

## SHORT COMMUNICATION

### TREES USED FOR TUBE SUPPORT BY *SPHODROS RUFIPES* (LATREILLE 1829)(ARANEAE, ATYPIDAE) IN NORTHWESTERN LOUISIANA

**Laurence M. Hardy:** Museum of Life Sciences, Louisiana State University in  
Shreveport, One University Place, Shreveport, LA 71115-2399

**ABSTRACT.** Little information is available concerning the tree species preferred by the American red-legged purseweb spider, *Sphodros rufipes* (Latreille 1829), for supporting their webs. During a study of the spiders of northwestern Louisiana, 26 pursewebs of *S. rufipes* were found. All were on deciduous trees, with 58% found on sweetgum or oak. None of the webs were on conifers or herbaceous plants even though conifers made up 7-92% of the trees in the sampled areas. All pursewebs were within 20 m of a stream and were on trees with a trunk less than 70 cm dbh.

**Keywords:** Purseweb, habitat, hardwoods, habitat preference, web placement

*Sphodros* Walckenaer 1835 contains seven species which are collectively known as the American purseweb spiders. The genus is distributed in eastern North America, from southern Ontario, through the eastern United States to Texas and northeastern Mexico. The following six species have restricted geographic distributions: *S. abboti* Walckenaer 1835 (restricted to southern Georgia and northern Florida in hammocks and mesic situations), *S. atlanticus* Gertsch & Platnick 1980 (found in Georgia, Illinois, North Carolina, and Virginia, forests), *S. coylei* Gertsch & Platnick 1980 (known only from South Carolina, mixed forest), *S. fitchi* Gertsch & Platnick 1980 (from Nebraska, Kansas, Oklahoma, and Arkansas, deciduous forest, grassland), *S. niger* (Hentz 1842) (northeastern U.S. and southern Ontario, habitat unknown [see below]), and *S. paisano* Gertsch & Platnick 1980 (southeastern Texas and northeastern Mexico, habitat unknown). Within the genus *Sphodros*, the first species described was *Sphodros rufipes* (Latreille 1829), which also has the largest geographic distribution (southeastern U.S. from Rhode Island into Louisiana and eastern Texas) and is the only species known from Louisiana. All of the specimens examined from northwestern Louisiana are *S. rufipes*.

*Sphodros rufipes*, the American red-legged purseweb spider, is usually found in mixed pine-deciduous forest and is uncommon throughout its geographic distribution in North America. While some information is available about the general biology of *S. rufipes*, such as its dramatic method of prey capture (Comstock 1965), few details are known about its habitat requirements and reproduc-

tion anywhere in its range. The pursewebs of *S. rufipes* are vertical tubes with the upper end of the tube attached to a tree, a rock, or even a concrete wall, and the lower end embedded several cm into the soil (McCook 1888).

The only information about the pursewebs of *S. rufipes* in Louisiana is from Gertsch & Platnick (1980), who collected a total of four specimens from four separate localities in Louisiana. The web of one of those specimens was on a cliff, one was on an oak tree (*Quercus*), and one was on a beech tree (*Fagus grandifolia*); no habitat was given for the fourth specimen. No other tree species was given for supporting the aerial web of *S. rufipes* out of 94 specimens (from throughout the geographic range) listed by Gertsch & Platnick (1980).

During a continuing survey of the spiders of northwestern Louisiana, several specimens of *S. rufipes* were found. The most effective search strategy for this rare species was to look for their very distinctive webs. It was quickly discovered that certain mixed pine-deciduous forest habitats produced many more pursewebs of *S. rufipes* than did others. There are few references concerning the tree species preferred by any species of *Sphodros* for the support of the pursewebs, and no references have reported the spider's preferences for hardwoods versus pines as web support structures.

