

EARTHWATCH INSTITUTE FIELD REPORT

Project title: The Lemurs and Forests of Madagascar

Report completed by: Jonah Ratsimbazafy

Date report completed: March 15, 2009

Period covered by this report: August 13 to August 27, 2009

Cover letter to volunteers

Dear friends,

Salama! Inona no vaovao? (Hello! What's new?)

Welcome back home!

On behalf of the Manombo team, I would like to express my deep appreciation to all of you who came to help us to study the black-and-white ruffed lemurs (*Varecia*) and the white collared brown lemurs (*Eulemur cinereiceps*) at Manombo forest. Despite the rains and the long walks you always felt happy to follow the lemurs. With your help we recorded 1,167 hours of behavioral data and made 500 m² of botanical plots. I am very pleased to tell you that we also recorded one new plant that we had not yet in the list of plants consumed by the *Varecia* at Manombo because of your help. We could therefore add to the list of food eaten by *Varecia*.

Thank you for coming to visit the villagers and learning about the challenges that we are facing to save the endangered biodiversity of Madagascar in general and Manombo in particular. Thank you for sharing with us your experiences to make Manombo a better place.

Now, you are our ambassador in where you live/work. Together, we can save the lemurs by helping people, and together we can make a difference. Remember that you are part of our success and be proud of yourself that you contributed to the conservation of the lemurs and forests of Madagascar.

Lastly, I would like to express my heartfelt gratitude to Nannye, Rindra, Hery, Mamy, Stella and Claude for making the 2008 expedition so successful.

Thanks again for being such wonderful people.

Misaotra betsaka sy veloma

Jonah Ratsimbazafy

Non-technical summary of results

Give an account of the data collected and results (inputs and data) for the period covered by this report, mentioning any emerging trends.

A. *Varecia v. variegata*

During this expedition, the observation of *Varecia variegata variegata* lasted 809 hours. The percentage of each activity is given in Figure 1.

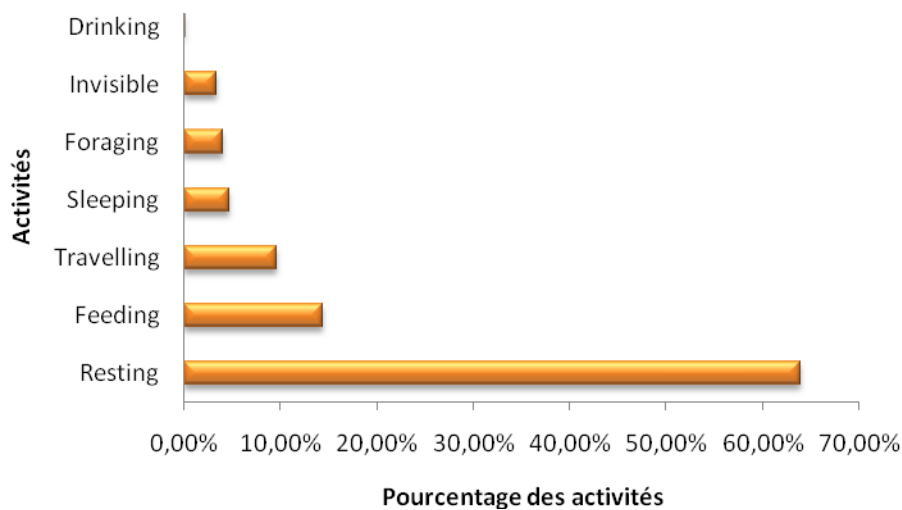


Figure 1: Percentage of each activity of *Varecia v. variegata*

Although *Varecia* is a diurnal species, it spent 64% of its activity budget on resting. Only 14% of the time was spent on feeding and 9.5% on travelling. By comparing the activity of *Varecia* in 2004 and 2008, we are able to draw the below graph (Figure 2).

