The green heart of our planet

A journey through the world of trees

Evelyne Kozlowski
Gregor Kozlowski

Forest Culture Center in Gołuchów

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Foreword

For the scientist as well as for the amateur naturalist, the most important thing is to learn about the natural world, to discover its secrets and to understand the laws that guide it. An extremely important step in achieving these goals is carried out by carefully observing what surrounds us, but one must also have the knowledge to understand what one has seen. Sometimes, a naturalist observes the uniqueness of nature from the window of his house or apartment, and sometimes, one must go on a long journey.

For many years, Evelyne and Gregor Kozlowski have been taking such trips in search of the uniqueness of nature. They have crossed continents to be immersed in the "forest of mysteries" and to find exceptional trees. Sometimes, the tree is big, and other times, it is inconspicuous, small, and ignored by everyone passing it. Then, the special moment arrives when you stand in front of a dendrological treasure. You can touch the bark on the trunk, feel the softness of the leaves and twigs in your hand, and raise your head to look at the crown through which the sun's rays are shining.

For centuries, trees have been stimulating our senses and feelings; they have been praised by poets and sometimes have inspired painters and musicians. Evelyne and Gregor Kozlowski look at them through the eyes of scientists but also through the eyes of a documentary photographer and artistic photographer. They learn about the trees, and then, they talk about these trees to others who have not seen them. They talk about their uniqueness and about the need to protect them.

Their vast knowledge and experience have resulted in a wonderful photographic exhibition and book in which they share their observations and reflections. I strongly believe that experiencing their work will be inspiring to all of us, and we will be enriched and will perceive the natural wealth that surrounds us differently.

Prof. Dr. hab. Dariusz J. Gwiazdowicz
(Chairman of the Scientific Council of the Forest Culture Center in Gołuchów, Poland)

Introduction

Trees are a major component of forests and many other ecosystems on our planet. As some of the largest and oldest organisms, they are the backbone of biodiversity, providing food and habitats for microorganisms, epiphytes and countless animal species. Trees have also accompanied humans throughout their evolution. Even today, billions of people use trees as the raw material for construction, tools and paper; ornamental plants in cities; artistic inspiration; or climate regulators at a global scale. Our future will also depend heavily on trees. Trees therefore have inestimable scientific, economic, social, cultural and aesthetic values. Thus, the latest estimates, which indicate that more than 35% of the forest cover on Earth has disappeared during the past hundreds of years of human existence, are disconcerting. This decline has not slowed over the past few centuries or decades. Overexploitation and climate change have brought tens of thousands of tree species to the brink of extinction.

This book has been prepared as a catalog for an exhibition at the Forest Culture Center in Gołuchów (Poland), which took place in June 2021. The main purpose of the book is to show the beauty, uniqueness and importance of trees to our planet and ourselves. On the one hand, the book presents fascinating trees. On the other hand, it shows the scientists and naturalists who are organizing expeditions to the ends of the Earth to study "their" trees and save them from extinction.

Everything in this book revolves around **25 tree species** that are directly or indirectly related to the research of the Botanical Garden at the University of Fribourg in Switzerland. However, this is not a simple list of 25 tree descriptions. Rather, this book is a journey, **a journey to 12 regions of the world** and to the countries and islands where these trees grow and where the research team of the Botanical Garden from Fribourg has been working for more than 10 years.

The journey begins with Swiss stone pine, a glacial relict tree, in the Prealps of Fribourg. The next stop is the Mediterranean (Sicily, the Aeolian Islands and Crete), where the famous Sicilian and Cretan zelkovas, among others, grow. The reader will then go to Transcaucasia (Georgia and Azerbaijan), where our team has been conducting research on endangered relict trees for years. The next regions lie in East Asia (China, Taiwan, Vietnam and Japan). The penultimate stop is Costa Rica, with its rare representatives of the walnut and oak families growing in Central America. Finally, the "world's smallest tree", the polar willow in Svalbard, is introduced. Therefore, the journey will end much as it began, with arctic and boreal species.

The description and photos illustrating each destination, each country or island, are divided into 3 parts. For the first part, a few landscape photos and a short piece of text are provided to briefly introduce the country or island. However, rather than providing an encyclopedic description, the book gives a brief personal account of why my research group went there and what particularly interested and intrigued us about the location. The second part contains information on the trees that occur in the region. The trees are, in a sense, the main characters of this book. The third section of each region's description provides a behind-the-scenes look at the scientists' work. In this section, we introduce key partners and collaborators, and we explain their interests and the reasons these scientists and naturalists work with us. There are also anecdotes, insights and culinary or cultural impressions. At the same time, this part of each region's section shows the importance of the Botanical Garden of the University of Friborg, which, although relatively small, has an extensive international network of collaborators.

Two important people substantially contributed to the origin and preparation of this book. The first person was Prof. Dr. hab. Dariusz J. Gwiazdowicz, with whom we have undertaken several research expeditions in recent years (including Switzerland, China, Crete and Svalbard). It was Dariusz who had the idea for an exhibition and a book, and for that, we are very grateful to him. The second person was Dr. Giuseppe Garfì, the discoverer of the Sicilian zelkova, an emblematic relict species, who for more than 10 years has provided tremendous help with our research due to his experience with relict trees. Both of these researchers have become our best friends in recent years.

Above all however, this book would not have been possible without generous support provided by *Fondation Franklinia*; its profound commitment to tree conservation is exemplary and is sincerely acknowledged.

We very much hope that this book will not only be of interest to tree specialists and researchers but also stimulate enthusiasm in the younger generation and the wider public for the world of trees and encourage further research and conservation of these unique organisms.

Ueberstorf, March 2021

1. Switzerland

The Gastlosen with the *Chalet du Soldat* in the canton of Fribourg (Switzerland) (Photo: E. Kozlowski).

Our journey begins on a doorstep, in the Prealps of Fribourg, on the border between German-speaking and French-speaking Switzerland and between the municipalities of Jaun and Charmey. Here lies the Gastlosen mountain range, popular with not only mountaineers but also botanists. A surprise awaits the nature-loving hikers here: the Swiss stone pine (*Pinus cembra*). Stone pine is an extremist; it is the only tree in Europe that can endure temperatures below -43°C in winter. As a small tree, it can grow far above the timberline, and in the Prealps of Fribourg, it can reach the summit areas that are above 2,000 m a.s.l. In the Central Alps and in eastern Switzerland, this tree species is very common, but on the northern side of the Alps, and especially in the mountainous areas of the canton of Fribourg, it is rare. The main reason why it is rare is the climate in Fribourg as it is too oceanic; i.e., the climate is too mild for this tree. This species prefers the cold.

Swiss stone pine (*Pinus cembra*) is known as the *Queen of the Alps* in Switzerland. The majestic tree has very valuable wood, and its large seeds taste delicious (Photo: E. Kozlowski).

The Gastlosen in winter (Photo: E. Kozlowski).

Protagonist

Swiss stone pine (*Pinus cembra*)

Pinaceae

The steep slopes of the Gastlosen range are among the wildest corners of the canton of Fribourg. They are home to the largest and perhaps most beautiful stands of Swiss stone pine in the Western Prealps. Swiss stone pine is a glacial relict that survived after the last ice age in Europe only at high altitudes in the Alps and Carpathians (Photo: E. Kozlowski).

Behind the scenes

The Swiss stone pine trio in the canton of Fribourg: Yann Fragnière (with the backpack) is a PhD student from the Department of Biology and a research associate at the Botanical Garden of the University of Fribourg. He is studying the distribution and ecology of this rare tree. Vincent Sonnenwyl (black T-shirt) is researching the population genetics of *Pinus cembra* for his master's thesis at the University of Fribourg. Benoît Clément (hidden in the background) is a gardener at the Botanical Garden and one of the main experts on the flora of Fribourg. After a year of climbing, counting and investigating, only 8,000 individuals of Swiss stone pine were found growing in the canton of Fribourg, and this number is much less than that in other regions of Switzerland. These trees grow exclusively in very cool places and in summit areas. Accelerating climate warming calls into question the long-term survival of this tree species in the canton of Fribourg (Photos: G. Kozlowski).

Prof. Dariusz Gwiazdowicz (University of Life Sciences in Poznan, Poland) is one of the world's greatest mite specialists. The aim of his research in the canton of Fribourg is to investigate the diversity of mites and other small animals that are bound to Swiss stone pine, and this is pioneering work. Furthermore, through this study, he hopes to determine how large the differences are between natural Swiss stone pine forests and grazed spruce forests in terms of species composition and invertebrate abundance (Photos: G. Kozlowski).

The Natural History Museum of Fribourg (Switzerland) is also involved in research on the biodiversity of Swiss stone pine forests along the Gastlosen mountain range. The main focus of this research is wood beetles, which are severely threatened by extinction throughout Europe. The work is led by Sophie Giriens, who is a zoology curator at the museum. Important support is provided by Gilles Hauser (red T-shirt), who studies biology at the University of Neuchâtel (Switzerland), and from Yannick Chittaro of the Swiss Center for the Cartography of Fauna (SZKF/CSCF) (Photos: G. Kozlowski).

Gregor Kozlowski stands in front of a plantation of Swiss stone pine (Les petits Chomiaux). Between 1885 and 1913, hundreds of thousands of *Pinus cembra* were planted in unsuitable locations in the canton of Fribourg, far from the natural distribution of this species. Unfortunately, today, out of all these plantings, only 650 trees have survived (Photo: E. Kozlowski).

