cribraria*; Plataspidae; soybean; *Glycine max*; kudzu

*Megacopta cribraria* (F.) (Hemiptera: Heteroptera: Plataspidae) was discovered in northeast Georgia in October 2009, and is the first report of this insect in the Western Hemisphere. *M. cribraria* was first deemed a nuisance pest because it aggregated on houses; yet, it is a potential pest of several agronomically important legume crops, including soybean, *Glycine max* Merrill. Eger et al. (2010) provides the most recent review (including 82 references) of *M. cribraria* biology, host range, distribution, and taxonomy, and will not be repeated herein. Briefly, however, *M. cribraria* is native to Asia where its preferred host is kudzu (*Pueraria* spp.), a legume. It is considered a minor-to-major pest of numerous legume crops in Asia. In the United States it is likely to continue to be a nuisance pest in areas where kudzu grows in proximity to human residences and other structures. Although its status as a crop pest has not yet been determined in the U.S., *M. cribraria* was found infesting soybeans in northeast Georgia and northwest South Carolina during late June and early July 2010.

**Discovery and Identification of *M. cribraria* in Georgia**

In mid- to late-October 2009, county agents from Barrow, Jackson, and Gwinnett Counties with the Georgia Cooperative Extension Service (University of Georgia’s College of Agricultural and Environmental Sciences) and employees from several independent pest management firms in northeast Georgia filed numerous reports with the University of Georgia’s Homeowner Insect and Weed Diagnostics Laboratory (Griffin Campus, Griffin, GA) regarding large numbers of insects that had aggregated on the outside walls of houses. On October 28, 2009 J. E. Eger recognized the insect as a plataspid (Hemiptera: Plataspidae), a family not known previously from the New World. Eger subsequently visited a site in Hoschton, GA (Jackson County) and reported thousands of the insects on two houses, surrounding vegetation, and nearby vehicles (Fig. 1A and B). He also reported, among other vegetation in the vicinity, a field of kudzu several dozen meters from the houses. Sweep-netting and beating the kudzu foliage and vines yielded large numbers of adults and some late-instar nymphs. Eger speculated that the insects aggregating on the structures had developed on kudzu and, as is typical of some stink bugs, were seeking overwintering sites as north Georgia temperatures were beginning to decline.

Kudzu is a common leguminous vine found across the southeastern U.S. It was imported into the U.S. from Asia >100 yr ago (Guertin et al. 2008, Forseth and Innis 2004). Its dense vines and root system were introduced into erodible areas to prevent soil erosion on sloped grades. Unfortunately, kudzu is an invasive weed, outcompetes native vegetation, and grows unimpeded throughout the southeastern U.S.

Eger, in conjunction with several other specialists (T. J. Henry, D. A. Rider, S. E. Halbert; see Acknowledgments), identified the insect as *M. cribraria* (Eger et al. 2010). Voucher specimens were deposited in the Florida State Collection of Arthropods (Gainesville, FL) and the United States National Museum of Natural History (Washington, DC). The insect’s identification was confirmed genetically by Jenkins et al. (2010). At the time of its discovery, *M. cribraria* was unknown from the New World. Adult *M. cribraria* are 4–6 mm anterior to posterior, oval shaped (broader posteriorly than anteriorly), and have greenish-brown forewings (Fig. 2).

**M. cribraria** is a Nuisance Pest

As a nuisance pest, *M. cribraria* adults apparently fly from nearby patches of kudzu onto warm, south and east facing walls of structures while presumably in the process of seeking a secluded location to overwinter (Fig. 3). When numerous, the bug readily flies to and lands on people and vehicles, especially light-colored surfaces. *M. cribraria* produce a mildly offensive odor when disturbed.

In October 2009, the numbers on houses were high enough to prompt property owners to seek relief by contacting professional pest management companies and/or report the incidents to county Extension agents in an effort to educate themselves. Some pest management firms reported bugs so numerous that they altered the property owner’s desire to spend time outdoors in areas where this pest was found. Typical control attempts by pest management professionals consisted solely of sprays (mostly pyrethroid insecticides) to the outside perim-
eter of infested houses (personal communication with numerous pest management professionals).

