

New State Records For Some Predatory And Parasitic True Bugs (Heteroptera: Cimicomorpha) of the United States

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New State Records For Some Predatory And Parasitic True Bugs (Heteroptera: Cimicomorpha) of the United States

Cover Page Footnote

The bulk of the work that went into this study was carried out during my time in the UMMZ, and I am grateful to Mark O'Brien (UMMZ) and Gary Parsons (MSUC) for the privilege of studying the material under their care. I also owe thanks to Tamera Lewis (USDA-ARS, Yakima Agricultural Research Laboratory, Wapato, Washington) and Paul Masonick (University of California, Riverside) for correspondence regarding identified material and state records of some "anthocoroid" and phymatine taxa, respectively. I also greatly appreciate the efforts of two anonymous reviewers, who made me aware of several obscure references and/or overlooked records, thereby significantly improving the utility of this study.

New State Records for Some Predatory and Parasitic True Bugs (Heteroptera: Cimicomorpha) of the United States

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Abstract

Forty new state records, distributed among Anthocoridae, Cimicidae, Lasiochilidae, Lyctocoridae, Nabidae, and Reduviidae, are reported for 25 species of Cimicomorpha found in the United States.

Keywords: true bugs, faunistics, distribution, Nearctic

The importance of reporting distributional records for organisms is not always immediately apparent and such information is frequently overlooked. However, at the basic level, having a more complete understanding of the distribution of a given species can help biologists better understand its natural history; this, in turn, can inform targeted conservation efforts (e.g., Vogt and Cashatt 2007 and references therein). Additionally, when ranges of several members of a genus are known, distributional information might allow insights into the evolutionary history of the group or provide opportunities or directions for testing hypotheses (e.g., Funk and Wagner 1995). Records carelessly dismissed and shoved into the dusty bin of “knowledge for knowledge’s sake”, such as those from an “expected” state, might corroborate single accounts from other states or even provide a breakthrough in understanding the microhabitat of a species where previously unknown (e.g., Skvarla et al. 2014). Similarly, records of species repeatedly taken over time can expose temporal changes, which might subsequently be correlated or explained by external biotic or abiotic forces or changes (e.g., Albrecht 1967). Furthermore, a better understanding of where and where not a species might occur could contain implications for their use and efficacy as biological control agents (e.g., Martin et al. 2018). Of particular significance are distributional records for predators because they compose a significantly smaller biodiversity and therefore are typically encountered with less frequency than herbivorous species, affording less opportunity to observe and study them.

Thus, herein are reported new state records for some predatory true bugs. Paralleling my prior treatment involving new pentatomorphan records (i.e., Swanson 2018), during the course of my survey of the Nabidae of Michigan (i.e., Swanson 2012), the Phymatinae of Michigan (i.e., Swanson 2013), and the Cimicoidea of Michigan (i.e., Swanson 2016), new extra-Michiganian state records for various cimicomorphan species were discovered among material housed in two major university collections in southern Michigan, as well as my personal collection. Those records form the basis of this treatment.

Materials and Methods

After examining the determined “anthocoroid”, nabid, and phymatine holdings and identifying much of the undetermined U.S. material in two Michigan university collections, the locality data of these specimens was compared with the most recent catalog for Heteroptera found north of Mexico (Henry and Froeschner 1988). Further records were culled after comparing with various post-1988 regional faunistic studies, as well as some pre-1988 references overlooked by the authors of the catalog (see annotations, plus Swanson 2011, 2018). The remaining specimen data are the subject of this treatment.

The identification of all specimens included in this study was rendered or confirmed by me, using Harris (1928) for the nabids, Kormilev (1962) for the phymatines, and my own keys (Swanson, unpublished)

to the United States taxa synthesized from various sources (e.g., Herring 1976, Kelton 1978) for the “anthocoroids”. I have confirmed identifications rendered by H. G. Barber, R. F. Hussey, and D. Punzalan, whereas those “anthocoroid” identifications rendered by T. Lewis and a single phymatine identification rendered by N. Kormilev have been accepted. All new records pertain to specimens vouchered in one of the collections listed below.

Label data were not copied verbatim, although complete locality information is included. Any additions, changes, or interpretive elements I provide are shown in brackets. Multiple localities are included, where possible, to fortify new records. Distributional or taxonomic notes are offered where deemed necessary or useful.

