



Annual report for 2013



Tsimanampseotra



Ampasambazimba

© Velizar Simeonovski

Prepared by

Steven M. Goodman, Marie Jeanne Raheirimalao, Achille P. Raselimanana,
Voahangy Soarimalala, and Malalarisoa Razafimpahanana

CONTENTS

A MESSAGE FROM THE PRESIDENT OF VAHATRA, DR. HDR. ACHILLE RASELIMANANA	1
LONG-TERM GOALS	2
VAHATRA – PERMANENT STAFF	2
VAHATRA'S BOARD OF DIRECTORS	3
STUDENTS	4
MALAGASY NATURE	8
WEBSITE	11
THE PUBLISHING HOUSE OF ASSOCIATION VAHATRA	11
ATLAS OF SELECTED LAND VERTEBRATES OF MADAGASCAR	12
OTHER CAPACITY BUILDING PROGRAMS FOR MALAGASY STUDENTS AND RESEARCHERS	15
RECENT AND CURRENT GRANTS	16
STEVE GOODMAN HONORED BY THE UNIVERSITY OF ANTANANARIVO	17
SPOTLIGHTS OF VAHATRA STAFF AND STUDENTS	17
OTHER PROJECTS	19
ACTIVE COLLABORATIONS OF VAHATRA	19
COLLECTION ROOM, UNIVERSITY OF ANTANANARIVO	22
NEW SPECIES OF ANIMALS DESCRIBED BY VAHATRA SCIENTISTS AND STUDENTS IN 2013	23
NEW SPECIES OF ANIMALS NAMED FOR VAHATRA SCIENTISTS IN 2013	23
ACTIVITIES OF VAHATRA PERMANENT MEMBERS DURING 2013	23
SCIENTIFIC OUTPUTS OF VAHATRA DURING 2013	30

It is with notable pleasure that we send you the Association Vahatra annual report for 2013. The association has just passed into its 7th year of formal existence. As we hope you will agree after reading this report, the activities during 2013 show important advances and a significant level of vitality. Notwithstanding the social-economic-political problems that Madagascar has been facing since 2009, Vahatra has been able to make notable advances in helping with the education and capacity building of young Malagasy scientists, as well as exploring aspects of the island's remarkable biological diversity. During the course of 2013, there have been continued modifications to the Vahatra website, which you are cordially invited to explore (www.vahatra.mg). As you will soon learn about, 2013 has been a year of new directions and achievements for the association. Our publishing house continues to thrive, including the publication in 2013 of a new book in the biodiversity series, as well as a large format atlas to land vertebrates of Madagascar. If you have any comments or questions on our activities or information presented in this report, please do not hesitate to be in contact (associatvahatra@moov.mg). On the behalf of Vahatra, best wishes to you and yours for 2013.

A MESSAGE FROM THE PRESIDENT OF VAHATRA, DR. HDR. ACHILLE RASELIMANANA

Since its inception, the Association Vahatra has placed special emphasis on the sharing of knowledge and lessons learned about Madagascar's biodiversity and its natural history. One of the specific aims is to contribute to the management and conservation of the island's natural heritage, unique to our World. With this spirit of sharing and exchange, the association launched in 2011 a guide series to the biological



diversity of Madagascar. During 2013, the fifth guide in the series was published, this one on extinct Holocene animals and ecosystems of the island. This volume has been a notable success not only among scientists but also among the Malagasy general public, who being familiar with many of the places and sites discussed in this book can clearly understand the book's message of how quickly the environment can change in a negative manner, which in turn touches our sense of being. Perhaps this is best measured by the number of times the authors have been asked to make presentations on its contents at scientific and non-scientific venues, clearly highlighting interest from different sectors of society.

The completion of the *"Atlas of selected terrestrial vertebrates of Madagascar"* is another considerable challenge met by the association in 2013. This atlas marks an important landmark in studies on Malagasy biodiversity, and in many ways a synthesis of at least two decades of fieldwork and laboratory and museum studies by different scientific members of Vahatra. Its large format, bilingual French-English text, and copious map illustrations should provide easy access to the wealth of information this volume contains to a varied audience.

Promoting effective collaboration with other institutions is an aspect that members of Association Vahatra consider important and an effective manner to share, exchange, and diffuse information. The year 2013 can be cited for this type of interactive development with diverse institutions, such as in the domains of communication (with HayZara), environment (with ONE), and conservation actions (with The Peregrine Fund Madagascar). The results of these collaborations are very encouraging and have enabled Vahatra to provide multi-faceted services to different organizations and individuals. This in turn has increased its visibility at national and international levels.

An event this past year that meant a lot to Vahatra was the bestowing by The University of Antananarivo of a "Honoris Causa" Doctorate Degree to Steve Goodman, one of the founding members of the association and current Scientific Advisor. This was in recognition of his years of pedagogic and research activities associated with this university.

As readers will see by the contents of this annual report, notable progress has been made in different fields related to advancing conservation science on Madagascar, but much remains to be done, and we hope that together we will be able to make further progress!

LONG-TERM GOALS

The long-term goals of the Association Vahatra are to advance Malagasy scientists, specifically graduate students within the university system, as well as other members of the national conservation biology community, and make important advances in understanding the island's unique biota. Our sincere intent is to create an organization with a long-term future, both in the sense of a vision and financial base. A critical aspect to mention is that we have created this vision largely based on the scientists and students working with the association, and, hence, distinctly Malagasy in prospective. This is in comparison, for example, to large international organizations that might not necessarily have the interests of Madagascar as their principal point of perspective. This aspect is fundamental for the long-term strength of the association, since members are engaged and committed by conviction with regard to the study and conservation of their natural heritage.

The seed was planted for Association Vahatra more than two decades ago in the context of a project organized by WWF-Madagascar and known as The Ecology Training Program (ETP). Steve Goodman and Achille Raselimanana were the coordinators of the project for many years, during which time several generations of Malagasy students finished their higher degrees within the university system in animal and conservation biology. Many of these graduates are amongst the major actors in the current community of Malagasy conservation biologists. These individuals are now responsible for the advancement of new generations of national field biologists in at least three different manners: 1) lecturers and professors within the national university system, 2) active scientific members of the Vahatra staff, and 3) playing important roles and holding key positions in the non-governmental and governmental sectors.

VAHATRA – PERMANENT STAFF

1. Professor Achille P. Raselimanana – President of Vahatra and Professor, Department of Animal Biology, The University of Antananarivo. Founding member. Achille was one of the first generation of ETP graduates and did his DEA and Ph.D. in the context of this program. In 2011, he presented his "Habilitation à Diriger des Recherches"

(HDR) at The University of La Réunion, which is the highest scientific degree in the French university system. Achille is a herpetologist with considerable experience in molecular systematics and worked as the Biodiversity Program Officer for WWF-Madagascar for almost 10 years before the creation of Vahatra.

2. Dr. Marie Jeanne Raherilalao – Editor of the journal *Malagasy Nature* at Vahatra and Lecturer, Department of Animal Biology, The University of Antananarivo. Founding member. Marie Jeanne did her Ph.D. associated with the ETP. Marie Jeanne is an ornithologist working on ecology, biogeography, and systematics.
3. Dr. Voahangy Soarimalala – Scientific Coordinator at Vahatra; Head Curator, Department of Animal Biology, The University



of Antananarivo; and Lecturer, The University of Fianarantsoa. Founding member. Voahangy did her DEA and Ph.D. associated with the ETP. Voahangy is a mammalogist with a particular interest in rodents and tenrecs.

4. Dr. Steven M. Goodman – Scientific Advisor at Vahatra and Lecturer, Department of Animal Biology, The University of Antananarivo and The University of Mahajanga. Founding member. Steve works with both mammals and birds and holds the post of MacArthur Field Biologist, Field Museum of Natural History, Chicago.
5. Mrs. Malalarisoa Razafimpahanana – General Secretary of Vahatra. Founding member. Malalarisoa formerly worked at WWF and transferred to Vahatra in October 2007. She is responsible for the administration of the association. Further, with considerable technical and aesthetic skills, she does the design and type setting of the journal *Malagasy Nature*, as well as the different books published by the association. She plays a key role in the maintenance of the association website.
6. Mr. Rachel Razafindravao called “Ledada” – logistic coordinator. Ledada started working with the ETP some 20 years ago and transferred to Vahatra in October 2007. He has helped organize logistics for well over 250 field missions to some of the remotest areas on Madagascar.
7. Mrs. Françoise Ramalalaitiana – domestic help. Françoise has worked with Vahatra since October 2007.
- 8-10. Mr. Elisa Malaimbohitsy, Mr. Mara Avisoa, and Mr. Mbola Marivosoa Alexandre – guardians.
11. Ms. Herivololona Mbola Rakotondratsimba – Consultant and GIS-specialist. Association Vahatra has hired her for a project associated with the publication of an atlas to selected endemic land vertebrates of Madagascar (see below).

VAHATRA'S BOARD OF DIRECTORS

In order to provide needed guidance and counseling for the current and future programs associated of Vahatra, a Board of Directors was named, which includes the following individuals:

Malagasy nationals

Professor Daniel Rakotoniravony – Department of Animal Biology, The University of Antananarivo.

Mrs. Nanie Ratsifandrihamanana – Design and Impact advisor, Conservation Strategy and Performance Unit-WWF International.

General Guy Ratrimoarivony – Général de Corps d'Armée, Director of Strategy Seminar, Center for Diplomatic and Strategic Studies.

Mrs. Chantal Andrianarivo – Former Head of Research and Biodiversity, Madagascar National Parks and now Technical Advisor at Western Indian Ocean Coastal Challenge – Islands Project.

Professor Joelisoa Ratsirarison – Forestry Department of the School of Agronomy, University of Antananarivo and Vice President of the University of Antananarivo in Charge of International Relations.

Mr. Jean Chrysostome Rakotoary – General Director of the National Office for the Environment (ONE).

Professor Raelina Andriambololona – Institut National des Sciences et Techniques Nucléaires (INSTN), The University of Antananarivo, General Director of INSTN and Member of the Malagasy Academy.



Foreign members

Mr. Paul Goodman – Kingfisher Group

Mr. John McCarter – Former president of the Field Museum.

Mr. Michael Polsky – President, Invenergy.

Mr. Olivier Langrand – Director of Global Affairs, Island Conservation.

Professor Jörg U. Ganzhorn – Professor, Tierökologie und Naturschutz, University of Hamburg.

The 2013 annual meeting of the Board of Directors will be held in the early portion of 2014.

STUDENTS

We are currently working directly with different Malagasy students registered within the national university system and conducting either their "Diplôme d'Etudes Approfondies" or DEA (roughly equivalent to a MSc), "Professional licence" (DESS), or PhD degrees and (see section below entitled "Active graduate students in 2012"). Further, the scientific members of Vahatra are also in contact with tens of other Malagasy students as secondary advisors and members of thesis and mémoire committees. We have made a dedicated effort to work with undergraduate and graduate students in universities outside of Antananarivo, including Toliara, Fianarantsoa, and Mahajanga. In addition, Vahatra staff members advise many other Malagasy students with aspects of their research, access to literature, and other forms of mentorship.

Since Vahatra open its doors in late 2007, something approaching 1000 different student and research visitors not registered with the program have visited the office to use the library facilities or consult with the scientific staff. (These figures are based on a sign-in notebook.) In 2013, something approaching 300 different student and researcher visits were made to the library and thousands of documents (books, reprints, theses, etc.) consulted. Steven M. Goodman also serves on the Ph.D. committees of students at The University of Kwa-Zulu Natal, where he is Honorary Professor, and other universities in North America and Europe; most of the research themes of these different Ph.D. projects are associated with Malagasy animals.

Malagasy students passing through the Vahatra program have considerable success finding permanent jobs within governmental and non-governmental sectors of Malagasy society. In many cases, these posts are in domains related to biology and conservation, for example, university appointments, working within NGOs, associated with the Madagascar National Parks, etc. Hence, one of the mandates of the association, to advance science and conservation in Madagascar with focused mentorship of graduate students, is working. A good example of this is the number of university appointments Vahatra graduates have received in the past few years (Table 1), which provides the means to increase substantially the impacts of the association's goals related to understanding aspects of the island's biota and using this data to advance its conservation. Another means to measure the success of the capacity building approach initiated by ETP and continue by Vahatra is the increasing number of NGOs that involve capacity development and reinforcement of young Malagasy scientist as a part of their higher education program. Vahatra staff scientists are on a regular basis solicited to co-supervise some of these students.

Table 1. Malagasy graduate students that worked with Vahatra and in the past years that obtained posts in the national university system. Most retain a sort of adjunct status at the Association Vahatra or continue research programs with Vahatra scientific members.

1. Zafimahery Rakotomalala – Thesis title: Distribution des communautés des micro-mammifères dans l'Ouest de Madagascar: Détermination de l'implication des traits hydrographiques naturels dans les assemblages zoologiques – This thesis was presented in March 2010. Zafimahery has subsequently obtained the post of Professor in the Department of Animal Biology, The University of Antananarivo.
2. Harimalala Fanja Ratrimomanarivo – Thesis title: Inventaire des espèces de chauves-souris synanthropiques malgaches et étude de la variation morphologique, phylogéographique des quatre espèces de Molossidae dans des îles occidentales de l'Océan Indien et de l'Afrique – This thesis was presented in April 2010. The student was engaged in an 18-month post-doc associated with Vahatra. Before the termination of her post-doc, she was named as Professor at The University of Toliara.
3. Claudette Patricia Maminirina – Thesis title: Etude systématique et phylogénétique de *Miniopterus* Bonaparte 1837 (Microchiroptera : Vespertilionidae) de

Madagascar – This thesis was presented in April 2010. The student was engaged in an 18-month post-doc associated with Vahatra and has published a series of papers associated with her research. She has recently been named as a Lecturer at The University of Antananarivo.

