NOTES ON THE DISTRIBUTION OF THE ROBBER FLY, *LAPHRIA VORAX* -- Robber flies (Diptera: Asilidae) are often conspicuous predators in open habitats, such as prairies, savannas, and woodlands (Wood 1981). Prey can consist of a variety of other insects, including grasshoppers, beetles, and wasps (Wood 1981). Members of this group often exhibit specific ecological preferences and can occur in small, localized populations (Martin and Wilcox 1965). Such characteristics have focused attention on the potential conservations needs of robber flies (Barnes et al. 2007).

The robber fly genus *Laphria* is represented by 31 species in North America (Bullington 1986). Several of the *Laphria* species found in the United States are considered to be bumblebee mimics, possessing contrasting patterns of yellow and black (Bromley 1930, Waldbauer and Sheldon 1971). The distributional patterns and ecological preferences of most *Laphria* species have yet to be defined.

Laphria vorax is a medium-sized representative of the genus, typically measuring up to 20 mm in length with a yellow and black color pattern (Fig. 1). The species was described by Bromley (1929) from specimens collected in Kansas (holotype: Montgomery County, 1916) and Nebraska. Bromley (1934) described a Great Plains centered distribution for *L. vorax*, listing it in Iowa, Kansas, Nebraska, and Oklahoma. Recent field collections in Arkansas expand the species range from the Great Plains to the southeast and highlight this robber fly's association with remnant grassland habitat.

Barnes et al. (2007) listed recent collection records of *L. vorax* that extend the species range into Arkansas. All records for *L. vorax* listed therein are made from remnant tallgrass prairies in northern and western portions of the state, specifically the Ozark Highlands and Arkansas Valley ecoregions. On 8 June 2007, I observed five *L. vorax* at Roth Prairie Natural Area in Arkansas County, Arkansas. Roth Prairie is a 16 ha tallgrass prairie remnant located in the Grand Prairie of eastern Arkansas A single individual was taken as a voucher specimen and deposited in the University of Arkansas Arthropod Museum.

To assess how Arkansas records of *L. vorax* relate geographically and ecologically to the species primary range, label data were compiled from entomological collections housing specimens of *L. vorax* (Florida State Collection of Arthropods, FSCA; Illinois Natural History Survey, INHS; University of Arkansas Arthropod Museum, UAAM; University of Kansas Natural History Museum, KU; University of Nebraska State Museum, UNSM; and University of Wyoming Insect Museum, ESUW). UNITED STATES: ARKANSAS: Baker Prairie Natural Area, Boone County (UAAM); Cherokee Prairie Natural Area, Franklin County (UAAM); H.E. Flanagan Prairie Natural Area, Franklin County (UAAM). IOWA: Sioux City (INHS). KANSAS: Coffey County (KU); Ellsworth County (KU); Jewell County (KU); Lyon County (ESUW, KU); Marion County (FSCA, KU); McPherson County (KU); Osage County (ESUW, KU, UAAM); Saline County (KU). NEBRASKA:

Figure 1. *Laphria vorax*

Lincoln (UNSM). Bromley (1934) lists additional occurrences of *L. vorax* from Douglas, Riley, and Wallace counties, Kansas and Craig County, Oklahoma.

Based on these records, the distribution of *L. vorax* is defined by Woodbury County, Iowa to the north, Wallace County, Kansas to the west, Coffey and Osage counties, Kansas to the east, and Franklin County, Arkansas to the south. The recent collection of *L. vorax* in Arkansas County, Arkansas extends the southeastern boundary of this species range an additional 240 km from the Franklin County, Arkansas record.

From a county level perspective, Kansas specimens of *L. vorax* were collected from ecoregions historically characterized by tallgrass and/or mixed grass prairies with some degree of interspersed woodland or forest (Chapman et al. 2001). Specific ecoregional records for Kansas include the Flint Hills (Lyon, Marion, and Riley counties), Osage Cuestas (Coffey, Douglas, Montgomery, and Osage counties), Rolling Plains and Breaks (Jewell County), and Smoky Hills (Ellsworth, McPherson, and Saline counties). The Wallace County, Kansas collection is situated in the Western High Plains, a region once typified by shortgrass and mixedgrass prairie. Nebraska records (Lincoln and Lancaster counties) are from the Loess and Glacial Drift Hills, an ecoregion historically characterized by tallgrass prairie with scattered oak-hickory (*Quercus*-*Carya*) forests (Chapman et al. 2001).

The Iowa locality (Woodbury County) is situated in the Western Loess Hills which, prior to settlement, contained shortgrass and mixedgrass prairie on south and west-facing slopes, and bur-oak (*Quercus macrocarpa*) woodland and tallgrass prairie on cooler, moister slopes (Chapman et al. 2002). The Oklahoma record is located near the southern terminus of the Osage Cuestas, a region historically dominated by tallgrass prairie (Woods et al. 2005).

Prior to European settlement, Arkansas contained scattered, discontinuous tallgrass prairies, from the Ozark Highlands (Clark 1977), southward into the Arkansas Valley (Armstrong and Moore 1957), and eastward to the Mississippi Alluvial Plain (Irving et al. 1980). The largest and easternmost of these prairies was the Grand Prairie of east-central Arkansas. Situated in the Mississippi Alluvial Plain, the Grand Prairie once contained 130,000 ha of tallgrass prairie (Heitmeyer et al. 2000). The tallgrass prairies of the Ozark Highlands and Arkansas Valley were smaller by comparison and occurred within a patchwork of forests, woodlands, and savannas (Woods et al. 2004). Like those of the Great Plains, most tallgrass prairies in Arkansas were destroyed through agricultural conversion or urban development (Samson and Knopf 1994, Heitmeyer et al. 2000).

Occurrence of *L. vorax* in Arkansas further underscores the entomological relationships that exist between the prairies of the Great Plains and southeastern United States (Brown 2003). Other Great Plains insects with disjunct distributions in Arkansas include the prairie mole cricket, *Gryllotalpa major*, (Vaughn et al. 1993), robber fly, *Microstylum morosum*, (Warriner 2004a), and Texas red milkweed beetle, *Tetraopes texanus*, (Warriner 2004b). All three aforementioned insects are listed as species of special concern in Arkansas due to their dependence upon isolated tallgrass prairie remnants. Like those species, *L. vorax* clearly has strong affinities to native grassland habitats across its range and, in Arkansas, appears to be restricted to intact tallgrass prairie habitats. Given the potential conservation needs of remnant-dependent insects (Panzer 1997), *L. vorax* has been listed as a species of special concern in Arkansas.--*Michael D. Warriner, Arkansas Natural Heritage Commission, 1500 Tower Building, 323 Center Street, Little Rock, AR 72201. E-mail address: michaelw@arkansasheritage.org*

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