First Report of the Plant Bugs *Phytocoris depictus, Phytocoris fumatus* and *Phytocoris tricinctipes* (Hemiptera: Miridae) for Oklahoma

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Abstract: Hemipterans belong to the largest order of hemimetabolous insects. The number of species in the order is about 75,000, with a great diversity of forms, including the largest family, Miridae (plant bugs). It contains major insect pests and predatory groups that can be used as biological control agents. Here, we document three species of Miridae in Oklahoma, for the first time.

Introduction

Over the last decade, several new bug (Hemiptera) records have been reported for Oklahoma, including multiple species reported by the authors (see Chordas and McAllister 2012, 2016, 2018, 2019; Chordas et al. 2017; McAllister and Robison 2017). With over 200 species known for the United States north of México (Henry and Wheeler 1988), the genus *Phytocoris* Fallén, 1814 (Hemiptera: Miridae) is the most specious of the plant bugs. Taxonomic works including phytocorids are somewhat limited to regional or local treatments (none specific to Oklahoma) rendering the phytocorids, at times, extremely challenging to identify. As such, some specimens need to be evaluated using multiple references and the original description for genuine identification. Over the past few years we were able to identify three *Phytocoris* species not previously reported for the state. Here, we document three new geographic distributional records for these *Phytocoris* species for Oklahoma.

Methods

Miridae were collected with an insect aspirator under a porch light or from black light pan traps at a residence in Hochatown, McCurtain County (34° 10’ 17.0286”N, 94° 45’ 5.7414”W). Habitat of the area consisted of various hardwoods (*Quercus* spp.) and pines (*Pinus* spp.) in uplands bordering the Ouachita National Forest. Specimens were placed in individual vials containing 70% (v/v) ethanol. Blatchley (1926), Knight (1923, 1941, 1968), and Stonedahl (1988) were consulted for species identifications. Henry and Wheeler (1988), Knight (1941, 1968), Maw et al. (2000), Ratnasingham and Hebert (2007) and Stonedahl (1988) were used as distributional references. Further, verifiable records from BugGuide.net (2020) and iNaturalist (2020) were also incorporated. Voucher specimens (Figs. 1A–3A) were deposited in the C. A. Triplehorn Collection at The Ohio State University, Columbus, Ohio. Images of male genital claspers and associated terminal abdominal structures (Figs. 2D, 3D) and dorsal habitus of each species (Figs. 1A–3A) were created via stacking digital photographs (using CombineZP)

of the curated voucher specimens captured with a Cannon EOS DLSR through an Olympus SZ60 dissecting microscope processed with Corel PaintShopPro 2021 (Corel Corporation 2020). Maps of literature records (Figs. 1C–3C) were created with CorelDraw 2019 (Corel Corporation 2019), museum and data labels with voucher specimen and millimeter (mm) scale (Figs. 1B–3B) were captured using a 10× close-up lens attachment on a Cannon EOS DLSR.

New Records (Hemiptera: Miridae: Mirinae: *Phytocoris*)

Phytocoris depictus Knight, 1923 (Plate 1). A single male of this colorful species was collected on 8-IX-2020 (data label Plate 1B; unique museum code of voucher = OSUC 620954). Predominantly an eastern species in North America associated with oaks, *Quercus* spp. (Knight 1941). *Phytocoris depictus* is now known from Ontario and Québec, Canada, and the following 15 US states: *Connecticut* (via iNaturalist) Illinois, *Maryland* (via BugGuide), *Massachusetts* (via iNaturalist), Minnesota, *Mississippi* (Ratnasingham and Hebert [2007] BOLD SIHET515-13), Missouri, *New Jersey* (via BugGuide), New York, Ohio, **Oklahoma (new state record)**, *Pennsylvania* (via BugGuide), *Tennessee* (Ratnasingham and Hebert [2007] BOLD SIHET516-13), *Virginia* (via BugGuide), Wisconsin (Plate 1C) and Washington, DC.

Phytocoris fumatus Reuter, 1909 (Plate 2). A single male was taken on 11-V-2018 (data label Plate 2B; unique museum code of voucher = OSUC 620953). Left clasper and tubercle above clasper of male are shown in Plate 2D. With a spotty distribution in mid- and eastern North America (north of México), we did not anticipate finding this species in Oklahoma. *Phytocoris fumatus* is now known from Nova Scotia, Canada, and the following 12 US states: *Florida* (Ratnasingham and Hebert [2007] BOLD SIHET521-13), Georgia, Illinois, Maryland, Massachusetts, Missouri, New Jersey, New York, North Carolina, North Dakota, **Oklahoma (new state record)**, Pennsylvania (Plate 2C), and Washington, DC. We could not locate any ecological data for this species.

