Report on the outcomes of a Short-Term Scientific Mission[1]

Action number: CA18201

Grantee name: Anaëlle TOUILLET LE MASSON

Details of the STSM

Title: Improving the Functional Connectivity of Grassland Networks for Plant-Pollinator Interactions on *Primula veris*

Start and end date: 19/04/2023 to 01/08/2023

Description of the work carried out during the STSM

The main focus of the efforts involved both fieldwork and data analysis. These endeavors spanned a range of activities, encompassing key aspects such as selecting suitable study sites, measuring plant traits, estimating morph ratios, and gauging the size of the *Primula veris* population. Moreover, an essential component included the gathering of *Primula veris* pollinators and meticulously recording visitation frequencies. To assess plant fitness, seed set data were collected, while leaves were procured for subsequent genetic analysis. The statistical evaluation was executed through the utilization of the R programming language, entailing the formulation of models grounded in the amassed data and the creation of corresponding visual representations.

The research question underwent a transformation from its original form, evolving from:

"How does the connectivity of grasslands and other grassland-like habitats in European rural landscapes affect plant and pollinator diversity, plant-pollinator networks, and floral resources available for pollinators?"

to the following queries:

1. "Does the number of visits from pollinators to *Primula veris* vary depending on the landscape type and population size?"

2. "Is there a difference in morphs ratio deviation among populations of *Primula veris* based on the landscape type?"

3. "Do plant traits, such as stalk height and rosette diameter, differ in connected landscapes compared to fragmented landscapes?"

[1]This report is submitted by the grantee to the Action MC for approval and for claiming payment of the awarded grant. The Grant Awarding Coordinator coordinates the evaluation of this report on behalf of the Action MC and instructs the GH for payment of the Grant.

Description of the STSM main achievements and planned follow-up activities

In contrast to our initial hypothesis, the fragmented landscape surprisingly and significantly fosters a heightened propensity among pollinators to visit Primula veris, contrary to the expectations from the connected landscape. Moreover, larger Primula veris populations experience a significantly augmented frequency of pollinator visits. The presence of shrubs and tree species, exemplified by Malus sp. and Prunus avium, actively contributes to the elevation of visitation rates for P. veris. This influence of the neighboring vegetation on pollinator visits exhibits a significantly enhanced role within smaller populations. Additionally, the pollination pattern in terms of the number of visits differed among pollinator orders (Diptera, Hymenoptera, Lepidoptera).

As our investigation delved into alternate hypotheses, including the anticipation of greater plant traits such as stalk length and flower number in the connected landscape, our findings did not yield statistically significant outcomes. Similarly, our hypothesis pertaining to morphological variation failed to achieve statistical significance.

Hence, the project aims to clarify the efficacy of suggested indicators for monitoring farmland biodiversity. The results obtained will be integrated with the forthcoming two-year findings, providing a comprehensive overview to assist in the management of grassland areas. The research culminates in an extensive 30-page report, making a significant contribution toward the completion of an Internship Master's degree. Furthermore, an accompanying poster has been developed and is annexed to the grant report.