Volume 16

April 2008

African Bat Conservation News

ISSN 1812-1268

Notice Board 1

Observations, Discussions and Updates 2 - 3

Scientific Contributions 4 - 7

The hunting of microchiropteran bats in different portions of Madagascar 4 - 7

Recent Literature 8- 12

Above: A female Long-tailed Serotine bat (*Eptesicus hottentotus*) caught at Farm Schaapplaats, Free State, South Africa [ECJS-79/2008 deposited in the Transvaal Museum.]

NOTICE BOARD

Conferences

13th International Hibernation Symposium (Hibernation 2008)

"Hypometabolism in animals: Hibernation, torpor and cryobiology"

To be held at: Swakopmund Hotel, Namibia, 6—12 August 2008

Further information: http//www.ihs2008.com/

Future planning

- 11th European Bat Research Symposium, Cluj-Napoca, Romania, August 2008.
- 12th European Bat Research Symposium, Lithuania, August 2011.

Download site for ABCN:

www.Africanbats.org

All Out · Transvaal Museum · Durban Natural Science Museum

OBSERVATIONS, DISCUSSIONS AND UPDATES

Observation #: 1

Tomb bat at Lapalala Wilderness School, South Africa

Submitted by: Anthony Roberts (anthony@lapalala.com)
Date of observation: 10 December 2007
Locality: Lapalala Wilderness School, Limpopo Province, South Africa.
GPS: S23.87378 E28.33236
Photo: Anthony Roberts
Email message:

I took a pic of this guy at the school this morning and just wanted confirmation that it was a tomb bat? - Anthony Roberts (11 December 2007).
This bat, who we have named Siegfried, lives just above my office door and there is a second one that roosts 10m away. On only one occasion were they roosting alongside each other. I am afraid that I do not have info on when they came but I would go so far as to say they have been here the whole of summer or at least the last 4 months. - Anthony Roberts (11 March 2008).

Editorial response: This does indeed seem to be a Tomb bat, the grey dorsal fur would suggest that it is the Mauritian tomb bat (*Taphozous mauritianus*). Only 14 known sites of this species are known from the Limpopo Province, South Africa, five of these are within the Kruger –NP. Within and around the Waterberg area only two sites are known one near Vaalwater on the farm Drileton 276 and the other 25 km ESE of Potgieterus on the farm Groothoek 99. These were collected in 1988 and 1974 respectively. - Ernest Seamark

Identification supported as a Mauritian Tomb bat (*Taphozous mauritianus*) by: Ara Monadjem, Ernest Seamark and Peter Taylor.

Observation #: 2

Swamp Boubou shrike killing bat at Kwetsani camp, Botswana

Submitted by: Dave Hood (letotse@yahoo.co.uk)
Observation by: Christopher Stride, Leseya "Lesh" Baitseng and Gaopalelwe Ronald.
Date of observation: 2 January 2008
Locality: Kwetsani camp, Botswana.
GPS: 19°14.65'S 22°32.23'E
Photo: Christopher Stride
Email message:
The incident occurred while Christopher Stride while out on a bush walk with Lesh and Ronald at Kwetsani one morning. The incident happened between management 4 and the rubbish pit. Lesh had stopped to look at something when they saw the bat and Boubou falling from a real fan palm. The two fell to the ground and the Boubou continued to attack the bat who was apparently screaming. The attack lasted about 2 minutes before the bat was killed and dragged into the bush by the Boubou.— Cathy Kays (Kwetsani camp).

As to the story, not much to tell, apart from the fact that we were on a morning bush walk and on our way back into camp (about 9:00am) when we stumbled across a skirmish going on in the bush. Initially all we could see was a Boubou having a go at something in the ground, and on closer inspection it was a bat. Unfortunately we missed the moment of attack, so cannot elaborate on how it occurred. We had about 2 minutes of seeing the Boubou finally get the better of the bat before dragging it under the cover of a large bush.— Christopher Stride.

Editorial response:
The bird in the pic is almost certainly a Swamp Boubou (*Laniarius bicolor)* which is common in the Okavango Delta of Botswana occurring in a variety of habitats from riparian woodland to papyrus swamps. The Tropical Boubou is also present in the extreme northern parts of Botswana, but has its flanks and under-belly washed with light rufous/russet brown and is a thicket/forest bird. – Ara Monadjem

The bat looks more "vesper-like" - maybe *Scotophilus* or even *Scoetecus*; but impossible to be accurate let alone precise. - Woody Cotterill.

My guess is that it may be a vesper bat and to stick my head out I would say the species is *Neoromicia rendalli,* it has translucent (white) wings and it has been recorded from Botswana. The other candidate would be *Scotoecus albofuscus*, but this has not been recorded from Botswana and also seems to be restricted to the eastern parts of Africa (again this is based on the distribution map).— Ernest Seamark.

Identification as a vesper is supported by: Woody Cotterill, Ara Monadjem, Ernest Seamark and Peter Taylor.

Observation #: 3

Slit-faced bat found at Lapalala Wilderness School, South Africa

Submitted by: Anthony Roberts (anthony@lapalala.com)
Date of observation: 13 March 2008
Locality: Lapalala Wilderness School, Limpopo Province, South Africa.
GPS: S23.87378 E28.33236
Photo: Anthony Roberts
Email message:

… we sadly found this bat dead in our information centre this morning. I do not have the time to look it up this morning so before I forget about it I thought I would just send a pic through to you for ID. Please excuse the picture quality but I had only my cell phone to use. I have put it in the deep freeze in case it is something interesting and you would like a DNA sample or the bat itself. - Anthony Roberts.

Editorial response:
The bat is certainly a *Nycteris* their long ears are distinctive, as to which species one would need to check the tragus shape and upper incisor tooth shape. They are really special bats in their incredible flight and echolocation ability they can hover and almost never get caught in bat traps or mist nets. They also night roost and leave piles of wings, legs and other insect remains at these sites.—Teresa Kearney

Identification supported as a *Nycteris* by*:* Robert Barclay, Jakob Fahr, Teresa Kearney, Ernest Seamark and Victor Van Cakenberghe.

Observation #: 4

Mauritian Tomb bat found in the Free State Province, South Africa

Submitted by: Erna Van Schalkwyk (Erna.VanSchalkwyk@thyssenkrupp.com)
Observation by: Mandy and Andre Roeland
Date of observation: around the 19th of March 2007
Locality: Plot 10, Mullersrust, between towns of Vanderbijlpark and Sasolburg, Gauteng Province, South Africa.
GPS: 26º 44'46.51''S; 27º 46'20.77''E
Photo: Mandy and Andre Roeland
Email message:

Attached is another photographic record for the Mauritian Tomb bat (*Taphozous mauritianus*). This was sent in a year ago by Mandy and Andre Roeland who live on a plot in-between Vanderbijlpark and Sasolburg. They observed the bat around the 19th of March 2007 last year, but did not see the bat return this year. The bat flew into their house and then got grounded on their floor. They handled the bat with a towel and were then able to take pictures of it.— Erna Van Schalkwyk

Editorial response:
Identification supported as a Mauritian Tomb bat (*Taphozous mauritianus*) by: Jakob Fahr, Ara Monadjem, Ernest Seamark and Peter Taylor.