As mentioned, the authority on which a state having a published record is based belongs to Henry (1988) for the Anthocoridae, although this is supplemented with several other recent distributional accounts (i.e., Lewis et al. 2005). For Cimicidae, the authority belongs to Froeschner (1988a). For the Nabidae, the authority belongs to Henry and Lattin (1988) and Kerzhner and Henry (2008). Reduviid records are based on Froeschner (1988b, c) and Swanson (2011). An updated distribution within the United States and Canada is included for each species treated herein. Records overlooked or reported subsequently are annotated in the distribution north of Mexico given at the end of each species account, whereas new records herein reported are presented in bold type; thus, this treatment also may be used as a partial compilation of references overlooked in Henry and Froeschner’s (1988) catalog. The abbreviations used for each U.S. state and Canadian province or territory follow the United States Postal Service and the Canada Post Corporation, respectively.

Collections are designated as follows: Daniel R. Swanson, personal collection (DRS); Albert J. Cook Arthropod Research Collection, Michigan State University, East Lansing, Michigan (MSUC); and University of Michigan Museum of Zoology Insect Collection, Ann Arbor, Michigan (UMMZ).

Results

As a result of this investigation, 40 new state records for 25 species in 12 genera in 6 families have been compiled. The following 24 states have new records: CA, CT, GA, IL, KY, LA, ME, MN, MT, NC, NE, NH, NM, NV, OH, PA, RI, SC, VA, VT, WA, WI, WV, WY.

Family ANTHOCORIDAE

Nine new state records are reported for 6 species in 4 genera.

Calliodis temnostethoides (Reuter, 1884). – **WISCONSIN**: Kenosha Co., Pleasant Prairie, I-94W, welcome center, ex. abandoned bird nest, 10 July 2014, 42.5218°N 87.9499°W, 710 ft., D. R. Swanson, #60, det. D. R. Swanson 2016 [1 ♀] (DRS).

Distribution: USA: CT, FL, IL, MI (Lattin 1999), MO, NC (McPherson and Weber 1981), NY, SC (Ulyshen et al. 2012), TX, **WI**; Canada: NB, NS, ON, PE, QC, SK (Kelton 1978).

Dasyleistes assimilis (Reuter, 1872a). – **GEORGIA**: [Gordon Co.], Calhous [sic], 29 August 1949, [no collector], det. T. Lewis 2004 [1 ♀] (MSUC); **LOUISIANA**: St. Charles Parish, Norco, Bonnet Carre Spillway, 20 February 1972, Eric H. Metzler, det. T. Lewis 2004 [1 ♀] (MSUC).

Notes: Carpintero (2002) revived the genus *Dasypterus* Reuter, 1872a and transferred this species to it, without any justification. In addition to the lack of explanation, Carpintero (2002) overlooked the fact that the anthocorid genus was preoccupied by *Dasypterus* Peters, 1871 in Mammalia: Chiroptera: Vespertilionidae; Swanson (2019) summarized the situation and supplied a replacement name for *Dasypterus* Reuter, 1872a.

Distribution: AR (Chordas et al. 2011), FL, **GA**, **LA**, SC, TX, VA.

Orius diespeter Herring, 1966. – **CONNECTICUT**: [Litchfield Co.], Lakeville, 29 June 1935, R. F. Hussey, det. D. R. Swanson 2012 [1 ♂, 2 ♀] (UMMZ).

Notes: This species was previously confounded with *Orius tristicolor* (White, 1879) in the east, but Lewis and Horton (2010) clarified its status; the distribution given below is based on that treatment.

Distribution: USA: AK, **CT**, CO, IA, ID, KS, MA, ME, MI, MN, MT, ND, NE, NH, NY, OR, PA, SD, UT, VT, WA, WY; Canada: AB, BC, NB, NS, ON, QC, YT.

Orius insidiosus (Say, 1831). – **MINNESOTA**: Houston Co., 28 May 1939, H. E. Milliron Coll., det. T. Lewis 2004 [1 ♀] (MSUC); [Jackson Co.], Jackson, 14 June 1955, R. W. Hodges, det. T. Lewis 2004 [1 ♂] (MSUC); Washington Co., Lakeland, Welcome Center on I-94W, 17 July 2013, 44.9517°N 92.8214°W, #27, 890 ft., D. R. Swanson, det. D. R. Swanson 2013 [1 ♂, 3 ♀] (DRS).

Distribution: USA: AL, AR (Tugwell et al. 1973, Elkassabany et al. 1996), CA, CO, CT, FL, GA (Kelton 1963), IA, IL, IN, KS, KY (Isenhour and Yeargan 1981), LA, MA, MD, ME (Parshley 1917), MI, MN, MO, MS (Lago and Testa 2000), NC, NE, NH, NJ, NM (Townsend 1892), NY, OH, PA, RI (Parshley 1917), SC, SD (Harris 1937), TN, TX, UT, VA, VT (Parshley 1917), WA (Newcomer 1958), WI, WV (Brown et al. 1988); Canada: AB (Knight 1925, Strickland 1953), BC(?), MB, ON, QC.