2. Sicily, Italy

Lava fields on Etna: a battle zone for black pine (*Pinus nigra* subsp. *laricio*) (Photo: E. Kozlowski).

Diversity and dynamism are two words that best describe Sicily for us. This Mediterranean island has impressive biodiversity, but it is also incredibly diverse culturally, historically and culinarily. In addition, many habitats, especially around the active volcano Etna, are dynamic and constantly changing. The plants that grow here had to prove themselves as survivors during the last millennia—even millions of years. The same is true for the three main relict trees on this island: the Sicilian zelkova (*Zelkova sicula*), the Sicilian fir (*Abies nebrodensis*) and the Mount Etna birch (*Betula aetnensis*). For all three species, their current narrow, endemic distributions are closely associated with climate changes following the last ice ages. Our first experience with relict trees in the Mediterranean started with the Sicilian zelkova. In 2010, we conducted our first research trip, and we not only learned about this extremely rare woody species but also made friends with the people who study and protect it.

Field work around the summit of Etna is not without danger. Continuously, eruptions are accompanied by emissions of toxic and very hot dust clouds (Photo: E. Kozlowski).

The landscape and the atmosphere on the slopes of Etna are reminiscent of the Caledonian Forest in Scotland than of trees near the Mediterranean Sea (Photo: E. Kozlowski).

The leaf of the Sicilian zelkova (*Zelkova sicula*). The closest relatives of this species grow in Crete and in Asia. Only two populations have been discovered to date in Sicily, with only 1,800 small trees (Photo: G. Kozlowski).

Protagonists

Sicilian zelkova (*Zelkova sicula*)

Ulmaceae

Dr. Giuseppe Garfì, one of the world's leading experts on relict trees from the genus *Zelkova*, poses in front of his discovery. He discovered the Sicilian zelkova in 1991 in the Hyblaean Mountains in southern Sicily, thereby identifying a completely new tree species in Europe, which was then, as it is now, a remarkable finding (Photo: G. Kozlowski).

Sicilian fir (*Abies nebrodensis*)

Pinaceae

Sicilian fir is one of the rarest tree species on Earth. There are fewer than 30 large individuals in the world that produce cones and seeds that can reproduce. They all grow within an extremely small area in the Madonie Mountains in northern Sicily. To conserve this rare species, every tree is important. The trees are therefore fenced, and the slopes around the population are secured against landslides and erosion (Photo: G. Kozlowski).

Mount Etna birch (*Betula aetnensis*)

Betulaceae

This small birch, which often forms multistemmed and curved individuals, is found only on the north-eastern slopes of the Etna volcano in western Sicily. There, it grows exclusively at high altitudes, between 1,200 and 2,000 m a.s.l. Its white bark contrasts strongly with the black floor of lava rock, giving its forests a magical character (Photo: E. Kozlowski).

Behind the scenes

No one knows the Sicilian zelkova as well as Giuseppe Garfì. The two known populations are fenced to protect them from grazing. Researchers and students from all over the world continue to observe and study this rare species. The pictures show a field course with students from the University of Fribourg (Switzerland) in 2015 (Photos: G. Kozlowski).

The populations of the Sicilian zelkova are severely threatened by not only grazing and forest fires but also prolonged droughts. By the end of summer, all the leaves are completely brown, and small trees suffer. Giuseppe Garfì is pictured with Joachim Gratzfeld. He is director of species conservation projects at BGCI (Botanic Gardens Conservation International in Great Britain) and active in the protection of relict trees worldwide (Photo: E. Kozlowski).

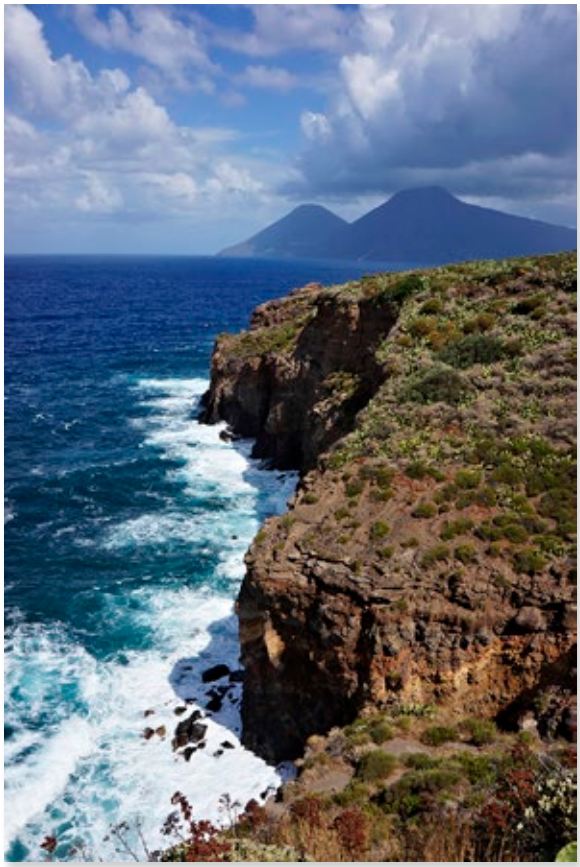
In addition to Giuseppe Garfì, Dr. Salvatore Pasta (white T-shirt) is an expert on Sicilian flora, geography and history. Excursions and field work in their company are always valuable not least because they are among the greatest connoisseurs of local culinary specialties. They always know where to get the best espresso, the best sausage or the best cheese. In the picture: *salsiccia pasqualora* and *pecorino* (Photos: E. and G. Kozlowski).

Evelyne Kozlowski on the slopes of Etna (Photo: G. Kozlowski).

3. Aeolian Islands, Italy

The fumaroles on Vulcano. This Aeolian Island was named after the Roman god of fire and the forge. It lives up to its name as it smells and smokes on the island without interruption (Photo: E. Kozlowski).

Fieldwork on the Aeolian Islands was like walking on a powder keg. Here, you can see and feel that the Earth's crust is always in motion in this region. The archipelago consists of seven islands, all of volcanic origin. The islands have pleasant sounding names: Lipari (the largest island), Salina, Vulcano, Stromboli, Filicudi, Alicudi and the smallest Panarea. Stromboli is especially famous and popular with tourists, and it has one of the most active volcanoes on Earth. Continually, there are major eruptions that cost human lives. Much more dangerous, however, is the dormant crater on the island of Vulcano. The last eruption between 1888 and 1890 was extremely explosive. Large parts of the island, including settlements, were completely destroyed. When the sleeping giant will awaken again, no one knows.



In the background, the island of Salina has the twin volcanoes *Monte Fossa delle Felci* (962 m a.s.l., the highest elevation of the Aeolian Islands) and *Monte dei Porri* (860 m a.s.l.). The picture is deceptive; getting from one island to another requires a boat ride that is sometimes several hours long. Lipari Island is in the foreground (Photo: E. Kozlowski).

The Aeolian Islands have been inhabited and cultivated for thousands of years. Vegetation has been strongly influenced by humans and today includes many introduced species, including agaves and opuntias. Lipari Island (Photo: E. Kozlowski).

Protagonist

Tyrrhenian broom (*Genista tyrrhena*)

Fabaceae

This yellow flowering shrub, which can also grow as a small tree, is exclusive to a few islands in the Tyrrhenian Sea north of Sicily. Its populations are particularly beautiful on the Aeolian Islands. On the picturesque island of Vulcano, this species embellishes the gently rising slopes surrounding the active volcanic crater. Vulcano Island (Photo: E. Kozlowski).

Behind the scenes

Endemic brooms are not the only plants of scientific interest on the Aeolian Islands. Dr. Giuseppe Garfì and Dr. Alessandro Gristina (right) collecting leaf samples from the widespread caper bush (*Capparis spinosa*). Alessandro is not only a specialist focusing on the genetic diversity of this species in the Mediterranean but also a lover of all kinds of culinary specialties made from this shrub. Lipari Island (Photo: E. Kozlowski).

Tyrrhenian broom (*Genista tyrrhena*) can reach considerable sizes, growing as not only a shrub but also a tree. Vulcano Island (Photo: E. Kozlowski).

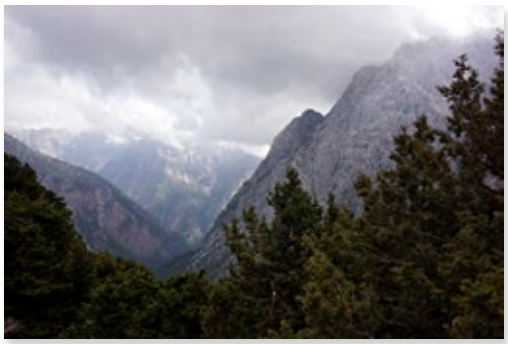
Silence before the storm? The activity of the crater on the Vulcano Island can change dramatically from one week to the next (Photo: E. Kozlowski).

The Stromboli volcano, on the other hand, is one of the most active on Earth. The summit is often completely closed to tourists and unfortunately also to researchers. Stromboli Island (Photo: E. Kozlowski).

4 Crete, Greece

Dikti Mountains. The dominant species in the picture are the Cretan maple (*Acer sempervirens*) and the kermes oak (*Quercus coccifera*) (Photo: E. Kozlowski).

