

The ongoing story of Ambodiriana forest in Madagascar

a representative case-study of in situ conservation



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eclerc

Overview



Deforestation in Madagascar

The early years of Ambodiriana forest protection (1996-2013)

Orchids of Ambodiriana

Recent events (2013-2018) and future?

Why deforestation in Madagascar?

- **Slash and burn (tavy)**
- **Charcoal**
- **Logging:** now mostly illegal

Rare woods: **Ebony – Rosewood - Palisander**



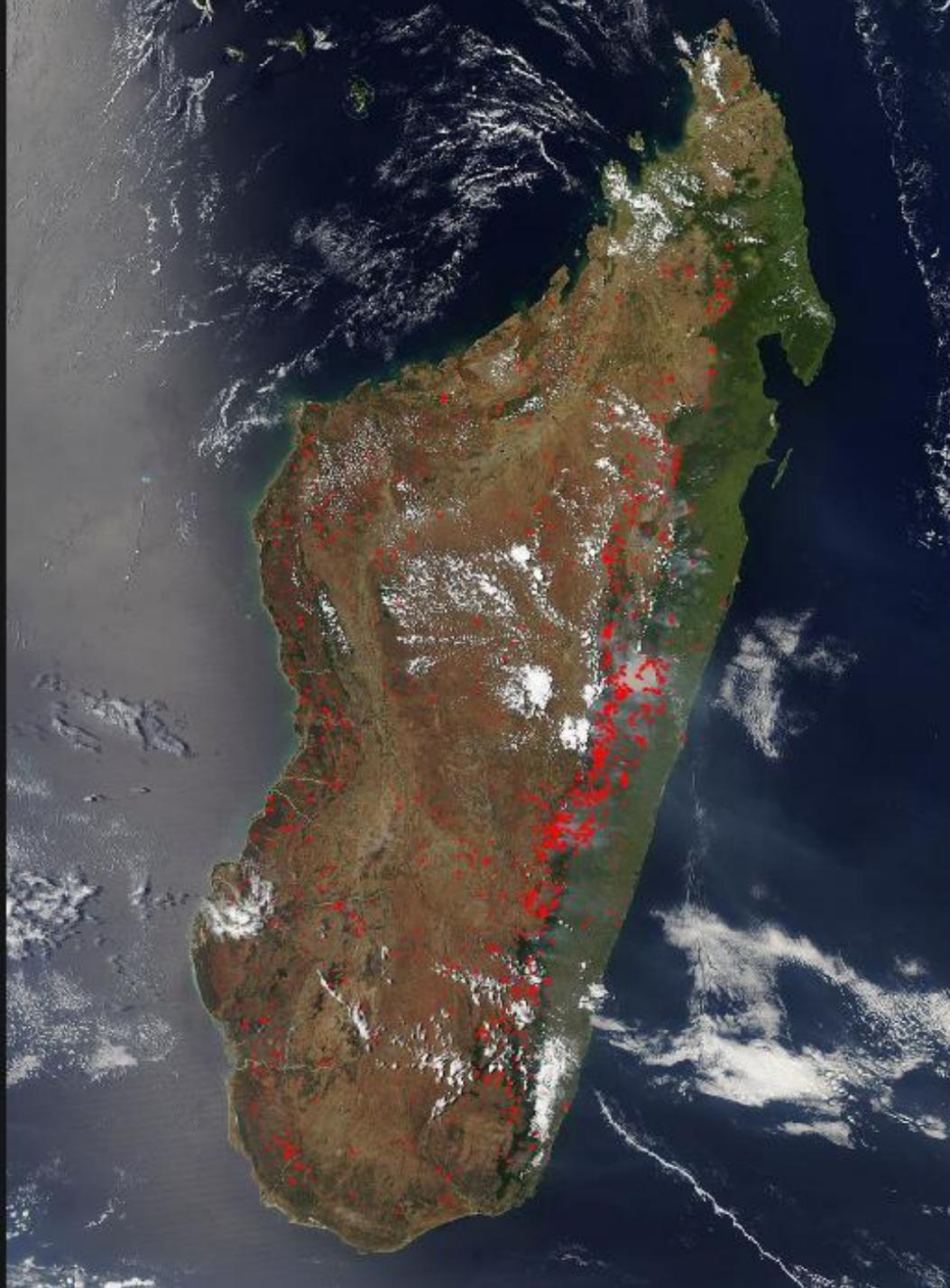
Yet the forest is a traditional resource for the people in the East coast of Madagascar

- **Housing:** traditionally in wood in this area
- **Cooking:** charcoal
- **Food:** animals, vegetables, fruits, etc.

The traditional custom in the East coast:

**Wood belongs to who cuts it
Land belongs to who clears it**





**Fires and smoke
along the Ankaratra
mountains of
Madagascar**

The Moderate Resolution Imaging Spectroradiometer (MODIS) instrument on NASA's Aqua satellite picked up the heat signatures of fires (red areas) and smoke on October 25, 2011 at 10:45 UTC (6:45 a.m. EDT). These are mostly agricultural fires.

*NASA image courtesy
Jeff Schmaltz, MODIS
Rapid Response Team.
Caption by Rob Gutro,
NASA's Goddard
Space Flight Center*

Humid tropical forest of the East coast of Madagascar...



