

A REMARKABLE ANOMALY IN THE MALE BULB OF A *SINOPODA* SPECIES* (ARANEAE: SPARASSIDAE) 巨蟹蛛一种畸形雄性触肢器记述

During examination of spider material in the Institute of Zoology, Chinese Academy of Sciences (IZCAS), one male specimen came to our attention, which showed a unique anomaly in its palp. The morphology of this specimen is documented and suggestions for further investigations are given.

Material. 2 males, Zhangjiajie National Park (29.08°N, 110.29°E) [reared to adult, leg. LI Shu-Qiang]; deposited in the Institute of Zoology, Chinese Academy of Sciences, Beijing: Araneae, Sparassidae #89. One of the males has both palps intact and belongs to a *Sinopoda* species, which has yet to be determined. In the other specimen only the left palp is present in a deformed state. From size and color of both specimens, it could be possible that both are conspecific.

Morphology. The anomalous morphology is limited to the palpal tarsus and to the retrolateral tibial apophysis (RTA). All remaining parts of the palp show a normal expression of morphological characters (e. g. spination, size, shape).

The RTA is deformed in a way as recorded for e. g. *Erigone atra* (Jaeger, 1995), i. e. its size is reduced and its shape is different in comparison with the intact specimen.

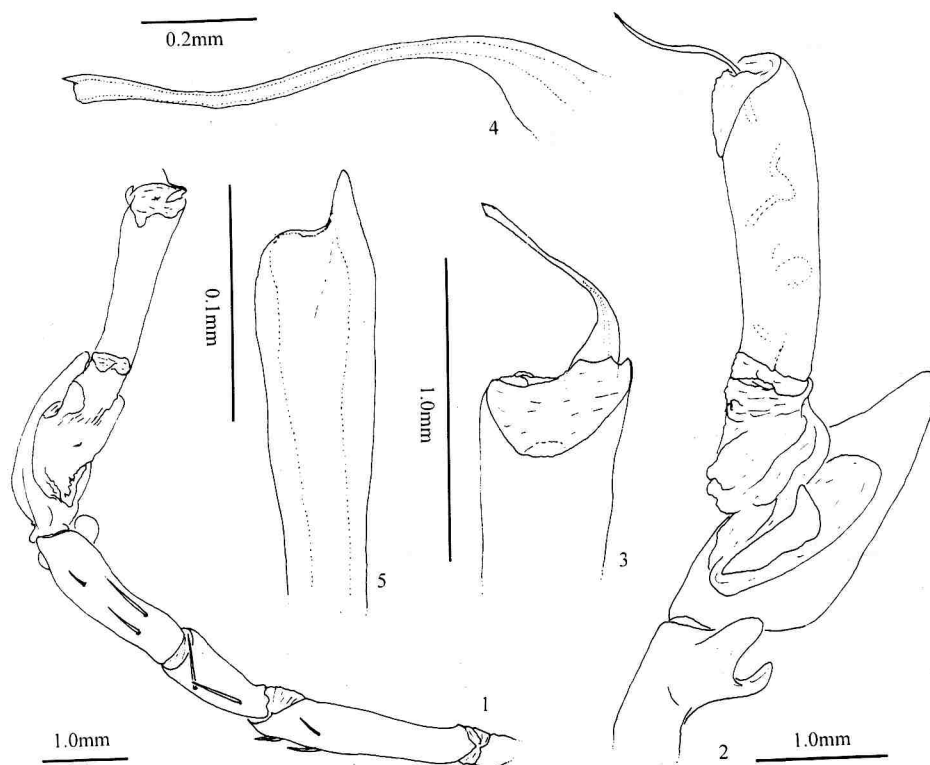
The main anomaly refers to the bulb, on the ventral side of the male tarsus. Usually, the bulb of sparassids composed of two sclerotized parts, tegulum and subtegulum, both separated by membranous parts, the haematodochae (cf. Yin *et al.*, 1983). The basal haematodocha connects the subtegulum to the cymbium, the dorsal part of the tarsus. The cymbium bears hairs and contains nerves, whereas the bulb does not. In *Sinopoda* spp. embolus and conductor arise from the tegulum (Jaeger, 1999). A sperm-duct extends from a distal opening on the embolus to the inner part of tegulum and subtegulum.

In the deformed specimen a second femur is present instead of the tegulum (Fig. 1). The doubled 'bulbal' femur is perfectly the same as the normal femur of the same palp, i. e. it carries hairs and spines (omitted in the drawings) in their regular position. In the position of the subtegulum a trochanter is partly present, which passes into the basal haematodocha. Within the basal haematodocha a single sclerite (= embolic 'petiolus' according to Grothendieck & Kraus 1994 and Sierwald 1997; see Fig. 2) is present as in normal specimens.

The embolus tip is extending beyond the distal end of the 'bulbal femur'. It passes through the membrane of the 'leg joint' (Fig. 3) and runs further inside the femur (Fig. 2). No remnants of tegulum, conductor or second part of embolus (cf. Jaeger, 1999) are recognizable. The distal tip of the embolus bears an opening and a sperm-duct (Figs. 4, 5). The terminal 'tooth' of the embo-

* The present work are supported by 1) the President Foundation of Chinese Academy of Sciences, 2) Grant for Systematic and Evolutionary Biology, CAS and 3) Special Support Project of the Department of Biology, CAS (STZ-00-19).

Received 16 May 2001, accepted 20 Oct. 2001.



Figs. 1-5 Anomalous male of *Sinopoda* sp. from Zhangjiajie

1. palp, proximal view 2. distal tibia and tarsus of palp, retrolateral view 3. apex of 'bulbal' femur with embolus, ventral view 4. embolus with sperm-duct, retrolateral view 5. apex of embolus with sperm-duct and apical 'tooth', retrolateral view (scales in mm)

lus is not present in the intact male from the same vial.

Discussion. The anomaly described is the first one of this kind within the true spiders (Araneae) known to the authors. Several cases of "doubling" of anatomical translocation of organs are known from insects (e. g. from *Drosophila* spp.). In the present case the "bulbal femur" obviously replaces the tegulum. The question, whether the present anomaly could give information on genetical expression of different structures, is interesting. However, at least one point should be emphasized: the embolus is built parallel (additionally) to the 'bulbal' femur (= tegulum). In intact specimens the embolus is connected with the tegulum continuously and is thus considered a part of the tegulum. If this is true and the tegulum is replaced by a structure, the embolus should be missing, too. If it is not, as in the present case, this could be an indication that embolus and tegulum are genetically encoded independently. The fact that in the normal specimen the sperm-duct extends through the tegulum to the supategulum, may support this interpretation.

Further investigations could enlighten where and how embolus, sperm-duct and tegulum are genetically encoded and how these structures develop in ontogeny.

Acknowledgements Thanks are due to Dr. Peter Schwendinger (Geneve) for improving the English of the manuscript.

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