Lapsus in GOODMAN *et al.* (2007): TM 46881 not TM 46481

By: Ernest C.J. Seamark, Vertebrate Department, Transvaal Museum, P.O. Box 413, Pretoria, 0001, Republic of South Africa.

In appendix 1 of GOODMAN *et al.* (2007: 1229) under *Miniopterus natalensis* they refer to TM 46481 from Haffenden Heights, South Africa. Cross checking the vouchers mentioned in the paper and the catalogue book at the Transvaal Museum, TM 46481 is a *Rhinolophus clivosus*, leg. Cohen, Lientjie, 5 October 2005; South Africa, Mpumalanga, Farm Sterkspruit 412KT, Mogaba (2435S 3037E). Within the Transvaal Museum only two vouchers are known from Haffenden Heights: TM 46881, *Miniopterus natalensis*, leg. Cohen, Lientjie, 3 November 2003; South Africa; Farm Haffenden Heights 35KT (2407S 3000E); and TM 46882, *Rhinolophus clivosus*, leg. Cohen, Lientjie, 3 November 2003; South Africa; Farm Haffenden Heights 35KT (2407S 3000E).

In Figure 8 of GOODMAN *et al.* (2007) they have the accession number as TM 46881. Therefore in the gazetteer: TM 46481 should be read as TM 46881.

I thank Dr. Steven M. Goodman for reading this communication, and agree's with my interpretation.

References

GOODMAN, S. M., RYAN, K. E., MAMINIRINA, C. P., FAHR, J., CHRISTIDIS, L., and APPLETON, B., 2007. The specific status of populations on Madagascar referred to *Miniopterus fraterculus* (Chiroptera: Vespertilionidae), with the description of a new species. *Journal of Mammalogy* **88**(5): 1216-1229.

ISSN 1812-1268

SCIENTIFIC CONTRIBUTIONS

THE HUNTING OF MICROCHIROPTERAN BATS IN DIFFERENT PORTIONS OF MADAGASCAR

By: Steven M. Goodman[1], Fanja H. Ratrimomanarivo[2], Julie Ranivo[2] and Scott G. Cardiff[3]
[1] Field Museum of Natural History, 1400 South Lake Shore Drive, Chicago, Illinois 60605, USA and Vahatra, BP 3972, Antananarivo 101, Madagascar. E-mail sgoodman@vahatra.mg
[2] Département de Biologie Animale, BP 906, Université d'Antananarivo 101 and Vahatra, BP 3972, Antananarivo 101, Madagascar
[3] Columbia University, Department of Ecology, Evolution, and Environmental Biology, New York, NY 10027 and Division of Vertebrate Zoology (Mammalogy), American Museum of Natural History, Central Park West at 79th Street, New York, NY 10024, USA

Key words: Madagascar, Microchiroptera, exploitation, bush meat

The past decade has seen a remarkable increase in research on Malagasy bats. This work has included wide scale surveys and associated taxonomic studies, which have greatly expanded measures of species richness on the island, described many species new to science, and added considerable new data on natural and synanthropic day roost sites and aspects of the natural history and conservation of these animals. During the course of this research, workers also gathered information about threats to this fauna.

It has become increasingly clear that a wide variety of mammal species are harvested by local people across Madagascar to supplement protein in their diets and in association with other activities (e.g., removal of pests, magical properties). Different mammal groups occurring on the island are exploited, including lemurs, bats, carnivorans, and tenrecs (GANZHORN *et al*. 1990; RANDRIAMANALINA *et al*. 2000; GARCIA and GOODMAN 2003; GOODMAN and RASELIMANANA 2003; MACKINNON *et al*. 2003; GOLDEN 2005; GOODMAN *et al*. 2005; BOLLEN and DONATI 2006; GOODMAN 2006; JENKINS *et al*. 2007a; RAKOTONANDRASANA and GOODMAN 2007). Amongst the studies of hunting, which are based on direct hunting observations, interviews, and the analysis of bone middens, there is increasing evidence that bats, ranging from large fruit bats to small insectivorous species, are much more widely harvested than previously realized.

There has been some information published on fruit bat exploitation on Madagascar (e.g., MACKINNON *et al*. 2003; JENKINS *et al*. 2007a; RACEY *et al*. in press; CARDIFF *et al*. submitted). Here we examine recent information on the exploitation of microchiropteran bats on a site-to-site basis (Figure 1), arranged from north to south, and demonstrate that the harvesting of these animals is not restricted to a particular region or ethnic group on the island, but is widespread. Further, we present evidence that people collect microchiropterans for reasons other than bush meat. For designations of different Malagasy cultural groups, we generally use the classification of VÉRIN (1990, p. 52). In many cases, the information presented herein is based on interviews or other types of extrapolation, rather than direct observation of exploitation. While in general we have confidence in the reported details, it is important to underline that certain sources of information are from second-hand sources.

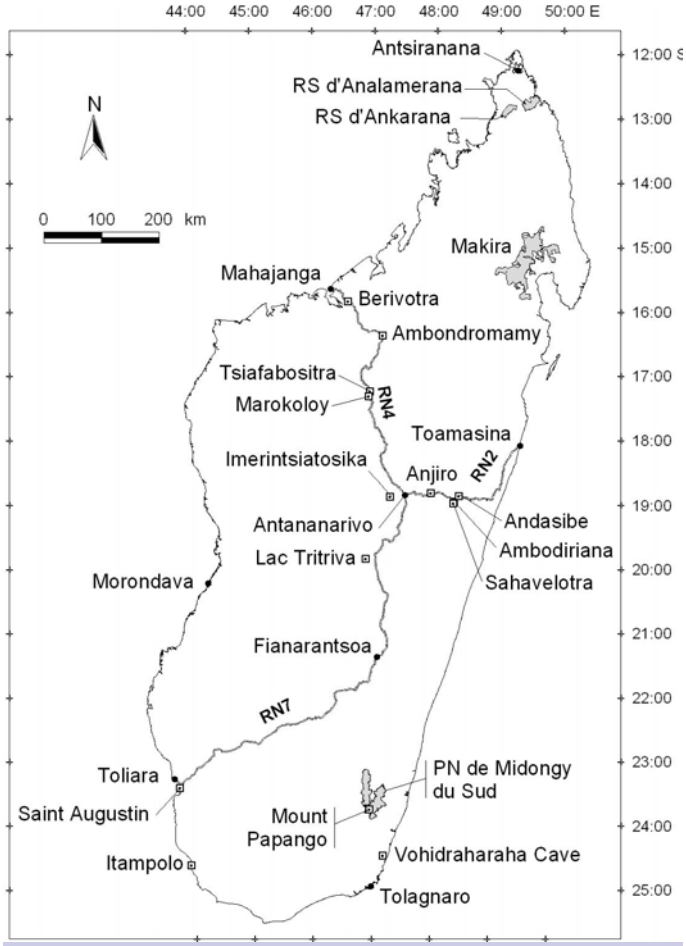

Figure 1: Map of different sites on Madagascar mentioned in the text.