Orius tristicolor (White, 1879). – **NEVADA**: [Washoe Co.], Reno, 2 July 1958, H. C. Chapman, det. T. M. Lewis 2008 [1 ♀] (MSUC).

Notes: As mentioned above, this species was previously confounded with *O. diespeter* in the east, but Lewis and Horton (2010) clarified its status; the distribution given below is based on conclusions drawn in that treatment, viz. previous records of *O. tristicolor* in the east actually referred to *O. diespeter* and the former species has not been collected east of Nebraska. Maw et al.'s (2000) listing of the Northwest Territories remains unplaced.

Distribution: USA: AK, AZ, CA, CO, ID, NE, NM, NV, OR, TX, UT, WA, WY; Canada: AB, BC, MB, SK, YT.

Xylocoris cursitans (Fallén, 1807). – **OHIO**: [Washington Co.], Marietta, 15 June 1957, R. A. Scheibner, det. T. Lewis 2004 [1 ♀] (MSUC); **PENNSYLVANIA**: [Pike Co.], Milford, 29 August 1955, R. Angle, det. T. Lewis 2004 [1 ♂, 1 ♀] (MSUC); **VIRGINIA**: Fairfax Co., Springfield, 10 August 1976, R. D. Ward, det. T. Lewis 2004 [1 ♂] (MSUC).

Notes: Lattin (2007) discussed the distribution of this and several other species of *Xylocoris* in the United States.

Distribution: USA: CT, ID, IL (McPherson and Weber 1990), IN, MA (Parshley 1917), MI, NH (Parshley 1917), NJ, NY, OH, OR, PA, VA, WA (Lattin and Stanton 1992); Canada: AB, BC, NS, ON, QC.

Family CIMICIDAE

One new state record is reported for 1 species in 1 genus.

Oeciacus vicarius Horváth, 1912. – **ILLINOIS**: Piatt Co., Monticello, Allerton Park, N. entr. nr. barns, ex. nest of barn swallow (*Hirundo rustica* L.), 3 Aug. 2018, 40.0153°N 88.6393°W, 700 ft., D. R. Swanson, det. D. R. Swanson 2018 [7 ♂, 5 ♀] (DRS).

Distribution: USA: AK (Scudder and Sikes 2014), CA, CO, CT (Parshley 1917), FL

(Loy and Regan 1991), IA, IL, MA (Parshley 1917), ME, MI (Swanson 2016), NC, ND (Brown et al. 2009), NE, NH, NY, OR, TX (Sikes and Arnold 1984, Kopachena et al. 2000), UT; Canada: AB, BC, MB (Maw et al. 2000), NS, ON, QC (Maw et al. 2000).

Family LASIOCHILIDAE

One new state record is reported for 1 species in 1 genus.

Dilasia fuscula Reuter, 1872a. – **WISCONSIN**: Shawano Co., [no further locality data], 31 August 1950, [no collector], det. T. Lewis 2004 [2 ♀] (MSUC).

Distribution: USA: FL, GA (Carpintero 2014), IA (Carpintero 2014), IL, IN, LA (Carpintero 2014), MA (Carpintero 2014), MD (Brown and Bahr 2008, Carpintero 2014), MI (Carpintero 2014, Swanson 2016), MS, NC (McPherson and Weber 1981), NJ, NY, OH (Carpintero 2014), SC, TN, TX, VA (Carpintero 2014), WI; Canada: ON, QC.

Family LYCTOCORIDAE

One new state record is reported for 1 species in 1 genus.

Lyctocoris stalii (Reuter, 1872a). – **WISCONSIN**: Lafayette Co., Belmont, 13 October 1968, W. C. Stehr, det. T. Lewis 2004 [1 ♂] (MSUC).

Note: Kelton (1967) questioned the validity of Van Duzee's (1917a) record from British Columbia.

Distribution: USA: AL, AR (Chordas et al. 2005), CA, FL, GA, IA (Kelton 1967), IL (Blatchley 1926, Kelton 1967), IN, LA (Kelton 1967), MI (Swanson 2016), MO, MS (Kelton 1967), NC, ND (Kelton 1967), NY, OH (Kelton 1967), SC, TX, WI; Canada: BC(?), MB (Kelton 1967, Maw et al. 2000).

Family NABIDAE

Fourteen new state records are reported for 9 species in 3 genera.

Himacerus major (Costa, 1840). – **OHIO**: [Summit Co.], Barberton, Keller St., 26 August 1960, B. A. Wilson, det. D. R. Swanson 2011 [1 ♂] (MSUC); idem. 12 September 1960 [1 nymph] (MSUC).

Notes: The presence of this introduced Palearctic endemic in various parts of North America has been noted by Barber (1932), Scudder (1961), Lattin (1966), and Wheeler (1976).

