Pilot study on the use of rope canopy access for sampling anurans in the lowland rainforest of Ecuador

- Team of 12 students from Glasgow University on a 6-week expedition to the Ecuadorian rainforest

Research station at San Jose de Payamino, in the Orellana province of Ecuador (www.payamino.org)

- Three of us trained in twin-rope canopy access

Twin-rope canopy access

- Adapted from Industrial Abseiling systems and safer than single-rope
- Two ropes are rigged over a suitably strong branch and attached to anchor points on the ground
- One rope is climbed while the other is used as a safety
- Climbers can be lowered to the ground in cases of emergency

Training in Basic Canopy Access Proficiency provided by Canopy Access Limited (www.canopyaccess.co.uk)

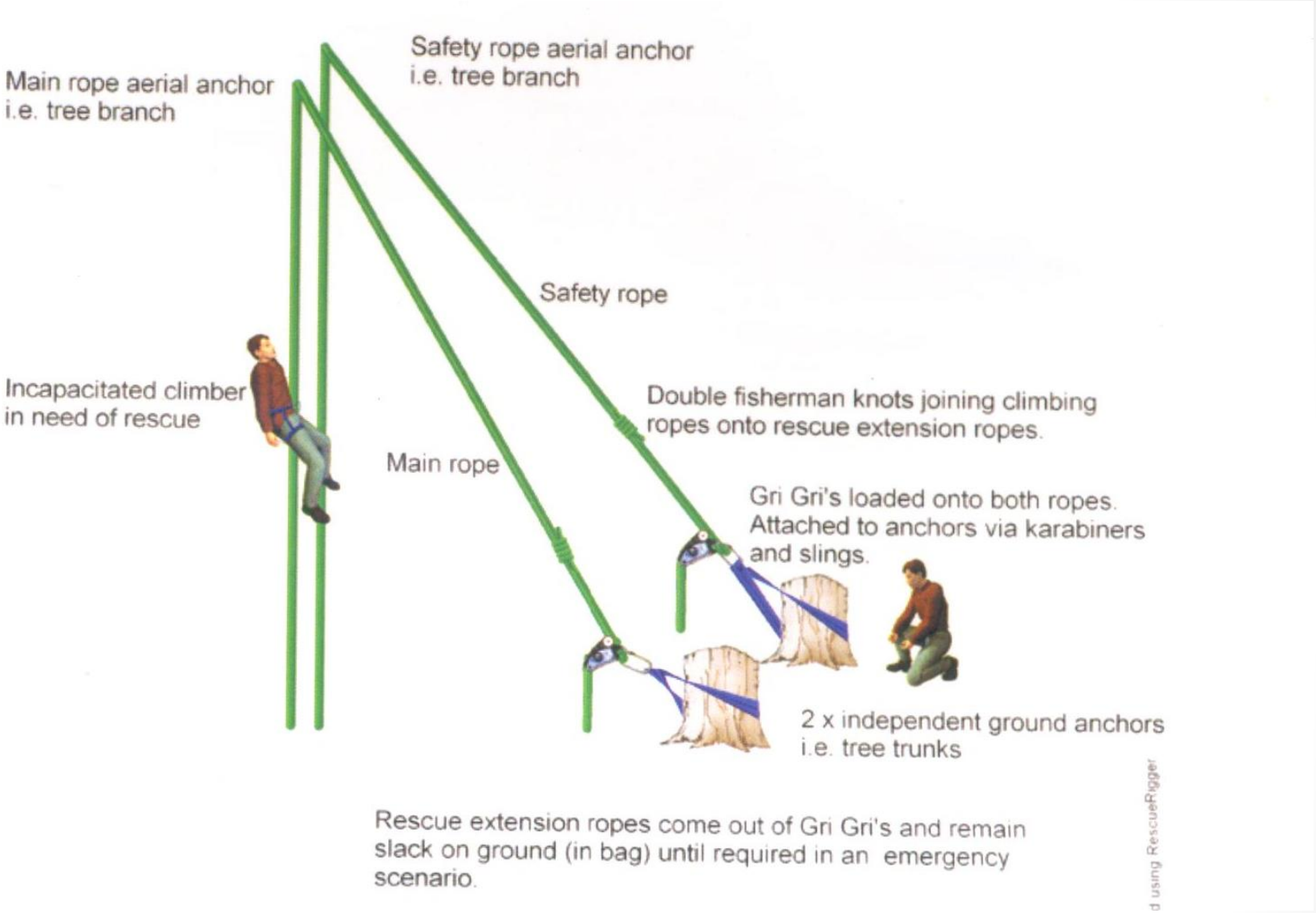
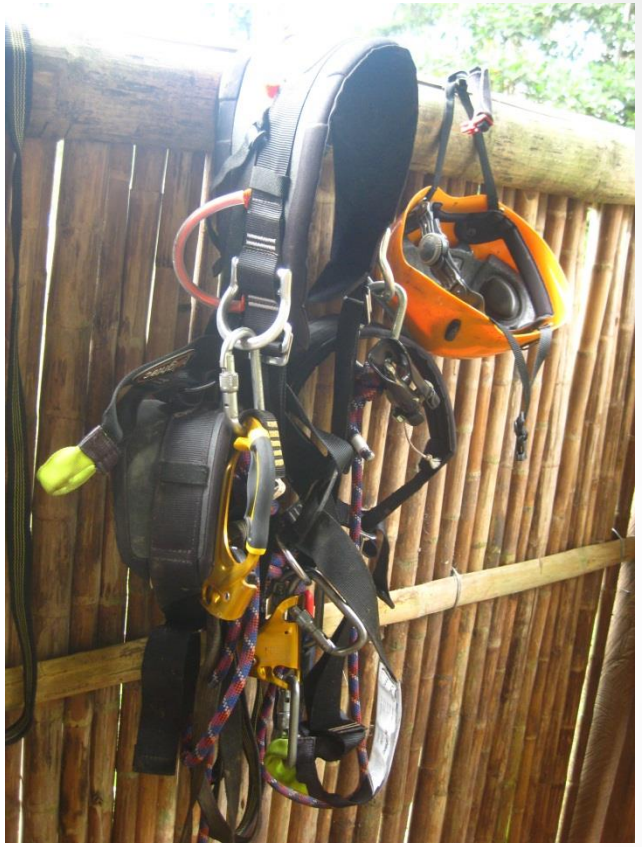