SITES OF EXPLOITATION (Figure 1)

Ankarana – The karstic zone of the Ankarana Plateau, much of which is within the Réserve Spéciale d'Ankarana, contains a myriad of caves and rock crevices and is home to a considerable density and diversity of bats (GOODMAN *et al*. 2005; CARDIFF 2006). CARDIFF *et al*. (submitted) indicate that hunting occurred at several different caves in and around Ankarana, including at least three colonies of *Hipposideros commersoni* (E. Geoffroy, 1813), and that hunting has negatively impacted at least one colony of *H. commersoni*. Hunters used sticks to knock down roosting bats and appeared to use fire and smoke at two different *H. commersoni* roosts. One person claiming to hunt in one cave indicated that *H. commersoni* are valued food items relative to other bats present because of their fattiness or oiliness. Ankarana is a region with extensive artisanal mining of sapphires and some miners work in caves and may hunt bats as well. The locally occurring ethnic group is the Antankarana, but miners come from different areas of the island.

Analamerana – In January 2004, Bazaribe Cave (12°42.7'S, 49°28.4'E, 90 m), in the Réserve Spéciale d'Analamerana, was visited and considerable numbers and diversity of bats were found occupying the site (GOODMAN *et al*. 2005). The entrance into and activities inside this cave are controlled by

ISSN 1812-1268

local taboos associated with human burials and the day-roosting bats are not harassed. A local guide mentioned that when *H. commersoni* become fat, before the start of the dry season which is also a period of food shortage, they are regularly hunted with whips and batons as they fly close to houses in proximity to the cave and just outside the reserve limit. The level of exploitation is unknown. The local ethnic group is the Antankarana.

Makira – In an extensive survey of villagers living around the Makira Forest in northeastern Madagascar associated with bush meat exploitation, GOLDEN (2005) learned that *Miniopterus* cf. *manavi* Thomas, 1906 are collected with some frequency with the use of throwing stones or batting them with sticks. This species has an average body mass of 5.1 g (RANIVO 2007). Amongst the different types of bats taken locally, it was the larger pteropodids, *Rousettus madagascariensis* G. Grandidier, 1928 and *Pteropus rufus* E. Geoffroy, 1803, which were more commonly consumed than *Miniopterus*. The local cultural group is Betsimisaraka.

Berivotra (15˚54.3'S, 46˚35.9'E, 200 m) – Evidence was found during a March 2005 visit to the village of Berivotra that *Chaerephon leucogaster* (A. Grandidier, 1870) are removed from synanthropic roost sites and used as food. Children using branches tap the bats as they exit the roost site. The locally occurring cultural groups are the Sakalava-Boeny and Tsimihety.

Ambondromamy (16˚26.1'S, 47˚09.4'E, 50 m) – During a March 2005 visit to this village, a considerable number of *Mops midas* (Sundevall, 1843) were tapped with branches as they exited a diurnal roost site, collected, and then the cooked cadavers were fed to domestic pigs. To our knowledge, this is the first evidence on Madagascar of bat exploitation for this purpose. The potential zoonotic implications of entering different viruses into the food chain of domestic animals and humans, associated with not completely cooked carcasses of bats, is an aspect that needs to be examined, especially given reported transmission of Nipah virus to pigs in Malaysia (WONG *et al*. 2002). The locally occurring cultural groups are the Sakalava-Boeny and Tsimihety.

Tsiafabositra (17˚18.3'S, 47˚57.3'E, 370 m) – This site was visited in February 2005 and small transient groups of *Miniopterus gleni* Peterson, Eger and Mitchell, 1995 were located during the night in large road drainage pipes. Local informants mentioned that these animals were occasionally killed with sticks and used as a protein supplement in the diet of local people. The locally occurring cultural group is the Sakalava-Boeny.

Marokoloy (17˚23.0'S 46˚55.7'E, 450 m) – In February 2005 local guides mentioned that *M. gleni* are taken during the day from road drainage pipes in the vicinity of this village. The local people, largely of the Sakalava-Boeny ethnic group, apparently ate these animals.

Anjiro (18°53'S, 47°58' E, 850 m) – During a survey of synanthropic bats species, conducted in February 2005, interview evidence was found in this village that local people exploited *Scotophilus robustus* Milne Edwards, 1881 for food. (This is the same site described as one of the first known synanthropic occurrences for this species [RATRIMOMANARIVO and GOODMAN 2005]). These animals are hunted with sticks, as they emerge at dusk from their day roost site, to be consumed as snack foods (*tsaky-tsaky*). A strain of the Dakar bat virus group, a non-arbovirus *Flavivirus*, as well as a non-classified virus have been isolated from the salivary glands of bats at Anjiro (COULANGES *et al*. 1974; ROUSSET and ANDRIANARIVELO 2003). Nothing is known about the epidemiology of these viruses with regards to bats or humans. The local cultural groups are predominantly Imerina and Bezanozano.

Andasibe (18˚55.3'S 46˚35.9'E, 950 m) – A well-known site for a colony of *Mops leucostigma* G. M. Allen, 1918 is in the post office of this village. On a regular basis, from approximately 2001 to 2003, local boys captured several individuals of this species as they emerged from the roost site at dusk (R. Dolch, PERS. COMM.). These animals were used to supplement protein intake of these boys and presumably their families. The colony remains active today and the level of exploitation does not appear to have seriously impacted this population. The locally occurring cultural groups include Imerina and Bezanozano.

Imerintsiatosika (18°59'S, 47°19'E, 1350 m) – In September 2006, local people mentioned that they captured molossids, which were removed from rock shelters in cliff faces, for food. The animals are obtained by starting fires at the entrances of the narrow rock crevices used as day roost sites, which forces the bats to exit, and they are then captured. Subsequently, it was verified that the animals in question include *Mops midas* and *Mormopterus jugularis* (Peters, 1865). Based on interviews with local hunters, in at least two cases roost sites have been abandoned or a given day-roost population extirpated. The local cultural group is Imerina.

Lakato – In October 2007, during a biological inventory of the Lakato region, local people mentioned that in an abandoned graphite mine, near the Sahavelotra Barrage (19°02.4'S, 48°19.6'E, 990 m), there was a colony of small bats. When the mine was visited, a mound of relatively fresh guano was found on the ground, surrounded by throwing sticks and batons used for firelight. With the exception of a single *Myotis goudoti* (A. Smith, 1834), no bat was found in the mine. Based on discussions with local people, the bats had been very recently harvested for bush meat.

During a visit in 2002 to a nearby site, an abandoned building at Ambodiriana (19°01.5'S, 48°20.5'E, 970 m), a variety of bats were found using the structure as a day roost, including *Chaerephon pumilus* (Cretzschmar, 1830-1831) and *Mormopterus jugularis*. A local man guarded the site with considerable interest to recover the produced guano for fertilizer. When this building was revisited in October 2007, with the exception of one *Emballonura atrata* Peters, 1874, no bat was found occupying the building. A locally made ladder was found providing access to the attic, where the roosting bats had been previously found. The people had apparently removed the bats, presumably for food consumption, and this was confirmed by a man living in a nearby village. The locally occurring cultural groups near Lakato are Imerina and Betsimisaraka.

