Testing female receptiveness to novel or previous mating partners in a wolf spider

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Summary

A number of hypotheses have been proposed as causes driving female multiple mating, distinguishing between direct or indirect benefits. We tested if Schizocosa malitiosa females recognize their first sexual mates and prefer other males for re-mating. We also analyzed if characteristics of a first mating affected female decision of re-mating. In monandry group (M), 20 virgin females mated and 3–4 days after they were exposed to the same male. In polyandry group (P), 20 virgin females mated and 3–4 days after they were exposed to a different male. Fifteen males courted mated females in M and 17 males in P. Re-mating occurrence and copulatory patterns were similar in both groups, but re-matings were briefer in P than in M and showed less palpal insertions compared to first matings. We did not find any relationship between copulatory characteristics and re-mating occurrence. We found no conclusive evidence that mated S. malitiosa females select second mates according to their first mate. The causes which determine female re-mating as well as changes in re-mating patterns are discussed.

Keywords: Schizocosa malitiosa, wolf spider, monandry, female re-mating, mate recognition.

Introduction

The mating system of a species is the result of a compromise between female and male reproductive interests (Schneider & Lubin, 1998; Arnqvist & Rowe, 2005). Polygamy is the most widespread mating system, implying that males and/or females have several mates per season (Andersson, 1994).
Females of many species perform multiple matings with different males but also with the same male (Eberhard, 1985, 1996; Arnqvist & Nilsson, 2000; Simmons, 2005). Mating with different males can provide direct benefits as increasing reproductive success by improving fertility, maximizing the progeny (or own) nutritional status, provision of paternal care (Arnqvist & Nilsson, 2000; Simmons, 2005). In addition, re-mating with different males can provide indirect benefits as genetic diversity within the progeny, allowing sperm competition and producing sons with the same successful characteristics than the father, or minimizing genetic incompatibility (Simmons, 2005; Maklakov & Lubin, 2006). Mating repeatedly with the same male can also ensure sperm supply to the female (Simmons, 2005). However, mating has several costs in terms of energy, increase of predation risk or physical harm, transmission of diseases, among other factors (Eberhard, 1985; Rowe, 1994; Chapman et al., 1995; Thrall et al., 2000), so females are expected to minimize the number of sexual encounters.

*Schizocosa malitiosa* Tullgren (1905) is a solitary wolf spider very common in Southern Uruguay. Males follow the silk draglines released by the females and perform an elaborate courtship display that includes visual, acoustic and tactile signals (Costa, 1975). Seven male courtship behaviours have been described, including male abdominal vibrations, palpal drumming and foreleg shaking (Costa, 1975). The male mounts on the female dorsum, placing his sternum on her carapace and facing opposite to each other, assuming the typical wolf spider mating position. The copulation in *S. malitiosa* is long (approx. 100 min) and has two consecutive behavioural patterns: Pattern 1 with multiple consecutive insertions of the same male palpal bulb, one side shift (turning while mounting on the female dorsum and preparing the other palp for insertion), and multiple insertions with the other palp and so on; and Pattern 2 with alternate use of palps after a single male insertion (Costa, 1979). After male dismount and for a variable period, females can remain in a quiescent state named catalepsy (Costa 1979).

Both males and females of *S. malitiosa* can remate. Costa (1979) observed males which mated until five times and females until three times under laboratory conditions. Females diminish their sexual receptivity after the first mating (Aisenberg & Costa, 2005; González & Costa, 2008). Stronger female reluctance for remating has been described in the wolf spider *Schizocosa ocreata* by Norton & Uetz (2005), where only recently mature females were likely to mate twice (Persons & Uetz, 2005). Sexual reluctance in *S.*