For those who know Greek mythology well, Crete is the island of the labyrinth of Minotaur, the tragedy of Icarus and Daedalus, and the birthplace of Zeus. The geological and botanical history of Crete is no less fascinating. In the past, the island was inhabited by dwarfed elephants, hippos and no fewer than eight species of deer. Some of these animals became extinct just before humans arrived. The Cretan zelkova (*Zelkova abelicea*), which brought us to Crete, is an ancient species that migrated to the island millions of years ago. We can imagine that its lush leaves and young shoots were a favorite food for the pygmy elephants. The elephants and hippos have long since disappeared. *Zelkova abelicea* survived them all and still thrives in a few hidden places in the mountains of Crete.



Crete is an island of contrasts. The highest mountain peaks rise above 2,450 m a.s.l. The White Mountains, also called Lefka Ori, near Samaria Gorge are shown in the photo (Photo: E. Kozlowski).

Fires are a major threat to many endangered species in Crete. Kedros (Photo: G. Kozlowski).

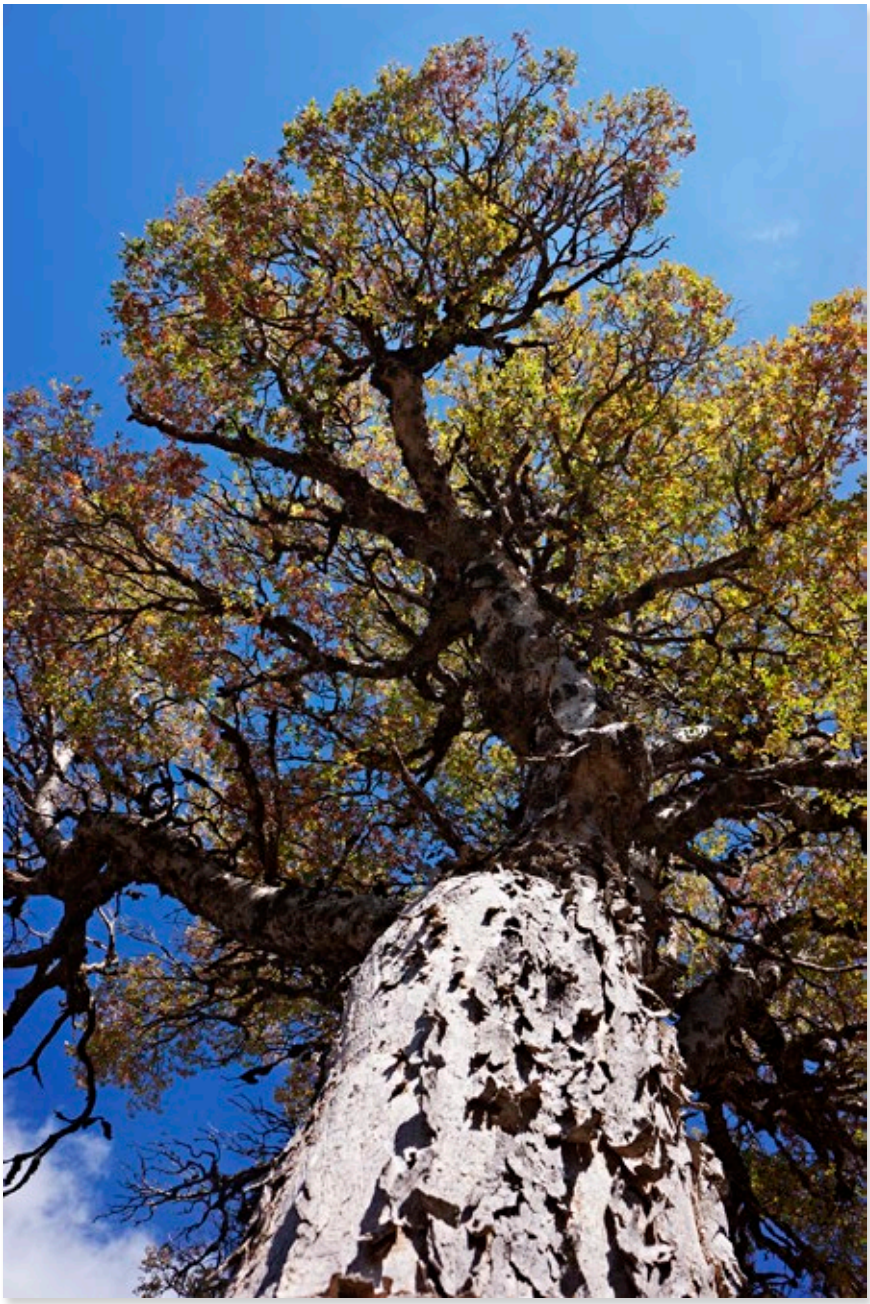
Preveli Bay with the Cretan date palm (*Phoenix theophrasti*) (Photo: E. Kozlowski).

Goats are omnipresent in the mountains of Crete. They are also always hungry (Photo: G. Kozlowski).

Protagonists

Cretan zelkova (*Zelkova abelicea*)

Ulmaceae



This tree is native only to the Greek island of Crete. It is a remnant of prior periods. Several million years ago, zelkovas were very common in dense and moist forests throughout Europe. After the last ice age, however, they survived only on the Mediterranean islands. Today, the mountains of Crete are the last refugia for these relict trees. Dikti Mountains (Photo: E. Kozlowski).

Cretan date palm (*Phoenix theophrasti*)

Arecaceae

This is a habitat similar to those found in Africa or other desert regions on the Earth, and yet, it occurs in Europe. This date palm is without doubt one of the most interesting botanical highlights of Crete. It has been recorded since prehistoric times and described by famous naturalists, including among others, Theophrastus of Eresos. Today, it is threatened with extinction and can only be found in approximately ten locations in coastal areas. Preveli (Photo: E. Kozlowski).

Behind the scenes

Practice-oriented research. Laurence Fazan is a PhD student at the University of Fribourg (Switzerland) and a world-renowned expert on Cretan zelkova. Dimos Dimitriou is a forest engineer and works at the Forest Directorate in Chania. The results from the research is helping foresters protect *Zelkova abelicea* (Photos: E. Kozlowski).

Dany Ghosn (dark glasses) and Ilektra Remoundou (yellow T-shirt), both from the Mediterranean Agronomic Institute of Chania (MAICh), lead the on-site species conservation project for *Zelkova abelicea* and raise awareness among the local population (Photos: G. and E. Kozlowski).

Fencing around *Zelkova abelicea* is a very efficient conservation measure protecting the species against heavy grazing and browsing by goats and sheep (Photos: G. Kozlowski).

Fencing off *Zelkova abelicea* and reducing grazing simultaneously protects many other rare plant species on Crete, such as *Ophrys episcopalis* (left) and *Paeonia clusii* subsp. *clusii* (Photos: E. Kozlowski).

Prof. Dariusz Gwiazdowicz (University of Life Sciences from Poznan, Poland) collects tree bark samples of *Zelkova abelicea* in this photo. Relict trees are inhabited by countless invertebrates that have never been identified or described, making them a true "El Dorado" for the world-renowned mite specialist (Photo: G. Kozlowski).

Field work on Crete requires endurance, experience and very good preparation. Orientation is not always easy, and water is almost never found. In the pictures, you can see Dr Camille Christe from the *Conservatoire et Jardin botaniques* of Geneva (Switzerland), Joachim Gratzfeld from the Botanic Gardens Conservation International (Great Britain), and Laurence Fazan and Benoît Clément from the University of Fribourg (Switzerland) (Photos: G. Kozlowski).

Fossil teeth of dwarf elephants can be found on Crete, and they are always proudly shown to visitors by Giannis Siganos, owner of a tavern on the Katharo Plateau in eastern Crete (Photos: G. Kozlowski).

5. Georgia

Ananuri Castle on the Aragvi River in the Great Caucasus (Photo: G. Kozlowski).

Georgia was also well known to the ancient Greeks. The Argonauts led by Jason, as reported by Homer in Odyssey, searched and found the famous Golden Fleece of the mythical ram Chrysomeles here. More precisely, it was found in western Georgia in the region of Colchis on the shores of the Black Sea. Our Golden Fleece in Georgia are relict trees, which are very numerous in the warm and rainy Colchic forests as well as on the southern slopes of the Great Caucasus. The Caucasian zelkova (*Zelkova carpinifolia*) and the Caucasian wingnut (*Pterocarya fraxinifolia*) are particularly important and endangered in many regions of Georgia. The research team of the Botanical Garden of the University of Fribourg has conducted several biogeographical and genetic studies on the relict trees of this region. The development of targeted conservation strategies was also part of our efforts, mainly in Kolkheti National Park in Colchis and in Lapankuri in eastern Georgia.