Potat (1889) reported a large population of *S. niger* in a pine forest in Wake Forest, North Carolina, and described the attachment of a purseweb (2 cm wide at the ground, 15 cm tall) to a small pine. Of 30 pursewebs Potat (1889) found in (or near) a 900 sq. yd. (754.8 sq. m) area during three years,

28 were attached to pines (3–35 cm diameter; species not given), one was on a very small persimmon (*Diospyros virginiana*) and the other was on a wild rose (*Rosa* sp.); all were vertical. The spiders studied by Poteat (1889) were well within the geographic range of the more common *S. rufipes*. The locality is also within the geographic range of the less common *S. atlanticus*, but is just southeast of the known geographic range of *S. niger*. Therefore, it is likely that Poteat's population was *S. rufipes*. The current status of Poteat's specimens is not known and they were not seen by Gertsch & Platnick (1980).

Bishop (1950) found only vertical pursewebs in Florida and agreed that the Poteat specimens were *S. milberti* Walckenaer (1837 [= *S. rufipes*]); however, Bishop did not mention the species of plants used to support the webs of spiders in his study.

Gertsch & Platnick (1980) doubted that all American *Sphodros* construct vertical tubes and suggested that *S. niger* does not. However, pursewebs that are horizontal to the ground surface, without a vertical aerial component, have not yet been documented in any species of *Sphodros*. Sarno (1973) described the tops of the pursewebs of *Atypus snetsingeri* Sarno 1973 in Pennsylvania as attached to lower stems and roots of a hedgerow, small magnolias, rhododendron, and a concrete foundation. Her references to the "tops" of the pursewebs attached to the plants and their lengths of 150–175 mm "above the surface of the soil, and the burrows from 100–150 mm below" clearly indicate a vertical aerial tube. Her mention of horizontal pursewebs is only for captive specimens in containers (Sarno 1973). Gertsch & Platnick (1980) incorrectly comment that although Sarno (1973) reported that her captive specimens of *Atypus snetsingeri* Sarno 1973 "resemble their European counterparts in building horizontal tubes along the surface of the ground, her description of the tubes in nature does not specify their orientation." Sarno never mentioned any comparison with European counterparts.

The excellent work by McCook (1888) on the pursewebs of *S. abboti* reports only vertical pursewebs and that *S. abboti* had no preference for any special tree. Gertsch (1936) reported only vertical pursewebs of *S. abboti* on sweet gums, oaks, and magnolias in Florida. Chamberlin and Ivie (1944) reported pursewebs on trees and that *S. abboti* tends to occur in colonies in Georgia. Muma & Muma (1945) studied 33 pursewebs of *S. bicolor* (= *S. rufipes*) in Maryland; there was no mention of any horizontal tube nor of the identity of the trees used.

The paucity of details on the species of trees used for web support and the confusions noted above concerning the webs of American purseweb spiders indicated the need for additional information. The objectives of this project were to, 1) document the species and size of trees used as web supports for

*Sphodros rufipes* in northwestern Louisiana, and 2) to determine if pine trees or hardwood trees are equally utilized by *S. rufipes* in northwestern Louisiana.

Specimens and pursewebs of *S. rufipes* were studied in several locations in Caddo, Winn and Grant Parishes, Louisiana, during 1996–2000 (see Specimens Examined). Purseweb spiders in northwestern Louisiana are found in contiguous mixed pine-deciduous secondary forest in bottomland areas, often in the vicinity of temporary or permanent water. In this region they are uncommon; however, due to the more durable web structure, the webs were found during all seasons of the year. When pursewebs were found, each was checked for a resident spider. The tree species and DBH (diameter at 4.5 feet from the base of the trunk, cm) were determined. The distance between the tree and the nearest stream was measured in some cases. All specimens examined are in the spider collection of the Museum of Life Sciences of Louisiana State University in Shreveport (LSUS).

To determine if individuals of *Sphodros rufipes* were selecting hardwoods over pines, it was necessary to determine the relative availability of pines and hardwoods in the forests that contained *S. rufipes*. To determine if pines and hardwoods were equally available for purseweb construction in the immediate vicinity of active pursewebs, I recorded the numbers of pines and hardwoods (15 cm DBH or larger) in four transects from each of five different localities (a total of 20 transects) that were at locations where 11 spiders were collected. At each locality the census transects consisted of four 2 m wide lanes, 50 m long, radiating at 0, 90, 180 and 270 degrees from the center (a total of 400 sq. m censused per locality).

A total of 26 pursewebs were found on 24 trees of 11 species (Table 1). The mean DBH of the 21 trees that were measured and that supported pursewebs was 20.9 cm (range = 3–65; median = 13).