Mananara National Park
Verezanantsoro sector
8 December 2007



Manjakatempo forest reserve
22 February 2011



An example of illegal logging...



**Rosewood
(Dalbergia sp.)**



Masoala National Park
250 000 ha « protected »



100 to 200 trees logged daily

7 containers of 30 tons per day

Photos ©Tobias Smith/EIA/Global Witness

Madagascar tries to dispose of seized stockpiles of illegally logged rosewood. The government must conduct a comprehensive inventory of the stockpiles, among other requirements issued by CITES. The current state of affairs, with untold thousands of rosewood logs still unaccounted for, and tens of thousands more stacked outside government offices, is widely seen as facilitating continued corruption and illicit activity.

Current estimates of tropical forest loss (hectares)

Country	Rank	Forest Loss 2014	Avg loss 2010-2014	Avg loss 2005-2014	Trend
Brazil	1	2,262,241	2,347,727	2,498,603	down
Indonesia	2	1,490,457	1,543,623	1,506,965	up
DR Congo	3	1,100,880	778,348	633,262	up
Malaysia	4	493,385	469,511	445,252	up
Paraguay	5	305,650	406,785	360,058	up
Bolivia	6	220,470	291,167	270,797	down
Myanmar	7	259,443	207,677	173,978	up
→ Madagascar	8	318,465	203,165	162,911	up
Cambodia	9	123,779	187,893	136,682	up
Peru	10	183,544	187,196	160,822	up
Colombia	11	165,507	183,676	203,500	down
Mexico	12	130,717	175,603	194,813	down
Laos	13	191,032	168,422	139,211	up
Mozambique	14	163,345	162,138	169,403	down
Tanzania	15	161,899	154,860	138,070	up
Tropics			10,046,182	9,664,875	
Sub-tropics			2,267,323	2,393,499	

Data source: *Hansen et al 2015*



Ambodiriana forest near Manompana

A 240 ha relict patch of the original forest that once covered the lowlands of Eastern Madagascar



Photo Chantal Misandeau



Ambodiriana forest seen from offshore



Manompana main street



Photo Jean-Michel Hervouet

Tintingue bay: a mangrove and a nice orchid spot with *Angraecum eburneum*

Tintingue mangrove in Manompana



Angraecum eburneum subsp. *superbum*



Angraecum sesquipedale

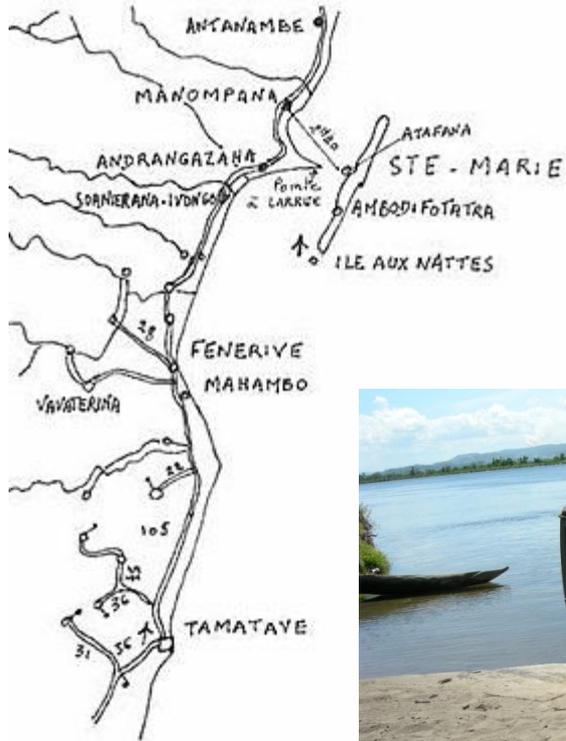




Humpback whale (*Megaptera novaeangliae*)

Access to Manompana...

National 5 ...



Unprotected areas: a « tavy » on the way to Ambodiriana...



ADEFA

www.adefa-madagascar.org

Association de Défense et d'Étude de la Forêt d'Ambodiriana-Manompana

Non profit organisation (French law 1901)

Created in 1996. Based in Saint-Leu, La Réunion island.

Agreement with Malagasy state since 1999,
for managing and protecting the site.



Goals:

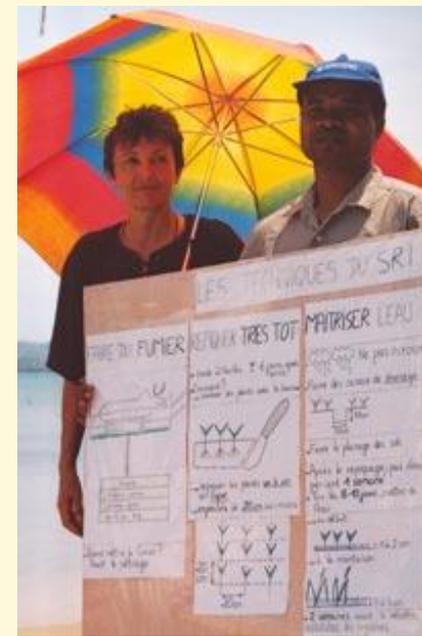
Developing a sustainable ecotourism, involving local communities.