4. Martin Raherlarisena – Thesis title: Les petits-mammifères non-volants (Afrosoricida, Soricomorpha et Rodentia) dans le complexe forestier de la région de Loky-Manambato : biodiversité, biogéographie et effets de fragmentation forestière – This thesis was presented in March 2010. Martin has subsequently obtained the post of Lecturer in the Department of Animal Biology, The University of Antananarivo. The student has published a few papers associated with the thesis topic.
5. Julie Ranivo Rakotoson – Thesis title: Révision taxinomique des espèces de Microchiroptera de la région sèche de Madagascar et leur écomorphologie. This was presented in 2007. Subsequently, she was named Grant Officer at the Madagascar Biodiversity Fund and then Lecturer at the Department of Animal Biology, The University of Antananarivo.
6. Hery Andriamirado Rakotondravony – Thesis title: Etude de la distribution des communautés d'amphibiens et de reptiles à partir d'inventaires et analyses biogéographiques dans la région de Daraina. He worked for the Ministry of the Environment since 2011, Service Climate Changes, and recently was hired by the Madagascar Biodiversity Fund as manager of project evaluation. He has been also named as a Lecturer at The University of Antananarivo.

Active graduate students working in different manners with Association Vahatra and presentations made during 2013

As can be seen from the following lists, the scientific members of Vahatra are extensively involved in the advancement of a large number of Malagasy and international graduate students. We consider this the hallmark of the importance of the association in advancing graduate studies for a large cadre of young Malagasy scholars.

A-Professional licence, DEA, Ph.D. and HDR diplomas presented by student members of Association Vahatra

- Ramasinatrehina, S. 2013. Contribution à l'étude écologique de *Mentocrex beankaensis* (Aves, Rallidae) dans la forêt de Beanka, Région Melaky). Mémoire de DEA, Université d'Antananarivo, Antananarivo.
- Randriandimbimahazo, R. 2013. Etude bioécologique des communautés de vertébrés et d'invertébrés terrestres dans un écotone savane-forêt sèche à Beanka, Maintirano. Mémoire de DEA, Université d'Antananarivo, Antananarivo.

Solonantenaina, O. A. 2013. Etude introductive pour la mise en place de l'écotourisme à Anjiamangirana, District d'Antsohihy, Région Sofia. Mémoire de Licence Professionnelle, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa.

B- Professional licence, DEA, Ph.D. and HDR diplomas defended with implication of Vahatra scientific members as a supervisor, member of lecture committee or jury member

- Andriahatrika, F. S. 2013. Contribution à l'étude des différents groupes d'*Eulemur rubriventer* dans la forêt de Sahavondronina, Ambatovaky, Fianarantsoa. Mémoire de Licence Professionnelle, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa, Fianarantsoa.
- Andriampenanana, Z. F. 2013. Suivi de la dynamique des populations et des menaces sur l'espèce cible de conservation *Astrachelys radiata* (Gray, 1973), dans trois sites (Aires protégées, Transfert de gestion, Zones à droit d'usage) du Plateau Mahafaly. Mémoire de DEA, Université d'Antananarivo, Antananarivo.
- Andrianandrasana, A. M. A. 2013. Contribution à l'étude des influences des variations écologiques altitudinales et saisonnières sur la communauté d'amphibiens de cours d'eau dans le massif de l'Ankaratra. Mémoire de DEA, Université d'Antananarivo, Antananarivo.
- Andrianandrasana, M. C. 2013. Suivi des aspects socio-économiques de la mise en œuvre du plan de sauvegarde du Parc National de la Montagne d'Ambre. Mémoire de DESS, Université d'Antananarivo, Antananarivo.
- Andrianarisoa, S. E. 2013. Contribution au suivi des pressions dans la Réserve Spéciale d'Analamazao, Andasibe. Mémoire de Licence Professionnelle, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa, Fianarantsoa.
- Andriantsitohaina, M. 2013. Etude du comportement alimentaire de la mésite variée (*Mesitornis variegata*) dans la Concession forestière de Kirindy, CNFEREF. Mémoire de DEA, Université d'Antananarivo, Antananarivo.
- Fitahiantsoa, M. G. 2013. Variation de la communauté des petits mammifères suivant la structure des microhabitats. Mémoire de Licence Professionnelle, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa, Fianarantsoa.
- Latoroson, O. F. 2013. Les effets de la reforestation sur la population des lézards dans la région de Kianjavato, Mananjary. Mémoire de Licence Professionnelle, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa, Fianarantsoa.
- Naidoo, T. 2013. Genetic diversity of the *Chaerephon leucogaster/pumilus* complex from mainland Africa and the western Indian Ocean islands. Ph.D. thesis, The University of Kwa-Zulu Natal.





Onihary, A. M. 2013. Caractérisation moléculaire et analyse phylogénétique des souches épidémiques de *Vibrio nigripulchritudo* (Bauman et al., 1971) isolées des crevettes de Madagascar. Mémoire de DEA, Université d'Antananarivo, Antananarivo.

Rabeary, J. 2013. Etude bio-écologique et conservation des caméléons dans les habitats écotoniques des rivières malgache. Thèse de Doctorat, Université d'Antananarivo, Antananarivo.

Radafiarimanana, C. H. J. 2013. Ecologie et préférence en habitat de *Calumma hilienisi*, Brygoo, Blanc et Domergue (1973) dans le massif de l'Ankaratra. Mémoire de DEA, Université d'Antananarivo, Antananarivo.

Radovimiandrinifary, H. T. R. 2013. Diversité des petits mammifères non-volants autres que les Primates du massif forestier d'Ankerana. Mémoire de DEA, Université d'Antananarivo, Antananarivo.

Raharinirina, O. N. P. 2013. Causes entomologiques et cryptogamiques du dépérissement d'*Eucalyptus camadulensis* à Manjakandriana, Anjozorobe, Arivonimamo, Ankazobe et Betafo. Mémoire de Licence Professionnelle, Université d'Antananarivo, Antananarivo.

Ralambomanana, J. 2013. Etude des effets de la destruction de l'habitat sur les deux genres de poissons endémiques malgaches : *Rheocles* (Bedontiidae) et *Ratsirakia* (Eleotridae) dans la Région Alaotra-Mangoro. Mémoire de DEA, Université d'Antananarivo, Antananarivo.

Ramilison, M. L. 2013. Contribution à l'étude de comportement alimentaire d'*Indri indri* (Gmelin, 1788) dans le site minier d'Ambatovy-Analamay, Moramanga. Mémoire de Licence Professionnelle, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa, Fianarantsoa.

Ranaivoharivelo, M. F. 2013. Domaine vital, mouvements saisonniers et aperçu de l'utilisation de l'habitat des tortues radiées (*Astrochelys radiata*) (Shaw, 1802), dans la forêt littorale de Lavavolo au Sud-ouest de Madagascar. Mémoire de DEA, Université d'Antananarivo, Antananarivo.

Randriamanana, L. 2013. Caractérisation des sites de reproduction de *Mantella aurantiaca* (Mocquard, 1900) (Amphibiens, Anoures, Mantellidae) dans la région de Moramanga. Mémoire de DEA, Université d'Antananarivo, Antananarivo.

Randrianambinintsoa, F. J. 2013. Contribution à l'inventaire des Phlébotomes (Psychodidae – Phlebotominae) de Madagascar et des îles voisines. Thèse en co-tutelle, Université de Reims Champagne-Ardenne et Université d'Antananarivo.

Randrianarijaona, M. J. P. 2013. Effet des bordures sur la communauté des petits mammifères du PN de Ranomafana. Mémoire de Licence Professionnelle, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa, Fianarantsoa.

Richards, L. 2013. Beyond DNA sequencing: Integrative approaches to resolving selected higher and lower taxonomic problems in Afrotropical Chiroptera. Ph.D. thesis, The University of Kwa-Zulu Natal.

Raonizafinarivo, S. 2013. Effets de l'agriculture et du pâturage sur la communauté d'oiseaux dans la région du PN de Tsimanampetsotsa. Mémoire de DEA, Université d'Antananarivo, Antananarivo.

Rasoanasonirainy, M. R. 2013. Contribution à l'étude de la communauté d'oiseaux d'eau dans le site minier d'Ambatovy, Moramanga. Mémoire de Licence Professionnelle, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa, Fianarantsoa.

Ratsitohaina, R. M. 2013. Evaluation initiale des populations des lémuriens diurnes et transfert de gestion dans la forêt classée d'Ambohilero, commune de Didy, Ambatondrazaka. Mémoire de DEA, Université d'Antananarivo, Antananarivo.

Razanadravonirina, D. A. 2013. Contribution à l'étude du cycle en captivité de *Mantella viridis* (Pintak & Bohme, 1988). Mémoire de DEA, Université d'Antananarivo, Antananarivo.

Soavinarivo, N. L. 2013. Modèle de répartition des oiseaux d'eau dans les zones humides de la nouvelle Aire Protégée de Bemanevika, District de Bealanana, Région Sofia. Mémoire de Licence Professionnelle, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa, Fianarantsoa.

Tantely, M. L. 2013. Biologie des moustiques vecteurs potentiels du virus de la Fièvre de la Vallée du Rift (FVR) à Madagascar. Thèse de Doctorat, Département de Biologie Animale, Université d'Antananarivo, Antananarivo.

Tu, V. T. 2013. Phylogéographie comparée des chauves-souris (Mammifères, Chiroptères) de l'Indochine. Ecole Doctorale Sciences de la Nature et de l'Homme – ED 227, Museum National d'Histoire Naturelle.

C- Professional licence, DEA, Ph.D. diplomas in preparation in direct collaboration with scientific members of the Association Vahatra

Fitahiantsoa, M. In preparation. Contribution à l'étude des comportements de *Propithecus diadema* dans la zone de conservation d'Ambatovy Analamay-Moramanga. Mémoire de Licence Professionnelle, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa.

Ramamonjisoa, D. In preparation. Etude biologique et écologique de la communauté herpétologique de Bemanevika, Région Sofia. Mémoire de DEA, Université d'Antananarivo, Antananarivo.

Ramanandraibe, F. G. In preparation. Contribution au suivi et détermination des facteurs de mouvement de communauté d'oiseaux d'eau dans le lac d'Ambatovy. Mémoire de Licence Professionnelle, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa.

Rasoamiaranjanahary, M. In preparation. Utilisation de l'espace et domaine vital de *Propithecus diadema* dans le site minier d'Ambatovy. Mémoire de Licence Professionnelle, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa.

Razafindralavo, S. In preparation. Effets de bordure sur la communauté aviaire forestière de Bemanevika. Mémoire de DEA, Université d'Antananarivo, Antananarivo.

Zazarohavana, D. H. In preparation. Contribution à l'étude des plantes consommées par des lémuriens diurnes dans le site minier d'Ambatovy. Mémoire de Licence Professionnelle, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa.

D- Presentations made by Vahatra scientific members (names in **bold** are those of Association Vahatra scientific staff and those in *italics* of collaborating students).

Block, N. L., S. J. Hackett, J. M. Bates, **S. M. Goodman** & **M. J. Raherilalao**. 2013. Explosive or non-explosive adaptive radiation? Cryptic diversity alters diversification rate estimates for the Bernieridae, a Malagasy passerine radiation. American Ornithologists' Union Annual Conference, 14-17 August 2013, Chicago, Illinois.

Eager, H. M., A. Hulme, A. Trinks, **S. M. Goodman**, J. Pascal, J.-M. Duplantier, N. Boivin, A. Anderson, K. Dobney, K. Larson & J. B. Searle. 2013. The house shrew *Suncus murinus* as a bioproxy in the western Indian Ocean. Conference Proto-globalisation in the Indian Ocean world, Sealinks Project, University of Oxford.

Goodman, S. M. 2013. The interface between bat phylogeny and ecology in the western Indian Ocean: Understanding their potential role as disease reservoirs and vectors. Workshop on bats, small mammals and infectious agents RUN-EMERGE PROGRAMME, La Réunion.

Goodman, S. M. 2013. Windows into the extraordinary recent land animals and ecosystems of Madagascar. Field Museum of Natural History, Chicago, 11 July 2013.

Goodman, S. M. 2013. Madagascar's Biodiversity: Its origins, patterns and future. Conference entitled Biodiversity Southern Africa, The University of Cape Town, 2-6 December 2013.

Goodman, S. M. 2013. Windows into the recent past: The interface of natural and human-induced extinctions and environmental change on Madagascar. Keynote lecture. Conference entitled Biodiversity Southern Africa, The University of Cape Town, 2-6 December 2013.

Goodman, S. M. 2013. The history of mammal introductions to islands in the western Indian Ocean. Conference Proto-globalisation in the Indian Ocean world, Sealinks Project, University of Oxford.

Goodman, S. M. 2013. Les extraordinaires animaux et écosystèmes de Madagascar récemment disparus. Ecole Supérieure des Sciences Agronomiques, Université d'Antananarivo, 4 October 2013.

Windows into the recent past: The interface of natural and human-induced extinctions and environmental change on Madagascar



Steve Goodman, 6 December
2013, Biodiversity, SA, Cape Town



Goodman, S. M. 2013. Les extraordinaires animaux et écosystèmes de Madagascar récemment disparus. Institut Français de Madagascar, Antananarivo, 7 September 2013.

Ramasindrazana, B., **S. M. Goodman** & P. Tortosa. 2013. Diversity and host specialization of filarial nematodes infecting Malagasy bats. Scientific days on Emerging Infectious Diseases in the South Western Indian Ocean region, RUN-EMERGE PROGRAMME, La Réunion.

Ramasindrazana, B., **S. M. Goodman** & P. Tortosa. 2013. Host specificity of haemosporidian parasites in Malagasy bats. Workshop on bats, small mammals and infectious agents RUN-EMERGE PROGRAMME, La Réunion.

