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# Canopy Raft Program discoveries and photos from Madagascar.

August 2007. The Canopy Raft Program is based on an inflatable raft type structure that is lowered onto the forest canopy by a blimp. Once in place the raft provides unrivalled access to undisturbed ecosystems and has led to the discovery of many new species. Some 2,000,000 species have been described by science to date, yet it is thought that as many as 10,000,000 species may exist.

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Tropical forests harbour the greatest biodiversity on earth,

canopy tree tops, which are often 150 feet above the ground, is probably the least explored ecosystem on land. The canopy raft system enables scientists to research more than just the tree tops. Once the raft is in place scientists can lower themselves on ropes to other parts of the forest. The raft also allows access to areas that are inaccessible at ground level. It is lowered into place from above, usually from the underside of a dirigible air ship. The raft also provides a base for sleeping and living, allowing scientists to remain in places overnight and for several days, meaning they can study the canopy at all times of day and over an elongated period, which would not otherwise be possible.

## Masoala National Park

Masoala National Park (MNP) on the west coast of the Masoala Peninsula in northeast Madagascar is one of the wettest places on

the island with an annual rainfall of over 350 cm per year. The MNP comprises 2100 sq. km of land plus three marine reserves, and includes the largest piece of primary lowland tropical forest in Madagascar.

## Canopy Raft, how it works

Dante Fenolio (Great name) and his collaborators participated in the French run canopy raft program to MNP in 2001 and discovered several new species. The survey equipment consisted of the canopy raft, a sled dragged underneath a dirigible, a bouyant balloon tied to a rope through the canopy, and two small, icosohedral 'tree-houses,'

or ICOS units set in canopy trees. Canopy searches were performed from the canopy raft, from the sled hung below the dirigible, from visual surveys from each of the two ICOS units, and from canopy ascents using free ropes secured to trees. Other levels of the forest were sampled using pitfall trap arrays and opportunistic searching along forest trails during the day and night.



## **New discoveries**

## New Frog

Frogs in the Masoala's wet forests exploit a variety of microhabitats

ranging from the ground to the upper canopy. These microhabitats also include plant-held waters, referred to collectively as phytotelmata. While surveying the herpetofauna at various canopy levels and studying phytotelm community structure, we found a species of frog that could not be classified as a currently recognized species.

The new species, Anodonthyla hutchisoni, is named in honour of a lifetime of dedication to excellence in herpetology by V. H. Hutchison.

The team also discovered two new, very small, frogs, Platypelis tetra which measures just 20mm) and the much larger (30 mm) Platypelis mavomavo. Both these frogs were collected within a day of each other on another expedition in 2002 by Dr. F. Andreone.

The team also made an interesting discovery of two species of tree-climbing crabs belonging to two families



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(Potamonautidae and Sesarmidae) that were collected from container microhabitats (phytotelmata) in rainforest in the Masoala Peninsula. This isolated peninsula supports one of the last undisturbed intact primary humid tropical forests in Madagascar, and is free from much of the human encroachment that has caused the environmental problems seen elsewhere on that island.

Most faunal surveys of rainforest ecosystems have necessarily focused on areas that are accessible from the ground. This study surveyed all levels of the forest. Special attention was paid here to phytotelmata because crabs (as well as other arthropods and frogs) often exploit water pools in leaf axils, tree holes, and crevices within branches. These microhabitats provide



moist humid conditions both within the rainforest under story, and in the high canopy layers which can be exposed to drying winds and intense sun exposure.



Not all tree climbing crabs are phytotelmic. There are a number of species that lay their eggs directly into the sea, yet climb trees for protection, concealment, and a source of fresh leaves to eat, rather than as using the phytotelmata as a freshwater microhabitat for their larval stages. For example, species of tree-climbing crabs that are not known to be phytotelmic have been reported from Tanzania, Kenya, Singapore, and Taiwan.

A growing number of species of true freshwater crabs are recognized to inhabit phytotelmata in rainforest ecosystems ranging from Africa to mangrove ecosystems in Asia. The present report of two little-known species of tree-climbing crabs living in phytotelmata at different levels of the rainforest canopy in Madagascar represents the first record of this nature for the island, and constitutes new distribution records for these two species.

For PDFs of these findings visit www.anotheca.com and click on the 'CV' tab.

Our sincere thanks to **Dante Fenolio** for his help and with this article, and for his images.

## More photos from the Madagascar Forests





Leaf Tailed Gecko

## Malagasy Tree Slug

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