



PROJECT OF
BIODIVERSITY CONSERVATION
2006-2007



**Life history traits as useful tool for the conservation of the
tomato frogs *Dyscophus antongili* and *D. guineti*
(Amphibia: Microhylidae) in eastern Madagascar**

**A proposal for the Management of the Residual Populations
and Conservation Biology**

A project submitted to *Zurich Zoo*

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Introduction

Amphibians of Madagascar, with more than 220 species currently known, are featured by a 99% endemism rate, facing anyway a poverty in terms of families (only Hyperoliidae, Mantellidae, Ranidae, and Microhylidae are present on the *Grand'Île*).

Madagascar is also sadly known for the increasing deforestation rate, with the so-called *tavy* (slash and burn cultivation) agricultural practice. Since great part of the Malagasy amphibians is closely tied with the rainforest belt, it is not hazardous to affirm that the destruction of the rainforest will be accompanied by the extinction of many species.

It is therefore likely that many still undescribed species have been already exterminated. Furthermore, due to their biological peculiarities and colourful aspect, some species are actively traded for the pet market, or anyway subject to a particular attention by local traders. This is for example the case of *Mantella aurantiaca*, the so-called golden frog, which is still captured in terms of hundreds (if not thousands) individuals from almost a single locality. Or of the tomato-frog, *Dyscophus antongili*, which is certainly present, upon our current knowledge, in a limited area of NE Madagascar, around the town of Maroantsetra.

The present project is addressed towards the conservation of the tomato frog *Dyscophus antongili*, providing data on its distribution and population state.

The tomato frogs *Dyscophus antongilii* and *D. guineti*

The tomato frog *Dyscophus antongilii* is a rather large species of frog with a snout-vent length of up to more than 100 mm, and a bright red dorsal colour. Moreover, it is the only Malagasy Amphibian included in CITES List I, and for this reason it is currently no more captured and traded (at least legally officially for the pet trade).

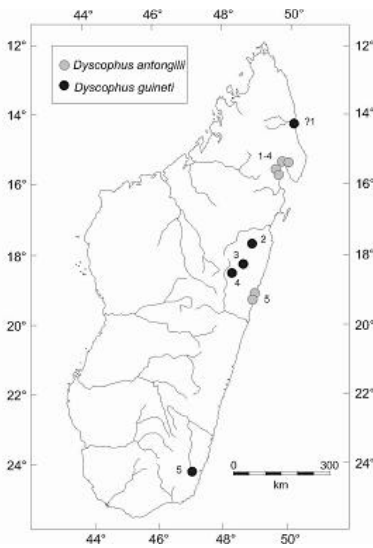
Indeed, the CITES classification dates back several decades, when large quantities of this species were exported from Madagascar, and its distribution area was thought to be restricted to Antongil Bay, in and around the small town of Maroantsetra. Anyway, it is worth stressing that facing this situation and the potential threat that likely affected the natural populations at the time of inclusion in CITES, very little is known about its biology and even distribution.

Being a species present, and possibly widespread, along the Masoala coasts, it is very surprising that it is not yet clearly understood which is its distribution within and around the Parc National de Masoala, and which is the current status of its populations.

In the coastal town of Maroantsetra it is a rather common species, living partly burrowed in sandy ground and reproducing in sewage water ditches (Glaw & Vences 1994). The species is also known from villages south of Maroantsetra [and after our former research its presence at Antara is confirmed too], but it is unclear whether it is a common species in the whole area. A further locality is located more to the south along the east coast, at Andevoranto (Blommers-Schlösser & Blanc 1991).

Almost no field data on the ecology of *D. antongilii* are available so far. Anyhow, seen the population insisting upon this area, it is clear that the human pressure has some evident fallout. In their fieldguide Glaw & Vences (1994) affirmed that *D. antongili* currently suffers the habitat degradation in the natural habitats within and around the town of Maroantsetra. For this, the species is considered as vulnerable by IUCN classifications (see Raxworthy & Nussbaum 2000).

