

History of SADABE Activities at Tsinjoarivo

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I. Research

Census 2000 – In July 2000, we censused forest fragments in the Mahatsinjo region and continuous forest in the Ankilahila region. We located seven *P. diadema* groups, and documented a previously unrecognized degree of pelage variation, including the existence of all-black individuals.

Census 2001 – During June-July 2001, we established census trails in 37 forest



fragments in the Mahatsinjo region varying from <1 to 228 hectares. We censused the lemur species in these fragments intensively during September-October, finding a total of 0-6 species per fragment. Smaller fragments consistently have fewer lemur species, highlighting the importance of fragment size and connectivity in preserving intact lemur communities. During August 2001, we established a new research site within the intact forest at Vatateza (east of Ankilahila) and censused the lemur community there. Our surveys, plus local observations, showed that this intact forest retains the full set of lemur species: *Propithecus diadema*, *Eulemur fulvus fulvus*, *Eulemur rubriventer*, *Haplemur griseus*, *Avahi laniger*, *Lepilemur mustelinus*, *Cheirogaleus major*, *Microcebus rufus*, and *Daubentonia madagascariensis*.

During September and October, we also performed botanical inventories in all 37 forest fragments at Mahatsinjo, in collaboration with botanists from Ranomafana National Park.

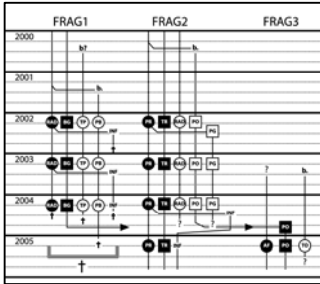
Ecology of *P. diadema* (2002-2003) – In November 2002, in collaboration with Dr. Ken Glander, we captured and marked *P. diadema* individuals within four study groups, and collected tissue samples and morphometric data. Two of these groups were found in the forest fragments at Mahatsinjo, and two were found within the continuous forest at Vatateza. These groups were habituated during all-day follows during December.

From January-December 2003, our research teams followed these four groups, accumulating more than 6,000 hours of behavioral data. We also collected phenological data at monthly intervals to provide estimates of food availability. Our data show clear differences between the fragment groups and the continuous forest groups. First, body mass for many animals is reduced in fragments. In general, females have similar mass, males are lighter in fragments, and juveniles are roughly 0.5 kg lighter in fragments relative to continuous forest. Second, the preferred fruits consumed in the continuous forest during the rainy season (January-April) are absent from the forest fragments (partly due to exploitation). Thus, fragment groups rely



on the fruits of the parasitic plant *Bakerella clavata* (Tongoalahy), thought to be a lower-nutrition substitute food. Finally, fragment groups show reduced activity levels, probably due to a lower-quality diet.

***P. diadema* Monitoring (2004-present)** – Since 2004, we have been monitoring the



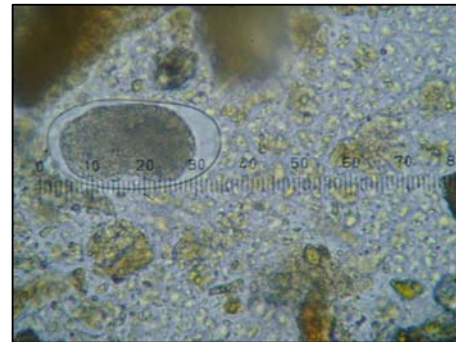
four *P. diadema* study groups at Tsinjoarivo. Because *P. diadema* is a long-lived species, it is important to compile long-term data in order to examine rates of reproduction, mortality, and transfer among groups. We now have >5 years of data, and preliminary analyses suggest important demographic differences between fragment and continuous forest groups (specifically an elevated mortality rate for juveniles in the forest fragments).

