

# Thesis-Topics 2025 - Evolutionary Morphology (Master BEE)

**Master thesis: Evolutionary trajectories of organ reduction after loss of function: the cribellum spinning organ in the Austral marronoid clade of spiders**

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**Background:** A synapomorphy of araneomorph spiders is the cribellum, a specialised spinning organ that produces thousands of nanofibres that are brushed up by a comb-like structure at the hind leg, the calamistrum, and processed into adhesive capture threads. Many lineages of spiders have lost the cribellum-calamistrum system and display different stages of reduction. Usually the loss of function happened multiple million years ago, making it impossible to reconstruct the evolutionary fate of reduction of the vestigial organ. However, a group of spiders from Australia and New Zealand - the Austral marronoid clade - exhibits different stages of relatively recent organ reduction, making it possible to reconstruct timelines of organ reduction across multiple convergent lineages.

**Question:** At macro-evolutionary timescales, was the cribellum size reduced before or after loss of function? Was it gradually reduced or in a jump-like way?  
*So far this is not known to science - and you could change that!*

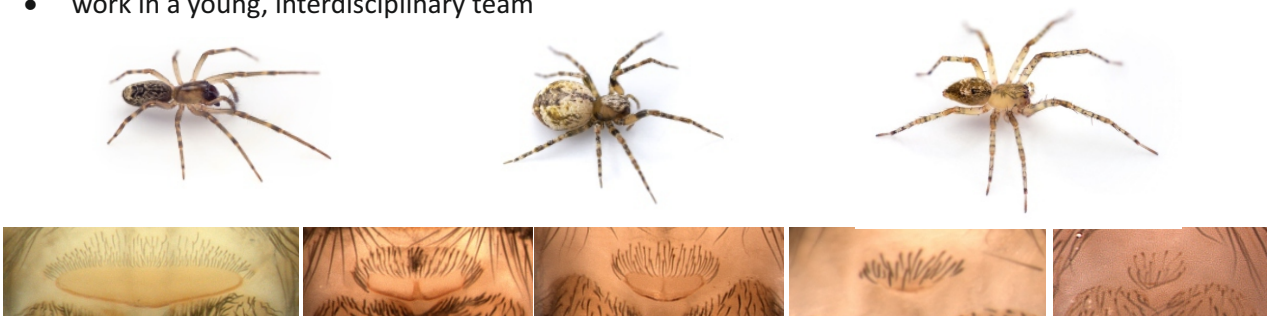
**Start:** any time 2025. This project is compatible with smart / remote working!

### Tasks:

- morphometric measurements (width, area of spinning field and whole organ) from microscopy images
- phylogenetic comparative analysis of the morphometric data and comparison of macro-evolutionary models

### Why should I take this topic?

- work with materials of diverse species from exotic regions - get fascinated by biodiversity
- learn digital image analysis techniques and phylogenetic comparative methods
- learn about phenotypic evolution across multi-million year timescales, how to infer the past from extant diversity, and how changes in behavioural traits interact with morphological and functional diversification processes.
- work in a young, interdisciplinary team



**Caught your interest? Please contact**

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