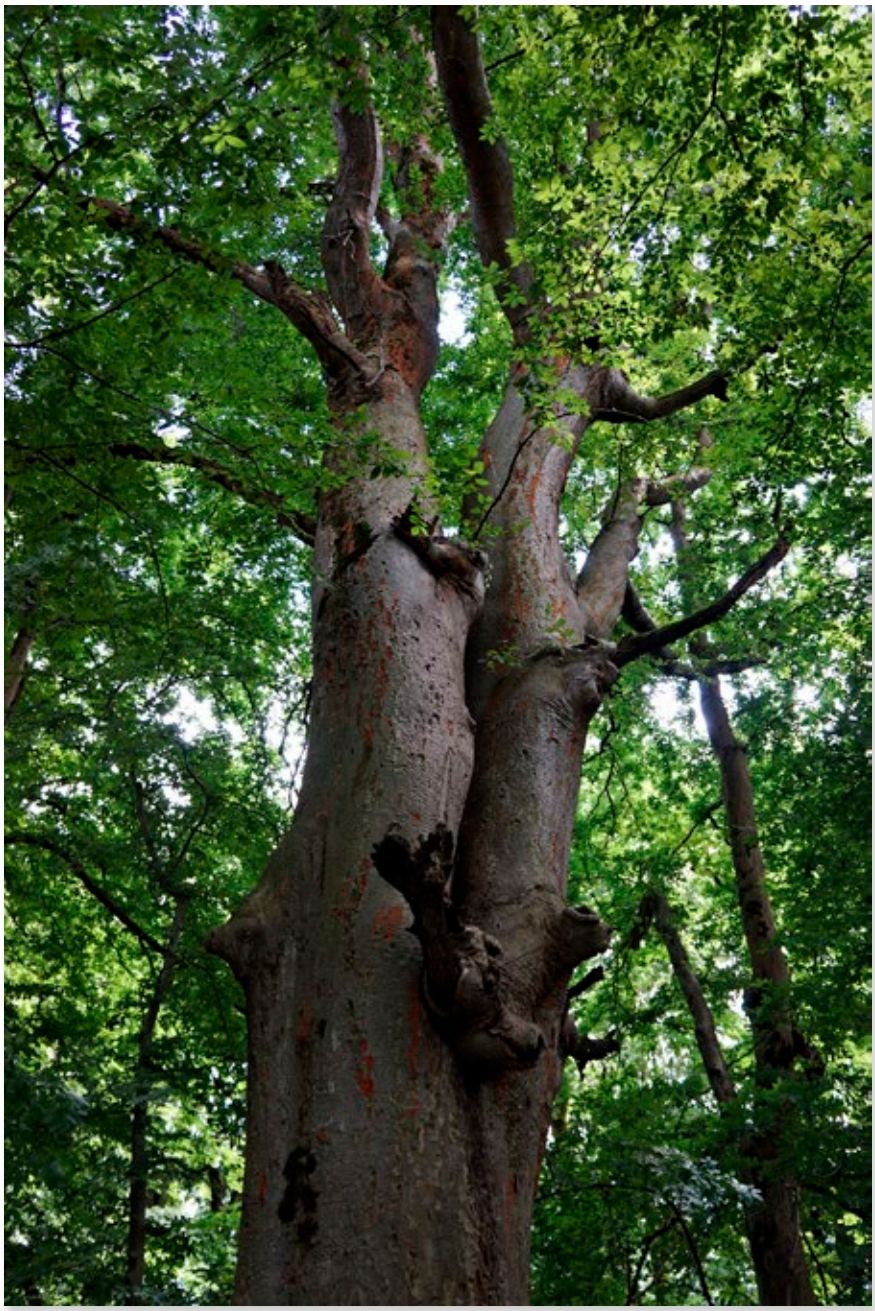
The Great Caucasus in the region of Kasbegi (Photo: G. Kozlowski).

Pichori River in Kolkheti National Park, surrounded by dense forests of the Caucasian wingnut (*Pterocarya fraxinifolia*) (Photo: G. Kozlowski).

Protagonists

Caucasian zelkova (*Zelkova carpinifolia*)

Ulmaceae



The species is undoubtedly one of the most important relict trees in the South Caucasus. It grows not only in Georgia but also in Turkey, Armenia, Azerbaijan and Iran. However, Georgians are particularly proud of it, as the name of the genus *Zelkova* originates from a dialect of the Georgian language, where the tree is referred to as *dzelkva*. Ajameti (Photo: G. Kozlowski).

Caucasian wingnut (*Pterocarya fraxinifolia*)

Juglandaceae

This is the only species of the genus *Pterocarya* that occurs in western Eurasia. All other species are native to Eastern Asia, mainly China. Millions of years ago, wingnut was widespread in floodplain forests throughout Europe. It survived the last ice age only in the South Caucasus and is found today in Georgia, Turkey, Azerbaijan and Iran. Kolkheti National Park (Photo: E. Kozlowski).

Behind the scenes

Dr. Manana Khutsishvili (red T-shirt), Director of the Georgian National Herbarium in Tbilisi, led our first expedition to the Caucasian zelkova (*Zelkova carpinifolia*) in 2010. Ajameti Nature Reserve (Photo: David Frey).

Dr. Anna Jasińska and Dr. Salvatore Pasta in front of a several hundred-year-old Caucasian zelkova (*Zelkova carpinifolia*) in Ajameti Nature Reserve. Anna studies the morphology, distribution and genetics of relict trees at the Institute of Dendrology of the Polish Academy of Sciences in Kórnik (Poland) (Photo: G. Kozlowski).

The Caucasian zelkova (*Zelkova carpinifolia*) in Ajameti Nature Reserve (Photo: G. Kozlowski).

Dr. Izolda Matchutadze (Shota Rustaveli State University in Batumi) leads several research projects in the floodplain forests of Kolkheti National Park. In the picture, she is immersed in discussion with Sebastien Bétrisey (Botanical Garden of the University of Fribourg, Switzerland), the long-term leader of species conservation projects in the South Caucasus, and with Giuseppe Garfì (Photo: G. Kozlowski).

A tree nursery with rare and endangered relict trees, with seedlings ready for restoration work in Kolkheti National Park (Photo: G. Kozlowski).

Well-deserved lunch break including a local specialty from the Mingrelia region: *khachapuri* (a kind of cheese bread) (Photo: G. Kozlowski).

Everywhere along the roadside you can find fruits from the region (Photo: G. Kozlowski).

6. Azerbaijan

Mud volcanoes are a trademark of Azerbaijan. More than half of the 1100 known mud volcanoes on Earth are found in this South Caucasian country. These mud volcanoes actually are not related to volcanoes. Mostly, natural gas rises to the surface and mixes with water and sediments in mud volcanoes. The muddy mass is therefore cold (Photo: E. Kozlowski).

Traveling in and understanding Azerbaijan requires considerable time. With the enormous diversity of habitat types from the Caucasus in the north, through the steppes, semideserts and cultivated landscapes in the center of the country, to the lush forests in the south, the country can almost stupefy a botanist. The country also has a long, complex and sometimes sad history and a resulting great diversity of languages and traditions. We spent a particularly long time in the Talysh Mountains, which are located in to the very south on the border with Iran and are inhabited by Persian people of the same name, Talysh. This region contains the so-called Hyrcanian Forest, which stretches along the southern shore of the Caspian Sea. This forest is a unique refugium for relict trees. The first time we stood in its shade, we were very moved.

We were surrounded by parrotias, zelkovas, wingnuts, gleditsias, albizias, and many other relict trees. This species composition is almost as one imagines the forests in Central Europe five or ten million years ago: a journey into the past.

Lahic region in the Great Caucasus (Photo: E. Kozlowski).

Steppe of Pereküskül near Baku, the capital of the country (Photo: E. Kozlowski).

Colorful fields near Lerik (Photo: E. Kozlowski).

A stream with the Caucasian wingnut (*Pterocarya fraxinifolia*) in the rain-fed Talysh Mountains (Photo: E. Kozlowski).

Protagonists

Persian ironwood (*Parrotia persica*)

Hamamelidaceae

Parrotia, as well as the whole witch-hazel family, is a favorite of paleontologists because its leaf shape is unmistakable. It was widespread within the past few epochs throughout the Northern Hemisphere; today, Persian ironwood is native exclusively to Azerbaijan and Iran. It is considered a typical relic tree. Talysh Mountains (Photo: E. Kozlowski).

Velvet maple (*Acer velutinum*)

Sapindaceae

Native to the Caucasus and Hyrcanian forests of Azerbaijan and Iran, this maple is a tree of superlatives. It can reach heights greater than 60 meters, and its leaves and red-colored fruit clusters are among the largest of all maple species in the world. Additionally, some trees in the Talysh Mountains (South Azerbaijan) can have a trunk circumference of nearly 10 meters. Talysh Mountains (Photo: E. Kozlowski).

Chestnut-leaved oak (*Quercus castaneifolia*)

Fagaceae

The chestnut-leaved oak is a magnificent tree. With its straight and tall trunks, it reaches up to 50 meters in height. Worldwide, this species of oak is found only in Azerbaijan and Iran. Its leaves are distinctive, with a size and shape resembling the leaves of sweet chestnut. Talysh Mountains (Photo: E. Kozlowski).

Behind the scenes

A mixture of modernity and ancient traditions, the capital Baku surprises with breathtaking buildings. However, in the countryside, ancient food customs are still cultivated (Photo: E. Kozlowski).

Culinary Azerbaijan has a lot to offer. Especially impressive are the numerous restaurants, where you are welcomed under the open sky in the middle of a forest or orchard (Photos: E. Kozlowski).

Dr. Emanuel Gerber (striped T-shirt) from the Natural History Museum of Fribourg (Switzerland) was our long-term companion and a tireless photographer on the research trips through Azerbaijan. Dr. Hadjiagha Safarov (center), the deputy director of Harcanian National Park, is an expert on the forests and trees in the Talysh Mountains (Photo: E. Gerber).

Dr. Hadjiagha Safarov (deputy director of the Hyrcanian National Park), Dr. Reshad Salimov (Institute of Botany, Academy of Sciences from Baku) and a park ranger, who patrols the national park with a horse (Photo: E. Kozlowski).

Typical spotted bark of the Persian ironwood (*Parrotia persica*) (Photo: E. Kozlowski).

