

MSc thesis in population genetics

Genetic diversity and differentiation of *Prunus armeniaca* in the Karakoram Mountains, Gilgit-Baltistan, Pakistan

Background

Despite its proximity to the Indian subcontinent, Gilgit-Baltistan (often referred to as “Hunza” region), belongs geographically, ethnically and climatically to the Central Asian cultural and natural region, where fruit tree horticulture is an important branch of agriculture. The occurrence of cultivated fruits in this region has a similarly broad spectrum as in Central Europe, but little is known about their local distribution, history, and intraspecific diversity. Besides walnut (*Juglans regia* L.), mulberry (*Morus alba* and *nigra* L.), vine (*Vitis vinifera* L.), and apple (*Malus* sp. L.), the locally known “Hunza” apricot (*Prunus armeniaca* L.) is by far the most common permanent crop, which has its centres of diversity in neighbouring regions such as Afghanistan, Iran, northwest China, Tajikistan and Kyrgyzstan. However, from the few studies conducted and own observations, a high intraspecific morphological and genetic diversity is evident from Gilgit-Baltistan, which was once crossed by the Silk Route, enabling the introduction and exchange of plant material. This diversity is particularly reflected by local varieties that are propagated by farmers or grow from seeds. Since about 20 years, this diversity is however severely threatened as other commercial crops, foremost modern/uniform cherry (*Prunus avium* L.) and apple cultivars, replace this traditional diversity. It is therefore likely that modern varieties will rapidly displace the old varieties in the coming years, with unknown effects on the genetic diversity of the entire apricot population. To understand the current distribution of diversity and to derive suitable management strategies will be goal of this master thesis.

Your tasks

1. Lab work (2-3 months): available leave material of ca. 300 samples will be prepared 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, 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 in close cooperation with Tropenzentrum (Dr. Martin Wiehle, University of Kassel) and the Department of Forest Genetics and Tree Breeding Department (Prof. Dr. Oliver Gailing, University of Göttingen)
- 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)
- Nov/Dec 2021-Apr/May 2022
- Later dates are possible upon consultation

More information

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Sample fruit material from Gilgit-Baltistan, Pakistan