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Additions to the List of Schizocosa (Family Lycosidae) for Arkansas

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Abstract

Schizocosa rovneri and *Schizocosa stridulans*, collected by the pitfall trap method in Drew and Ashley Counties, are reported as new species for the Arkansas state list. Palp variation and leg morphology are the main distinguishing characteristics between these species. Two previously defined species of *Schizocosa* are also discussed for clarification

Introduction

Two new species of *Schizocosa* from Ashley and Drew Counties are reported for Arkansas, *Schizocosa stridulans* and *Schizocosa rovneri*. Two previously defined species of *Schizocosa*, *S. crassipes* and *S. ocreata* are also redefined because of new information which has been presented by Dondale and Redner (1978). Previous identification of these four species has been difficult resulting in a state of confusion and dispute for taxonomist until leg morphology and micrographic studies of pedipalps elucidated the morphological differences.

Schizocosa stridulans is identified by dark brown to black pigmentation present on the tibia, patella, and distal 1/3 to 1/2 of femur I (Stratton, 1991). *S. rovneri* is recognized by the lack of this pigmentation and by the lack of a fine, thick brush of black hairs present on tibia I and the proximal half of metatarsus I which is present on *S. crassipes*, as shown in Fig. 1. *S. ocreata*, which is very similar to *S. crassipes*, is also determined by a fine, thick bristle of black hairs present on tibia I and the proximal half of metatarsus I of the male.

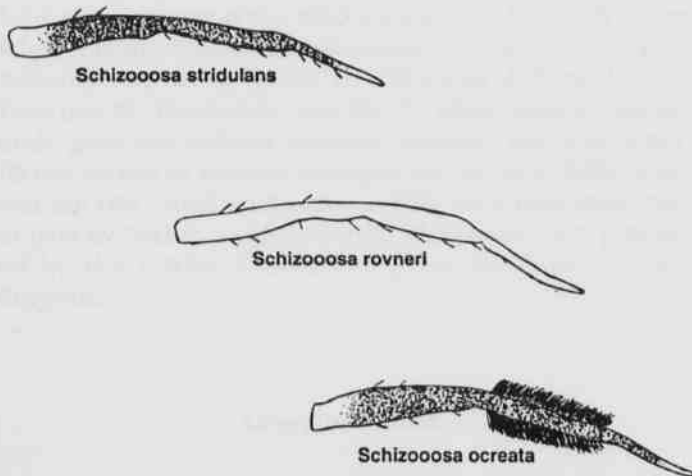


Fig. 1. Leg morphology of *Schizocosa* Spp.

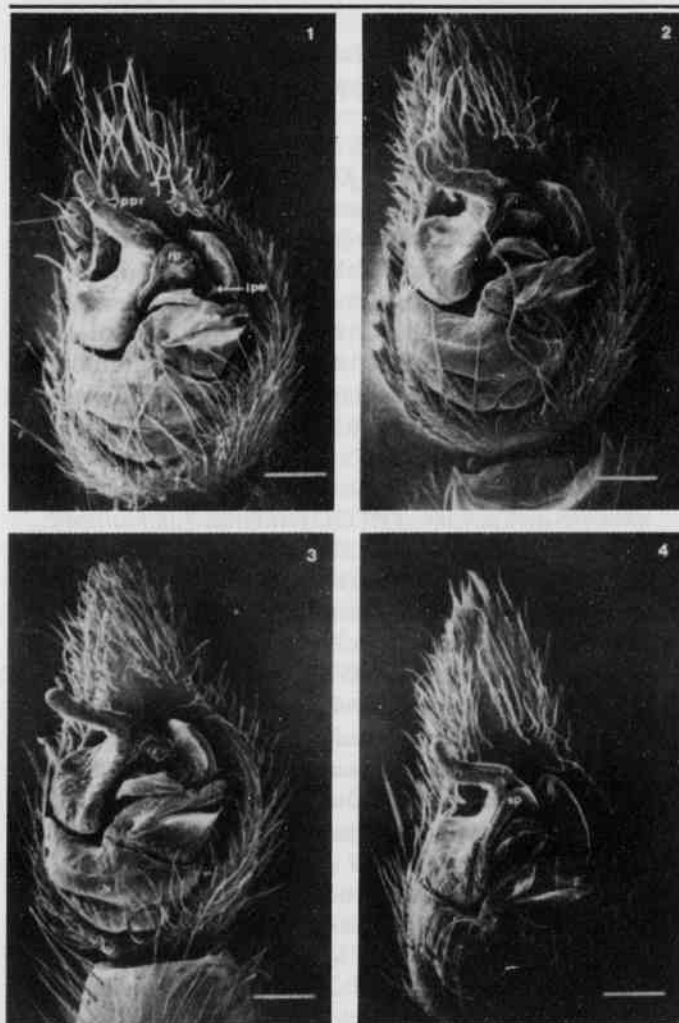


Fig. 2. Ventral aspect of left palp of *Schizocosa* species.
(1) *S. stridulans* (2) *S. rovneri*
(3) *S. ocreata* (4) *S. crassipes*

Schizocosa crassipes and *S. ocreata* may be differentiated by the prominence along the retrolateral side of the

paleal process of the pedipalps (Dondale and Redner, 1978). The photomicrographs in Fig. 2 (Stratton, 1991) show minute details of palpal processes. Dorris (1985) listed *S. crassipes* and *S. ocreata* as two distinct species in her Arkansas checklist but controversy over *S. crassipes* and *S. ocreata* has existed for many years as "lumpers" have put the two species together and "splitters" have separated them. Kaston (1948, 1978) listed only *S. crassipes* and Comstock (1965) listed only *S. ocreata*. It was not until Dondale and Redner (1978) published their revision of the *Schizocosa* genus that the controversy was ended. *S. ocreata* has a rugose or wrinkled prominence along the retrolateral side of the paleal process of the pedipalp as compared to *S. crassipes* which has a smooth prominence. While leg markings are the identifying characteristic for *S. stridulans* and *S. rovneri*, pedipalps are the key to identification of *S. crassipes* and *S. ocreata*.