The Vice-Minister of the Environment of Azerbaijan, Dr. Vugar Karimov (with the white cap) is also an expert on the local flora (Photo: G. Kozlowski).

The famous Babakhan Rakhmanov (in the middle of the picture, with the red shirt) is also called "The Leopard Man". He survived an injury from an attack by a leopard! A small population of wild cats still roams the dense Hyrcanian forests. Field work in the Talysh Mountains is slow: at each hamlet, one must take a small break with tea, bread and cheese to exchange news and, of course, listen to the exciting tales of Babakhan (Photo: G. Kozlowski).

Evelyne Kozlowski in the Talysh Mountains on the border with Iran (Photo: G. Kozlowski).

7. China

Lao Jie Ling Nature Park in Henan Province, densely covered with *Pinus armandii* (Photo: G. Kozlowski).

China is a country of superlatives. It is as large as a continent and soon to be populated by more than 1.4 billion people who speak approximately 300 languages. However, there are a large number of areas that have remained wild and biologically diverse. For researchers working with relict trees, China is a must-see location. Hundreds of tree and shrub species have survived the climatic changes of the past millions of years only in China. Some of them are world famous, such as the ginkgo tree, which is considered a "living fossil". Nowhere else in the world can you find so many tree species and genera of the walnut, elm or beech family. We came to China for the zelkovas (*Zelkova*) and wingnuts (*Pterocarya*), which are represented here by several species. In addition, as in the Mediterranean, we very quickly found like-minded people and friends for life.

With an estimated 25 million inhabitants, Shanghai is one of the largest megapolises in the world (Photo: E. Kozlowski).

Shu He is a traditional village in Yunnan Province located at the foot of the Himalayas (Photo: E. Kozlowski).

Protagonists

Chinese zelkova (*Zelkova sinica*)

Ulmaceae

Of the three East Asian zelkovas, this species has the smallest geographical range. It is an endemic tree of China and has been found in only eight provinces. Many forests with *Zelkova sinica* have been converted to farmland or cleared for timber in recent decades. Today, only a few old and large individuals of this species exist. Gu Tan Gou, Henan Province (Photo: G. Kozlowski).

Delavay's chinquapin (*Castanopsis delavayi*)

Fagaceae

The species is representative of chinquapin trees from the beech family, which are native to the tropical and subtropical regions of Southeast Asia. In China, there are nearly 60 different *Castanopsis* species, including *C. delavayi*, which has a very small range in western China. Shu He, Yunnan Province (Photo: E. Kozlowski).

Stone oak (*Lithocarpus hancei*)

Fagaceae

The species-rich genus *Lithocarpus* is exclusively native to Southeast Asia. As with many other genera of the beech family, China is one of the most important diversity centers of this plant group. *Lithocarpus hancei* impresses researchers with its densely packed, large fruits. Shu He, Yunnan Province (Photo: E. Kozlowski).

Huangshan pine (*Pinus hwangshanensis*)

Pinaceae

This tree is a symbol of the Huangshan Mountains (also known as the Yellow Mountains), located in southern China's Anhui Province. However, this pine is also found in other mountainous regions and provinces, where it is very popular as not only a decorative tree but also an important supplier of timber. Huanghsan Mountains, Anhui Province (Photo: E. Kozlowski).

Behind the scenes

The first expedition in 2012 was a success, and it marked the beginning of a long-lasting collaboration and friendship with Yi-Gang Song. Yi-Gang completed his doctoral thesis at the University of Fribourg and is now an assistant professor at the research institute of the Chenshan Botanical Garden in Shanghai (Photo: E. Kozlowski).

There is not enough time in one's life to try all the culinary specialties of China (Photos: E. Kozlowski).

Our favorite dish (and as you can see, Giuseppe Garfi's as well) is dumplings prepared with a wide variety of fillings, especially when cooked by Yi-Gang Song's family (Photo: Y-G. Song).

The flora of the Chinese mountains is very diverse. It helps enormously to have a good specialist as an expedition leader. Prof. Zongcai Liu (Nanyang Normal University) knows all the tree species in Henan Province. A smartphone application helps with communication and determining scientific names (Photos: Y-G. Song and G. Kozlowski).

Evelyne Kozlowski in the rain and cold in a forest on the slopes of the Himalayas in Yunnan (Photo: G. Kozlowski).

8. Taiwan

Taroko National Park, in the middle of the Taiwanese mountains (Photo: E. Kozlowski).

When we heard about the discovery of several new plant species in Taiwan a few years ago, we were amazed. We thought at the time that Taiwan was a small island in the Pacific Ocean, densely populated and heavily urbanized, which was an incorrect assessment. Taiwan, formerly known as Formosa, has two faces. There is the modern and highly developed part of Taiwan, with Taipei and its skyscrapers. However, for us, the second, more natural part was a breathtaking discovery. More than 70% of the island is covered with mountains, and what mountains they are: mighty, steep, and rugged slopes that are almost 4,000 m a.s.l. Only a few people know that the indigenous people of Taiwan still survive there today, and more than a dozen tribes exist. These tribes were the origin of all Polynesian peoples in the Pacific. The Maoris in New Zealand or on Easter Island originally descended from immigrants from Taiwan. We were brought to Taiwan by the zelkovas. However, finding them in the dense and steep forests of Taiwan was a great challenge.

The modern, technically developed side of Taiwan is particularly visible in the capital Taipei (Photos: E. Kozlowski).

The more natural, little-known side of Taiwan is found in the mountains on the eastern side of the island (Photo: E. Kozlowski).

Protagonists

Schneider's zelkova (*Zelkova schneideriana*)

Ulmaceae

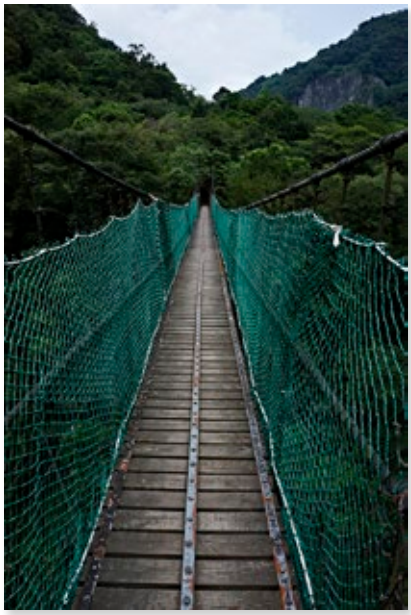
This tree is a little-known *Zelkova* species that is often confused with other species of the genus, both in the field and in arboretums. Therefore, the populations from Taiwan were counted as Japanese zelkova for a very long time. Recently, to the surprise of researchers, new genetic studies revealed that individuals from the mountainous island of Taiwan belong to *Zelkova schneideriana*. Taroko National Park (Photo: E. Kozlowski).

Taiwan fir (*Abies kawakamii*)

Pinaceae

The above picture is deceptive. This was captured not in the Alps but rather in the tropics; in fact, it was taken in the mountains of Taiwan at approximately 3,200 m a.s.l. This fir species, which forms dense forests, is endemic to the island. Only a few *Abies* species occur on Earth even further south (e.g., *A. delavayi* in Vietnam and *A. guatemalensis* in Central America). Taroko National Park (Photo: E. Kozlowski).

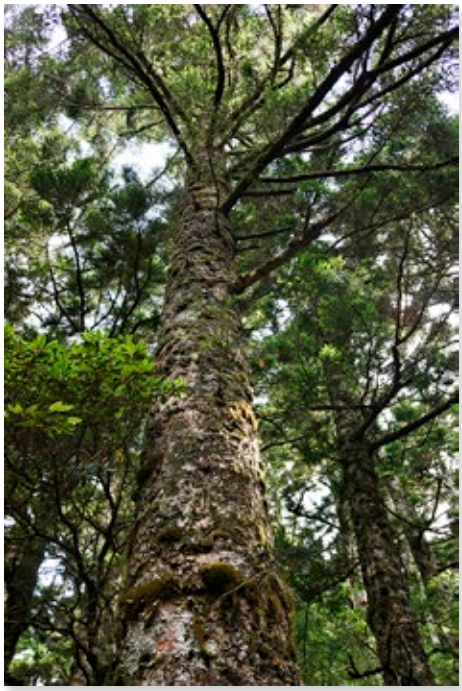
Behind the scenes



Our guide through the mountains and on the flora of Taiwan was Ralf Knapp. He is a specialist and book author on the fern species on the island. In many regions of Taiwan, steep slopes can be reached only through narrow tunnels or suspension bridges, some of which date back to the time of Japanese occupation (Photos: E. Kozlowski).

Over 750 fern species have been described from Taiwan to date, and new species are found every year. The diversity of forms and life strategies is enormous. *Nephrolepis biserrata* (leaf, underside with spores) and *Asplenium nidus* (as an epiphyte on an old tree) (Photos: E. Kozlowski).

