DISJUNCT DISTRIBUTIONS OF *PSEUDOPOMALA BRACHYPTERA* AND *CAMPYLACANTHA OLIVACEA* (ORTHOPTERA: ACRIDIDAE) IN THE BLACKLAND PRAIRIES OF MISSISSIPPI, U.S.A.[1]

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ABSTRACT: Reports of disjunct distributions of two grasshoppers, *Pseudopomala brachyptera* and *Campylacantha olivacea* are given.

KEY WORDS: Disjunct distribution, *Pseudopomala brachyptera, Campylacantha olivacea,* Blackland Prairies, Mississippi, U.S.A.

Mississippi has two physiographic regions characterized by prairie, the Black Belt Prairie and the Jackson Prairie (Figure 1). The Black Belt Prairie is a crescent-shaped region that extends from McNary County in southern Tennessee through east-central Mississippi to Russell County, Alabama, near the Georgia border (Lowe, 1921; Smith, 1926; Stephenson and Monroe, 1940; Schiefer, 1998). The Black Belt is underlain by Cretaceous Selma chalk that is composed of fossiliferous, soft, white-gray limestone that weathers into fertile black soil for which the region is named (Logan, 1903; Lowe, 1913; Stephenson and Monroe, 1940; Hicks and Haynes, 2000).

Floristic surveys of the prairies in the Black Belt have revealed a distinct plant community that is similar to that of the Great Plains (Schuster and McDaniel, 1973; MacDonald, 1996; Leidolf and McDaniel, 1998). The most common grasses (Poaceae) include *Bouteloua curtipendula* (Michx.) Torr., *Panicum virgatum* L., *Schizachyrium scoparium* (Michx.) Nash, and *Sorghastrum nutans* (L.) Nash. Prominent forbs include *Asclepias viridis* Walter (Asclepladaceae), *Dalea candida* (Michx.) Willd., *D. purpurea* Vent. (Fabaceae), *Liatris squarrosa* (L.) Michx., *L. squarrulosa* Michx. (Asteraceae), *Ratibida pinnata* (Vent.) Barnh. (Asteraceae), *Silphium laciniatum* L., and *S. terebinthinaceum* Jacq. (Asteraceae).

The Jackson Prairie extends eastward from central Mississippi to just across the Alabama line into Washington County. The soils of this region, like those in the Black Belt, are formed from fossiliferous chalk that weathers into a dark rich soil (Moran et al., 1997).

The Mississippi Entomological Museum (MEM) has been surveying the insect fauna of the prairie regions of the state since the late 1980s. These surveys have documented populations of the bee, *Tetraloniella albata* (Cresson) (Anthophoridae), four species of Cerambycidae, and several species of moths that are disjunct from the Great Plains (MacGown and Schiefer, 1992; Schiefer, 1998; Brown, 2003).

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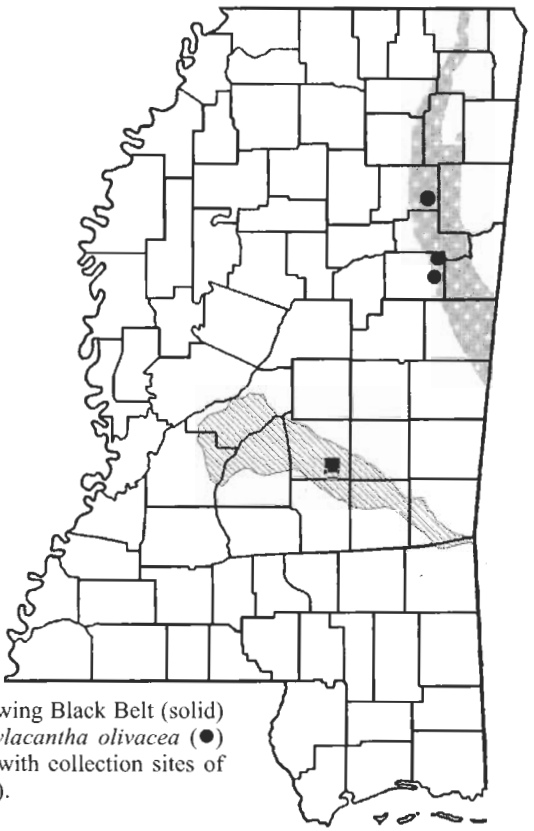

Figure 1. Mississippi map showing Black Belt (solid) with collection sites of *Campylacantha olivacea* (●) and Jackson Prairie (hatched) with collection sites of *Pseudopomala brachyptera* (■).