Lac Tritriva (19°56'S, 46°55'E, at approximately 1200 m) – Surrounding this crater lake there are a number of open vertical rock crevices occupied by *Eidolon dupreanum* (Pollen, 1866) and *Mormopterus jugularis*. During a visit of March 2000, local people mentioned that the *Mormopterus* were captured and roasted (*brochette*) for local consumption. The locally occurring cultural group is the Vakinankaratra.

Midongy-Sud, Mount Papango (23°50'S, 46°58'E, 800 m) – In October 2003, teenage boys from the village of Befotaka guided us to a deep rock shelter at the foot of Mount Papango that contained a large mixed colony of *Miniopterus manavi* and *Myotis goudoti*. The boys mentioned that on occasion, specifically during periods of food shortage, they visit the cave to harvest up to 100 small bats per visit to provide additional meat protein for their families. The exact level of exploitation is not possible to quantify. Further, at several nearby sites in the region of Midongy-Sud, based on interviews, we obtained other information on microchiropteran exploitation in different caves. The local cultural group is a mixture of Antesaka and Antefasy.

Saint Augustin (23°28'S, 43°46'E, 40 m) – During a 2004 visit to the region, it was mentioned by local people that *H. commersoni* are occasionally exploited for food. They are hunted during nights of full moon with sticks as they pass along pathways in search of prey. The local cultural group is composed largely of Vezo and Mahafaly.

Tolagnaro region, Vohidraharaha Cave (47°12'S, 24°33'E, 140 m) – JENKINS *et al*. (2007b) report that local people capture *Rousettus madagascariensis* and *Triaenops rufus* Milne-Edwards, 1881 with a locally made trap as these animals exit the cave at dusk. These animals are apparently exploited for bush meat. The local ethnic group is Antanosy.

Plateau Mahafaly in the region of Itampolo – A recent survey of the Mahafaly Plateau, in the general vicinity of Itampolo, found that on a seasonal basis considerable numbers of microchiropteran bats, particularly *Hipposideros commersoni*, are taken for food during periods of famine (GOODMAN 2006), which coincides with the season this species gains considerable body fat. At one cave, it was estimated that approximately 2,700 individuals of *H. commersoni* are annually harvested and on a regional basis, this extrapolated to between 70,000–140,000 microchiropterans, mostly *H. commersoni*, per year. Other species, incidentally taken, include at least *Miniopterus gleni* and *Triaenops rufus*. These levels of estimated harvest may surpass the estimated breeding potential of these animals and presumably over time may result in extirpation of local populations. The locally occurring cultural group is the Tanalana.

Conservation implications

In recent years, it has become clear that the hunting of bats, most particularly pteropodids, on Madagascar for bush meat at a local level can be extensive and result in considerable pressures pushing local populations towards extirpation or abandonment of day roost sites (MACKINNON *et al*. 2003; CARDIFF *et al*. submitted). What has not been as well appreciated is that hunting of microchiropteran bats is extensive across the island. In most cases, this exploitation is associated with augmenting human protein intake and, as demonstrated with the case studies presented herein, is not restricted to a few regions or cultural groups. This practice is widespread across the different biomes and elevational zones of the island. What is unclear is if there has been an actual increase in exploitation of microchiropterans, or with a greater number of field workers visiting more sites on the island, the level of hunting has simply been uncovered. As witnessed by the case at Andasibe, a relatively large village next to a main national road, the habit of harvesting insectivorous bats is not restricted to people living in small remote villages or hamlets. The exploitation of these animals has several important implications. Hunting may affect the long-term future of certain bat populations and could affect the epidemiological risk of potential transfer of bat viruses to humans (e.g., OSBORNE *et al.* 2003; WOLFE *et al.* 2007).

It is clear that exploitation of microbats is partially associated with periods and regions of Madagascar where local people have considerable difficulty in obtaining sufficient protein for their diets. In certain cases, bats represent a famine food resource in the southwest, particularly for *H. commersoni*; this species weighs on average about 50 g and considerably augments its body fat during a period that coincides with food shortages (GOODMAN 2006). The level of off-take for this species in the southwest probably exceeds natural population growth and is hence unsustainable on the long-term. In other cases, species are being exploited that are even smaller in body mass, such as *Miniopterus manavi*, which weigh about on average about 5 g. Different bat species are being consumed that have prominent scent glands, particularly members of the family Molossidae, which presumably taint the flavor of the meat.

Evidence is presented that certain bats are collected as fodder for domestic animals. In this case, they are at least partially cooked cadavers of molossid bats, which are known on Madagascar to be the reservoirs of several different viruses (COULANGES *et al*. 1974; ROUSSET and ANDRIANARIVELO 2003), are fed to domestic pigs. The epidemiology of these viruses is completely unknown with regards to the bats, domestic animals and humans. Given the recent discoveries of different emerging diseases associated with wild animals in contact with synanthropic species and humans, this is an area in need of investigations on Madagascar.

The hunting of microchiropterans in certain regions of Madagascar may threaten the continued existence of local populations, and based on current Malagasy laws these animals are not explicitly protected, other than populations living in parks and different types of reserves (DURBAN 2007). To properly evaluate the role of this pressure, studies are required of the breeding ecology and population dynamics of the exploited animals. In the case of synanthropic dwelling species, it is unclear if these populations are surplus from natural roosting sites or there has been a shift in the type of day roost sites occupied from caves and crevices to buildings. This is clearly a critical point to assess the importance of the exploitation of these animals on natural populations. As compared to some other land vertebrates, there is no evidence that micro-chiropteran bats are exploited for their use in magical potions or other aspects of purported magical properties.

More famine relief aid could reduce the need to turn to bush meat during food crises. The recent field surveys and interviews with local people indicate that microchiropteran bats are broadly exploited across the island and this hunting needs to be considered for conservation programs associated with these animals.

Acknowledgements

We are grateful to the Direction des Eaux et Forêts and Association National pour la Gestion des Aires Protégées for issuing permits to conduct faunal surveys on Madagascar. This research was financed by grants from the John D. and Catherine T. MacArthur Foundation, the Volkswagen Foundation, and CABS of Conservation International. We are grateful to L. Wilmé for Figure 1 and R. Dolch for some unpublished information. R. Jenkins and an anonymous reviewer provided helpful comments on a previous version of this paper.

References

BOLLEN, A. and DONATI, G. 2006. Conservation status of the littoral forest of south-eastern Madagascar. *Oryx* 40:1-10.

CARDIFF, S.G. 2006. Bat cave selection and conservation in Ankarana, northern Madagascar. Master's thesis. Columbia University, New York.

