



# **PhD Position in Natural Science, specialising in Biology/Environmental Science (plant ecophysiology)**

Diary id: PAR 2019/1188

Employment level: Fixed term

Location: Department of Biological and Environmental Science

Apply by: 2020-01-20

At the Department of Biological and Environmental Sciences (BioEnv) we have teaching and research activities that stretch from the alpine ecosystem, through forests, cultivated land and streams, all the way into the marine environment. In these environments we study different levels of biological organisation from genes, individuals and populations, to communities and ecosystems. We work within ecology, evolution, physiology, systematics and combinations of these fields in order to understand the impact of natural and anthropogenic changes of the environment.

The department is placed at three different localities: in the Gothenburg Botanical garden, at Medicinarberget in Gothenburg, and at the marine research station Kristineberg. The current position is placed at the Botanical garden.

## **Project description**

This PhD project is within the research field of plant ecophysiology. Its aim is to explore how warming and drought affects the functioning, competitiveness and survival of different tropical montane tree species. Key overall questions addressed by the project are: (i) How do warming and drought affect the water use and functioning of tropical trees? (ii) What are the key traits predisposing tropical trees to drought- and/or heat-induced mortality? The specific questions and focus of the research will be developed together with the supervisor. The project is primarily based on field research on multi-species plantations established at different sites along a tropical elevation gradient in Rwanda. Sites differ in climate and each site additionally includes experimental manipulation of water supply (irrigation and/or rainout shelters) and nutrient availability (unfertilized, fertilized). Field measurements will particularly focus on traits that potentially predispose trees for drought- and/or heat-induced mortality, including tree hydraulics, gas exchange, structure and biochemistry.

The student will be hosted in the Department of Biological and Environmental Sciences under the supervision of Prof Johan Uddling. The project includes collaboration with scientists and PhD students from the University of Rwanda, as well as other international researchers that

share an interest in understanding and predicting how tropical trees and forests respond to climate change. The research group has ongoing collaboration with leading ecosystem and climate modellers through which the large- and longer-scale implications of key findings can be explored. Development research and capacity building are important components of the research collaboration with the University of Rwanda.

The project is linked to the strategic research area BECC (Biodiversity and Ecosystem services in a Changing Climate; <http://www.becc.lu.se/>), which also hosts a research school that will be open for the recruited PhD student: ClimBEco (<https://www.cec.lu.se/sv/utbildning/forskarutbildning/forskarskolan-climbeco>).

## **Job assignments**

The main task is to conduct the PhD thesis work under supervision, which includes development of the PhD student's methodology experience, analytical skills, and theoretical depth and breadth. Data collection will be conducted mostly through field work, but some lab work will also be included. Quantitative data analysis is an important part of the work and may include components of modelling/programming.

Specific research topics, tools and techniques that may be included in the research project include:

- Plant ecophysiology, including the regulation of plant water use, photosynthesis, leaf energy balance, carbon allocation and growth
- Processes controlling tree mortality under dry and/or hot conditions
- Tree water transport (hydraulics), considering the entire soil-plant-atmosphere continuum
- Plant-atmosphere gas exchange, i.e. transpiration, photosynthesis, stomatal regulation
- Tree carbon allocation and carbohydrate status under heat and/or drought
- Mathematical analyses of collected data to quantitatively describe tree functioning and ecosystem processes (hydrology, carbon budgets), possibly including collaboration with ecosystem modellers

Training will be provided but the student should be keen to learn any new skills required. A few periods (one to two months each) will be spent on field work in Rwanda.

## **Third cycle education**

Admission to third cycle education is aiming at a PhD in Natural Science, specialising in Biology (the PhD student can choose to take the PhD degree in Environmental Science instead). The education runs for four years of fulltime studies, containing three years of thesis work and one year of academic education (i.e. course work and literature studies). A selection of courses at the Department/Faculty is available, but national/international courses can also be selected. Some teaching and/or course administration can be included which extends the contract to the same extent.

# Eligibility

To be eligible for third-cycle studies, the applicant must meet both the general and specific entry requirements. A person meets the general entry requirements for third-cycle (PhD) courses and study programs if he/she:

1. has been awarded a second-cycle qualification (master degree), or
2. has satisfied the requirements for courses comprising at least 240 credits of which at least 60 credits were awarded in the second-cycle (master level), or
3. has acquired substantially equivalent knowledge in some other way in Sweden or abroad.

To meet the specific entry requirements for third-cycle studies, applicants must:

1. have a second-cycle (master level) degree in a relevant\* subject area in the natural sciences, or
2. have completed studies for at least 60 higher education credits at a second-cycle level in relevant subject areas in the natural sciences, or
3. have completed a corresponding programme of relevance to the planned third-cycle (PhD) programme, in Sweden or in another country, or have equivalent qualifications.

\*Relevant subject for the planned third-cycle (PhD) education is biology, or related subjects (e.g. environmental science or earth sciences) if including substantial components of biology.

# Assessment

Rules regarding education and employment on a doctoral level you will find in Högskoleförordningen (HF, SFS 1993:100). Only applicants who are admitted to the postgraduate level may be hired. Upon appointment the degree of ability to successfully complete the PhD program must firstly be evaluated.

We are seeking a motivated person for PhD studies in Biology with emphasis on plant ecophysiology. The assessment of candidates will be based on the following essential and advantageous attributes:

## *Essential attributes:*

- Knowledge in plant biology, including ecophysiology, ecology, physiology, or equivalent
- Analytical skills
- Creative thinking
- Excellent communication skills, written and spoken, in English
- Works well alone and as part of a group; cooperative
- Willingness to conduct field work in Rwanda

## *Advantageous attributes:*

- Knowledge in plant ecophysiology (» physiological ecology or functional ecology)
- Experience using ecophysiological methods
- Experience conducting field work under remote/challenging conditions
- Experience with quantitative data analysis and/or programming in R
- Experience working in a team

- Experience with scientific publication
- Willingness to teach undergraduate students at the host department

**The application should preferably be written in English and must include:**

- A short cover letter with the applicant's justification for the application, i.e., that describes how the applicant meets the selection criteria
- An attested list of qualifications (CV)
- Examination certificates and a transcript of courses with grades
- A copy of the Master thesis (or equivalent)
- Employments certificates and other documents deemed important by the applicant

The top ranked candidates will be selected for an interview, which might be held in English and could also be performed by phone/skype.

## **For further information regarding the position**

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Publications: <https://scholar.google.se/citations?user=wHEdxesAAAAJ&hl=sv&oi=ao>

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## **Unions**

Union representatives at the University of Gothenburg:

[http://www.gu.se/english/about\\_the\\_university/job-opportunities/union-representatives](http://www.gu.se/english/about_the_university/job-opportunities/union-representatives)

## **How to apply**

In order to apply for a position at the University of Gothenburg, you have to register an account in our online recruitment system. It is the responsibility of the applicant to ensure that the application is complete in accordance with the instructions in the job advertisement, and that it is submitted before the deadline. The selection of candidates is made on the basis of the qualifications registered in the application.

*The University of Gothenburg promotes equal opportunities, equality and diversity.*

*Applications will be destroyed or returned (upon request) two years after the decision of employment has become final. Applications from the employed and from those who appeal the decision will not be returned.*

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