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A Preliminary Annotated Checklist of Mississippi Mecoptera (Insecta)

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Abstract. We summarize distribution records for 22 Mecoptera species known to occur in Mississippi. These include the first specimens of *Bittacus occidentis* Walker, *B. strigosus* Hagen, *Hylobittacus apicalis* (Hagen) and *Panorpa insolens* Carpenter to be recorded from the state.

Key words. scorpionfly, hangingfly, Panorpidae, Bittacidae, Meropeidae

Introduction

The insect order Mecoptera currently includes 240 North American species placed in five families (Penny 2013). The first major revision of Nearctic panorpidids by Carpenter (1931) did not include specific Mississippi records, although he did note that Hine (1901) had reported *Panorpa nuptialis* Gerstaecker from the state. Subsequently, 14 species of Panorpidae and three Bittacidae were listed for Mississippi by Penny (2013), and many of these records are based on studies by Byers (e.g., 1958, 1962a, 1962b, 1973, 1993, 1996). Recently, Schiefer (2015) reported the first records of *Merope tuber* from the state. In this study we compiled records of Mississippi mecopterans from the literature and from the following institutional and individual collections, noted in the text by the acronyms listed below.

ABHC — Audrey B. Harrison Collection, Jackson, Mississippi
BPSC — Bill P. Stark Collection, Mississippi College, Clinton, Mississippi
FSCA — Florida State Collection of Arthropods Collection, Gainesville, Florida
INHS — Illinois Natural History Survey Collection, Champaign, Illinois
MEMU — Mississippi Entomological Museum Collection, Mississippi State University, Mississippi
SEMC — Snow Entomological Museum Collection, University of Kansas, Lawrence, Kansas
UMIC — University of Mississippi Insect Collection, Oxford, Mississippi
WBIC — Wes Bicha Insect Collection, Oliver Springs, Tennessee
WESC — William E. Smith Collection, Brookhaven, Mississippi

Results

In the following list, state distributions are taken from Byers (1993), Dunford et al. (2007), Flint (2013), Jones (2010), Penny (2013), Schiefer and Dunford (2005), Schiefer (2015), and Somma (2011a).

Family Bittacidae: Hangingflies

Bittacus occidentis Walker

Bittacus occidentis Walker, 1853: 469. Erie [Pennsylvania]

Bittacus arizonicus Banks, 1911: 350. Palmerlee, Arizona, syn. (Carpenter, 1931)

Distribution. AL, AR, AZ, DC, DE, IA, IL, IN, KS, KY, MD, MO, NC, NE, NY, OH, OK, PA, SC, SD, TN, TX, VA.

Published Mississippi Records. Fig. 46 in Webb et al. (1975) shows Mississippi in the range of this species, but Penny (2013) does not include Mississippi in the states from which records occur.

New Mississippi Records. Oktibbeha Co., Ag. Col., 4 July 1922, H. M. Harris, 1 ♀ (MEMU). Same location, 1920, S.R. Cooley, 1 damaged specimen (MEMU).

Comments. These specimens were identified by G.W. Byers in the 1970s. The first specimen listed is intact and in good condition. The second specimen has pest damage, the left hind wing has an apical crossvein, although the other wings do not, and the abdomen is missing. Numerous bittacid specimens have been collected in the vicinity of Starkville, yet this pair, collected in the 1920's, are the only *B. occidentis* specimens known for the state.

Bittacus pilicornis Westwood

Bittacus pilicornis Westwood, 1841:196. "America Septentrionale"

Distribution. AL, AR, DC, FL, GA, IA, IL, IN, KS, KY, LA, MA, MD, MI, MO, MS, NC, NH, NJ, NY, OH, PA, TN, TX, VA, WI, WV.

Published Mississippi Records. Fig. 45 insert map in Webb et al. (1975) includes Mississippi in the range of this species, and Byers (1973) reports "... a few teneral adults were present..." at the type locality of *Panorpa vernalis* in Claiborne Co. in April 1972. Byers (1996) includes the following Mississippi records: **Hinds Co.**, locality unknown, 25 April 1981, W. Bicha, 1 ♂. **Lauderdale Co.**, 6 miles east of Meridian, 24 May 1986, W. Bicha, 2 ♀. **Lee Co.**, Tombigbee State Park, SE of Tupelo, 18 May 1993, G.W. Byers, 2 ♂, 6 ♀. Tombigbee State Park, 30 May 1982, W. Bicha, 3 ♀. **Winston Co.**, Tombigbee National Forest, 18 May 1993, G.W. Byers, 1 ♂, 7 ♀.

New Mississippi Records. **Claiborne Co.**, Ragsdale Creek, Regantown Road, 13 June 1995, C. Middleton, 1 ♀ (BPSC). Big Sand Creek, 12 May 1978, B. Stark, 3 ♀ (BPSC). Same site, 19 May 1978, 2 ♂ (BPSC) 3 adults (INHS), 2 ♂ (FSCA), 1 ♀ (MEMU). Same site, 5 May 1986, R. Hayman, 2 ♂, 1 ♀ (BPSC). Natchez Trace Parkway, Mile 35, 5 miles SSW Port Gibson, 4 May 1984, D.W. Webb, 8 adults (INHS). Lower Choctaw Boundary, Natchez Trace Parkway, 32° 08.873' N, 90° 43.493' W, 25 May 2013, B. Stark, 1 ♂, 2 ♀ (BPSC). **Copiah Co.**, Brushy Creek, 20 May 1978, B. Stark, 3 ♀ (BPSC), 1 ♂, 1 ♀ (UM), 1 adult (INHS), 2 ♀ (FSCA), 1 ♀ (MEMU). Gallman, 7 June 1993, B. Curtis, 1 ♂ (BPSC). Kings Creek, 12 May 2013, W.E. Smith, 3 ♂, 2 ♀ (WESC). **Grenada Co.**, T21N, R2E, Sec 12, 13 N & R3E, Sec 7S, 18N, 18 May-2 June 1992, Malaise trap in woods, G. Snodgrass, 1 ♂, 5 ♀ (MEMU). T22N, R3E, Sec 31NW, 5-18 May 1992, Malaise trap, G. Snodgrass, 1 ♂ (MEMU). **Hinds Co.**, Clinton, 8 May