Parasitology (2004-present) – The parasites of lemurs in the wild remain

understudied, and even basic questions such as species richness and host specificity remain poorly known. Starting in 2004, in collaboration with Prof. RABETAFIKA Lydia of the University of

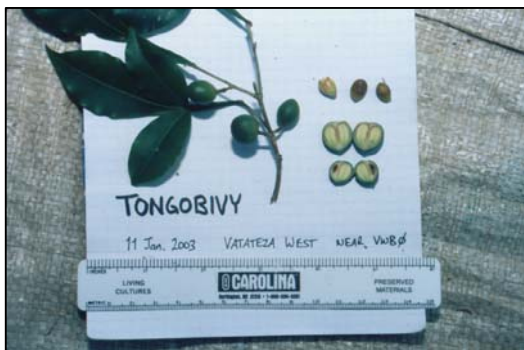


Antananarivo we have collected fecal samples from *P. diadema* study groups in order to



document the diversity of their parasites, and how infection rates change across seasons and habitats. Specifically, we will test whether nutritional stress in forest fragments exacerbates parasite infections. Analyses are ongoing, and these data will form the basis for Raharison's doctorate.

Nutrition (2006-2008) – From August 2006 to July 2007, our research teams



collected feeding data and samples of food items for all four *P. diadema* study groups. During 2007-2008, we are now analyzing all food items for protein, fiber, sugars, fats, minerals, and ash. This analysis will quantify their nutritional intake, including differences across habitats and seasons. With these data, we will be able to assess the effects of habitat fragmentation on the nutritional status and health of sifaka populations at Tsinjoarivo.

Cheirogaleid Diversity and Ecology (2006-2007) – In November 2006 and November 2007, we trapped *Cheirogaleus* and *Microcebus* at Mahatsinjo and Vatateza, in collaboration with Marino Blanco of the University of Massachusetts. Preliminary results show that *Cheirogaleus* diversity is higher than expected: animals at Vatateza resemble *C. major*, but animals at Mahatsinjo are morphologically distinct and resemble the poorly-known species *C. sibreei*, which is of great conservation concern. Future research will examine the reproductive ecology of all three Cheirogaleid species, and the effects of microhabitat and microclimate on the timing and success of reproduction.



Future Research – In June 2008, we plan to capture *P. diadema* individuals from eight study groups across a gradient of habitat disturbance, and perform detailed biomedical health assessments. In collaboration with Dr. Randall Junge of the St. Louis Zoo, we will examine the relationships between habitat disturbance and physiological indicators of health, specifically body mass, morphometrics, baseline bloodwork (hematology, serum biomedical profile, and nutrition analysis), and ectoparasite infection.

We will then monitor these groups over one year in order to examine: (1) differences in diet, behavior, and ranging patterns, (2) non-invasive measures of physiologic stress, including urine (c-peptide, a measure of energy balance) and feces (cortisol, a hormone indicating stress, and endoparasites).




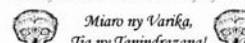

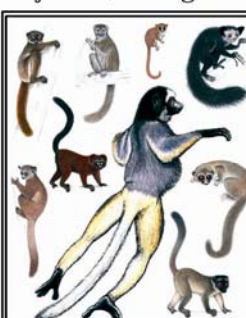
Sponsors of Research at Tsinjoarivo: Conservation International (Margot Marsh Biodiversity Foundation), Primate Conservation Inc., National Geographic Society, Stony Brook University, NSERC, St. Louis Zoological Park.

II. Development

Education – In 2002-2003 our research teams made monthly visits to local schools at the Mahatsinjo and Vatateza field sites. We forged relationships with the students and teachers, gave presentations highlighting the region's unique biodiversity, introduced our research project and methods, and offered instruction in English language. In November 2003, we hosted school groups from both regions for visits to our habituated *P. diadema* groups. Although the children live in the region, many of them (roughly half) had never seen lemurs up close. We held another school visit in 2007 at Mahatsinjo

In 2002, we printed 2000 brochures (1000 in Malagasy, 1000 in English) highlighting the lemurs of Tsinjoarivo. These were illustrated with drawings by Stephen Nash of Conservation International and encouraged awareness of lemur diversity and conservation. We distributed these brochures widely throughout Tsinjoarivo commune in 2002 through the present, left copies at the Musee du Rova at Tsinjoarivo, the Mayor's office at Tsinjoarivo, and the DEF office at Ambatolampy.