Protecting the Ambodiriana forest. Extending the protected area.

Upgrading the official status to: « Remarkable Natural Monument »

Funding:

Members, research organisations, ecotourism, garage sales



Actions with villagers must be respectful of their beliefs and customs

Ambodiriana was a sacred forest, with a number of « fady » or taboos:

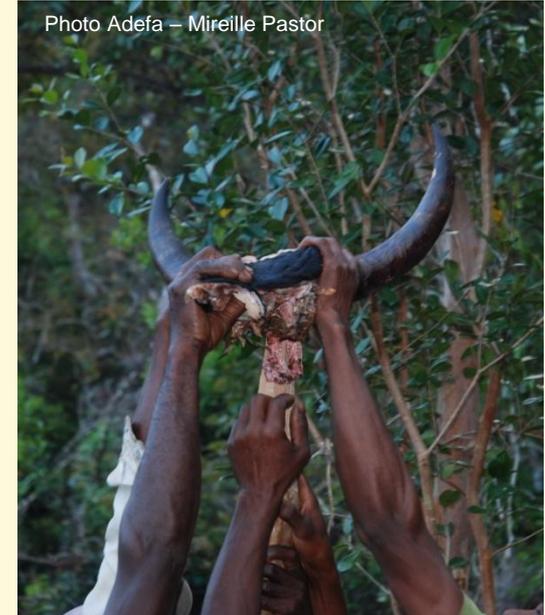


No agriculture on Tuesday
Walking barefoot
Bathing nude in the river
No entry for some « vazaha »



Modifications of « fady » possible

For this, ADEFA asked the « **tangalamena** » to do sacrifices, to beg the ancestors their consent. At Ambodiriana, it was a zebu for asking and another one to thank the ancestors, who accepted.





2007. « Jôro » ceremony to thank the ancestors

Reforestation

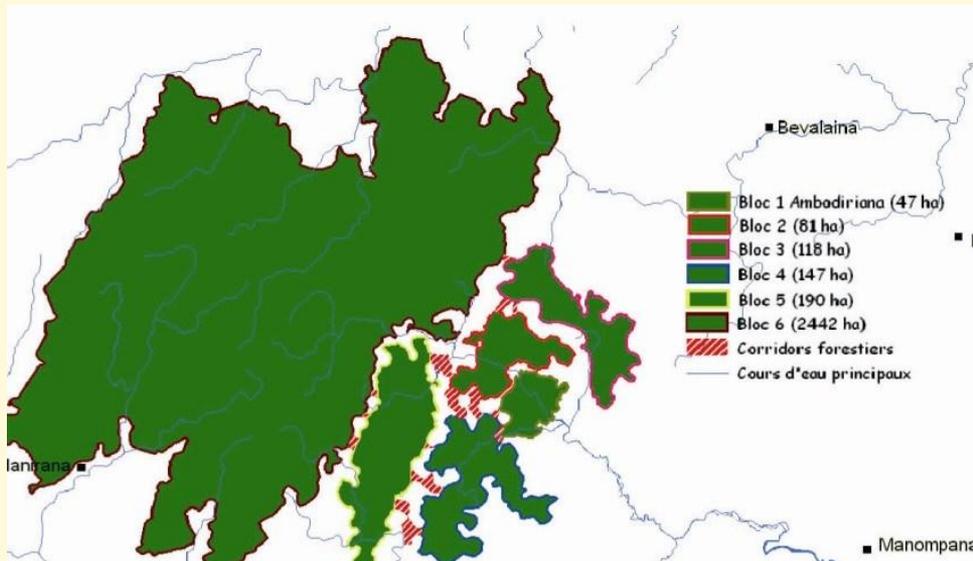
Planting endemic species on old tavy with low income

Fighting bank erosion in the river

Creating green corridors in Ambodiriana-Manompana



Developing the nursery



Helping villagers develop their crops

Creation of an educational farm for teaching organic agriculture



(LEGPA Saint-Paul, Franche-Comté University and Kokopelli and Yapluka associations)



***Distribution of seeds
Fertilization with worms***



Growing yams



Eco-tourism



Photo Adefa – Gérard Dupuy

Photo Chantal Misandeau



Accommodation in the forest for groups or individuals

Treks in nearby areas and villages

Partnership with malagasy tourist operators

Teaching and training guides on local fauna and flora



Photo Chantal Misandeau

Lodging in the camp...

Photos Chantal Misandeau



Leptotes pirithous



Visit of a French Orchid Society (SFO) group in 2012

Researchers...

