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EENY252

Big-Eyed Bugs, *Geocoris* spp. (Insecta: Hemiptera: Lygaeidae)[1]

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Introduction

The big-eyed bugs, *Geocoris* spp., are small insects (approximately 1/6 inch long) that occur in many parts of the world. They are generally regarded as beneficial because they prey upon numerous kinds of insect and mite pests of turf, ornamental and agricultural crops. Big-eyed bugs are among those insects receiving research attention in Florida (and elsewhere) for their value as predators. To aid in identification of big-eyed bugs in Florida, a key to adults and late instar nymphs is provided in this publication.

Distribution

Geocoris uliginosus (Say) ranges over most of the United States and southern Canada. In Florida, *G. uliginosus* is known at least as far south as Ft Myers.

Geocoris punctipes (Say) is primarily an Austroriparian species, common throughout Florida, and ranging from New Jersey west to southern Indiana and Colorado south and southwest to Texas, Arizona, California, and Mexico. Other localities include Guatemala, Panama and Hawaii.

Geocoris bullatus (Say), the large bigeyed bug, is widely distributed in the United States and Canada, from coast to coast. There are numerous Florida records from the northern border south to Key West.

Figure 1. Adult bigeyed bug, *Geocoris* sp., feeding on a whitefly nymph.
Credits: Jack Dykinga, USDA

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Figure 2. Adult *Geocoris uliginosus* (Say), a big-eyed bug.
Credits: Lyle J. Buss, University of Florida

Figure 3. Adult *Geocoris punctipes* (Say), a big-eyed bug.
Credits: Lyle J. Buss, University of Florida

Description

Big-eyed bugs are small, oblong-oval lygaeids having the head broader than long, and prominent eyes that curve backward and overlap the front of the pronotum. The stylus has a longitudinal groove. These features can be seen on nymphs as well as adults and serve to separate big-eyed bugs from similar bugs. A distinguishing feature of adult big-eyed bugs is the very short or absent claval commissure.

Figure 4. Adult *Geocoris bullatus* (Say), the large bigeyed bug.
Credits: Julieta Brambila, USDA

Lygaeids such as chinch bugs, *Blissus* spp.; false chinch bugs, *Nysius* spp.; and pamera bugs, *Neopamera* spp. are sometimes confused with big-eyed bugs, but these genera have a claval commissure (Fig 5.) approximately half as long as the scutellum. Also, the head has more of a triangular shape in these lygaeids. Caplan (1968) emphasized the need for turf specialists to distinguish between big-eyed bugs and chinch bugs. Misidentification could result in a chinch bug spray directed against geocorines, resulting in needless loss of money and beneficial insects.

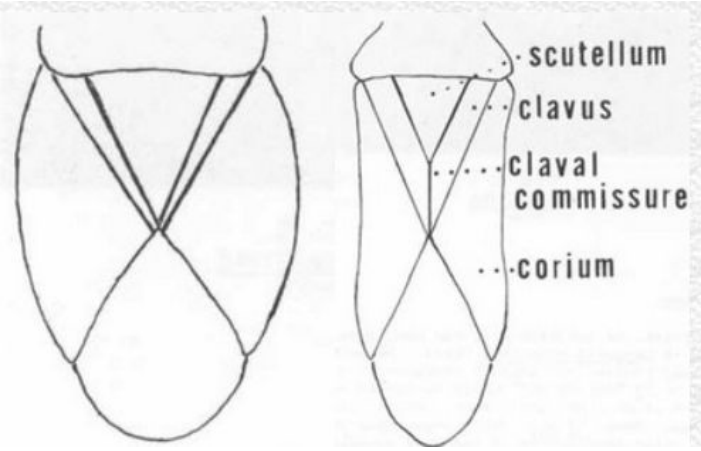

Figure 5. A comparison of the claval commissure on a big-eyed bug, *Geocoris* sp. (left), and a pamera bug, *Neopamera* sp. (right).

Figure 6. Adult (left) and nymph (right) chinch bugs, *Blissus* sp.
Credits: Lyle J. Buss, University of Florida

Figure 7. Adult (left) and nymph (right) false chinch bugs, *Nysius raphanus* Howard.
Credits: Lyle J. Buss, University of Florida

Key to Species of Adult Geocorinae in Florida

The following key to geocorines in Florida does not include two species of *Hypogeocoris,* which have been reported in Florida, but apparently are scarce or rare. Some minor variations in *Geocoris bullatus* (Say) and *G. uliginosus* (Say) have been formalized as subspecies, but will not be considered here.

1. Beak with segment I (basal) longer than II; head (except in *G. punctipes*) punctulate (with small pits) or rugulose (minutely wrinkled) . . . . *Geocoris* 2

1'. Beak with segment I subequal to or shorter than II; head smooth, impunctate, shining . . . . . *Hypogeocoris*

Figure 8. Adult pamera bug, *Neopamera* sp.
Credits: Lyle J. Buss, University of Florida

2. Nearly all black above except for pale border along each side; scutellum entirely black (Fig. 2) . . . . . *G. uliginosus* (Say) 1832

2'. Mostly pale above; scutellum with a pair of pale areas or spots (Fig. 3, 4) 3

3. Scutellum with a pair of prominent, smooth (impunctate), calloused basolateral, pale spots, the spots sometimes extending posteriorly (extension punctulate); pronotum with a pair of somewhat lunate impunctate callosities, usually shiny black but sometimes invaded by various amounts of yellow; head smooth, polished, not at all granulose; inner posterior margin of corium not marked with fuscous or at most weakly so; groove of tylus extending back onto vertex and crossed near middle by an arcuate, transverse sulcus (Fig. 9), length 3.5 to 4.2 mm (Fig. 3) . . . . . G. punctipes (Say) 1832