<p>Matavirambo: <i>Cheirogaleus major</i></p>  <p>Minirana voankazo sy tsiron-boninkazo ary bibikely ity varika ity. Matetika izy dia mandeha ireny. Mandritra ny ririna tontolo (May ka hatramin'ny Oktobra) dia matory izy na andro na alina. Alohan'ny atoriany amin'ny volana May dia mitombo tavy be izy, indrindra ao amin'ny rambony. Noho io toetra io dia afaka matory fotsiny izy ka tsy mila misakafo akory. Amin'ny alina no miremby ny Matavirambo.</p> <p>Hay-hay: <i>Daubentonia madagascariensis</i></p>  <p>Bibikely sy voanio no sakafon'ity varika ity. Matetika izy dia mandeha ireny. Miremby amin'ny alina ny Hay-Hay ary sarotra ny mahita azy noho izy saro-kenatra be. Kanefa dia fantatra ny fisiany ao anaty ala raha ahitana fanitra avelany amin'ny hazo maty rehefa avy nisakafo teo izy. Amin'ny toerana maro eto Madagasikara dia vononin'ny olona izy fa atahorana mitondra vintana ratsy.</p>	<p>Tsilamodamoka: <i>Microcebus rufus</i></p>  <p>Bibikely sy voankazo ary ravin-kazo no sakafon'ity varika ity. Matetika izy dia mandeha ireny. Ity varika ity no kely indrindra amin'ny varika sy gidro ary ny rajako eran-tany (50 grammes fotsiny). Amin'ny alina izy no miremby.</p> <p>Ny varika dia biby manokana an'i nosintsika, ary isan'ny lovan'izao tontolo izao. Ny ala any Afrika sy amin'ny toeran-kafa dia tsy ahitana azy fa gidro sy rajako ihany no misy any fa tsy varika. Ny karazan'ny varika sivy eto Tsinjoarivo dia tadidon-doza noho ny haza, fahasimban'ny ala, doro-tanety, ary ny fanimbana ataon'ny olona. Maro ny varika no efa nangavona tanteraka, ary ny sisan-taolana ambany tany sisa no ahafantarana azy ireny. Afaka miao ny varika miaina eto Tsinjoarivo lanao:</p> <ul style="list-style-type: none"> • Aza hazaina izahay tompokol! Tsy manana taranaka maro toy ny Trandraka izahay, ary na dia haza kely aza dia mety hanjavona mandrakizay izahay! • Tandremo ny doro ala savoka - aza avela hiranaka hatrany anaty ala foneranany ny afol! • Anjarjo amin'ny fomba voarary ny fambolena dia hitombo ny vokatra ary tsy ho simba ny ala! • Araho ny toro-lalan'ny Rano sy Ala amin'izay dia afaka hikarakara anay izy ireol! <p>Miao ny Varika, Tia ny Tanindrazana!</p> 	<p>Ny Olona sy ny Ala</p> <p>Tsy ho an'ny varika ihany ny maha-saro-bidy ny ala fa indrindra ho an'ny olombelona ihany koa!</p> <ul style="list-style-type: none"> • Miao ny nofon-tany ny ala - rehefa rava ny ala dia fahin'ny ranon'orana ny tsiron-tany, ary ho tolotry ny fotaka ny tanimbary! • Manome rano madio ny ala - ny fahadiovan'ny rano anefa dia miao amin'ny aretina sy manome sakafo ihany koa, toy ny trondro sy orana. • Raha voatrandaraka amin'ny fomba voarindra ny ala dia afaka hanome tombontsoa lehibe sy mahantra ho an'ny mponina - raha tsy minindra kosa anefa ny fampiasana ny ala dia ho rava tanteraka ary ho very ny tombon-tsoan'ny rehetra mety azy amin'ny ala!  <p>Lova ho an'ny taranaka mifandimby ny ala eto Tsinjoarivo! Omeo azy ireo sahala ny nataon'ny Razana teo aloha izany!</p>	<p>Ny Varika Eto Tsinjoarivo, Madagasikara</p>  <p>Tsinjoarivo Forest Fragments Project ICTE Institute for the Conservation of Tropical Environments</p> <p>INTERNATIONAL PRIMATE Protection League</p> <p>Miao ny Varika, Tia ny Tanindrazana!</p> <p>Nosoratan'i Mitchell IRWIN sy Serge RATSIRAHONANA Sary nataon'i Stephen D. NASH</p>
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Ny Varika Eto Tsinjoarivo, Madagasikara