Laurent Brillard



P. Bosc et al.

Thierry Pailler



Miguel Sanchez

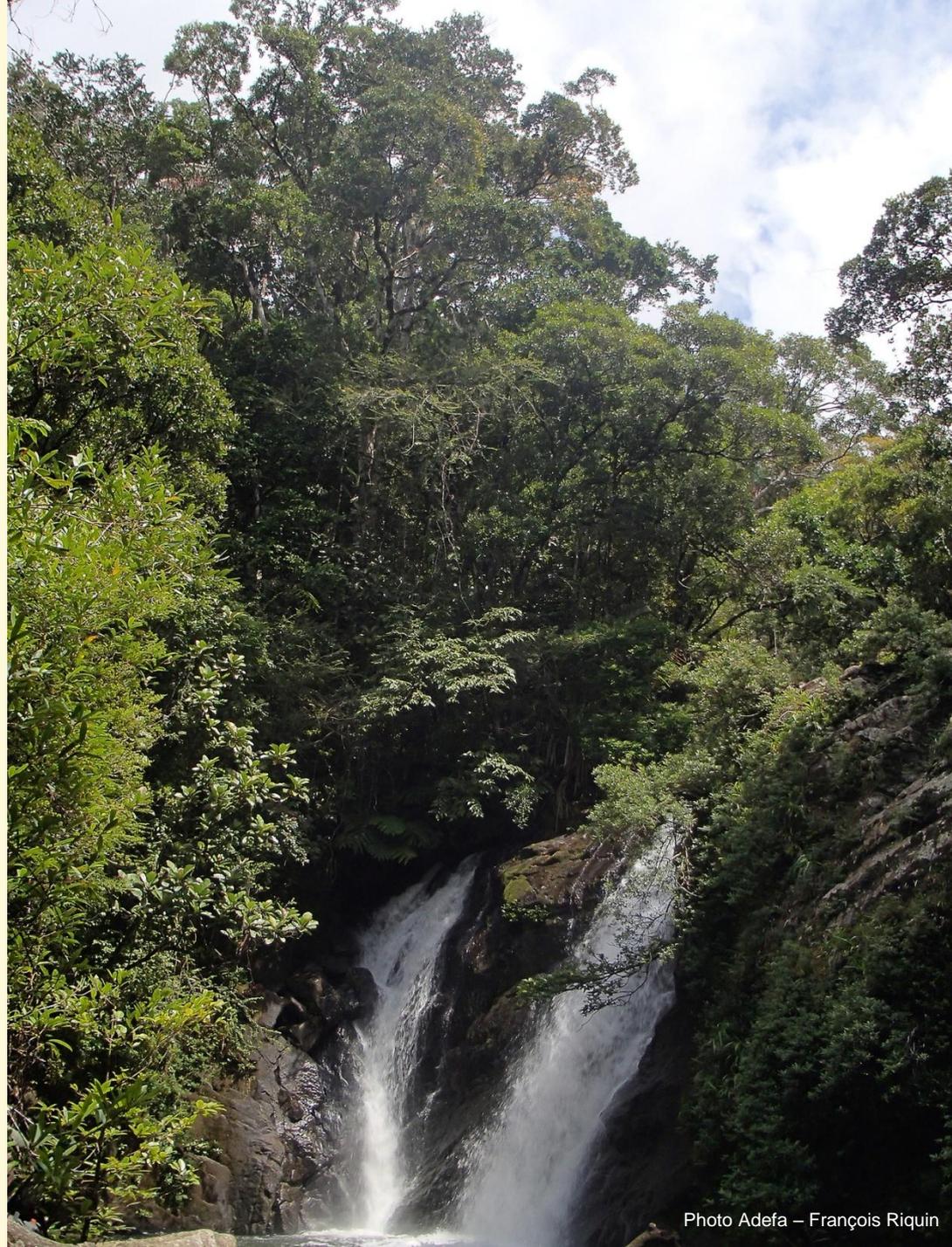
The forest

Up-to-date figures (2018):

- **800** species of **trees**
- **35** species of **palms**
- **53** species of **ferns**
- **95** species of **orchids**
- **30** species of **reptiles**
- **45** species of **amphibians**
- **12** species of **lemurs**
- **76** species of **birds**
- **120** species of **arachnids**

Not yet fully surveyed:

- Micromammals
- Insects



Rare palms



Satranala decussilvae

Status: endangered (IUCN 2007)

Known on **two sites** only



Dypsis fanjana

1st photograph of fructification

photo C. Wattier

Rare or new animals



Uroplatus fimbriatus



Boophis roseipalmata



Aye-aye, Daubentonia madagascariensis

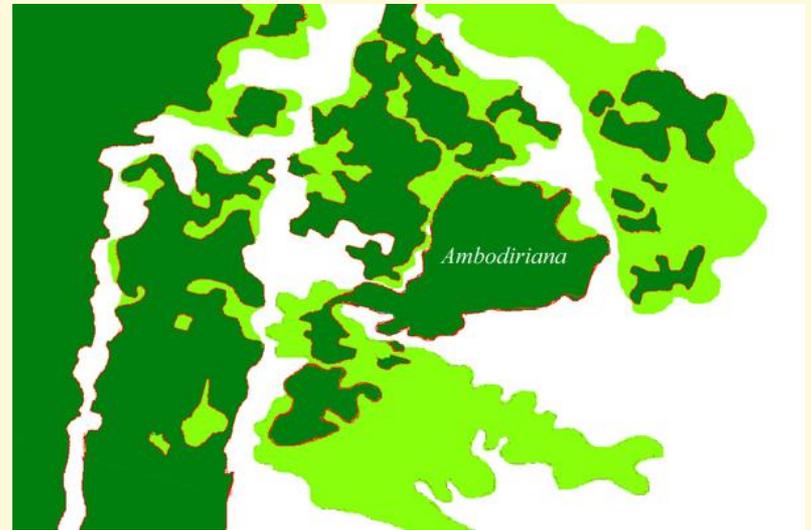


Euryceros prevostii



Results

- 12 local people hired, 25% of Manompana municipality income
- The reserve is popular among a large majority of villagers
- An effective protection of the forest
- Creation of « Association des Guides Protectors de la Nature » (AGPN)



Forest in 2008 (light green) and in 2014 (green)
(after Marc Fayolle and Ségolène Beaucent)

Ambodiriana species
in the IUCN red list:
Critically endangered (CR),
Endangered (EN),
Vulnerable (VU).

