

# The La Gamba Research Station in Costa Rica – History, Nature and Research

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Initiated by the Austrian nature conservation association “Rainforest of the Austrians”, the tropical station was founded in 1993. It is now owned by the association “Förderverein des Tropenstation La Gamba”, based at the University of Vienna. The station is located in the Pacific region of southern Costa Rica near the village of La Gamba and the Piedras Blancas National Park, one of the last remaining perhumid lowland rainforests on the Pacific coast of Central America. Due to its geographic, climatic and geological conditions, it is one of the most species-rich regions of Central America with about 2,700 plant, 370 bird, more than 90 reptile, 50 amphibian and 145 mammal species. The roots of Austrian scientific activity in this region reach back to an expedition of the Vienna Natural History Museum conducted in 1930. Since the establishment of the tropical station, research has been carried out on many tropical biology issues.

## **Huber W. & Weissenhofer A., 2019: Die Tropenstation La Gamba in Costa Rica – Geschichte, Natur und Forschung.**

Ausgehend vom österreichischen Naturschutz-Verein “Regenwald der Österreicher” wurde die Tropenstation im Jahr 1993 gegründet und ist inzwischen im Besitz des „Fördervereins der Tropenstation La Gamba“ mit Sitz an der Universität Wien. Die Station befindet sich im Süden Costa Ricas in der pazifischen Region in unmittelbarer Nähe der Ortschaft La Gamba und des Nationalparks Piedras Blancas, einem der letzten noch erhaltenen perhumiden Tieflandregenwälder an der Pazifikküste Mittelamerikas. Dieser gehört auf Grund seiner geographischen, klimatischen und erdgeschichtlichen Gegebenheiten mit etwa 2.700 Pflanzen-, 370 Vogel-, über 90 Reptilien- und 50 Amphibien- sowie 145 Säugetierarten zu den artenreichsten Regionen Mittelamerikas. Österreichische Wurzeln der wissenschaftlichen Betätigung in dieser Region reichen zurück bis zu einer Expedition des Naturkundlichen Museums/Wiens im Jahre 1930. Seit dem Bestehen der Tropenstation wird an vielen tropenbiologischen Fragestellungen gearbeitet.

**Keywords:** Field station, field course, rainforest, Neotropics.

## **Introduction**

The La Gamba Research Station was founded in the year 1993. It is located near the small village of La Gamba and close to the Piedras Blancas National Park (Esquinas Rainforest). This national park exists thanks to the conservation efforts of the Austrian Michael SCHNITZLER, who collected financial donations in Austria and forwarded them to the Costa Rican government, which in turn purchased large tracts of forest from landowners. This resulted in the establishment of the Piedras Blancas National Park, with the section “Rainforest of the Austrians” and various private properties of the Tropical Research Station, which play a very important role in nature conservation and in the building of a biological corridor in the southern part of Costa Rica. The Piedras Blancas National Park harbors the last primary tropical lowland rainforest on the Pacific coast of Central America and boasts exorbitantly high biodiversity.

## History

In 1993 the association “Rainforest of the Austrians” bought a small farmhouse (finca) for the first students (the authors of this article and Astrid KEBER) who started their scientific activities in La Gamba. The farmhouse was the precursor of the Tropical Research Station La Gamba. Since 2002 the Austrian non-profit association “Förderverein der Tropenstation”, closely linked to the University of Vienna, has taken over responsibility for the station. Together with the financial support of the association “Rainforest of the Austrians”, the Austrian Ministry of Science and Research and the University of Vienna, the Tropical Research Station has been expanded and improved repeatedly during the last decade. It now comprises several buildings, including a laboratory, library and a botanical garden. It provides comfortable living and research facilities for about 40 visitors.

With support from the University of Vienna (specifically Prof. Anton WEBER and Prof. Roland ALBERT) the scientific activities began to increase. Since those beginnings, many students and scientists have visited La Gamba on excursions or to work at the station (ALBERT 2013).

However, scientists have worked in the Golfo Dulce region for far longer than the first days of the station. In the 50s of the last century, the US-American botanist Paul H. ALLEN worked in the region and published the book “The rainforest of the Golfo Dulce” (ALLEN 1956). He was employed at the research department of the United Fruit Company.