Kotraika:
Hapalemur griseus griseus

Mihinana tsirin-dravina sy tahom-bolo ary karazana voankazo sy ravin-kazo ny Kotraika. Miaina amin'ny tarika kely ary miremy amin'ny andro mazava izy. Sarotra hita ny kotraika satria saro-kenatra sy kely vatana! Rehefa taitra izy dia ahetsiketsiny aloha sy aoriana ny rambony.

Varika mena:

Eulemur rubriventer

Voankazo sy voninkazo no tena sakafon'ny varika mena. Miaina ao anaty tarika kely izy izay ahitana lahy iray sy vavy iray ary ny zanany. Andro atoandro no miremy izy. Mora ny manavaka ny lahy amin'ny vavy, satria miloko fotsy ny tratran'ny vavy ary misy faritra fotsy kosa eo ambanin'ny mason'ny lahy. Samy avo feo ny varika mena sy ny varika.



Varika:

Eulemur fulvus fulvus

Ny varika dia miaina ao anaty tarika lehibe kokoa noho ny varika mena. Voankazo sy voninkazo ihany koa ny sakafony. Miremy amin'ny atoandro koa izy. Rehefa mihinana voankazo anaty ala ny varika sy ny varika mena dia mitelina ny vao, ary manaparitaka izany amin'ny tainy. Manampy amin'ny fiparitahan'ny zana-kazo ao anaty ala izany.



Mihoatra noho ny 40 karazana ny varika miaina eto Madagasikara. Maro karazana ny ala fonenany, toy ny ala miaina any andrefana, ny ala feno tsilo any atsimo, ary ny ala mando any antsinanana. Isaky ny karazana fonenana dia misy karazana varika samy hafa. Ny ala mando amin'ny havoana eto Tsinjoarivo dia fonenan'ny karazana varika sivy.

Eran'izao tontolo izao dia eto Madagasikara ihany no ahitana ny varika.



Sadabe:
Propithecus diadema

Voan-javatra, ravin-kazo sy voankazo manta no tena sakafon'ny Sadabe izay miaina anaty tarika kely. Mampiasa ny feny lavabe izy rehefa mitsambikina eny ambony hazo. Miremy amin'ny andro mazava izy. Volana Jiona no fandatsahan'ny Sadabe ny zanany. Sadabe no lehibe indrindra amin'ny varika eto Tsinjoarivo (4.5 kg), ary vitsy dia vitsy ny isany. Tsy hita any Ranomafana sy Perinet izy io fa eto Tsinjoarivo ihany!



Ramiona:
Avahi laniger

Mihinana ravin-kazo, ary miaina anaty tarika ahitana lahy iray sy vavy iray ary ny zanany ity varika ity. Mitsambikina toy ny Sadabe ihany koa izy na dia kely kokoa aza ny vatany. Miremy mandritra ny alina ary matory kosa izy rehefa mazava ny andro.



Tsilamodamoka:
Microcebus rufus

Bibikely sy voankazo ary ravin-kazo no sakafon'ity varika ity. Matetika izy dia mandeha ireny. Ity varika ity no kely indrindra amin'ny varika sy gidro ary ny rajako eran-tany (50 grammes fotsiny!). Amin'ny alina izy no miremy.



Ny Olona sy ny Ala

Ny ala tene sady ilain'ny Varika no ilain'ny olona ihany koa.

