

STEPHANITIS BLATCHLEYI (HEMIPTERA: TINGIDAE): FIRST HOST-PLANT ASSOCIATION FOR A RARELY COLLECTED LACE BUG

A. G. WHEELER, JR.¹ AND CRAIG A. STOOPS²

¹School of Agricultural, Forest, and Environmental Sciences, Clemson University, Clemson, SC 29634-0310, USA

²3721 Mill View Ct., Orange Park, FL 32065

*Corresponding author; E-mail: awhlr@clemson.edu

Supplementary material for this article in the Florida Entomologist 96(2) (2013) is online at <http://purl.fcla.edu/fcla/entomologist/browse>

Four species of the lace bug genus *Stephanitis* Stål (Hemiptera: Tingidae) are found in North America (Froeschner 1988). *Stephanitis pyrioides* (Scott) and *S. takeyai* Drake & Maa are Asian immigrants thought to have been introduced into the United States with shipments of nursery stock. Although *S. rhododendri* Horváth was described from Europe and once was considered to have been similarly introduced into the eastern United States from the Palearctic Region, it might be native to North America. As pests of ornamental azaleas, rhododendrons, and other ericaceous plants (Ericales: Ericaceae), all three lace bugs have been the subject of numerous biological studies (Neal & Schaefer 2000).

In contrast to the other species of *Stephanitis* in North America, *S. blatchleyi* Drake apparently is precinctive to Florida and seldom has been mentioned in the literature. Following its description by Drake (1925) from Dunedin (Pinellas County), Blatchley (1926) provided the only information on bionomics, noting that he collected the lace bug at Dunedin (mid-Feb to mid-Apr) by beating Spanish moss, sweeping plants at the edge of a hammock and foliage along the bay front, and sifting at the bases of grass clumps. No host plants are known (Drake & Ruhoff 1965; Mead 1967), and only a few additional Florida records (county level) have been published: Alachua, Hillsborough, and Polk (Mead 1967). The Florida State Collection of Arthropods, Gainesville (FSCA), has 5 specimens of *S. blatchleyi*: Alachua Co., 15-III-1946 (1), Putnam Co., 12-IV-1988 (1); Sarasota Co., North Port, 22-III-1989 (2); and Sanford (Seminole Co.), 15-III-1926 (1). The U.S. National Museum, Smithsonian Institution (USNM), has 10 specimens: 2 from Dunedin (1 from the type series and another collected later); duplicates from Putnam Co. (1) and Sanford (5); and new records from Hudson (Pasco Co.), 13-VII-1938 (1) and Naples (Collier Co.), 8-X-1938 (1).

Here we give the first host-plant record for *S. blatchleyi* and a new county record. We also describe our efforts to collect the lace bug elsewhere in peninsular Florida. Voucher specimens from our fieldwork are deposited in the FSCA and USNM.

A pdf file with supplementary material for this article – including color photographs (Suppl. Figs. 1-4) – is available in Florida Entomologist 96(2) (2013) online at <http://purl.fcla.edu/fcla/entomologist/browse>.

On 11 Dec 2007, we encountered an unfamiliar species of *Stephanitis* (Suppl. Fig. 1) in the Jennings State Forest, ca. 8.5 km north of Middleburg (Clay Co.); 2 last-instar nymphs (Suppl. Fig. 2), 8♂, and 1♀ were beaten from rusty lyonia, *Lyonia ferruginea* (Walt.) Nutt. (Ericaceae), along the Fire and Water Nature Trail (N 30°08.482'W 81°53.246'; ca. 30 m asl). The scrubby flatwoods in which we found the tingid has a mainly open canopy of longleaf pine (*Pinus palustris* Mill.; Pinales: Pinaceae) and a shrub layer that includes gallberry (*Ilex glabra* (L.) A. Gray; Celastrales: Aquifoliaceae), saw palmetto (*Serenoa repens* (W. Bartram) Small; Arcales: Arecaeae), and scrubby oaks (*Quercus* spp.; Fagales: Fagaceae); herbaceous plants include narrowleaf silkgrass (*Pityopsis graminifolia* (Michx.) Nutt.; Asterales: Asteraceae) and wiregrass (*Aristida beyrichiana* Trin. & Rupr.; Poales: Poaceae).