Diagram of a Ground-Based Rescue System (CAL, 2010) allowing incapacitated climbers to be lowered to safety



Climbing harness with hand and chest ascenders and descender

Lots of equipment is necessary

Objectives

- I wanted to see if we could use canopy access to find arboreal frogs and how effective it would be compared to more common methods
- We heard a lot of frog calls in the canopy but all sampling efforts on previous expeditions were directed towards ground transects
- Unfortunately, there has been very little previous research ! Neotropical arboreal frogs are extremely understudied and even their diversity is poorly known, they are usually unsuitable for ground studies, many localities are under-sampled and the canopy rarely searched.
- They have mainly been found in bromeliads, which we weren't allowed to remove or dissect.

Phyllomedusa vaillanti (white-line leaf frog), an arboreal species

Methods

- We successfully rigged 9 trees, but were only able to regularly climb 6 as the other 3 were found to be unsafe after the first climb (stinging insects)
- We realised a total of 33 climbs, of which a third were during night time
- During each climb we searched the trunk and surrounding branches and epiphytes for frogs or signs of them

It was our first time doing canopy access, so as you can imagine there were plenty of difficulties …

Some problems

- Equipment lost, lines tangled, trees with high epiphyte loads were very difficult to rig
- Limited to large and healthy trees
- Limited to sampling close to the trunk, in the lower to mid-canopy only
- Pseudo-replication an issue
- Little standardisation of experimental protocols for canopy work
- Very time consuming !

