

Dare to be Wild: My Journey into the Fern World

Eğreltiler Dünyasına Yolculuğum

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ABSTRACT

My interest in plants, which started at a young age, was shaped over time and led me to becoming a collector who started collecting during my university years. My journey to the magical world of ferns began with a fern I came across in the Alfred Heilbronn Botanical Garden of Istanbul University. After that, the tropical fern house I created in the basement of my home in Istanbul started to develop over time. I started collecting biological species as well as tropical ferns. This adventure took me to Thailand, where I had the chance to observe and collect tropical specimens in the field. I continue to advance this collection by adding different collection plants in Antalya.

Keywords: Collection, fernery, ferns, Thailand, Turkey

One of the oldest memories I have of my surroundings and living things is the anthill at my father's pastry shop entrance. Whenever I remember it, it makes me happy. I was a six-year-old boy, and I spent my whole time watching the ants every time at the pastry shop. I was fascinated with the movements, behaviors, and attitudes of the ants. I placed food scraps around the nest, and I watched them for hours with great interest while they carried the food scraps to their nest. Meanwhile, we moved to an apartment with a garden which allowed me to introduce an environment in which I could spend more time with living things. I spent most of my time watching ant species and other insects. I sometimes trapped the ants in a jar, and I was amazed at their movements. Also, I named the ant species depending on their physical differences and behaviors and told them to my friends, *i.e.*, fast-moving racing ants, bigheaded ants, biting vampire ants, and *so on*.

I have always been in touch with nature and living things since my childhood. During primary school, I was growing beans in

ÖZ

Küçük yaşlarda başlayan bitkilere olan merakım, zamanla üniversite yılları zamanında başlayan bir koleksiyoncu olma yönünde şekillendi. İstanbul Üniversitesi Alfred Heilbronn Botanik Bahçesi'nde rastladığım bir eğrelti otu ile eğreltiotlarının büyüdü dünyasına yolculuğum başladı. Bundan sonra İstanbul'da evimin bodrumunda oluşturduğum tropical eğrelti evi zamanla gelişmeye başladı. Tropikal eğreltilerin yanı sıra doğal türleri de toplamaya başladım. Bu macera beni Tayland'a kadar sürükledi, orada tropical örnekleri arazide gözlemleme ve toplama şansını elde ettim. Şimdi bu koleksiyon üzerinde Antalya'da farklı koleksiyon bitkilerini de katarak ilerletmeye devam ediyorum.

Anahtar Kelimeler: Eğrelti evi, eğreltiler, koleksiyon, Tayland, Türkiye

damp cotton, which made me very excited. It was amazing how a small bean quickly turned into a plant and gave beans again! After this experiment, I started growing watermelons, melons, zucchini, and ornamental peppers on our balcony, which can be considered to be my first collection. Wherever I saw a different type of pepper, I asked my mom for pepper seeds. Again, one of my friends in primary school gave me a *Betta splendens* (Regan, 1910) fish as a birthday present, which paved the way for having an aquarium hobby for long years. This hobby also made me meet Prof. Osman Erol, a distinguished botanist, at the aquarium club of our university.

While I was studying the teaching of German at Istanbul University, I spent almost my whole free time at the Department of Biology. I used to take hydrobiology classes voluntarily, and I was attempting to gain a better understanding of the genus *Aphanius* (Nardo, 1827), mainly, which is an inland water fish. I harbored these fish species, which are of many endemic species in Turkey, in an aquarium and observed

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their breeding. Even after graduation, I tried to maintain my relations with the Department of Biology as much as possible. One day when I visited the Istanbul University Alfred Heilbronn Botanical Garden, a plant caught my attention: a bird's nest fern belonging to the genus *Asplenium* L. had a very different structure from the usual fern form with its large fancy and full-form fronds (Figure 1). I couldn't believe it, when I first learned that this plant was a type of fern! That day was the beginning of a new adventure for me. It was such a unique and gorgeous plant that I couldn't get it out of my mind. As I started to search for this splendid species, which grows on trees as epiphytes in nature, I opened the door to the magical world of ferns.



Figure 1. *Asplenium australasicum* Hook. in Alfred Heilbronn Botanical Garden.