Distribution: USA: CA, MI (Swanson 2012), NY, OH, OR, PA, WA; Canada: BC, NS (Wheeler and Hoebeke 2004), ON (Paiero et al. 2003).

Lasiomerus annulatus (Reuter, 1872b). – **VIRGINIA**: Alexandria, 20 July 1972, Collector: Barry M. O'Connor, det. D. R. Swanson 2011 [1 ♂] (UMMZ); **WISCONSIN**: Shawano Co., 23 August 1940 [add. date: 31 August 1950], [no collector], det. D. R. Swanson 2011 [3 ♀] (MSUC).

Distribution: USA: AR (Chordas et al. 2005), CT, IA, IL, IN, MA, MD (Brown and Bahr 2008), MI (Hussey 1922, Swanson 2012), MN, MO, MS, NC, NJ, NY, OH, OK (Drew and Schaefer 1963), PA, RI (Parshley 1917), SD, TN (Lambdin et al. 2003), VA, WI; Canada: ON, QC.

Lasiomerus constrictus (Champion, 1899). – **NORTH CAROLINA**: Haywood Co., Crestmont, 3 August 1924, elevation 1800 feet, T. H. Hubbell, *Nabis constrictus* Champ., det. R. F. Hussey 1952 [1 ♂] (UMMZ).

Distribution: DC, FL, MD, NC, VA.

Nabis (Dolichonabis) americolimbatus (Carayon, 1961). – **VERMONT**: Rutland Co., Killington, Gibson Woods State Park, 11 Aug. 2014, 43.6725°N 72.8115°W, 1670 ft., D. R. Swanson, #94, det. D. R. Swanson 2016 [1 ♀] (DRS).

Distribution: USA: AK (Maw et al. 2000), ME, MI (Swanson 2012), MN, NY, VT; Canada: AB, BC (Larivière 1994), MB (Larivière 1994), NB (Larivière 1994), NF, NS (Larivière 1994), NT (Larivière 1994), ON, PE (Larivière 1994), QC, SK (Larivière 1994), YT (Larivière 1994, Scudder 1997).

Nabis (Dolichonabis) nigrovittatus nearcticus (Kerzhner, 1981). – **WYOMING**: Albany Co., Medicine Bow National Forest, Curtis Gulch Campground, T28N – R73W – Section 8, 8–10 July 1974, Roland L. Fischer, det. D. R. Swanson 2011 [1 ♂] (MSUC).

Distribution: USA: AK, CO, ID, NY, WY; Canada: AB, BC, MB, NB, NF, NS (Larivière 1994), NT, ON, PE, QC, SK, YT.

Nabis (Nabicula) subcoleoptratus (Kirby, 1837). – **LOUISIANA**: [Winn Par.], Winnfield, 15 May 1918, [no collector], det. R. F. Hussey [1 ♀] (UMMZ); **VIRGINIA**: Page Co., Skyline Drive, Jewel Hollow outlook, 19 June 2016, 38.6273°N 78.3387°W, 3330 ft., D. R. Swanson, #26, det. D. R. Swanson 2018 [1 ♀] (DRS); **WYOMING**: [Goshen Co.], Jay Em, 22 June 1955, R. L. Fischer, det. D. R. Swanson 2011 [1 ♂] (MSUC).

Notes: Although Harris (1928) questioned the Texas record reported by Van Duzee (1917a), the Louisiana record here reported strengthens the likelihood of a southern population.

Distribution: USA: CO, CT, IA, ID, IL, IN, KS, LA, MA (Parshley 1917), ME, MI, MN, MT (Uhler 1878), NC (Torre-Bueno 1913, Brimley 1938), ND, NE, NH, NJ, NY, OH, OK (Carpenter 1937), PA, SD, TN (Lambdin et al. 2003), TX, VA, VT (Parshley 1917), WA (Torre-Bueno 1934), WI, WY; Canada: AB, BC, MB (Larivière 1994), NB, NS, ON, PE, QC, SK.

Nabis (Nabis) roseipennis Reuter, 1872b. – **KENTUCKY**: [Fayette Co.], Lexington, 20 June 1954, R. L. Fischer, det. D. R. Swanson 2012 [1 ♂] (MSUC); Jackson Co., McKee, jct. Hwy. 421 & First Street, lights, 11 June 2011, 37.4303°N 83.9977°W, #30, 1030 ft., D. R. Swanson, det. D. R. Swanson 2012 [1 ♂, 1 ♀] (DRS); [Scott Co.], Georgetown, 21 June 1954, R. L. Fischer, det. D. R. Swanson 2012 [1 ♂, 2 ♀] (MSUC); idem. D. L. Haynes [2 ♀] (MSUC); **SOUTH CAROLINA**: Pickens Co., Clemson, 30 May 1958 [add. dates: 3 July 1958, 16 June 1959], R. C. Fox, det. D. R. Swanson 2012 [1 ♂, 2 ♀] (MSUC).