A very similar species, *Dyscophus guineti*, is known from mid-altitude sites along the east coast, and has also been recorded from southeastern Madagascar (Soavala). This species differs from *D. antongilii* by its more extended blackish dorsal colour, mainly forming a lateral band along the flanks. However, the significance of this character is uncertain, and at present it cannot be excluded that *D. guineti* and *D. antongilii* are conspecific, although some data obtained by recent nuclear gene analysis indicates that they represent two distinct species. This is also relevant for conservation purposes, because considering the inclusion of *D. antongilii* on appendix I of CITES, the pet trade currently concentrates on *D. guineti* which benefits from no legal protection. The impact on the trade on this species is completely unknown, and also the extent of trade is not surveyed.



The current known distribution of *Dyscophus antongili* and *D. guineti*. *D. antongili*, 1 Maroantsetra, 2 Iharaka, 3 Voloina, 4 Rantabe, 5 Andevoranto; *D. guineti*, 1 Sambava (questionable), 2 Antsihanaka, 3 Ancaye, 4 Fierenana, 5 Soavala.

Former experiences and the aims of the project

The current project is a continuation of a series of research aimed to unveil crucial aspects of the life history of critically endangered, endangered and traded species of frogs from Madagascar. We already carried out studies on *Mantella cowani*, *M. viridis*, *M. expectata*, *M. bernhardi*, and *Scaphiophryne gottlebei*. In the meanwhile, *Dyscophus antongili* has been object of a few previous research (in collaboration with Dr. M. Vences from Amsterdam and Y. Chiari from Konstanz University). These researches already helped to clarify some aspects regarding the taxonomic differentiation with respect to the relative *D. guineti*, but yet much remains to be done.

A series of surveys were done around the town of Maroantsetra, while a preliminary survey has been carried out around the village of Antara, much southwards than Maroantsetra and out the known distribution limits of the species, and around Ambatovaky. Interestingly enough, there will be a monitoring action to establish the adaptation ability of *D. antongili* and about the possibility that it is able to colonise anthropogenic habitats, such as ricefields and draining ditches. Information will be also collected about the possible capture rate operated by local people. Last but not least, the populations around Antara, where most of our efforts will be directed, are until now underknown, and we even do not know whether they are clearly conspecific with the “real” *D. antongili*. In fact, another very similar species (*D. guineti*) still in trade and not yet included in any CITES list, is said to occur along the eastern rainforest belt. Recent studies by Chiari et al. (2005) showed that these two species, although very similar in terms of morphology and mitochondrial DNA, are differentiated in terms of nuclear DNA and ecological preferences, *D. antongili* being (apparently) a low altitude species, while *D. guineti* being a midaltitude species. Interestingly, at the light of these considerations, we do not know which is the real distribution of *D. antongili*:

This program will be implemented doing research on (1) the distribution of *critically endangered*, *endangered*, and *data deficient* species, (2) the effectiveness of the existing protected area network to assure the survival of the most iconic species, (3) the possibility to boost the divulgation and public awareness of the local people, (4) the possibility to assure captive breeding programs in case of necessity.

The project on *Dyscophus antongili* will be one of these step stones, and will assure a major visibility of the action plan using the tomato frog (as well as other iconic species, such as *Mantella aurantiaca* and *Scaphiophryne gottlebei*) as a charismatic flag for the conservation of the amphibians. Frogs of Madagascar have indeed the potentiality of becoming a real tool for the conservation of 3 indeed the potentiality of becoming a real tool for the conservation of wildlife in Madagascar, second only to lemurs!! This was highlighter by the President of *Conservation International* R. A. Mittermeier during the recent *Amphibian Conservation Action Plan*, held in Washington DC from 16 to 19 September 2005.

The herpetological studies at Masoala

Furthermore, in the past years we already carried out some herpetological surveys within and out the Masoala NP and at Nosy Mangabe. These data revealed a very rich herpetofauna, and helped to draw general conservation actions. Thus, the present project will be now put together to provide an overall scenario of the herpetofauna and herpetofaunal conservation of Masoala and nearby areas. The survey work on *Dyscophus antongili* perfectly fits with this program, and will be a main step to understand whether the species could be valorised in terms of conservation. We also wish to stress that the present work is included in a more wider action plan for the conservation of the Madagascan amphibians that will start in the nearby future.

