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Lengthening of embolus and copulatory duct: a review of an evolutionary trend in the spider family Sparassidae (Araneae)

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Dedicated to Dr Manfred Grasshoff on occasion of
his 70th anniversary and in memory of
his contributions to the functional morphology of
the spider family Araneidae

Abstract: The phenomenon of lengthening copulatory structures in the spider family Sparassidae is reviewed. One can distinguish between a diversifying type and a lengthening type, but admitting that there may be combinations and transitions between these cases. Some 55% of 662 species examined show clearly that the embolus and/or copulatory ducts are lengthened in comparison with the ancestral species, whereas only in 8% there is no noteworthy lengthening of these structures. Different types of lengthening are recognised: 'tegular coil', 'distal coil', 'distal screw', the irregular or combination type, and the so-called 'functional lengthening'. In these types uniformity of the copulatory structures prevails, although diversifying elements may occur albeit rarely. Combined morphological changes, occurring in the course of evolutionary lengthening, are considered as being dependent on functional constraints. The position of the embolus' tip may play an important role in this context. Understanding of functional and evolutionary aspects may enlighten possible mechanisms which trigger the phenomenon.

Key words: spider genitalia, copulatory organs, tip of embolus, evolutionary mechanisms, types of lengthening, functional constraints, huntsman spiders