1986, B. Stark, 1 ♀ (BPSC). Big Spring Road, 32° 12.910' N, 90° 20.688' W, 7 May 2013, B. Stark, 1 ♂ (BPSC). Butts Park, Jackson, 32° 18.415' N, 90° 19.173' W, 11 May 2013, B. Stark, 1 ♂, 1 ♀ (BPSC). Choctaw Trails, 32° 18.292' N, 90° 17.868' W, 11 May 2013, B. Stark, 2 ♂, 5 ♀ (BPSC). **Jasper Co.**, County Road 2357, 32° 13.200' N, 89° 16.136' W, 13 May 2013, B. Stark, 3 ♂, 2 ♀ (BPSC). **Jefferson Co.**, 6 miles SW Fayette, 4 May 1984, D.W. Webb, 2 adults (INHS). **Lafayette Co.**, Oxford, 25 May 1979, S. Hurdle, 1 ♂ (UMIC). Same site, 23 June 1986, P.K. Lago, 1 ♀ (UMIC). **Lauderdale Co.**, 32.31438° N, 88.55678° W, 20 May 2011, W. Bicha, 1 ♀ (WBIC). **Lawrence Co.**, Robbins Lane, Jayess, 1 June 2013, W.E. Smith, 2 ♂ (WESC). **Lincoln Co.**, Caseyville, 24 May 2014, W.E. Smith, 3 ♂, 3 ♀ (WESC). **Oktibbeha Co.**, MSU North Farm, 10 June 1990, J. MacDonald, 1 ♀ (MEMU). Starkville, Echols Rd, nr. Bent Tree Rd, 33.38012° N, 88.82893° W, 22-23 May 2014, J.E. Hayden, R.L. Brown, MV, UV light, 1 ♂ (FSCA). **Panola Co.**, Sardis Lake, 34° 25' 35" N, 89° 48' 21" W, 2 June 1997, R.L. Brown, 1 ♂, 1 ♀ (MEMU). **Perry Co.**, 4.5 miles WSW New Augusta, 24 May 1987, P.K. Lago, 1 ♀ (UMIC). **Pontotoc Co.**, 1 mile SE Ecu, 17 July 1980, W.H. Cross, 1 ♀ (MEMU). **Scott Co.**, Snooks Road, 32° 19.210' N, 89° 36.182' W, 13 May 2013, B. Stark, 3 ♂, 5 ♀ (BPSC). Forest Road 518, 32° 20.509' N, 89° 36.182' W, 13 May 2013, B. Stark, 4 ♂, 7 ♀ (BPSC). **Simpson Co.**, Mill Creek, Hwy 472, 31° 51.824' N, 89° 59.524' W, 7 May 2013, B. Stark, 2 ♂, 2 ♀ (BPSC). Same site, 17 May 2013, 2 ♂ (BPSC). Merit Water Park, Hwy 43, 31° 55.641' N, 89° 59.580' W, 17 May 2013, B. Stark, 1 ♂ (BPSC). **Smith Co.**, 1 mile N Raleigh, 14-15 June 1985, R.L. Brown, G. Burrows, 3 ♂ (MEMU). **Tishomingo Co.**, Tishomingo State Park, 25 May 1995, P.K. Lago, 2 ♀ (UMIC). **Walthall Co.**, Jayess, 11 June 2013, W.E. Smith, 2 ♂, 4 ♀ (WESC). **Warren Co.**, Vicksburg, 5 June 1989, B. Mather, 1 ♂ (MEMU). Same site, 25 May 1988, B. Mather, 1 ♀ (MEMU). Same site, 1 June 1990, B. Mather, 1 ♀ (MEMU). Bovina, 16 May 1989, B. Mather, 1 ♂ (MEMU). Jeffers Hollow Road, Redwood, 32.479515 N, 90.782068 W, 22 May 2013, A. Harrison, 1 ♂, 1 ♀ (ABHC). Same site, 18 June 2013, A. Harrison, 2 ♀ (ABHC). **Wayne Co.**, Matherville, 1 June 1993, J.A. MacGown, 1 ♂ (MEMU). **Yazoo Co.**, Woods Road, N of Teshiva Creek, 32° 57.011' N, 90° 14.511' W, 27 May 2013, A. Harrison, B. Stark, 3 ♂ (ABHC).

Comments. Byers (1996) indicates, *B. pilicornis* is relatively common throughout its range. In central Mississippi, it emerges slightly earlier than other *Bittacus* (earliest records from 4 May) and is more abundant than *B. punctiger* with which it often co-occurs.

***Bittacus punctiger* Westwood**

Bittacus punctiger Westwood, 1841:195. Georgia

Distribution. AL, DC, FL, GA, IL, IN, MD, MS, NC, SC, TN, TX, VA, WV.

Published Mississippi Records. The insert map (Fig. 44) in Webb et al. (1975) includes Mississippi in the range of this species and Byers (1996) gives the following record: **Lauderdale Co.**, 6 miles east of Meridian, 24 May 1986, W. Bicha, 1 ♀. Byers (1962a) includes a single record from **Oktibbeha Co.**, State College, no date, 1 specimen without abdomen.

New Mississippi Records. **Clarke Co.**, 15 miles SSW Enterprise, 14 June 1987, P.K. Lago, 1 ♀ (UMIC). **Copiah Co.**, Turkey Creek, 2.2 miles ESE Dentville, 31° 56' 57" N, 90° 31' 11" W, 12 July 1993, D. Pollock, T.L. Schiefer, 1 ♂ (MEMU). **Franklin Co.**, Porter Creek, T5N, R4E, Sec 8NW, 2-8 June 1992, Malaise trap, T.L. Schiefer, R. Fontenot, 2 ♀ (MEMU). **Grenada Co.**, T22N, R3E, Sec 31 NW, 31 July-7 August 1991, Malaise trap, M. MacGown, 1 ♂ (MEMU). T21N, R2E, Sec 12, 13 N & R3E, Sec 7S, 18N, 5-18 May 1992, Malaise trap, G. Snodgrass, 1 ♂ (MEMU). Same site, 18 May-2 June 1992, Malaise trap in woods, G. Snodgrass, 2 ♀ (MEMU). **Hinds Co.**, Clinton, 20 May 1985, B. Stark, 1 ♂ (BPSC). Choctaw Trails, 32° 18.292' N, 90° 17.868' W, 31 May 2013, B. Stark, 1 ♂ (BPSC). **Lauderdale Co.**, 6 miles east of Meridian, 25 May 1986, W. Bicha, 1 ♀ (INHS). **Lawrence Co.**, Robbins Lane, Jayess, 1 June 2013, W.E. Smith, 2 ♂ (WESC). **Lincoln Co.**, Caseyville, 24 May 2014, W.E. Smith 2 ♂, 5 ♀ (WESC). **Marshall Co.**, Wall Doxey State Park, 29 May 1986, S. Testa, 1 ♂ (UMIC). **Noxubee Co.**, S.D. Hamilton Noxubee Wildlife Refuge, Education Center nr Bluff Lake, 33° 15' 52" N,

88° 46' 50" W, 17-19 May 2013, W.L. Grogan, Jr., Malaise trap, 2 ♀ (FSCA). **Perry Co.**, 6 mi SW New Augusta, 24 May 1987, P.K. Lago, 1 ♂ (abdomen missing), 1 ♀ (UMIC). **Warren Co.**, Jeffers Hollow Road, Redwood, 32.478772° N, 90.781704° W, 16 May 2013, A. Harrison, 1 ♂ (ABHC). Same site, 18 June 2013, A. Harrison, 1 ♂, 1 ♀ (ABHC). **Wilkinson Co.**, Mississippi River, 7 miles NNW Ft. Adams, 24 May 2005, P.K. Lago, J.G. King, 2 ♀ (UMIC). **Yazoo Co.**, Woods Road, Eden-Midway Road jct, 32° 56.626' N, 90° 15.473' W, 27 May 2013, B. Stark, A. Harrison, 1 ♀ (BPSC). Woods Road, N of Teshiva Creek, 32° 57.011' N, 90° 14.511' W, 27 May 2013, A. Harrison, B. Stark, 1 ♂, 2 ♀ (ABHC).

Comments. *Bittacus punctiger* is known from Wilkinson Co. in the far southwestern region of the state to Marshall Co., in the northern tier of counties, and from Warren Co., near the western boundary with Louisiana, to Lauderdale Co., near the eastern boundary with Alabama. The species, though seldom common, was collected with *B. pilicornis*, *B. stigmaterus* and *B. strigosus* at the Jeffers Hollow Road site, with *B. pilicornis* and *B. strigosus* at the Woods Road site, north of Teshiva Creek in Yazoo Co., and the Caseyville site in Lincoln Co., and with *B. pilicornis* and *B. stigmaterus* at the Robbins Lane site in Lawrence Co.