Counterparts

The research activity will be done, as usual, in close collaboration with the local populations, and with the most prominent Malagasy herpetologists, who will assure a continuous formation framework for the new generations of naturalists. Just to make some names, ss Malagasy counterparts, the project will involve students and researchers of the Université d'Antananarivo, Departement de Biologie Animale (Prof. N. Raminosoa, Prof. O. Ramilijaona, L. Raharivoloniaina and at least one additional student), of the Parc Botanique et Zoologique de Tsimbazaza (Dr J. E. Randrianirina), and of the NGO Antongil Conservation in Maroantsetra (A. Sarovy).

All the individuals mentioned will benefit from the project by receiving intensive training in herpetological inventory and fieldwork techniques applicable to conservation prioritisation that can be used in future independent works. Furthermore, the two Malagasy institutions will also receive all of the equipment (tents, torches, etc.) acquired by the project, and therewith will be enabled to carry out further works. This is especially relevant in the case of Antongil Conservation, which is a rare example of a highly efficient NGO performing small-scale conservation projects with intensive educational involvement of local populations.

Last but not least, because the project implies intensive contacts to villagers (which will be interviewed as to the occurrence of certain species, and which will be employed as guides and porters during the expeditions) and to pet trade collectors and exporters, it will offer numerous opportunities of intensive discussions on the relevance of biodiversity conservation, thus **increasing the overall awareness** on this issue.

Personnel involved in the research

The Malagasy counterparts will be responsible for a substantial part of these expeditions, which will contribute to their training in conservation biology and fieldwork.

Local people will conduct the research in the field. This is especially worth of attention, since this means that Malagasy students and professionals (university professors, researchers, curators) will be the main actors in the research study. Most of the steps of the research as here depicted will be done independently by the local people, accordingly to their inclinations, specialities, and time availability. For each expedition there will be a Malagasy coordinator (already experienced after years of activity in the field) and one or more students (for their master or PhD).

The main expenses will be conceived for their activity. Moreover, some of the European people will eventually participate to some of the expeditions. They will follow the research, and will devote special attention to some aspects. They will not ask for salaries or international flights, thus allowing a considerable reduction of costs. They will eventually take benefit of local organisation and availability of camping facilities, and in some cases will obtain national flight tickets.

- **Franco ANDREONE**, PhD and Curator, Gondwana Research and Museo Regionale di Scienze Naturali di Torino, Italy (international coordinator).
- **Fabio MATTIOLI**, Curator, Acquario di Genova, Italy.
- **Vincenzo MERCURIO**, PhD student, Senckenberg Museum, Frankfurt a.M., Germany.
- **Jasmin E. RANDRIANIRINA**, Curator, Parc Botanique et zoologique de Tsimbazaza, Antananarivo, Madagascar (local coordinator).
- **Herilala RANDRIAMHAZO**, Biodiversity Programs, Wildlife Conservation Society, Antananarivo, Madagascar.
- **Olga RAMILJAONA**, Professor of Biology and Department Head, University of Antananarivo, Department of Animal Biology, Antananarivo, Madagascar.
- **Miguel VENCES**, Curator and Assistant Professor, Zoological Museum Amsterdam, The Netherlands; and Zoological Institute, Technical University of Braunschweig, Germany.
- **Tokihery J. Razafindrabe**, Département de Biologie Animale, Université d'Antananarivo, BP 906, Antananarivo 101, Madagascar.
- **One** or more students chosen by university professors or PBZT curators.

Final outcome

Besides several scientific publications reporting on the research results - a document will be prepared and published that **summarizes all conservation-relevant data on the species studied, makes concrete proposals for their CITES listing, for maximum collection and export quotas, and for possible legal habitat protection**. This document will outline which strategy should be followed to ensure, on one hand, an effective conservation, and on the other hand allow the continued, sustainable harvesting of these emblematic frogs for the pet trade - an activity that certainly involves substantial economic benefits for local *communities* and thereby increases their awareness of the need of habitat conservation. Publication of the action plan in a publication from the MRSN series is possible if requested.

Furthermore it is possible to prepare and print **colour posters** to disseminate these results (in French language) in Madagascar. Because these final results will be based on a combination of field data and posterior lab work, as well as long-term surveys, their completion will require 18-24 months and is therefore expected latest for early 2007 (preliminary reports will be handed in after completion of the main fieldwork in autumn 2006).