Once the lace bug was identified as the little-known *S. blatchleyi* (Suppl. Figs. 3, 4), we sampled *L. ferruginea* periodically, from late Dec 2007 to mid-Oct 2012, to determine if the tingid population persisted at the original site; the bug was found on all subsequent sample dates ($n = 8$). We also observed the tingid's feeding symptoms and habits and sampled syntopic Ericaceae for its potential presence. Branches of rusty lyonia were tapped into a pan or over the bag of a beating net. Dislodged adults were collected into small plastic vials; nymphs were fixed in 70% ethanol and sorted to instar, using a stereomicroscope. The numbers of males and females are listed parenthetically, with Roman numerals used to indicate nymphal instars.

Adults (18♂, 16♀) were common on 27 Dec 2007, with chlorosis evident on abaxial surfaces of leaves on lower branches. In 2008, adults (2♂, 3♀) were found on 25 Feb. On 10 Mar 2008, adults, including a mating pair, were present with early instars (I–II, 5–III); 10 min. of sampling

yielded more than 60 adults (all were released). Three last instars were observed on 26 Apr 2008. Adults (1♂, 5♀) were found on 2 Jan 2009, one adult (released without determining gender) was observed on 19 Mar 2010, adults were uncommon (3♂, 1♀) on 18 Aug 2012, and 5 last instars were found with adults (4♂, 6♀) on 12 Oct 2012. We did not find the lace bug on other Ericaceae, including flyweed (*Bejaria racemosa* Vent.), which was syntopic with *L. ferruginea*.

Lyonia ferruginea can be considered a true host of *S. blatchleyi* rather than a plant used only for adult feeding or shelter. Populations persisted over multiple seasons; a mating pair, nymphs, and exuviae were observed; and feeding symptoms (foliar chlorosis) and dark spots of excrement were evident on upper and lower leaf surfaces, respectively. In addition, adults taken on 12 Apr 1988 in Putnam County, Florida—one deposited in the FSCA, the other in the USNM—bear labels indicating their collection from *L. ferruginea*.

Insects considered rare or scarce often prove common once their habits are better known (Wagner 2006; Wheeler 2009b). Herbivores, including tingids (Wheeler 2008, 2009a), often can be taken in numbers after their host plants are discovered. The host of *S. blatchleyi*, rusty lyonia, ranges in Florida from the northernmost peninsular counties south to Lake Okeechobee and west to the central counties of the Panhandle (Godfrey 1988; Nelson 2003). We, therefore, expected to find the lace bug elsewhere in peninsular Florida by sampling *L. ferruginea*, and visited Dunedin, the type locality where well-known naturalist Willis S. Blatchley first collected the tingid that would bear his name.

Blatchley, who began spending his winters in Florida in 1913 (Blatchley 1930), probably collected the tingid on or near his Dunedin property. The Blatchley house and grounds along the bayfront now are part of J. C. Weaver Park; we learned that most woody plants no longer exist on Blatchley's former property. Historically, *L. ferruginea* was common at Dunedin in a nearby nature preserve, The Hammock (Genelle & Fleming 1978), but we were unable to find the plant there and were told that it has not been seen in the preserve in recent years (T. R. Cuba, pers. comm.). Although we found rusty lyonia in the Starkey Wilderness near New Port Richey in neighboring Pasco County, we did not find *S. blatchleyi*. Attempts to find the tingid on *L. ferruginea* at other sites in peninsular Florida also were unsuccessful: Camp Blanding (Clay Co.), Lake Placid Scrub (Highlands Co.), sand scrub along Rt. 19 west of Astor Park (Lake Co.), Ocala National Forest (Marion Co.), Hickory Lake Scrub south of Frostproof (Polk Co.), and Lyonia Preserve in Deltona (Volusia Co.). We also did not find the lace bug on a morphologically similar congener, coastal

plain staggerbush (*Lyonia fruticosa* (Michx.) G. S. Torr.), in Black Ravines Creek Conservation Area southeast of Middleburg (Clay Co.) and Welaka State Forest near Welaka (Putnam Co.).

