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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.

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

Fig. 1. Leg morphology of Schizocosa Spp.

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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 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 stereo-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).

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

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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 striulans 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. striulans. 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. striulans, 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. striulans. 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. striulans 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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Literature Cited


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