Phytocoris tricinctipes Knight, 1968 (Plate 3). As far as we could determine, this species has not been reported in any work since Stonedahl (1988). The current Oklahoma record is a significant eastern range extension of over 1,300 km (808 mi) for this uncommon species. A single male was collected on 8-V-2018 (data label Plate 3B; unique museum code of voucher = OSUC 620952). *Phytocoris tricincitipes* is now known from three US states: California, Nevada, **Oklahoma (new state record)** (Plate 3C). Species determination was arduous for us. However, the drawings in Stonedahl (1988) and the key and description were eventually confirmative for this western species. The left

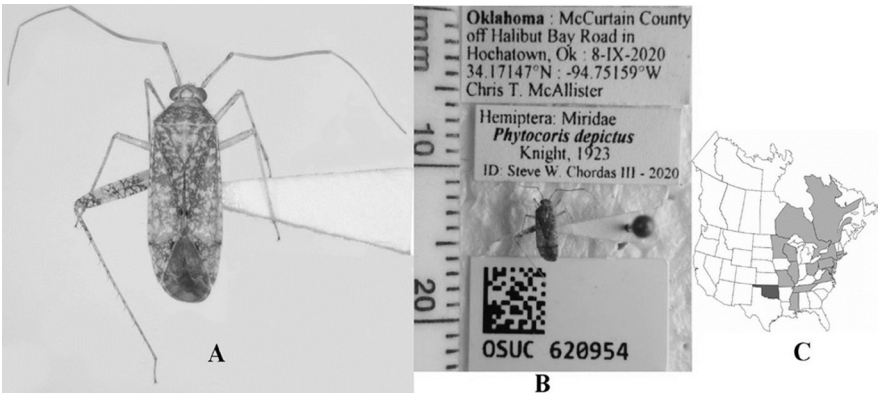

Plate 1 (Figures 1A–C). (A) Dorsal habitus of *Phytocoris depictus*; (B, top to bottom): location label, identification label, voucher specimen, unique museum number and code, scale in millimeters (mm) on left side of image; (C) distribution map (north of México), light shade = prior record, dark shade = new Oklahoma record.

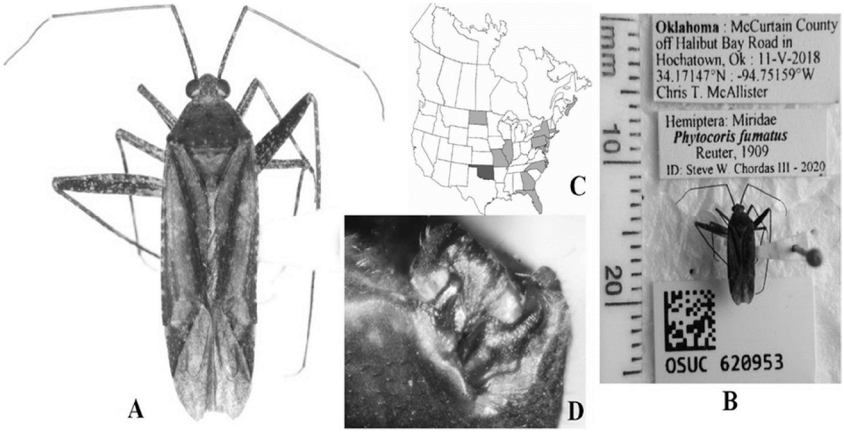

Plate 2 (Figures 2A–C). (A) Dorsal habitus of *Phytocoris fumatus*; (B, top to bottom): location label, identification label, voucher specimen, unique museum number and code, scale in millimeters (mm) on left side of image; (C) distribution map (north of México), light shade = prior literature record, dark shade = new Oklahoma record; (D) left male genital clasper, large tubercle above clasper and associated terminal abdominal structures.

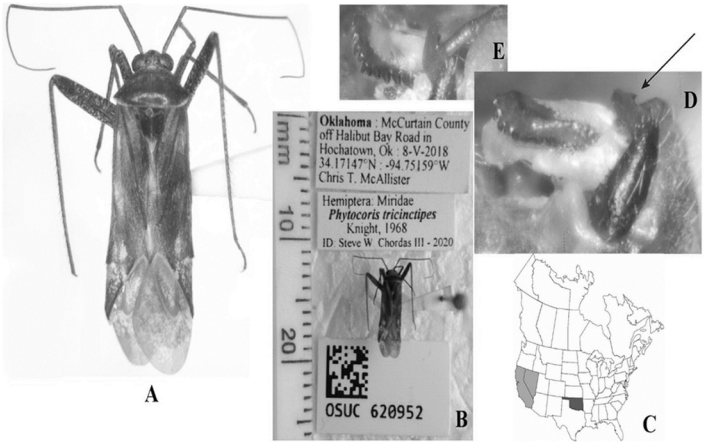

Plate 3 (Figures 3A–D). (A) Dorsal habitus of *Phytocoris tricinctipes*; (B, top to bottom): location label, identification label, voucher specimen, unique museum number and code, scale in millimeters (mm) on left side of image; (C) distribution map (north of México), light shade = prior literature record, dark shade = new Oklahoma record; (D & E) left male genital clasper, flagellum and associated terminal abdominal structures.

clasper shaft of the male has a clear posteriorly projecting protuberance, a morphological character illustrated by Stonedahl (1983, 1988), but not mentioned in the original description or in Knight's (1968) drawings (Plate 3D [arrow] and 3E). Most other characters and color combinations, with some variability, fit the descriptions in both Knight (1968) and Stonedahl (1988). Stonedahl (1988) reported *P. tricinctipes* to be a predaceous species that occurred in the Intermountain Sagebrush region of Nevada and eastern California (Inyo County) on pinyon pine (*P. monophylla* Torr. & Frem.); but was also attracted to lights (collection method of our specimen).

Additional collections of hemipterans, both aquatic and terrestrial, in the state should likely yield taxa yet unreported in the refereed literature for Oklahoma. Efforts to document

the bugs in Oklahoma is an ongoing endeavor.

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