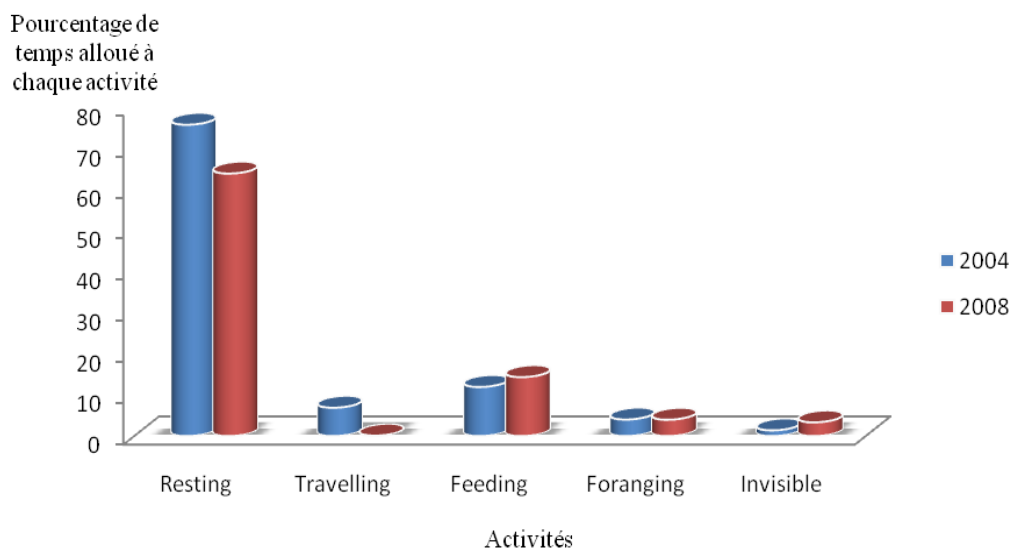


Figure 2: Comparison of time allocated to each activity for the years 2004 and 2008

From this graph, the time spent to each activity in 2004 and 2008 are not very different. *Varecia v. variegata* spent its 70% of its time on resting, 13% on feeding and 4% on foraging and travelling.

The list of food species eaten by *Varecia v. variegata* is represented in Figure 3. The food sources of *Varecia v. variegata* were obtained from 18 plant species in which the top eight species are:
 Vines (26,13%), Ravinala (18,82%), Figs (12,61%), *Cecropia* (12,61%), unidentified species (7,21%), vine species sp1 (7,21%), Fantsinakoho (3,60%) et Ramy (1,80%).

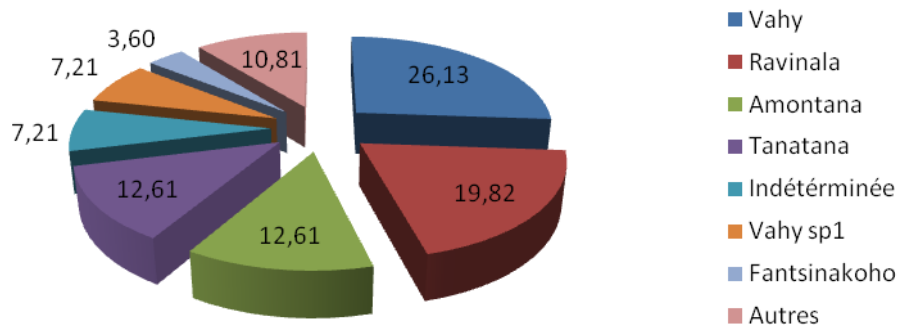


Figure 3: Percentage of plant species consumed by *Varecia v. variegata* during the observation

Varecia v. variegata is a frugivorous species, which means that the diet is mainly composed of fruits. The damage caused by cyclone Gretelle in 1997 changed the structure and forest composition. As a result, the changes also affected the diet of *Varecia v. variegata*. Despite the cyclone, the diet was still composed of fruits (77%), nectar (17.31%), flower buds (3.85%) and leaves (1.92%). Most of the fruits consumed were ripe (87,50%).