Even Austrians have worked in the region before. The roots of Austrian scientific work in Costa Rica date back to 1930, when an Austrian expedition led by the botanist Otto PORSCH visited Costa Rica and the Golfo Dulce region.

In the 70s of the last century, scientific work increased and was mainly conducted by US scientists. Scientists were particularly attracted once the Corcovado National Park was founded in 1975. In 1989 the Instituto Nacional de Biodiversidad (INBio), the national institute for biodiversity and conservation in Costa Rica, was founded. A goal of the institute was to complete an inventory of the natural heritage of Costa Rica. For this purpose, INBio sent parataxonomists and field scientists to the region around the Golfo Dulce to gather more information on its diversity.

## Location and nature

The Golfo Dulce region is located at the southern corner of Costa Rica’s Pacific coast, close to the border to Panama, in an area comprising the Corcovado and Piedras Blancas National Parks (Esquinas forest). The region’s forests are the only remaining moist and wet evergreen lowland forests on the Pacific slope of Central America. The elevation of the region ranges from sea level to a height of 745 m on the Cerro Rincón, Peninsula de Osa, and 579 m on the Cerro Nicuesa in the Esquinas Forest. Annual precipitation is about 6.000 mm, with a short dry season from December to March (Fig. 1).

The relief is strongly structured at the landscape level and contains many microhabitats and niches. The region is very diverse in soil types, and has high vegetation dynamics (i.e. many forest gaps). All these factors, together with the biogeographical position of

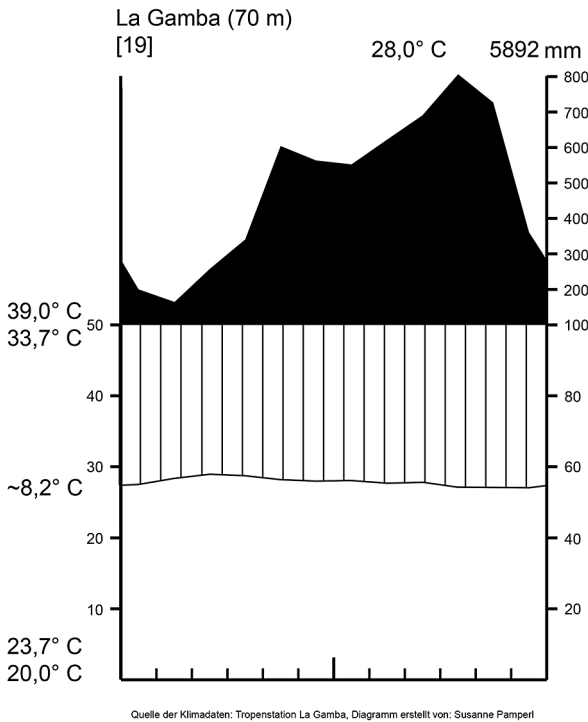


Fig. 1: Climate diagram, tropical research station La Gamba.  
– Abb. 1: Klimadiagramm, Tropenstation La Gamba.

the Golfo Dulce region, have led to a highly species-rich forest, with about 2.700 species of higher plants and around 145 mammals, 50 amphibians, 90 reptiles, 370 birds and numerous insects (WEISSENHOFER et al. 2008). Much of the recently gathered biological data, together with older research, indicate that these lowland forests rank among the most highly diverse lowland rainforest ecosystems in Central America.

The station itself is located close to the primary tropical rainforests and in the vicinity of the village of La Gamba, with its mosaic of managed land, including secondary forests, reforestations, oil palm plantations, tree plantations, pastures, rice fields and home gardens. The field station therefore offers easy access to many types of natural and

man-made ecosystems. Even marine ecosystems like mangroves, coastal forests and beaches are within reach. Thus, the station offers plenty of options to study different scientific issues in tropical environments.

Costa Rica's geographical location on the connecting "bridge" between North and South America (Fig. 2) has led to remarkable biogeographical patterns, along with the fact that some parts of the country – like the region around the Golfo Dulce – formed a kind of refuge for tropical animals and plants during the last ice age. The region contains numerous range-restricted plants and animals (high endemism) of which many reach their northern limits in southern Costa Rica.