***Bittacus stigmaterus* Say**

Bittacus stigmaterus Say, 1823:164. Fort Osage, Missouri

Bittacus pallidipennis Westwood, 1841:195. Unknown locality, syn. (Hagen 1861)

Distribution. CT, DC, FL, GA, IA, IL, IN, KS, KY, LA, MD, MI, MO, MS, NC, NE, NY, OH, OK, SC, TN, TX, VA.

Published Mississippi Records. The insert map (Fig. 48) in Webb et al. (1975) includes Mississippi in the range of this species.

New Mississippi Records. **Franklin Co.**, Middletown Creek, T5N, R4E, Sec 31S, 23-29 June 1992, Malaise trap, T.L. Schiefer, R. Fontenot, 1 ♂ (MEMU). **Lawrence Co.**, Robbins Lane, Jayess, 1 June 2013, W.E. Smith, 2 ♂, 2 ♀ (WESC). **Marion Co.**, Columbia, 20 June 1987, P.K. Lago, 1 ♀ (UMIC). **Oktibbeha Co.**, Starkville, 2 July 1981, W.H. Cross, 1 ♂, 1 ♀ (MEMU). **Warren Co.**, Jeffers Hollow Road, Redwood, 32.478772° N, 90.781704° W, 18 June 2013, A. Harrison, 1 ♀ (ABHC). Vicksburg, 24 May 1989, B. Mather, 1 ♀ (MEMU).

***Bittacus strigosus* Hagen**

Bittacus strigosus Hagen, 1861:246. Chicago, Illinois and Washington, D.C.

Distribution. AL, AR, CT, DC, IA, IL, IN, KS, KY, MA, MB, MD, MI, MN, MO, MT, NC, ND, NE, NH, NJ, NY, OH, OK, PA, PQ, SC, TN, VA, VT, WV, WY.

Published Mississippi Records. The insert map (Fig. 47) in Webb et al. (1975) includes Mississippi in the range of this species, however Penny (2013) does not list Mississippi in its known distribution.

New Mississippi Records. **Grenada Co.**, T21N, R2E, Sec. 12, 13N & R3E, Sec 7S, 18N, 1-8 June 1991, Malaise trap in woods, T.L. Schiefer, 1 ♀ (MEMU). **Hinds Co.**, Deans Stand, 32° 14.062' N, 90° 32.462' W, Natchez Trace Parkway, 25 May 2013, B. Stark, 1 ♀ (BPSC). **Lafayette Co.**, Oxford, 12 June 1988, P.K. Lago, 1 ♀ (UMIC). Same site, 16 July 1989, P.K. Lago, 1 ♂ (UMIC). Same site, 22 July 1995, E.B. Lago, 1 ♀ (UMIC). Same site, 5 June 1990, E.B. Lago, 1 ♀ (UMIC). Same site, 31 May 1987, E.B. Lago, 1 ♀ (UMIC). Same site, 30 May 1987, E.B. Lago 1 ♂ (UMIC). **Lincoln Co.**, Caseyville, 24 May 2014, W.E. Smith, 2 ♂, 4 ♀ (WESC). **Oktibbeha Co.**, Starkville, 16 July 1974, W.H. Cross, 1 adult (INHS). Same site, 17 June 1975, W.H. Cross, 1 adult (INHS). **Warren Co.**, Jeffers Hollow Road,

Redwood, 32.479515° N, 90.782068° W, 22 May 2013, A. Harrison, 4 ♂, 3 ♀ (ABHC). Same site, 18 June 2013, A. Harrison, 1 ♂, 4 ♀ (ABHC). Vicksburg, 16 June 1988, B. Mather, 1 ♀ (MEMU), Same site, 24 June 1992, B. Mather, 1 ♂ (MEMU). **Yazoo Co.**, Woods Road, N of Teshiva Creek, 32° 57.011' N, 90° 14.511' W, 27 May 2013, B. Stark, A. Harrison, 8 ♂, 6 ♀ (BPSC), 1 ♂, 4 ♀ (ABHC).

***Hylobittacus apicalis* (Hagen)**

Bittacus apicalis Hagen, 1861: 248. Southern Illinois
Haplodictyus incertus Navás, 1926:59. Wilmerding, Pennsylvania, syn. (Carpenter, 1932)

Distribution. AL, AR, GA, IL, IN, KY, MI, MO, NC, NY, OH, OR, PA, TN, VA, WV.

Published Mississippi Records. Webb et al. (1975) in the Fig. 43 inset map shows the species range passing along the northern border of the state. Penny (2013) does not include Mississippi in its known distribution.

New Mississippi Records. **Grenada Co.**, T21N, R2E, Sec 13N, 5 June 1991, J.R. MacDonald, 1 ♂ (MEMU). T21N, R2E, Sec 12, 13N & R3E, Sec 7S, 18N, 5-18 May 1992, Malaise trap, G. Snodgrass, 1 ♂ (MEMU). **Pontotoc Co.**, 1 mile SE Ecu, 2 July 1980, W.H. Cross, 1 ♀ (MEMU).

Comments. This species is recognized by the dark wing tips of the adults, and was not previously reported from the state.

Family Meropeidae: Earwigflies

***Merope tuber* Newman**

Merope tuber Newman, 1838:180. Trenton Falls, New Jersey

Distribution. AL, AR, DC, FL, GA, IA, IL, IN, KS, KY, MD, ME, MI, MN, MO, MS, NC, NJ, NY, OK, ON, PA, VA, WS, WV.

Published Mississippi Records. Schiefer (2015) reported this species at five Mississippi sites. Counties in which the species has been collected include Lincoln, Noxubee, Oktibbeha, Pearl River and Wayne.

New Mississippi Records. None available.

Comments. The records listed by Schiefer (2015) represent the first for the state and document the presence of this unusual species across much of the eastern Gulf Coastal Plain. Schiefer and Dunford (2005) recently reported populations of the species in Alabama, and Dunford et al. (2007) and Somma (2011a) reported the species distribution in Florida. Mississippi specimens were collected from early May to mid June (Schiefer 2015).

Family Panorpidae: Scorpionflies

***Panorpa americana* Swederus**

Panorpa americana Swederus, 1787:279. Georgia

Distribution. AL, DE, FL, GA, LA, MS, NJ, NC, SC, VA.

Published Mississippi Records. Five sites on Map 5, Byers (1993). Byers (1993) reports the species from **Chickasaw Co.**, near Woodland, 25 September, and **Oktibbeha Co.**, near State College, 25 September.