Class	Species	IUCN status	Estimated population
Amphibians	<i>Platypelis tetra</i>	EN	
	<i>Gephyromantis webbi</i>	EN	
Reptiles	<i>Phelsuma serratacauda</i>	EN	
Birds	<i>Brachypteracias leptosomus</i>	VU	
	<i>Brachypteracias squamiger</i>	VU	
Lemurs	<i>Avahi laniger</i>	VU	87 individuals/km ²
	<i>Daubentonia madagascariensis</i>	EN	09 individuals/km ²
	<i>Eulemur rubriventer</i>	VU	13 individuals/km ²
	<i>Hapalemur griseus griseus</i>	VU	06 individuals/km ²
	<i>Indri indri</i>	CR	
	<i>Microcebus simmonsii</i>	EN	145 individuals/km ²
Other mammals	<i>Cryptoprocta ferox</i>	EN	
Orchids	<i>Aeranthus albidiflora</i>	CR	
	<i>Aeranthus neoperrieri</i>	EN	
	<i>Cynorkis schlechteri</i>	CR	
	<i>Gastorchis tuberculosa</i>	EN	
	<i>Gastrodia madagascariensis</i>	CR	
	<i>Goodyera flaccida</i>	CR	
Palms	<i>Dypsis bernierana</i>	VU	
	<i>Dypsis carlsmithii</i>	CR	
	<i>Dypsis fanjana</i>	EN	
	<i>Dypsis hiarakae</i>	VU	
	<i>Dypsis hovomantasina</i>	CR	
	<i>Dypsis integra</i>	EN	
	<i>Dypsis linearis</i>	CR	
	<i>Dypsis mirabilis</i>	EN	
	<i>Dypsis paludosa</i>	VU	
	<i>Dypsis plurisecta</i>	DD	
	<i>Dypsis pierrieri</i>	VU	
	<i>Dypsis ramentacea</i>	CR	
	<i>Dypsis simiamensis</i>	EN	
	<i>Dypsis tsaravoasira</i>	VU	
	<i>Dypsis utilis</i>	EN	
	<i>Dypsis viridis</i>	VU	
	<i>Orania ravaka</i>	VU	
	<i>Ravenea dransfieldii</i>	EN	
	<i>Ravenea juliettiae</i>	EN	
	<i>Satranala decussilvae</i>	EN	

Orchids of Ambodiriana

Aerangis (4) : articulata, citrata, pallidiflora, seegeri

Aeranthes (5) : albidiflora, grandiflora, neoperrieri, ramosa, tenella

Angraecum (13) : calceolus, ferkoanum, crassum, danguyanum, dasycarpum, eburneum subsp. superbum, filicornu, linearifolium, littorale, mauritianum, mirabile, rhynchoglossum, sesquipedale

Benthamia (1) : nigrescens

Bulbophyllum (19) : boiteaui, coriophorum, hamelinii, humblotii, longiflorum, lyperocephalum, mangelotii, moramanganum, multiflorum, oclusum, occultum, perpusillum, pervillei, protectum, subclavatum, variegatum + 3 new species + other unknown

Cheirostylis (1) : gymnochiloides

Cymbidiella (2) : falcigera, flabellata

Cynorkis (9) : angustipetala, schlechteri, fastigiata, gibbosa, graminea, lowiana, nutans, calanthoides, + new species

