

A Visual Guide for Identification of *Euschistus* spp. (Hemiptera: Pentatomidae) in Central TexasJesus F. Esquivel¹, Roger M. Anderson¹, and Robert E. Droleskey²

Stink bugs have become problematic in cotton, *Gossypium hirsutum* L., following efforts by Boll Weevil Eradication Programs. These programs have led to a reduced number of insecticide applications that normally suppressed stink bugs. Several phytophagous species of *Euschistus* in cotton and other crops are often grouped into the "brown stink bug complex." However, this does not enable accurate identification of individual *Euschistus* species; unlike the southern green stink bug, *Nezara viridula* L., and green stink bug, *Acrosternum hilare* Say, which are relatively easy to identify in the field. In addition to their similarities in coloration causing potential problems with identification, brown stink bugs are less susceptible to certain classes of insecticides (Snodgrass et al. 2005). Dichotomous keys are available for identifying *Euschistus* spp. (Rolston 1974, McPherson and McPherson 2000) but are not helpful for accurate and rapid identification of stink bugs in the field. Because of the advanced stage of the Boll Weevil Eradication Program in the Blacklands region, known tolerances to certain classes of insecticides, and seemingly apparent similarities between species, this study was undertaken to identify *Euschistus* spp. in Central Texas and provide a visual guide for accurate identification in the field.

From January 2007 through January 2009, five black-light and two pheromone-baited traps were used to collect adult brown stink bugs in Central Texas (Burleson County). Traps were placed in or near pecan, *Carya illinoensis* (Wangenh.) K. Koch, orchards adjacent to fields previously planted with maize, *Zea mays* L.; cotton; or soybeans, *Glycine max* (L.) Merr. Traps were serviced three times a week, and captured adults were taken to a laboratory where dichotomous keys of Rolston (1974) and McPherson and McPherson (2000) were used for identification. Voucher specimens (Accession Number 672) were confirmed and cataloged by Ed G. Riley, Museum Curator, Department of Entomology, Texas A&M University, College Station, TX.

Six *Euschistus* species were identified in the region (Fig. 1). The absence of spots in the membranous area of the hemelytra (Fig. 1A, inset upper right) is the key characteristic for distinguishing *E. quadrator* Rolston from other species. Spots in the membranous area (Fig. 1B, inset upper right) or in confluence with (i.e., in line with) venation of the hemelytra are present in the other five species.

Similar to *E. quadrator*, *E. tristigmus* (Say) has a unique character in the presence of large median black spot(s) on the abdominal venter (Fig. 1B, inset lower right) that can be used to distinguish this species from all others in the region.

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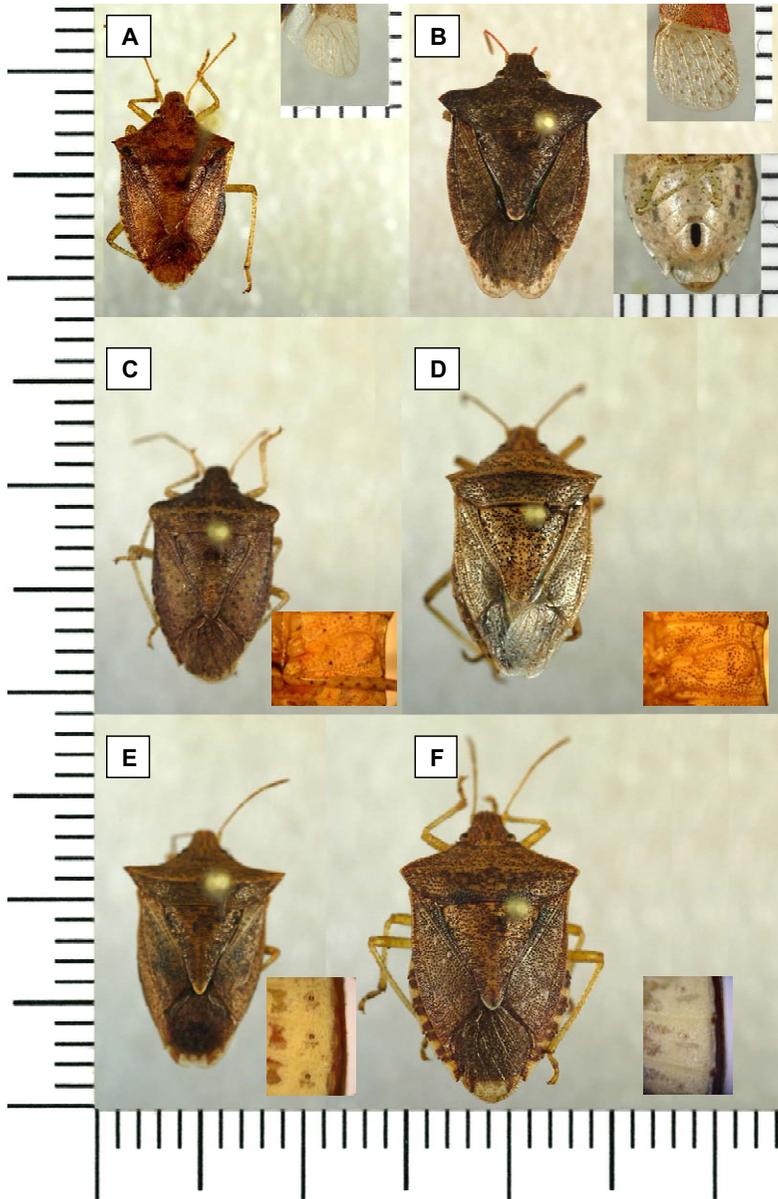


