Kaisaniemi Botanic Garden

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17/03/25-07/04/25

As a student at the Eden project, as aspect of the course is to undergo self planned work experience. I am studying Bsc Horticulture (Plant Science); a three year course which encompasses a range of practical skills and scientific skills in the field of botany and horticulture. This time allows us to pursue personal interests or projects within the field and so improving our employability skills in horticulture. For my work experience I chose to work at Kaisaniemi Botanic Garden maintaining their scientific collections, between the 17/03/25-07/04/25, under the supervision of Mari-Hanna Hanwell. This garden is located in the south of Helsinki, Finland. This trip provided the valuable opportunity to learn the skills and knowledge of maintaining tropical collections within a greenhouse and how these greenhouses are influenced by the climate in Finland. The weather in the UK is milder than Finland and working with these gardeners allowed me to understand how harsher seasons can influence greenhouse maintenance.

Aims:

-Developing my plant identification skills and general knowledge of plant families by studying the plants in the collections.

-Developing my pest and disease identification skills by studying their symptoms from infected plants in the greenhouses.

-Develop my skills as a gardener within a botanical collection scenario.

-Understanding how a harsher climate may or may not influence the functionality of a greenhouse for tropical plants.

-Understanding if Finland any gardening restrictions or benefits due to being a part of the EU or other laws isolated to Finland

My experience in the botanic garden:

Kaisaniemi was established in 1829 and has an outdoor garden, arboretum and 10 greenhouses (Luomus, 2024). The outer estate has little life to it currently due to the season so most work was completed inside. Each greenhouse is decided to a specific climate (such as the Desert or South African room) or type of plants (such as the Palm house or African violet room). I enjoyed this format as it was less overwhelming compared to larger gardens and made it much easier to study each plant and see their key features in relation to their families. The first attraction I was drawn to inside the

gardens was the plants with warning labels of toxicity and those considered ‘living fossils’ (fig. 1). This shows off the range of the plants grown at Kaisaniemi and the educational aspect of the garden’s goals. On site there are a range of building including a seed bank and museum. The museum is now used for offices and as a herbarium that houses roughly 3.5 million specimens.

Figure 1. Examples of plants labelled as 'living fossils' within the Botanic Garden, left is *Welwitschia mirabilis*, right is *Wollemia nobilis*.

17/03/25: Arrive in Finland

18/03/25-21/03/25: Kaisaniemi was closed to the public for a greenhouse maintenance period.

Tasks included:

-Cleaning the greenhouses

-Cleaning of the water lily pond and preparation of the pond for the planting of *Victoria cruziana.*

-Cleaning of stored *V. cruziana* seeds to ensure viability for the next few years. They are stored in bags and kept in a wet dark place. Seeds are collected from old flower heads that have been stored in mesh bags and left to decay.

-Planted young *V. cruziana* in the pond (fig. 2).

-Cleaned surfaces and plant labels with a mix of Havumäntysuopalious and water.

-Installed pond plants such as *Salvinia natans* and *Pistia stratiotes*.

Figure 2. *Victoria cruziana* planted in the centre of the pond, left shows the size of the plant of the plant in March, 2025 and the right shows the flowered plant in early May, 2025.

22/03/25: Visited Seurasaari Island and observed the natural landscape (fig. 3).

Figure 3. Lichens, fungi and mosses found on Seurasaari Island in March, 2025.

25/03/25-28/03/25: General garden tasks and maintenance took place during this week as the gardens were now open. Prior to visiting hours all rooms needed a check for fallen leaves on pathways and in plant beds and needed cleaning. Depending upon the humidity of the room and state of the plants watering and misting needed to be completed. An electronic system is in place to measure the humidity and temperature (among other things) of the rooms and change these by altering the heating or ventilation.

Tasks included:

-Cleaning the rooms of weeds and fallen leaves (raking leaves in the arboretum outside).

-Watering and misting plants.

-Repotting a range of bulbous plants and seedlings.

-Cleaning of aquatic plant pot of algae.

-Releasing of biocontrol agents into the greenhouses.

30/04/25

Visited the Natural History Museum in Helsinki (fig.4).

Figure 4. Taxidermy birds found in the Natural History Museum of Helsinki.

31/03/25-04/04/25

During this week tours of the museum and outdoor garden occurred. Inside the museum is the herbarium, which contains samples from before modern technology. An aspect of the work in the herbarium I was shown was the process of digitising the paper samples to the online collection. This ensures the evidence of the samples exist in case of damage to the physical copies and to increase access to the specimens to a larger audience. There was a tour of the seed bank showing the collection of seeds present at Kaisaniemi and the methods of sorting and collection. I was also taken and given a tour of the partnered Kumpula botanic garden (closed to public at the time).