An extensive system of trails in the Piedras Blancas National Park (La Gamba) and on the properties of the station offers perfect insight into tropical rainforests, and the region is an excellent place for naturalists to learn about tropical nature.

## The field Station La Gamba

The station is located close to the Pan-American Highway and near the small cities of Golfito and Rio Claro. The station itself is close to the village of La Gamba and provides comfortable accommodation and research facilities for about 40 visitors at a time. A small botanical garden, a laboratory and library are also part of the installation (Fig. 3). The sta-



Fig. 2: Geographical location of Costa Rica and the Golfo Dulce region with the Corcovado National park (Parque Nacional Corcovado) and Piedras Blancas National Park (Parque Nacional Piedras Blancas). Preparation: Bettina BERGER-ZIMMERMANN. – Abb. 2: Geografische Lage Costa Ricas und des Golfo Dulce, mit dem Corcovado Nationalpark (Parque Nacional Corcovado) und dem Piedras Blancas Nationalpark (Parque Nacional Piedras Blancas). Gestaltung: Bettina BERGER-ZIMMERMANN.



Fig. 3: Aerial photo of the station and its surroundings. – Abb. 3: Luftbild der Station und ihrer Umgebung.

tion owns about 300 hectares of pasture, reforestations, and primary and secondary forests in various stages in the vicinity of La Gamba and in the region.

Thanks to its location close to various tropical habitats and to its infrastructure, the station has gained international attention as a research institution and educational centre focusing on scientific exploration and conservation of Neotropical rainforests (WANER et al. 2017). At about 300 m a.s.l. lies the rustic farmhouse Finca Alexis, an outpost of the station that provides space for about six visitors in two rustic rooms. The Finca Alexis is located close to a lower mountain rainforest about one hour by car from La Gamba.

### **Overview of scientific work at the Station**

Since 1993 numerous scientific publications have resulted from research performed at the Tropical Research Station La Gamba, including around 170 doctoral and diploma theses. Studies of the flowering plants of the region resulted in the book “An Introductory Field Guide to the Flowering Plants of the Golfo Dulce Rain Forests” (WEBER et al. 2001), as did further scientific work in the book “Natural and Cultural History of the Golfo Dulce Region, Costa Rica” (WEISSENHOFER et al. 2008). Catalogues about groups of animals, plants, the history of the station, the biological corridor, the stream ecosystems and about the life of the people in La Gamba have been published. Various exhibitions on the nature of the Golfo Dulce region and on the scientific work carried out at the field station have



been presented in Austria, and one even in La Gamba itself. The scientific work initially focused on the flora and vegetation of the Esquinas forest but has now broadened to include a wide range of other topics, such as animal-plant interactions, herpetology, ornithology, entomology, limnology, plant ecophysiology, biogeochemistry, geography and sociology. Around 100 field courses and excursions have been conducted, enabling students and scientists from universities all over the world to visit and study the Piedras Blancas National Park (Fig. 4). Some of the most exceptional scientific work will be described in more detail in this book and mentioned below. All publications resulting from work done at the field station are cited in the “Wissenschaftlicher Bericht” at [www.lagamba.at](http://www.lagamba.at).

