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THE AFRICAN CLUSTER BUG, *AGONOSCELIS PUBERULA* (HETEROPTERA: PENTATOMIDAE), ESTABLISHED IN THE NEW WORLD

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ABSTRACT

An African species of Pentatomidae, *Agonoscelis puberula* Stål, is reported for the first time from Mexico, the southern United States and the islands of Jamaica and Hispaniola, where it has now established. The oldest Western Hemisphere record dates from 1985. This species has gone unrecognized probably because of its close resemblance to species of the New World genus *Trichopepla* Stål. The primary host plant of *A. puberula* is the introduced weed, common horehound, *Marrubium vulgare* L. It has also been reported damaging winter fruits in South Africa.

Key Words: cluster bug, horehound, stink bug, invasive species

RESUMEN

Una especie Africana de Pentatomini, *Agonoscelis puberula* Stål, es reportada por primera vez para México, sur de Estados Unidos y las islas de Jamaica y Española, en donde se ha establecido. Los registros en el hemisferio oeste más antiguos son de 1985. Esta especie no había sido reconocida probablemente por su gran parecido a las especies del género del Nuevo Mundo *Trichopepla* Stål. La planta hospedera primaria de *A. puberula* es la hierba conocida como marrubio, *Marrubium vulgare* L. También ha sido reportada dañando frutos de invierno en Sudáfrica.

Translation provided by author.

In this paper we give the first report of the African pentatomid bug, *Agonoscelis puberula* Stål, in the New World. Established populations of this stink bug have been discovered in the United States, Mexico, and the islands of Jamaica and Hispaniola. The species was first found among a series of specimens collected in 1991 near the town of Yautla in the state of Morelos, Mexico. These specimens were tentatively identified by one of us (GOL) as an undescribed species of the north-temperate genus *Trichopepla* Stål, to which they keyed in Rolston and McDonald's (1984) treatment of Western Hemisphere Pentatomini. Its discovery in the Greater Antilles led another of us (JEE) to recognize this stink bug as an introduced species of the genus *Agonoscelis* Spinola, one referred to in the economic literature as a "cluster bug" (Haines 1935).

Taxonomy and Recognition

As in *Trichopepla*, species of *Agonoscelis* are generally yellowish, often with a red tinge and with black punctures arranged in a pattern of irregular dark stripes, and a distinctly hirsute dorsum (Fig. 1). Other shared characteristics include the scent gland orifice attended by a short auricle; the post-frenal scutellum more than half the width of the scutellar base, and base of the abdomen lacking a tubercle. In both genera the head is elongate compared with other pentatomines. Our specimens range from 8-10 mm in body length. In spite of their similarity, *Trichopepla* and *Agonoscelis* have been split into different tribes. This anomaly arises largely because there is no consensus classification for the Pentatominae. American workers, such as Rolston & McDonald (1984), follow the tribal arrangement in Kirkaldy's Catalogue (1909) which places both genera in the Pentatomini. Asian workers, such as Ahmad et al. (1974), follow the arrangement of Distant (1921) which places *Agonoscelis* in the Eurydemini (=Strachiini). African workers, such as Cachan (1952), include *Agonoscelis* with the tribe Carpocorini. Inasmuch as there are no external morphological characters to distinguish *Agonoscelis* from *Trichopepla*, their placement in different tribes is problematic. According to McDonald (1966), the female spermatheca of *Trichopepla* is unique in lacking a sclerotized supporting rod

Fig. 1. *Agonoscelis puberula*, specimen from Morelos, Mexico.

and pumping region that is present in all other Pentatomines, including *Agonoscelis* (illustrated by Gross 1976). Such being the case, the separation of the two genera can be sustained, although the tribal-level separation seems dubious. *Agonoscelis puberula* has a distinctively marked hemelytral membrane featuring dark radiating stripes. This character is variable among species of *Agonoscelis*, but the membrane is unmarked in all species of *Trichopepla* (McDonald 1976); thus, the striped membrane allows quick recognition of this adventive stink bug.

The genus *Agonoscelis* has not been revised, although regional faunal treatments (Horváth 1904; Jensen-Haarup 1920; Cachan 1952; Yang 1962; Ahmad et al. 1974; Linnavuori 1975, 1982; Hsaio et al. 1977) provide means to diagnose many of the species. There are 22 nominal species of *Agonoscelis* including those of uncertain validity. Among the determined specimens available to us for study, representing six species, we noted that the male genitalia are distinctive to a given species, and it is on these characters that our determination relies. The New World invader is conspecific with specimens from South Africa identified by D. A. Rider and others as *A. puberula* Stål. The male genitalia of this particular species are illustrated by Linnavuori (1975) whose material was compared to Stål's types in Stockholm. We have deposited voucher specimens in the United States National Museum, the Canadian National Collection, the Instituto de Biologia of the Universidad Nacional Autonoma de México, at Texas A&M University, in the Florida State Collection of Arthropods, and in the collections of the authors.

Distribution

Agonoscelis puberula is native to southern and eastern Africa extending northward to the Arabian peninsula (Linnavuori 1982). Our oldest New World record dates from 1985 on the island of Jamaica. The first records for the United States are from Arizona in 1990. U.S. records include Arizona, New Mexico, and Texas. It is also well established in Mexico with records from Yucatan in the south to Nuevo Leon in the north covering the years 1988 to 2001. Our collection data includes the following specific localities and dates:

JAMAICA: St. Andrew Parish, 2 mi. S. Newcastle, 2-VIII-1985, C.B. & H.V. Weems Jr. & G.B. Edwards.