- ❖ Ny ala dia miaro ny nefontany tsy ho kaon'ny riaka. Entin'ny riaka ateraky ny orana nohozany ny nefontany aza volena Rehefa fongana tsy misy ny ala ary tototry ny atsanana ny tanimbary sy ny tany aza volena ambany toerana rehetra.
- ❖ Miaro mandrakariva ny rano mba hado ny ala ary amin'ny rano madio no ahafahan'ireo karazantsakafao hafa ho an'ny olona toy ny trondro sy ny orana miaina ara-dalana. Ny fampiasana rano madio ihany koa dia miaro amin'ny aretina. Rehefa ringana ny ala dia haloto tahaka ny Onive ny rano rehetra.
- ❖ Ao anatin'ny ala ihany no mitahiry ireo karazanjavatra izy mety ho ilain'ny olona amin'ny fiainany andavanandro raha toa ka voatantana sy voalanjanga ara-dalana ny fampiasana ny ala. Raha toa kosa anefa ka aripadripaka fahatany fotsiny ny ala, dia ho fongana tanteraka tokoa ireo ala kely sisa tavela.

Hay-hay:
Daubentonia madagascariensis

Bibikely sy voanio no sakafon'ity varika ity. Matetika izy dia mandeha ireny. Miremy amin'ny alina ny Hay-Hay ary sarotra ny mahita azy noho izy saro-kenatra be. Kanefa dia fantatra ny fisiany ao anaty ala raha ahitana faritra avelany amin'ny hazo maty rehefa avy nisakafao teo izy! Amin'ny toerana maro eto Madagasikara dia vonoin'ny olona izy fa atahorana mitondra vintana ratsy.



Matavirambo:

Cheirogaleus major

Mihinana voankazo sy tsirom-boninkazo ary bibikely ity varika ity. Matetika izy dia mandeha ireny. Mandritra ny ririna tontolo (May ka hatramin'ny Oktobra) dia matory izy na andro na alina. Alohan'ny atoriany amin'ny volana May dia mitombo tavy be izy, indrindra ao amin'ny rambony. Noho io toetra io dia afaka matory fotsiny izy ka tsy mila misakafao akory. Amin'ny alina no miremy ny Matavirambo.



Tsidika:

Lepilemur microdon

Ravin-kazo no sakafony. Matetika dia mandeha ireny ity varika ity, afa-tsy ny vavy miaraka amin'ny zanany. Miremy izy mandritra ny alina. Sarotra ny manavaka ny Tsidika amin'ny Ramiona. Manana sofina lehibe kokoa ny Tsidika ary misy tsipika mainty an-damosiny. Mena volo kokoa ny Ramiona, ary fotsy ny faritra ambany amin'ny tongony.



**Miaro ny Varika,
Tia ny Tanindrazana!**



Nosoratan'i Mitchell IRWIN, Jean-Luc RAHARISON, sy Serge RATSIRAHONANA. Sary nataon'i Stephen D. NASH

Plaque "The Lemurs of Tsinjoarivo", installed at Tsinjoarivo, Mahatsinjo and Vatateza.

Also in 2002, we printed and distributed more than 200 t-shirts with the message “Miaro ny Varika, Tia ny Tanindrazana”. The front panel featured the sadabe, *Propithecus diadema*, and the back panel contained pictures of all nine lemur species found at Tsinjoarivo. These t-shirts were distributed both to local guides and residents, collaborators at Tsinjoarivo (Mayor’s office), Ambatolampy (DEF office) and Antananarivo.



In 2004, we installed five permanent educational plaques: one at Tsinjoarivo town center, two at the research site at Mahatsinjo, and two at the research site at Vatateza. The first plaques, “Ny Varika Eto Tsinjoarivo”, gave details about all lemur species, highlighting their ecology, behavior and uniqueness. The additional plaques “Ny Sadabe Eto Mahatsinjo” and “Ny Sadabe Eto Vatateza”, gave details of local groups of sadabe (*P. diadema*), including their ecology, diet and behavior.

In 2004-2005, we collaborated with the Madagascar Ankizy Fund (www.ankizy.org) to facilitate the donation of a public school to the



Mahatsinjo region. Previously, the only school in the region was a private catholic school which was held in the church building (usually inoperable during the cyclone season due to rain damage).