We found *S. blatchleyi* only at one site, but it is not "probably extinct in North America," as Neal & Schaefer (2000) suggested, referring to Drake's (1925) original description, which does not mention extinction. The lace bug probably is more widespread in the state than our limited sampling suggests. Additional fieldwork is needed to determine if the tingid uses host plants other than *L. ferruginea*. In Japan, *S. takeyai* develops on 2 principal ericaceous hosts: *Pieris japonica* (Thunb.) D. Don ex D. Don and *Lyonia ovalifolia* var. *elliptica* (Sieb. & Zucc.) Handel-Mazzetti (Tsukada 1999). Further studies on *S. blatchleyi* also are needed to determine voltinism and the number of nymphal instars, whether the typical heteropteran five, or only four, as in *S. rhododendri* (Johnson 1936; Neal & Schaefer 2000). Establishing the number of instars in *S. blatchleyi* might help resolve the question of its appropriate generic placement—*Leptobyrsa* or *Stephanitis*—as discussed by Neal & Schaefer (2000).

We thank Thomas Henry (Systematic Entomology Laboratory, USDA, ARS, Washington, DC [SEL, USDA, ARS]) for verifying the determination of *S. blatchleyi* and providing label data from USNM specimens, David Ziesk (Florida Department of Agriculture & Consumer Services, Division of Plant Industry, Gainesville) for label data from FSCA specimens, Dixie Damrel and Patrick McMillan (Department of Biological Sciences, Clemson University) for plant identifications, Thomas Cuba (Delta Seven Inc., St. Petersburg, FL) for commenting on the status of *Lyonia ferruginea* at The Hammock, Lalena Sheets (Dunedin Parks & Recreation Department) for facilitating our visit to The Hammock, Jerry Kerce and Sandra Oxenrider (Camp Blanding) for allowing us to sample for insects and providing a map with locations for rusty lyonia, Charles Beard (School of Agricultural, Forest, and Environmental Sciences [SAFES], Clemson University) for Suppl. Figs. 1 and 2, Michele Touchet (SEL, USDA, ARS, Washington, DC) for Suppl. Figs. 3 and 4 and Peter Adler (SAFES, Clemson University) for suggestions that improved an early draft of the manuscript.

SUMMARY

Stephanitis blatchleyi, described in 1925, is a rarely collected lace bug known only from a few localities in peninsular Florida; its host plants previously were unknown. We observed adults, nymphs, exuviae, and foliar chlorosis on the ericaceous shrub rusty lyonia (*Lyonia ferruginea*) at a site in Clay County, Florida, from December 2007 to October 2012. Feeding symptoms were

confined to leaves of lower branches. Although the tingid was not found elsewhere in Florida on *L. ferruginea* (or on *L. fruticosa*), additional field-work probably will show that *S. blatchleyi* is more widespread than suggested by our sampling.

Key Words: Ericaceae, rusty lyonia, *Lyonia ferruginea*

RESUMEN

Stephanitis blatchleyi, especie descrita en 1925, es un chinche de encaje pocas veces coleccionado en unas cuantas localidades en la península de Florida; sus plantas hospederas eran desconocidas. Observamos adultos ninfas, exuvias y clorosis foliar en un arbusto de la familia de las Ericacias (*Lyonia ferruginea*), en un lugar en el condado de Clay, Florida, de diciembre del 2007 a Octubre de 2012. Los síntomas producidos por la alimentación de este insecto se encontraron restringidos a las ramas bajas del arbusto. A pesar de que este tinguído no se encontró en otras partes de Florida sobre *L. ferruginea* (o *L. fruticosa*), trabajo adicional de campo probablemente demuestre que *S. blatchleyi* tiene una distribución más amplia de lo sugerido por nuestro muestreo.

