

**Ferns of Finca Dos Lados:  
A Survey of Cloud Forest Pteridophytes**



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## Survey Site

Finca Dos Lados (“Farm with Two Sides”) is a research and reforestation project on a cloud-hugging property—ranging from 1700 to 2100 meters—that bridges the continental divide. This lower montane rainforest, owned and maintained by Sara Clark, is part of the biological corridor between Juan Castro Blanco and Paos Volcano National Parks. Much of the property was cleared for pasture land prior to her purchasing these 720 acres in 2002, although some primary forest does linger alongside the Gorrion, Trojas and Sarchi rivers. She has organized the planting of some 18,000 trees, including nitrogen-fixing alder. In addition, light-gap specialists have colonized the cleared hillsides; many of these are Pteridophytes (non-seeded plants with vascular tissue). Hence Finca Dos Lados currently provides fertile grounds for many terrestrial ferns, and a smaller number of epiphytes. Given enough time, measured in decades, most terrestrial ferns will be out-shaded by taller trees and supplanted by epiphytic Pteridophytes.



Figure 1. A sample of ferns on one of the many trails on the farm.

## Fern Diversity

The Pteridophytes, which are nonflowering and instead reproduce by spores found in sori (specialized spore cases), exceed 12,000 species worldwide, and have found homes in all but the coldest Arctic and remotest desert. Ferns are excessive opportunists that arose in the Carboniferous Period 360 million years ago. They existed long before the dinosaurs, completely thrived alongside them, and still flourish today. Nearly one-tenth of the world’s fern species are found within Costa Rica’s unique array of microclimates; the most diverse reside within the wet realm of the cloud forest. The increased precipitation of mid to high elevations provides a particularly suitable environment for epiphytes; ferns also require moisture in their diminutive gametophyte stage of their life cycle to allow the sperm to swim from the antheridium to the egg found in the archegonium.



Figure 2. Owner Sara Clark hiking along the river.

## Fern Colonizers

Many Costa Ricans view ferns as pests, as they grow rapidly on cleared land and along roadside banks. With no flowers or fruits, both their ascetic and nutritional value is limited. However, ferns can be useful indicator species, and their longevity—geologically speaking—is indicative of their evolutionary adaptiveness. Regardless of their value to

humans, one can't help feel an inherent appreciation for this prehistoric presence. Hidden spore clusters under ornate leaflets—revealed by the curious with the lift of a frond—and the intricate symmetry of their delicate blades are only part of their simple yet elegant beauty.

### **Fern Allies**

There are a number of fern relatives that, similar to all Pteridophytes, possess vascular tissue that enables them to stand upright and conduct water and nutrients throughout the plant body. These allies include club mosses (Lycopodiaceae), spike mosses (Selaginellaceae), horsetails (Equisetaceae) and whisk ferns (Psilotaceae). Where ferns produce sori on leaflet undersides, fern allies usually produce spore cases in conelike stalks often found at the tips of stems. A number of these fern allies have been included in this survey.



Figure 3. Sara Clark has allowed green growth to return to Finca Dos Lados, including many ferns. In stark contrast, above these young plants is land just outside her property (by the hill crest), which resembles what most of the farm looked like back in 2002.



Figure 4. Multiple club moss species, an example of fern allies.

## Pteridophyte Photo List

Photos were taken between April 17 and 24, 2011. Forty-two separate ferns and fern allies were identified. Where possible, using the resources available on site, these were classified to a specific species, genus or family. From some 1400 photos, nearly 200 were carefully selected to document these species; these photos can be found in a separate folder entitled “Pteridophyte Photos”. Below is a complete list of the ferns and fern allies identified:

### Species (7)

*Blechnum falciforme*  
*Blechnum occidentale*  
*Cyathea multiflora*  
*Elaphoglossum lingua*  
*Lophosoria quadrapinnata*  
*Phlebodium pseudoaureum*  
*Polypodium fraxinifolium*

### Genera (16)

*Blechnum* (5 belonging to this genus)  
*Dicranopteris*  
*Gleichenia* (4 belonging to this genus)  
*Micropolypodium*  
*Pityrogramma*  
*Pteridium*  
*Thelypteris*  
*Trichomanes* (2 belonging to this genus)