3'. Scutellum with a pair of punctate, non-calloused, submedial, pale-yellow areas; the shape and extent of pale areas variable but usually oblong and partially angulate; pronotum with the pair of impunctate callosities nearly round, pale-yellow; head granulose; inner posterior margin of corium marked with two fuscous "spots," the posterior one larger; groove of tylus not extending back onto vertex; vertex lacking transverse sulcus; length 3.0 to 3.5 mm (Fig. 4) . . . . . *G. bullatus* (Say) 1832, the large bigeyed bug

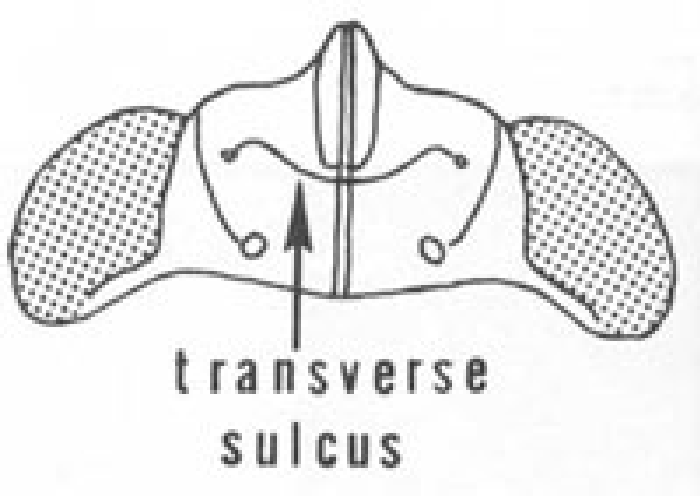

Figure 9. Dorsal aspect of the head of G. punctipes

Key to Late Instar Nymphs of Florida Species of Geocoris

To make sure a nymph is a lygaeid, consult the key by Herring and Ashlock (1971) and/or the one by DeCoursey (1971). To key a lygaeid nymph to genus, consult Sweet and Slater (1961).

1. Dorsal ground color of head and thorax dark brown (Fig. 10) . . . . . *G. uliginosus* (Say)

1'. Dorsal ground color of head and thorax pale (irregular dark spots often present) 2

Figure 10. Nymph of *Geocoris uliginosus* (Say), a big-eyed bug. Credits: Lyle J. Buss, University of Florida

2. Mesothoracic wing pads (developing forewings) either unmarked or with only one apical brown spot; scutellum with two pairs of linear brown marks, sometimes coalesced into one large pair, these marks basolaterad; pronotum usually with three pairs of brown spots, variable in shape and degree of pigmentation, often inconspicuous; antennal segments I through III each with prominent dorso-apical pale spot (Fig. 11) . . . . . *G. bullatus* (Say), the large bigeyed bug

Figure 11. Nymph of the large bigeyed bug, *Geocoris bullatus* (Say). Credits: Ronald Smith, Auburn University; bugwood.org

2'. Mesothoracic wing pads each with four or five brown marks (usually three basal streaks, one middle dot, and one prominent apical spot); scutellum with three to five pairs of dark brown marks (usually four pairs), the most prominent pair near middle; pronotum with five to six pairs of conspicuous dark brown irregular spots; antennal segments I to III each without dorsoapical pale spot (Fig. 12) . . . . . *G. punctipes* (Say)

Life Cycle and Biology

The literature on the food habits and life histories of *Geocoris* spp. is too extensive for more than a token review here. The most abundant big-eyed bug in Florida and the southeastern United States is *G. punctipes* (Say). McGregor and McDonough (1917) reported the life history of *G. punctipes* at Batesburg, South Carolina, finding the average development time from egg to adult was 30 days. York

Figure 12. Nymph of *Geocoris punctipes* (Say), a big-eyed bug. Credits: Lyle J. Buss, University of Florida

(1944) reported that adult *Geocoris* required either free moisture or plant moisture as well as insect prey. Sweet (1960) found that *Geocoris* adults can survive on sunflower seeds and water, without insect food. Dumas et al. (1962) found more *G. punctipes* in the morning than at midday or evening, either by sweep net sampling or complete plant examination in Arkansas soybean fields. Stoner (1970) found that *G. punctipes* apparently needed prey for proper development and fecundity.

Figure 13. Eggs of *Geocoris bullatus* (Say), the large bigeyed bug. Credits: Ronald Smith, Auburn University; www.insectimages.org

Hosts

Bell and Whitcomb (1964) reported that, in Arkansas, *G. punctipes* and *G. uliginosus* were among the most abundant and important predators of bollworm eggs, *Helicoverpa* (=*Heliothis*) zea (Boddie) on cotton from mid-June until September. Whitcomb and Bell (1964) reported that big-eyed bugs preyed upon aphids, plant bugs, eggs, and young larvae of the bollworm and cotton leafworm in Arkansas cotton fields. On the negative side, however, the prey occasionally were beneficial species (*Orius* spp.). Champlain and Sholdt (1967) reported on the life history of *G. punctipes* in the laboratory. Lingren et al. (1968) reported *G. punctipes* was a more effective predator than *G. uliginosus* against *Helicoverpa* (=*Heliothis*) spp. Nymphs consumed an average of 47 mites, and adults an average of 83 "red spider" mites on cotton per day. Orhanides et al. (1971) reported that *G. punctipes* was an effective predator of the pink bollworm, *Pectinophora gossypiella* (Saunders), in southern California cotton fields. Tamaki and Weeks (1972) listed 46 references, itemized from the literature the prey list of *Geocoris* spp., and presented extensive research results from a five year project on *Geocoris* in the Yakima Valley of Washington, including data on *G. bullatus.*

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