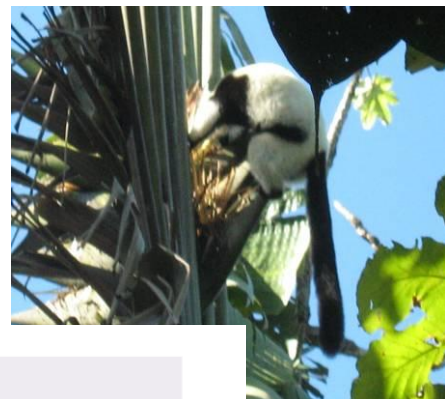


Photo : Earthwatch 2008

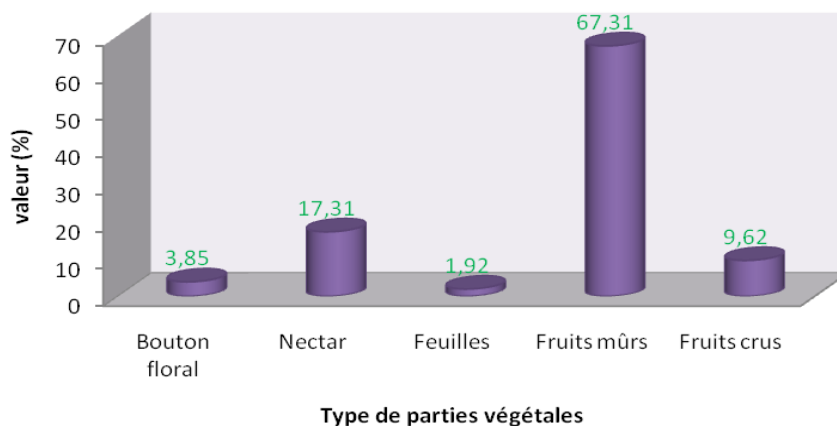


Figure 4 : Percentage of part eaten by *Varecia v. variegata*

The below figure shows the plant species eaten by *Varecia* during the 2008 Earthwatch expedition. The fruits consumed were mostly from:

Vahy/Vines (37.66%), Figs (18.18%), unidentified species (11.69%) and *Cecropia peltata* originally from South America (Tanatana) (9.09%).

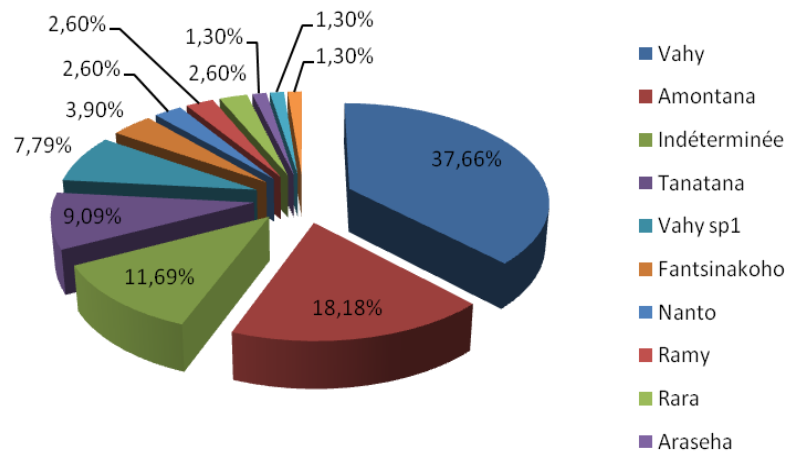


Figure 5: Fruit species consumed by *Varecia v. variegata*

By comparing the species consumed by *Varecia v. variegata* in 2007 and 2008, we noticed a great change in terms of the quantity of plant consumed. The amount of species consumed in 2007 was higher than in 2008.

