

2014

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A. K. Jones

Northwest Arkansas Community College, ajones47@nwacc.edu

D. H. Jamieson

Crowder College Cassville Campus

T. L. Jamieson

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Recommended Citation

Jones, A. K.; Jamieson, D. H.; and Jamieson, T. L. (2014) "Fecundity of Arkansas Tarantulas *Aphonopelma hentzi* (Girard)," *Journal of the Arkansas Academy of Science*: Vol. 68 , Article 27.

Available at: <http://scholarworks.uark.edu/jaas/vol68/iss1/27>

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Fecundity of Arkansas Tarantulas *Aphonopelma hentzi* (Girard)

A.K. Jones^{1*}, D.H. Jamieson², and T.L. Jamieson³

¹Department of Life Sciences, NorthWest Arkansas Community College, One College Drive, Bentonville, AR 72712

²Department of Biological Sciences, Crowder College Cassville Campus, 4020 North Main Street, Cassville, MO 65625

³Ozark High School, 1350 West Bluff Drive, Ozark, MO 65721

*Correspondence: ajones47@nwacc.edu

Running Title: *A. hentzi* Reproduction in Arkansas

Aphonopelma hentzi (Girard) is a species of theraphosid spider found throughout arid regions of the eastern expanse of the southwestern United States. Its range has been stated as occurring from the Mississippi river west into New Mexico, north to Colorado and Missouri and south into southern Texas and possibly Mexico (Hamilton et al. 2011). There has been some uncertainty surrounding the taxonomy of *Aphonopelma* species in Arkansas. Morphological data, county records, and public survey data was compiled by Warriner (2008) who concluded that *A. hentzi* was the sole species of theraphosid present in Arkansas. Using mitochondrial DNA markers, Hamilton et al. (2011) suggested that no other species exists north of the Colorado River Basin in Texas. Populations of this spider occurring in Arkansas are primarily found in the upland portions of the state (Warriner 2008) where their occurrence has been strongly correlated to xeric habitats with well drained soils such as cedar glades and disturbed areas (Baerg 1958). *Aphonopelma hentzi* was the first species of tarantula described in the US (Girard 1854) and is the largest spider within the state. There is a distinct lack of published information concerning the ecology of this species in Arkansas and none could be found specifically concerning populations endemic to the Ouachita Mountains physiographic region. The bulk of information to be found comes from studies conducted over several decades by the famous William J. Baerg at a field site in the Ozark Mountains near the University of Arkansas, Fayetteville (Baerg 1958).

The main purpose of this research was to increase the body of knowledge surrounding *A. hentzi* populations occurring within Arkansas with special interest placed on reproductive data.

Egg sacs were collected between June and August from 3 sites over a period of 5 years (2009-2013). Sites were located in both the Ozarks and Ouachita Mountains physiographic regions. Site 1 consisted of Ozark glade habitat along the western border of Lake

Leatherwood in Carroll County (Table 1). Site 2 was an open canopied disturbed roadside ditch amongst recently burned pine in the Ouachita National Forest approximately 3 km west of HWY 71 on Buffalo Road, Scott County (Table 1). Site 3 was a power line right-of-way in the Ouachita National Forest approximately 2 km west of HWY 71 on Poteau Mountain Road, Scott County (Table 1). Once located, females were coaxed away from their burrow entrances and egg sacs collected by hand. The sacs were placed into cotton pillow cases and then into a cooler for transport. The females were then photographed (Figure 1) and their overall carapace length measured in mm with a flexible ruler from Carolina Biological Supply Company (Table 1). Collected egg sacs were opened with scissors (Figure 2) under a dissecting scope and numbers of first instar spiderlings/eggs were recorded. After counting, the first instar *A. hentzi* were either placed in 95% v/v ethanol or were observed for several weeks and released.

Table 1: Date and location of collection, carapace length of adult female (CLAF), offspring number, and body length of first instars (LFI).

Site	ID	Date Collected	Coordinates	CLAF (mm)	Offspring #	LFI (mm)
1	A	8 Aug 2009	36°26'18.15" N 93°45'32.34" W	19.0	268	4.5
1	B	5 July 2010	36°26'16.41" N 93°45'37.78" W	19.0	743	4.0
1	C	31 July 2010	36°26'47.53" N 93°45'8.12" W	21.0	278	4.5
2	A	16 June 2012	34°58'10.48" N 94°8'58.67" W	22.0	813*	n/a
3	A	17 June 2012	34°58'37.94" N 94°6'46.48" W	21.0	694	3.5
3	B	27 July 2013	34°58'37.94" N 94°6'46.48" W	19.0	467	4.5
3	C	28 July 2013	34°58'26.69" N 94°6'42.17" W	24.0	780	5.0

*unhatched eggs

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Figure 1. Adult female at Site 2 with egg sac 16 June, 2012.



Figure 2. First instars counted and returned to opened egg sac.

Three egg sacs were collected from Sites 1 and 3 and one from Site 2. Carapace length of the adult females (CLAF) from which egg sacs were collected ranged from 19.0 mm to 24.0 mm with a mean of 20.7mm (Table 1). First instar number per egg sac ranged from 268-780 with a mean of 538.3. The body length of first instar spiderlings (LFI) ranged from 3.5-5.0 mm with a mean of 4.3 mm. One egg sac contained 813 eggs that were still yet to hatch.

The data collected over 5 seasons showed that on average females observed were slightly larger than those from previous studies. The largest female of this study was encountered from Site 3 and had a carapace length more than 4mm longer than any specimen described from the state by Warriner (2008) and also outsized a “well-fed” captive female described by Baerg (1958) at 23.3 mm. Female size however did not appear to correlate to offspring number. The number of offspring per egg sac was highly variable and had a range of 268-813 which fell within the range noted by Baerg (1958). *A. hentzi* egg sacs collected from the Ouachita Mountains physiographic region of Arkansas

had a higher mean number of offspring (688.5) than specimens from the Ozarks (429.7) (Table 1).

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