Randriamiharisoa, L. O., A. Ranirisoa, **M. J. Raherilalao**, D. Rakotondravony, L. Willemé & J. Ganzhorn. 2013. Effects of transhumance on the richness and composition of bird communities in Tsimanampetsotsa National Park. Open Landscape 2013 – Ecology, Management and Nature Conservation, 29 September-3 October 2013. Hildesheim, Germany.

Soarimalala, V. 2013. Ecology and population dynamics of small mammals in the Ankazomivady Forest, Madagascar. Workshop on bats, small mammals and infectious agents RUN-EMERGE PROGRAMME, La Réunion.



MALAGASY NATURE

Our intention with the scientific review *Malagasy Nature* is to publish a peer-reviewed journal including articles of high scientific and technical standards. As the journal has an ISSN number, it is considered an international scientific review published in Madagascar. Manuscripts in French or English are passed through a review and editorial process. We work closely with Malagasy authors, particularly graduate students and young researchers, to help them understand the process of composing, writing, and editing scientific articles. In many cases, the first publication of a researcher poses considerable hurdles and *Malagasy Nature* provides the means for these individuals to find their way across such problems. Based on this approach, this journal plays an important role in regional capacity building, which in turn separates it from other journals of international standards. Further, the journal allows Malagasy scientists to return information to the worldwide scientific world, rather than only being on the receiving end. We consider this a very important professional step for the Malagasy scientific community. This instills a certain sense of responsibility and helps Malagasy authors understand the importance of invested efforts when producing scientific articles of international standards and the resulting interactions with national or foreign scientists. *Malagasy Nature* also guarantees the local availability of research results in the fields of ecology and biology conducted on the island, as compared to foreign scientific journals with copies not always being repatriated to Madagascar.

Marie Jeanne Raherilalao is the Editor of *Malagasy Nature* and a group of Associated Editors assists her. At least one volume of the journal is published each year. The editorial board of *Malagasy Nature* is composed of both national and international scientists, from the Anglophone and Francophone worlds, made up of the following individuals:

Head editor

Marie Jeanne Raherilalao

Associated editors

Steven M. Goodman

Achille P. Raselimanana

Voahangy Soarimalala

Malagasy Nature



**Etudes scientifiques dans la forêt de Beanka, Région Melaky,
Ouest de Madagascar / Scientific studies of the Beanka Forest,
Region Melaky, Western Madagascar**

Editors : Steven M. Goodman, Laurent Gautier & Marie Jeanne Raherilalao

Editorial committee

Birds

Frank Hawkins
Olivier Langrand

Mammals

Jörg U. Ganzhorn
Peter J. Taylor
Manuel Ruedi
Daniel Rakotoniravony
Jean-Marc Duplantier

Entomology

Brian Fisher
Henri-Pierre Aberlenc
Wilson Lourenço

Reptiles/Amphibians

Franco Andreone
Miguel Vences

Crustaceans/Fish

Jeanne Rasamy
Melanie Stiassny

Parasitology

Vincent Robert

Plants

Christopher Birkinshaw
Roger Edmond
Joelisoa Ratsirarson

History/Archeology

Henry Wright
Chantal Radimilahy

Paleontology

John Flynn
David Burney

Andrianaivoarivony, Bako Rasoarifetra, Lucien M. A. Rakotozafy & Steven M. Goodman

- **Cartographie de la couverture forestière du massif de Beanka, Région Melaky, Ouest de Madagascar** – Cyrille Chatelain, Mitia R. Hanitrarivo, Brice F. L. Rakotozafy, Ralph Bolliger, Iacopo Luino, Patrick Ranirison & Laurent Gautier
- **Structure et composition floristique de la forêt sur faciès karstique de Beanka, Région Melaky, Ouest de Madagascar** – Brice F. L. Rakotozafy, Riambola M. Hanitrarivo, Patrick Ranirison, Jacques A. Tahinarivony, Roger Edmond & Laurent Gautier
- **Inventaire des plantes vasculaires de la région de Beanka, Région Melaky, Ouest de Madagascar** – Laurent Gautier, Ralph Bolliger, Martin Callmander, Mitia R. Hanitrarivo, Iacopo Luino, Louis Nusbaumer, Pete Phillipson, Luc Ranaivavisoa, Patrick Ranirison, Brice F. L. Rakotozafy, Nathalie Rasolofo & Jacques A. Tahinarivony
- **The non-marine molluscs of Tsingy Beanka, Melaky Region, western Madagascar** – Owen L. Griffiths & David G. Herbert
- **Diversity of ants in burned and unburned grassland, and dry deciduous forest in the Beanka Reserve, Melaky Region, western Madagascar** – Andrianjaka Ravelomanana & Brian L. Fisher
- **Distribution et diversité des communautés terrestres et fouisseuses de vertébrés et d'invertébrés dans un écotone savane-forêt sèche de Beanka, Région Melaky, Ouest de Madagascar** – Rindra Randriandimbimahazo
- **Faune herpétologique de la forêt de Beanka, Région Melaky : richesse biologique, intérêt biogéographique et importance dans la conservation de la biodiversité malgache** – Achille P. Raselimanana
- **Premier aperçu de la diversité des oiseaux de la forêt sèche sur tsingy de Beanka, Région Melaky, Ouest de Madagascar** – Marie Jeanne Raherilalao & Steven M. Goodman
- **Aperçu sur l'écologie de *Mentocrex beankaensis* (Aves, Rallidae) de la forêt sèche de Beanka, Région Melaky, Ouest de Madagascar** – Nasolo S. Ramasinatrehina & Marie Jeanne Raherilalao

Contents of the most recent issue of *Malagasy Nature*

Volume 7 (2013, 295 pp.)

The most recent issue of the journal was published in December 2013 and contains the following articles:

- **Préface et remerciements/Preface and acknowledgements**
- **La forêt de Beanka, Région Melaky, Ouest de Madagascar : introduction et présentation du milieu** – Laurent Gautier, Steven M. Goodman & Marie Jeanne Raherilalao
- **Current conservation trends in the Beanka Reserve** – Aldus Andriamamonjy, Owen Griffiths & Roger Randalana
- **Caves of the Beanka karst, Melaky Region, western Madagascar** – Gregory J. Middleton
- **Rapport sur une mission archéologique à Beanka, Région Melaky, Ouest de Madagascar** – Chantal Radimilahy, Rafolo





- VAHATRA Annual report for 2013

WEBSITE

During 2013, Vahatra has updated the association's bilingual website (English and French) for the dissemination of information on its pedagogic and research activities. The site address is: www.vahatra.mg. The General Secretary of Vahatra, Mrs. Malalarisoa Razafimpahanana, was responsible for creating and constructing the website. As she is the site webmaster, it is a simple manner for Vahatra to add new information and update existing pages. We welcome your comments on the site and its contents.

THE PUBLISHING HOUSE OF ASSOCIATION VAHATRA

The year 2011 marked an important advancement for Association Vahatra with the creation of its own publishing house. The first major project involves a series entitled "Guides sur la diversité biologique de Madagascar" [Guides to the biological diversity of Madagascar].

For individuals that have grown up over the past 40 years in North America, portions of Latin America or western Europe, information on regional faunas and floras was readily available in a remarkable number of field guides. These types of books, generally arranged thematically by taxonomic group (e.g. ferns, reptiles, birds, etc.) and region, revolutionized making information on biodiversity available and penetrable by members of different age groups in these different countries. These guides provide an in-depth window into a variety of organisms, the means for individuals to become familiar with different groups near where they live or travel, and, most critically, integrating this familiarity into how they conceive the beauty and importance of the natural world. It is not an exaggeration to state that these types of guides have led to the "greening" of numerous sectors of western society. For a country that is so rich in plants and animals, as well as of being of international conservation concern, the lack of such books is an considerable void that Association Vahatra strongly believes needs to be filled.

In 2011, three different books were published in the series, which is edited by Marie Jeanne Raherilalao and Steven M. Goodman and designed and typeset by Madame Malalarisoa Razafimpahanana:

ASSOCIATION VAHATRA
GUIDES SUR LA DIVERSITE BIOLOGIQUE DE MADAGASCAR

LES ANIMAUX ET ECOSYSTEMES DE L'HOLOCENE DISPARUS DE MADAGASCAR



STEVEN M. GOODMAN & WILLIAM L. JUNGERS

ILLUSTRATIONS DE VELIZAR SIMEONOVSKI





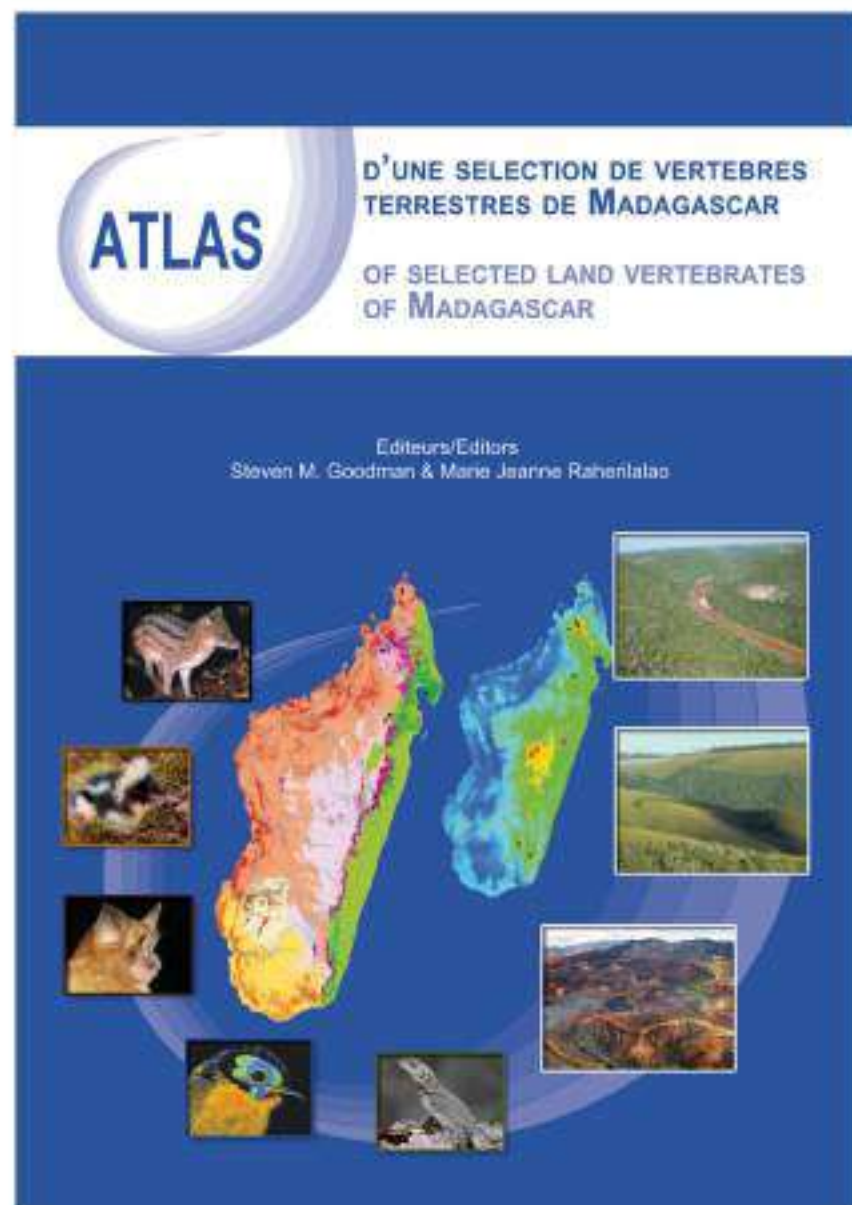
1. *Les chauves-souris de Madagascar* [The bats of Madagascar] by Steven M. Goodman, 2011, 129 pp.
2. *Les petits mammifères de Madagascar* [The small mammals of Madagascar] by Voahangy Soarimalala and Steven M. Goodman, 2011, 176 pp.
3. *Histoire naturelle des familles et sous-familles endémiques d'oiseaux de Madagascar* [The natural history of the families and subfamilies of endemic Malagasy birds] by Marie Jeanne Raherilalao and Steven M. Goodman, 2011, 146 pp.

The fourth volume entitled *Les Carnivora de Madagascar* [The Carnivora of Madagascar] by Steven M. Goodman was published in the first half of 2012 and the most recent volume *Les animaux et écosystèmes de l'Holocène disparus de Madagascar* [The extinct Holocene animals and ecosystems of Madagascar] was written by Steven M. Goodman and William Jungers and published in mid-2013. The production of the first three books in the series was financed by a grant from the Critical Ecosystem Partnership Fund. A generous grant was received from the Ellis Goodman Family Foundation for an additional five guides in the series, which include the already published Carnivora and extinct animal books. The additional three volumes to be published in the series and with subsidy from the Ellis Goodman Family Foundation over the next few years include:

1. *The amphibians of the dry forests of Madagascar* – by Franco Andreone, Gonçalo M. Rosa, and Achille Raselimanana, which is nearly completed and anticipated to be printed by mid-2014.
2. *The genera of ants of Madagascar* – by Brian Fisher, the first draft is anticipated in the first half of 2014.
3. *Guide to the reptiles of the subarid region of Madagascar* – by Achille P. Raselimanana

To date, other than the free diffusion of these books to numerous Malagasy students and scientists, a notable number of copies have been sold to people coming to the Vahatra office or through overseas booksellers. In general, we are pleased with the interest these books have generated. We are currently negotiating with The University of Chicago Press the possibility that they will take over distribution of published volumes in this series in North America and Europe.