Recent collections of grasshoppers in prairie regions of the state have documented two additional species with disjunct distributions. Examinations of grasshopper holdings in the University of Mississippi insect collection and MEM have revealed additional records of one of these species in the latter collection. Voucher specimens of newly collected material have been deposited in the MEM collection.

Pseudopomala brachyptera (Scudder)

Otte (1981) reported the distribution of *Pseudopomala brachyptera* as "mainly northern United States and western Canada, but ranging southward through Kansas and Oklahoma." This species has been reported to be commonly found on Little Bluestem, *Schizachyrium scoparium,* a dominant plant on Mississippi's prairies (Morse, 1896; Blatchley, 1920). *Pseudopomala brachyptera* was found at only one of the three Jackson Prairie sites that were surveyed, at which it was relatively common. Because of its restricted distribution in Mississippi, only a limited number of voucher specimens were collected.

Mississippi Records. Scott Co.: Pinkston Hill, T5N R9E Sec.17, Jackson Prairie, 30 June 2001 (2 females), 12 July 2003 (2 males, 1 female).

***Campylacantha olivacea* (Scudder)**

The known distribution of *Campylacantha olivacea* extends from Illinois west to Nebraska and southeastern Colorado and south to Fort Worth, Texas, with disjunct populations reported from Macon, Georgia, and Marengo County, Alabama (Rehn and Hebard, 1916; Blatchley, 1920; Dakin and Hays, 1970). It is interesting to note that these disjunct populations, as well as the Mississippi records of *C. olivacea* reported here, all occur on or are associated with blackland prairies. Dakin and Hayes (1970) list two specimens from Marengo County, Alabama, which lies within Alabama's Black Belt and historically contained about 4150 ha of prairie according to surveys made in the 1800s (J. A. Barone, pers. comm.). The older Mississippi specimens are labeled as having been collected at either Agricultural College, or A&M College, both of which are former names for Mississippi State University. Parts of the campus lie at the edge of the Black Belt in Oktibbeha County and still contain prairie features to this day.The most recent specimens from Mississippi were taken on Western Ragweed (*Ambrosia psilostachya* DC.) from a prairie remnant at Osborn, Oktibbeha County. This is consistent with Rehn and Hebard (1916) who state that this species is often very abundant on large ragweeds (*Ambrosia* spp.) in Georgia. Blackland prairie remnants were recently described in Houston and Bleckley counties, which lie just south of Macon, Georgia, near where *C. olivacea* was historically collected (Klaus and Patrick, 2002).

Mississippi Records. Chickasaw Co.: Buena Vista, 4 Aug. 1916 (1 female). Oktibbeha Co.: Agricultural College [Mississippi State University], 19 Aug.-12 Nov., 1914-1931 (13 females); Osborn, 33°30'41"N 88°44"08"W, Black Belt Prairie, 14 Aug. 2001 (1 female), 13 Oct. 2003 Sweeping *Ambrosia psilostachya* DC., Black Belt Prairie (2 males, 1 female).

Another orthopteroid with a disjunct distribution in the Southeast is the Prairie Tree Cricket, *Oecanthus argentinus* Saussure. This speciesis found in the western United States east to Ohio, with disjunct populations occurring in Alabama and Florida (Helfer, 1971; Walker and Moore, 2004). Dakin and Hays (1970) list *O. argentinus* as a species inhabiting the Black Belt Prairie in Alabama, but this species has not yet been found in Mississippi's Black Belt. The distribution of these three species adds additional support to Brown's (2003) hypothesis that the Black Belt was a refugium for Great Plains species during and after the Wisconsin glaciation (approximately 0.1-0.01 million years ago). Further biogeographical studies are needed to better understand how isolated open habitats in the southeast, such as the Black Belt and Jackson Prairie, are associated with each other and with the Great Plains.

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LITERATURE CITED

Blatchley, W. S. 1920. Orthoptera of northeastern America. The Nature Publishing Company. Indianapolis, Indiana, U.S.A. 784 pp.