Distribution: USA: AL, AR (Tugwell et al. 1973), CO, CT, DC, DE, FL, IA, ID, IL, IN, KS, KY, MA, MD (Brown and Bahr 2008), ME, MI, MN, MO, MS, NC, NE, NH (Parshley 1917), NJ, NY, OH, OK (Drew and Schaefer 1963), OR (Van Duzee 1917b), PA, RI (Parshley 1917), SC, SD, TN, UT (Knowlton 1935), VA, VT, WI, WV; Canada: AB, BC, MB, NB, NS (Parshley 1923, Maw et al. 2000), ON, PE (Scudder 2008), QC, SK.

Nabis (Reduviolus) ameroferus Carayon, 1961. – **VIRGINIA**: Alexandria, 26 June 1972 [add. dates: 20 October 1972, 5 June 1973], Collector: Barry M. O'Connor [4 ♂, 2 ♀] (UMMZ); Alleghany Co., Immanuel Baptist Church in Clifton Forge, 15 June 2009, 37.8315°N 79.7893°W, #74, 1100 ft., D. R. Swanson, det. D. R. Swanson 2012 [3 ♂, 2 ♀] (DRS); Alleghany Co., Clifton Forge, Laundry Land parking lot, 8 June 2011, 37.8178°N 79.8040°W, #21, 1180 ft., D. R. Swanson, det. D. R. Swanson 2012 [1 ♀] (DRS); [Rappahannock Co.], Sperryville, 4 August 1973, Collector: Barry M. O'Connor [1 ♂] (UMMZ); **WEST VIRGINIA**: Greenbrier Co., Blue Sulphur Springs, on low wet veg: sedges, mints, grasses, etc., 8 September 1958, T. E. Moore, det. D. R. Swanson 2012 [1 ♂, 1 ♀] (UMMZ).

Distribution: USA: AK (Scudder and Sikes 2014), AR (Tugwell et al. 1973, Chordas et al. 2005), AZ, CA, CO, CT, GA, IA, ID, IL, IN, KS, MA, MD, ME, MI, MN, MO, MS, MT, NC, ND, NE, NH (Parshley 1917), NJ, NM, NY, OH, OK (Smith 1940, Drew and Schaefer 1963), OR, PA, RI (Parshley 1917), SC (Roach 1991), SD, TN, TX, UT, VA, VT

(Parshley 1917), WA, WI, WV, WY (Turner 1959, Dennis et al. 2010); Canada: AB, BC, MB, NB, NF, NS, NT (Maw et al. 2000), ON, PE (Maw et al. 2000), QC, SK, YT (Evans et al. 1978, Scudder 1997, Maw et al. 2000).

Nabis (Tropiconabis) capsiformis Germar, 1838. – **LOUISIANA**: Winn Co. [sic], Winnfield, 27 June 1918 [add. date: 28 June 1918], G. R. Pilate, det. H. G. Barber [4 ♂, 1 ♀] (UMMZ); [East Baton Rouge Par.], Baton Rouge, 27 April 1934, F. E. Lyman, det. D. R. Swanson 2011 [1 ♂] (UMMZ).

Distribution: AL, AR, FL, GA, IA (Hendrickson 1930), LA, MO, MS, NC, OK (Stoner et al. 1962, Drew and Schaefer 1963), SC, TN, TX, UT.

Family REDUVIIDAE

Fourteen new state records are reported for 7 species and 5 subspecies in 2 genera.

Subfamily PHYMATINAE

Identifications made for the following records relied heavily on the latest treatment for the genus (Kormilev 1962), with especial reference to the figures of the connexiva.

Phymata americana americana Melin, 1931. – **CONNECTICUT**: [Litchfield Co.], Lakeville, 25 August 1934 [add. date: 2 September 1934], R. F. Hussey, det. D. Punzalan 2011, det. D. R. Swanson 2013 [5 ♂, 1 ♀] (UMMZ); [Litchfield Co., Salisbury, 21–25 August 1989, M. O'Brien, det. D. Punzalan 2012, det. D. R. Swanson 2013 [1 ♀] (UMMZ)]; **MAINE**: [Penobscot Co.], Orono, 27 August 1966, [no collector], det. D. R. Swanson 2013 [3 ♂, 1 ♀] (MSUC); [Cumberland Co.], Gorham, August 1963 [add. date: August 1969], [no collector], det. D. R. Swanson 2013 [1 ♂, 2 ♀] (MSUC); [Lincoln Co.], Ocean Point, 18 August 1956, R. L. Fischer, det. D. R. Swanson 2013 [1 ♂] (MSUC); [Kennebec Co.], Winslow, 18 August 1956, W. A. Drew, det. D. R. Swanson 2013 [3 ♂, 1 ♀] (MSUC); idem. R. W. Hodges [1 ♂, 1 ♀] (MSUC); idem. R. L. Fischer [1 ♂] (MSUC); **NEW HAMPSHIRE**: [Carroll Co.], Conway, 19 August 1956, R. W. Hodges, det. D. R. Swanson 2013 [2 ♂] (MSUC).