ATLAS OF SELECTED LAND VERTEBRATES OF MADAGASCAR



Edited by Steven M. Goodman & Marie Jeanne Raherilalao
Maps & analyses by Herivololona Mbola Rakotondratsimba
Design & typesetting by Malalarisoa Razafimpahanana

Contents:

- **Foreword** – Olivier Langrand
- **Preface** – Joelsona Ratsirarson
- **Acknowledgements**
- **General introduction** – Steven M. Goodman & Marie Jeanne Raherilalao
- **Technical aspects associated with the realization of the atlas** – Herivololona Mbola Rakotondratsimba
- **Lizards or the class Reptilia** – Achille P. Raselimanana & Steven M. Goodman
- **Birds or the class Aves** – Steven M. Goodman & Marie Jeanne Raherilalao
- **Bats or the order Chiroptera** – Steven M. Goodman & Beza Ramasindrazana
- **Small mammals or tenrecs and rodents (Nesomyidae)** – Steven M. Goodman, Voahangy Soarimalala, Martin Raheriarisena & Daniel Rakotondravony
- **Carnivorans or the order Carnivora** – Steven M. Goodman
- **Index of scientific names**

The atlas was published by Association Vahatra in late 2013; it is a large format (28.9 x 40.1 cm) hard cover book of slightly less than 300 pages and with over 450 color illustrations and maps. The project, including publication costs, was largely financed by a grant from the John D. and Catherine T. MacArthur Foundation, as well as kind donations from Biodiversity Conservation Madagascar, Joyce and Bruce Chelberg, Field Museum of Natural History, Gail and Jack Klapper, and WWF-Madagascar.

Introduction

While the past few decades have seen numerous publications about the extraordinary and endemic terrestrial vertebrate fauna of Madagascar, ranging from technical papers, to species descriptions, and field guides, no detailed mapping exercise has been completed in the form of an

atlas. The purpose of this bilingual French-English book is that, to bring together information from numerous sources and present distributional maps on a range of taxa, descriptive texts to interpret associated patterns, and, for most taxa, potential habitat models (Maxent).

The authors are amongst the recognized authorities for the different vertebrate groups covered within this volume, having spent many decades conducting biological inventories in some of the more remote forests on the island, visiting natural history museums around the world to examine specimens from Madagascar, having a thorough grasp of the relevant literature, and publishing widely on their respective groups. This volume brings up to date research on the land vertebrates of one of the most extraordinary and threatened biodiversity hotspots on our planet. For the different reptiles, birds, and mammals treated herein, this atlas is an important reference for students, researchers, naturalists, and conservationists.

Contents

Sources and other aspects of data used in the production of the atlas

Species identifications: The authors of each section were responsible for the verification of all database records (specimens, observations, or published information) used to produce the maps and incorporated into the modeling exercises, as well as employing up-to-date taxonomy.

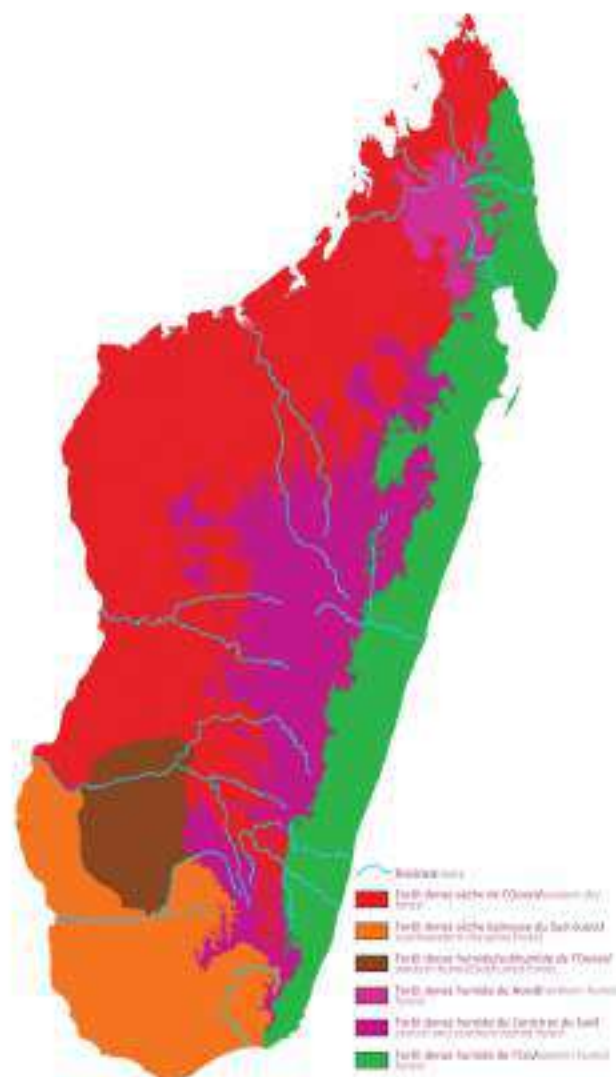
Table 2. Number of verified database records employed for each group in the mapping and modeling exercises associated with this atlas. For all of these groups, an important number of records were not used because of dubious localities, coordinates, and identifications; these do not appear in the figures presented here.

Taxonomic group	Number of records
Reptiles (Oplurinae and Gerrhosauridae lizards) – 26 species in total	2,045
Forest-dwelling birds – 101 species in total	20,971
Bats – 40 species in total	7,864
Endemic small mammals – 58 species in total	11,238
Endemic Carnivora – 11 species in total	577
Total – 236 species in total	42,695





Temporal span of the data set and coverage: The database used in this project of more than 45,500 records is derived from specimens and direct observations in nature spanning the period from 1860 to 2012 (Table 2). As many of the animals covered in this atlas are forest-dwelling and their natural habitats have been greatly reduced in area during the last century and a half, this imposes several problems for certain comparisons. In numerous cases, the use of a modern vegetation map places older records of certain forest-dwelling animals a considerable distance from existing forests, and hence, falsifying critical aspects of the modeling exercises. Hence, it was necessary to create a new map of the inferred vegetation of the island approximately at the period that humans originally colonized the island.



Text associated with each species

Maxent: The calculated value of the "area under curve" (AUC) generated by the Maxent model is presented. The Maxent analyses employed a variety of environmental variables (soils, vegetation, altitude, geology, and meteorology) to examine possible preferences for the species in question. In a similar manner, the results of these analyses provide insights into the biogeography of a given species.

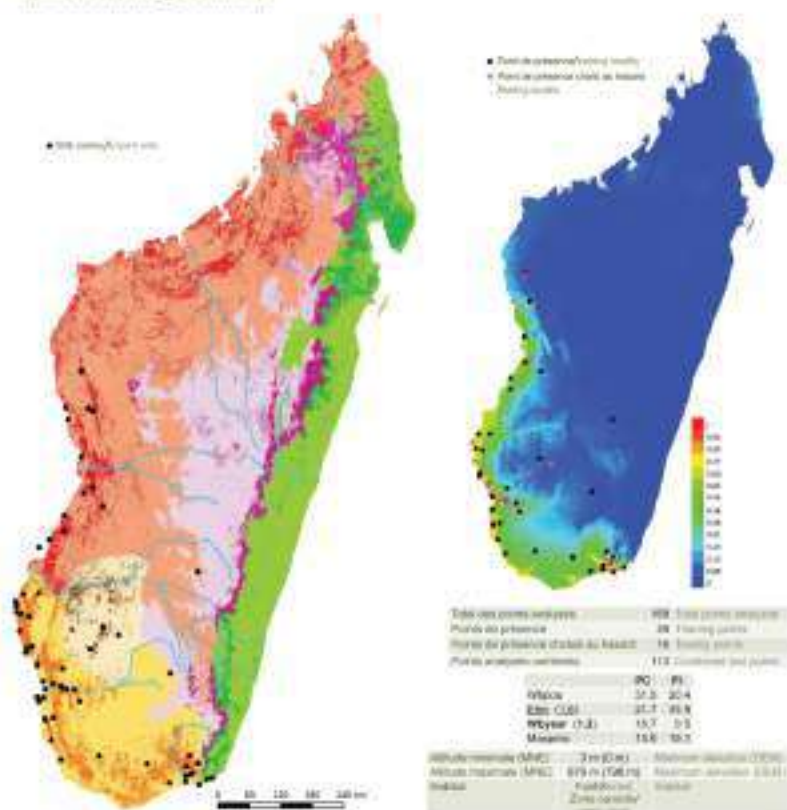
Distribution & habitat: Information is first presented (in bold) on the status of the species in question, specifically if it is endemic or not endemic to Madagascar and, when appropriate, its overseas distribution. Further, aspects of the generalized environment the species uses followed by more precise details on habitat types based on a simplified vegetation map.

Elevation: Information is presented under this heading when published data on the species is different from that given in the table associated with each mapped taxon.

Systematics: In this section, relevant aspects of the systematics of the species concerned are given, which can include patterns of geographical variation and subspecies, insights from molecular genetic studies, important aspects of geographical distribution, etc.

Other comments: This covers miscellaneous points, when relevant, such as nomenclatural differences between authors, allopatric-sympatric occurrence of sister taxa, state of knowledge of the species in question, and potential problems with certain field identifications.

Conservation Status: The IUCN "red-list" conservation statutes are presented. For each taxon, the red list category is presented and in some cases with brief comments on other factors potentially impacting the future of the species in question, such as hunting. Certain species mapped in the atlas, have limited geographical distributions and for these we have calculated their "Extent of Occurrence".

Chalarodon madagascariensis

Motif : ASC + 0.028
 Distribution & habitat : Endémique. Partiellement forestière, mais peut se rencontrer dans les forêts boisées ouvertes, en particulier sur les sommets. Types d'habitats : humides, les humides forestiers et les secs. Présente dans la zone de transition entre habitat humide et sec, souvent en bordure de la zone sèche, souvent aussi sur les bords de la zone sèche.
 Typologie : Différence morphologique marquée avec la population du Sud-est (P. 1 et Andohahelo) et celle du Sud-ouest (P. 2).
 Autres commentaires : Tendance à fréquenter les large pentes d'altitude, depuis la zone côtière aux Hautes Terres centrales, avec comme limite nord centrale, Antananarivo (13).
 Conservation : Préoccupation mineure avec des populations stables (15).

Motif : ASC + 0.028
 Distribution & habitat : Endémique. Partiellement forestière, mais peut se rencontrer dans les forêts boisées ouvertes, en particulier sur les sommets. Types d'habitats : humides, les humides forestiers et les secs. Présente dans la zone de transition entre habitat humide et sec, souvent en bordure de la zone sèche, souvent aussi sur les bords de la zone sèche.
 Typologie : Différence morphologique marquée avec la population du Sud-est (P. 1 et Andohahelo) et celle du Sud-ouest (P. 2).
 Autres commentaires : Tendance à fréquenter les large pentes d'altitude, depuis la zone côtière aux Hautes Terres centrales, avec comme limite nord centrale, Antananarivo (13).
 Conservation : Préoccupation mineure avec des populations stables (15).

26

OTHER CAPACITY BUILDING PROGRAMS FOR MALAGASY STUDENTS AND RESEARCHERS

Lecture series

A lecture series is organized at the Vahatra office to allow dissemination of new information concerning research, and different conservation themes about Madagascar. Another intent for the series is the exchange of ideas, both in a formal setting in the context of the lectures, and in a more informal setting of a cocktail after each lecture. To meet this goal individuals and organizations from the private, academic, and governmental sectors are invited to participate. A relatively large room at the Vahatra office, which normally serves as the students' work space, is easily converted into a lecture hall, with folding chairs rented from a nearby restaurant. Lectures are attended by 40-80 people and have been enthusiastically received by the Malagasy scientific and conservation communities.

In 2013, only a single conference was presented:

1. **Mesures de la diversité génétique et application avec le logiciel Genetix** – Lounès Chikhi, Chargé de Recherche au Centre National de la Recherche Scientifique à l'Université Paul Sabatier de Toulouse (August 2013).

Field Schools

Each year, Vahatra holds at least one field school for aspiring young Malagasy graduate students to help advance their knowledge and interest in field biology. These field schools are also often held with students and professors from other countries to help build links, a greater international context for science, and a broader sense of ecosystems and different organisms that occur in them.

In the context of a grant Association Vahatra received from the Helmsley Charitable Trust to advance capacity building for conservation field and professional staff, a field school was presented to members of the Peregrine Fund Madagascar at one of their conservation sites at Bemanevika in northern Madagascar. This session was conducted by Marie Jeanne, Achille, and Steve from 17 October to 3 November 2013 and attended by nine agents and technicians and two students working





with the Peregrine Fund, as well as two students from The Animal Biology Department, The University of Antananarivo. After the field school, the two University of Antananarivo students remained at the site to conduct research associated with their DEA degrees.

In the context of SuLaMa project Marie Jeanne, Voahangy, and Achille organized and implemented a field school at the Tsimanampetsotsa National Park in April 2013. The participants included students from Department of Animal Biology and The School of Agronomy, The University of Antananarivo; Institute Superior of Technology and Environment, The University of Fianarantsoa; Biodiversity and Environment Department, The University of Toliara; and agents from Madagascar National Park working at the site. At the end of the session, each group of participants presented the results of their individual field school projects.



RECENT AND CURRENT GRANTS

- Volkswagen Foundation – The advancement of Malagasy conservation biologists, 2007-2012. Project terminated in late December 2012.
- John D. and Catherine T. MacArthur Foundation – Assessing the impacts of climatic change on high mountain animals and tests of new biogeographic hypotheses to understand biotic diversity on Madagascar, 2009-2012, extended until 2013.
- Vontobel Foundation – Constitution of a team of Malagasy biologists trained in flora and fauna studies for conservation planning, 2011-2013.
- John D. and Catherine T. MacArthur Foundation – The dissemination of scientific information to the Malagasy people, 2010-2013, extended until 31 December 2015.
- Ellis Goodman Family Foundation – Financing for the "Guides sur la diversité biologique de Madagascar" series, 2012-2015.