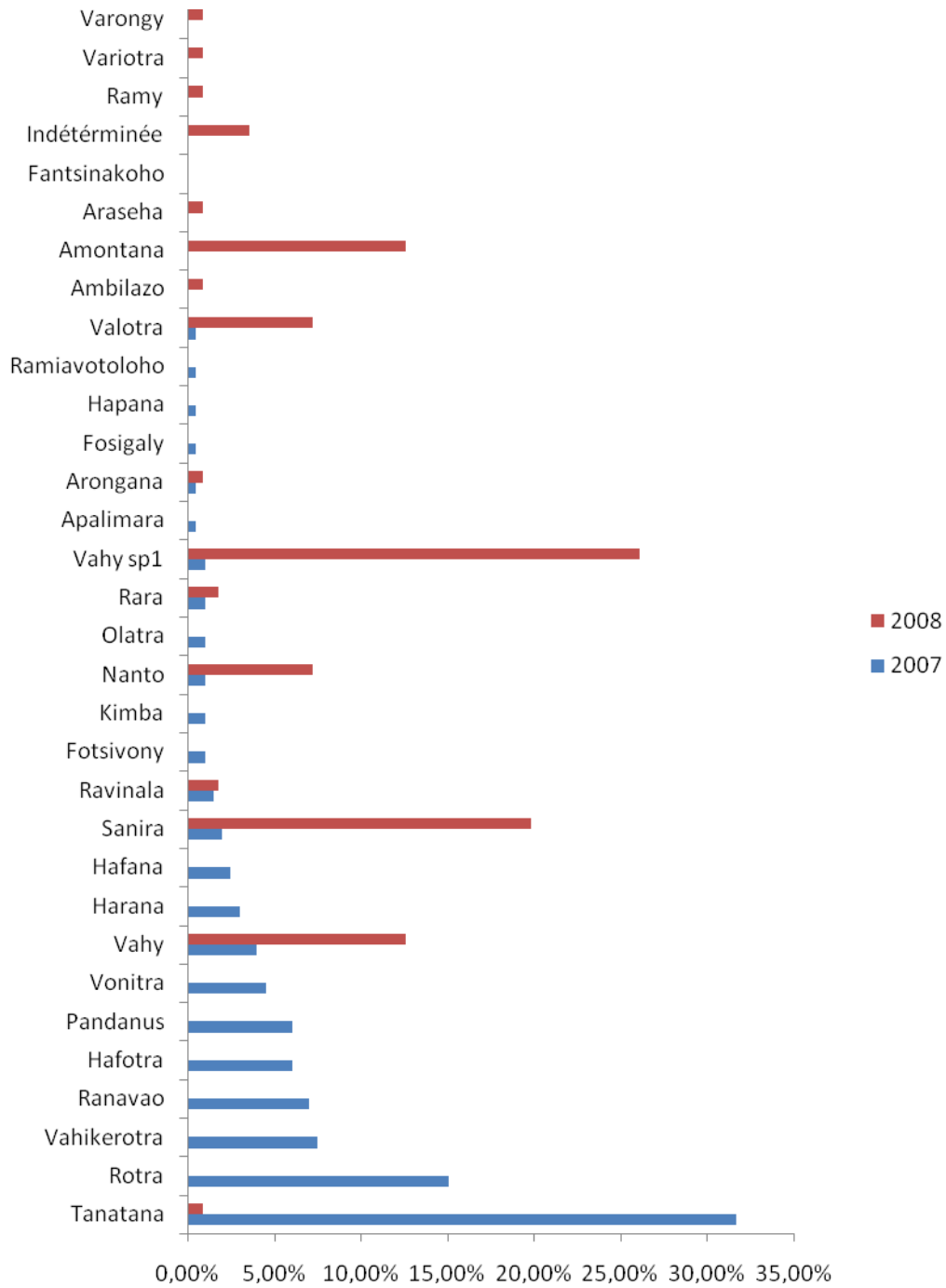


Figure 6: Comparison of species consumed by *Varecia v. variegata* in 2007 and 2008

The height of the focal animal from the ground was also recorded. This allowed us to know the preferred tree height the animals prefer. Figure 7 shows the different heights used by the animals during the observations.

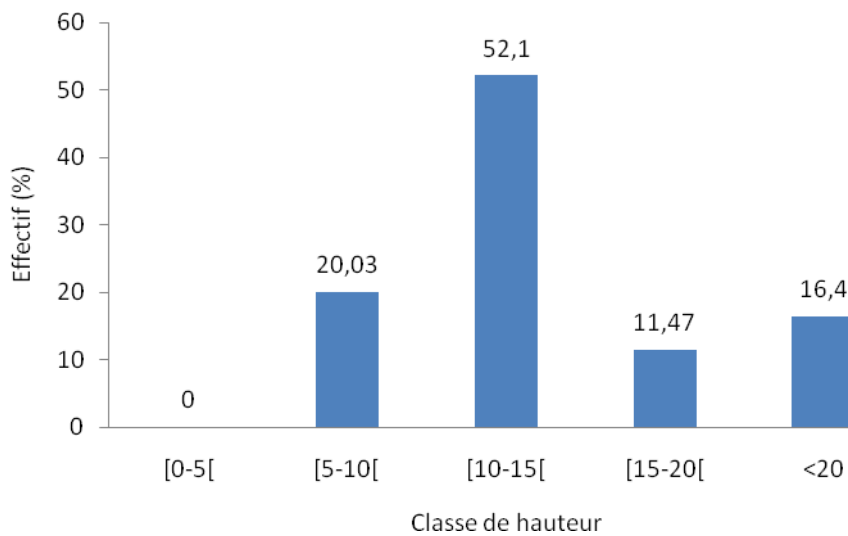


Figure 7: Height classes used and preferred by *Varecia v. variegata*

Varecia v. variegata preferred the height between 10 to 15m, but the height level 5 to 10m was used at 20.03% of the total height, because most of their food was in that interval.