Parents were obliged to pay high monthly fees to support the teachers’ salaries. The new school, Sekoly RAH King Mahatsinjo, was built during 2004 and inaugurated in 2005. It is maintained by the Madagascar Ankizy Fund, which pays the salary of four teachers.



Inscription is free, and approximately 200 students from Mahatsinjo and nearby regions benefit from this free, high-quality education. The Ministry of National Education and Scientific Research recognized the RAH King and supplied one principal teacher starting in November 2007. Eventually, this school will become an Ecole Primaire Publique (EPP) and management will gradually be transferred to CISCO.

Training and Capacity Building – Starting in 2000, we have trained 11 local people in research techniques. They have gained skills in botanical inventories, phenological monitoring, behavioral observations, and lemur census techniques. Training has also included instruction in English and French. We have also trained our three core senior guides in data recording, and these three guides can now work autonomously in data collection. In 2007 we distributed materials intended to help our research guides and other local people learn English and French. This will aid in the career development of people who wish to become tourist guides. We have already helped local people at Mahatsinjo form a legal association (“Imaintso an’Ala”), which will be responsible for co-ordinating tourist visits. The development of these local skills will be crucial in: (1) facilitating future research, (2) developing ecological monitoring programs for the protected area to be developed at Tsinjoarivo, and (3) ensuring the success of the ongoing ecotourism initiative.



Health – Medical and dental care is extremely limited in Tsinjoarivo commune. The nearest doctor is located at Tsinjoarivo (up to 15 km away from the rural villages) and the nearest dentist is in Ambatolampy (approx. 75 km away). Many people in Tsinjoarivo commune do not receive needed medical and dental care due to this distance, as well as lack of money. During July 2007, our teams hosted a Madagascar Ankizy Fund dental mission at Mahatsinjo, held at the



Sekoly RAH King. The team included one dentist and professor (Dr. Laurence Wynn) and five dental students (four from New York, one from Madagascar), plus a small support staff. During 8 days, the team treated more than 200 patients from



Mahatsinjo and nearby regions, including many with badly infected teeth and gums. The team provided extractions of teeth that were too badly decayed to be saved, restorations for teeth with minor decay, endodontic reconstructions (root canals) and education in oral health. They also provided free toothbrushes, antibiotics, and painkillers. They also collected data on dental health, which will be

used in guiding future clinics.

Future Activities – We are currently planning a second dental clinic, in collaboration with the Madagascar Ankizy Fund, and a women's health clinic (including specialist doctors from Canada) in June-July 2008.

III. Reforestation

In July 2005, we established the Mahatsinjo Reforestation Initiative, funded by Conservation International. In collaboration with the Direction des Eaux et Forêts office in



Ambatolampy and with the agreement of the local people at Mahatsinjo, we delimited 12 areas for reforestation. We engaged local people at a series of meetings in order to integrate our reforestation efforts with local needs, and gain the support of the local people. Areas chosen for reforestation included



strategic connections between isolated forest fragments, and were chosen so as to reduce the impact on local agricultural production. During 2005-2006 project staff collected more than 10,000 seedlings either grown from seed or harvested from the nearby forest. During 2006-2007 we employed local villagers to plant 7 corridor locations

and install signs demarcating the corridor areas. The total number of trees planted was more than 55,000, and the project has provided full-time employment for one resident of

Mahatsinjo and part-time employment for more than 40. In future years we will employ local villagers to maintain the growing corridors, and reforest the remaining areas.



Publications, Theses and Conference Presentations Resulting from SADABE Research at Tsinjoarivo

Publications and Theses:

Irwin MT, Raharison JL (in prep.) Ecosystem in decay: Factors influencing primate species extinctions in forest fragments of Tsinjoarivo, Madagascar.

Irwin MT, Glander KE, Raharison JL, Samonds KE (in prep.) Effect of habitat and sex on body mass and morphometrics of diademed sifakas (*Propithecus diadema*).