New Mississippi Records. **Lafayette Co.**, Oxford, 10 January 1948, H.V. Weems, Jr., 1 ♀ (FSCA). T7S-R2W Sec. 25, 26 September 1977, A.E. Zuccaro, 1 ♀ (UMIC). Same site, 27 September 1978, C. Edwards, 1 ♀ (UMIC). 15 miles NE Oxford, 20 September 1976, J. Burris, 1 ♀ (UMIC). 11 miles NE Oxford, 5 October 1982, L. Bates, 1 ♀ (UMIC). **Monroe Co.**, 4 miles N Amory, T12S, R8E, Sec 8 NW, 31 October 1990, T.L. Schieffer, 1 ♂ (MEMU). **Noxubee Co.**, Noxubee National Wildlife Refuge, 33° 17' 00" N, 88° 45' 16" W, 6 October 1993, D.M. Pollock, 1 ♂ (MEMU). **Oktibbeha Co.**, Ag. C., 20 September, J.B. Switz, 1 ♂ (FSCA). State College, 20 June 1974, R. Mizell, 1 ♂ (MEMU). Oktibbeha County Lake, 33° 30' 51" N, 88° 56' 30" W, 14 October 1995, T.L. Schieffer, 1 ♀ (MEMU). **Pontotoc Co.**, T95-RIE Sec. 17, 23 September 1977, D.E. Stanford, 1 ♂, 2 ♀ (UMIC). Locality unknown, 21 September 1974, R. Patterson, 1 ♀ (FSCA). Sessums, 23 October 1920, J.T. Harris, 1 ♀ (MEMU). 4 miles SW Troy, 21 September 1974, R. Patterson, 1 ♀ (MEMU). **Stone Co.**, University of Mississippi Forestlands, 17 October 1986, S. Testa, 1 ♂ (UMIC).

Comments. This species is regarded primarily as an autumnal emerger by Byers (1993), but as he notes, a few specimens were reported by Carpenter (1939) from early June at Yonah Mountain, Georgia. Mississippi records also include a single June collection of a male from Oktibbeha County, and an unusual January specimen collected by H.V. Weems, Jr. from Lafayette County in 1948.

Panorpa anomala Carpenter

Panorpa anomala Carpenter, 1931:245. Leavenworth Co., Kansas

Panorpa proximata Carpenter, 1931:247. Washington Co., Arkansas, syn. (Byers 1974)

Distribution. AR, IA, IL, IN, KS, LA, MI, MO, MS, WI.

Published Mississippi Records. Fig. 186 insert map in Webb et al. (1975) includes Mississippi in the range of this species, and Byers (1973) reports 9 specimens collected in **Grenada Co.**, at Grenada, in June 1971, and indicates specimens of *P. anomala* were abundant at the type locality of *P. vernalis* in **Claiborne Co.** in April, 1972, and also present at the same site in September, 1977. Byers (1962a) reported a single male from State College, **Oktibbeha Co.** 2 May 1959.

New Mississippi Records. **Alcorn Co.**, Locality unknown, 30 May 1982, W. Bicha, 3 ♂, 1 ♀ (WBIC). **Attala Co.**, Locality unknown, 25 May 1986, W. Bicha, 1 ♂ (WBIC). **Chickasaw Co.**, Natchez Trace mile 241.1, 34° 00' 34" N, 88° 53' 48" W, 19-27 May 1992, pitfall trap in deciduous forest, J. MacGown, T.L. Schieffer, 1 ♂ (MEMU). **Choctaw Co.**, Choctaw Lake, 2 May 1995, D.M. Pollock, 3 ♂ (MEMU). Same site, 26 July 1995, D.M. Pollock, 2 ♂ (MEMU). **Claiborne Co.**, near Rocky Springs, 24 April 1981, W. Bicha, 2 ♀ (FSCA). Same site, 24 April 1981, W. Bicha, 19 ♂, 17 ♀ (WBIC). Same site, 23 April 1994, W. Bicha, 1 ♂ (WBIC). Same site, 2 May 1998, W. Bicha, 2 ♂ (FSCA), 1 ♂, 1 ♀ (WBIC). Same site, 24 April 1981, W. Bicha, 2 ♂ (FSCA). Sand Creek, 29 April 1980, B. Stark, 1 ♂, 1 ♀ (BPSC), 1 ♀ (UMIC), 1 ♀ (MEMU). Same site, 15 April 1982, B. Stark, 1 ♂ (BPSC). **Grenada Co.**, Grenada, 10 June 1971, C. Bryson, 1 ♂ (MEMU). T21N, R2E, Sec 12, 13N & R3E, Sec 7S, 18N, 17-23 October, 1991, pitfall trap in woods, G. Snodgrass, 1 ♂ (MEMU). **Hinds Co.**, Clinton, 21 April 1980, B. Stark, 1 ♂, 3 ♀ (BPSC), 2 ♂, 1 ♀ (UMIC), 2 ♀ (FSCA), 1 ♂ (MEMU). Same site, 22 April 1980, J. Johnston, B. Sanders, 5 ♂, 3 ♀ (BPSC). Same site, 24 April 1980, B. Stark, 1 ♂, 1 ♀ (BPSC). Same site, 5-6 May 1980, B. Stark, 1 ♂, 1 ♀ (BPSC). Seven Springs Road, 8 April 1982, C. Breazeale, B. Stark, 1 ♂, 3 ♀ (BPSC). **Itawamba Co.**, Natchez Trace mile 280.6, 34° 26' 37" N, 88° 31' 01" W, 19-27 May 2003, pitfall trap in deciduous forest, J. MacGown, T.L. Schieffer, 1 ♂, 4 ♀ (MEMU). Same site, 27 May 2003, pitfall trap in deciduous forest, J. MacGown, T.L. Schieffer, 5 ♂ (MEMU). **Lauderdale Co.**, 6 miles east of Meridian, 24 May 1986, W. Bicha, 1 ♀ (WBIC). **Lee Co.**, Tombigbee State Park, 12 May 1973, R. Patterson, 1 ♀ (MEMU).

Neshoba Co., 1.5 miles N Dixon, 9 May 1979, P.K. Lago, 1 ♂, 1 ♀ (UMIC). **Newton Co.**, 32.32588° N, 88.94093° W, 20 May 2011, W. Bicha, 6 ♂ (WBIC). **Noxubee Co.**, S.D. Hamilton Noxubee Wildlife Refuge, Education Center nr Bluff Lake, 33° 15' 52" N, 88° 46' 50" W, 17-19 May 2013, W.L. Grogan, Jr., Malaise trap, 1 ♀ (FSCA). Noxubee National Wildlife Refuge, 26 April 1991, F. Zeng, 1 ♀ (MEMU). Same site, 17 May 1991, T.L. Schiefer, 1 ♂ (MEMU). Same site, 2 May 1999, M.L. Heddle, 1 ♂ (MEMU). **Oktibbeha Co.**, State College, 10 May 1950, W. Smith, 1 ♂ (FSCA). Same site, 5 June 1950, Cothorn, 1 ♀ (FSCA). Same site, 4 June 1956, Curtis, 1 ♂ (MEMU). Craig Spring, 6 June 1980, G. Snodgrass, 1 ♂ (MEMU). Dorman Lake, 30 April 1974, C. Bryson, 1 ♀ (FSCA). **Scott Co.**, Locality unknown, 25 April 1981, W. Bicha, 1 ♂, 2 ♀ (WBIC). **Webster Co.**, milepost 210 Natchez Trace, 6 September 1986, W. Bicha, 4 ♂, 2 ♀ (WBIC). **Winston Co.**, Tombigbee National Forest, 33° 10' 20" N, 89° 03' 55" W, 3 May 1999, T.L. Schiefer, 1 ♂ (MEMU). **Yalobusha Co.**, CR 330, 25 April 2009, W. Bicha, 4 ♂, 2 ♀ (WBIC).

Comments. *Panorpa anomala* is present from late April through early June, and also has a late summer and autumnal emergence at some sites (Byers 1993). Byers reported fall emergence in Claiborne Co., and we include specimen records from Choctaw County in late July and September and October from Grenada and Webster counties.