B. *Eulemur cinereiceps*

During the survey, we recorded 358 hours of behavioral data. Our results indicated that *Eulemur cinereiceps* spent 43% of its time to rest. Then, 31% for feeding and 10% for traveling.

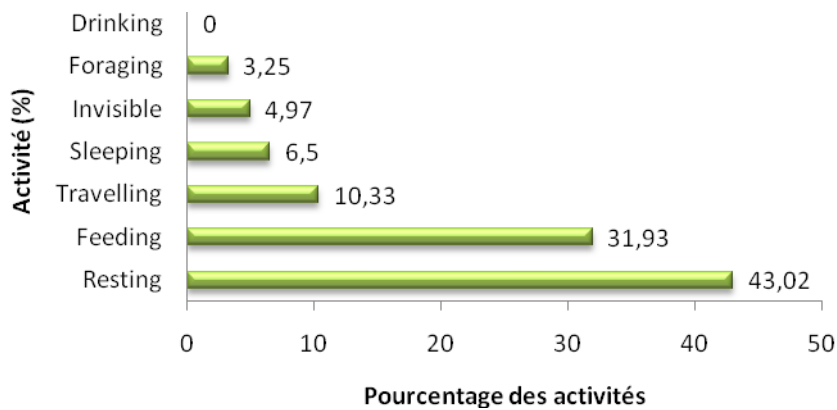


Figure 8: Percentage of each activity of *Eulemur cinereiceps*

Concerning the diet, half of the amount of fruits eaten by *E. cinereiceps* is from *Clidemia hirta* (Mazambody). Then after, the fruits of *Lantana camara* (radiaka) (16%), *Tsirika* (9.79%), *Cecropia* (8.39%) and vines (9.09%).

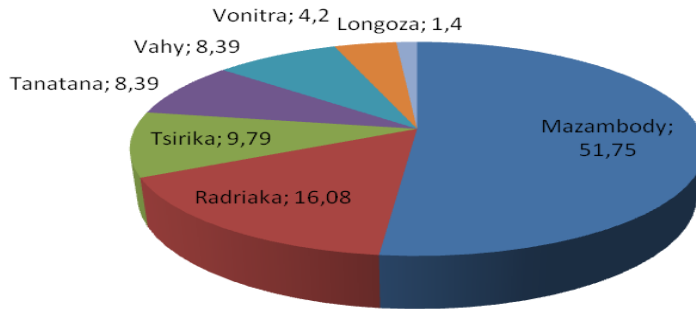
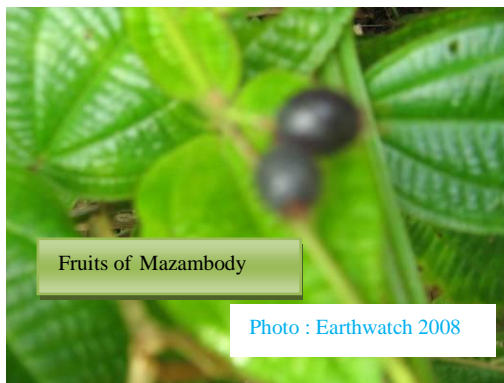


Figure 9: Percentage producing fruits consumed by *Eulemur cinereiceps*



Eulemur cinereiceps ate also leaves in which Araseha constitutes half of the amount of the leaves consumed. Then, vines at 37.50%, *Clidemia hirta* at 12.50%.

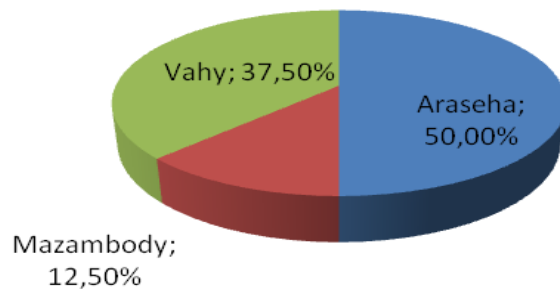


Figure 10: Proportion of species providing leaves for *Eulemur cinereiceps*

Overall, the diet of *E. cinereiceps* is composed by fruits 94.16%, and then leaves at 5.19% and a small amount of flowers (1.92%). Therefore, *E. cinereiceps* is also a frugivorous species. They prefer ripe fruits to unripe fruits.