### Family (1)

Cyatheaceae

### Unknowns (14)

1. Branching secondary veins fern
2. Fish scale pattern fern
3. Fuzzy fern
4. Lacy fern
5. Possibly Antrophyum
6. Possibly high altitude Nephrolepis
7. Rounded lobed fern
8. Sori ridges fern
9. Tall erect fern
10. Tapering blades fern
11. Tender tribranched fern - lobed
12. Tender tribranched fern
13. Terrestrial fern
14. Zigzag fern

### Fern Allies (4)

*Equisetum* (genus)  
*Lycopodiella* (genus)  
*Lycopodium* (unknown species)  
*Lycopodium clavatum*



Figure 5. Photo of *Lophosoria quadrapinnata*, showing detail of the sori on the leaflet underside.

## Species Accounts

This section includes additional information on the forty-two fern types found, including frequency on the farm lands, location found on-site, relative size (small = less than 20cm, medium = 20 to 60cm, large = more than 60cm) and other attributes that may assist in further classification.

### Species (7)

#### *Blechnum falciforme*

Common on the farm, medium-sized fern, stem woody.

#### *Blechnum occidentale* (hammock fern)

Uncommon fern, found at N 10° 10.146' W084° 17.710' GPS coordinates, smallish fern, young fronds reddish in colour.

#### *Cyathea multiflora*

Very uncommon tree fern, found only on Caribbean side of continental slope.

#### *Elaphoglossum lingua* (hart's tongue)

Very common and distinct fern with a single blade. Found throughout site. Spore-bearing fertile fronds extremely rare in April.

#### *Lophosoria quadrapinnata*

Most common fern present in Finca Dos Lados, large tree fern with little or no trunk, enormous fronds well over a meter long.

#### *Phlebodium pseudoaureum*

Very common fern, especially along roadside banks, terrestrial and epiphytic.

#### *Polypodium fraxinifolium*

Uncommon on the farm, found partway up trail to continental ridge, distinct, wavy secondary veins resemble fish bones.

## Genera (16)

### *Blechnum* 1

Common fern with scaly rachis. Large, slender, pointy leaflets are tightly packed together, almost overlapping where they attach to the stem.

### *Blechnum* 2

Very common fern on the farm, found in many areas. Distinct sterile and fertile fronds, fertile fronds have very long and narrow leaflets, leaflets are conspicuous, especially on sterile fronds, in having deeply rolled over margins.

### *Blechnum* 3

Uncommon fern on the farm, found on trail up to continental ridge. Small to medium-sized, young fronds distinctly red.

*Blechnum 4*

Uncommon fern on the farm, found along continental ridge. Similar to *Blechnum 3*, but margins more ruffled.

*Blechnum 5*

Only found one specimen on farm on path up to continental ridge. Smallish fern with oval-shaped leaflets, grows in rosette pattern.

*Dicranopteris*

Very common fern on banks or excavated areas, with distinct branching pattern and pale whitish waxy underside to leaflets.

*Gleichenia 1*

Very common fern on banks or excavated areas, with distinct branching pattern and scaly brown leaflet undersides.

*Gleichenia 2*

Uncommon on farm, smallish, fronds branch into two, multiple times from same stem, brown scaly on rachis, margins curved.

*Gleichenia 3*

Uncommon on farm, brown scaly stem, bud with scales.

*Gleichenia 4*

Common on farm, white scaly stem, secondary veins branched, leaflet underside pale whitish.

*Micropolypodium*

Uncommon fern, very diminutive (long, slim frond about 1cm in width), epiphytic in wet areas. Both leaflets and sori possess hairs that are scarcely visible with the naked eye.

*Pityrogramma*

Relatively uncommon, found in creek that provides hydro power, medium-sized fern, rounded leaflets overlap and under-lap neighbouring leaflets, seen in rosette.

*Pteridium* (bracken)

Relatively uncommon on farm, found some groups on sloping hillside above Sarchi River.