Palabras Clave: Ericaceae, *Lyonia ferruginea*

REFERENCES CITED

- BLATCHLEY, W. S. 1926. Heteroptera or True Bugs of Eastern North America. Nature Publishing Co., Indianapolis, IN. 1116 pp.
- BLATCHLEY, W. S. 1930. *Blatchleyana*. Nature Publishing Co., Indianapolis, IN. 77 pp.
- DRAKE, C. J. 1925. Concerning some Tingitidae from the Gulf States (Heteroptera). Florida Entomol. 9: 36-39.
- DRAKE, C. J., AND RUHOFF, F. A. 1965. Lacebugs of the World: a Catalog (Hemiptera: Tingidae). Smithsonian Institution, Washington, DC. 634 pp.
- FROESCHNER, R. C. 1988. Family Tingidae Laporte, 1807 (= Tingididae; Tingitidae): the lace bugs, pp. 708-733 In T. J. Henry and R. C. Froeschner [eds.], Catalog of the Heteroptera, or True Bugs, of Canada and the Continental United States. E.J. Brill, Leiden.
- GENELLE, P., AND FLEMING, G. 1978. The vascular flora of "The Hammock," Dunedin, Florida. Castanea 43: 29-54.
- GODFREY, R. K. 1988. Trees, Shrubs, and Woody Vines of Northern Florida and Adjacent Georgia and Alabama. University of Georgia Press, Athens. 734 pp.
- JOHNSON, C. G. 1936. The biology of *Leptobyrsa rhododendri* Horvath (Hemiptera, Tingitidae), the rhododendron lacebug. I. Introduction, bionomics and life history. Ann. Appl. Biol. 23: 342-368.
- MEAD, F. W. 1967. *Stephanitis* lace bugs of the United States (Hemiptera: Tingidae). Florida Dep. Agric., Div. Plant Ind. Entomol. Circ. 62. 2 pp.
- NEAL, J. W., JR., AND SCHAEFER, C. W. 2000. Lace bugs (Tingidae), pp. 85-137 In C. W. Schaefer and A. R. Panizzi [eds.], Heteroptera of Economic Importance. CRC Press, Boca Raton, FL.
- NELSON, G. 2003. Florida's Best Native Landscape Plants: 200 Readily Available Species for Homeowners and Professionals. Univ. Press of Florida, Gainesville. 411 pp.
- TSUKADA, M. 1999. Interpopulation variation of hiberna-aestival-diapause in the egg parasitoid wasp *Anagrus takeyanus*: adaptation to seasonal host-plant alternation of the tingid host, *Stephanitis takeyai*. Entomol. Exp. Appl. 92: 37-43.
- WAGNER, D. L. 2006. A precautionary tale about rarity: on the larva and life history of *Lithophane joannis* (Lepidoptera: Noctuidae). J. Lepid. Soc. 60: 174-176.
- WHEELER, A. G., JR. 2008. *Leptodictya plana* Heidemann (Hemiptera: Tingidae): first specific host-plant and new distribution records for a seldom-collected, grass-feeding lace bug. Proc. Entomol. Soc. Washington 110: 804-809.
- WHEELER, A. G., JR. 2009a. *Teleonemia huachucae* Drake (Hemiptera: Tingidae): new distribution and host-plant records of a rarely collected lace bug. Proc. Entomol. Soc. Washington 111: 762-765.
- WHEELER, A. G., JR. 2009b. *Keltonia balli* (Knight) (Hemiptera: Miridae: Phylinae): a rarely collected specialist on staminate flowers of the dioecious shrub Florida rosemary (*Ceratiola ericoides* Michx.; Ericaceae). Proc. Entomol. Soc. Washington 111: 880-889.