

MSc thesis in population genetics

Genetic diversity and differentiation of *Salix* sp. along the Hunza/Indus river of the Karakorum Mountains, Pakistan

Background

The northern regions of Pakistan are a mountainous and hence biodiverse spots at the co-junction of three mountain ranges, namely the Himalayas, the Karakorum and the Hindukush. Its valleys harbour riparian forests that are shaped by rough environmental conditions (high daily and annual temperature amplitudes, crumbling rocks, flooding event). Only a few woody species do persist such strong abiotic stresses, one them do belong to the species of the willow *Salix* genus. *Salix* spp. take thereby over environmental services such a soil stabilisation, pasture protection, carbon sequestration and do provide additional forage for livestock and construction material humans. Amplified disturbances (illegal logging, over-browsing/-grazing, and climatic variations) of stands however led and still lead to the decline of stand densities, along with the probable change of genetic diversity patters. Genetic signals (lower genetic diversity, bottlenecks, among others) are therefore expected. How far genetic aspects are important factors or are even affected by these changes is unclear, but are key to be considered for management and conservation purposes. At the same time, they should be the leading scope of the announced MSc thesis.

Your tasks

1. Lab work (2-3 months): available leave material from about 250 individuals should be tested and analysed with already established SSR-markers at Forest genetics and Tree Breeding Department (Göttingen)
2. PC-analyses (2 months): common population genetics software (R-packages, GenAlex, etc.)
3. Thesis write-up (1-2 month/s)

Your skills

- Good English: not a prerequisite, but improves the chance to become a co-author in an internationally peer-reviewed paper. A thesis in German is also possible.
- Interest in molecular and population genetics
 - lab work
 - use/explore of new software
- communicative

We offer

- Lab and desktop work at the Department of Forest Genetics and Tree Breeding Department (Prof. Dr. Oliver Gailing, University of Göttingen) in close cooperation with Tropenzentrum (Dr. Martin Wiehle, University of Kassel)
- Set up of efficient time schedules
- Fast response and exchange between you and supervisors
- Flexible working hours and collegial off-work activities

Expected time frame

- 6 months (regular MSc thesis)
- May-Nov 2019
- Later dates are possible upon consultation

More information

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Natural riparian forest with *Salix* spp. in Baltistan, Pakistan, 2018