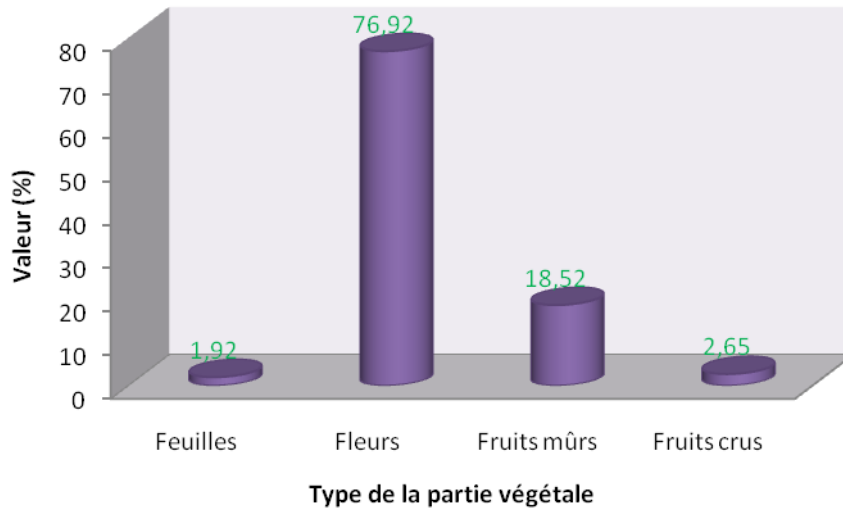


Figure 11: Percentage part eaten of plant by *Eulemur cinereiceps*

The list of plant species consumed by *Eulemur cinereiceps* is represented in Figure 12. The proportion of these plants is: *Clidemia hirta* (47.27%), *Lantana camara* (14.55%), Tsirika (13.33%), vines (9.09%), *Cercopia* (7.88%), Dypsis (palm tree) (3.64%), Araseha (2.42%), *Afromum* (1.21%) and Figs (0.61%).

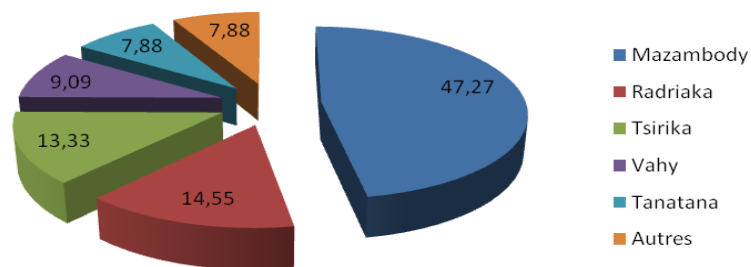


Figure 12: Species consumed by *Eulemur cinereiceps* during the observation

The below graph shows the height *E. cinereiceps* used during the observation. They preferred the height between 5-10m and 0-5m. Because of the two preferred food height are between 0-5m, which was why *E. cinereiceps* were seen on the ground. They searched for their food at the level of 3 m, but they used heights around 7 m for vigilance.

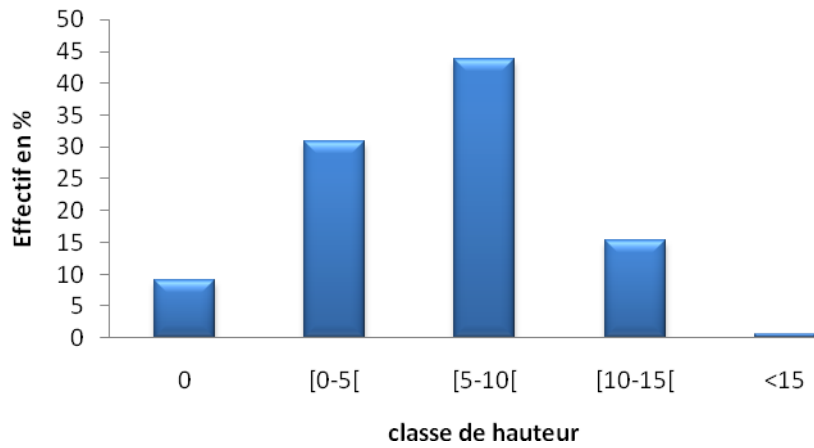


Figure 13: Percentage of height classes preferred by *Eulemur cinereiceps*

Eulemur cinereiceps selected the trees where they want to rest. Ambilazo tree is their first choice, then Rehiaky and Hafotra trees. (Figure 14)