Disperis (1): oppositifolia

Eulophia (1): plantaginea

Eulophiella (1): elisabethae

Gastrodia (1) : madagascariensis

Gastorchis (1) : tuberculosa

Goodyera (1) : flaccida

Grammangis (1) : ellisii

Graphorkis (2) : concolor, ecalcarata

Habenaria (1) : new species

Imerinea (1) : madagascarica

Jumellea (5) : exilis, stenophylla, recurva , stenoglossa, major

Liparis (3) : clareae, dryadum, stenophylla

Malaxis (1) : welwitschii

Microcoelia (1) : bispiculata, macrantha

Oberonia (1) : disticha

Oeonia (1) : volucris

Oeoniella (1) : polystachys

Polystachya (2) : mauritiana, waterlotii

Vanilla (3) : planifolia + 2 unknown species



Total : around 95 species



Photos Chantal Misandeau



Bulbophyllum occultum Thouars

Photo Jean-Michel Hervouet



Bulbophyllum occultum Thouars

Photo Jean-Michel Hervouet



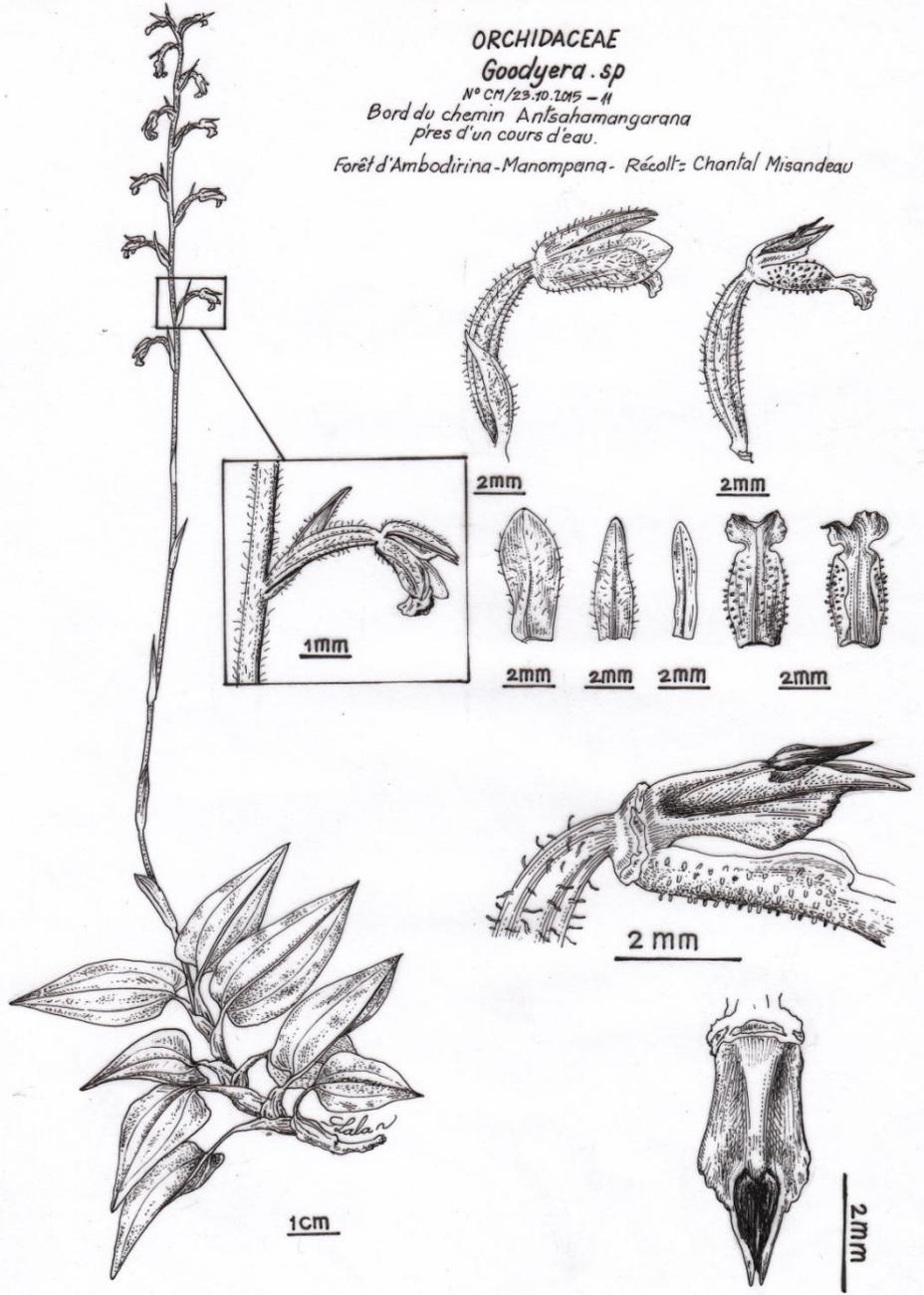


Bulbophyllum perpusillum H. Wendl. & Kraenzl.

Cynorkis schlechteri H. Perrier



Goodyera flaccida Schltr.



ORCHIDACEAE

Goodyera . sp

N° CM / 23-10. 2015 - 11

Bord du chemin Antsahamangarana
pres d'un cours d'eau.

Forêt d'Ambodirina - Manompana - Récoll: Chantal Misandeau

1mm

2mm

2mm

2mm

2mm

2mm

2mm

2 mm

1cm

2mm

Eulophiella elisabethae Linden & Rolfe
on *Dyopsis fibrosa*



Imerinaea madagascariensis Schltr.



Photos Augustin Kaloloha

Angraecum mirabile Schltr.



Photo Adefa – Augustin Kaloloha



Microcoelia bispiculata

1:1



Gastrorchis tuberculosa (Thouars) Schltr.



Gastrorchis tuberculosa (Thouars) Schltr.



Bulbophyllum protectum H. Perrier

Photo Jean-Michel Hervouet



Bulbophyllum moramanganum Schltr.



Photo Jean-Michel Hervouet



Photo Jean-Michel Hervouet

Bulbophyllum sp. nov.

Bulbophyllum sp. nov.



Photos Jean-Michel Hervouet



Bulbophyllum sp. nov.