Ferns also took me back to one of my old curiosities. When I was in primary school, I always wanted to be a paleontologist. The world of dinosaurs fascinated me like every child. Ferns, an indispensable part of the age of dinosaurs, were one of the earliest inhabitants of our world, and it was stunning that I was traveling in time as I watched them. As I was curious about these subjects, I started to read and investigate today's ferns, as well as the evolution of land plants and paleobotany. In a short time, my love of ferns turned into a passion, and I started to create my living plant collection. Undoubtedly, *Asplenium australasicum* Hook. was the first plant. As a result of a web search, I put it in a sun-drenched corner of the house and watered it almost daily. What a mistake! It rotted in 10 days. Then, I realized that there was a lot to learn.

For us, a shadow and low light spot away from the glass can be quite dark for plants. Although the need for light varies depending on the plant species, plant care can be complex if the interior of the home is not bright enough in general for ferns. For appropriate plant care at home, proper lighting is required. In general, ferns in nature need wet areas such as damp brooks and waterfalls, and irrigation should be carried out without overdoing it. In particular, rot is inevitable if parameters such as light and heat are not feasible. After my first failure, I attempted many types of lamps starting with aquarium lamps. I started to use the basement of my house in Istanbul as my new laboratory. I achieved quite favorable results with sodium lamps and metal

halide lamps. I was easily able to keep the humidity at high levels, as it was an indoor place that I only used for plants. During the winter, I used to heat with a central heating system to maintain the room temperature at $>22^{\circ}\text{C}$ and to minimize the loss with 70 to 80% humidity and plant lighting. Meanwhile, I visited plant importers located in Istanbul every week and tried to discover new species. After a while, the number of species in my collection increased from 70 to 80. Although the environment was quite satisfactory, as the collection grew, I considered that there might be different requirements for each type of species. For instance, some species are epiphytes growing on a tree trunk, while others are limestones, or in the forest and rich in organic materials. In addition, some species are green throughout the year, while some others go through periods of dormancy or disappear and sprout out when seasonal conditions are met. The environment I provided was stable without these alterations. As a result, I cared for tropical evergreen ferns the most successfully. (Figure 2, 3).

The essential species I had were not all tropical species and some were even grown in the Black Sea region of our country. I exposed these species to seasonal transitions in the north-facing windows of the house. By the way, these plants formed the greenest windows of the street and attracted a lot of attention from outsiders. Some found them very attractive and took photos, while others considered that I had a plant obsession which made me famous in my neighborhood in those days. I spent my days watching healthy and good-looking fiddleheads of ferns with a delicate touch (Figure 4). As a reminder, observing and imitating nature are the



Figure 2. Tropical fernery in the basement.

key steps to making plants happy at home. I also tried to enrich my knowledge and gain a better understanding of the natural habitat of ferns by visiting the groves and forests of Istanbul as much as possible. I observed many natural species grown in our country in the Northern forests of Istanbul, on the historical buildings in the city and on the islands. One of them was *Pteris multifida* Poir. that became naturalized in the Süleymaniye region of the city, probably when spores escaped from the Istanbul University botanical garden and came to life on the nearby historical buildings. The article that I wrote on our naturalized species was first published in Nezahat Gökyiğit Botanical Garden *Bağbahçe Bilim Dergisi* in 2016 (Figure 5).



Figure 3. Tropical fernery in the basement



Figure 4. Ferns grew on the window of the house in Istanbul.



Figure 5. *Pteris multifida* on the wall in the Süleymaniye region of Istanbul.

The Antalya province, located in the southwest of the country, was the second region where I carried out my fern travels. The province is an essential region with fascinating *Adiantum capillus-veneris* L. landscapes that are completely covered with limestone in the waterfalls and many small rock fern species adapted to the hot and dry Mediterranean climate of its mountains and canyons (Figure 6). Undoubtedly, when it comes to ferns, the Black Sea region comes to mind first in terms of the amazing species diversity. Ferns are common almost everywhere in this region, more than in the Mediterranean region. My first trip to the Black Sea was with one of my friends, Ergün Bacak, who is a birdwatcher. It was a delightful trip with many conversations about birds and ferns. The Rize province fascinated me with its glorious nature and greenery and has a tremendous fern species diversity. I remember the moment I first saw the *Matteuccia struthiopteris* (L.) Tod. so widely and I felt that I was in a prehistoric forest and would encounter a dinosaur at any time. If you are interested in ferns, you would probably like to visit the Black Sea region again and again. My second trip to this region was with Prof. Adil Güner and the team of Nezahat Gökyiğit Botanical Garden (Figure 7). Besides having the chance to offer my assistance on the fern specimens for the illustrated flora of Turkey to be prepared, I had an unforgettable moment when I first found the *Woodsia alpina* (Bolton) Gray that has been widely mentioned in the previous flora of Turkey, but has no herbarium specimens or records. Fortunately, the specimen of this species can now be found in the Nezahat Gökyiğit Botanical Garden herbarium (Figure 8). In addition to Black Sea trips, Çanakkale was the second place that I frequently visited with Prof. Ersin Karabacak (Figure 9). Meanwhile, I was also trying to produce almost every species I had spores (Figure 10, 11). The germination ability of spores varies depending on the species. To illustrate, some species are grown on the walls or on the bottom of the pots, even if it is undesirable. Some others are incredibly picky about the germination medium. I was germinating spores in small storage containers using specific materials according to the species: limestone for those growing on the limestones, peat moss or cocopeat for those that need organic materials (Figure 12).