Herivololona Mbola Rakotondratsimba

In the context of the atlas project (see details below), Mbola was engaged as the GIS-specialist to manage the database, conduct different analyses, and to create a wide assortment of maps. Her expertise was of considerable importance to terminate correctly the atlas project. Now that the vast majority of the work is in order for the atlas, Mbola will return to her Ph.D. studies at the University of Antananarivo.

During the northern summer of 2013, she attended a workshop and then two different conferences in California. The workshop of nearly two weeks was organized by The Society for Conservation Geographic Information System (SCGIS) users and concentrated on capacity building for young GIS-scholars, specifically those working in the domain of conservation. The first conference, from 8-12 July, was the ESRI user conference to help GIS practitioners to learn about new technological advancements. The theme of this conference was "Using GIS technology to unite the World". The second conference was from 16-18 July and put together by The SCGIS. Over 300 members of the society attended, including new members.



Beza Ramasindrazana

After his attendance of a field school organized by Association Vahatra in 2007, it was clear that Beza was a very promising student. He was engaged to conduct his DEA on the bats of a forestry station in lowland eastern central Madagascar. This work was done in a professional manner with considerable clarity, precision, and in nearly record time to completion. After presenting his DEA in 2009, he commenced his Ph.D. work, which concerned different aspects of the ecology, bioacoustics, and systematics of two different groups of bats. This was presented in 2012 and resulted in several important publications.

Thereafter, Beza obtained a nine-month post-doc in the laboratory of "Centre de Recherche et de Veille sur les maladies émergentes dans l'Océan Indien" (CRVOI) on La Réunion and with which The Association Vahatra has several collaborative projects (see below). The focus of this project was on different types of blood parasites occurring in bats and was in part financed by the RunEmerge program of The University of La Réunion. He has recently received a second phase post-doc at CRVOI, this one for a year and financed by The Field Museum of Natural History, to continue on different projects associated with bat parasites and diseases.



OTHER PROJECTS

The extinct Holocene animals and ecosystems of Madagascar

In collaboration with Bill Jungers at The State University of New York, Stony Brook, Steve Goodman has finished writing a book, which comprises a synthesis for a general audience on Holocene extinctions on Madagascar. The book is entitled, *"Windows into the extraordinary recent land animals and ecosystems of Madagascar"* and will be published by The University of Chicago Press in 2014. The text is centered on 20 extraordinary plates created by Velizar Simeonovski, reconstructing different sites on Madagascar, specifically the animals and habitats that existing based on data from fossils. In each case, the importance of natural climatic change versus human-induced change is assessed, in the attempt to answer the question as to what happened? The book is anticipated to be released in late August 2014.



ACTIVE COLLABORATIONS OF VAHATRA

In order for Vahatra to develop new directions for the Malagasy and regional scientific communities, a number of collaborative endeavors have been advanced. Below is a listing of some of these projects:

- **The University of Antananarivo, Department of Animal Biology** – Vahatra closely collaborates with this department in several different manners including training and mentoring of students, seminars and classes, and field schools. All of the scientific founding members of Vahatra have professional links to this department. The ability for the association to advance on numerous fronts particularly related with student capacity building and field research is directly based on this collaboration. Vahatra is also largely responsible for the curation and management of scientific specimens in the "Collection Room" of the department (see below).





- **Centre de Recherche et de Veille sur les maladies émergentes dans l'Océan Indien (CRVOI), La Réunion, France** – Vahatra collaborates closely with CRVOI on a number of different projects. These include, for example, a large-scale program with different collaborators to develop a catalog of diseases occurring amongst land vertebrates (native and introduced) of the western Indian Ocean. CRVOI through a grant generously supported by FEDER Réunion, Programme Opérationnel de Coopération Territoriale (2007-2013), "Faune Sauvage-Océan Indien" (project number 31189) was able to subsidize considerable portions of different field projects. This project ended in 2013. Further, researchers and students from Vahatra have taken part in several field trips on Madagascar, nearby islands, and continental Africa to obtain samples. A number of important and interesting results from laboratory analyses have been obtained, including those concerning different viruses, some of which have important implications for public health. Several papers have been submitted or are being prepared to present these results and their implications. A Malagasy student that did his DEA and Ph.D. based out of Vahatra, Beza Ramasindrazana, has a post-doc post for 2014 at CRVOI. To further strengthen these ties, Steve Goodman serves as a member of the scientific council of CRVOI.
- **Field Museum of Natural History (FMNH), Chicago, Illinois** – for something approaching three decades, the Field Museum has been a critical collaborator for our pedagogic and scientific projects on Madagascar. This has been on many fronts, ranging from assistance with the management of grants, fund-raising, overseas study visits of Malagasy scholars and students, and in many ways being the "big brother" institution of Association Vahatra. Steve Goodman is employed by the Field Museum and holds the post of "Field Biologist" on their staff.
- **Institut Pasteur, Madagascar and Paris** – part of the consortium of the "Faune Sauvage-Océan Indien" project mentioned above in association with CRVOI, includes the Institut Pasteur de Madagascar (IPM). Students and researchers from Vahatra have conducted a number of joint field missions with researchers and technicians from IPM. Further, a number of scientific papers



have been published or soon will be submitted in collaboration with IPM and CRVOI. This collaboration was expanded in 2013 with a new program directed by Sandra Telfer and concerns diseases of endemic and introduced rodents. This project is financed by a grant from the Wellcome Trust to The University of Aberdeen and the IPM. A Ph.D. student working out of Vahatra is conducting his research on rodent ecology in the context of this project.

- **The University of Kwa-Zulu Natal, Durban, South Africa** – part of a southern hemisphere network-collaboration project. Students and professors from The University of Kwa-Zulu Natal, Durban, worked in collaboration with Vahatra students and researchers in Madagascar, taking part once per year in field schools held in forest-settings in Madagascar over the course of five years. These field schools were financed by a grant from the Volkswagen Foundation, which ended in 2012. Over the past few years, at least six South African students have conducted a portion of their graduate students on Malagasy animals, in collaboration with Malagasy counterparts at Vahatra. Two of



© - Louise Jasper


these students finished in 2013 their Ph.Ds. Further, Malagasy students and professors have attended specially arranged courses in Durban labs concerning molecular genetic research and ecological modeling. Finally, one of the Durban counterparts recently moved to The University of Venda, in northern South Africa, and several students from that university attended field schools in Madagascar.

- **Biodiversity Conservation Madagascar (BCM), Antananarivo and Bioculture Mauritius** – Vahatra has a collaborative project with these organizations to conduct research at two different forest blocks, Sahafina and Beanka, that BCM manages and to help advance research and conservation activities. A monograph on scientific studies conducted at the Beanka Forest was recently published in *Malagasy Nature*. Vahatra will be helping to coordinate and give advice for an upcoming BCM project to reintroduce giant tortoises, a group now extinct on Madagascar, to the Beanka Forest to study the ecological role these giant herbivore-frugivores played in habitat regeneration.



- **Les conservatoire et jardin botaniques de la Ville de Genève (CJB), Switzerland** – A joint grant has been received by CJB and Vahatra in 2011 from the Vontobel Foundation in Zürich under





the title, "Constitution of a team of Malagasy biologists trained in flora and fauna studies for conservation planning." The project involves joint field studies to develop research programs, particularly in the Beanka Forest (see above) on the interactions between local fauna and flora, with the view of developing aspects of ecosystem functioning. The Geneva team has installed in the annex building of Vahatra, to create closer ties and working relations between these two organizations.

- **The University of Hamburg, Germany** – The Association Vahatra is an active partner in a project known as "Sustainable Land Management on the Mahafaly Plateau" or SuLaMa. The principal role of the association is pedagogic in the context of field schools and scientific mentorship of Malagasy graduate students conducting fieldwork on animals.



- **REBIOMA** – Association Vahatra has a direct collaboration with REBIOMA (Réseau de la Biodiversité de Madagascar) to contribute to a large on-line database associated with Malagasy animals. All of the scientific members of Vahatra serve on the "Taxonomic Review Board" of REBIOMA. Further, this

organization has helped in the creation of the database used in the *"Atlas of Selected Land Vertebrates of Madagascar"* (see above).

COLLECTION ROOM, UNIVERSITY OF ANTANANARIVO

One of the permanent staff members of Vahatra, Dr. Voahangy Soarimalala, is the principal curator of the "Collection Room" in the Animal Biology Department at The University of Antananarivo. This research collection is managed at the standards of an international natural history museum. During 2013, Vahatra scientists played a very active role in the deposition, cataloging, identification, and verification of mammal, bird, and reptile specimens within the collection in the context of the atlas project mentioned above. Through different grant funds, Vahatra also purchased in 2013 for the Collection Room: two large shelving units to store jars with fluid preserved specimens, transparent curtains to block out sunlight and better protect specimens, and 450 l of ethanol for specimen stockage.



NEW SPECIES OF ANIMALS DESCRIBED BY VAHATRA SCIENTISTS AND STUDENTS IN 2013

One of the direct results of the biological inventories conducted by Vahatra and associated collected specimens, is the discovery of animal species previously unknown to science. Several new species have been described in 2013:

1. *Ixodes microgalei* Apanaskevich, Soarimalala & Goodman. 2013. – A new *Ixodes* species (Acari: Ixodidae), parasite of shrew tenrecs (Afrosoricida: Tenrecidae) in Madagascar. *Journal of Parasitology*, 99: 970-972.
2. *Miniopterus mossambicus* Monadjem, Goodman, Stanley & Appleton. 2013. – A cryptic new species of *Miniopterus* from southeastern Africa based on molecular and morphological characters, *Zootaxa*, 3746: 123-142.

NEW SPECIES OF ANIMALS NAMED FOR VAHATRA SCIENTISTS IN 2013

1. *Rossodes goodmani* Gibon, F.-M. 2013. – Une sous-famille caractéristique des forêts humides primaires malgaches : les Rossodinae (Trichoptera, Philopotamidae). *Zoosystema*, 35: 151-174.
2. *Afroheterozetcon goodmani* Klompen, Amin & Gerdeman. 2013. – A revision of the genus *Afroheterozetcon* (Acari: Heterozetconidae). *Zootaxa*, 3626 (3): 301-325.

ACTIVITIES OF VAHATRA PERMANENT MEMBERS DURING 2013

Members of the Vahatra scientific staff were involved in a variety of different actions, which are summarized below. Amongst these activities were the review of scientific manuscripts submitted to different international journals; these are not cited below, but involved about 34 different reviews conducted in 2013 by the four scientific members.

Activities reporting for 2013

January

In the context of "Atlas of selected faunal vertebrates of Madagascar" project, Marie Jeanne, Voahangy and Steve worked extensively on verifying specimen records of small mammals and birds in the Collection Room of the Animal Biology Department, University of Antananarivo.

Marie Jeanne worked with Sehen Ramasinatrehina, a student associated with the Vahatra program, to follow the advancement of her DEA mémoire before its submission to the lecture committee at The University of Antananarivo.

Marie Jeanne also took part in the finalization of documents and procedures for a major change in the Faculty of Science, University of Antananarivo, graduate studies to a LMD (Licence, Master, Doctorate).

Voahangy supervised the writing of mémoires of two students (Miarisoa Ramilison and Rasoanasolonirainy Raissa) associated with research conducted at the Ambatovy mine site and to be defended in mid-January as "Professional license mémoires".

Voahangy terminated the preparation of a MOU between Association Vahatra, Institut Pasteur de Madagascar (IPM), and The University of Aberdeen associated with a study of small mammal diseases in the Moramanga Region to be conducted by these three institutions and financed by the Wellcome Trust. A Malagasy student working in collaboration with Vahatra, Toky Randriamoria, is directly implicated in this project and will use a portion of the collected data for his thesis under the direction of Voahangy and Steve.

Achille Raselimanana, in parallel with his teaching activities at the university, continued to work on the "Guide to the amphibians of Malagasy dry forests", as well as some scientific articles.

During this month, Steve worked on several scientific papers and a book, as well as helping Stephanie Razakaratriho, a student working with the Peregrine Fund Madagascar, to identify prey remains recovered from bat falcon pellets.





February

Marie Jeanne continued working on the bird database associated with the atlas project. She supervised advancements of a DEA student (Lalaina Randriamanana) studying the reproduction of the golden frog (*Mantella aurantiaca*) in the Moramanga region.

Voahangy carried out field research with IPM in the Mahatsara (Andasibe) forest in the context of an ecological study of small mammal diseases in the region of Moramanga. In tandem with Steve, they continued working on the small mammal database associated with the atlas.

This month was devoted to exam sessions at The University of Antananarivo and Achille dedicated a large portion of his time to this activity. When possible, he also worked on the "Guide to the amphibians of Malagasy dry forests".

During this month, Steve was actively working on different manuscripts and reviewing papers submitted to various overseas scientific journals. He was one of four invited individuals to take part in a press conference associated with the 50 anniversary of WWF, Madagascar, which received considerable local media coverage.

March

The Board of Directors meeting was held at The Association Vahatra office on 1 March.

Marie Jeanne continued working on the bird database and commenced editing the subfossil book with Steve for the Vahatra guide series. At The University of Antananarivo, she participated in the supervision of the second exam session, and served as a member of an editorial commission and jury member for a DESS mémoire (Mihoby Clara Andrianandrasana) related to the monitoring of socio-economical aspects and conservation in a national park.

Voahangy presented courses at The University of Fianarantsoa. She also helped in the preparation of a field school planned for Tsimanampetsotsa National Park in the context of the SuLaMa ("Sustainable Land Management on the Mahafaly Plateau") project organized by The University of Hamburg. When she was in Antananarivo, a considerable amount of time was devoted, in collaboration with Steve, to working

through the small mammal collection, as well as other curatorial duties associate with the Collection Room at The University of Antananarivo.