Methods of research

Capture and marking techniques - The individuals will be searched overnight (by means of hand-torches) and captured at hand. Furthermore, a second method consists in pitfall trapping. This method, already used in other researches consists in placing buckets (about 280 mm deep, 290 mm top internal diameter, 220 mm bottom internal diameter), sunk in the ground at interval along a plastic drift fence. The fence (0.5 m high) is made from plastic sheeting stapled to thin wooden stakes. The fence bottom is buried 50 mm deep into the ground using leaf litter and ground and positioned to run across or along each pitfall trap. The trap lines are usually checked each morning and evening and pitfall captures removed. Basic measurements (such as snout-urostyle, weight) will be taken using metric rules and dynamometers. The acoustic repertoire will be recorded using a professional hand recorder. A small portion of a selected finger or toe will be cut and conserved in 70° ethanol for successive age studies. The toe-clipped finger will allow recognising immediately as already captured (and marked) the individuals.

Conservation genetics and age estimate - Several different methods will be applied to the samples collected during the fieldwork, to obtain data on genetic differentiation among populations and on the age of *Dyscophus* individuals. No funding is requested for this research that will be carried out in European labs in the framework of other projects. Exportation of the genetic material and voucher specimens will be possible in the framework of existing cooperation accords between the Museo Regionale di Scienze Naturali, the Gondwana Conservation and Research, and the Parc Botanique et Zoologique de Tsimbazaza. Similar permits were obtained from the pertinent Malagasy authorities

without major problems regularly during the last 15 years. During the fieldwork, samples will be collected from all specimens found, and preserved in pure ethanol. Sample collection will be done by clipping off one or two toes from the specimens, a well-established system in frogs which does not harm the survival of specimens after posterior release. All specimens will further be measured and weighed, their colour and sex recorded, and in some of them the stomach content obtained by flushing methods. From the tissue samples obtained during the fieldwork, DNA will be extracted and population genetic studies carried out using two main methods. First, a fragment of the mitochondrial cytochrome b gene (which is known to be sufficiently variable) will be sequenced in at least 100 *Mantella* and 50 *Dyscophus* specimens to understand the phylogeographic structuring of populations. Second, at least two microsatellites will be analysed in all expected 200-300 individuals. The bones of the *Dyscophus* toe clips will further be used to estimate the age of specimens by skeletochronological methods. This procedure which uses lines of arrested growth of bones as "year rings" has been proven to be applicable to amphibians in tropical Madagascar (e.g., Andreone et al. 2002).

Survey of the commercial trade - During the two study years, a maximum of information on the pet trade in *Dyscophus* will be gathered. Representatives of the complete chain of involved people will be interviewed, from collectors, resellers and exporters, to get a picture of the amount of specimens that are collected but eventually die before being exported. By contacts with Malagasy and European CITES authorities, and with the non-governmental organization BIODEV, insight into the yearly numbers of officially exported specimens will be gained. BIODEV reviewed the trade in Malagasy amphibians and reptiles thoroughly in the past, and should have comparative data on the evolution of numbers of exported frogs in the last decade.

Study periods

The time schedule of the project will depend on the availability of funds. Anyhow, some preliminary steps have been already done, notably those regarding two pre-missions. A first one was led by J. E. Randrianirina in February 2005, and the second will be done in in January-February 2006, during which we observed in the past animals in mating activity.

The applicant, accompanied by F. Mattioli and J.E. Randrianirina (and likely other persons, e.g., Malagasy university students and technicians) will visit Madagascar to implement a project funded by the Nando Peretti Foundation (development of a rapid assessment methodology for Malagasy amphibians). At this occasion, and pending further financial support as requested herein from the Zurich Zoo program, it will be possible to carry out field expeditions to contribute to the knowledge of *Dyscophus antongilii* and *D. guineti*.

The other study periods, through the two-years 2006-2007, are schematised in the enclosed time schedule.