CARDIFF, S.G., RATRIMOMANARIVO, F.H., REMBERT, G. and GOODMAN, S.M. Submitted. Hunting and roost site persistence of bats at Ankarana, northern Madagascar. *African Journal of Ecology.*

COULANGES, P., ROBIN, Y., LE GONIDEC, G., MAYOUX, A. and BORDAHANDY, R. 1974. Chiroptères et arbovirus à Madagascar (Isolement de souche de virus Dakar-bat, étude sérologique de Chauves–souris frugivores). *Archives de l'Institut Pasteur de Madagascar* 43:109–18.

DURBAN, J. 2007. New legislation for the protection of Malagasy species. *Lemur News* 12:4-6.

GANZHORN, J.U., GANZHORN, A.W., ABRAHAM, J.P., ANDRIAMANARIVO and RAMANANJATOVO, A. 1990. The impact of selective logging on forest structure and tenrec populations in western Madagascar. *Oecologia* 84:126-133.

GARCIA, G. and GOODMAN, S.M. 2003. Hunting of protected animals in the Parc National d'Ankarafantsika, north-western Madagascar. *Oryx* 37:115-118.

GOLDEN, C. D. 2005. Eaten to Endangerment: Mammal Hunting and the Bushmeat Trade in Madagascar's Makira Forest. Honors thesis, Bachelor of Arts, Harvard College.

GOODMAN, S. M. 2006. Hunting of Microchiroptera in south-western Madagascar. *Oryx* 40:225–228.

GOODMAN, S.M., ANDRIAFIDISON, D., ANDRIANAIVOARIVELO, R., CARDIFF, S.G., IFTICENE, E., JENKINS, R.K.B., KOFOKY, A., MBOHOAHY, T., RAKOTONDRAVONY, D., RANIVO, J., RATRIMOMANARIVO, F., RAZAFIMANAHAKA, J. and RACEY, P.A. 2005. The distribution and conservation of bats in the dry regions of Madagascar. *Animal Conservation* 8:153-165.

GOODMAN, S.M. and RASELIMANANA, A. 2003. Hunting of wild animals by Sakalava of the Menabe region: A field report from Kirindy-Mite. *Lemur News* 8:4-6.

JENKINS, R.K.B., ANDRIAFIDISON, D., RAZAFIMANAHAKA, H.J., RABEARIVELO, A., RAZAFINDRAKOTO, N., RATSIMANDRESY, Z., ANDRIANANDRASANA, R.H., RAZAFIMAHATRATRA, E. and RACEY, P.A. 2007a. Not rare, but threatened: the endemic Madagascar flying fox *Pteropus rufus* in a fragmented landscape. *Oryx* 41:263–271.

JENKINS, R.K.B., KOFOKY, A. F., RUSS, J. M., ANDRIAFIDISON, D., SIEMERS, B. M., RANDRIANADRIANINA, F., MBOHOAHY, T., RAHAINGONDRAHETY, V. N. and RACEY, P. A. 2007b. Ecology and conservation of bats in the southern Anosy Region. In *Biodiversity, ecology and conservation of the littoral ecosystems in southeastern Madagascar, Tolagnaro (Fort Dauphin).* J. U. Ganzhorn, S.M. Goodman & M. Vincelette (Eds.). Smithsonian Institution/ Monitoring and Assessment of Biodiversity Program Series #11. Smithsonian Institution, Washington, D.C.

MACKINNON, J.L., HAWKINS, C.E. and RACEY, P.A. 2003. Pteropodidae, fruit bats. In *The natural history of Madagascar*: 1299-1302. Goodman, S. M. and Benstead, J. P. (Eds.). Chicago: The University of Chicago Press.

OSBORNE, J. C., RUPPRECHT, C. E., OLSON, J. G., KSIAZEK, T. G., ROLLIN, P. E., NIEZGODA, M., GOLDSMITH, C. S., AN, U. S. and NICHOL, S. T. 2003. Isolation of Kaeng Khoi virus from dead *Chaerephon plicata* bats in Cambodia. *Journal of General Virology* 84:2685–2689.

RACEY, P.A., GOODMAN, S.M. and JENKINS, R.K.B. In press. The ecology and conservation of Malagasy bats. In *Island Bats.* Fleming T.H. and Racey, P.A. (Eds.). Chicago: Chicago University Press.

RAKOTONANDRASANA, E.N. and GOODMAN, S.M. 2007. Bat inventories of the Madagascar offshore islands of Nosy Be, Nosy Komba and Ile Sainte-Marie. *African Bat Conservation News* 12: 6-10.

RANDRIAMANALINA, M.H., RAFARARANO, L., BABARY, L. and LAHA, R. 2000. Rapport des enquêtes sur les châsses dans les Fotontany d'Ivondro, d'Erara et d'Etsilesy. *Lemur News* 5:11-14.

RANIVO, J. 2007. Révision taxonomique des espèces de Microchiroptera de la région sèche de Madagascar et leur Ecomorphologie. Ph.D. thesis, Département de Biologie Animale, Université d'Antananarivo.

RATRIMOMANARIVO, F. H. and GOODMAN, S. M. 2005. The first records of the synanthropic occurrence of *Scotophilus* spp. on Madagascar. *African Bat Conservation News* 6: 3-5.

ROUSSET, D. and ANDRIANARIVELO, M. R. 2003. Viruses. In *The natural history of Madagascar*: 165-170. Goodman, S. M. and Benstead, J. P. (Eds.). Chicago: The University of Chicago Press.

VÉRIN, P. 1990. Madagascar. Paris: Éditions Karthala.

WOLFE, N. D., DUNAVAN, C. P. and DIAMOND, J. 2007. Origins of major human infectious diseases. *Nature* 447:279-283.

WONG, K. T., SHIEH, W.-J., KUMAR, S., NORAIN, K., ABDULLAH, W., GUARNER, J., GOLDSMITH, C.S., CHUA, K. B., LAM, S. K., TAN, C. T., GOH, K. J., CHONG, H. T., JUSOH, R., ROLLIN, P. E., KSIAZEK, T. G., ZAKI, S. R., and NIPAH VIRUS PATHOLOGY WORKING GROUP.2002. Nipah virus infection: Pathology and pathogenesis of an emerging paramyxoviral zoonosis. *American Journal of Pathology* 161: 2153-2167.

Submitted: 10 January 2008
Accepted: 10 March 2008

RECENT LITERATURE

CONFERENCE PRESENATIONS

Presentations at the 7th Southern African Society for Systematic Biology Conference

Drakensville Resort, Harrismith, South Africa,

14—18 January 2008

Poster Presentations

MOLECULAR PHYLOGENETIC ANALYSIS OF THE MALAGASY MOLOSSIDAE (CHIROPTERA: *CHAEREPHON PUMILUS*)

Waheeda Buccas

BUCCAS, W.[1], Lamb, J.M.[1], Taylor, P.J.[2], and Goodman, S.M.[3]
[1]School of Biological and Conservation Sciences, George Campbell Building, University of KwaZulu-Natal, Howard College Campus, King George V Avenue, Durban, South Africa, 4001.
[2]Mammal Department, Durban Natural Science Museum, P.O. Box 4085, Durban, South Africa, 4000.
[3]Field Museum of Natural History, Chicago.

