At the Faculty of Geography, the research group Ecological Plant Geography, Jun.-Prof. Dr. Maaike Bader offers two third-party funded part-time positions (each 65 % of regular working hours) for 3 years, starting 01.07.2016, for

2 Scientific Researchers (PhD students)

Salary and benefits are according to a public service position in Germany, pay scale E 13. The positions will offer the possibility of scientific qualification in the frame of the assigned duties.

The successful candidates will work within the German Research Foundation (DFG)-funded Project “Climate-change effects on bryophyte carbon balances in the warm tropics: a rainforest experiment complemented by simulation modelling”. The study area is located in the lowland rainforest of La Selva, Costa Rica. The project is supervised by Jun.-Prof. Dr. Maaike Bader (University of Marburg) and Prof. Dr. Gerhard Zotz (University of Oldenburg).

Mosses are conspicuously rare in most lowland tropical forests. The high temperatures and consequent quick drying and short photosynthetic activity may well be responsible for this. Further temperature increases would exacerbate this problem, while at the same time increased dark-respiration rates may further reduce net carbon gains. On the other hand, increased atmospheric CO$_2$ concentrations may alleviate the reduced carbon gain while changes in moisture conditions would cause additional changes. These complex interactions are the focus of this research project and are studied experimentally and through simulation modelling.

The successful applicants will hold an MSc-degree (with very good results) or equivalent in Biology or a related relevant discipline and have an interest and, preferably, practical experience in plant ecophysiological research and data analysis (statistics), plus specific experience as indicated in the position descriptions below. Experience with fieldwork in the tropics would be beneficial. Further requirements include a creative, analytical and critical mindset, the ability to work independently and to help further develop the project, good communication skills, the willingness to carry out fieldwork in Costa Rica for extended periods of time, and good English oral and writing skills. Knowledge of at least either German or Spanish and the willingness to learn the missing language at least to conversational level are required.

**Position 1: Experimentally studying climate-change effects on tropical bryophytes**

In an experiment in the tropical rainforest you will expose epiphytic bryophytes (mosses and liverworts) to climate-change simulations (warming, increased CO$_2$ and changed moisture regime) in open-top chambers. You will study how these changes affect the growth and survival of the bryophytes and what physiological processes play a role, e.g. diel courses of metabolic activity (measured via chlorophyll fluorescence and gas-exchange) and physiological acclimation (studied using gas-exchange measurements and plant chemistry). The results of these measurements will also serve the parameterization and validation of the carbon-
exchange model that is developed by your colleague (position 2) and will be used for further “virtual” experiments on climate-change effects on tropical bryophytes.

Your tasks will include planning, setting up and maintaining the field experiment (ca. 20 months in Costa Rica), independently carrying out the measurements and data analysis, coordinating your activities with those of the respective project colleague (position 2), and the preparation of several scientific publications.

Apart from the general requirements (see above), for this position it is required to have a strong interest and preferably experience in experimental ecology or ecophysiology and in environmental engineering (for the set-up and maintenance of the experiment, incl. electronics).

**Position 2: Modelling bryophyte carbon balances based on weather and microclimate**

You will develop a model to calculate moss carbon balances based on climatic data. The model will use, among other processes, hydration kinetics and photosynthetic environmental response curves to create daily courses of carbon exchange, which together determine the long-term carbon balance. The primary goals of the model are to explain the responses observed in the field experiment and to predict further climate-change responses of tropical bryophytes.

Your tasks will include contributing in the planning and set-up of the field experiment (ca. 4 months in Costa Rica), developing, implementing and testing a moss carbon-balance model, ecophysiological measurements on bryophytes (hydration kinetics, gas exchange), data analysis, coordinating your activities with those of the respective project colleague (position 1), and the preparation of several scientific publications.

Apart from the general requirements (see above), for this position it is required to have a strong interest and preferably experience in plant-growth or carbon-exchange modelling and in informatics and programming (e.g. in R).

More information about both positions can be obtained from Jun.-Prof. Dr. Maaike Bader (maaike.bader@geo.uni-marburg.de).

We support women and particularly invite them to apply. Applicants with children are welcome - the Philipps-University is certified as a family friendly university. A reduction of working time is possible. Applicants with a disability as described in SGB IX (§ 2 Abs. 2, 3) will be preferred in case of equal qualifications. Application and interview costs cannot be refunded.

Please send your application (including a motivation letter in English, curriculum vitae and contact details of three potential referees) mentioning registration number fb19-0003-wmz-2016-1 (Position 1) or fb19-0003-wmz-2016-2 (Position 2) as a single PDF file to maaike.bader@geo.uni-marburg.de before April 15th 2016.