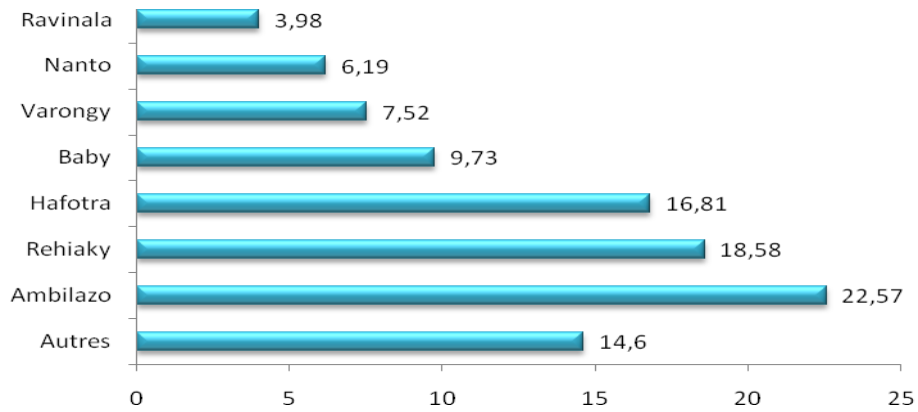


Figure 14: Percentage resting on different trees used by *Eulemur cinereiceps*

How do these data contribute to achieving conservation impacts? (e.g. actions based on results, management plans, site protection)

In the Farafangana region, there is some sort of platform in which all of the stakeholders are present. With other NGOs such as WWF, Missouri Botanical Garden and many others, we could provide suggestions to the region. We also work with the park services (Madagascar National Parks and Ministry of Environment) who request our findings in order to re-orient their conservation activities. Although the park services are the managers of the sites, they do not have researchers to monitor biodiversity in Manombo, so they need our results and suggestions.

What is/ are the significance/ benefits of your research at the following levels?

- **Local (to the area of the research site)**

This year the EW volunteers were only composed of Malagasy fellows, but like every year, they contributed greatly to plant trees with the local community. In addition, the local field assistants enriched their knowledge from learning and/or exchanging experiences with the fellows. Once again, the volunteers recorded that *Varecia* fed on a plant species that was not in our list of the food of the species yet. That was good news for us to better understand the feeding ecology of the species. During the expedition, the volunteers collected data at the same time on *Varecia v. variegata* and *Eulemur cinereiceps*, so that we could make a straight comparison between the two sympatric species. It is important to note that both species are *Critically Endangered* species and *E. cinereiceps* is one of the 25 most endangered primates in the world, therefore, the information on the species can be used for public awareness.

Tourism could be developed at Manombo, because we know the territory of the study groups and made nice trails within.

- **National / Regional**

During our expedition in August, we inaugurated the new primary school that the Association Madagascar Ankizy Fund, in collaboration with Durrell Wildlife Conservation Trust, built in Manombo. This big event was attended by high authorities and several local notables' people including the Chief of the Region (the number one of the Farafangana region) and the chief of the district. It was an opportunity for me to emphasize the importance of conserving the biodiversity of Manombo in order to attract the attention of the decision makers and why the volunteers of Earthwatch are there. I stressed the point that: "Manombo is one of the few last remaining lowland rainforest and home of the two endangered species of lemurs and many other species." Once again, I noted that during the *International Primatology Society Congress* held in Torino/Italy in August 2004, in Entebbe/Uganda in 2006 and in Edinburgh/Scotland in 2008 that I attended, the brown-collared lemur (*Eulemur cinereiceps*) is among the 25 most endangered non-human primates in the world. Manombo is the only protected area where *E. cinereiceps* lives. Because of that, the Chef de Region expressed his support to the conservation of these species and the designation of the Manombo Classified Forest as a new protected area. The General Director of Madagascar National Parks also said that he will request to the Ministry of Environment that the Classified Forest should be part of the Manombo Special Reserve.

The report of this expedition was already given to the Ministry of Environment and the Madagascar National Parks office in Antananarivo.

