



# Doctoral student in Natural Science, specializing in Biology with emphasis on plant ecophysiology

Ref PAR 2022/220

The University of Gothenburg tackles society's challenges with diverse knowledge. 56 000 students and 6 600 employees make the university a large and inspiring place to work and study. Strong research and attractive study programmes attract scientists and students from around the world. With new knowledge and new perspectives, the University contributes to a better future.

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 to understand the impact of natural and anthropogenic changes of the environment.

The department is placed at three different localities: in Gothenburg Botanical garden, at Medicinarberget in Gothenburg and at Kristineberg Center, Fiskebäckskil. The current position is placed at the university building in the Botanical garden.

General information about being a doctoral student at the University of Gothenburg can be found on the [university's doctoral student pages](#).

## Project description

The PhD project is within the research field of plant ecophysiology. It aims to explore how climate stress (drought, flooding and/or heat) affects the suitability of tree species for planting in cities under the current and the future climate. The key research goals include: (i) Determining which traits make tree species tolerant to hot, dry and flooded conditions, and ii) Assessing the links between tree traits, and growth and vitality in different urban settings, such as parks and street canyons. The specific questions and focus of the research will be developed in collaboration with the supervisors. The experimental work will consist of measurements of eco- and plant physiological responses to water availability manipulations and temperature of young trees growing in greenhouses. In addition, measurements on older trees in different urban sites in the Gothenburg area are included. A wide selection of methods will be utilized, ranging from vitality assessments and biomass harvests to measurements of plant hydraulics, gas exchange physiology, tissue isotopic signatures and leaf lipid composition as well as abiotic factors such as air temperature and soil moisture.

The student will be hosted at the Department of Biological and Environmental Sciences with Dr. Lasse Tarvainen as the main supervisor. The project will be carried out in collaboration with researchers from the University of Gothenburg, the Swedish University of Agricultural Sciences and the Gothenburg Botanical Garden. The position is financed by the Swedish Research Council for Sustainable Development (Formas) and the Department. The research group collaborates actively with scientists working on urban forests, plant ecophysiology and ecological modelling in Sweden and abroad.

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>). Some domestic and international travel for PhD courses and scientific conferences should be expected.

## Duties

The main task is to conduct the PhD thesis work under supervision, which includes development of the PhD student's methodological experience, analytical skills, as well as theoretical depth and breadth. The studies will be conducted mostly as greenhouse and field studies in Gothenburg 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 photosynthesis, plant water use, leaf energy balance, carbon allocation and growth
- Processes controlling tree mortality under dry, wet 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 drought, flooding and/or heat stress
- Variation in air and soil microclimate within the urban landscape
- Mathematical analyses of collected data to quantitatively describe tree functioning and ecosystem processes (hydrology, carbon budgets), including collaboration with soil and ecosystem modellers

Training will be provided but the student should be keen to learn any new skills required.

Education at third-cycle level comprises four years of full-time study, and leads to a doctoral degree in Natural Science, specializing Biology.

As part of your employment as a doctoral student, you may have departmental duties corresponding to up to 20 % of full-time employment, distributed throughout your study period. Departmental duties usually consist of teaching at first- and second-cycle levels, but may also include research and administration.

## Eligibility

Education at third-cycle level requires general eligibility and, where appropriate, specific eligibility as set out in the general syllabus for the subject.

**The general eligibility requirements for education at third-cycle level are:**

1. having completed a degree at second-cycle level, or  
- the fulfilment of course requirements totalling at least 240 credits, of which at least 60 credits must be at second-cycle level, or
2. the acquisition of equivalent knowledge in some other way, either in Sweden or abroad.

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

1. have a second-cycle (advanced-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 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, landscape architecture or earth sciences) if including substantial components of biology.

# Assessment criteria

The selection of applicants who meet the basic and specific eligibility requirements will be based on the ability to assimilate the education at third-cycle level.

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 in English, both written and spoken, are necessary since we work in an international environment.
- Ability to work well alone and as a part of a group; cooperative
- Willingness to carry out extensive greenhouse and field measurement campaigns
- A driving license is necessary for the field work conducted within the project

## Advantageous attributes:

- Knowledge in plant ecophysiology (physiological ecology or functional ecology)
- Experience of using ecophysiological methods
- Experience of conducting measurement campaigns to monitor abiotic factors and/or measure instantaneous plant responses
- Experience of greenhouse and/or field work
- Experience with quantitative data analysis and statistics
- Experience of working in a team
- Experience of scientific publication
- Basic knowledge of urban climatology
- Willingness to teach undergraduate students at the host department

# Employment

Once you have been admitted for education at third-cycle level, you will be employed as a doctoral student at the University of Gothenburg.

The provisions for employment as a doctoral student can be found in ordinance SFS 1993:100.

Initial employment as a doctoral student may apply for a maximum of one year, and may be renewed by a maximum of two years at a time.

A doctoral student may be employed as a doctoral student for a maximum of eight years, but the total period of employment may not be longer than the equivalent of full-time education at third-cycle level for four years.

Location: Department of Biological and Environmental Sciences. Extent: 100%. First day of employment: 2022-06-13 or upon agreement

The University applies a local agreement on salaries for doctoral students.

## 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 Zoom.

## Contact information

### For further information please contact

Dr. Lasse Tarvainen - main supervisor of the project  
Email: [lasse.tarvainen@bioenv.gu.se](mailto:lasse.tarvainen@bioenv.gu.se)

Webpage:

Department webpage: <https://www.gu.se/en/biological-environmental-sciences>

Group webpage: <https://www.gu.se/en/biological-environmental-sciences/our-research/plant-ecology-physiology-environmental-science>

Publications: [https://scholar.google.se/citations?hl=sv&user=k\\_CqBCoAAAAJ](https://scholar.google.se/citations?hl=sv&user=k_CqBCoAAAAJ)

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## Unions

Union representatives at the University of Gothenburg can be found here:  
<https://www.gu.se/om-universitetet/jobba-hos-oss/hjalp-for-sokande>

## Application

You can apply to be admitted for education at third-cycle level via the University of Gothenburg's recruitment portal.

It is your responsibility to ensure that the application is complete as per the vacancy notice, and that the University receives it by the final application deadline.

**Applications must be received by: 2022-05-02.**

## Information for International Applicants

Choosing a career in a foreign country is a big step. Thus, to give you a general idea of what we and Gothenburg have to offer in terms of benefits and life in general for you and your family/spouse/partner please visit:

<https://www.gu.se/en/about-the-university/welcome-services>  
<https://www.movetogothenburg.com/>

The University works actively to achieve a working environment with equal conditions, and values the qualities that diversity brings to its operations.

Salaries are set individually at the University.

In accordance with the National Archives of Sweden's regulations, the University must archive application documents for two years after the appointment is filled. If you request that your documents are returned, they will be returned to you once the two years have passed. Otherwise, they will be destroyed.

In connection to this recruitment, we have already decided which recruitment channels we should use. We therefore decline further contact with vendors, recruitment and staffing companies.

**Apply**