Hyla geographica, an arboreal species which can be found on lower trunks

Results

- We only found one frog, at 18 m above ground during a night climb
- We saw 3 foam nests, at over 20 m high

Foam nest attached to a branch in the canopy

→ There were definitely frogs up in the canopy, but they were very difficult to find.

Reasons: small, nocturnal, difficult to spot, seem to prefer thin branches in the outer canopy, and very mobile

A view of the surrounding canopy while climbing

To conclude on twin-rope canopy access as a method for finding arboreal frogs:

Cons

- Relatively expensive, lots of equipment necessary and very time-consuming compared to similar studies run on the ground
- Laterally fixed position when climbing and limited access to the canopy
- Lack of long-term background data on canopy science collected with standard technique
- Small sample sizes and little replication
- Only 1 frog found !

Pros

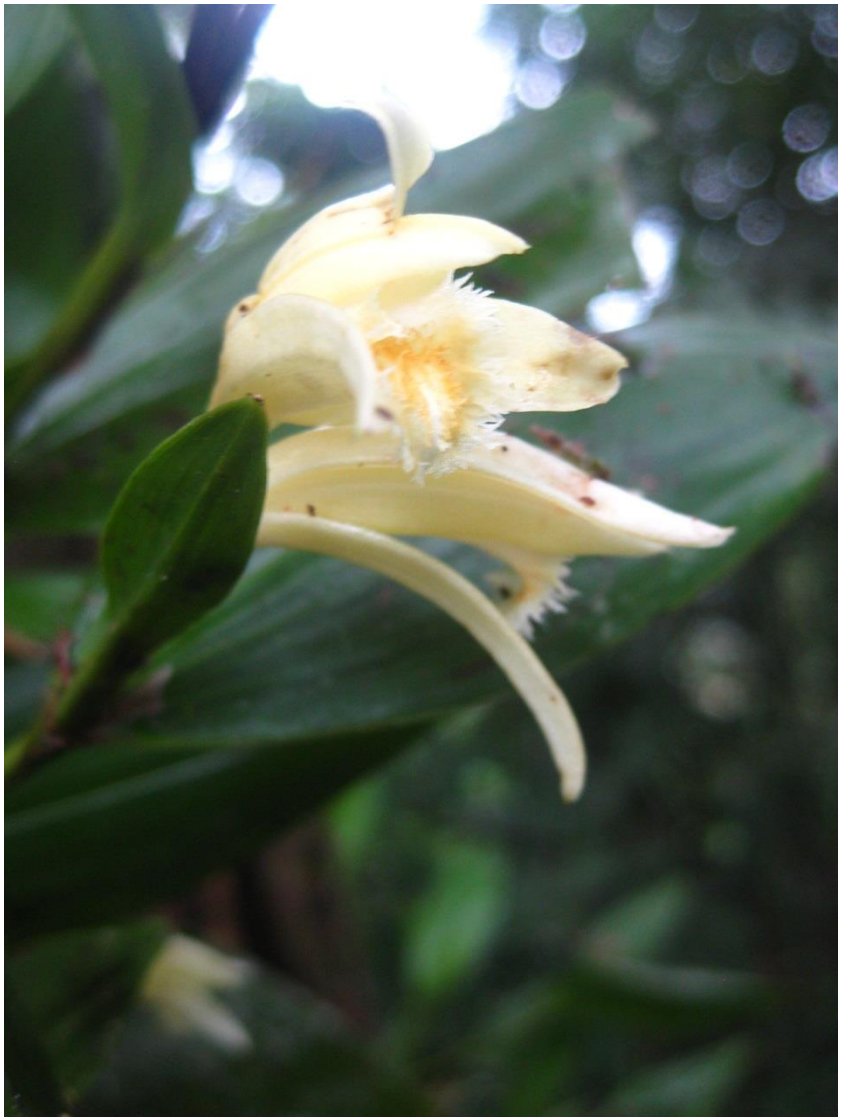
- Far cheaper and simpler to operate than other canopy access methods (cranes, walkways, aircraft)
- Easily portable, only requires 2-3 people
- Has previously shown to produce samples of rarely encountered arboreal frogs, and the discovery of new species

Twin-rope canopy access is one of the cheapest and simplest ways to study the canopy and provides access to frog species rarely encountered on the ground. However it is not particularly suited to visual encounters with arboreal frogs as they are mobile and difficult to spot.