- **International**

Currently we have an article in review on the post cyclone Gretelle effects on the diet of *Varecia* and *E. cinereiceps*. That article will be published in Biotropica. We used all of the data that we are collected since 1998 and the data collected by Earthwatch volunteers were included in the analysis. I also plan to give a presentation of our work in Manombo at the IPS congress in Japan in 2010.

In May 2009, I will give a talk on our Manombo conservation project in Canada. I was invited by the Mountain View Conservation and Breeding Center.

Communication of results

Printed: peer reviewed scientific publications; books / book sections; reports, management plans or policies; fact sheets, brochures, leaflets, pamphlets, posters, academic dissertations, annual reports, proceedings of conferences or workshops; letters; newsletters.

Ratsimbazafy, J.H., Rakotoniaina, L.J & Durbin, J.C (2008). Cultural Anthropologists and Conservationists: Can We Learn From Each Other to Conserve the Diversity of Madagascar Species and Culture? *In: Greening the great red island: Madagascar in Nature and Culture*. Kaufmann, J.C; (ed). African Institute of South Africa, Pretoria. pp. 301-315.

Mass media: broadcast production; film; TV, radio, print (newspaper/ magazine coverage); Press releases; press conference; interview, article creation; press trip

Here are website links which show documentary films I participated with. Although the sites were not in Manombo, being as the PI of Earthwatch made people to solicit me to contribute in the films.

<http://ma-tvideo.france3.fr/video/iLyROoafJvZ3.html#iLyROoafonW>

guardianweekly.co.uk

ejmagazine.com page 36-37: Madagascar at a crossroads: Between development and conservation, an island's unparalleled biodiversity persists

I was invited three times for an interview at the Madagascar National Radio to talk about biodiversity and conservation.

We have had the CD of the event during the inauguration of the school in Manombo that was organized by the EW volunteers. It was in Malagasy language and was displayed on the National TV and radio.

Educational Opportunities

During the course of your project, have you directly or indirectly involved the following groups in your research topic?

- Local communities YES (the Manombo local community)
- Students YES (from the Dept of Anthropology, Botany, and Medical Veterinary)
- Early career scientists YES
- Other groups YES (There were two Rio Tinto employees in the team; the Madagascar National Parks)

How does your research help these groups better understand and act towards the conservation of a sustainable environment? (Please provide specific examples of any activities you are aware of.)

Durrell always works very closely/in partnership with stakeholders in the sites where we conduct projects aiming to conserve our targeted species. We have created 8 community associations whose activities are focused on development and conservation. We built wells and schools, for example, with the local communities. We also brought schoolchildren to the forest to see lemurs, so that we could teach them the importance of having lemurs in their forests. All of the people working with us in Manombo are villagers. They have had great experiences on the lemurs and their habitats, so they could teach the volunteers the names of the plants that the lemurs eat for example. But the students could also teach them scientific explanations of some behaviour. Therefore, it was a good exchange between the guides and the volunteers.

Four of the six EW volunteers are students who are preparing their MSc degree on primatology and botany. From that expedition, they could learn about techniques and methods to study lemurs and working with local communities and park rangers.

The two employees of Rio Tinto who were in the team are responsible of biodiversity monitoring in Tolagnaro. They could take the advantages of comparing what they do with our methods.

Has your project contributed to the completion of Masters' or PhD theses or degrees, or other educational research findings?

Yes, indirectly as the 4 students are preparing their MSc, so the field expedition will greatly help them in designing their methods for their own research.

Recently, there was a student who conducted research on establishing a management plan for the Classified forest of Manombo. Our data greatly helped her in finishing her thesis.

Acknowledgements

Once again, we are delighted for the concern and support offered by the Earthwatch Institute. Without its help, it was difficult to achieve our goals of conserving the *Varecia* and *E. cinereiceps* of Manombo and enhance people's lives. The Earthwatch and Rio Tinto grant allows us to save lemurs by helping people. Therefore, on behalf of the Manombo, I would like to express my deep appreciation to the Earthwatch Institute and Rio Tinto. Thank you very much.

My acknowledgments also go to the Madagascar National Parks (ex. ANGAP) and the Ministry of Environment, Forest and Tourism by giving us the permit of carrying out all of the conservation activities in Manombo. We are very grateful to the authorities (Chief of the Region, Chief of District, the Mayor of Anakara, CISCO) and local community of Manombo who have always expressed their willingness to work with us and help the volunteers.