

# DAVIS EXPEDITION FUND

## REPORT ON EXPEDITION / PROJECT

<b>Expedition/Project Title:</b>	São Tomé - collection of materials to support key research plant groups of RBG Edinburgh
<b>Travel Dates:</b>	13-28 <sup>th</sup> March 2014
<b>Location:</b>	São Tomé
<b>Group Members:</b>	Martin Gardner and Carl Berthold
<b>Aims:</b>	To collect research materials of plant groups currently being studied at RBGE. To carry out a field assessment for IUCN conservation assessment for <i>Afrocarpus mannii</i> . To forge research links with with Jardim Botânico e do Herbário Nacional de São Tomé e Príncipe

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### Outcome (not less than 300 words):-

#### Aims of fieldwork:

1. Collection of research materials of plant groups currently being studied at RBGE
2. Studies of population size and current threats of *Afrocarpus mannii* with a view to updating its conservation assessment
3. To forge research links with with Jardim Botânico e do Herbário Nacional de São Tomé e Príncipe

#### Fieldwork and outcomes:

Our first day was spent meeting our local contacts, collecting our vehicle and organizing our first day of fieldwork. Fieldwork for the whole trip was carried out in central/northern part of São Tomé on the slopes of the extinct volcano of Pico (see Figure 1 and 2).

The first day of collecting was to Lagoa Amélia which is the centre of the volcano that is now an enclosed swamp. We began our survey at the botanical garden which is located near Monte Café (See figure 1). Here we met with Estevão, our guide and ranger to the whole park. The botanical garden was initiated by an EU fund to do

research on the island but has since been mostly ignored by the ministry of the environment. The building consisted of a colonial house with a herbarium, offices and a teaching room. The site itself was very remote with a very basic road connecting it to the local village – this has had a negative impact on visitors and maintenance on the garden.

We began our trip going through disturbed forest and semi-abandoned plantations. Here we managed to find an endemic species of *Leea tinctoria* (Leeaceae – see Figure 3), *Polystachya albescens* and *Alsophylla thomeana*.