Using rope canopy access in conjunction with other methods such as bromeliad patch sampling (removing and dissecting bromeliads) or placing traps may be far more effective.

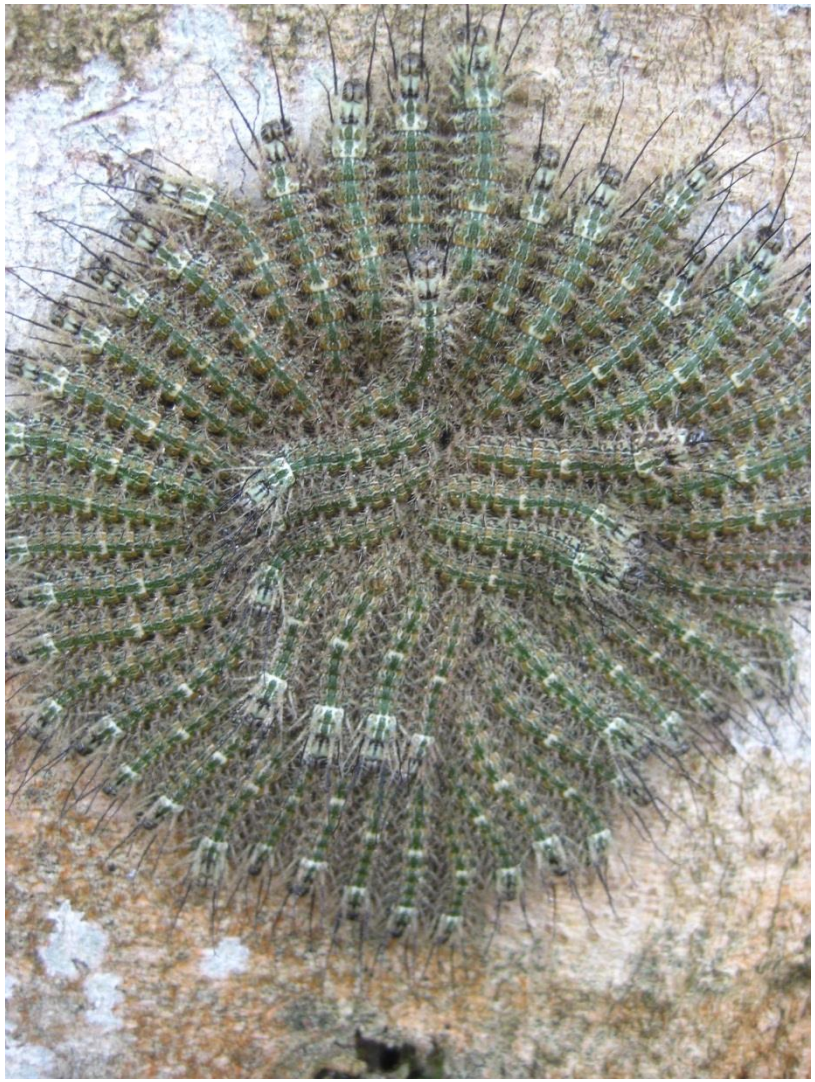
Osteocephalus cabrerai, a semi-arboreal species

At least we saw some fun stuff : a flowering canopy orchid



A whipscorpion (order Thelyphonida) 5m up a trunk

Recently hatched caterpillars arranged on a trunk



They stayed like this for several days and were slowly picked off one by one by birds

Another unknown caterpillar species

Thank you !

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All photos by Malyon Bimler, Ecuador 2011