

**FIRST SOUTHEASTERN U.S. RECORDS OF THE WESTERN
HETEROPTERANS *PRIONOSOMA PODOPIOIDES*
(PENTATOMIDAE) AND *AUFEIUS IMPRESSICOLLIS*
(RHOPALIDAE), WITH A REVIEW OF
DISTRIBUTION AND HOST PLANTS**

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Abstract.—Two heteropteran species native to western North America, the pentatomid *Prionosoma podopioides* Uhler and the rhopalid *Aufeius impressicollis* Stål, are recorded for the first time from southeastern United States. Populations of *P. podopioides* are reported from northern South Carolina on bracted plantain, *Plantago aristata* Michx., documenting the suspected host relationship for this species; *A. impressicollis* is reported from the same area on Palmer amaranth, *Amaranthus palmeri* S. Wats. Hosts of both heteropterans are native western plants naturalized in the Southeast.

In analyzing postglacial dispersal in certain animal groups, biogeographers have identified relict eastern populations of formerly more widespread western species, including a few coreids among the Heteroptera (Baranowski and Slater, 1986). But in much more recent time (the past one hundred years) several heteropterans indigenous to the western United States have expanded their ranges to include eastern North America. A well-documented example is *Catorhintha mendica* Stål, a Great Plains coreid that has followed the establishment of wild four o'clock, *Mirabilis nyctaginea* (Michx.) Mac Mill. (Nyctaginaceae), along railroad right of ways. Seed contaminating surplus grain products spilled from freight cars, allowing the plant to become naturalized in the East and this specialist herbivore to track its host to eastern Pennsylvania (Balduf, 1957) and eventually to Long Island, New York (Hoebeke and Wheeler, 1982) and Connecticut (Slater, 1983). Spread of the boxelder bug, *Boisea trivittata* (Say), also is well documented. This presumed southwestern rhopalid that develops mainly on boxelder, *Acer negundo* L. (Aceraceae), is now established essentially throughout the eastern states and in southern Ontario (Slater and Schaefer, 1963; Schaefer, 1975). Its spread is believed to have been aided by the extensive planting of boxelder trees east of the original range. Another coreoid, the grass-feeding alydid *Esperanza texana* Barber, is thought to have moved eastward from Texas into the Southeast in recent years (Froeschner, 1980; Wheeler and Henry, 1984).

In 1987, field work in northern South Carolina provided the first southeastern U.S. records of *Prionosoma podopioides* Uhler (Pentatomidae) and *Aufeius impressicollis* Stål (Rhopalidae). Bracted plantain, *Plantago aristata* Michx. (Plantaginaceae), is given here as the first documented host of *P. podopioides*. *Aufeius impressicollis* is reported from Palmer amaranth, *Amaranthus palmeri* S. Wats. (Amaranthaceae), verifying that amaranths are its principal hosts. Previous records of these heteropterans east of the Mississippi River and their host plant relationships are reviewed. Voucher specimens have been deposited in the insect collections of Cornell Univer-

sity, Pennsylvania Department of Agriculture, and U.S. National Museum of Natural History.

Prionosoma podopioides

Distribution. Uhler (1863) described this pentatomid from California; *P. villosum* Provancher, described from British Columbia, and *Neurohalys bucculatus* Bliven, also described from California, are considered junior synonyms of *P. podopioides* (Van Duzee, 1904; Rolston and McDonald, 1984). Van Duzee (1904) noted that this "western species" also is known from Colorado, Nevada, Utah, and south through Arizona and New Mexico to Mexico. Blatchley (1926) did not include this stink bug in his manual of eastern Heteroptera (species occurring east of the 90th meridian); Stoner (1916, 1920) had published records from Iowa and Missouri just west of the 90th meridian. Stoner (1920) gave *P. podopioides* as an example of the tendency of western Heteroptera to spread eastward "where favorable environmental conditions may occur." Records from southern Michigan (McPherson, 1970) and Illinois (McPherson and Cuda, 1975; McPherson, 1982) have remained the easternmost for *P. podopioides* (Fig. 1).

On 9 May 1987, I collected an adult at Pageland (Chesterfield Co.), South Carolina, by sweeping an old field dominated by grasses; weeds, mainly *Rumex acetosella* L. (Polygonaceae); and eastern prickly pear, *Opuntia humifusa* Raf. (Cactaceae). The collection area, a transition zone between the Piedmont Plateau and Coastal Plain, is characterized by white sandy soil. Sweeping the supposed host of this pentatomid, *Plantago aristata*, growing near the original collection site yielded another adult on 3 July 1987, and 12 adults and nymphs (instars III–V) were taken on heads of bracted plantain at a nearby site (4 miles west of Pageland). On 4 July, 7 adults and instars II–V were swept from *P. aristata* along Rt. 151, 0.5 mi north of McBee (Chesterfield Co.) in the Carolina Sandhills. Large numbers were present near Pageland and McBee (many more specimens could have been collected), but this species was not encountered in other areas of Chesterfield Co. or in nearby Anson and Union counties of North Carolina, even though bracted plantain was present along roadsides and in fields.