*Thelypteris*

Relatively uncommon, found near Sarchi River, tough medium-sized fern, sori resemble tiny blackberries.

*Trichomanes 1*

Uncommon, found near the cabina on Caribbean side of continental divide, small slight fern with feathery leaflets.

## *Trichomanes* 2

Uncommon, found near Sarchi River, small fern with brown rachis, rounded leaflets that are not quite divided.

### **Family (1)**

Cyatheaceae

The tree ferns are more common near rivers. Some 80 species are indigenous to Costa Rica. This particular tree fern possesses a sizeable trunk and abundant scales—which taper to a point—located on the trunk and new, unfurling fiddleheads.

### **Unknowns (14)**

#### 1. Branching secondary veins fern

Somewhat common fern, found on path up to continental ridge. Resembles *Phlebodium pseudoaureum* but secondary veins branch in a different pattern (forms more V-shapes than the hexagons seen in *Phlebodium pseudoaureum*).

#### 2. Fish scale pattern fern

Uncommon fern, found on path up to continental ridge. Small fern with unique secondary veins pattern that often resemble stacked pentagons.

#### 3. Fuzzy fern

Very common fern, found throughout farm, small to medium-sized with white hairs on all parts.

#### 4. Lacy fern

Uncommon fern, found on continental ridge, medium-sized and almost frilly-looking, with short white hairs on stem and leaflets, leaflet margins curled and underside possesses a white deposit on one edge.

#### 5. Possibly Antrophyum

Uncommon fern, found past cabina on Caribbean side of continental divide, small epiphytic fern with only single blade.

#### 6. Possibly high altitude Nephrolepis

Uncommon fern, found past cabina on Caribbean side of continental divide, medium to large-sized with long, dangling fronds.

#### 7. Rounded lobed fern

Uncommon fern, found in small creek which provides hydro power, fern possesses distinct rounded leaflets.

#### 8. Sori ridges fern

Uncommon fern, found on sloping hillside above Sarchi River. Small epiphytic fern with two distinct rows of spores on either side of midvein.

9. Tall erect fern

Uncommon fern, found outside main lodge, medium-sized with tall slender fronds, when spores emerge from indusium the sori resemble tiny tacos.

10. Tapering blades fern

Uncommon fern, found in small creek which provides hydro power, medium-sized typical fern lacking conspicuous characteristics.

11. Tender tribranched fern - lobed

Very uncommon fern, found by Sarchi River, light and tender to touch, very distinct oval to squarish leaflets, new fiddleheads emerge distinctly at center of stem.

12. Tender tribranched fern

Very uncommon fern, most groups found along continental ridge. Largest collection found at N 10° 11.149' W084° 17.138' GPS coordinates. Very light fern, soft and feathery to touch, new fiddleheads emerge distinctly at center of stem.

13. Terrestrial fern

Uncommon fern, found near Sarchi river, largish typical fern lacking conspicuous characteristics.

14. Zigzag fern

Common fern if you look closely, found in multiple areas on farm, very small, both stem and leaflets possess conspicuous zigzag pattern.

**Fern Allies (4)**

*Equisetum* (horsetail genus)

Common on farm, although this is the only horsetail seen, medium in height, very small in width, more abundant at higher elevations.

*Lycopodiella* (genus)

Common on farm, found in multiple areas, club moss with drooping stem and leaves that branch repeatedly and often terminate in drooping spore cones.

*Lycopodium* (unknown species)

Relatively common on farm, more frequent at higher elevations, erect club moss, almost triangular appearance, stem branches repeatedly at short intervals.

*Lycopodium clavatum* (stag horn club moss)

Very common on farm, found in many areas, trailing club moss with upright spore cones, spore cones start from single stems that branch into clusters.

## Acknowledgement

Our heartfelt thank you to Sara for allowing us to be a part of her farm and family for ten days of wonderful discovery. Not only were you our guide, chef, friend and most gracious host, but your passion and dedication are an inspiration for all things natural.



Figure 6. Jennifer Beavington next to *Lophosoria quadrapinnata*, a type of tree fern with no distinct trunk.



Figure 7. Lee Beavington inspects the fern diversity along the Gorrion River.