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Acizzia jamatonica (Hemiptera: Psyllidae) and Bruchidius terrenus (Coleoptera: Chrysomelidae: Bruchinae): Additional U.S. Records of Asian Specialists on Mimosa (Albizia julibrissin; Fabaceae)

A. G. Wheeler, Jr.1 and E. Richard Hoebeke2

Abstract

Previously published U.S. records are reviewed for two recently detected Asian insects that have become established on mimosa, or silk tree (Albizia julibrissin), in the southeastern United States: Acizzia jamatonica (Kuwayama) (Hemiptera: Psyllidae) and Bruchidius terrenus (Sharp) (Coleoptera: Chrysomelidae: Bruchinae). The psyllid is newly recorded from Illinois, Indiana, Kentucky, Missouri, and Virginia and the bruchine chrysomelid from Illinois, Kentucky, Missouri, and Virginia. Both immigrant insects can be considered either detrimental or beneficial additions to the U.S. fauna, depending on whether mimosa is regarded as a desirable ornamental or an invasive plant. New and previously published records of both species are mapped.

Mimosa, or silk tree (Albizia julibrissin Durazz.; Fabaceae), native to temperate Asia (Everett 1981), was introduced into North America as an ornamental in the eighteenth century. Although 1745 often is cited as the date of introduction, the plant apparently was introduced by André Michaux about 1785 (Spongberg 1990, Cothran 2004). Mimosa was common in colonial American gardens (Leighton 1976), has long been a prized ornamental in southern U.S. landscapes (Spongberg 1990; Cothran 2003, 2004), and more recently has become a popular landscape plant in New York City (Everett 1981).

Several Old World scale insects that include mimosa in their broad range of hosts (Miller and Davidson 2005, Ben-Dov et al. 2012) became established in the United States in the late nineteenth or early twentieth century (Miller et al. 2005). The first Palearctic insect to feed extensively on mimosa in the New World was the mimosa webworm (Homadaula anisocentra Meyrick; Galacticidae), which was detected in Washington, DC, in 1940 (Clarke 1943). Nearly 65 years passed before Asian mimosa-specialist insects were recorded from the United States. Between 2007 and 2009, three Asian species were found in southeastern states: the psyllid Acizzia jamatonica (Kuwayama) in Georgia (Halbert 2007, Ulyshen and Miller 2007); the buprestid Agrius subrobustus Saunders in Georgia (Westcott 2007); and the bruchine chrysomelid Bruchidius terrenus (Sharp) in Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee (Hoebeke et al. 2009). Bruchidius terrenus was observed in the Athens, Georgia, area as early as 2001, but only later was identified (Chang et al. 2011). No definite additional U.S. records of B. terrenus are available, although reference to “bruchid beetle predation” on mimosa at Pittsburgh, Pennsylvania (Chang et al. 2011), might refer to this species. Subsequent records for the psyllid are Alabama, Florida, Mississippi, North Carolina, South Carolina, and

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Tennessee, as well as 19 additional counties in Georgia (Wheeler and Hoebeke 2009). Currently, *Agrilus subrobustus* has been documented from Alabama and South Carolina and 11 more counties in Georgia (Hoebek and Wheeler 2011) and mimosa confirmed as its larval host in the Southeast (Hansen et al. 2012). Here we extend the known Nearctic range of *Acizzia jamatonica* to Illinois, Indiana, Kentucky, Missouri, and Virginia and that of *B. terrenus* to Illinois, Kentucky, Missouri, and Virginia.

All specimens listed below were collected (AGW) in 2012 by beating branches of mimosa. Voucher specimens are deposited in the University of Georgia Collection of Arthropods, Athens, GA, and National Museum of Natural History, Smithsonian Institution, Washington, DC.


**Discussion**

When surveys were initiated for the three Asian insects detected recently on mimosa in southeastern states, they already were too widely established to suggest likely U.S. points of entry. The insects might have entered multiple times at southeastern maritime ports such as Charleston or Savannah, or inland at a major airport such as Hartsfield-Jackson in Atlanta. Their initial establishment might not necessarily have been near port cities, but elsewhere with the transport of infested cargo from ports of entry (Hoebek and Wheeler 2011). In any case, an initial establishment of the Asian insects in the U.S. Southeast seems likely (Wheeler and Hoebeke 2009, Hoebek and Wheeler 2011), owing not only to the prevalence of mimosa in landscape plantings but also such extensive naturalization (Elias 1989, Pardini 2006) that the tree can be considered invasive (Miller 2003, Pardini and Hamrick 2008). Detection of *A. jamatonica* in Europe (Alma et al. 2002) and the United States (Halbert 2007, Ulyshen and Miller 2007) in the first decade of the twenty-first century suggests its recent establishment (last 10–15 years). A similar time frame for detection of *B. terrenus* in Europe (Stojanova 2010) and the United States (Hoebek et al. 2009, Chang et al. 2011), as well as the buprestid in the United States (Hoebek and Wheeler 2011), also supports a hypothesis of recent introduction.

*Acizzia jamatonica* and *B. terrenus* currently can be collected from mimosa in most areas of Alabama, Georgia, and South Carolina and are established in
several other states (Wheeler and Hoebeke 2009; Hoebeke et al. 2009; AGW, pers. obs.), including regions such as western Tennessee where neither species was recorded during previous surveys. Based on fieldwork in 2012, both species now are established in western Kentucky, southern Illinois and Missouri, and western Virginia; the psyllid also is reported herein from southern Indiana. Even though these five states were not included in our prior surveys, both insects might have spread north and west since our initial surveys. In contrast, the immigrant buprestid, *A. subrobustus*, was not found in 2012 in any of the five additional states. The large psyllid densities and host injury (foliar chlorosis and premature defoliation) now prevalent in the Southeast were not observed in more northern and western populations where mimosa trees, though naturalized and sometimes common in southern parts of Illinois, Indiana, and Missouri (McClain et al. 2012), probably are less abundant than in southeastern states. In 2012, the psyllid was found in Missouri at only one site, whereas the chrysomelid was detected at three additional sites in the state. Neither the psyllid nor chrysomelid was detected in Illinois north of Richland County, which is near the northern limit of mimosa’s naturalization in the state (McClain et al. 2012). The known extent of the two Asian insects’ U.S. establishment is 38° north latitude and –90° (*A. jamatonica*) or –91° west longitude (*B. terrenus*).
Because our earlier surveys, as well as fieldwork in 2012, were limited and not conducted systematically, the U.S. distribution of both adventive insects probably is more extensive than currently known.

Ulyshen and Miller (2007) noted that the newly detected psyllid *A. jama-tonica* might be regarded as posing a threat to mimosa culture by those who value the plant as an ornamental, but potentially beneficial as a biocontrol agent by those who consider mimosa an undesirable non-native species. Similarly, the other two recently detected Asian insects can be considered either useful or detrimental additions to the North American fauna. In areas of the eastern United States where mimosa is less common and has become little naturalized, the three Asian immigrant insects seem more likely to be viewed as potentially harmful to an ornamental that lends an exotic touch to the landscape. Regardless of how the presence of mimosa and its immigrant insects are perceived in the United States, the New World reassociation of this Asian plant with several of its native herbivores, as noted by Chang et al. (2011), provides an opportunity to assess ecological and evolutionary changes in a novel environment.

Figure 2. County-level distribution of the Asian bruchine chrysomelid *Bruchidius terre-nus* in the United States. New records: black; previous records: grayscale.
Literature Cited


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