Panorpa banksi Hine

Panorpa banksi Hine, 1901:247. Sea Cliff, New York

Panorpa affinis Banks, 1895:315. Preoccupied

Panorpa chelata Carpenter, 1931:251. Wollaston, Massachusetts, syn. (Byers 1974)

Distribution. GA, IA, IL, IN, KY, MA, ME, MI, MS, NC, NY, SC.

Published Mississippi Records. Recorded from the state by Penny (2013).

New Mississippi Records. **Calhoun Co.**, 13 miles NE Bruce, 6 June 1980, P.K. Lago, 1 ♂, 1 ♀ (UMIC). **Choctaw Co.**, Tombigbee National Forest, 18-19 May 1993, L.R. Davis, Jr., 1 ♂, 1 ♀ (FSCA). Locality unknown, 25 May 1986, W. Bicha, 2 ♂, 3 ♀ (WBIC). Ballard Creek, 33° 30' 33" N, 89° 10' 51" W, 12 May 2007, W. Bicha, 2 ♂ (WBIC). **Grenada Co.**, Grenada, 10 June 1971, C. Bryson, 1 ♂ (FSCA). T21N, R2E, Sec 12, 13. 10 April 1991, T.L. Schiefer, 1 ♂ (MEMU). Same site, 14 May 1991, T.L. Schiefer, 1 ♂ (MEMU). Same site, 10 June 1991, T.L. Schiefer, 1 ♀ (MEMU). **Hinds Co.**, Big Creek Road, 32° 12.910' N, 90° 20.688' W, 7 May 2013, B. Stark, 1 ♂ (BPSC). Seven Springs Road, 8 April 1982, B. Stark, 1 ♂ (BPSC). **Lafayette Co.**, Oxford, 1 July 1988, E.B. Lago, 1 ♀ (UMIC). **Lauderdale Co.**, 32.31438° N, 88.55678° W, 20 May 2011, W. Bicha, 2 ♂, 2 ♀ (WBIC). **Lee Co.**, Locality unknown, 30 May 1982, W. Bicha, 2 ♂ (WBIC), 1 ♀ (FSCA). Locality unknown, 25 May 1986, W. Bicha, 1 ♂ (WBIC). Tombigbee State Park, 25 April 2009, W. Bicha, 5 ♂, 4 ♀ (WBIC). **Marshall Co.**, 5 miles ESE Waterford, 20 May 1993, P.K. Lago, 1 ♂ (UMIC). **Neshoba Co.**, 32.70031° N, 89.14657° W, 20 May 2011, W. Bicha, 1 ♂ (WBIC). **Newton Co.**, 6 miles SE Newton, 10 May 1979, P.K. Lago, 1 ♂ (UMIC), abdominal tip missing). Chunky River, several miles west of Chunky, 2 May 1998, W. Bicha, 1 ♂, 2 ♀ (WBIC). **Scott Co.**, Locality unknown, 25 April 1981, W. Bicha, 1 ♀ (FSCA), 3 ♂, 5 ♀ (WBIC). **Simpson Co.**, Mill Creek, Hwy 472, 7 May 2013, B. Stark, 2 ♂, 3 ♀ (BPSC). **Webster Co.**, The Cove, 7 miles W Walthall, T20N, R8E, Sec 12, 15 June 1988, T.L. Schiefer, 1 ♂ (MEMU). **Winston Co.**, Louisville, 3 May 1973, C. Bryson, 1 ♀ (MEMU). Tombigbee National Forest, 33° 14' 28" N, 88° 54' 23" W, 21 May 1999, D.M. Pollock, 1 ♂ (MEMU).

Comments. Mississippi records are from mid April through mid June with a record of a single female collected in Lafayette County on July 1.

***Panorpa capillata* Byers**

Panorpa capillata Byers, 1996: 520. Auburn University Forestry Research Station, Hwy 43, 10 miles N of Fayette, Fayette Co., Alabama

Distribution. AL, AR, KY, MS, TN.

Published Mississippi Records. Byers (1996) includes the following records in the type series. Allotype and paratypes: **Lee Co.**, Tombigbee State Park, SE of Tupelo, 24 May 1978, G.W. Byers, C.W. Young, 6 ♂, 4 ♀. Additional paratypes: **Lafayette Co.**, Puskus Lake, 12.8 km NE of Oxford, 23 May 1978, G.W. Byers, C.W. Young, 4 ♂, 3 ♀. **Lee Co.**, Tombigbee State Park, 18 May 1993, G.W. Byers, 4 ♂. Same site, 5 May 1982, G.W. Byers, 1 May 1982, 1 ♂. Same site, 30 May 1982, W. Bicha, 5 ♂.

New Mississippi Records. **Calhoun Co.**, near Carepepta, 25 April 2009, 2 ♂, 2 ♀ (WBIC). **Grenada Co.**, T21N, R2E, Sec12, 13N & R3E, Sec 7S, 18N, 5-18 May 1992, Malaise Trap, G. Snodgrass, 1 ♂, 5 ♀ (MEMU). Same site, 18 May-2 June 1992, pitfall trap in woods, G. Snodgrass, 1 ♂, 1 ♀ (MEMU). Same site, 5-18 May 1992, pitfall trap, G. Snodgrass, 2 ♂ (MEMU). T21N, R2E, Sec 7S, 18N, 14 April 1992, T.L. Schiefer, 3 ♂ (MEMU). **Lee Co.**, Tombigbee State Park, 25 April 2009, W. Bicha, 3 ♀ (WBIC). **Winston Co.**, Tombigbee National Forest, 33° 10' 20" N, 89° 03' 55" W, 3 May 1999, T.L. Schiefer, 2 ♂ (MEMU).

Comments. Specimens of this species were collected from mid April through early June.

***Panorpa choctaw* Byers**

Panorpa choctaw Byers, 1993:66. Lee Co., Mississippi, 6 miles S Tupelo, Tombigbee State Park

Distribution. AL, AR, GA, KY, MO, MS, OK, TN.

Published Mississippi Records. 8 sites on Map 3, Byers (1993). Byers (1993) includes the following specimens among the type series. **Lee Co.**, Tombigbee State Park, 6 miles SE Tupelo, 26 September 1977, G.W. Byers, Holotype ♂, allotype ♀, 20 ♂, 18 ♀ paratypes. Additional paratypes: **Benton Co.**, 14 mi S Ashland, 7 September 1986, W. Bicha, 7 ♂. 4 mi SW Troy, 21 September 1974, R. Patterson, 1 ♂. **Chickasaw Co.**, Davis Lake, 11 mi WNW Okalona, 25 September 1977, G.W. Byers, 3 ♂, 4 ♀. **Clairborne Co.**, Rocky Springs, Natchez Trace Parkway, 23 September 1977, G.W. Byers, 3 ♂. **Itawamba Co.**, 2 miles south of Tremont, 13 September 1992, W. Bicha, 1 ♂. **Lee Co.**, Tombigbee State Park, 14 September 1974, R. Patterson, 1 ♀. Natchez Trace Parkway, milepost 276, 6 September 1986, W. Bicha, 3 ♂. **Prentiss Co.**, Booneville, 11 October 1984, S. MacDonald, 1 ♀. **Tippah Co.**, 1 mile S Falkner, 7 September 1986, W. Bicha, 2 ♂. **Webster Co.**, 7 miles W Walthall, 18 October 1987, 1 ♀. 19 October 1990, T.L. Schiefer, 1 ♂.