Achille presided over a DEA presentation in the Animal Biology Department, University of Antananarivo (Justin Ralambomanana). He also continued to supervise the analyses and writing of three different DEA student diplomas (Rindra Randriandimbimahazo, Alda D. Razanadravoninirina, and Christinah H. J. Radafiarimanana), the first of which is directly associated with an Association Vahatra project.

For Steve, a good portion of the month was devoted to assisting fieldwork of a Vahatra Ph.D. student (Claude Fabienne Rakotondramanana) associated with a project on Malagasy insect-eating bats. Work was conducted at Andasibe, Isalo, and Anjozorobe.

April

In the context of SuLaMa project, Marie Jeanne, Voahangy, and Achille organized and implemented a field school at the Tsimanampetsotsa National Park. This year the participants included students from Department of Animal Biology and The School of Agronomy, The University of Antananarivo; Institute Superior of Technology and Environment, The University of Fianarantsoa; Biodiversity and Environment Department, The University of Toliara; and agents from Madagascar National Park working at the site.



Marie Jeanne continued editing the subfossil book with Steve. She also spent considerable time editing and revising two DEA mémoires (Soafara Raonizafinarivo and Dolette Alda Razanadravoninirina) as a member of the reviewing committee. The first DEA treated aspects of birds grazing on agricultural products and the second on the biological cycle of *Mantella viridis* in captivity.

Voahangy, in collaboration with a group from the School of Biological Sciences, Belfast University, wrote a grant application to The Rufford Foundation for a project entitled, "Quantifying the benefits of community driven reforestation projects for Madagascar's endemic biodiversity".

In the context of a project on *Uroplatus* geckos, Achille and a colleague at The University of Antananarivo conducted fieldwork with two new DEA students (Dina L. Ramamonjisoa and Mirado Z. Rabeniarisoa) working with Association Vahatra during a one-week rapid field trip in the Fierenana and Morarano forests, north of Moramanga. The principal focus was locating the most cryptic and rarest member of this genus, *U. pietschmanni*, for the production of a pamphlet guide on *Uroplatus* species. He also organized a field school for the undergraduate class (year 4) from the Animal Biology Department, The University of Antananarivo. This "green class" is associated with an extra-training program at the university.

Steve was a jury member for a thesis presented at The University of Antananarivo and associated with the IPM (Luciano Tantely). He spent a good portion of the month guiding a potential donor family around Madagascar.

May

In their roles as "taxonomic coordinators" associated with the Rebioma database project (<http://www.rebioma.net/>), Marie Jeanne, Steve, Voahangy, and Achille reviewed a large number of entered records on different animal groups. The intent was to verify these records, allowing them to pass into the general database.

Marie Jeanne, in collaboration with Steve, worked on a manuscript on the birds of the Beanka Forest, continued to work on the bird database, and edited the subfossil book.

Voahangy co-authored a paper with Steve and a former Vahatra DEA student (Haridas Zafindranoro) on small mammal communities of the Beanka Forest. As the MacArthur Foundation "Science for the people" project arrived at its final stage, she regularly provided technical and scientific assistance to the team in the preparation of the last activities report. She also carried out a field school in the Ambatovy mine site,



Andasibe National Park and Maromiza Forest for students from The University of Fianarantsoa, and pursued her teaching activities.

Aside from his teaching and supervising activities at The University of Antananarivo, Achille spent considerable time working on different scientific articles and a book with various collaborators. These manuscripts include articles on leaf-tailed *Uroplatus* geckos, ecology and life history aspects of chameleons, and extinction risk and conservation of Madagascar reptiles.

Steve was proposed by The Critical Ecosystem Partnership Fund (CEPF) as a member of the advisory group to formulate the Madagascar profile for a new round of funding from this organization. Initial meetings took place during early May. Steve devoted a considerable amount of the month to writing texts associated with the different animal groups treated in the atlas, as well as verifying maps and analyses.





June

Marie Jeanne was involved in the final DEA supervision of Sehen Ramasinatrehina and served as a jury member for the associated presentation at The University of Antananarivo. She also acted as a member of the review committee for a DEA mémoire on small mammals (Todisoa Radovimiandrinifary), as well as giving courses at The University of Antananarivo. Together with Steve, major advances were made on the text associated with the bird section of the atlas.

Voahangy continued to curate the Collection Room at the Animal Biology Department, The University of Antananarivo. Together with Steve, she also worked on the small mammal text for the atlas. She furnished regular technical and scientific advice to the "Science for the people" team. She also attended a workshop on modeling terrestrial ecosystems organized by Rebioma and participated in the preparation of fieldwork in the Moramanga region associated with the IPM small mammal disease project. Voahangy supervised a "Professional license" degree by Latoroson Orlando on the effects of reforestation in the Kianjavato region on lizard populations.

Achille conducted a final verification of the reptile database and worked with Steve on the associated text for the atlas, as well as continued to make important advances on the dry forest amphibian guide. During this month, he participated in four different DEA presentations in the context of jury president, examiner, or reporter (Christinah H. J. Radafiarimanana, Zo F. Andriampenomanana, Ranjalis M. Ratsitohaina, and Nasolo S. Ramasinatrehina).

Steve devoted a large portion of the first portion of June to advancing different aspects of the atlas. In mid-June, he left for France to work in the collections of the Muséum National d'Histoire Naturelle and then on to the USA for his annual northern summer visit at the Field Museum. Together with Marie Jeanne and Laurent Gautier, Conservatoire et Jardin botaniques de Genève, Steve commenced with the editing and advancement of manuscripts for a monograph to be published on the Beanka Forest in *Malagasy Nature*.

July

Marie Jeanne continued to work on the bird portion of the atlas, and pursued different teaching activities at The University of Antananarivo. She participated as a DEA mémoire jury member (Soafara Raonizafinarivo) and helped supervise the DEA project of Lalaina Randrimanana.

Voahangy, in collaboration with Achille and Marie Jeanne, contributed to the preparation of documents associated with faunal diversity, monitoring, and conservation priorities of the Ampasindava Peninsula and Loky-Manambato complex within the "Managed Resources Protected Areas" (MRPA) project. She continued working, in collaboration with Steve, on the text for the small mammal section of the atlas. Voahangy also spent one week assisting a field school organized in the Isalo National Park for students from The University of Fianarantsoa.

As an internal reporter of two Ph.D. theses (Gilbert Rakotoarisoa and Jeanneney Rabearivony), Achille review these documents and prepare his evaluations for The University of Antananarivo. In the context of a recently accorded grant from the Helmsley Charitable Trust, he identified the student that will conduct a DEA project on amphibians (Dina L. Ramamonjisoa). He also acted as a reporter for a DEA presentation at The University of Antananarivo (Alda D. Razanadravoninirina).

Steve presented a talk at the Field Museum entitled, "Windows into the extraordinary recent land animals and ecosystems of Madagascar", associated with a book that will soon be published by The University of Chicago Press. He also made a brief presentation to the Board of Directors associated with the Field Museum's Science Action Center on activities in Madagascar.

August

During this month, Marie Jeanne was involved in similar activities as in July, which also included being member of the editorial committee for a DEA related to the diet of an endemic Malagasy bird species (Manjary Andriantsitohaina), and she acted as a member of jury of two students (Lalaina Randrimanana and Todisoa Radovimiandrinifary).

Voahangy was involved in fieldwork associated with the IPM project on small mammal diseases in the Moramanga region. She also helped

to prepare aspects of field projects on the Ampasindava Peninsula and Loky-Manambato complex. Three students defended their "Professional license" degrees and Voahangy was the principal supervisor (Gilbert Fitahiantsoa, Jeanne Randrianarijaona, and Feno Andriahiatrika).

Achille was responsible for three DEA presentations at The University of Antananarivo (Rosaly T. H. Radovimiandrinifary, Alain M. Onihary, and Olivia L. Randriamanana). As designated by the head of the Exam Center, University of Antananarivo, he spent a full week in preparing and supervising the Baccalaureate session – this official exam is taken by last year high school students to pass into the university system.

Based at the Field Museum in Chicago, Steve worked on different manuscript projects, the atlas, and attended the American Ornithologists' Union meeting held in Chicago. He returned to Madagascar on 28 August.

September

Marie Jeanne worked on the atlas and presented courses at The University of Antananarivo.

Voahangy continued with the preparations associated with fieldwork on the Ampasindava Peninsula and Loky-Manambato complex; the field groups left Antananarivo for 2 weeks of fieldwork at these two sites. She helped to develop "Professional license" projects at the Ambatovy mine site for three students (Felamanitra Ramanandraibe, Misaotranà Fitahiantsoa, and Miranirina Rasoamiaranjanahary) from The University of Fianarantsoa and pursued her teaching activities at the same institution.

Achille and Steve were involved in the DEA presentation of Rindra Randriandimbimahazo, an Association Vahatra student. In the context of a collaboration with the NGO "Biodiversity Conservation Madagascar" (BCM), as well as to provide field training for two new DEA students (Dina L. Ramamonjisoa and Simplicie Razafindranaivo) who will conduct their research in the context of a Vahatra-Helmsley project, Steve and Achille accompanied these students and BCM staff for a rapid biological assessment in the northern portion of the Beanka Forest. They also carried out a feasibility assessment for a reintroduction program of the Aldabra giant turtle at Beanka in the forest-savanna ecotone.

Steve made a presentation at the Institut Français de Madagascar entitled, "Les extraordinaires animaux et écosystèmes de Madagascar récemment disparus".

October

In the context of the Helmsley Charitable Trust project, Marie Jeanne, Achille, and Steve, as well as two DEA students (Dina L. Ramamonjisoa and Simplicie Razafindranaivo) working with Vahatra in the context of this project, conducted a field school in the Bemanevika Forest. This session was devoted to help advance different technical and field staff of the Peregrine Fund Madagascar (PFM) to augment their scientific capacity and having a greater context of the importance of their work. Nine PFM agents were trained during this session.

During the balance of the month, Marie Jeanne continued to work intensively on the atlas and different teaching responsibilities at The University of Antananarivo.

Voahangy helped with one "Professional license" project at the Ambatovy mine site for a student (Zazarohavana Danny) at The University of





Fianarantsoa. She, in collaboration with Achille Raselimanana, was involved in preparing preliminary reports on faunal inventories conducted at Ampasindava and Loky-Manambato complex.

During the balance of the month, Achille spent a considerable amount of time teaching at The University of Antananarivo.

On 4 October, Steve was honored during a ceremony at The University of Antananarivo with the diploma "Honoraria Causa" and the same day presented a new book co-authored with William Jungers and published by the Association Vahatra under the title, "Les animaux et écosystèmes de l'Holocène disparus de Madagascar." He devoted the balance of the month to the finalization of texts and illustrations for the atlas.



November

Marie Jeanne worked on editing the Beanka monograph, soon to be published in *Malagasy Nature*. She also pursued her teaching program at The University of Antananarivo. With Achille and Voahangy, Marie Jeanne elaborated the final reports concerning the faunal diversity and threats assessment of the biodiversity and ecosystem trends, monitoring and conservation priorities of the Ampasindava Peninsula and Loky-Manambato complex within the Managed Resources Protected Areas project.

Voahangy attended a meeting at The University of La Réunion in the context of the RunEmerge project, as well as a workshop on "Bats, small mammals and infectious agents". She gave a talk entitled, "Ecology and population dynamics of small mammals reservoirs in Ankazomivady Forest, Madagascar."

Before and after the mission to Bemanevika, Achille spent the balance of the month teaching and supervising students at The University of Antananarivo and working on different manuscript projects.

Steve attended the same meeting as Voahangy at The University of La Réunion and presented an invited lecture under the title, "The interface between bat phylogeny and ecology in the western Indian Ocean: understanding their potential role as disease reservoirs and vectors". Thereafter he attended a conference at The University of Oxford treating the subject "Proto-globalisation in the Indian Ocean world" and gave a talk "The history of mammal introductions to islands in the western Indian Ocean." On his way back to Madagascar, he was a committee member for a thesis presented at The University of Paris (Tu Tan Vong).

Voahangy gave a talk to children attending schools in Antananarivo and organised by Rotaract Club "Amontana" and the educational authorities. The talk, given in Malagasy, was designed around messages about the Malagasy endemic fauna and environment.

The third week of November, Steve was at a printing house on Mauritius to follow the production of the "*Atlas d'une sélection de vertébrés terrestres de Madagascar/Atlas of selected land vertebrates of Madagascar*" (see above). Once back to Madagascar he conducted fieldwork at Ambohitantely, together with Beza Ramasindrazana, particularly to



show a bat researcher from Kenya different methods to record the acoustic sounds of bats.

December

Marie Jeanne and Steve, together with Laurent Gautier of the Conservatoire et Jardin botaniques de Genève finalize the text for the Beanka monograph (see under *Malagasy Nature*, above). These texts were then turned over to the General Secretary of Vahatra, Madame Malala Razafimpahanana, who was responsible for the type setting and a large number of other details, including the monograph appearing on line (<http://www.vahatra.mg/volume7.html>) before the end of the month.

Under the guidance of Voahangy, one student (Larissa Soavinarivo) defended her "Professional license" degree on aquatic birds at Bemanevika, Bealanana region. She also supervised the advancement of the fieldwork of three other students (Felamanitra Ramanandraibe, Misaotranà Fitahiantsoa, and Miranirina Rasoamiaranjanahary). One student (Odonie Solonantenaina) involved in "Science for the People"

project defended her "Professional license" in mid-December and Voahangy as his supervisor played a key role. In collaboration with Madagascar National Parks, she attended a workshop on Madagascar ecoregions in the context of updating the "Plan GRAP" project.

Achille conducted a short field visit to the Marotandrano Special Reserve to look for a new frog species that he is about to describe. On his way back to Antananarivo, he recuperated at Bealanana the two students conducting their field research at Bemanevika in the context of the Helmsley project (Dina L. Ramamonjisoa and Simplicie Razafindranaivo). He was also the internal reviewer of a Ph.D. thesis presented at The University of Antananarivo the last days of the month.