Blanco MB, Godfrey LR, Rakotonratsima M, Samonds KE, Raharison JL, Irwin MT (submitted) Discovery of sympatric dwarf lemur species in the high-altitude rainforest of Tsinjoarivo, eastern Madagascar: Implications for biogeography and conservation.

Irwin MT (2008) Feeding ecology of diademed sifakas (*Propithecus diadema*) in forest fragments and continuous forest. *International Journal of Primatology* 29(1):95-115.

Irwin MT (2008) Diademed sifaka (*Propithecus diadema*) ranging and habitat use in continuous and fragmented forest: Higher density but lower viability in fragments? *Biotropica* 40(2):231-240.

Godfrey LR, Irwin MT (2007) The evolution of extinction risk: Past and present anthropogenic impacts on the primate communities of Madagascar. *Folia Primatologica* 78:405-419.

Irwin MT (2007) Living in forest fragments reduces group cohesion in diademed sifakas (*Propithecus diadema*) in eastern Madagascar, by reducing food patch size. *American Journal of Primatology* 69:434-447.

Irwin MT, Raharison JL, Rakotoarimanana H, Razanadrakoto E, Ranaivoson E, Rakotofanala J, Randrianarimanana C (2007) Diademed sifakas (*Propithecus diadema*) use olfaction to forage for the inflorescences of subterranean parasitic plants (Balanophoraceae: *Langsdorffia* sp., and Cytinaceae: *Cytinus* sp.). *American Journal of Primatology* 69:471-476.

Irwin MT (2006) Ecologically enigmatic lemurs: The sifakas of the eastern forests (*Propithecus candidus*, *P. diadema*, *P. edwardsi*, *P. perrieri* and *P. tattersalli*). In: *Lemurs: Ecology and Adaptation* (L. Gould & M. Sauther, eds.). New York: Springer, pp. 305-326.

Irwin MT (2006) Ecological Impacts of Forest Fragmentation on Diademed Sifakas (*Propithecus diadema*) at Tsinjoarivo, Eastern Madagascar: Implications for Conservation in Fragmented Landscapes. PhD Dissertation, Stony Brook University, Stony Brook, NY, USA.

Irwin MT, Ravelomanantsoa HV (2004) Illegal rum production threatens health of lemur populations at Tsinjoarivo, eastern central Madagascar: Brief report and request for information. *Lemur News* 9:16-17.

Conference Presentations:

Irwin MT, Raharison JL, Wright PC (2008) Spatial and temporal variability in predation by *Cryptoprocta ferox* on sifakas in continuous and fragmented rainforest in Madagascar: Do forest fragmentation and predation act synergistically? Annual Meeting of the American Association of Physical Anthropologists.

Blanco MB, Godfrey LR, Rakotonratsima M, Samonds K, Raharison JL, Irwin MT (2008) Discovery of sympatric Cheirogaleus species in the high-altitude rainforest of Tsinjoarivo, eastern central Madagascar: Implications for biogeography and conservation. Annual Meeting of the American Association of Physical Anthropologists.

- Bradley BJ, Irwin M, Kappeler PM, Moisson P, Morelli TL, Pastorini J, Mundy NI (2008) Primate pigmentation: Understanding the genetic basis of convergent coat color phenotypes. Annual Meeting of the American Association of Physical Anthropologists.
- Bradley BJ, Pastorini J, Moisson P, Irwin M, Morelli TL, Mundy NI (2007) The colour of monkeys: Genetics of primate pigmentation often contradict expectations based on the mouse model. 11th Congress of the European Society for Evolutionary Biology.
- Irwin MT, Glander KE, Raharison JL, Samonds KE (2007) Effect of habitat and sex on body mass and morphometrics of diademed sifakas (*Propithecus diadema*). American Journal of Physical Anthropology 132(S44):134.
- Irwin MT (2006) Forest fragmentation alters ranging and habitat use in diademed sifakas (*Propithecus diadema*): Implications for viability of fragmented populations. 31st Annual Meeting of SQEBC (Société Québécoise pour l'Étude Biologique de Comportement), 2006.
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