New Mississippi Records. **Benton Co.**, 14 miles south of Ashland on highway 5, 7 September 1986, W. Bicha, 8 ♂, 3 ♀ (WBIC). **Chickasaw Co.**, milepost 242 Natchez Trace, 6 September 1986, 2 ♂ (WBIC). **Franklin Co.**, Meadville, 23 November 1978, G. Graves, 1 ♂ (UMIC). **Jefferson Co.**, 3.2 miles W Lorman, 11 October 2007, R. Patterson, 1 ♂ (MEMU). **Pontotoc Co.**, 7.5 miles west of Highway 6 and Highway15, 13 September 1992, W. Bicha, 1 ♂, 2 ♀ (WBIC). **Warren Co.**, Vicksburg, 8 October 2007, R. Patterson, 1 ♂ (MEMU). Same site, 6 November 2005, R. Patterson, 4 ♂ (MEMU). **Winston Co.**, Tombigbee National Forest, 33° 11' 50" N, 89° 03' 20" W, 1-8 November 1999, pitfall traps in deciduous forest, J. MacGown, T.L. Schiefer, 1 ♂ (MEMU).

Comments. The Franklin Co. record is based on the southwestern-most specimen collected from the state. The apical spine on the dististyle cup is scarcely developed and the ventral parameres, while as long as in typical *P. choctaw*, lack a setal fringe along the outer margin. Byers (1993) notes the former feature in Arkansas and Oklahoma populations, however the ventral parameres are said to be shorter

than those of populations east of the Mississippi River. The specimen was previously determined as *P. virginica* Banks by Penny.

Panorpa confinis Byers

Panorpa confinis Byers, 1993:80. Hale Co., Alabama, Payne Lake, 24 miles SE Tuscaloosa

Distribution. AL, MS.

Published Mississippi Records. Two sites are shown on Map 5 in Byers (1993) and he includes paratype specimens of the species from **Choctaw Co.**, Ackerman, 24 September 1977, G.W. Byers, 3 ♀, and from **Oktibbeha Co.**, State College, 16 November 1981, W.H. Cross, 1 ♀. Same site, 20 April 1950, R. Humphrey, 1 ♀. Same site, 10 April 1961, J. Boyd, 1 ♀. Same site, 24 June 1961, M.J. Wade, 1 ♀.

New Mississippi Records. **Choctaw Co.**, Choctaw Lake, 2 May 1995, D.M. Pollock, 1 ♂ (MEMU). **Lauderdale Co.**, Hwy 80 at Pineforest Road, 32° 19' 31" N, 88° 55' 10" W, 13 May 2007, W. Bicha, 1 ♂ (WBIC). **Neshoba Co.**, 32.70031° N, 89.14657° W, 20 May 2011, W. Bicha, 3 ♂, 1 ♀ (WBIC). **Newton Co.**, 32.32588° N, 88.94093° W, 20 May 2011, W. Bicha, 2 ♂, 4 ♀ (WBIC). Chunky River, several miles west of Chunky, 2 May 1998, W. Bicha, 1 ♂, 2 ♀ (WBIC). **Oktibbeha Co.**, Craig Spring, 16 November 1981, W.H. Cross, 1 ♂ (MEMU). **Simpson Co.**, Mill Creek, Hwy 472, 7 May 2013, B. Stark, 1 ♂ (BPSC). Merit Water Park, Hwy 43, 7 May 2013, B. Stark, 1 ♂ (BPSC).

Comments. As Byers (1993) notes, the flight period of this species includes the spring months of April through June and fall months of September through November.

Panorpa confusa Westwood

Panorpa confusa Westwood, 1841: 190. Massachusetts

Panorpa rufescens Rambur, 1842: 330. Laurel Lake near Jacksonville, Vermont, syn. (Somma 2011b)

Comments. Carpenter (1931), using an erroneous 1846 date for Westwood's study, placed *P. confusa* as a junior synonym of *P. rufescens*. Subsequently, this species has been listed from Mississippi (and other areas) by various authors as *P. rufescens*, and Webb et al. (1975) shows its range overlapping the eastern boundary of the state in Fig. 181. Somma (2011b, 2012) corrected the publication date for Westwood's article from 1846 to 1841 which established priority for *P. confusa* over *P. rufescens*. Byers (1993) proposed a new species name, *P. ferruginea*, for southeastern populations once included under *P. rufescens* (= *P. confusa*). Accordingly, no valid specimens of *P. confusa* are known for the state, and those previously referred to as *P. rufescens* are listed as *P. ferruginea*.

Panorpa consuetudinis Snodgrass

Panorpa consuetudinis Snodgrass, 1927:77. Takoma Park, Maryland

Panorpa elaborata Carpenter, 1931:239. Falls Church, Virginia, syn. (Byers 1974)

Distribution. AL, CT, DC, DE, MD, MS, NC, NJ, NY, OH, PA, SC, VA.

Published Mississippi Records. Fig. 187 in Webb et al. (1975) shows the range of *P. consuetudinis* includes Mississippi. Byers (1962a) reported 1 male (as *P. elaborata* Carpenter) from **Alcorn Co.**, 11 miles SE Corinth, 7 June 1958.

New Mississippi Records. Lafayette Co., Oxford, 3 June 1983, P.K. Lago, 1 ♂ (UMIC). Same site, 11 June 1978, P.K. Lago, 1 ♂ (UMIC).

***Panorpa ferruginea* Byers, 1993**

Panorpa ferruginea Byers, 1993:78. Chambers Co., Alabama, 1 mile N Fairfax

Distribution. AL, GA, MS.

Published Mississippi Records. 1 site on Map 5, Byers (1993). Byers (1993) includes paratype specimens of the species from **Alcorn Co.**, 11 miles SE Corinth, 7 June 1958, G.W. Byers, 2 ♂, 3 ♀. Previously (Byers 1962a) listed these specimens as *P. rufescens* (see *P. confusa* discussion above).

New Mississippi Records. None available.

***Panorpa insolens* Carpenter**

Panorpa insolens Carpenter, 1935:106: Cincinnati, Ohio

Distribution. AR, GA, IA, IL, IN, KS, KY, MI, MN, MO, NC, OH, SC, TN, UT, VA, WI, WV.

Published Mississippi Records. None available.

New Mississippi Records. Oktibbeha Co., MSU, 26 October 1969, C. Bryson, 1 ♂ (MEMU), MSU, 26 October 1969, C. Bryson, 1 ♂ (FSCA). **Scott Co.,** 25 April 1981, W. Bicha, 3 ♀ (WBIC). **Washington Co.,** Greenville, September 1974, unknown collector, 1 ♂ (MEMU).

Comments. Although this species is uncommon in the state, a few specimens have been taken in April and in September-October.

***Panorpa isolata* Carpenter**

Panorpa isolata Carpenter, 1931:241. Stone Mountain, Georgia

Distribution. AL, DC, GA, KY, MS, NC, PA, SC, TN.

Published Mississippi Records. Recorded in Byers (1993) from **Tishomingo** and **Yalobusha** counties, without specific locality data, in May.