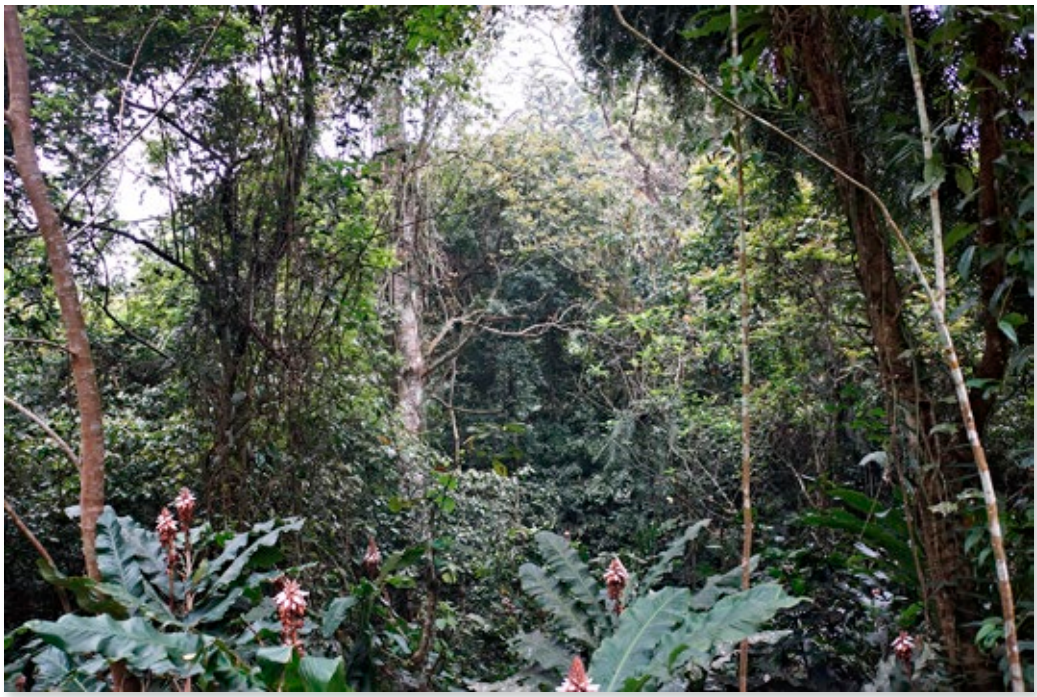
Steep gorges in Taroko National Park (Photo: E. Kozlowski).



Dense virgin forests with the Taiwan fir (*Abies kawakamii*) (Photo: E. Kozlowski).

Plants of Taiwan's high-altitude fir forests (above 3,000 m a.s.l.). *Monotropastrum humile* is a chlorophyll-less plant of the heather family (Ericaceae) that feeds by root association with fungi and trees. In addition, an endemic Formosa lily (*Lilium formosanum*) (Photos: E. Kozlowski).

9. Vietnam



Impenetrable forests in Cuc Phuong National Park (Photo: E. Kozlowski).

Like its neighbor China to the north, Vietnam is one of the most important diversity centers of rare relict tree species. Although large areas of the lowlands have been heavily modified as cultivated landscapes or settlement areas for thousands of years, large areas of near-natural forests still exist in the mountainous regions. Due to the numerous conflicts and wars in the region, entire large sections have been inaccessible to researchers for a very long time. Therefore, today, Indochina, especially the mountainous border region among Vietnam, Laos and Myanmar, is one of the last areas on Earth where there is still much to discover. For us, trees from the walnut family (Juglandaceae) brought us to Vietnam. Here, approximately ten species of this ancient group of trees exist. Among the most interesting is *Alfaropsis roxburghiana*, but there are also many rare, endemic and endangered species from the genera *Platycarya*, *Pterocarya* (wingnut) and *Carya* (hickory).

Mountainous and densely forested areas of Vietnam are important refugia for rare and endangered species. Cuc Phuong National Park (Photo: E. Kozlowski).

Con Dao National Park is located on the island of the same name far from mainland Vietnam and still hides many botanical secrets from researchers (Photo: E. Kozlowski).

Protagonist

Alfaropsis roxburghiana

Juglandaceae

This species has a wide range and is found from Pakistan to Indonesia. For a long time, it was not clear how to classify this tree taxonomically. However, the latest molecular studies have shown that *Alfaropsis* provides a link between the East Asian members of the walnut family (*Engelhardia*) and the Central American genera *Alfaroa* and *Oreomunnea*. Cuc Phuong National Park (Photo: E. Kozlowski).

Behind the scenes

A long and rich history and modern cities shape the image of Vietnam for the increasing number of tourists (Photos: E. Kozlowski).

The culinary traditions and wealth of specialties of Vietnamese cuisine are famous worldwide. In the pictures are richly covered tables in the canteen of the Vietnam National University of Forestry in Hanoi (Photos: E. Kozlowski).

Prof. Hoang Van Sam (center) and his assistant Pham Thanh Ha on the campus of the National Forestry University in Hanoi. Hoang is a recognized tree researcher in Vietnam, with a special interest in ethnobotany (Photo: E. Kozlowski).

One of the discoveries of our research work: a previously unknown and isolated occurrence of *Engelhardia spicata* (Juglandaceae) in Con Dao National Park (Photo: E. Kozlowski).

Carya sinensis (Juglandaceae), a hickory species, is one of the most endangered trees of the walnut family. Cuc Phuong National Park (Photo: E. Kozlowski).

Vietnamese forests are very rich in various species of figs: *Ficus auriculata* in Cuc Phuong National Park (Photo: E. Kozlowski).

The Asian kapok tree (*Bombax ceiba*) has very large (diameter 10-15 cm) and bright red flowers. It is planted in many countries in Southeast Asia, as it is very popular as a source of wood, as a medicinal plant and as an ornamental tree. However, it occurs naturally in the virgin forests of Vietnam (Photo: E. Kozlowski).

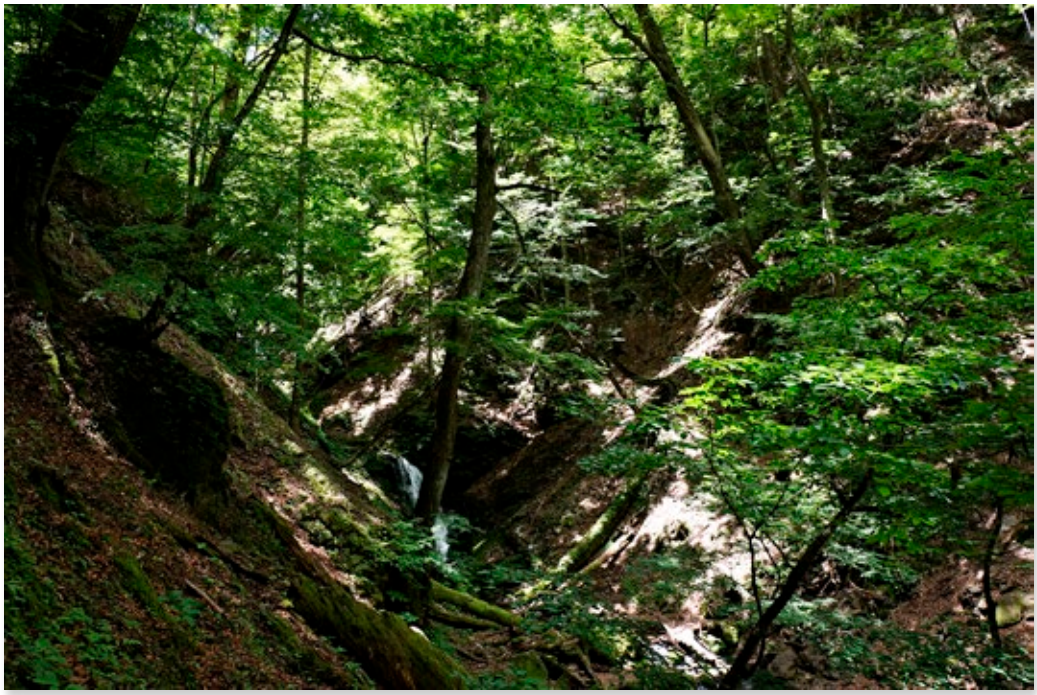
The dangers of the last war still lurk in the jungles of Vietnam. A warning sign prohibits entering an area in Cuc Phuong National Park where the toxins still pose a danger to humans (Photo: E. Kozlowski).

10. Japan

Bamboo forests in the Tadoroki Valley in Tokyo (Photo: E. Kozlowski).

Compared to Vietnam or subtropical China, Japan is located much further north. Nevertheless, the country is one of the most important refugia of relict trees in the world. Even in Tokyo, one of the largest metropolises in the world, small forest fragments can be found, where Japanese zelkova (*Zelkova carpinifolia*) forms large stands. The main destination of our trip, however, was Chichibu-Tama-Kai National Park, just an hour train ride northwest of Tokyo. In the middle of the park is an experimental site where well-preserved riparian forests at the Ooyamazawa Riparian Forest Research Site are being studied. The research there has been conducted for decades by a colleague, Prof. Hitoshi Sakio, from Niigata University. It takes several hours of walking to get to the research site. In addition, one must always remain attentive since in the mountains of the national park, many Asiatic black bears roam through the area.

Japan is a modern and well-organized country. A bus stop in Tokyo (Photo: E. Kozlowski).