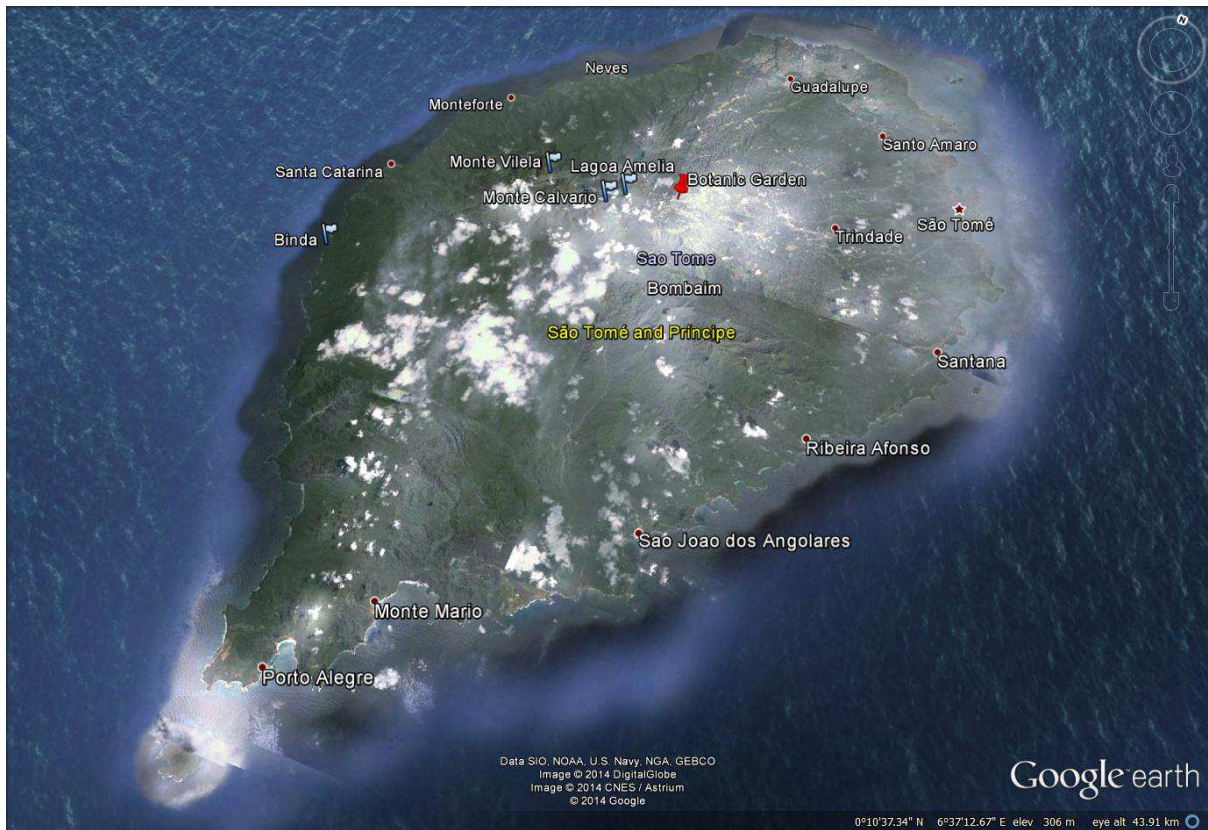


Figure 1 – The island of São Tomé. Collecting sites are designated by blue flags and the botanic garden by a red marker.

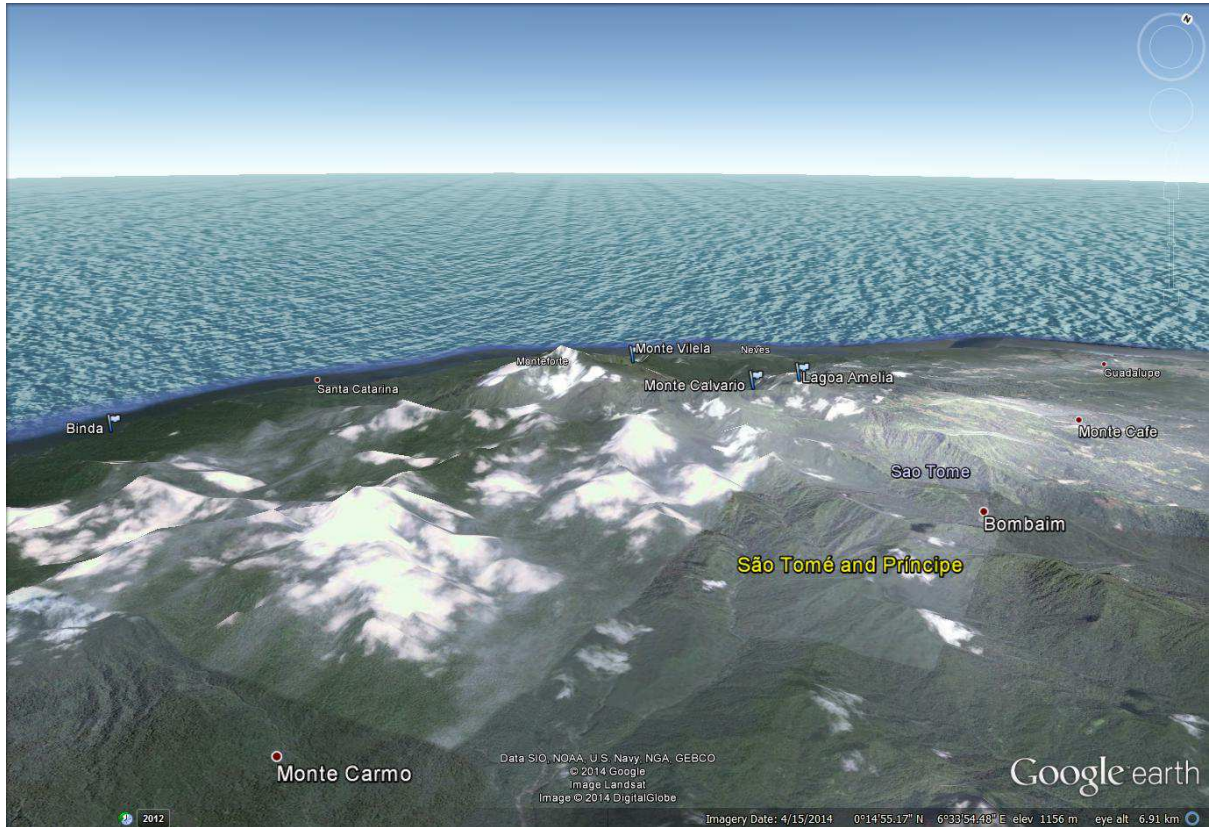


Figure 2 – Panoramic view of the collecting sites showing the topography of the island.