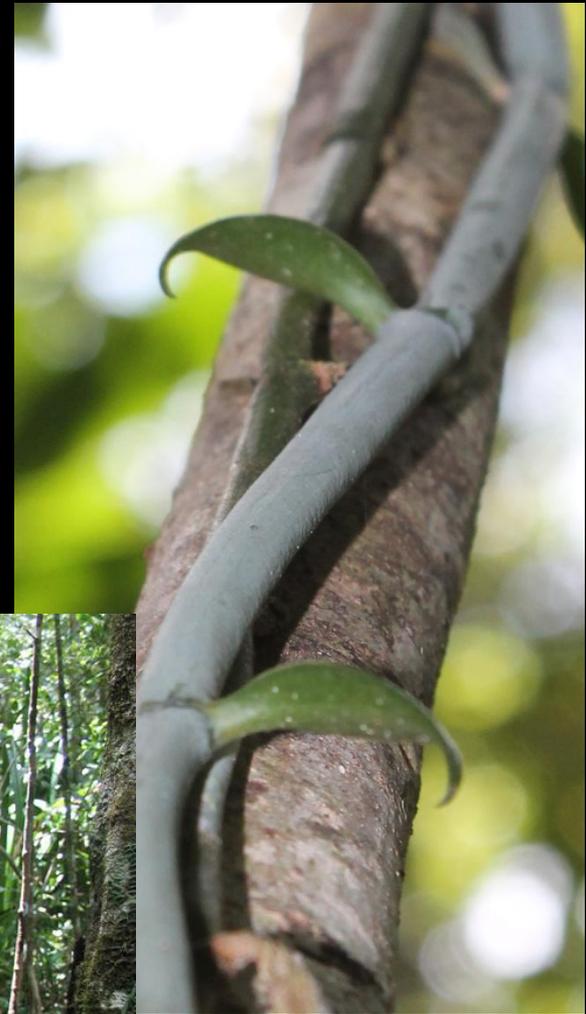
Cynorkis sp. nov.



Bulbophyllum sp. nov.



Mysterious vanillas
With or without leaves...
flowers never seen!



Photos Esther Lauri

Many others are not identified...



Photos Augustin Kaloloha



Gastrodia madagascariensis H. Perrier.