Host plants. In New Mexico, Ruckes (1937) reported *P. podopioides* as abundant in axils and flowers of a wild sunflower, but the literature strongly suggested that bracted plantain would prove to be a preferred food plant. Froeschner (1941) recorded this "scarce" pentatomid from four counties in Missouri during July, August, September, and December, noting that all but the winter record were from "fields or open woods where the Large Bracted Plantain, *Plantago aristata*, was common." The first Illinois record resulted from its collection near a colony of the same plant. The single female collected was kept alive on heads of *P. aristata* for 1½ months in the laboratory, though no eggs were deposited. Because additional trips to the same site failed to yield more specimens, nothing further could be added to the biology of this "rare" and "poorly known species" (McPherson and Cuda, 1975).

Discovery of large populations on bracted plantain at two localities in South Carolina substantiates this plant as a primary host of *P. podopioides*. I also collected 4 fifth-instar nymphs on this plant 7 mi west of Conway (Faulkner Co.), Arkansas, on 12 June 1987; this is a new state record (see Barton and Lee, 1981). The nymphs completed their development on inflorescences and seed heads of *P. aristata*.



Fig. 1. Previously published records of *Prionosoma podopioides* (closed circles) and *Aufeius impressicollis* (open circles) east of the Mississippi River (see text for references) and new localities for both species (⊗ in circle).

Gray (1886) remarked that bracted plantain is most abundant west of the Mississippi. Nearly a century later, Muenscher (1980) still referred to *P. aristata* as most common in the "middle western United States, where it is native." This plant, however, is widely naturalized in the eastern states, having begun its spread in the late 1860's (Fernald, 1950).

Aufeius impressicollis

Distribution. Of probable Sonoran origin (Slater, 1974), this rhopalid is widely distributed in the western United States, ranging from Iowa, Missouri, Nebraska, and South Dakota west to Idaho and Washington, and south from California to Texas; it also is known from Mexico and Guatemala (Wheeler, 1984). Few records are available east of the Mississippi (Fig. 1). Osborn and Drake (1915) reported *A. impressicollis* from Columbus, Ohio, which remained the easternmost record until Wheeler (1984) recorded it from Baltimore, Maryland. This species also has been collected in Indiana (Blatchley, 1926).

I swept 2 adults at Pageland, South Carolina, on 9 May 1987 near the old field where *Prionosoma podopioides* had been collected. No additional specimens were found at this site on 3–4 July, but *Amaranthus* spp., the apparent principal hosts (Wheeler, 1984), could not be located. But further south in Chesterfield Co., along Rt. 151, 8.5 mi north of McBee, large numbers of adults were encountered (17 were collected) on inflorescences of *Amaranthus palmeri* growing at the edge of a cultivated field. A population of the rhopalid estimated at several hundred (19 adults were collected) was found on the same host growing in a crop field along Rt. 1, 2 mi northeast of McBee in the sandhills region. On 4 September adults were less numerous at the field northeast of McBee. A mating pair was observed on an inflorescence and single adults were collected on heads of two other *A. palmeri* plants.

Host plants. Wheeler (1984) reviewed ecological data available in the scant literature on this rhopalid and from labels attached to museum specimens, noting that records suggested a preference for amaranthaceous plants and possibly Chenopodiaceae. After finding adults on smooth pigweed, *Amaranthus hybridus* L., at Baltimore, he was able to obtain oviposition in the laboratory and to rear the bugs from egg to adult on this plant. That *A. impressicollis* specializes on amaranths is now supported by its collection on Palmer amaranth in South Carolina and on *Amaranthus* spp. in Nebraska in July 1986 (Wheeler, unpubl.).

The host plant in South Carolina, Palmer amaranth, is native to the southwestern states and is a common weed in Texas (Muenscher, 1980). *Amaranthus palmeri* has spread into the Mississippi Delta states and apparently is generally distributed north to most of Missouri, southern Illinois and Indiana, nearly all of Kentucky, extreme southern West Virginia, and the southern half of Virginia (Elmore et al., 1986). Gleason and Cronquist (1963) listed it as an occasional weed occurring at scattered stations in the Northeast.

DISCUSSION

Available evidence suggests that the discovery of *Prionosoma podopioides* and *Aufeius impressicollis* in the Southeast should not be attributed to relict eastern populations or to accidental introduction with commerce. Instead, the South Carolina

populations seem to be the result of recent range expansions. These heteropterans, indigenous to western North America, appear to have spread eastward following establishment of their host plants east of their original ranges. The plants may have become established in parts of the southeastern United States as early as the mid-to-late nineteenth century, but there is no evidence to suggest how long the bugs have been established. Because the heteropteran fauna of this region has not been thoroughly collected and collectors could overlook these noneconomic species, *P. podopioides* and *A. impressicollis* could have been present in the Southeast for several decades.

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