Distribution: USA: AR, AZ, CO, CT, DC, DE, IA, IL, IN, KS, MA, MD, ME, MI, MN, MO, MT, NC, ND, NE, NH, NJ, NM, NY, OH, PA, SD, TN (Howden and Crossley 1961), TX, VA, VT, WI; Canada: AB (Maw et al. 2000), MB (Maw et al. 2000), ON, QC (Maw et al. 2000), SK (Maw et al. 2000).

Phymata americana coloradensis Melin, 1931. – **MONTANA**: Fallon Co., 11.5

mi. E. of Baker, 27 July 1955, D. & T. Bailey, det. D. R. Swanson 2013 [1 ♂, 1 ♀] (UMMZ).

Distribution: AZ, CO, ID (Harris and Shull 1944), KS, MT, NE, NM, OK, OR, TX, UT, WA.

Phymata americana metcalfi Evans, 1931. – **WASHINGTON**: Columbia Co., Huntsville, 8 September 1945, Pierce Brodkorb, det. N. Kormilev 1986 [4 ♂, 2 ♀] (UMMZ).

Distribution: USA: ID (Harris and Shull 1944), NV, OR, UT, WA; Canada: BC.

Phymata borica Evans, 1931. – **NEW MEXICO**: Sierra Co., 3 mi. W. Kingston, 30 July 1989, F. W. Stehr, det. D. R. Swanson 2012 [1 ♀] (MSUC).

Notes: The combination of a virtual absence of a lateral notch on the pronotum, a simple rounded connexival outline, simple veins of the hemelytral membrane, and size greater than 6.5 mm will diagnose *P. borica* among the United States fauna. The elevation of the collection site is probably between 6,500 and 8,000 feet, which corresponds well with previous localities for this species. The specimen reported seems to have been syntopic with *Phymata saileri* Kormilev (see below).

Distribution: AZ, CO, ID, NM, UT.

Phymata fasciata fasciata (Gray, 1832). – **KENTUCKY**: Laurel Co., Bald Rock, 11 June 1978, R. L. Fischer, det. D. R. Swanson 2012 [1 ♂] (MSUC); Marion Co., Rowan's Knob Summit, 26 August 1985, Greg A. Dahlem, det. D. R. Swanson 2012 [1 ♀] (MSUC); [Pulaski Co.], Burnside, 20 June 1954, R. L. Fischer, det. D. R. Swanson 2012 [1 ♂, 1 ♀] (MSUC); **PENNSYLVANIA**: [Pike Co.], Milford, 3 September 1955 [add. date: 7 September 1955], R. Angle, det. D. R. Swanson 2012 [1 ♂, 1 ♀] (MSUC); **WEST VIRGINIA**: Greenbrier Co., Alvon, 18 June 1957, R. A. Scheibner, det. D. R. Swanson 2012 [2 ♂, 2 ♀] (MSUC); idem. R. L. Fischer [1 ♂] (MSUC); McDowell Co., along Mt. Ridge nr. Crumpler, 10–12AM, 18 August 1952, P. F. & E. J. Kormondy, det. D. R. Swanson 2013 [1 ♂] (UMMZ); Pendleton Co. Brandywine, Brandywine Rec. Area, 20 June 2016, 38.6016°N 79.2027°W, 1890 ft., D. R. Swanson, #30, det. D. R. Swanson 2018 [2 ♂, 2 ♀] (DRS); [Wood Co.], Rockport, 11 June 1954, R. L. Fischer, det. D. R. Swanson 2012 [1 ♂] (MSUC).

