

**2 PhD positions in plant ecophysiology and functional anatomy: 1 position at Ulm University and 1 position at the Technical University of Munich (TUM, Germany)**

**Duration:** 3 years

**About the positions:** Within an international research team, two PhD candidates are expected to investigate the effects of drought stress on roots and leaves of flowering plants. Special attention will be paid to structural and physiological changes at the soil-root interface **(1)**, the hydraulic constraints on transpiration, recovery thresholds of leaves **(2)** and roots, and the mechanisms behind positive xylem pressure (known as “root pressure”) and guttation during plant rehydration **(3)**. These questions will be addressed in a joint DFG project between Ulm University (research team of Steven Jansen) and the TUM (research group of Mutez Ahmed).

Growth experiments in greenhouses and lab experiments will be combined with ecophysiological measurements of growth and photosynthesis, as well as a wide range of imaging methods to conduct morphological and anatomical observations. Key questions that will be addressed include the structural and physiological changes that roots and leaves undergo during periods of dehydration and rehydration. Moreover, the project aims to investigate the mechanisms of diurnal patterns of positive xylem pressure in relation to tissue rehydration and plant growth.

Based on the long-standing expertise of both research groups on root-soil interactions, functional plant anatomy, and water transport in plants, the PhD students will contribute to our understanding of drought-induced constraints on plant growth, and how plants recover from drought stress. The projects will have implications for our understanding of plant water use and plant responses to drought, which is especially relevant given current concerns about climate change and changes in drought frequency and intensity at many places worldwide.

**Expected starting date:** between May and August 2025 (or to be discussed)

**About the candidate:** we are looking for 2 motivated PhD students with a MSc degree or equivalent. The candidates are expected to have experience with experimental lab work, a general scientific background, and be highly interested in plant ecophysiology. Earlier experience with plant ecophysiology and functional morphology are a plus, while experience in working with R is desired.

**To apply, please send your CV and a cover letter with your motivation before 30 April 2025 to [steven.jansen@uni-ulm.de](mailto:steven.jansen@uni-ulm.de) and [mutez.ahmed@tum.de](mailto:mutez.ahmed@tum.de)**

**References:** **(1)** Duddek P, Carminati A, Koebernick N, Ohmann L, Lovric G, Delzon S, Rodriguez-Dominguez CM, King A, Ahmed MA (2022) The impact of drought-induced root and root hair shrinkage on root-soil contact. *Plant Physiology* 189: 1232-1236. **(2)** Fortunel C, Stahl C, Coste S et al. (2023) Thresholds for persistent leaf photochemical damage predict plant drought recovery dynamics in a tropical rainforest. *New Phytologist* 239: 576-591. **(3)** Schenk HJ, Jansen S, Höllttä T (2021) Positive pressure in xylem and its role in hydraulic function. *New Phytologist* 230: 25-47.

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