

SHORT TERM SCIENTIFIC MISSION (STSM) SCIENTIFIC REPORT

This report is submitted for approval by the STSM applicant to the STSM coordinator

Action number: CA18201 - An integrated approach to conservation of threatened plants for the 21st Century

STSM title: Children's book as a strategy for plant conservation

STSM start and end date: 01/10/2021 to 15/10/2021

Grantee name: Sissi Donna Lozada Gobillard

PURPOSE OF THE STSM:

The main purpose of the STSM was to finalize the first stage of the elaboration of a children book as a strategy for plant conservation. Specifically, during the two weeks of staying I performed bibliographic compilation and documentation on selected critically endangered plant species for the elaboration of a narrative and literary script of the children book.

DESCRIPTION OF WORK CARRIED OUT DURING THE STSM

The work during the STSM was divided in two parts, i) species selection and bibliographic documentation and ii) story writing together with the first draft of illustrations for two of the species.

Species selection and bibliographic documentation

This project will contain 4 endemic endangered species endemic from Europe and Israel: 1) *Iris atropurpurea* (Israel) 2) *Primula appennina* (Italy) 3) *Minuartia smejkalii* (Czech Republic) and 4) *Petrocoptis grandiflora* (Spain). We selected these 4 species based on their traits and interesting adaptations or pollination systems. Selection of plant traits are very important for constructing the script later. The species 1, 2 and 4 we will be focus on their pollination systems, while for the species 3, we will tell a story of its evolution. During this stage of the project we identified the problem of each species and defined an educational aim to achieve with the stories.

1) *Iris atropurpurea*: Pollination system of this species is by long-antenna male *Eucera* bees that uses the black irises as shelter to sleep overnight. This flower does not produce any nectar but offers the bees a shelter and next morning, due to its specific morphology and dark color, the temperature of the flower increases faster than the air outside. This increase of temperature helps to increase the body temperature of the bees, so they can fly away earlier.

PROBLEM: Delicate interaction between plant and pollinator which is essential for the successful reproduction of the plant. EDUCATIONAL AIM: Do not pick flowers from the wild, do not kill the bees.

2) *Primula appennina*: Selection of pollination for the story. In this species it was not clear for very long who was the true pollinator, it was like a mystery. Now we know it is pollinated by a moth (*Macroglossum stellatarum*).

PROBLEM: The complex interaction with the "true" pollinator can be negatively affected by changes in the climate causing a potential mismatch between the moth's migration and the flower blooming.

EDUCATIONAL AIM: Be aware of this interaction and conserve both the plant and the moth.

3) ***Minuartia smejkalii***: This species suffered from humans who almost cause its extinction in the 60s, but now the same humans are saving the populations. There is a more than a decade conservation program Life for *Minuartia*, but still their natural habitat is under threat. This species is very specialized to basic serpentine soils which confers it an advantage over other species. But changes in its natural habitat can cause introduction of invasive species, more competition and therefore threat of extinction.

PROBLEM: Delicate highly specialized serptophyte that cannot live in other conditions. Change of habitat (shade, soil, invasive species) are threatening the populations of *Minuartia*. **EDUCATIONAL AIM:** Promote the conservation of its habitat.

4) ***Petrocoptis grandiflora***: the interaction of these species with nectar robbers and "true" pollinators was selected to build the story. Eventhough this species is threatend by climbers (humans) because it grows in rocky cliffs, the story will mainly focus on the pollination system. Nectar robbers, big bumblebees (*Bombus*), are to big to introduce their bodies in the flower so they rob nectar. However, their position while robbing allows them to get and give some pollen in the flowers. The presumed antagonists robbers turned out to be effective pollinators in *Petrocoptis*.

PROBLEM: Missidentification of "antagonists" that rob nectar. Not everything is like it seems. In addition, this species only grows on rocky walls, it is hightly specialized and threatened by humans. **EDUCATIONAL AIM:** Promote the conservation of all pollinators and its natural habitat.

DESCRIPTION OF THE MAIN RESULTS OBTAINED

Scripts: Story witting

Iris atropurpurea: The tale is based on the pollination system of this species. The tale is about "Antenita" and the "Black iris". Antenita is a bee that goes for nectar searching for the first time, his friends show him around and later he finds a large beautiful dark-colored black iris and he is up for some interaction.

Primula appenina: Tale based on its pollination system. We developed a story in a rhyme type to talk about a detective mistery to solve: The Apennine case. Somebody stole the precious golden treasure of the appenine plant and she is calling the lizard detective to solve the case.

Minuartia smejkalii: The tale is about the family "Minuartia" that tells about how the *Minuartia smejkalii* came to be, how it "evolved" and had to search for difficult places to survive (serpentine soils), high temperatures becoming a good competitor. But humans came with their highways and waterdams threatening the Minuartias. Are Minuartias strong enough to survive? The story tells how humans also helped them and are currently conserving the *Minuartia* populations.

Petrocoptis grandiflora: The tale is about the pollination system of the *Petrocoptis*. Not everything is like it seems. Nectar robbers insects might seem antagonists at the beginning but they turned out to be effective pollinators by "mistake". This is the story of these pollinators and how the plant interact with all of them.

General link characters and first drafts of the illustrations

We developed a main "general link" character, a small kid called IRIS whose mother is an explorer and takes her on her adventures to save plants around the world. The book will tell the expeditions to 4 countries: Israel, Italy, Chech Republik and Spain and the stories of the plants whitin. We will start with Israel and the Black Iris because in honour of this plant the mother named her daughter Iris.

In addition, for *Iris atropurpurea* and *Petrocoptis grandiflora* we developed some first draft skemes for the story.

FUTURE COLLABORATIONS (if applicable)

In the near future the second stage of the project will be to setup a contract with an illustrator (if funding is available), work on the final design of the book, make a proposal to an Editorial and final printing.

The head of DIVULGARE Lab, Luis Navarro, is connected with an Editorial specialized on Children Books here in Spain that showed interest in publishing a children book. Also we will invest in the translation of the stories to other languages, in particular to those from where the species come from.

This second stage of the project will be finalized before the end of the year.