**Regulatory Action After Discovery of *M. cribraria***

Within days of identification, the Georgia Department of Agriculture was notified of the insect’s presence. On November 3, 2009, a meeting was convened at the Barrow County Cooperative Extension Office and was attended by members of the University of Georgia’s Entomology Department, the Georgia Cooperative Extension Service, the Georgia Department of Agriculture, and the United States Department of Agriculture (APHIS-PPQ). The goal was to educate the group on the discovery, presence and known distribution of the insect in northeast Georgia. Two Pest Alerts were subsequently produced and released (www.gabugs.uga.edu). One was designed for and sent specifically to each county Extension office in Georgia. The second Alert was designed for and sent specifically to 700–900 professional pest management firms by the Georgia Pest Control Association (www.gpca.org) and the Certified Pest Control Operators of Georgia (www.cpcoofga.com). The Alerts also were sent to extension and research faculty and other personnel with responsibilities associated with soybeans in Georgia and several surrounding states. Both Alerts were released November 5, 2009. The intent of the Alerts was to generate feedback on the insect’s distribution by asking county Extension agents and pest management professionals to report encounters with *M. cribraria*. We also asked that individuals sample patches of kudzu in their area and report the bug’s presence if found.

On November 12, 2009, a teleconference was convened by the USDA-APHIS-PPQ, and included participants from APHIS-PPQ (state and regional), the Georgia Department of Agriculture, several members of the University of Georgia’s Entomology Department, and J. E. Eger, Jr. The intent of the teleconference was to communicate to

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**Fig. 1.** (A) In mid- to late-October 2009, large numbers of *M. cribraria* were found congregating on the outside walls of houses. (B) *M. cribraria* congregating in the corner of a window frame on the outside of a house in Hoschton, GA on 3 November 2009. (D. R. Suiter)

**Fig. 2.** Adult *M. cribraria* are 4–6 mm anterior to posterior, oval shaped, and with greenish-brown forewings. (J. E. Eger, Jr.)
APHIS-PPQ and the Georgia Department of Agriculture the current status and distribution of *M. cribraria* in Georgia. Before the meeting, APHIS-PPQ had produced an internal report that summarized the literature and commented on *M. cribraria* in Georgia. The report highlighted several immediate needs:

a. Develop a list of host preferences for *M. cribraria* in the U.S.;

b. Delimit *M. cribraria*’s distribution, spread, and ability to overwinter in the U.S.;

c. Determine impacts of *M. cribraria* on other potential hosts in the U.S.; and
d. Initiate research on the biological and chemical control of *M. cribraria*.

**Distribution of *M. cribraria***

The current (August 9, 2010), known distribution of *M. cribraria*, as reported herein, was assimilated from reports from county Extension agents and professional pest management firms in response to the Pest Alerts, from R. C. Kemerait who surveyed for *M. cribraria* while surveying for soybean rust (*Phakopsora pachyrhizi*) in sentinel patches of kudzu and soybean fields throughout Georgia during the fall of 2009 and spring of 2010, and from various scientists and specialists from the University of Georgia and Clemson University (Fig. 4).

By 1 December 2009, *M. cribraria* had been reported from nine counties in northeast Georgia, including Barrow, Clarke, DeKalb, Gwinnett, Hall, Jackson, Oconee, Oglethorpe, and Walton (Fig. 4, dark blue). By August 9, 2010, *M. cribraria* were reported from 39

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**Fig. 3.** As a nuisance pest, *Megacopta cribraria* apparently moves from patches of kudzu (foreground) to east- and south-facing walls (background) of nearby structures, presumably in an attempt to find overwintering sites. (D. R. Suiter)

**Fig. 4.** State map of Georgia showing the estimated distribution of *M. cribraria* as of August 9, 2010 from 48 northeast Georgia counties. (W. A. Gardner)