Fifty-four percent (13 of 24) of the trees containing pursewebs and 58% (15 of 26) of all pursewebs were on *Liquidambar* or *Quercus* (Table 1). However, 50% (7 of 14) of all spiders were found on the other nine species of trees and only 21% (3 of 14) were found on *Quercus* (Table 1). Fifteen pursewebs (68% of the 22 tubes) did not contain spiders. The only trees with two pursewebs were one *Liquidambar* and one *Quercus*. All spiders were in pursewebs on trees less than 36 cm DBH. The mean tree DBH for occupied pursewebs was 17.3 cm (range = 3–35; median = 13;  $n = 10$ ). The trees bearing empty pursewebs were as large as 65 cm and at one time were used by a resident spider. Most of the trees that supported pursewebs were less than 0.5 m dbh, but all were well rooted saplings or larger (Fig. 1). None of the pursewebs was on grass or other herbaceous plants, even

Table 1.—Characteristics of support trees for 26 pursewebs of *Sphodros rufipes* from northwestern Louisiana.<sup>1,2</sup> Two pursewebs were on the same tree.<sup>3</sup> 25 cm is the maximum size of 3 different trees, other measurements were not recorded; this was counted as one tree in calculations.

Tree	DBH (cm)	Date	Notes
<i>Liquidambar styraciflua</i>	13	10 Nov. 1996	Spider in tube 10–15 cm long
<i>Liquidambar styraciflua</i>	30	10 Nov. 1996	Spider in flat tube 24 mm wide
<i>Liquidambar styraciflua</i>	11 <sup>1</sup>	21 Nov. 1996	
<i>Liquidambar styraciflua</i>	11 <sup>1</sup>	21 Nov. 1996	
<i>Liquidambar styraciflua</i>	10	21 Nov. 1996	Tube forked
<i>Liquidambar styraciflua</i>	16	21 Nov. 1996	
<i>Liquidambar styraciflua</i>	12.5	20 May 1999	Spider in tube
<i>Quercus falcata</i>	32 <sup>2</sup>	21 Nov. 1996	
<i>Quercus falcata</i>	32 <sup>2</sup>	21 Nov. 1996	
<i>Quercus falcata</i>	56	21 Nov. 1996	
<i>Quercus velutina</i>	65	21 Nov. 1996	
<i>Quercus alba</i>	—	13 July 1999	Spider in tube
<i>Quercus nigra</i>	23	21 Nov. 1996	
<i>Quercus</i> sp.	35	16 May 2000	Spider in tube
<i>Quercus/Elmus</i> (3 trees)	25 <sup>3</sup>	3 Nov. 1996	4 spiders, 1 tube/tree, 1 tube w/2 spiders
<i>Acer saccharum</i>	24	21 Nov. 1996	Spider in tube
<i>Acer saccharum</i>	5	21 Nov. 1996	Spider in tube
<i>Carpinus carolineanus</i>	3	21 Nov. 1996	Spider in tube
<i>Carpinus carolineanus</i>	6	21 Nov. 1996	
<i>Cornus florida</i>	5	21 Nov. 1996	
<i>Ilex opaca</i>	—	10 May 2000	Spider found in tube
<i>Ostrya virginiana</i>	12	21 Nov. 1996	Spider found in tube
Small tree		21 June 2000	
Unknown	13	29 Nov. 2000	Spider found in tube

though such herbaceous plants were present in the immediate vicinity of active pursewebs.

Twenty 50 m transects contained 73 hardwoods and 34 pines. The mean frequency of pines per transect was 45.2% (range = 0–92.3%; *n* = 20). Within the five localities studied, pines represented 7.1–

92.3% of the sampled trees. Therefore, pines (*Pinus taeda* L., Loblolly; *P. echinata* Miller, Shortleaf; *P. palustris* Miller, Longleaf; and *P. elliotii* Engelman, Slash) were readily available at all localities, but were not used by *Sphodros rufipes* for web support.

If *Sphodros* was using hardwoods and pines with equal frequency, based on the relative abundance of each tree type, then the frequencies of pursewebs on pines should be the same as the frequency of pines in the forest surrounding the web.