Notes: Given the difficulty associated with phymatine identification (see discussion in Swanson 2013), and the early convolution of *Phymata erosa* Linnaeus, 1758; *Phymata wolffii* Stål, 1876; and *P. fasciata* in partic-

ular, the baseline distribution of this species is gleaned from three revisionary studies: Melin (1931), Evans (1931), and Kormilev (1962). Records prior to these treatments (e.g., Osborn 1894: CA; Townsend 1894: NM; Osborn 1900: OH; Cockerell 1901: NM; Hart and Gleason 1907: IL; Barber 1914: FL; Parshley 1917: CT, MA, RI, VT; Parshley 1922: SD; Blatchley 1926: IN; Hendrickson 1928: IA; Johnson 1930: MA; Knowlton 1931: UT; Torre-Bueno 1931, 1933: FL) are considered suspect and therefore excluded. Harris' (1937) record for South Dakota also is excluded, as he questionably equated his specimens of "*Phymata erosa fasciata*" with *P. americana*, the latter likely being the correct identification. Melin (1931) described this subspecies, *Phymata fasciata georgiensis* Melin, 1931, from "Carolina", Georgia, and Texas. Evans (1931) greatly extended the range of this subspecies, adding Arkansas, Florida, District of Columbia, Illinois, Kansas, Louisiana, Maryland, Mississippi, Missouri, Nebraska, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, and Virginia, without including specific locality data. Kormilev (1962) noted examined specimens (as *P. f. fasciata*) from a more southerly distribution, mentioning only Arizona, "Carolina", Georgia, Louisiana, Mississippi, and Texas; this is the distribution given by Froeschner (1988b). Despite prior characterization of *P. f. fasciata* as a southern or coastal species, Melin's (1931) treatment is here vindicated, as I have examined the following corroborative material: **ARKANSAS**: Montgomery Co., Mt. Ida, 15 June 1978, R. L. Fischer, det. D. R. Swanson 2012 [2 ♂] (MSUC); **KANSAS**: Stafford Co., salt marsh, 18 April[?] 1934, C. W. Sabrosky Collector, det. D. R. Swanson 2012 [2 ♂] (MSUC); **MARYLAND**: [Prince George's Co.], Laurel, 24 August 1958, W. T. Van Velzen, det. D. R. Swanson 2012 [1 ♀] (MSUC); **MISSOURI**: Carter Co., Van Buren, Ozark Mts., 18 June 1930, E. A. Pence, det. D. R. Swanson 2013 [1 ♀] (UMMZ); Jasper Co., Joplin, 22 June 1961, G. C. Eickwort, det. D. R. Swanson 2012 [1 ♂, 3 ♀] (MSUC); Ozark Co., Tecumseh, 9 June 1960, W. T. Van Velzen, det. D. R. Swanson 2012 [2 ♂] (MSUC); **NEW MEXICO**: [Dona Ana Co.], 30 mi. NW. Las Cruces, 13 August 1955, R. R. Dreisbach, det. D. R. Swanson 2012 [1 ♂] (MSUC); [Hidalgo Co.], Rodeo, Skelton Can., 10 August 1955, 4200 ft., R. R. Dreisbach, det. D. R. Swanson 2012 [2 ♂] (MSUC); **NORTH CAROLINA**: Clay Co., near Chatuge Lake dam, 6 September 1952, T. H. Hubbell & party, det. D. R. Swanson 2013 [1 ♂] (UMMZ); Haywood Co., Crestmont, 27 July 1922, elevation 1800 feet, T. H. Hubbell, det. D. R. Swanson 2013 [1 ♂] (UMMZ); [Haywood Co.], L[ake] Junaluska, 24 May 1954, H. V. Weems, Jr., det. D. R.

Swanson 2013 [1 ♂] (UMMZ); Wayne Co., [ex.] *Apocynum cannabinum* L., 15 June 1955, H. V. Weems, Jr., det. D. R. Swanson 2013 [1 ♂] (UMMZ); **OHIO**: Hocking Co., Good Hope Twp., 11 September 1932, R. M. Bailey, det. D. Punzalan 2012, det. D. R. Swanson 2013 [1 ♂, 1 ♀] (UMMZ); [Hocking Co.], nr. S. Bloomingville, 2 July 1946, U. N. Lanham, det. D. R. Swanson 2013 [1 ♂] (UMMZ); [Washington Co.], Marietta, 11 June 1954 [add. dates: 15 June 1957, 16 June 1957], R. L. Fischer, det. D. R. Swanson 2012 [2 ♂, 3 ♀] (MSUC); idem. R. A. Scheibner [1 ♂, 1 ♀] (MSUC); [Washington Co.], Layman, 16 June 1957, R. A. Scheibner, det. D. R. Swanson 2012 [1 ♂] (MSUC); **VIRGINIA**: Amherst Co., Sweet Briar, 3 May 1938, Elsie Herbold, det. D. R. Swanson 2013 [1 ♂, 1 ♀] (UMMZ); [Floyd Co.], Floyd, 18 June 1957, R. A. Scheibner, det. D. R. Swanson 2013 [1 ♀] (MSUC); Rockbridge Co., Brushy Mts., 17 September 1934, L. K. Gloyd, det. D. R. Swanson 2013 [1 ♂] (UMMZ); Alexandria, 23 September 1972 [add. dates: 2 October 1972, 30 June 1973, 18 August 1973, 19 August 1973], B. M. O'Connor, det. D. Punzalan 2012, det. D. R. Swanson 2013 [2 ♂, 3 ♀] (UMMZ).