Evaluation of my work experience:

Across the greenhouses there was a major pest problem due to the populations of *Pseudococcus* spp. (commonly known as mealy bugs). The horticulture trade can be a major distributer of pests and disease (DAERA., 2025). Signs of these pests in the greenhouse appeared as insect molts on leaves and plant labels (fig. 5) and a reduction in the health of plants heavily afflicted. During my time in the garden I become more familiar with these signs of infestation however I did not mange to identify the specific species of mealy bug. Another pest present in the greenhouse was two-spotted spider mites (*Tetranychus urticae*). These mites are less visible than the mealy bugs and so could only be found based upon physical signs –such as the presence of webbing and leaf chlorosis (AHDB, 2025). Working between different plant species and habitats it allowed me to discover which plants were more vulnerable to mealy infestation and so which environmental conditions are more suited for mealy. This included many plants from the Palm house, such as *Cycas circinalis* and *Strangeria eriopus*. Knowing what rooms and plants are more likely to be infested is important for preventing pest outbreaks to reduce chemical reliance and take an integrated pest management approach (UC IPM, 2025). Working within Kaisaniemi also gave me the opportunity to aid in the removal of these pests. Large populations of mealy bugs were physically removed using water and clothes on the fronds of afflicted plants (fig. 6). Biological control was released into the greenhouses to naturally predate the pest populations. *T. urticae* is predated upon by *Phytoseiulus persimilis* (Koppert,

Figure 5. *Pseudococcus spp*. molts on the back of a plant label.

2025a) and the mealy bugs were predated upon by *Cryptolaemus montrouzieri* (Koppert, 2025b). The use of biological control has many benefits as pest control due to the fact it has lower risks to human health and the environment, reduce the incidence of pest resistance to chemicals, and actively seek out pests (Sinha, 2025).

Figure 6. The fronds of *Cycas circinalis* before and after the removal of insect molts using water.

Throughout the experience I worked within each greenhouse on site. Tasks included: weeding, pruning, sweeping, potting, watering, fertilising and misting. During the greenhouse maintenance week, the site needed to be closed to the public to allow for the removal the grates of the floor gutters and use of loud equipment during the day. A specific area that needed preparation was the Water Lily room. The basin was cleaned of all dirt and a pot prepared for the water lily seedling, once the water was at an appropriate level the seedling was planted. Other areas of the pond were also prepared for the planting of floating plants (fig. 7). This process is important for the garden as it is a popular attraction and so brings in customers to the garden. This experience allowed me to

Figure 7. The pond of the Water Lily room after planting was completed.

use a range of equipment (fig. 4). Managing the site is important to ensure a clean environment. Cluttered environments increase stress (Gordon, 2024) and so providing tidy spaces for the public allow them to feel calmer within the gardens increasing mood as it is believed green spaces improve mental health (Barton and Rogerson, 2017). The act of decluttering is also beneficial to the person doing it and gardening itself can improve mood, attention span and self-esteem (WebMD, 2024).

Figure 8. Examples of gardening equipment: injector for fertilising, a harness and a wet and dry vacuum cleaner.

Kaisaniemi garden hosted a large variety of plant species from a range of plant families. While I didn't directly work with every plant, observing them allowed me to study the key features and improve my identification skills. These skills were developed by creating picture collections of the families and the use of Kotka (a plant inventory software) to familiarise myself with the plant names. These skills are useful to aid in identifying species susceptible to pests, identifying weeds within the garden, being able to give talks regarding the plants in the garden and for the correct identification of plants distributed by trade (Kirchoff, 2025). Plant inventory is an important skill in the gardening industry (fig. 9) and I was taught how each plant was labelled to ensure easy updating of software for the purposes of monitoring plants and plant trade between gardens.

Surveying, collecting and maintaining accurate records of work conducted throughout the gardens such as planting schedules, maintenance records and inventory data. Providing relevant briefings and formal reports to the Estate Operations Director with updates on garden conditions, surrounding areas and estate environment, supplemented and supported with regular photography.

Figure 9. A section of a gardening job description highlighting the skills of plant inventory.

Due to my lack of Finnish speaking skills there was not much interaction with the customers on a verbal level. However I had many conversations with gardeners that work in the greenhouses, herbarium, seed bank and partnered garden Kumpula. This was mainly concerned with how the climate in Finland influences the gardens. Winter in Finland can be very unpredictable. The winter sun can make the greenhouses very hot and dry (exceptions, humid mild winter) increasing the need for watering and humidity, which is costly and causes issues with ventilation (Hanwell, 2025). The low temperatures can also freeze items so soil and compost must be stored appropriately to prevent freezing (Puustinen, 2025). Creating connections with people from other gardens can act as a strong introduction into the career world of gardening by collecting references for future jobs.

Working within Kaisaniemi Botanic Garden gave me insight into the daily routines of greenhouse gardening. Becoming more familiar with the plants has allowed me greater understanding of their common vulnerabilities –such as pests. Being able to use a range of garden tools will make a beneficial addition to my C.V and make myself appear more experienced in horticulture to potential employers. While I may have lacked some development in more specialist skills (such as pest identification), all work within the garden acted as a time to develop problem solving skills within a gardening environment to prepare myself for gardening work.

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Break down of costs

-Grant gifted by Merlin Trust: £1000

-£264.72 for the flights

-£950 for the accommodation

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