

Project information

Keywords

pollinators, plant-insect interaction, monitoring, phenology

Project title

Frame-by-frame: a new approach for monitoring plant-pollinator interactions by time lapse photography

Year

2018

Project leader

Jane Uhd Jepsen

Geographical localization of the research project in decimal degrees (max 5 per project, ex. 70,662°N and 23,707°E)

Varanger (70.4 N, 28.64 E) and Tromsø (69.68 N, 18.96 E)

Participants

Project participants: Ingrid Jensvoll, Dept. Education, UIT, Ingrid.jensvoll@uit.no, Toke T. Høye, Dept. Bioscience, Aarhus University, th@bios.au.dk, Alexandros Iosifidis, Dept. Engineering, Aarhus University, alexandros.iosifidis@eng.au.dk, Ole Petter Vindstad, Dept. Arctic and Marine Ecology, UIT, ole.p.vindstad@uit.no

Flagship

Terrestrial

Funding Source

Fram Centre, UIT, NINA, Århus University, Danish Research Council

Summary of Results

Frame-by-frame aims at testing and implementing a recently formulated protocol for monitoring the climatic sensitivity of plant-pollinator interactions in the Arctic. The protocol is based on high frequency sampling of image-based observations of pollinators in action on their host plants using time lapse cameras. The project is an incentive project with a significant proportion of methodological development involved. Prior to launch of the project in 2018, the proposed protocol had been tested during a single season in west Greenland (two cameras). During 2018 the protocol was tested under very variable conditions and phenologies in Finse, W Greenland (Narsarsuaq), NE Greenland (Thule), Iceland, Svalbard, Varanger and Tromsø. At our two sites at Tromsø and Varanger we collected > 700.000 pictures of *Dryas* and 300.000 of *Rubus* covering the whole phenology from bud burst to seed set. This material is now feeding into the development of the processing pipeline and being used for generating training data. While the protocol generally works well on *Dryas*, needs for further small adjustments have been identified to ensure a standardized use of the protocol across sites. It is hence our goal to complete one additional sampling season at the main experimental site in Varanger in 2019. *Rubus* have been significantly more challenging due to the rapid and very varied vertical growth of this plant which increase the need for manual adjustments during the growing season. In 2019 we hope to solve this by adjusting the tripod design to allow for capturing at larger focal distances. However, there is a trade-off between focal distance and detail (ability to detect and identify insects on flowers), which need to be tested further before we can conclude whether this protocol is sufficiently robust for monitoring of *Rubus*.

Master and PhD-students involved in the project

None in 2018. From 2019 a new PhD student will be associated with the project funded from our project partners from Århus University, Denmark.

For the Management

Not relevant at this stage

Published Results/Planned Publications

Frame-by-frame is an incentive project not expected or planned to produce publishable results during 2018.

Communicated Results

Preliminary results of the tests have been communicated by project collaborators at the CAFF meeting in Rovaniemi in 2018 (below). In addition news from the project and this summer's field work has been communicated on social media by both the project leader and project partners.

Høye, T.T. 2018. Image-based monitoring of arctic arthropods. Arctic Biodiversity Congress, 9-11. Oct 2018, Rovaniemi Finland.

Interdisciplinary Cooperation

The project is an interdisciplinary collaboration between ecologists and computer scientists.

Budget in accordance to results

Costs in 2018 have been in accordance to budget.

Could results from the project be subject for any commercial utilization

No

Conclusions

The aims of the project for 2018 were fulfilled and funding from the Fram Centre has contributed significantly to this.