Dissemination of results

As a follow-up of the project, the action plan will be published in order to allow a most efficient dissemination. As mentioned above, it is also planned to prepare **1-2 colour posters** (in high print runs of at least 1000 copies), with the results and recommendations presented in French language. Although little innovative, such posters are very much appreciated in Madagascar, in villages as well as official institutions, and they can substantially contribute to increase environmental awareness. At the present state, it is difficult to decide in which form the results should be published in order to achieve a maximum impact. Similarly, details of the poster elaboration can only be decided later on.

Certainly, dissemination of results will be carried out in cooperation with other organizations, such as Conservation International, WCS, WWF, and, of course, with national organisations, such as PBZT.

Repatriation of equipment for counterparts

Because the counterparts (Antongil Conservation, the Université d'Antananarivo, Département de Biologie Animale, the Parc Botanique et Zoologique de tsimbazaza) are involved in this project, the equipment that is acquired and that will serve for capacity building will be distributed between these two institutions.

Budget, requested funds and justification

The funds here requested concern the activity for the years 2006 and 2007. We explicitly exclude the first pre-survey that will be taken in January 2006 for which we already asked for a contribution (2000 €). The budget includes a first general part (marked with A), where we reported the general expenses, mainly for materials and equipments, and a second detailed part (marked with B), where we reported the detailed live expenses and salaries.

Key Bibliography

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THE TIME SCHEDULE ¹		
1	January-February 2006	Antara 2006 Field study on <i>Dyscophus antongili</i> at the Antara site
2	March 2006	Redaction of a preliminary report regarding the field surveys
3	April-September 2006	Trade surveys Interviewers at the local collectors and exporters to better define the trade traffic in Madagascar
4	October 2006	Pre-missions Short “reconnaissance” missions to locate the study sites of the following field surveys (not calculate in the general budget; potentially subject to other fundings)
5	November-December 2006	Masoala 2006 Field study on <i>Dyscophus antongili</i> at Masoala, west and east coasts.
6	January-February 2007	Antara/Ambatovaky 2007 Field study on <i>Dyscophus antongili</i> at Antara/Ambatovaky,
7	March 2007	Redaction of a preliminary report regarding the field surveys
8	April-August 2007	Trade surveys Interviewers at the local collectors and exporters to better define the trade traffic in Madagascar
9	September 2007	Pre-missions Short “reconnaissance” missions to locate the study sites of the following field surveys (not calculate in the general budget; potentially subject to other fundings)
10	October 2007	Andevaranto/Vevembe 2007 Field study on <i>Dyscophus antongili</i> at Andevaranto/Vevembe.
11	November-December 2007	Fierenana 2007 Field study on <i>Dyscophus guineti</i> at Fierenana.
12	January-February 2008	Redaction of a final report regarding the field surveys
13	March 2008	Realisation of the poster

¹ The project is thought as having 2-3 main studying periods, which correspond to the warm-wet season (November-March). In these periods we will concentrate the field activity.

SUMMARY OF BUDGET (BY ACTIVITIES)

€(up to)

1. Costs of permanence in Antananarivo

Local transports and others (including unexpected expenses) 430

TOTAL 1 430

2. Costs of joint fieldwork (local travel, administrative fees, accommodation, guides)

Administrative fees 500

Internal flight(s) 1000

Car renting 7800

Per diem compensation for assistants 1700

Per diem compensation for technicians and students 1000

Local guides and porters 1720

Food in the field and in the town 1350

TOTAL 2

3. Costs of materials for the research

Tape recorder 200

GPS 400

Digital camera 1200

Tents and field equipment 500

Batteries 500

TOTAL 3 2800

4. Dissemination of results

Publication of report, printing of posters 2700

TOTAL 4 2700

TOTAL 21000

DETAILED BUDGET AND STUDY PLANNING ²

A. GENERAL EXPENSES

items	Unitary price	Quantity	cost
A1. MATERIALS AND EQUIPMENT ³			
Tape recorder and cassettes	200,00 €	1	200,00 €
GPS	100,00 €	4	400,00 €
Digital camera(s)	1200,00 €	1	1200,00 €
Tents, backpacks boots, raincoats, and other generic materials	forfeit		500,00 €
Batteries and photographic equipment	forfeit		500,00 €
Administrative expenses ⁴	forfeit		500,00 €
TOTAL			3300,00 €
A2. DISSEMINATION OF RESULTS			
Printing of a Poster and expenses for the publication of scientific and popular papers		forfeit	2700,00 €
TOTAL			2700,00 €