After visiting many regions for ferns in Turkey, I dreamed of going to tropical countries. I recently met Patra Sangdanuch, who lives in Bangkok, Thailand, and together we planned our first trip. Meanwhile, Patra was writing a book about plants, particularly ferns, and also had a large fern collection. We made fern trips four times in Thailand and once in Malaysia. We visited Chiang Mai, Nakhon si Thammarat, Khao Yai, Pahto Chumpon, Chanthaburi in Thailand, Cameron Highlands in Malaysia, and many natural habitats on our way. There was an incredible variety of species; we could see new species at almost every step in some areas (Figure



Figure 6. *Adiantum capillus veneris* in Kurşunlu waterfall in Antalya.



Figure 7. An excursion view to Black Sea region with Nezahat Gökyiğit Botanical Garden collecting team.



Figure 8. Habitus of *Woodsia alpina*.



Figure 9. Çanakkale excursion with Prof. Dr. Ersin Karabacak.



Figure 10. Gathering in the field.



Figure 11. Mature spore collecting on white paper for germination studies.



Figure 12. Spore germination in small storage containers.

13, 14, 15, 16). In addition, there were many plant collectors in Thailand. Indeed, some collectors had much more species than we saw on a forest trip. It was a fascinating experience for me to meet academics working on ferns in Thailand, recognize new collectors, and make these useful trips with Patra Sangdanuch (Figure 17, 18). The number of living fern species I observed until that time reached about 500. As a result of these experiences, it was a pleasure for me to be a co-author of the latest book of Patra Sangdanuch, *Ferns*, published in the Thai language.



Figure 13. Observing open forest areas in Thailand.



Figure 14. The jungle in Thailand.

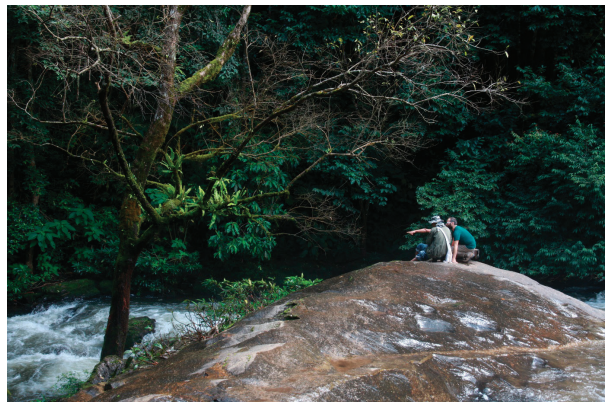


Figure 15. Observing river banks in Thailand.



Figure 16. Checking sporangia in the forest.



Figure 17. One of the fern collections in Thailand.



Figure 18. Another fern collection in Thailand.