Brown, R. L. 2003. Paleoenvironment and biogeography of the Mississippi Black Belt: Evidence from insects. [pp. 11-26.] *In,* E. Peacock and T. Schauwecker (Editors). Blackland Prairies of the Gulf Coastal Plain: Nature, Culture, and Sustainability. The University of Alabama Press. Tuscaloosa, Alabama, U.S.A. 348 pp.

Dakin, M. E. and K. L. Hays. 1970. A synopsis of Orthoptera (*sensu lato*) of Alabama. Agricultural Experiment Station Bulletin 404. Auburn University. Auburn, Alabama, U.S.A. 118 pp.

Helfer, J. R. 1971. How to know the grasshoppers, cockroaches, and their allies. Wm. C. Brown Company Publishers. Dubuque, Iowa, U.S.A. 359 pp.

Hicks, M. B. and C. G. Haynes. 2000. An annotated list of Trichoptera in the Black Belt region of west central Alabama. Entomological News 111: 215-222.

Klaus, N. and T. Patrick. 2002. Draft Management for the blackland prairies, oaky woods, and Ocmulgee Wildlife Management Area. Report submitted to the Georgia Department of Natural Resources Non-game Wildlife and Natural Heritage Section. 5 pp.

Leidolf, A. and S. McDaniel. 1998. A floristic study of Black Prairie plant communities at Sixteen-Section Prairie. Oktibbeha County, Mississippi. Castanea 63: 51-62.

Logan, W. N. 1903. The geology of Oktibbeha County. Geological and Industrial Survey of Mississippi, Report 1. Rand McNally and Co., Chicago, Illinois, U.S.A. 67 pp.

Lowe, E. N. 1913. Forest conditions of Mississippi. Mississippi State Geological Survey Bulletin 11.166 pp.

Lowe, E. N. 1921. Plants of Mississippi: A list of flowering plants and ferns. Mississippi State Geological Survey Bulletin 17.292 pp.

MacDonald, J. 1996. A survey of the flora of Monroe County Mississippi. M.S. Thesis. Mississippi State University, Mississippi State, Mississippi, U.S.A.163 pp.

MacGown, M. W. and T. L. Schiefer. 1992. Disjunct distribution and new record for an anthrophorid bee, *Xenoglossodes alabata* (Hymenoptera: Anthoporidae), in the southeastern United States. Entomological News 103: 81-82.

Moran, L. P., D. E. Pettry, R. E. Switzer, S. T. McDaniel, and R. G. Wieland. 1997. Soils of native prairie remnants in the Jackson Prairie region of Mississippi. Mississippi Agricultural and Forestry Experiment Station, Bulletin 1067. 11 pp.

Morse, A. P. 1896. Notes on the Acrididae of New England, II: Truxalinae. Psyche 7: 382-384.

Otte, D. 1981. The North American grasshoppers, Volume I, Acrididae: Gomphocerinae and Acridinae. Harvard University Press. Cambridge, Massachusetts, U.S.A. 275 pp.

Rehn, J. A. G. and M. Hebard. 1916. Studies in the Dermaptera and Orthoptera of the Coastal Plain and Piedmont region of the southeastern United States. Proceedings of the Academy of Natural Science of Philadelphia 68: 87-314.

Schiefer, T. L. 1998. Disjunct distribution of Cerambycidae (Coleoptera) in the Black Belt Prairie and Jackson Prairie in Mississippi and Alabama. The Coleopterists Bulletin 52: 278-284.

Schuster, M. F. and S. McDaniel. 1973. A vegetative analysis of a black prairie relict site near Aliceville, Alabama. Journal of the Mississippi Academy of Science 19:153-159.

Smith, E. A. 1920. Geological map of Alabama. Geological Survey of Alabama. A. Hoen and Company. Baltimore, MD.1: 2,375,000.

Stephenson, L. W. and W. H. Monroe. 1940. The Upper Cretaceous deposits. Mississippi State Geological Survey Bulletin 40. University of Mississippi. University of Mississippi, Mississippi, U.S.A. 296 pp.

Walker, T. J. and T. E. Moore. 2004. The singing insects of North America. http://buzz.ifas.ufl.edu/581a.htm (accessed on July 9, 2004).