² The project was originally submitted with a starting date in December 2003. Due to several reasons and also to the answer for grant availability obtained late, the program has been shifted, in terms of starting date, to January 2004. As a general and overall program we here establish a period of 2 years, thus from 1 January 2004 to 31 December 2005, with a possibility of extension to a few months at the beginning of 2006. It must be clearly stressed that the dates reported below are in general quite general and merely indicative, since time schedules in Madagascar are often difficult and hazardous, and also because the field activity will be calibrated according to weather conditions. Also, we cannot exclude that some of the time modules here reported will be slightly modified to fit and adapt to the circumstances.

³ This is only an indicative list of the materials needed. Most of the others are already owned by the team, and will not be demanded here. Some others will be eventually asked throughout further funding requests at other organisations.

⁴ These are in general the expenses for Visas, access and research authorisations, provided in forfeit manner.

B. DETAILS OF EXPEDITIONS

Unitary price Quantity

B1. ANTARA 2006 ⁵

STUDIED SPECIES ⁶

- *Dyscophus antongili*
- Other low altitude rain forest amphibians

STUDY PERIOD

20 days in the (scheduled starting date: 10th January 2006)

RATIONALE FOR THE RESEARCH ⁷

The research, already programmed within a former study program (sponsored by the Nando Peretti Foundation) is aimed to collect data at the Antarara/Ambatovaky area.

B1. MASOALA 2006/2007

STUDIED SPECIES ⁸

- *Dyscophus antongili*
- Other low altitude rain forest amphibians

STUDY PERIOD

40 days in the November February period (scheduled starting date: 1st November 2006)

Car 4X4 with car driver ⁹	150,00 €/day	10 days	1500,00 €
Per diem compensation for Malagasy assistant ^{10 11}	15,00 €/day	40 days	600,00 €
Per diem compensation for Malagasy student ¹²	10,00 €/day	40 days	400,00 €

⁵ The names of the expeditions characterise the locality and the species.

⁶ The main studied species. We cannot exclude that other species will be potentially studied in the meanwhile.

⁷ Information and importance of the research.

⁸ The main studied species. We cannot exclude that other species will be potentially studied in the meanwhile.

⁹ The cost for renting a car is based upon recent experiences. It includes also the cost of the driver (it is impossible to rent a car without driver), food/accommodation for driver(s), and fuel. We cannot exclude that during the going on of the research it will increase substantially.

¹⁰ The Malagasy assistant will be chosen among the people already studying amphibians and collaborating with the team leader. At some occasion he will be a person of PBZT; at some others he will be a person of Antananarivo University. Other researchers and/or students will join the team in the case there will be further funds.

¹¹ The per-diem compensation is a needed procedure by Malagasy Government. In a few words, foreign persons conducting research activities in Madagascar are requested to be accompanied by local people, in general by Malagasy researchers. In this case the per diem is intended as compensation to Malagasy salaries, since local institutions do not support full salaries. The same is also valid for students, who make a formation experience and need to be covered for what concerns usual fees. We explicitly do not ask for salaries to foreign people.

¹² Usually a person from Parc Botanique et Zoologique de Tsimbazaza.

Local guides and porters (including food) ¹³	7,00 €/person/day	15 porters X 4 days	420,00 €
Food in the town and in the field ¹⁴	3,00 €/person/day	5 persons X 40 days	600,00 €
TOTAL			3520,00 €

RATIONALE FOR THE RESEARCH¹⁵

The survey will be conducted at the two coasts of Masoala Peninsula, namely on the west coast (where the town of Maroantsetra lies) and on the east coast. Along the Masoala Peninsula it is very likely to gather further information on the species distribution, especially for what concerns its occurrence within the borders of the National Park. On the east coast we would like to obtain data on the occurrence of the species at Sambava and further southwards.