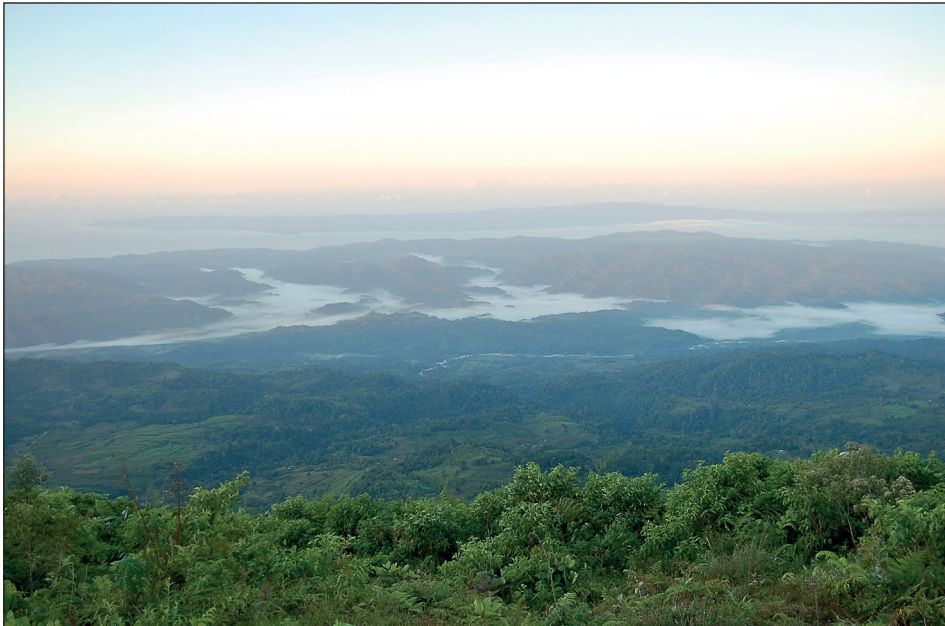


Fig. 4: The Piedras Blancas National Park. – Abb. 4: Der Piedras Blancas Nationalpark.

*Vegetation and Botany:* Many publications were completed on the plant diversity and vegetation of the region – mainly by the authors of this article. More work on different groups of plants like Rubiaceae (BERGER et al. 2015, BERGER et al. 2017), Orchids (HETHERINGTON-RAUTH & RAMIREZ 2016, RAKOSY et al. 2013), Lichens (BALOCH & GRUBE 2009, BREUSS & NEUWIRTH 2007, GRUBE et al. 2004, LÜCKING et al. 2013) and many more has been carried out.

*Ecophysiology:* Under the guidance of Wolfgang WANEK, research into primary production and nutrient cycling has led to various publications (HOFHANSL et al. 2015). Wolfgang WANEK (WANEK et al. 2002) and Wolfram WECKWERTH (WANG et al. 2016) are interested in the metabolism of the genus *Clusia*.

*Plant-Animal Interactions:* Research into pollination in plants is a research topic of Florian ETL, Anton WEBER and Jürg SCHÖNENBERGER (ETL et al. 2016). For almost 20 years Veronika MAYER (MAYER et al. 2018) has focused on the relationship of ants, plants and fungi.

*Limnology*: Students of Fritz SCHIEMER (SCHIEMER et al. 2010) and Leopold FÜREDER (FÜREDER et al. 2014) have worked on ecology and diversity in freshwaters of the region.

*Animal Biology*: Many scientists are focusing on bees, including Thomas ELTZ, Santiago RAMIREZ and Tamara POKORNY (POKORNY et al. 2017), Stefan JARAU (FLAIG et al. 2016), and Johannes SPAETHE (SPAETHE et al. 2014). Research on other invertebrate groups (dragonflies, butterflies) has been conducted by Christian SCHULZE and students (SCHULZE 2008) and Harald KRENN and Martin WIEMERS (butterflies) (KRENN et al. 2010). Meanwhile, Gerlinde HÖBEL (HÖBEL 2000), Michael FRANZEN (FRANZEN & KOLLARITS 2018), Walter HÖDL (HÖDL 1996, MANGOLD et al. 2015) and Dennis KOLLARITS (KOLLARITS et al. 2017) have been working on amphibians and reptiles, and Christian SCHULZE (SEAMAN & SCHULZE 2010) and Gerhard AUBRECHT (AUBRECHT et al. 2013) have studied the region's birdlife. An inventory of the mammals was completed by Armin LANDMANN (LANDMANN et al. 2008).

*Conservation Biology*: Christian SCHULZE (FREUDMANN et al. 2015, GALLMETZER & SCHULZE 2015) has worked on various animal groups and their abundance and diversity in different anthropogenic habitats and reforestations. Peter HIETZ (HIETZ & KLEINSCHMIDT 2018) and Wolfgang WANER (WANER et al. 2002) have worked on natural succession, soils and CO<sub>2</sub> sequestration in reforested habitats within the Biological Corridor COBIGA, mainly on Finca Amable.

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