syn. *Didymoplexis madagascariensis* (H. Perrier) Summerhayes



Gastrodia madagascariensis. August 2014

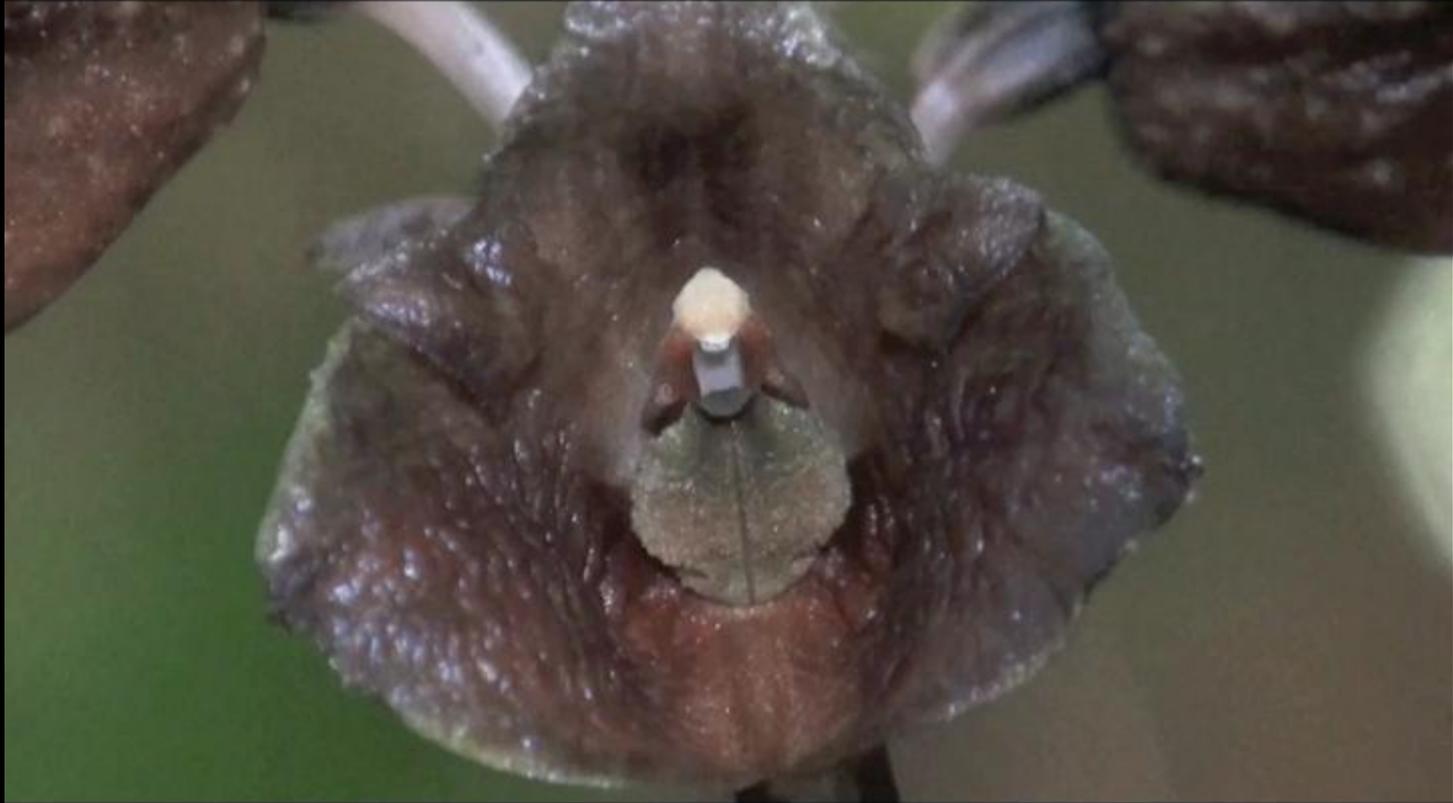


Gastrodia similis Bosser. La Réunion
(movie by Florent Martos, MNHN)



Gastrodia madagascariensis Perrier. Ambodiriana forest.

(movie by Florent Martos, MNHN)



2014-2017: in dire straits...

- 2013: 3 tourists killed by mob in Nosy-Be. Tourism drops.
- 2014: agreement with Malagasy government for the management of Ambodiriana not renewed.
- 2015: important batch of solar cells and equipment stolen in the camp. The camp guard goes to jail.
- 2015: without new agreement for Ambodiriana, the ADEFA board of directors decides that the association is dissolved. Equipment and money transferred to AGPM, the local guides.
- 2017: cyclone Enawo strikes the East coast, access path flooded for weeks, bungalows in camp damaged by fallen trees.
- 2017: the owner of the land rented for the camp dies. His family wants to slash and burn it to grow rice.



The camp on the 16th of March 2017

Path to Ambodiriana forest, 7th of April 2017



07/04/2017 09:02

Second half of 2017: hope...

Manompana mayor grants an agreement to AGPN to manage the forest.

The local guides of AGPM organise surveys to protect the forest.

ADAFAM created, « association of friends of Ambodiriana-Manompana forest » with new statutes.

Visit of local forest authorities, positive report for the creation of a VOI (Vondron' Olona Ifotony: association of all involved parties) to manage the future reserve.

New agreement for provisional rental of land for the camp.

Rainforest Trust decides to help us and commissions a Malagasy NGO, Madagasikara Voakajy, to do the enquiries, surveys and documents leading to a new status of protected area.



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TRUST®

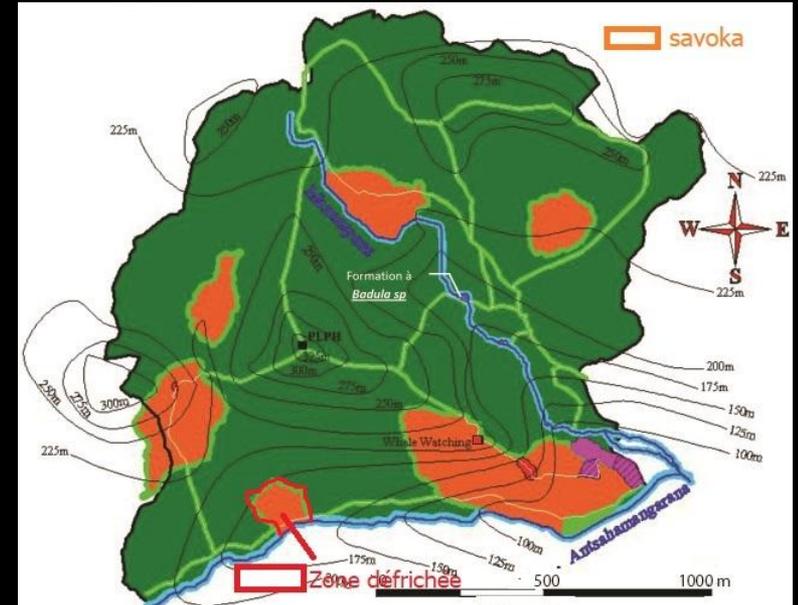
James LEWIS



Skirmishing along the border...



Eco-warriors...



2018: rebirth?

2018: Bungalows in camp rebuilt.



2018: Feralis, a new French fund for the protection of tropical forest, decides to fund Ambodiriana.

Goal of ADAFAM: develop ecotourism and make investments for the local guides until it becomes a sustainable activity for them, without us:

- Securing the camp by buying land or long term renting
- Building a guides headquarter in Manompana

Conclusion

Nothing is granted forever in orchid protection

IUCN status used by sponsors

An amazing number of orchids preserved in a small area

Local communities must be involved

Research on orchids boosted by local guides

Madagascar context is difficult...

Waiting for a new status for the Ambodiriana forest...

A blue and grey chameleon (Furcifer pardalis) is perched on a bamboo stalk. The chameleon has a textured, bumpy skin with shades of blue, grey, and brown. Its large, prominent eye is visible, and it has a small, pointed snout. The background is a lush, green, out-of-focus forest setting.

Thank you for your attention!

See you soon in Ambodiriana!

Furcifer pardalis