B2. ANTARA/AMBATOVAKY/VOLOINA 2007¹⁶

STUDIED SPECIES	<ul style="list-style-type: none"> – <i>Dyscophus antongili</i> and/or <i>D. guineti</i> – Other rainforest amphibians 		
STUDY PERIOD	20 days in the January-February period (scheduled starting date: 8 January)		
Car 4X4 with car driver	150,00 €/day	6 days	900,00 €
Per diem compensation for Malagasy assistant	15,00 €/day	20 days	300,00 €
Per diem compensation for Malagasy student ¹⁷	10,00 €/day	20 days	200,00 €
Local guides and porters (including food)	10,00 €/person/day	10 persons X 2 days	200,00 €
Food in the town and in the field	3,00 €/person/day	5 persons X 20 days	300,00 €
Unexpected expenses			80,00 €
TOTAL			1980,00 €

RATIONALE FOR THE RESEARCH

We already obtained information on the species presence at this site. This survey, extended eventually to Voloina, will define better the species distribution, gathering in the meanwhile data for a locality that is little known in terms of herpetofaunal occurrence and distribution.

¹³ The cost for local guides and porters is highly variable, and depends on several aspects, including the period of the year, the locality where the research is carried out, and the benefit obtained by the porters themselves. We here included a sort of forfeit amount, which included integrations, and also the cost of food bought for the porters.

¹⁴ Forfeit amount.

¹⁵ Information and importance of the research

¹⁶ Alternatively, if the study work in January 2006 has been highly successful and it will turn out to be useless to do a further research at the same site, a replacement site (likely more southwards) will be chosen.

¹⁷ Usually a person from Parc Botanique et Zoologique de Tsimbazaza.

B3. ANDEVARANTO-VEVEMBE 2007

STUDIED SPECIES	– <i>Dyscophus antongili</i> and/or <i>D. guineti</i>		
	– Other rainforest amphibians		
STUDY PERIOD	20 days in October (scheduled starting date: 10 October 2007)		
Flight travel (for 4 persons)	250 € / person	4 persons	1000,00 €
Car 4X4 with car driver	150,00 € /day	6 days	900,00 €
Per diem compensation for Malagasy assistant	15,00 € /day	20 days	300,00 €
Per diem compensation for Malagasy student ¹⁸	10,00 € /day	20 days	200,00 €
Local guides and porters (including food)	10,00 €/person/day	10 persons X 2 days	200,00 €
Food in the town and in the field	3,00 €/person/day	5 persons X 20 days	300,00 €
Unexpected expenses			100,00 €
TOTAL			3000,00 €

RATIONALE FOR THE RESEARCH

Data on the occurrence on a yellow *Dyscophus* are available for both Andevaranto and Vevembe. We will collect data and make interviews to local people to implement to knowledge.

B4. FIERENANA 2007

STUDIED SPECIES	– <i>Dyscophus guineti</i>		
	– Other rainforest amphibians		
STUDY PERIOD	20 days in December 2007		
Car 4X4 with car driver	150,00 € /day	20 days	3000,00 €
Per diem compensation for Malagasy assistant	15,00 € /day	20 days	300,00 €
Per diem compensation for Malagasy student ¹⁹	10,00 € /day	20 days	200,00 €
Local guides and porters (including food)	10,00 €/person/day	10 persons X 6 days	600,00 €
Food in the town and in the field	3,00 €/person/day	5 persons X 20 days	300,00 €
Unexpected expenses			100,00 €
TOTAL			4500,00 €

RATIONALE FOR THE RESEARCH

D. guineti is known to occur there. We plan to gather further data on its occurrence either here or in neighbouring localities.

^{18 18} Usually a person from Parc Botanique et Zoologique de Tsimbazaza or from Antananarivo University.

B7. TRADE SURVEYS

STUDIED SPECIES	All the species of the project		
STUDY PERIOD	2 years (from 1 January 2004 to 31 December 2005), with some visits to exporters and local collectors		
Car 4X4 with car driver	150,00 €/day	10 days	1500,00 €
Per diem compensation for Malagasy student	10 €/day	20 days	200,00 €
Food and accomodation	Forfeit		150,00 €
Visits to local collectors and exporters and unexpected expenses	Forfeit		150,00 €
TOTAL			2000,00 €

RATIONALE FOR THE RESEARCH