In the first portion of the month, Steve attended a conference at The University of Cape Town dedicated to Biodiversity Southern Africa conference. He gave a keynote talk under the title, "Windows into the recent past: The interface of natural and human-induced extinctions and environmental change on Madagascar". He also gave a public





presentation "Madagascar's biodiversity: origins, patterns and the future". In the middle portion of the month, he conducted some fieldwork with Malika Virah-Sawmy at Lake Tsimanampetsotsa to obtain pollen cores for paleoenvironmental reconstructions.

SCIENTIFIC OUTPUTS OF VAHATRA DURING 2013

Publications from 2013, including in press and submitted manuscripts

Names in **bold** are scientific members of Vahatra and those in *italics* are current or past student members.

Andriamandimby, S. F., M. Ratsitorahina, R. Ramiandrasoa, J.-M. Reynes, J. H. Rasambainarivo, L. Dacheux, A. Lepelletier, **S. M. Goodman**, J.-M. Héraud & H. Bourhy. Surveillance and control of rabies in La Réunion, Mayotte, and Madagascar. *Veterinary Research*, 44: 77.

Apanaskevich, D. A., **V. Soarimalala** & **S. M. Goodman**. A new *Ixodes* species (Acari: Ixodidae), parasite of shrew tenrecs (Afrosoricida: Tenrecidae) in Madagascar. *Journal of Parasitology*, 99: 970-972.

Block, N. L., **S. M. Goodman**, S. J. Hackett, J. M. Bates & **M. J. Raherilalao**. Submitted. Merger of ancient lineages in a passerine bird discovered based on evidence from host-specific ectoparasites. *Journal of Evolutionary Biology*.

Boria, R. A., L. E. Olson, **S. M. Goodman** & R. P. Anderson. In press. Spatial filtering to reduce sampling bias can improve the performance of ecological niche models. *Ecological Modelling*.

Brouat, C., A. Tollenaere, S. Sommer, R. Soanandrasana, L. Rahalison, M. Rajerison, A. Estoup, **S. M. Goodman** & J.-M. Duplantier. Submitted. Invasion genetics of a human commensal rodent: the black rat *Rattus rattus* in Madagascar. *Molecular Ecology*.

Carleton, M. C., C. Smeenk, R. Angermann & **S. M. Goodman**. In press. Taxonomy of nesomyine rodents (Muroidea: Nesomyidae: Nesomyinae): Designation of lectotypes and restriction of type localities for species-group taxa in the genus *Nesomys* Peters. *Proceedings of the Biological Society of Washington*.

Crane, E. & **S. M. Goodman**. A case of a mouse lemur (*Microcebus lehilahytsara*) being inextricably entangled in a spider's web. *Lemur News*, 17: 9.

Dammhahn, M. & **S. M. Goodman**. Trophic niche differentiation and microhabitat utilization revealed by stable isotope analyses in a Malagasy dry forest bat community. *Biotropica*, online: doi:10.1017/S00266467413000825.

Duron, O., U. E. Schnepapat, A. Berthomieu, **S. M. Goodman**, B. Droz, C. Paupy, J. O. Nkoghe, N. Rahola & P. Tortosa. In press. Origin, acquisition and diversification

A NEW *IXODES* SPECIES (ACARI: IXODIDAE), PARASITE OF SHREW TENRECS (AFROSORICIDA: TENRECIDAE) IN MADAGASCAR

Dmitry A. Apanaskevich, Veehangy Soarimalala*, and Steven M. Goodman†

United States National Tick Collection, The James H. Oliver, Jr. Institute for Coastal/Pan-Scholar, Georgia Southern University, Statesboro, Georgia 30460. Correspondence should be sent to: dapanaskevich@georgiasouthern.edu

ABSTRACT. A new tick species belonging to the African subgenus *Africulus* Motz, 1966 of the genus *Ixodes* Latreille, 1795, namely *Ixodes (Africulus) microgaster* n. sp., is described. Females of this species are most similar to those of *Ixodes (Africulus) arbuti* Arthur, 1957 and *Ixodes (Africulus) vanderplanki* Uilenberg & Hoogstraal, 1969. The female of the new species can only be differentiated from *I. (Africulus) arbuti* by a short spur on coxae IV, and from *I. (Africulus) vanderplanki* by longer spurs on coxae I and large papillae on its scutum. *Ixodes (Africulus) microgaster* is known only from the eastern humid forest of Madagascar, specifically in the Province of Antananarivo, where its females have been collected from several species of shrew tenrecs (*Afrosoricida*: *Tenrecidae*), namely, *Microgale dolomieu* Thomas, *Microgale jayak* (Günther), and *Microgale schubertii* Jenkins.

Despite the global distribution and significant medical importance of some species of the genus *Ixodes* Latreille, 1795, the vast majority of species in this genus are still inadequately studied, and the life stages of many remain undescribed. On the basis of new field collections, taxonomic revisions and descriptions of new taxa and different life stages help to fill these gaps.

Seven species of *Ixodes* are currently recognized from Madagascar (Uilenberg et al., 1999). One of these taxa, *Ixodes (Africulus) arbuti* Arthur, 1957, is a hard parasite, and the others, *Ixodes (Africulus) vanderplanki* Uilenberg & Hoogstraal, 1969, *Ixodes (Africulus) jayak* (Günther), 1957, *Ixodes (Africulus) schubertii* Jenkins, 1958, *Ixodes (Africulus) dolomieu* Thomas, 1907, *Ixodes (Africulus) vanderplanki* Uilenberg & Hoogstraal, 1969, and *Ixodes (Africulus) rufipes* Uilenberg & Hoogstraal, 1969, are mammal parasites (Arthur, 1965; Uilenberg et al., 1999). These 6 species of *Ixodes* have been recorded from a wide variety of introduced and endemic small mammal species (Rahalison et al., 2001; Klopfer, 2003). There are relatively few specimens of Malagasy *Ixodes* species in museum collections around the world, and virtually nothing is known about their natural history.

A new species of *Ixodes* has recently been discovered at western humid forest sites in the Antananarivo Province, Madagascar, and the female is described here. Females of this species parasitize various species of shrew tenrecs of the genus *Microgale* Thomas (Afrosoricida: Tenrecidae, Oryzomyini), members of this mammal subfamily are endemic to Madagascar and are notably species in the island's humid forests (Soarimalala and Goodman, 2011).

MATERIALS AND METHODS

The material examined to describe this new species is provided below. Only ticks obtained during fieldwork associated with small mammal inventories were available for study. *Africulus* ticks from trapped animals were removed from their hosts and preserved in 70% ethanol. Examined tick specimens, as well as mammalian voucher specimens, are deposited in the Field Museum of Natural History (FMNH), Chicago, Illinois, USA; University of Antananarivo, Département de Biologie Animale (UADBA), Antananarivo, Madagascar; and the United States National Tick Collection (USNTC), Georgia Southern University, Statesboro, Georgia, USA.

The four structures of the female were examined with the aid of a compound microscope; the microstructures of females were examined

under a stereomicroscope. Tick measurements are given in millimeters (mm). Measurements are arranged as follows: maximum (range), n = number of specimens measured. All illustrations by D. A. Apanaskevich. Small animal identifications were based on characters outlined in Soarimalala and Goodman (2011).

DESCRIPTION

Ixodes (Africulus) microgaster n. sp.
(Fig. 1)

Female: Microgaster (Fig. 1A, B) suboval, wider at level of coxae IV; length from nuchal spine to posterior body margin 1.31, breadth 0.55; 1.64 times as long as broad (1) measured specimen measured. Scutum (Fig. 1A) elongate, outline broadly rounded, length 0.32-0.45 (0.38; n = 7), width 0.15-0.18 (0.18; n = 7), 1.15-1.34 times (1.53; n = 7) as long as broad. Lateral corner distinct, divergent, not reaching posterior margin; ventral groove indistinct, shallow. Papillae relatively large and deep, evenly distributed over scutum. Setae numerous and moderately long (ca. 0.45), some slightly shorter than those on abdomen, distributed as shown in figure. Abdomen (Fig. 1A) as illustrated. Setae short, numerous, evenly distributed, length ca. 0.06, with distinct apices. Venter (Fig. 1B) as illustrated, small, ventrally oval; paired papular plates located medially to spur of coxae I, their longest dimension 0.07, each bearing 2 setae. Genital aperture medial to posterior margin of coxae III; genital apophysis broadly rounded posteriorly. Genital groove well developed. Anal groove circular with open posterior margin. Setae numerous, length of anal setae ca. 0.08, evenly distributed. Setae plates (Fig. 1B, C) subcircular, diameter in anteroposterior plane slightly greater than that in dorsoventral plane; length 0.18-0.20 (0.19; n = 5), width 0.16-0.19 (0.18; n = 5), 1.08-1.14 times (1.08; n = 5) as long as broad. Gnathosoma (Fig. 1A, B) length from palpal apices to posterior ventral setae on basis capituli 0.36-0.45 (0.38; n = 5), width at apex of lateral processes 0.25-0.33 (0.33; n = 5), 1.71-1.81 times (1.81; n = 5) as long as broad. Basis capituli (Fig. 1A, B) broadly subtriangular; posterior margin convex; coxae model, triangular with anteriorly rounded or tapering apices. Postic spine indented with well-developed hooklet, separated by a distance approximately equal to their own width. Basis capituli ventrally perpendicular, with posterior margin convex, subacute incised, long-triangular, sharply tapering to apex. Palp (Fig. 1A, B) elongate, curved; length 0.18 segments 0.38-0.45 (0.43; n = 5), width 0.09-0.13 (0.10; n = 5), 4.08-4.45 times (4.51; n = 5) as long as broad; length of segments in descending order: 2, 3, 1, 4; segment 1 well developed without spine, segment 2 narrow proximally and gradually widening to midlength and apically pointed; setae from midlength to distal end; segment III entirely straight and apically converging to blunt rounded apex. Hypostome (Fig. 1B) tapering with sharply pointed apex, arising from a medial anterior projection of basis; length 0.22-0.25 (0.24; n = 2), width 0.09 (n = 2), 2.77-2.98 times (2.81; n = 2) as long as broad; widest in posterior half, distal third 3/5 throughout hypostomal length; denticles sharply pointed. Lipae moderately long, slender. Coxae (Fig. 1B) coxae I with long triangular posteroventral spur with sharply pointed apex and with modest triangular posterolateral spur with tapering apex; posteroventral spur considerably shorter than posteroventral spur; coxae II and III without spur; coxae IV with short triangular spur with tapering apex; coxae I-III with synsoma. Tarsi (Fig. 1D, E) tarsus I elongate, tars II-IV

Received 17 May 2013; revised 24 July 2013; accepted 31 July 2013.

* Association Vahatra, BP 3972, Antananarivo 1015, Madagascar.

† Field Museum of Natural History, 3008 South Lake Shore Drive, Chicago, Illinois 60605.

DOI: 10.1645/13-086.1

of heritable bacterial endosymbionts in louse flies and bat flies. *Molecular Ecology*.

Fuchs, J., J. L. Parra, S. M. Goodman, M. J. Raherilalao, J. VanDerWal & R. C. K. Bowie. Extending species distribution models to the past 120,000 years corroborates the lack of phylogeographic structure in the crested drongo (*Dicrurus forficatus*) from Madagascar. *Biological Journal of the Linnean Society*, 108: 658-676.

Gautier, L. & S. M. Goodman. La forêt de Beanka, Région Melaky, Ouest de Madagascar : introduction et présentation du milieu. Dans : *La forêt de Beanka, Région Melaky, Ouest de Madagascar/The Beanka Forest, Melaky Region, western Madagascar*, eds. S. M. Goodman, L. Gautier & M. J. Raherilalao. *Malagasy Nature*, 7: 3-13.

Goodman, S. M. Genus *Coua* Schinz 1821. *The birds of Africa. Volume viii. The Malagasy region*, eds. Roger Safford & Frank Hawkins, pp. 539-557, Christopher Helm, London.

Goodman, S. M. Carnivores ou ordre Carnivora/Carnivores or the order Carnivora, pp. 271-285. Dans : *Atlas d'une sélection de vertébrés terrestres de Madagascar/Atlas of selected land vertebrates of Madagascar*, eds. S. M. Goodman & M. J. Raherilalao. Association Vahatra, Antananarivo.

Goodman, S. M. & L. Gautier. The importance of field inventories and associated studies to understand biodiversity patterns: The case of the Beanka Forest, Melaky Region, western Madagascar. Dans : *La forêt de Beanka, Région Melaky, Ouest de Madagascar/The Beanka Forest, Melaky Region, western Madagascar*, eds. S. M. Goodman, L. Gautier & M. J. Raherilalao. *Malagasy Nature*, 7: 271-283.

Goodman, S. M. & W. L. Jungers. *Les animaux et écosystèmes de l'Holocène disparus de Madagascar*. Association Vahatra, Antananarivo.

Goodman, S. M. & W. L. Jungers. In press. *Windows into the extraordinary recent land animals and ecosystems of Madagascar*. The University of Chicago Press, Chicago.

Goodman, S. M. & M. J. Raherilalao, eds. *Atlas d'une sélection de vertébrés terrestres de Madagascar/Atlas of selected land vertebrates of Madagascar*. Association Vahatra, Antananarivo.

Goodman, S. M. & M. J. Raherilalao. Introduction générale/General introduction, pp. 11-17. Dans : *Atlas d'une sélection de vertébrés terrestres de Madagascar/Atlas of selected land vertebrates of Madagascar*, eds. S. M. Goodman & M. J. Raherilalao. Association Vahatra, Antananarivo.

