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Reproductive biology and functional morphology of the copulatory organs in *Psilochorus simoni* (Berland, 1911) (Araneae, Pholcidae)

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Psilochorus simoni is a rarely found pholcid spider that has presumably been imported from America and has spread out over most parts of Europe since the beginning of this century. Where as much work has been done on the reproductive biology of the frequent *Pholcus*-species, almost nothing is known about *Psilochorus simoni*, which is (in contrast to *Pholcus*) considered to be an element of the New World-group of Pholcidae.

Differences to *Pholcus* regarding genital morphology occur in the bulbal apophyses which cannot be homologized unambiguously, in the simple and slender procursus and in the absence of the trochanter-apophyses and the lateral cheliceral apophyses. In the female epigyne there are paired cavities instead of an epigyneal hook. The uterus externus is anteriorly provided with a median diverticulum that is in contact with glands and gets packed with sperm during copulation. It is therefore considered to function as a receptaculum seminis.

Courtship in *Psilochorus simoni* corresponds largely with the pattern described in *Pholcus*. Courtship duration was 7–53 min (n = 13). The beginning of copulation is characterized by intensive leg movements of both mates. Opisthosoma vibrations and gentle pedipalp movements were observed during the whole copulation. Copulation duration was 9–19 min (n = 7).

Genitalia coupling was studied by freeze-fixation of copulating pairs with nitrogen and preparation of histological serial sections of the genitalia in functional contact. Differences to *Pholcus phalangioides* were found: (1) in the function of the frontal cheliceral apophyses, that are inserted into the paired epigyneal cavities in *P. simoni* (in *Pholcus* they grasp the epigyneal hook), (2) in the mode of pedipalpal stabilization after precopulatory rotation, which is in *P. simoni* accomplished by jamming in the trochanter between chelicera and pedipalpal coxa (in *Pholcus* by contact trochanter-apophysis and lateral cheliceral apophysis), (3) in the fixation-position of the bulb in the uterus, which takes place ventrally and anteriorly in *P. simoni* (in *Pholcus* dorsally and posteriorly). The usefulness of these characters for phylogenetic research is investigated.

As in *Pholcus*, also *P. simoni* females are capable of producing more than one egg-sac (up to four observed, at an interval of 30–70 days) after a single copulation. These are carried with the chelicerae, until the spiderlings (20–30) hatch after 25–50 days. Newly inseminated females react aggressively to males, but two females which had already produced three and four egg-sacs respectively, accepted a further male for copulation. The low number of spiderlings that hatched from fourth egg-sacs (0, 10, 12, 17) and the fact in these egg-sacs some (or all) eggs were apparently not fertilized, indicates that the number of sperm stored might be a limiting factor for offspring number.

References

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