Insectivorous bats are an important component of Madagascar's unique fauna, yet they are among the least studied of the mammalian groups on the island. To date very few ecological studies have been conducted on Malagasy Molossidae, whereas no molecular studies have been done. In light of this lack of molecular knowledge, this project aimed to use molecular genetic techniques and phylogenetic analysis to assess and compare the modern genetic diversity of *Chaerephon pumilus* (the little free-tailed bat) within and between eleven localities in Madagascar, using DNA sequences of the D-loop and Cytochrome *b* regions of the mitochondrial genome. A further aim was to infer phylogenetic relationships with other members of the Molossidae family from Madagascar and mainland Africa. Results of Phenetic and Cladistic analyses for both mitochondrial regions, displayed well-supported clades with distinct genetic variation between north-eastern and south-eastern *C. pumilus* populations, indicating substantial geographic structuring. Haplotype analyses using cytochrome-b sequence data uncovered five haplotypes with a haplotype diversity of 0.818. The control region revealed the presence of five haplotypes with a haplotype diversity of 0.7519. Significantly large genetic distances were observed between *C. pumilus* in Madgascar and its African counterpart, which was found to be more genetically similar to Malagasy populations of *C. leucogaster*.

INVESTIGATION OF THE GENETIC DIVERSITY OF CHIROPTERAN MOLOSSIDAE

Hajra Kajee

KAJEE, H.[1], Lamb, J.M.[1], Taylor, P.J.[2] and Goodman, S.M.[3]
[1]School of Biological and Conservation Sciences, George Campbell Building, University of KwaZulu-Natal, Howard College Campus, King George V Avenue, Durban, South Africa, 4001.
[2]Mammal Department, Durban Natural Science Museum, P.O. Box 4085, Durban, South Africa, 4000.
[3]Field Museum of Natural History, Chicago.

The Molossidae is a widespread family of Chiropterans found in the warmer parts of the world, occurring in all zoogeographic regions except Antarctica. DNA sequencing of the mitochondrial cytochrome b region was carried out for over three humdred representatives of the family, mainly from Madagascar, but also from Africa and Asia to investigate the relationships between established taxa. Haplotype analyses showed haplotype diversities ≥0.6 for all species investigated with the exception of *Mops leucostigma* while nucleotide diversities per site varied from 0.001 to 0.005, except for both species of *Mops* which were lower than 0.001. Both Bayesian and neighbour-joining analyses produced trees with congruent topologies which revealed two major sister-groupings. There was strong bootstrap support (100%) for an *Otomops*-only cluster. Sister to this was a well-supported (90%) grouping comprising taxa derived from *Tadarida, Chaerephon and Mops.* This corresponds to the current view that these three genera are actually subgenera within *Tadarida.* Within this, a group comprising *T. fulminans* and *C. jobimena* (100% support) appears basal to a *Mops*/*Chaerepon* subgroup (95% support) which contains three distinct strongly-supported (100%) groupings; *M. midas, M. leucostigma* and *M. condylurus,* and *C. pumilus.* Samples attributed to *Mormopterus* fell outside the above groupings.

PHYLOGENETIC ANALYSIS OF *CHAEREPHON PUMILUS* (MOLOSSIDAE) FROM SOUTHERN AFRICA

Devendran Reddy

REDDY, D.[1], Lamb, J.M.[1], Taylor, P.J.[2] and Goodman, S.M.[3]
[1]School of Biological and Conservation Sciences, George Campbell Building, University of KwaZulu-Natal, Howard College Campus, King George V Avenue, Durban, South Africa, 4001.
[2]Mammal Department, Durban Natural Science Museum, P.O. Box 4085, Durban, South Africa, 4000.
[3]Field Museum of Natural History, Chicago.

Chaerephon pumilus or the little free-tailed bat (family: Molossidae) has a distribution throughout most of sub Saharan Africa and along the eastern region of Madagascar. The vast geographical distribution of this species is accompanied by considerable variation in colour and size, which may conceal cryptic species or sister species. Cytochrome *b* and D-loop regions of the mitochondrial DNA were sequenced to assess phylogenetic relationships within C. *pumilus* and in relation to *Chaerephon* species from Madagascar. Samples were obtained from KwaZulu-Natal, South Africa, and localities in Swaziland. The Cytochrome b sample was found to comprisefour haplotypes, with a haplotype diversity of 0.6727, whilst the D-loop dataset comprised 13 haplotypes with a haplotype diversity of 0.8342. Neighbour joining, Maximum Parsimony and Bayesian analysis revealed congruent tree structures for both mtDNA regions. *C. pumilus* from Madagascar appeared basal to a *C. pumilus* clade which comprised samples from KwaZulu-Natal, Swaziland, The Kruger National Park and *C. leucogaster* from Madagascar.

Paper Presentations

ANALYSIS OF THE GENETIC DIVERSITY OF OTOMOPS (CHIROPTERA: MOLOSSIDAE) IN MAINLAND AFRICA AND MADAGASCAR

Taryn Ralph

RALPH, T.M.C.[1], Lamb, J.M.[1], Taylor, P.J.[2] and Goodman, S.M.[3]
[1]School of Biological and Conservation Sciences, George Campbell Building, University of KwaZulu-Natal, Howard College Campus, King George V Avenue, Durban, South Africa, 4001.
[2]Mammal Department, Durban Natural Science Museum, P.O. Box 4085, Durban, South Africa, 4000.
[3]Field Museum of Natural History , Chicago.

Otomops, or the large-eared, free-tailed bat, is part of the *Molossidae* family and, within the regions of Africa and Madagascar, there exist two species, namely *O. martiensseni,* from mainland Africa, and *O. madagascarensis,* from Madagascar. According to the International Union for the Conservation of Nature (IUCN), 0. *martiensseni* has a 'Vulnerable' status. In recent years, there has been much controversy concerning the true taxonomy of *Otomops. Otomops martiensseni* and *O. madagascariensis* are considered to be species, however *O. icarus* Chubb (1917) from Durban, South Africa is sometimes considered to be synonym of *O. martiensseni,* or a separate species.

DNA sequencing of mitochondrial cytochrome *b* and D-loop were used to determine the genetic diversity of *Otomops* populations found throughout Africa and Madagascar. Neighbour-joining and Bayesian analyses suggest the existence of two reciprocally-monophyletic *Otomops* clusters/clades (Madagascar and Africa), with the African group further divided into two reciprocally-monophyletic clusters/clades (north/east Africa (NEA) and south/west Africa (SWA)). The clade from Madagascar is recognized as *O. madagascariensis.* However, NEA and SWA lineages might be better classified as ESUs, since divergence levels between these groups are low (cytochrome *b,* 2.1 %). Genetic divergence values indicate that Ivory Coast *Otomops* could be a speciating population and might be regarded as a potential MU or ESU. Asian *Otomops* species appear to be older than their Afro-Malagasy counterparts, although cytochrome *b* and D-loop haplotype networks each suggest different patterns of dispersal from Asia. Further sampling and application of new techniques must be done to further investigate this genus.