DOMINICAN REPUBLIC: La Vega: 21 Km S Jarabacoa, 18-26-VI-1994, C. & K. Messenger.

MEXICO: Guanajuato: San Miguel de Allende, 7-11-VIII-1988, G. B. Edwards; Chipicuaro, Presa Solis, 12-III-1997, E. Barrera & H. Brailovsky; Ojo Seco, 12-III-1997, E. Barrera & H. Brailovsky; San Antonio Emenguaro, 12-III-1997, H. Brailovsky, E. Barrera & G. Ortega-Leon. Morelos: Yautla, 3-V-1991, H. Brailovsky & E. Barrera. Distrito Federal: Piramides de Cuicuilco, 2-IV-1992, E. Gonzalez; Delegacion Iztapalapa, 1-VIII-1999, J. Contreras; Colonia Irrigacion, 18-VI-2001, H. Brailovsky. Mexico: Ixtapan de la Sal, 4-X-2000, H. Brailovsky & E. Barrera; Malinalco, VII-1996, E. Barrera. Guerrero: Tuxpan, 25-X-2001, H. Brailovsky, E. Barrera & G. Ortega-Leon. Hidalgo: Huichapan, 5-VI-1999, H. Brailovsky & E. Barrera; Huasca, 4-VIII-1995, H. Brailovsky. Michoacan: San Lorenzo, 24-X-2001, H. Brailovsky & E. Barrera. Oaxaca: Dominguillo, 18-II-1998, H. Brailovsky, E. Barrera & G. Ortega-Leon; Tehuacan-Oaxaca Km 140, 11-III-2000, H. Brailovsky & E. Barrera. Puebla: Tecamachalco-Tehuacan Km 1, 12-VI-1993, H. Brailovsky & E. Barrera; La Trinidad, 3-II-1994, E. Barrera & G. Ortega-Leon; La Trinidad, 13-II-1994, E. Barrera & G. Ortega-Leon; La Trinidad, 21-III-1994, E. Barrera & G. Ortega-Leon; Atlixco 23-IV-1994, E. Barrera & G. Ortega-Leon; Atlixco-La Trinidad, 29-V-1994, H. Brailovsky & E. Barrera; La Trinidad, 15-VI-1994, E. Barrera & G. Ortega-Leon; 5 Km SE Atlixco, 23-IV-1994, 15-VI-1994, H. Brailovsky, E. Barrera & G. Or-

tega-Leon; 2 Km W. La Trinidad, 19-III- 1994, G. Ortega-Leon & E. Barrera; Atexcal, 11-III-1994, E. Barrera & G. Ortega-Leon; Nicolas Bravo, 20-III-1993, H. Brailovsky, E. Barrera & G. Ortega-Leon; Tecamachalco, 6-I-1993, 27-I-1993, 12-VI-1992, 20-VII-1992, H. Brailovsky & E. Barrera; Atlixco, 18-VIII-1996, H. Brailovsky, E. Barrera & G. Ortega-Leon; Portezuelo, 10-II-1995, E. Barrera & G. Ortega-Leon. Queretaro: Pinal de Amoles, 27-IV-1998, 1-III-1998, E. Barrera & G. Ortega-Leon. Yucatan: Temax, 24-V-1995, E. Barrera & H. Brailovsky. Nuevo Leon: El Pinito, 3-IX-1995, D.B. Thomas & J. Burne.

UNITED STATES: Arizona: Pinal Co., Peppersauce Canyon, Santa Catalina Mtns., 9-IV-1991, C. Olson; Santa Cruz Co., Madera Canyon, 16-IV-1990, 17-VII-1990, 27-VII-1990, W. Jones; Patagonia, 8-VII-1994, B. Brown & E. Wilk; Santa Rita Mtns., Florida Canyon, 1-VIII-1992, W. Jones; Arrivaca Springs 1-VIII-1992, W. Jones. New Mexico: Hidalgo Co., 11 mi. NE Lordsburg, 31-VIII-2000, J. Huether. Texas: Concho Co., Eden, 29-XII-1999 [no collector].

Host Plants

At four separate Arizona localities a total of 26 adults was collected by one of us (WJ) on the pandemic weed, common horehound, *Marrubium vulgare* L. (Labiatae). At one of these sites nymphs were also present. This is also a known host plant for the Australian horehound bug, *Agonoscelis rutila* (F.) (Gross 1976). In South Africa, Haines (1935) reported that *A. puberula* breeds on its natural host plant in the summer, but overwinters in buildings and on fruit trees, sometimes clustering on the fruits and causing "considerable damage." Unfortunately, Haines neglected to state the species of the host plant or the fruit damaged in South Africa. Our specimens from Concho County, Texas, were found on December 29 among stems and leaves of live oak, suggesting that they were overwintering in this habitat.

Our colleague Thomas J. Henry (USDA-ARS) informs us that he has frequently identified *Agonoscelis versicolor* (F.), intercepted on cut flowers shipped to the United States from South Africa via the Netherlands. This suggests a plausible route for the entry of *A. puberula* which may have established because of the ready availability of an acceptable host plant. According to Correll and Johnston (1970), common horehound is widely distributed in North America, flowers throughout the year, and is a weed typical of waste places and roadsides.

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