In my humble opinion, it is of utmost importance to identify species by observing them alive and *on-site*. It is undeniable that herbarium specimens are long-lasting and essential for scientific research; however, visiting the habitats and observing them alive, and even creating living plant collections would make the picture in mind much clearer, if possible. Of note, many species are similar to each other that can be easily mistaken. If you have a living plant collection, their presence and abundance is everywhere and at any time, like your family members at home, allowing you to learn every detail about them. Beyond any doubt, this leads to space problems over time. In my experience, I made a significant change in my life and moved to Antalya from Istanbul, as the basement of

my house in Istanbul became inadequate. My parents were living in a house with a large terrace in Antalya. Despite the common belief that tropical plants can be easily looked after in the climate of Antalya, the truth is not like that at all, in particular, for the ferns! If you can find microclimate areas in this harsh climate, tropical species with a high tolerance for temperature alterations can probably be kept under natural conditions. However, the terrace of my parent's house had a southwest facade that did not meet the appropriate conditions. Eventually, I covered the part of our terrace and its top to form a glass greenhouse and I planned to control heat as much as possible with an air conditioner, considering the hot and dry summer days (Figure 19,20). Although I attempted to maintain the temperature at 22°C at night and 27°C at daytime throughout the year, these values might be slightly below or above depending on the season. I also used shade net 75% to prevent overheating and provide my plants with the filtered light they needed. I first saw this system in the Nezahat Göküğürt Botanical Garden tropical greenhouses. Since I moved to Antalya in 2018, I have had some difficulties in maintaining the relevant parameters stable, except for having better-quality natural light. Despite the use of an air conditioner, there were the effects of seasonal and day & night temperature differences in the glass greenhouse. It was also not always possible to keep the humidity high due to the effect of the air conditioner. As the greenhouse's ceiling was not high, the plants close to the glass at the top of the plant shelves experienced heat or cold stress depending on the season. Consequently, the lack of appropriate conditions and opportunities resulted in species losses.



Figure 19. Fern collection in the greenhouse in Antalya.

Calcareous tap water in Antalya was the second main problem for me. Watering the plants with limewater caused lime accumulation in the pots over time and the pH range of the material on which the plant was seeded increased and became alkaline, thereby leading to plant illness due to inadequate nutrition. To overcome this situation, it is reasonable to harvest rain, particularly in regions like Antalya, where there is plenty of rain precipitation. On my terrace, I have a water system coming from the top of the greenhouse to the water drain and to the water tanks with a total capacity of 5.000 liters which is adequate until the summer season comes to an end. In addition,



Figure 20. Fern collection in the greenhouse in Antalya.

I use a reverse osmosis system to prevent the plants from any harm caused by the limewater in the summer; however, I also plan to create a more professional fernery in the near future.

Currently, I am working with many tropical plant species, particularly aroids, zingiberales, bromeliads, palms, and many other plants that I can achieve much more satisfactory results in my greenhouse (Figure 21, 22, 23). Despite harsh conditions from time to time, I keep my motivation and desire for success and to better understand the fern world. I hope to pursue and share this adventure where I find true happiness from my new experiences and excitement.

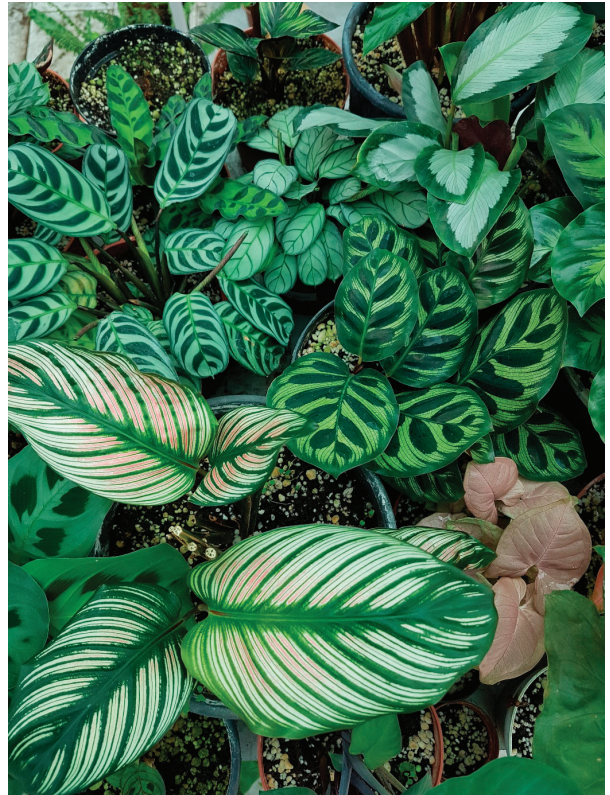


Figure 22. *Calathea* G. Mey collection in the greenhouse in Antalya.



Figure 21. *Alocasia* Neck. collection in the greenhouse in Antalya.



Figure 23. *Caladium* Vent collection in the greenhouse in Antalya.