GENETIC DIVERSITY OF *CHAEREPHON* SPECIES (MOLOSSIDAE) FROM THE WESTERN INDIAN OCEAN REGION

NAIDOO, T.[1], Lamb, J.M.[1], Taylor, P.J.[2] and Goodman, S.M.[3]
[1]School of Biological and Conservation Sciences, George Campbell Building, University of KwaZulu-Natal, Howard College Campus, King George V Avenue, Durban, South Africa, 4001.
[2]Mammal Department, Durban Natural Science Museum, P.O. Box 4085, Durban, South Africa, 4000.
[3]Field Museum of Natural History, Chicago.

Relationships among 79 samples field-identified as *Chaerephon* species (either C. *leucogaster* or C. *pumilus*) were determined by analysis of mitochondrial cytochrome *b* (863 nucleotides) and D-loop (288 nucleotides) sequences. Samples were obtained from Madagascar (east and west-facing slopes), the Comores (Grand Comore, Mayotte, Anjouan and Moheli), Tanzania (Pemba Island and the Bukoba Minziro Forest) and South Africa (Durban and St. Lucia, KZN).

The 79 cytochrome *b* sequences obtained grouped into 17 haplotyes, with a haplotype diversity of 0.841 (standard deviation 0.00119). Of the 863 sites, 97 were variable, yielding a nucleotide diversity of 0.01444 (standard deviation 0.00334). Neighbour-joining and maximum parsimony analysis of cytochrome *b* data yielded congruent results. All samples field-identified as *Chaerephon* formed a well-supported (100%) monophyletic clade with reference to the outgroups, *Mops midas* and *M. leucostigma.* Within this clade, samples identified as *C. pumilus* from east Magacascar formed a well-supported (98%) sister clade to a moderately-supported (70%) clade comprising all other samples. Within this clade were four unresolved groups comprising samples from; Comores (98% support), Tanzania (Bukoba Minziro forest) (85% support), KwaZulu-Natal (87% support) and, lastly, west Madagascar, Pemba and the Comores (64% support). This poorly-supported broad grouping comprises samples identified as *C. leucogaster.* Cytochrome *b* genetic distances (HKY) within the experimental sample ranged from 0% to 3.45 %. Based on congruent cytochrome *b* and D-loop data analyses, samples field identified as C. *pumilus* from east Madacascar appear to represent an as yet unidentified taxonomic grouping.

MORPHOMETRIC VARIATION IN POPULATIONS OF *OTOMPS* (CHIROPTERA: MOLOSSIDAE) FROM MAINLAND AFRICA AND MADAGASCAR


Leigh Richards

RICHARDS, L.R.[1], Contrafatto, G.C.[1], Lamb, J.M.[1], Taylor, P.J.[2] and Goodman, S.M.[3]
[1]School of Biological and Conservation Sciences, George Campbell Building, University of KwaZulu-Natal, Howard College Campus, King George V Avenue, Durban, South Africa, 4001.
[2]Mammal Department, Durban Natural Science Museum, P.O. Box 4085, Durban, South Africa, 4000.
[3]Field Museum of Natural History, Chicago.

The description and number of Afrotropical taxa belonging to the genus *Otomops* has in previous years been a contentious issue. Some authors indicate a single polytypic African species *O. martiensseni* and a separate Malagasy species *O. madagascariensis.* Others argue that within the Afrotropical region, three distinct species occur. These are *O. martiensseni* from West and East Africa and the Arabian Peninsula, *O. icarus* from southern Africa, and *O. madagascariensis* from Madagascar. Both the mainland and insular populations carry a Vulnerable IUCN Red Data List rating. Intra- and interpopulation cranial size and shape variation were described using 12 craniometric characters and 14 dorsal landmarks. The sexes were treated separately as size and shape data revealed significant sexual dimorphism in African and Malagasy populations, with males larger than females. Analyses of craniometric character and landmark data revealed three morphologically distinct populations (morphospecies), corresponding to *O. martiensseni* from northeastern Africa, *O. icarus* from South Africa and *O. madagascariensis* from Madagascar. The Malagasy population presented significant cranial size and shape differentiation from mainland populations and is recognised as a distinct species. Additionally, the evolutionary history of African *Otomops* has been significantly shaped by local adaptation to regional climatic conditions. A number of adaptive mechanisms may explain clinal variation in African *Otomops,* including 'starvation resistance'. Parapatric speciation has resulted in larger high-altitudinal/arid-adapted individuals and smaller tropical/mesic individuals.

PUBLISHED PAPERS

ANDRIAFIDISON, D., KOFOKY, A., MBOHOAHY, T., RACEY, P. A., and JENKINS, R. K. B., 2008. Diet, reproduction and roosting habits of the Madagascar free-tailed bat, *Otomops madagascariensis* Dorst, 1953 (Chiroptera: Molossidae). *Acta Chiropterologica* 9(2): 445-450.

Otomops madagascariensis is a large (24-27 g) molossid bat endemic to Madagascar. Unlike its congener *O. martiensseni*, in nearby mainland Africa, little is known about its ecology although it appears to roost only in caves. It is only known from a few sites in the west and occupies a small percentage of the available caves. We studied roosting colonies in seven vertical erosion domes in the roof of a cave in Parc National Tsingy de Bemaraha during July and October 2003. We also captured bats as they emerged from and returned to a roost cave in the south. Female bats examined in the west during October and in the south during November were pregnant. In the roosting colonies, one group contained 57 pregnant females and five adult males. Most other groups also consisted of both sexes but three male-only groups were encountered in October. Diet consisted mainly of Lepidoptera and Coleoptera and there was variation between sites and study locations in the contribution of these prey types. *Otomops madagascariensis* is an obligate cave dweller that appears to be rare within its known range and should be a target species for conservation and research.

DUVAL, L., ROBERT, V., CSORBA, G., HASSANIN, A., RANDRIANARIVELOJOSIA, M., WALSTON, J., NHIM, T., GOODMAN, S. M., and ARIEY, F., 2007. Multiple host-switching of Haemosporidia parasites in bats. *Malaria Journal* 6(157).

Background: There have been reported cases of host-switching in avian and lizard species of *Plasmodium* (Apicomplexa, Haemosporidia), as well as in those infecting different primate species. However, no evidence has previously been found for host-swapping between wild birds and mammals.

Methods: This paper presents the results of the sampling of blood parasites of wild-captured bats from Madagascar and Cambodia. The presence of Haemosporidia infection in these animals is confirmed and cytochrome *b* gene sequences were used to construct a phylogenetic analysis.

Results: Results reveal at least three different and independent Haemosporidia evolutionary histories in three different bat lineages from Madagascar and Cambodia.

Conclusion: Phylogenetic analysis strongly suggests multiple host-switching of Haemosporidia parasites in bats with those from avian and primate hosts.

GOODMAN, S. M., and RATRIMOMANARIVO, F. H., 2007. The taxonomic status of *Chaerephon pumilus* from the western Seychelles: resurrection of the name *C. pusillus* for an endemic species. *Acta Chiropterologica* 9(2): 391-399.