In northwestern Louisiana the pursewebs of *S. rufipes* are on hardwoods of moderate size (less than a meter, DBH; Fig. 1). None was found on pines or herbaceous plants. The loose, flaky nature of pine bark is probably detrimental to the long-term survival of the pursewebs. All pursewebs were found in the vicinity of a stream (1–15 m from tree). In many of the examples reported here the pursewebs were found on the vertical back wall of the trunk between buttressed roots and the web below ground always curved under the center of the tree trunk.

**Specimens of Spiders Examined (*n* = 15).**—All localities are in Caddo Parish, Louisiana unless noted otherwise and all specimens are in the spider collection of the Museum of Life Sciences of Lou-

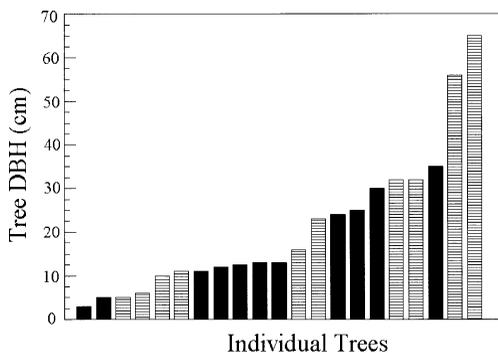


Figure 1.—Size (DBH in cm) distribution of trunks, from the smallest to the largest, that supported pursewebs of *S. rufipes*. Each bar represents an individual tree. The hatched bars represent unoccupied webs; the solid bars represent pursewebs that contained a spider.

isiana State University in Shreveport. 2.5 mi. W, 1.0 mi. S Blanchard, 3 Nov. 1996 (LMH 11708, ♀, total length [TL]= 17 mm; 11709, ♀, TL = 11; 11710, ♀, TL = 8; 11711, ♀), 21 Nov. 1996 (LMH 11744, ♀, TL = 13; 11745, ♀, TL = 12; 11746, ♀, TL = 12; 11747, ♀, TL = 10); 0.6 mi. W, 3.0 mi. N Keithville, 10 Nov. 1996 (LMH 11720, ♀, TL = 19, 11721, ♀, TL = 12); Winn Parish, 4.0 mi. E, 2.0 mi. S Goldonna, 10 May 2000 (LMH 12228, ♂, immature), 16 May 2000 (LMH 12244, ♀, TL = 11), 29 Nov. 2000 (LMH 12365, ♀, TL = 23); 5.0 mi. S, 2.3 mi. W Brewton Mill, 20 May 1999 (LMH 11957, ♀, TL = 19); Grant Parish, 3.8 mi. W, 3.2 mi. S Packton, 13 July 1999 (LMH 12090, ♀, TL = 12).

#### LITERATURE CITED

- Bishop, S.C. 1950. The purse-web spider, *Atypus abbotii* (Walckenaer), with notes on related species. (Arachnida: Atypidae). Entomological News 61(5):121–124.
- Chamberlin, R.V. & W. Ivie. 1944. Spiders of the Georgia region of North America. Bulletin of the University of Utah 35(9):1–267.
- Comstock, J.H. 1965. The Spider Book. Comstock Publishing Associates, New York, 729 p.
- Gertsch, W.J. 1936. The nearctic Atypidae. American Museum Novitates 895:1–19.
- Gertsch, W.J. & N.I. Platnick. 1980. A revision of the American spiders of the family Atypidae (Araneae, Mygalomorphae). American Museum Novitates 2704:1–39.
- McCook, H.C. 1888. Nesting habits of the American purseweb spider. Proceedings of the Academy of Natural Sciences of Philadelphia, p. 203–220.
- Muma, M.H. & K.E. Muma. 1945. Biological notes on *Atypus bicolor* Lucas (Arachnida). Entomological News 56:122–126.
- Poteat, W.L. 1889. A tube-building spider. Journal of the Elisha Mitchell Scientific Society 6(I): 134–147.
- Sarno, P.A. 1973. A new species of *Atypus* (Araneae: Atypidae) from Pennsylvania. Entomological News 84:37–51.

*Manuscript received 24 June 2002, revised 18 March 2003.*