Distribution: AR (Evans 1931), AZ (Kormilev 1962), DC (Evans 1931), FL (Evans 1931), GA, IL (Evans 1931, Swanson et al. 2017), KS (Evans 1931), **KY**, LA (Evans 1931, Kormilev 1962), MD (Evans 1931), MO (Evans 1931, Dowdy 1955), MS (Evans 1931, Kormilev 1962), NC (Evans 1931, McPherson and Weber 1981), NE (Evans 1931), NJ (Evans 1931), NM, OH (Evans 1931, Dailey et al. 1978), OK (Evans 1931, Drew and Schaefer 1963), PA, TN (Lambdin et al. 2003, Vlach et al. 2010), TX, VA (Evans 1931), WV.

Phymata fasciata mystica Evans, 1931. – **SOUTH CAROLINA**: Berkeley Co., Monks Cr., 9 May 1944, [no collector], det. D. R. Swanson 2012 [1 ♂, 1 ♀] (MSUC).

Notes: See notes under the preceding subspecies. The baseline for records of this species comes from the original description (Evans 1931: FL, GA), plus a record added by Kormilev (1962: LA). I have examined the following material corroborating the latter: **LOUISIANA**: [East Baton Rouge Par.], Baton Rouge, 24 May 1934, F. E. Lyman, det. D. R. Swanson 2012 [1 ♂] (UMMZ).

Distribution: FL, GA, LA (Kormilev 1962), SC.

Phymata pennsylvanica Handlirsch, 1897. – **RHODE ISLAND**: Providence Co., Chepachet, Putnam Pike, Acotes Field, 15 Aug. 2014, 41.9070°N 71.6611°W, 460 ft., D. R. Swanson, #102, det. D. R. Swanson 2016 [3 ♂, 2 ♀] (DRS).

Distribution: USA: AR, CO, CT, DC, DE, FL, GA, IA, IL, IN, KS, KY, MA, MD, MI, MN, MO, MT, NC, ND, NE, NJ, NY, OH, PA, RI, SD, VA, WI, WV; Canada: AB (Strickland 1953), BC (Maw et al. 2000), ON (Maw et al. 2000), QC (Moore 1907, Maw et al. 2000).

Phymata saileri Kormilev, 1957. – **NEW MEXICO**: Sierra Co., 3 mi. W. Kingston, 30 July 1989, F. W. Stehr, det. D. R. Swanson 2012 [2 ♀] (MSUC); idem. R. L. Fischer [1 ♀] (MSUC).

Notes: In the United States, only three species, *Phymata saileri* Kormilev, 1957; *Phymata granulosa texasana* Kormilev, 1957; and *Phymata rossi* Evans, 1931, possess setigerous granules on the body, and the latter species is densely covered with these structures, separating it from the other two more sparsely-covered species. The shallow lateral notch of the pronotum will separate *P. saileri* from *P. g. texasana*. Furthermore, the localities seem to corroborate this identity as this western New Mexico locality is nearer to areas where the species is known in Arizona; *P. g. texasana*, however, is known from extreme southern Texas. The specimens here reported appear to have been syntopic with *P. borica* (see above).

Distribution: AZ, NM.

Phymata vicina Handlirsch, 1897. – **CALIFORNIA**: Ventura Co., Sespe Canyon, 10 July 1959, J. E. Bath Collector, det. D. R. Swanson 2012 [1 ♂] (MSUC).

Distribution: USA: AZ, CA, CO, CT, DC, FL, IL, IN, KS, MA, MO (Froeschner 1944), NC (Torre-Bueno 1913), NE, NJ, NY, PA, RI, SD, TN (Lambdin et al. 2003), TX, UT, VA; Canada: AB, BC (Maw et al. 2000), MB (Maw et al. 2000), SK (Maw et al. 2000).

Subfamily STENOPODAINAE

Oncocephalus geniculatus (Stål, 1872). – **NEBRASKA**: Knox Co., Crofton, Weigand Marina, night lights, 19 July 2013, 42.8359°N 97.5774°W, 1210 ft., D. R. Swanson, #36, det. D. R. Swanson 2013 [1 ♂] (DRS).

Distribution: AL, AR, AZ, CO, FL, GA (Swanson 2011), IL, KS, LA, MD, MO, MS (Swanson 2011), NC, NE, NJ, NM (Swanson 2011), OK, SC (Payne et al. 1968, Swanson 2011), TN, TX, VA.

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