We investigate the taxonomic status of a molossid bat from the western Seychelles that has been previously considered distinct and then subsequently synonomized with the widespread *Chaerephon pumilus*. We compare specimens available from the Seychelles (Aldabra and Amirantes), including the holotype and paratype of *C. pusillus*, to specimens assigned to *C. pumilus* from Kenya, the Comoros Archipelago (Mayotte, Mohéli, Anjouan, and Grande Comore), and from lowland areas of the northern half of Madagascar. Based on these comparisons, the animals from the Aldabra and Amirantes are distinctly smaller than these other regional island and mainland populations and we conclude that the name *C. pusillus* should be resurrected for this endemic Seychelles species.

GOODMAN, S. M., and MAMINIRINA, C. P., 2007. Specimen records referred to *Miniopterus majori* Thomas, 1906 (Chiroptera) from the Comoros Islands. *Mammalia* 71(4): 151-156.

Miniopterus majori, named from specimens collected in the Central Highlands of Madagascar, is generally considered a bat of higher elevations and its known day roosts include caves and rock shelters. A series of 15 specimens collected by Léon Humblot in the Comoros Islands (Grande Comore) in the late 19th century are the only known records of this taxon outside Madagascar. We compared specimens of *M. majori* from Madagascar (Central Highlands) to those from Grande Comore and concluded that they are similar and best considered conspecific, based on morphological and cranial characters. No evidence of *M. majori* was found during a recent extensive survey of Grande Comore, with the majority of caves on the island known to hold bats visited. It is proposed that the locality information of the Humblot specimens is incorrect and that they were collected on Madagascar.

PETERSON, A. T., PAPES, M., CARROLL, D. S., LEIRS, H., and JOHNSON, K. M., 2007. Mammal taxa constituting potential coevolved reservoirs of filoviruses. *Journal of Mammalogy* 88(6): 1544-1554.

The virus family Filoviridae includes 2 genera, the Marburg viruses and the Ebola viruses. The ecology of the filoviruses is poorly known, and indeed their host relationships remain completely unknown. An earlier effort prioritized mammalian taxa as to their possible status as the long-term coevolved reservoir of the filoviruses based on a coarse, regional classification of occurrences; here, we greatly refine the geographic data set for the mammalian taxa based on rich occurrence data sets and range interpolations from ecological niche models for each species involved. This improved detail permits a much more detailed inspection of distributional overlap patterns, and consequently a shorter list of candidate taxa-geographic analysis of 124 mammalian clades led to identification of 55 groups of interest that coincide spatially with known filovirus outbreaks, and fulfill the requirements of several additional assumptions. We discuss implications of our results for the search for the filovirus reservoir, and for research in African mammalogy.

REINHARDT, K., HARNEY, E., NAYLOR, R., GORB, S., and SIVA-JOTHY, M. T., 2007. Female-limited polymorphism in the copulatory organ of a traumatically inseminating insect. *Am. Nat.* 170(6): 931-935.

Sexual conflict can produce several evolutionary outcomes, one of which is female-limited trait polymorphism. We examine the African bat bug *Afrocimex constrictus* (Cimicidae), a species where both sexes are subjected to traumatic intromission from males. We show that males possess female genital structures that in related species ameliorate the costs of traumatic insemination. Moreover, the male form of these structures differs morphologically from the standard female form. Examination of females in our isolated study population revealed a discrete polymorphism in female genitalia. Some females had the typical cimicid form, while others had genitalia that more closely resembled the distinctive male form. Males, as well as females with the distinctive male form, experienced fewer traumatic copulations than the typical female morph. We propose that some females mimic the bizarre male condition in order to reduce the frequency of costly traumatic inseminations. To our knowledge this is the first example of a distinct female-limited genital polymorphism: its nature, as well as its association with traumatic sexual interactions, strongly suggests that sexual conflict underpins this unique phenomenon.

RUSSELL, A. L., GOODMAN, S. M., FIORENTINO, I., and YODER, A. D., 2008. Population genetic analysis of *Myzopoda* (Chiroptera: Myzopodidae) in Madagascar. *Journal of Mammalogy* 89(1): 209-221.

The chiropteran family Myzopodidae is endemic to Madagascar and is characterized by several unique morphologies, such as sessile adhesive discs on the thumb and sole. A new species, *Myzopoda schliemanni*, was recently described from western Madagascar that is morphologically distinct and geographically disjunct from the eastern species, *M. aurita*, the only other member of this family. Geographic variation within *Myzopoda* has only recently been studied at the morphological level and has never been addressed at the genetic level. We used a combination of phylogenetic, coalescent, and population genetic analyses to characterize the speciation history of *Myzopoda* and to clarify current and former patterns of gene flow within and between *Myzopoda*. Mitochondrial DNA sequences were used to determine whether genetic data support the morphologically distinct species *M. schliemanni*, to infer the distribution of the common ancestor of extant *Myzopoda*, to estimate effective population sizes (Ne) and levels of migration between species, and to determine patterns of population structure within species. Phylogenetic and network analyses revealed the existence of 4 well-supported clades in *Myzopoda*, but could not resolve relationships among those clades. Divergent haplotypes within species may result from either recent gene flow between the 2 species or more likely from incomplete lineage sorting. Multiple coalescent-based methodologies produced concordant estimates of Ne for *Myzopoda*, but conflicting signals for migration between the species, probably reflecting differences in the underlying models used by the methods. We found significant genetic structure within *M. aurita*, but no correlation with geography. This pattern may result from recent gene flow facilitated by expansion of *Ravenala* stands, an important day-roost tree for *Myzopoda*, associated with anthropogenic deforestation and the opening up of new habitat for members of this genus.

VOLLETH, M., and HELLER, K.-G., 2007. Chromosome number reduction accompanied by extensive heterochromatin addition in the bat *Glauconycteris beatrix* (Mammalia; Chiroptera, Vespertilionidae). *Cytogenetic and Genome Research* 119: 245-247.

The presumed ancestral karyotype of the bat family Vespertilionidae consists of 44 chromosomes with a fundamental number of autosomal arms (FNa) of 50. Previously, only two of the roughly 350 vespertilionid species have been reported with 2n lower than 26. In this paper we report the 2n = 22 karyotype of the African vespertilionid *Glauconycteris beatrix* which shows an X-autosome translocation and extended, paracentromeric, chromomycin-A3-positive heterochromatin.

Call for contributions

African Bat Conservation News publishes brief notes concerning the biology of bats, new geographical distributions (preferably at least 100 km from the nearest previously published record), sparsely annotated species lists resulting from local surveys including roost counts and echolocation and sonograms of bat species occurring on the African continent and adjacent regions, including the Arabian peninsula, Madagascar, and other surrounding islands in the Indian and Atlantic oceans.

African Bat Conservation News Project Cycle

Issues will be published Quarterly (January, April, July, October).

Deadlines for scientific contributions (1 November, 1 February, 1 May, 1 August).

Deadlines for non-scientific contributions (1 December, 1 March, 1 June, 1 September).

General contributions should be sent to the editor: EditorABCN@Africanbats.org

Scientific Contributions should be sent to: ScientificEditorABCN@Africanbats.org