Materials and Methods

Pitfall traps with rain covers are constructed in the following way: a 16 oz. plastic drinking cup is placed in a one quart metal oil can opened at both ends and inserted into a hole in the ground. The cup contains 5 fl. oz. of a one to one mixture of antifreeze (ethylene glycol) and water. The cup can be easily removed and its contents placed in baby food jars for transportation to the laboratory. A one ft. square plywood rain lid, held one in. over the cup with rocks or wood blocks, reduces the amount of rain and leaf litter entering the trap. Traps are emptied weekly, sorted by forest treatment, and placed in 80% ethyl alcohol. Weekly collections from all traps within each treatment area are pooled for storage. Specimens are later identified with a stereoscopic microscope, placed in screw cap vials with 70% ethyl alcohol and placed in spider storage cabinets.

Results and Discussion

Spiders of the *Schizocosa* genus can be distinguished from each other by the following criteria: courtship behavior, geographic distribution and habitat, leg morphology and pedipalps. For sympatric species, courtship behavior is an isolating mechanism (Stratton, 1991). The bounce, which is the rapid and forceful slamming of the male's body to the substrate during mating, differs from species to species (Stratton and Miller, 1994). Males of certain species will not court females of a different species, nor will females mate with males of differing species (Stratton, 1991). The courtship behavior can be distinguished from species to species by the manner in which the male moves his legs and body during mating. It

is those movements which the female recognizes as compatible with her; thus, this is the way in which courtship behavior serves as a key to identification and as an isolating mechanism between species (Uetz and Denterlein, 1979).

The range of *S. stridulans* overlaps that of *S. rovneri* and *S. ocreata*. The habitat of *S. stridulans* is upland leaf litter in oak or hickory forests (Stratton, 1991). Previous collections of *S. stridulans* have been made from southern Ohio, Illinois, Kentucky, Tennessee, Missouri, Alabama and Mississippi (Stratton, 1991). This paper also verifies its presence and that of *S. rovneri* in Ashley and Drew Counties (Fig. 3).



Fig. 3. *Schizocosa stridulans* (x) and *Schizocosa rovneri* (o).

Schizocosa rovneri is primarily found in floodplains and bottomlands and co-occurred with *S. ocreata*. The spiders are often found in or on flattened mud-packed leaf litter or in and on piles of drift that occur in floodprone ecosystems (Stratton, 1991). However, further studies done by Stratton and Miller (1994) indicate that *S. rovneri* is not the dominant medium-sized wolf spider in the floodplains of the south but is found in moist deciduous woods.

Schizocosa ocreata is often found in moist areas in association with *S. crassipes* and *S. floridans*. *S. ocreata* has been collected in floodplains and wet areas, along drier uplands, and along bottomlands. It appears that it is not selective and that the habitat preference should depend on geographic locality and on the presence or absence of competing species according to Stratton (1991). The distribution and locomotor activity is directly related to

moisture and the physical features of the habitat (Cady, 1984). Also, *S. ocreata* is more likely to be found in areas of full leaf litter and high soil moisture. Microhabitat selection appears to be important in courtship activities.

Although *Schizocosa crassipes* and *S. ocreata* have been identified as two distinct species, and although they co-exist in Arkansas, *S. crassipes* has been identified as the more southern species. Studies of behavior have primarily been done in more northern states where *S. ocreata* is more prevalent; consequently, the relationship between *S. crassipes* and other spiders of the *Schizocosa* genus is not as clearly known as the affinities of *S. ocreata* and requires further research. As a result, most information is put in terms of *S. ocreata* rather than *S. crassipes* when the "brush-legged" spider is mentioned.

Leg morphology was the identifying characteristic of *Schizocosa stridulans* and *S. rovneri*. Dark brown to black pigmentation on the tibia, patella and distal 1/2 to 1/3 of femur I is the identification pattern of *S. stridulans*. Pigmentation is lacking on leg I of *S. rovneri* which also lacks the brush of leg hairs present on *S. ocreata* and *S. crassipes* (Stratton, 1991). Figure 1 shows pigmentation and brush differentiation. The main difference between *S. crassipes* and *S. ocreata* must be discerned by the pedipalps. The former has a smooth prominence along the retrolateral side of the paleal process, while the latter has a rugose or wrinkled prominence.

Conclusions

Leg morphology and palp variation are the major criteria by which *S. rovneri* and *S. stridulans*, two new species for Arkansas, are being identified. The habitats of *S. rovneri* and *S. crassipes* are now known to overlap. Stratton and Miller (1994) reported a range extension of *S. rovneri* to high moisture deciduous forests which overlaps the range of *S. stridulans*. Although habitat is not a concrete way to identify arachnids, it is an indicator and can be used to form generalizations. This present research has shown that *S. stridulans* and *S. rovneri* co-exist in Arkansas and with clarification of pedipalp structure of *S. crassipes* and *S. ocreata*, future conclusions about speciation should be more easily made.

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