

## A CASE OF HETEROSPECIFIC MATING IN WOLF SPIDERS (ARANEAE, LYCOSIDAE)

Heterospecific matings are known to occur between closely related wolf spider species in captivity (Locket & Millidge 1951; Den Hollander et al. 1973; Uetz & Denterlein 1979; Suwa 1980, 1985; Stratton & Uetz 1983; Francescoli & Costa 1992). The present note will report on an occasional mating between two distantly related Palearctic species, viz., *Acantholycosa lignaria* (Clerck) and *Pardosa sphagnicola* (F. Dahl). [The genus *Acantholycosa* was placed as a junior synonym to *Pardosa* by Wunderlich (1984), though this has not been followed by all subsequent authors.] The long-legged *A. lignaria* lives on dead tree trunks, tree stumps and among masses of large stones. *P. sphagnicola* prefers mires, notably with a *Sphagnum* cover.

The specimens were collected ca. 20 km N of Stockholm, Sweden, in May 1993. Specimens of *Pardosa sphagnicola* were brought home alive and kept separate in captivity for observations on courtship behavior. In addition, a single subadult female of *Acantholycosa lignaria* was captured (on 2 May). When not further needed, two of the *P. sphagnicola* males (captured as adults on 27 May) were presented as food for the considerably larger female of *A. lignaria*. The *P. sphagnicola* males were, however, not attacked for days (period not exactly recorded) by the female *A. lignaria*, which was fed on *Drosophila melanogaster*.

On the morning (about 0815 h) of 16 June, the female *A. lignaria* had finally, probably during the previous night, molted to adult. What is more, one of the male *P. sphagnicola* was "riding" her in the typical type 3 (Foelix 1982) mating position common to lycosids. The male had probably mounted the female in connection with her molting, i. e., when she could not maintain her aggressive/repelling behavior. The male occasionally performed movements of the body that normally precede palpal insertions. Though I was able to observe only a small number of coupling attempts, it is unlikely that the male bulbus ever linked to the epigyne. The copulatory organs in the two species are considerably different (cf., e. g., Holm 1947) and a coupling would probably

be impossible due to morphological incompatibility. Maybe the size difference between the two specimens (total body length *A. lignaria* ♀: 7.7 mm, *P. sphagnicola* ♂: 4.8 mm) also prevented the male bulb from reaching the epigyne. The male remained in the mating position during the whole day and did not leave the female until the following night (0040 h) when the pair had just been moved into another box with wet cotton (both specimens were very thirsty) after being photographed (Fig. 1). No further observations were made (the female was then put in ethanol).

Sexual behavior in male lycosid spiders is induced by contact with female silk and/or integument and, most likely, sex semiochemicals from the females are involved (Tietjen & Rovner 1982). Males also emit substances which, at least in certain species, will act as sex semiochemicals. Cuticular pores could well be the emitting site for integumental semiochemicals, and such pores have been found in both males and females of lycosids (Kronstedt 1986; Juberthie-Jupeau et al. 1990). A species-specificity in the sex semiochemicals would be of advantage in bringing the sexes together. It is known, however, that males of various lycosid species do not fully discriminate conspecific mating partners from those of related species, while the females show a stricter species-specific choice of males (*Schizocosa*: Uetz & Denterlein 1979, Stratton & Uetz 1983; *Pardosa*: Suwa 1980, 1985; *Lycosa*: Costa & Capocasale 1984). Hegdekar & Dondale (1969) demonstrated that males of two *Pardosa* and two *Schizocosa* species were sexually excited by some substrate-deposited semiochemical from the conspecific female, though one of the male *Pardosa*, *P. moesta* Banks, was also aroused by a substrate previously exposed to female *Schizocosa crassipalpata* Roewer. Also, subadult females may attract mature conspecific males in lycosids. In the sedentary species *Geolycosa turricola* (Treat), mature males were found at the burrow entrance of subadult females waiting for them to molt (Miller & Miller 1986). Though it is not experimentally shown which cues are operating in close range mate-finding in this species,

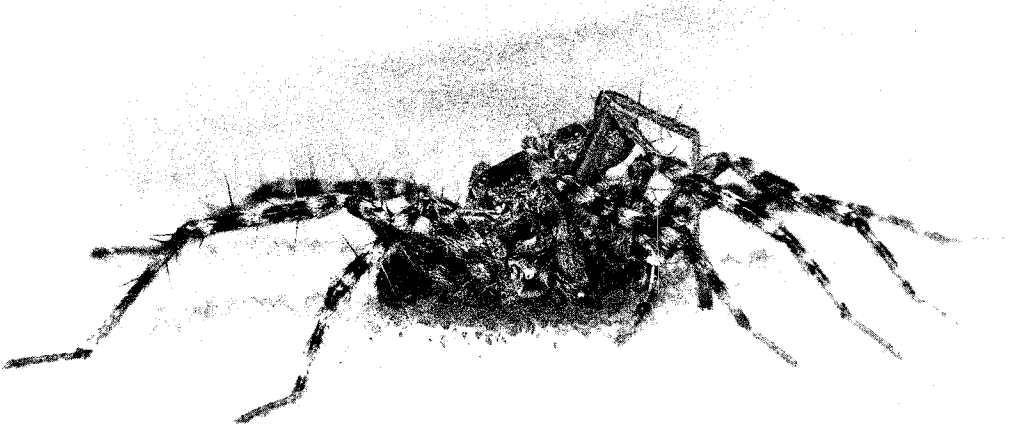


Figure 1.—Heterospecific mating between a male *Pardosa sphagnicola* (on top, facing leftward) and a female *Acantholycosa lignaria*.

chemical ones associated with silk and/or aerial sex-attractants may be involved. Apart from the *Geolycosa* case, evidence of emitting sexual signals by subadult lycosid females is unknown.

Some semiochemical was most likely emitted from the integument of the female *Acantholycosa lignaria*, enabling the male *Pardosa sphagnicola* to recognize her as a mating partner. As the two species are not closely related, one may ask whether there exist components in the chemical “messages” of lycosid females common to species within a certain “phyletic distance”? May a longer absence from females lower the species-specificity in sexual response of conspecific males? Or, is some component in a presumed integumental semiochemical of the female *A. lignaria* biologically active also in just the male of *P. sphagnicola*, a somewhat unlikely coincidence?

I thank J. S. Rovner and G. E. Stratton for comments when reviewing the manuscript.

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*Received 3 August 1993, revised 24 September 1993.*