**Fig. 5.** In late June and early July 2010, *M. cribraria* was found on soybeans in 20 counties in northeast Georgia and five counties in northwest South Carolina. (A) Infestations ranged from 0 to 50+ bugs per plant. (B) Adult bugs were concentrated on the main stem, most commonly near main stem nodes; bugs were not seen feeding on blooms. (C) Female bugs oviposited primarily on the underside of soybean leaves. (J. K. Greene)

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additional counties (Fig. 4, orange), bringing the total number of counties with confirmed presence of the bug in Georgia to 48. Those counties that have been surveyed but have not yielded any plataspids are also noted in Fig. 4 (gray and light blue).

In the spring of 2010, *M. cribraria* was found in numerous locations within the original counties where it was found (Fig. 4). In Gainesville, GA (Hall County) there were 526 hours of temperatures at or below freezing between October 1, 2009 and March 30, 2010 (Georgia Automated Environmental Monitoring Network 2010). For the same dates and at the same location the number of hours at or below freezing for the three previous periods was 460 (2008–2009), 262 (2007–2008), and 257 (2006–2007). Clearly, *M. cribraria* exhibits some degree of cold tolerance.

**M. cribraria on Soybeans in June 2010**

*M. cribraria* was found on soybean plants during the last week of June through July 21, 2010 in 20 counties in Georgia (Banks, Burke, Elbert, Franklin, Glascock, Greene, Hart, Jasper, Jefferson, Oconee, Oglethorpe, Madison, Morgan, Newton, Putnam, Richmond, Walton, Warren, Washington, and Wilkes; Fig. 4, solid black circles) and an additional five counties in South Carolina. Infestations in South Carolina were adjacent to infested areas in Georgia. Infestations in Oconee County, GA, were at the University of Georgia Plant Sciences Farm on different soybean breeding lines and commercial varieties. Adults were found on recently germinated soybean, but high numbers (50+ adults per plant) were present on many vegetative and blooming soybean plants (Fig. 5A). Adults, eggs, and young nymphs were observed on soybean with adults concentrated on the main stem, most commonly near main stem nodes (Fig. 5B and C). Adults were observed feeding and defecating on plants, but there was no apparent injury, at least within the first few days of observation of the infestations. Plants with 50+ adults had no apparent damage and appeared the same as soybean plants with no insects. No adults or feeding damage were observed on blooms (Fig. 5B). All soybean research plots were infested, but some fields had much higher insect numbers than others, despite no kudzu being within sight of the plantings. An edge effect within infested fields was apparent in many areas, with highest concentrations of *M. cribraria* in the outside rows, but infested plants occurring throughout those fields. Observations 5 and 7 days later revealed adults more commonly observed on the underside of expanded leaves in addition to their presence on stems.

**Future Efforts**

Since its discovery and identification in northeast Georgia in October 2009, *M. cribraria* has been detected in 48 Georgia counties and 13 South Carolina counties. It was first found infesting soybean plants in Georgia in late June and has since been recovered from soybean in 20 Georgia counties and five South Carolina counties. Although its potential dispersal and successful establishment beyond this area is unknown, it clearly has some cold tolerance and can overwinter in northern Georgia. Given its propensity to fly and to land on and get inside vehicles we believe *M. cribraria* will continue to spread into most areas where kudzu is established. Furthermore, kudzu grows along many Georgia waterways and railways, thus providing potential conduits for further distribution of the insect.

In light of the discovery of *M. cribraria* on soybean in the summer of 2010, research is needed to determine *M. cribraria*’s pest status on soybean as well as other leguminous crops. As noted in Eger et al. (2010) and by the APHIS-PPQ in their internal report, future research efforts should include continued surveillance to further delineate the distribution and spread of *M. cribraria*, the screening of various legume crops for susceptibility, quantification of damage caused by various pest densities on susceptible crops and plants, and the development of efficacious methods of management, including ecological, chemical, and biological tactics.

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