New Mississippi Records. Choctaw Co., Locality unknown, 25 May 1986, W. Bicha, 1 ♀ (WBIC). **Lee Co.,** milepost 276 Natchez Trace, 6 September 1986, W. Bicha, 1 ♂, 1 ♀ (WBIC). **Oktibbeha Co.,** T18N, R14E, Sec 23, 21 May 1991, R.L. Brown, B.B. Brown, 1 ♀ (MEMU). **Pontotoc Co.,** 1 mile SE Ecu, 21 May 1980, W.H. Cross, 1 ♂ (MEMU).

Comments. Byers (1993) reports spring and fall emergence of this species in several southeastern states, however, the only autumnal Mississippi record is based on a male and female collected by W. Bicha from Lee County in September, 1986.

***Panorpa lugubris* Swederus**

Panorpa lugubris Swederus, 1787:279. "America Septentrionale"

Distribution. AL, FL, GA, LA, MS, NC, SC, VA.

Published Mississippi Records. Four sites in SE Mississippi on Map 1, Byers (1993) and Byers (1962a) reported 1 ♂, 1 ♀ from Wiggins, **Harrison Co.**, 26 October 1929, J.P. Kislanko.

New Mississippi Records. **Hancock Co.**, 3 miles E Pearlinton, T9S, R16W, Sec 26NE, 23 October 1992, T.L. Schiefer, 8 ♂, 6 ♀ (MEMU). **Harrison Co.**, Landon, 20 October 1914, R.W. Harned, 1 ♀ (MEMU). **Lafayette Co.**, July-August 1966, E.C. Napier, 1 ♀ (UMIC). **Pike Co.**, Magnolia, 7 December 1920, A. McIntosh, 1 ♂, 1 ♀ (MEMU).

Comments. Evans and Flint (2009) found Virginia specimens of this relatively uncommon species to be abundant in low vegetation in areas of mixed longleaf and pond pines. Specimens were elusive and active primarily during narrow windows of favorable thermal conditions. Byers (1993) states "... the range of *lugubris* and *nuptialis* meet but do not overlap." Our Lafayette Co. specimen, if labeled correctly, might provide an exception to this. Unfortunately, the collection data are incomplete, and the circumstances of its presumed collection in Lafayette County are unknown to us. Specimens are typically found in the autumnal emergence period.

***Panorpa nuptialis* Gerstaecker**

Panorpa nuptialis Gerstaecker, 1863:187. Texas

Distribution. AL, AR, KS, LA, MS, MO, OK, TX.

Published Mississippi Records. Eight sites plotted on Map 1, Byers (1993), and Webb et al. (1975) shows Mississippi in the range of this species (Fig. 165). Hine (1901) also recorded the species from the state.

New Mississippi Records. **Adams Co.**, 8 miles N Natchez, 3 October 1978, R. Young, 1 ♀ (UMIC). Same site, 13 November 1978, R. Young, 1 ♂, 1 ♀ (UMIC). **Bolivar Co.**, 2 miles W Rosedale, 10 October 1980, P.K. Lago, 4 ♂, 5 ♀ (UMIC). Same site, 3 November 1980, P.K. Lago, 3 ♀ (UMIC). Cleveland, 10 October 1984, B. Ingben, 1 ♀ (MEMU). **Calhoun Co.**, 9 miles NW Bruce, 8 September 1980, E.A. Ivy, 1 ♂ (UMIC). **Chickasaw Co.**, Tombigbee National Forest, 33° 55' 39" N, 88° 51' 18" W, 18 November 2001, J.G. Hill, 1 ♀ (MEMU). Same site, 28 July 2003, J.G. Hill, 1 ♂ (MEMU). **Coahoma Co.**, Glory Hole boat ramp, Burke's Hunting Club, 34.24329°N, -90.82828°W, 28 October 2014, A. Harrison, 1 ♂, 1 ♀ (ABHC). **Hinds Co.**, Clinton, 15 September 1967, R. Kimbro, 1 ♂, 1 ♀ (BPSC). Same site, 30 October, 1984, B. Stark, 1 ♀ (BPSC). 4 miles W Clinton, 23 October 1981, D. Dickerson, 1 ♀ (BPSC). **Issaquena Co.**, 2 miles E Talullah, 10-29 November 1997, R. Kergosien, 1 ♂ (MEMU). **Lafayette Co.**, Oxford, September-October 1967, G.K. Alex, 1 ♀ (UMIC). Same site, 12 September 1976, J. Burns, 1 ♀ (UMIC). 7 miles NW Oxford, 25 September 1986, S. Testa, 1 ♂ (UMIC). 11 miles NW Oxford, 14 October 1982, R. Upchurch, 1 ♂ (UMIC). **Lee Co.**, Natchez Trace mile 252, 34° 09' 01" N, 88° 49' 04" W, 1 October 2009, J.G. Hill, 1 ♀ (MEMU). **LeFlore Co.**, Minter City, 18 November 1984, M. Bouchard, 1 ♂ (MEMU). **Lincoln Co.**, 5 Creeks Hunting Club, Harvey Road, 23 November 2012, W.E. Smith, 1 ♀ (WESC). **Marshall Co.**, 4 miles N Holly Springs, 3 October 1976, S. Hurdle, 1 ♂ (UMIC). **Noxubee Co.**, Noxubee National Wildlife Refuge, 20 September 1984, K. Allen, 1 ♂ (MEMU). **Oktibbeha Co.**, Locality unknown, 14-29 October 1964, J.R. McCoy, 2 adults (INHS). Adaton, 29 October 1972, C. Bryson, 1 adult (INHS). Starkville, 3 November 1973, W.H. Cross, 1 adult (INHS). Ag. Coll., 23 October 1919, R.G. Prescott, 1 ♂ (FSCA). Same site, Fall 1917, F.H. Jones, 1 ♀ (FSCA). Mississippi State University, 17 October 1972, C. Bryson, 1 ♀ (FSCA). Same site, 21 November 1970, C. Bryson, 1 ♀ (FSCA). **Panola**

Co., Como, 11 October 1971, M.I. Shaw, 1 ♀ (UMIC). Crowder, 20 October 2001, H. Smith, 1 ♀ (UMIC). Eureka Springs, 15 October 1993, J.W. Meek, 1 ♀ (UMIC). **Pontotoc Co.**, Natchez Trace mile 250, 34° 07' 40" N, 88° 50' 18" W, 10 October 2009, J.G. Hill, 1 ♀ (MEMU). **Rankin Co.**, 1 mile SE Brandon, 19 October 2002, B. Jackson, 1 ♂ (UMIC). **Scott Co.**, Bienville National Forest, 21 October 2001, B. Stark, 1 ♀ (BPSC). Same site, 31 October 1998, B. Stark, 1 ♂, 1 ♀ (BPSC). **Tunica Co.**, Dundee, 8-9 October 1977, X.A. Williams, 2 ♂, 4 ♀ (UMIC). Same site, 29 October 1977, X.A. Williams, 1 ♀ (UMIC). **Warren Co.**, Vicksburg, 8 October 1981, C. Breazeale, 1 ♀ (BPSC). Same site, 16 October 2011, R. Patterson, 1 ♀ (MEMU). **Washington Co.**, Greenville, 26 October 1974, collector unknown, 2 adults (INHS). Stoneville, 27 October 1985, C. Bryson, 1 ♂ (MEMU). Stoneville, Delta Exp. For., 2 November 1988, J.R. MacDonald, 3 ♀ (MEMU).