Goodman, S. M. & M. J. Raherilalao. Oiseaux ou classe des Aves/Birds or the class Aves, pp. 63-168. Dans : *Atlas d'une sélection de vertébrés terrestres de Madagascar/Atlas of selected land vertebrates of Madagascar*, eds. S. M. Goodman & M. J. Raherilalao. Association Vahatra, Antananarivo.

Bird fossils from Ankilite Cave: Inference about Holocene environmental changes in Southwestern Madagascar

STEVEN M. GOODMAN^{1,2}, MARIE JEANNE RAHERILALAO^{3,4} & KATHLEEN MULDOON⁵

¹Science and Education, Field Museum of Natural History, 1400 South Lake Shore Drive, Chicago, Illinois 60605, USA

E-mail: sgoodman@fieldmuseum.org

²Association Vahatra, BP 1971, Antananarivo 101, Madagascar. E-mail: raherilalao@vahatra.mg, sgoodman@vahatra.mg

³Département de Biologie Animale, Université d'Antananarivo, BP 906, Antananarivo 101, Madagascar

⁴Department of Anatomy, The College of Medicine, Harvard, San Francisco 94155, USA

E-mail: Kathleen.Muldoon@harvard.edu

⁵Department of Anthropology, Dartmouth College, Hanover, New Hampshire 03755, USA

*Corresponding author

Abstract

The identifications of non-permineralized fossil bird bones recovered from Ankilite Cave in southwestern Madagascar are presented. Among the more than 560 elements recovered, 29 different taxa were identified, the vast majority being species that still occur in this region of the island. Eggshell remains from the extinct elephant bird (Family *Aepyornithidae*) and assigned to *Aepyornis* sp. were found at the site. Two identified extinctions, *Scopsus umbretta* and *Motacilla banyolsi*, no longer occur in the area immediately surrounding the cave. The available radiocarbon measurements of collagen from fossil bird bones and avian eggshell carbonate of recovered from the cave range from 13,270 Cal yr BP to modern times. Hence, the presumed ecological shifts that took place resulting in the disappearance or range contractions of these three taxa is within the Holocene and are presumed to be associated with natural climatic change and in more recent centuries associated human pressures. Information is also presented on the origin of guinea fowl (*Nasiridae*) and inference on the period of colonization of *Corvus albus* on Madagascar.

Key words: Ankilite Cave, birds, *Aepyornis*, *Motacilla banyolsi*, *Nasiridae*, fauna, environmental shifts, C14 dates.

Résumé

Les identifications des os d'oiseaux fossiles récupérés dans la Grotte d'Ankilite dans le Sud-ouest de Madagascar sont présentées ici. Parmi les 560 éléments et plus récupérés, 29 taxa différentes ont été identifiées dont la majorité sont des espèces qui se trouvent encore dans cette région de l'île. Des restes de coquilles d'œuf de l'oiseau-éléphant (famille des *Aepyornithidae*) et affecté à *Aepyornis* sp. ont été trouvés sur le site. Par ailleurs, deux taxa actuels, *Scopsus umbretta* et *Motacilla banyolsi*, ont été identifiés mais ne se rencontrent plus à proximité de la grotte. Sur la base des mesures disponibles de radioc carbone de fossiles d'oiseaux récupérés dans la grotte, le matériel le plus ancien est daté à 13 270 ± 40 "C BP et le plus récent à l'époque moderne. Par conséquent, les changements écologiques présumés, ayant entraîné la disparition ou la restriction de la zone de répartition de ces trois taxons, ont eu lieu dans l'histoire récente. Ces changements sont probablement associés à perturbations climatiques naturelles et aux pressions humaines ultérieures. Des informations sont aussi présentées sur l'origine de la pintade (*Nasiridae*) et l'inférence sur la période de la colonisation de *Corvus albus* à Madagascar.

Introduction

There is good evidence to suggest that since the start of the Holocene some rather dramatic environmental changes have taken place on Madagascar (Burney *et al.*, 2004). These vicissitudes have had considerable impact on the





- Goodman, S. M. & B. Ramasindrazana.** Chauves-souris ou classe des Chiroptera/Bats or the class Chiroptera, pp. 169-209. Dans : *Atlas d'une sélection de vertébrés terrestres de Madagascar/Atlas of selected land vertebrates of Madagascar*, eds. S. M. Goodman & M. J. Raherilalao. Association Vahatra, Antananarivo.
- Goodman, S. M., J. C. Mittermeier, J. Ramamonjisoa & L. A. René de Roland.** Submitted. A note on the dietary habits of Barn Owls (*Tyto alba*) in the spiny bush of southwestern Madagascar. *Malagasy Nature*.
- Goodman, S. M., M. J. Raherilalao & K. Muldoon.** Bird subfossils from Ankililolo Cave: Inference about historical environmental changes in southwestern Madagascar. *Zoosystema*, 3750: 534-548.
- Goodman, S. M., M. P. H. Rakotondratsima & L. A. René de Roland.** In press. Further evidence of raptor predation on nocturnal lemurs: remains collected from a nest of the Madagascar Goshawk (*Accipiter henstii*). *Lemur News*.
- Goodman, S. M. & V. Soarimalala.** M. Raheriarisena & D. Rakotondravony. Petits mammifères ou tenrecs (Tenrecidae) et rongeurs (Nesomyidae)/Small mammals or tenrecs (Tenrecidae) and rodents (Nesomyidae), pp. 211-269. Dans : *Atlas d'une sélection de vertébrés terrestres de Madagascar/Atlas of selected land vertebrates of Madagascar*, eds. S. M. Goodman & M. J. Raherilalao. Association Vahatra, Antananarivo.
- Lourenço, W. & S. M. Goodman.** A synopsis of the scorpion fauna of the Loky-Manambato (Daraina) region in Madagascar. *Revista Ibérica de Aracnología*, 22: 47-58.
- Measey, G. J., A. P. Raselimanana & A. Herrel.** 2013. Ecology and life history of chameleons, pp. 85-114. In: *The biology of chameleons*, eds. K. A. Tolley & A. Herrel. The University of California Press, Los Angeles.
- Monadjem, A., S. M. Goodman, W. T. Stanley & B. Appleton.** A cryptic new species of *Miniopterus* from south-eastern Africa based on molecular and morphological characters. *Zoosystema*, 3746: 123-142.
- Naidoo, T., M. C. Schoeman, P. J. Taylor, S. M. Goodman & J. M. Lamb.** Stable Pleistocene-era populations of *Chaerephon pumilus* (Chiroptera: Molossidae) in southeastern Africa do not use different echolocation calls. *African Zoology*, 48: 125-142.
- Naidoo, T., S. M. Goodman, M. C. Schoeman, P. J. Taylor & J. M. Lamb.** Submitted. The *Chaerephon pumilus* species complex (Chiroptera: Molossidae) from south eastern Africa and the western Indian Ocean islands is not a classical ring species. *Acta Chiropterologica*.
- Newmark, W. D., W. T. Stanley & S. M. Goodman.** In press. Ecological correlates of vulnerability to fragmentation among Afrotropical terrestrial small mammals in northeast Tanzania. *Journal of Mammalogy*.
- Olive, M.-M., N. Razafindralambo, T. Andrianaivo Barivelo, J.-T. Rafisandratantsoa, V. Soarimalala, S. M. Goodman, P. E. Rollin, J.-M. Heraud & J.-M. Reynes.** Absence of Rift Valley fever virus in wild small mammals, Madagascar. *Emerging Infectious Diseases*, 19: 1025-1027.
- Radimilahy, C., R. Andrianaivoarivony, B. Rasoarifetra, L. M. A. Rakotozafy & S. M. Goodman.** Rapport sur une mission archéologique à Beanka, Région Melaky, Ouest de Madagascar. Dans : *La forêt de Beanka, Région Melaky, Ouest de Madagascar/The Beanka Forest, Melaky Region, western Madagascar*, eds. S. M. Goodman, L. Gautier & M. J. Raherilalao. *Malagasy Nature*, 7: 49-84.
- Raherilalao, M. J. & S. M. Goodman.** Premier aperçu de la diversité des oiseaux de la forêt sèche sur tsingy de Beanka, Région Melaky, Ouest de Madagascar. Dans : *La forêt de Beanka, Région Melaky, Ouest de Madagascar/The Beanka Forest, Melaky Region, western Madagascar*, eds. S. M. Goodman, L. Gautier & M. J. Raherilalao. *Malagasy Nature*, 7: 225-236.
- Rakotoarisoa, J.-E., S. M. Goodman & M. Raheriarisena.** Evidence for a role of historical factors on the evolution of the endemic rodent *Eliurus carletoni* (Rodentia: Nesomyinae) in an ecological transition zone of northern Madagascar. *Journal of Heredity*, 104: 23-35.
- Rakotoarisoa, J.-E., M. Raheriarisena & S. M. Goodman.** Late Quaternary climatic vegetational shifts in an ecological transition zone of northern Madagascar: insights from genetic analyses of two endemic rodent species. *Journal of Evolutionary Biology*, 26: 1019-1034.
- Rakotondramanana, C. F., S. M. Goodman, B. Ramasindrazana & M. C. Schoeman.** Submitted. Vocalisations de *Pipistrellus* spp. *sensu lato* de Madagascar : Expérience sur l'effet de confinement. *Malagasy Nature*.
- Ramasinatrehina, N. S. & M. J. Raherilalao.** 2013. Aperçu sur l'écologie de *Mentocrex beankaensis* (Aves, Rallidae) de la forêt sèche de Beanka, Région Melaky, Ouest de Madagascar. Dans : *La forêt de Beanka, Région Melaky, Ouest de Madagascar*, eds. S. M. Goodman, L. Gautier & M. J. Raherilalao. *Malagasy Nature*, 7: 237-244.
- Ramasindrazana, B., S. M. Goodman, C. F. Rakotondramanana & M. C. Schoeman.** Morphological and echolocation call variation in Malagasy trident bats, *Triaenops* Dobson, 1871 (Chiroptera: Hipposideridae). *Acta Chiropterologica*, 15.
- Raselimanana, A. P. & S. M. Goodman.** Lézards ou classe Reptilia/Lizards or the class Reptilia, pp. 35-62. Dans : *Atlas d'une sélection de vertébrés terrestres de Madagascar/Atlas of selected land vertebrates of Madagascar*, eds. S. M. Goodman & M. J. Raherilalao. Association Vahatra, Antananarivo.
- Rasoma, R. V. J., A. P. Raselimanana, Y. R. Ratovonamana & J. U. Ganzhorn.** Habitat use and diet of *Astrochelys radiata* in the sub-arid zone of southern Madagascar. *Chelonian Conservation and Biology*, 12: 56-69.
- Ratsoavina, F. M., N. R. Raminosoa, E. E. Louis Jr., A. P. Raselimanana, F. Glaw & M. Vences.** 2013. An overview of Madagascar's leaf tailed geckos (genus

- Uroplatus*): species boundaries, candidate species and review of geographical distribution based on molecular data. *Salamandra*, **49**: 115-148.
- Recknagel, H., K. R. Elmer, B. P. Noonan, **A. P. Raselimanana**, A. Meyer & M. Vences. 2013. Multi-gene phylogeny of Madagascar's plated lizards, *Zonosaurus* and *Trachelioptychus* (Squamata: Gerrhosauridae). *Molecular Phylogenetics and Evolution*, **69**: 1215-1221.
- Reynes, J.-M., N. K. Razafindralambo, V. Lacoste, M.-M. Olive, T. A. Barivelo, **V. Soarimalala**, J.-M. Heraud & A. Lavergne. In press. Anjozorobe hantavirus, a new genetic variant of Thailand virus detected in rodents from Madagascar. *Vector-Borne and Zoonotic Diseases*.
- Robert, V., B. Ramasindrazana & **S. M. Goodman**. Submitted. The species composition and distribution of insects collected by light-traps, with special reference to hematophagous groups in and near cave systems of Madagascar. *African Entomology*.
- Samonds, K. E., L. R. Godfrey, J. R. Ali, **S. M. Goodman**, M. Vences, M. R. Sutherland, M. T. Irwin & D. W. Krause. Imperfect isolation: factors and filters shaping Madagascar's extant vertebrate fauna. *Plos One*, **8**(4): e62086. doi:10.1371/journal.pone.0062086.
- Schoeman, M. C., **S. M. Goodman**, B. Ramasindrazana & B. Appleton. Submitted. Species interactions during diversification and community assembly in Malagasy *Miniopterus* bats. *Journal of Evolutionary Biology*.
- Shi, J. J., L. M. Chan, Z. Rakotomalala, A. M. Heilman, **S. M. Goodman** & A. D. Yoder. Latitude drives diversification in Madagascar's endemic dry forest rodent, *Eliurus myoxinus* (sub-family Nesomyinae). *Biological Journal of the Linnean Society*, **110**: 500-517, DOI: 10.1111/bj.12143.
- Soarimalala, V., H. H. Zafindranoro & S. M. Goodman** Diversité des petits mammifères sur une formation de tsingy : cas de la forêt de Beanka, Région Melaky, Ouest de Madagascar. Dans : La forêt de Beanka, Région Melaky, Ouest de Madagascar/The Beanka Forest, Melaky Region, western Madagascar, eds. S. M. Goodman, L. Gautier & M. J. Raherilalao. *Malagasy Nature*, **7**: 245-258.
- Tortosa, P., N. Dsouli, Y. Gomard, B. Ramasindrazana, C. W. Dick & **S. M. Goodman**. Evolutionary history of Indian Ocean nycteribiid bat flies mirroring the ecology of their hosts. *Plos ONE* **8**(9): e75215. doi:10.1371/journal.pone.0075215.





Photo: Coua verreauxi - © Louise Jasper

Association International Vahatra
BP 3972, Antananarivo 101, Madagascar
associativahatra@moov.mg - www.vahatra.mg - +261 20 22 27755