JAMES RENNIE BEQUEST

REPORT ON EXPEDITION / PROJECT / CONFERENCE

Expedition/Project/ Conference Title: Alpine plants diversity expedition to Aosta valley in Italy

Travel Dates: 10th - 28th of July, 2023

Location: Aosta valley in Italy

Group member(s): Ayana Sato

Aims: To learn vegetation transition along the elevational gradients and to collect the data for investigating the variation of the functional traits.

Photography consent form attached:
(please refer to your award letter)

☐ Yes
☒ No

OUTCOME (a minimum of 500 words):-

During the three weeks in the Italian Alps in Aosta valley, I achieved to familiarise myself with the plants growing in the higher elevations as well as to collect the leaves for further research on investigating the variation in the functional traits of genus *Campanula* plants. The three-week stay in Italy was physically intense but quite rewarding.

First of all, I spent the first few days in familiarising myself with what plant species are common in higher altitudes. It was quite interesting to see the plant species that are common in the Alps but not in elsewhere because they often have the characteristics that are advantageous in growing in higher altitudes. For example, *Leontopodium nivale* known as Edelweiss have very hairy petals to keep the heat in cold conditions. *Ranunculus glacialis* orient their flowers to the sun to maximise the light intensity which they capture. Succulent plants are also quite common in higher elevations where water availability is low such as *Sempervivum arachnoideum* and *Sempervivum glaucum.* As I observe the alpine plants during hiking, I realised that these characteristics become more outstanding as going higher. This gives me the incentive to answer the simple research question: how do the functional traits vary along the altitudinal gradient?

In collecting data for this research for the rest of weeks, I focused on the genus *Campanula plants* which have diverse species in the area and species transition along the elevations. The functional traits of interest are plant height, stomatal density, SLA and foliar content of carbon and nitrogen. To be able to measure these, I had to conduct the three tasks per each sample. I firstly recorded the condition of collecting sites, specifically elevation, coordinates and habitat. Secondly, I took the average of the height of 3 individuals from the population for plant height. Third, I collected the 4 or 10 leaves from the three depending on the leaf size and laid them out on the 5mm grid paper to take a picture of them. This allows me to calculate the fresh leaf area afterwards. The collected leaves were put in an envelope per sample and stored in a bag of silica gel to dry them as soon as possible. These samples would be used to stomatal density measurement as well as elemental analysis where foliar content of carbon and nitrogen are measured. I am going to look at those variation both interspecifically and intraspecifically. Indeed, I have already seen the negative trend in plant height and leaf size as I went to higher elevations. *Campanula senisia* is the species that shows the highest distribution, and they had tiny leaves and grew between rocks, which made it difficult to collect data. and samples.

JAMES RENNIE BEQUEST

In the end of the stay, I collected over 100 samples, and this equipped me with data collecting skills in the field. Specifically, this trained me to think deeply about the anticipated problems and solutions to avoid them, as well as how much leaves would suffice for further analysis and how those data would graphically be presented. I am immensely grateful to James Rennie Bequest Fund who financially supported my expedition which widened my academic experience at the university.