Comments. This is the largest, most widely distributed and most colorful *Panorpa* in the state. Byers (1993) noted its occurrence in grassy patches in sparse woods, in forest edges and in open grassland. Adult collections in the state are known from late July through November.

Panorpa rufa Gray

Panorpa rufa Gray, 1832:323. Georgia

Distribution. AL, FL, GA, MS, NC, SC.

Published Mississippi Records. Two sites on Map 2, Byers (1993). These plots are probably based on the specimens in the MEMU identified by Byers from these locations. **George Co.**, 4.5 miles NNW Lucedale, T1S, R6W, Sec 6 SE, 29-30 October 1989, T.L. Schiefer. **Jasper Co.**, 2 miles SE Paulding, T2N, R12E, Sec 13 NE, 30 October 1989, T.L. Schiefer.

New Mississippi Records. None available.

Comments. Byers (1993) comments on the elusiveness of this species and notes it is known from only 18 total sites, all in the southeastern United States. In Florida they recently have been collected from upland xeric habitat (Somma et al. 2014, L. Somma personal communication 2014). The only state records are from specimens collected in late October.

Panorpa rupeculana Byers

Panorpa rupeculana Byers, 1993:86. Pulaski Co., Arkansas, Burns Park, I-40, NW Little Rock

Distribution. AR, LA, MS.

Published Mississippi Records. 5 sites on Map 5, Byers (1993). Byers (1993) includes paratype specimens from **Choctaw Co.**, milepost 188 Natchez Trace, 6 September 1986, W. Bicha, 1 ♂. **Itawamba Co.**, Natchez Trace mile 280.6, 34° 26' 37" N, 88° 31' 01" W, 19-27 May 2003, pitfall trap in deciduous forest, J. MacGown, T.L. Schiefer, 1 ♂. **Lafayette Co.**, Puskus Lake, 8 miles NE Oxford, 23 May 1978, G.W. Byers, C.W. Young, 1 ♂. **Pontotoc Co.**, 7.5 miles west of Highway 6 and Highway 15, 13 September 1992, W. Bicha, 1 ♂, 3 ♀. **Tishomingo Co.**, Locality unknown, 25 May 1986, W. Bicha, 1 ♂. **Webster Co.**, Natchez Trace Parkway, milepost 211, 6 September 1986, W. Bicha, 2 ♂.

New Mississippi Records. **Attala Co.**, Locality unknown, 25 May 1986, W. Bicha, 2 ♂, 2 ♀ (WBIC). **Lauderdale Co.**, 6 miles east of Meridian, 24 May 1986, W. Bicha, 1 ♂, 2 ♀ (WBIC). **Oktibbeha Co.**, John Star Memorial Forest, 33° 21' 25" N, 88° 52' 17" W, 23 May 1995, D.M. Pollock, 2 ♂ (MEMU). Same site, 2 June 1995, D.M. Pollock, 1 ♂ (MEMU). **Winston Co.**, several miles west of Louisville, 17 September 2000, W. Bicha, 1 ♂ (WBIC).

***Panorpa vernalis* Byers**

Panorpa vernalis Byers, 1973:363. Claiborne Co., Mississippi, Rocky Springs, Natchez Trace Parkway

Panorpa vernalis: Byers, 1993:88. Fall collection records

Panorpa vernalis: Jones, 2010:2. Texas records and comments on variation

Distribution. AR, LA, MS, TX.

Published Mississippi Records. Byers (1973) includes the holotype ♂, allotype ♀, 18 ♂, 7 ♀ paratypes from the type locality, **Claiborne Co.**, Rocky Springs, Natchez Trace Parkway, 24 April 1972, G.W. Byers, a single female paratype from the same site collected 23 April 1972, and a male paratype specimen collected at the same site on 27 April 1969 by B. Mather. Byers (1993) also records 3 ♂, 2 ♀ collected from the type locality on 23 September 1977.

New Mississippi Records. Claiborne Co., Rocky Springs, 24 April 1981, W. Bicha, 2 ♂, 6 ♀ (WBIC), 1 ♀ (FSCA). Same site, 2 May 1989, W. Bicha, 1 ♀ (FSCA). Same site, 23 April 1994, W. Bicha, 1 ♂, 1 ♀ (WBIC). Same site, 2 May 1998, W. Bicha, 1 ♀ (WBIC). Same site, 30 October 2010, W. Bicha, 1 ♀ (WBIC). Sand Creek, 29 April 1980, B. Stark, 1 ♂ (FSCA). **Hinds Co.**, Clinton, 8 April 1980, B. Stark, 1 ♂ (BPSC). Same site, 5 May 1980, B. Stark, 1 ♀ (BPSC). Locality unknown, 25 April 1981, W. Bicha, 1 ♂, 1 ♀ (WBIC). **Lafayette Co.**, Oxford, 2 June 1974, P.H. Darst, 1 ♂ (UMIC). **Madison Co.**, Pearl River Wildlife Management Area, 9 April 2004, B. Stark, 1 ♂ (BPSC). Same location, 15 April 2010, S. Green, 1 ♂ (BPSC). **Stone Co.**, Red Creek, Hwy 15, 9 May 1979, P.K. Lago, 1 ♂ (UMIC). **Webster Co.**, Mile post 211, Natchez Trace Parkway, 6 September 1986, W. Bicha, 1 ♂ (FSCA).

Discussion

These results indicate a minimum of 22 species in three families occur in the state, which compares favorably with the mecopteran fauna reported for Arkansas (16 species, 3 families, Robison et al. 1997), California (9 species, 3 families, Penny 2006), Florida (12 species, 3 families, Somma and Dunford 2008, Somma 2011a), Illinois (17 species, 4 families, Webb et al. 1975), Kentucky (17 species, 3 families, Byers and Covell 1981), Michigan (20 species, 4 families, Thornhill and Johnson 1974), and Maryland (11 species collected on or adjacent to Plummers Island (Flint 2008)). North Carolina, one of the states with highest Nearctic mecopteran diversity, has 29 species in 4 families included on Penny's (2013) list. Table 1 presents a checklist along with flight periods for the Mecoptera species known for Mississippi.

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Table 1. Monthly flight period summary for twenty-two species of Mecoptera in Mississippi.

Species	J	F	M	A	M	J	J	A	S	O	N	D
	a	e	a	a	a	u	u	u	e	c	o	e
	n	b	r	r	y	n	l	g	p	t	v	c
<i>B. occidentis</i>							•					
<i>B. pilicornis</i>				•	•	•	•					
<i>B. punctiger</i>					•	•	•	•				
<i>B. stigmaterus</i>					•	•	•					
<i>B. strigosus</i>					•	•	•					
<i>H. apicalis</i>					•	•	•					
<i>M. tuber</i>						•						
<i>P. americana</i>	•					•			•	•		
<i>P. anomala</i>				•	•	•	•		•	•		
<i>P. banksi</i>				•	•	•	•					
<i>P. capillata</i>				•	•	•						
<i>P. choctaw</i>									•	•	•	
<i>P. confinis</i>				•	•	•			•		•	
<i>P. consuetudinis</i>						•						
<i>P. ferruginea</i>						•						
<i>P. insolens</i>					•				•			
<i>P. isolata</i>					•				•			
<i>P. lugubris</i>								•		•		•
<i>P. nuptialis</i>							•	•	•	•	•	
<i>P. rufa</i>										•		
<i>P. rupeculana</i>					•	•			•			
<i>P. vernalis</i>				•	•	•			•	•		