Fig. 1. *Euschistus* spp. in Central Texas: A) *E. quadrator* (inset upper right, membranous wing area without spots [7X]); B) *E. tristigmus* (inset upper right, membranous wing area with spots [7X]; inset lower right, spot ventrally on abdomen [7X]); C) *E. obscurus* (inset lower right, evaporative area adjacent to scent gland not punctuate with black markings [3X]); D) *E. crassus* (inset lower right, evaporative area adjacent to scent gland punctuate with black markings [3X]); E) *E. ictericus* (inset lower right, ventral abdominal spiracles narrowly ringed with black [5X]); and, F) *E. servus* (inset lower right, ventral abdominal spiracles narrowly ringed with pale color [5X]). In all figures, the scale bar unit = 1 mm.

The number of spots can vary from one to three, and insects with three spots have been observed in southern Brazos County (R. Anderson, personal observation). Additionally, the shape of the spots varies between males and females; females have more elongated spots. Although not shown, the predatory spined soldier bug, *Podisus maculiventris* (Say), also has markings on the venter but can be differentiated by the more acute and lateral orientation of the humeri, or 'shoulders', on the pronotum than those shown in Fig. 1B.

The remaining four species (Fig. 1C-F) do not have median black spots on the abdominal venter. The four species can be partly differentiated based on the presence or absence of a callous ridge, or fascia, located dorsally between the humeri. The callous ridge is formed by the absence of punctate black markings (i.e., spots) across the dorsal surface of the pronotum between the humeri. *Euschistus obscurus* (Palisot) (Fig. 1C), *E. crassus* Dallas (Fig. 1D), and *E. ictericus* L. have a callous ridge between the humeri but each has additional criteria to help in differentiation.

To differentiate between *E. obscurus* and *E. crassus*, the ventral evaporative areas adjacent to the scent glands should be examined. In *E. obscurus*, the evaporative area is not punctate with black markings (Fig. 1C, inset). Conversely, the evaporative area is punctate with black markings on *E. crassus* (Fig. 1D, inset lower right), and this is the only species of the six identified that has such markings on the evaporative area. Also, *E. obscurus* has more densely punctate markings on the anterior half of the pronotum than do other species, making the anterior half of the *E. obscurus* pronotum appear darker than the posterior half.

Euschistus ictericus (Fig. 1E) can be differentiated from *E. obscurus* and *E. crassus* based on the acute humeri and presence of black rings around the abdominal spiracles (Fig. 1E, inset lower right). However, while *E. ictericus* does have a callous ridge between humeri, the degree of punctate markings can vary such that the callous ridge is not clearly defined.

Unlike *E. ictericus*, *E. servus* (Say) (Fig. 1F) does not have ventral abdominal spiracles ringed with black, acute humeri, or a callous ridge on the pronotum. The spiracles are narrowly ringed with pale color on *E. servus* (Fig. 1F, inset lower right) and has variably shaped humeri. *E. servus* is the largest of the six species.

In conjunction with the aforementioned species-specific characteristics, coloration can be used to assist in separating some of the species. *E. tristigmus* and *E. obscurus* are typically darker than the other four species. *E. ictericus* occasionally has russet (or red) coloration at the humeri, and this coloration can extend dorsally. Coloration should not be a sole determining factor for species identification, however.

Size of the insect can be helpful to differentiate species. Morphometrics or repeated measurements of adults were not done but the specimens shown in Fig. 1 are representative of each species. At the two extremes, *E. quadrator* (Fig. 1A) was the smallest (in length and width), approximately 9 mm long and 5 mm wide along the abdomen (excluding protrusion of humeri); *E. servus* (Fig. 1F) was the most robust and largest of all species, approximately 14 mm long and 8 mm wide along the abdomen (excluding protrusion of humeri). Specimens of *E. tristigmus*, *E. crassus*, and *E. ictericus* are of similar size but each has the unique aforementioned characteristics to accurately identify the species.

Observations and character designations presented here are in agreement with terminologies by Rolston (1974) and McPherson and McPherson (2000), but a more precise description is needed to accurately identify *E. obscurus* in Central

Texas. Rolston (1974) and McPherson and McPherson (2000) described the membrane of the hemelytra as “unspotted” or “not marked with brownish spots” for *E. obscurus*, suggesting absence of spots. Examination of voucher specimens reveals that *E. obscurus* does not have spots in the membranous area of the hemelytra *per se*, but the spots are in confluence with the venation of the membranous area. Museum specimens from 12 localities indicate the numbers of spots vary, but personal communications (S. Bundy, New Mexico State University) suggest the presence and localization of the spots within the venation may be a regional occurrence. Regardless, all voucher specimens from Central Texas exhibited the markings within the wing venation.

The species identified were found in or near corn, cotton, soybeans, and pecan orchards in Central Texas and have been reported as economically important pests in row, forage, and tree fruit crops (McPherson and McPherson 2000, and references therein). This visual guide allows simplified and accurate identification of *Euschistus* spp. by row, forage, and fruit crop producers and researchers, as well as assists in selection of appropriate insecticides to control these insects.

Mention of trade names or commercial products in this report is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the U.S. Department of Agriculture.

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