

Thesis-Topics 2024 - Evolution of Behaviour (Bachelor, Master BEE)

Master thesis: 1. Kinematic analysis of the prey wrapping behaviour in spiders

Supervisors: Maitry Jani; Dr. Jonas Wolff; Prof. Gabriele Uhl

Background: Many spiders immobilise their prey by silk wrapping. Such wrap attacks differ in the speed, time and type of silk used (e.g. dry vs. sticky silks).

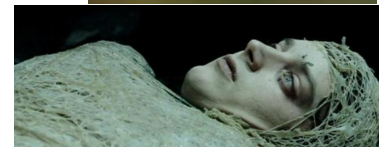
Question: How does the speed, time and movement of body, legs and spinnerets differ in wrap attacks across different evolutionary lineages of spiders? *So far this is barely known to science - and you could change that!*

Start: any time 2024

- Tasks:**
- filming wrap attacks in different species of spiders using high-speed video
 - describing the movements of body and limbs during the handling of silk
 - (3D) video-tracking of landmarks and determination of silk drawing speeds
 - measurement of attack duration and quantification of silk mass

Why should I take this topic?

- work with diverse species and materials - get fascinated by biodiversity
- learn to use high speed video and digital video analysis techniques
- learn about variation and evolution of predatory strategies
- work in a young, interdisciplinary team



Bachelor or Master thesis: 2. Diversity of silk based locomotion behaviours (abseiling, bridging, ballooning)

Supervisors: Maitry Jani; Dr. Jonas Wolff; Prof. Gabriele Uhl

Background: Spiders use silk to elegantly move through the three-dimensional space - including vertical drop-down on dragline (abseiling), the bridging of vertical gaps by 'shooting' lines (like Spiderman) and even flying through the air using sails of silk fibres.

Question: How did silk based locomotion evolve across different lineages of spiders?

How do these behaviours differ between different species? For example, which techniques are applied by the spider to initiate and control the silk flow and descend?

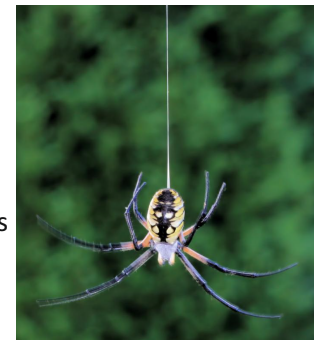
So far this is barely known to science - and you could change that!

Start: any time 2024

- Tasks:**
- observation and documentation (with macro-photography and filming) of silk based locomotion behaviours in different spider species
 - video-tracking analyses to determine silk drawing speeds and silk-based deceleration in abseiling and bridging behaviours

Why should I take this topic?

- work with diverse species and materials - get fascinated by biodiversity
- improve digital photo/videography skills and learn digital video analysis techniques
- learn about locomotion, kinematics and biological materials
- work in a young, interdisciplinary team



Caught your interest? Please contact

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