Figure 3 – *Leea tinctoria* (Leeaceae)

Soon after we arrived at the swamp which proved to be a treasure trove for Begonia's. Our first find was *Begonia baccata*, a tree-like *Begonia* which grew among the forest (where it grew tallest, competing for light – see Figure 4) and along the edges of the swamp (where it grew shorter, but had more flowers). We also

found the endemic *Rhipidoglossum brevifolium* orchid which is known only from this swamp (see Figure 5)



Figure 4: *Begonia baccata* in tree-form growing up to 8 meters high;  
Figure 5: *Rhipidoglossum brevifolium* is an orchid that grows only in water all year round

On our way back we came across a small population of *Afrocarpus mannii* with a carpet of week-old seedlings under the canopy (See figure 6). Due to the lack of young adult trees we managed to gather that there is a high juvenile death rate. We also managed to find *Begonia subalpestris* and *B. thomeana*.



Figure 6 – *Afrocarpus mannii* seedlings.

### Monte Calvário

After discussing with our local contact Ricardo Lima and the rangers we decided to search for *Afrocarpus mannii* in a more remote area of the volcano which consisted of a 4km ridge from varying spans of 2m to 100m wide. The path to this ridge led us through farmland and into secondary forest - the ridge being mostly primary. On the slopes leading to the ridge we managed to find *Begonia ampla* (see Figure 7), *Renealmia sancti-thomae* (endemic - see Figure8) and a terrestrial orchid. Upon reaching the ridge we found and collected several ferns of which we have brought back spores. We did not find any *Afrocarpus* on the ridge but were told there is still a population one hour from the highest point on the island but due to time constraints we could not carry on to the peak.



Figure 7: Author next to *Begonia ampla* – growing at lower altitudes than *B. baccata*.  
Figure 8: *Renealmia sancti-thomae* growing in dense undergrowth on the steep slopes of Pico.

## Binda

The last village on the northern road going west along the coast. The north of the island consists mostly of savannah and introduced African species of *Acacia* and Baobab trees. Binda was once a large cocoa plantation but was also remote enough to contain good amounts of coastal vegetation. Here we found *Begonia mulleri* and *B. annobonensis*, *Asplenium cf. inaequilaterale* (see Figure 9), *Drynaria laurentii* and *Brillantaisia lamium* (see Figure 10).



Figure 9 - *Asplenium cf. inaequilaterale* growing over a fallen tree in the middle of the river. Only specimen found of this species during the whole trip.



Figure 10 - *Brillantaisia lamium*, growing in disturbed habitats near plantations.

### Ridge of Monte Vilela

Our last survey was mainly focused on searching for young trees of *Afrocarpus mannii*. Our guide, Estevão, took us to a ridge near Monte Vilela looking for young juvenile trees so we could assess whether the population of this species was in rapid decline or not. We had already learned from local sources that the timber of *Afrocarpus mannii* was the best hardwood timber on the island and that the previous

president had cut down 35% of the population to furnish his house. Luckily, we found a population of 30 trees which were around 50-100 years old (See Figure 11) but this site had no new seedlings. We also came across *Begonia molleri* (see Figure 12) and a species of *Afromomum* which was just in leaf. We also managed to collect seed of *Begonia ampla* from another population.



Figure 11 – the fine leaves of *Afrocarpus mannii* are easy to distinguish from the other tropical trees in the forest.

Figure 12 – *Begonia molleri* growing up trees in deep shade.

A total of 35 species were collected on the trip for herbarium samples with silica samples also collected. Duplicates were deposited in the herbarium in São Tomé along with living material of *Rhipidoglossum brevifolium*. Fern spores were also collected along with seeds from various *Afrocarpus mannii* populations.

These collections have already proven valuable for the research here at RBGE, with pickled and specimen material already being used by PhD students for the *Renealmia* and the *Begonia* species. For *Afrocarpus mannii* we estimated a total of 3000 trees are left of the island but the majority we were told are mature trees and their numbers declining due to logging and seedlings not adapting to new climate. This and more information has contributed greatly to the completion of its IUCN conservation assessment. Information was also gathered for *Rhipidoglossum brevifolium* which is only known from the single site in the world.



## **Acknowledgements**

I would like to thank Martin Gardner for pioneering this project and his patience and knowledge in dealing with local authorities. I would also like to thank Ricardo Lima and the staff at the botanic garden in São Tomé for their invaluable help and knowledge.

Many thanks to the Davis Expedition Fund for making this trip possible. This grant made it possible to survey and establish links with an island that is poorly studied and hard to reach, allowing material and conservation information to reach the hands of researchers at RBGE and, in due process, the world.