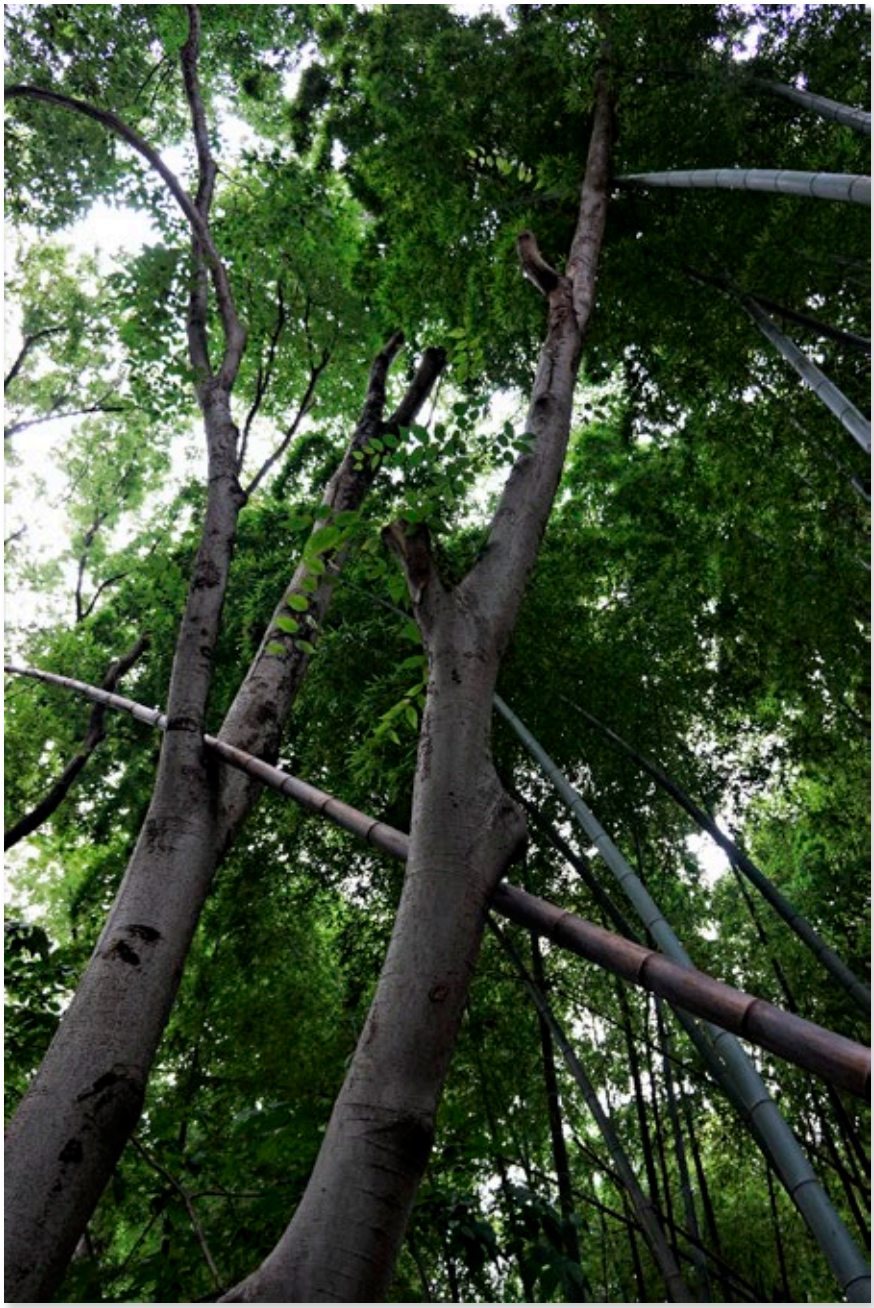


Chichibu-Tama-Kai National Park with its wild and densely forested gorges (Photo: E. Kozlowski).

Protagonists

Japanese zelkova (*Zelkova serrata*)

Ulmaceae



Despite its name, Japanese zelkova is found not only in Japan but also in China, South Korea and North Korea. In Japan, however, it forms large and dense forests, where it also appears as the dominant tree species and is one of the most important species for the wood industry. It is also frequently planted in city parks and temple complexes. Todoroki Valley, Tokyo (Photo: E. Kozlowski).

Euptelea (*Euptelea polyandra*)

Eupteleaceae

Today, this beautiful relict species is native to East Asia. However, the tree is very well known among paleontologists because 50-60 million years ago, it was widespread in many forest communities throughout the Northern Hemisphere. Chichibu-Tama-Kai National Park (Photo: E. Kozlowski).

Katsura (*Cercidiphyllum japonicum*)

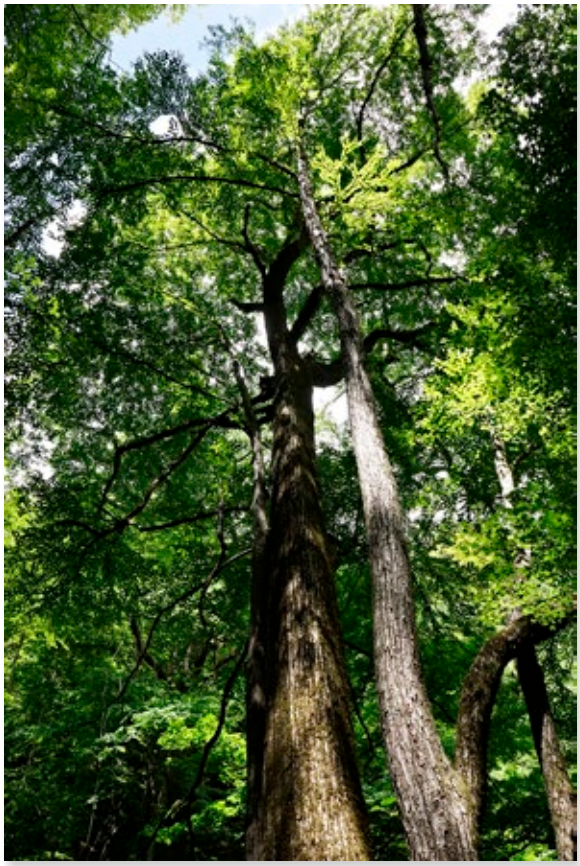
Cercidiphyllaceae

This tree is a living fossil. It already existed on Earth by the Cretaceous period more than 65 million years ago when there were dinosaurs, and it was widespread throughout the Northern Hemisphere. Today, this imposing tree is found as a relic only in Japan, China and Korea. It is a dioecious species. The picture shows its female flowers. Chichibu-Tama-Kai National Park (Photo: E. Kozlowski).

Behind the scenes

Traveling through Japan always involves many historical, cultural and culinary surprises (Photo: E. Kozlowski).

Prof. Hitoshi Sakio (left) in front of an information board in the middle of the Ooyamazawa forest. The main topics of his research are the regeneration and forest structure of riparian forests dominated by three tree species: *Cercidiphyllum japonicum*, *Pterocarya rhoifolia*, and *Fraxinus platypoda*. Chichibu-Tama-Kai National Park (Photo: E. Kozlowski).



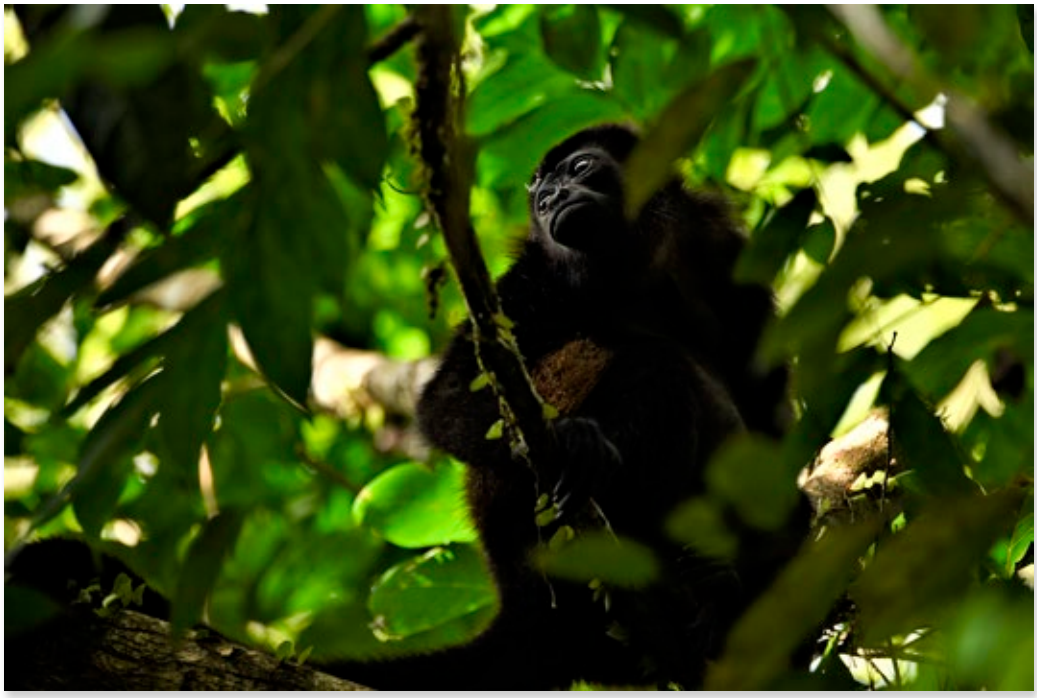
An imposing and very old katsura (*Cercidiphyllum japonicum*) set the tone in the riparian forests of Ooyamazawa. Chichibu-Tama-Kai National Park (Photo: E. Kozlowski).

Acer shirasawanum. To date, 13 maple species have been found in the relatively small study area of Ooyamazawa. This is an enormous richness of tree species. In Switzerland or Poland, for example, only 3-4 species of this genus are found. Chichibu-Tama-Kai National Park (Photo: E. Kozlowski).

Acer distylum. Without fruit, many of the Japanese maples are hard to recognize, as they have very different leaf shapes than those of European species. Chichibu-Tama-Kai National Park (Photo: E. Kozlowski)

Alnus sieboldiana. Chichibu-Tama-Kai National Park (Photo: E. Kozlowski).

11. Costa Rica



Mantled howler (*Alouatta palliata*) in Tortuguero National Park (Photo: E. Kozlowski).

Costa Rica is very small. However, it is one of the most biodiverse regions on Earth. No fewer than 10,000 plants and more than 2,000 tree species have been found there to date. The country is the center of the tropical walnut family (Juglandaceae), especially for the two genera that have more than 7 species, *Alfaroa* and *Oreomunnea*. However, these Juglandaceae grow only at cooler, higher altitudes, starting at approximately 1,000 m a.s.l. and are accompanied by a number of tree and shrub species, all of which migrated here from the north in past eras. It is quite special to visit forests composed of oaks (*Quercus*), alders (*Alnus*) or *Viburnum* in the middle of the tropics. However, accessing these forests requires overcoming difficult physical conditions, such as high humidity and temperatures above 40°C. In addition, it is necessary to have a good guide. With Leonel Coto, a researcher from a research center in Tapanti National Park, we were very lucky. Although we had to laboriously follow a wild tapir trail for hours and fight

against spiny lianas, Lionel always found the tree populations we were looking for. At the sight of the dense, overgrown with epiphytes tree giants in the untouched jungle, we very quickly forgot all challenges.

Costa Rica is one of the countries with the largest number and area of national parks and nature reserves. Primeval forest in Tapanti National Park (Photo: E. Kozlowski).

Some sections of the coast of Costa Rica are very rocky and inaccessible. This characteristic preserved many areas from intensive settlement by Europeans. This is also the case in Corcovado National Park (Photo: E. Kozlowski).

Protagonists

Oreomunnea (*Oreomunnea mexicana*)

Juglandaceae

This tree is representative of the walnut family and is found exclusively in the tropics of Central and South America, mainly in the mountains between 500 and 2,000 m a.s.l. There, the climate is wetter and cooler, which is still preferred by these relict trees that migrated south from North America millions of years ago. Tapanti National Park (Photo: E. Kozlowski).

Quercus bumelioides

Most oaks on the two American continents occur in the USA and Mexico. Only a few oak species reached the narrow Central American land connection within the past millions of years, and some even arrived in South America. *Quercus bumelioides* is a relict and a guest from the North. Tapanti National Park (Photo: E. Kozlowski).

Behind the scenes

The rivers provide access to the most remote areas in Costa Rica's national parks. However, one must always be careful when exploring riparian areas, even along smaller streams because the American crocodile (*Crocodylus acutus*), which can reach a size longer than 7 meters, exists there (Photos: E. Kozlowski).

Leonel Coto stands in front of *Oreomunnea mexicana*. He is a researcher from a research center in Turrialba (*Centro Agronómico Tropical de Investigación y Ensenanza*, CATIE) and an expert on the native tree flora. Tapanti National Park (Photo: G. Kozlowski).

Finding rare tree species in the middle of the jungle is a challenge. One must pay attention to important clues. Trunks of *Oreomunnea mexicana*, for example, are densely covered with exfoliating and rolling strips of bark. In the case of *Quercus bumelioides*, one must look for acorns lying on the ground. Tapanti National Park (Photos: E. Kozlowski).

Animal life is also diverse and omnipresent, although often well camouflaged, such as in the plumed basilisk (*Basiliscus plumifrons*, left), or nocturnal, such as in the northern tamandua (*Tamandua mexicana*), a tree-dwelling anteater. Corcovado National Park (Photos: E. Kozlowski).

After the rain, strawberry frogs (*Oophaga pumilio*) crawl on the forest floor. Care should be taken, however, as these amphibians, barely 2 centimeters long, are very poisonous. The secretion of their skin is used as arrow poison by Native Americans. Tortuguero National Park (Photo: E. Kozlowski).

Satyria warszewiczii, one of the numerous woody lianas from the heather family (Ericaceae), decorates treetops in Tapanti National Park. The plant is named after a Polish botanist, Józef Warszewicz (1812-1866). Through a recommendation from Alexander von Humboldt, he traveled to Central and South America between 1845 and 1853. After his return to Poland, he worked on his abundant collections at the Botanical Garden in Kraków (Photo: E. Kozlowski).

Evelyne Kozlowski in front of *Oreomunnea mexicana* (Juglandaceae) in Tapanti National Park (Photo: G. Kozlowski)

12. Svalbard, Norway

Wide and untouched landscapes on Svalbard. Hornsund (Photo: G. Kozlowski).

The book began with a glacial relict in the foothills of the Prealps of Fribourg. The last journey takes us to Svalbard, where some species are exposed to even more extreme conditions. One looks in vain for trees on this Arctic archipelago. However, numerous woody plants grow here that are perfectly adapted to the cold, such as polar willow (*Salix polaris*). We were eager to experience firsthand what it feels like to be in an ice age and to hike and explore in an area surrounded by glaciers. However, global warming is occurring with greater intensity here as well. "Heat days" of approximately 5°C and warmer are more frequently experienced in June or August. The frozen ground or permafrost is disappearing at a rapid pace. The Arctic is greening. However, no one is happy about this, including both the inhabitants of the few settlements where the bridges and houses are sinking into the ground and the researchers. Svalbard's sparse nature consists of a few building blocks that can adapt only slowly to new conditions. We understood on our journey, both in the tropics and in the Arctic cold, how fragile and how unique our planet and its inhabitants are.

In the middle of summer, ice, snow and cold are still omnipresent in Svalbard. Hornsund (Photo: G. Kozlowski).

Several small woody plants manage to bloom and successfully reproduce on Svalbard. The Arctic bell heather (*Cassiope tetragona*) is from the heather family (Ericaceae). Longyearbyen (Photo: G. Kozlowski).

Protagonist

Polar willow (*Salix polaris*)

Salicaceae

This woody species, similar to some closely related arctic and high-alpine willows, is often referred to as "the world's smallest tree." Botanically speaking, they are creeping shrubs. It is often the case that only their leaves come out of the ground. Thus, this plant protects itself from the cold. Hornsund (Photo: G. Kozlowski).

Behind the scenes

The Polish Polar Station in Hornsund, in the south of Svalbard, was the base of our expedition for many long days. It was organized by Prof. Dariusz J. Gwiazdowicz, who has been studying the Arctic and Antarctic ecosystems for years and is well versed in weapons (Photos: G. Kozlowski).

The remote regions of the archipelago can be visited only due to the support of the team from the Hornsund Polar Station, and a weapon, which serves as protection against polar bears, is mandatory (Photographs: D. J. Gwiazdowicz and G. Kozlowski).

Hansbreen (Hans' Glacier) in southern Svalbard (Photo: D. J. Gwiazdowicz).

Always on foot (in summer and in times without snow cover, vehicles are banned), you can traverse up to 20 kilometers a day. However, you do not have to hurry, as it remains light around the clock for 24 hours (Photo: D. J. Gwiazdowicz).

Hundreds of lichen species dominate the vegetation of Svalbard (Photo: G. Kozlowski).

Only in mild places protected from the cold do larger flowering plants grow. Especially beautiful is northern Jacob's ladder (*Polemonium boreale*) and the symbol of the archipelago, the Svalbard poppy (*Papaver dahlianum*) (Photos: G. Kozlowski).

Walking long distances, collecting, labeling, and photographing, field work in the High North is very exhausting but is enjoying, especially when you are well protected against polar bears (Photos: D. J. Gwiazdowicz and G. Kozlowski).

The overnight stay in a remote research hut of the University of Wrocław (Poland) was unforgettable. The station supervisor had not had a visitor for weeks and served us homemade ham and bacon as a welcome meal (Photos: G. Kozlowski).

The tasty smell of Polish culinary specialties attracted a visitor. The euphoria of our first meeting with a polar bear quickly turned into fear. The hut was by no means safe against an attack. We spent the whole night on the very narrow—but for a bear—inaccessible screed (Photos: G. Kozlowski).

The authors

Evelyne and Gregor Kozlowski in Hyrcanian National Park in Azerbaijan (Photo: S. Pasta).

Evelyne Kozlowski

Evelyne has worked as a photographer at the Botanical Garden of the University of Fribourg (Switzerland) for several years and currently works as a microscopy specialist at the Institute of Pharmacology of the University of Bern (Switzerland). Her photographs exploring the beauty of nature were taken with great dedication and perseverance, especially when conditions were very unfavorable. She often recalls particularly difficult work in tropical areas, where high humidity interferes with the cameras. In addition, dangerous animals such as venomous spiders and snakes lurked. An attack by leeches in the humid forests of Yunnan Province in China and 15 centimeter-long scorpions in the jungles of Costa Rica were particularly memorable for her. In her everyday life, she is always smiling and full of positive energy, which is infectious.

Gregor Kozlowski

Gregor is the Director of the Botanical Garden and a professor at the University of Fribourg (Switzerland). His scientific interests include relict tree species that have survived in inaccessible parts of our planet. Therefore, he carries out research and projects to protect rare species on several continents. As a native of the Greater Poland region and a resident of Switzerland for several decades, he has been extremely meticulous, planning everything to the smallest detail. Moreover, he is very open to others and hospitable, which makes people of different ages, countries and cultural backgrounds willing to cooperate with him. Together with Evelyne, they are a wonderful, complementary duo not only in their marriage but also in their professional work.

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