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# African Bat Conservation News

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## Inside this issue:




Above: A Welwitsch's hairy bat (*Myotis welwitschii*) caught at Lapalala Wilderness area, Limpopo Province, South Africa (TM 47968).

# 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/

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

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# RESEARCH AND CONSERVATION


July 2007

Above: Lloyd Wingate holds a Slit-faced bat in an Eastern Cape mine tunnel (image Dispatch online Thursday, July 8, 1999).




## In Memory of Lloyd R. Wingate (1947 – 2007)

Lloyd Roland Wingate was born in Pretoria. He initially studied at the University of Pretoria (B.Sc. – 1969, B.Sc. Hons. – 1970), and then at the University of Natal, Durban (M.Sc. – 1983). His masters thesis, supervised by Waldo Meester, was entitled "Population dynamics of five species of cave-dwelling microchiroptera in Natal" (WINGATE, 1983, University of Natal, Durban).

He was an active rock climber and caver and undertook a trip around 1980 with Sandie Sowler to the caves of Ismont Crevasse near Pietermaritzburg in Natal to investigate the occurrence and use of the crevasse by *Rousettus aegyptiacus*.

Lloyd started his career at the Kaffarian Museum (now known as the Amathole Museum) in May 1978 as Curatorial Assistant. He then moved to the University of Transkei and served as Chief Technician/Curator in the University Museum of Zoology between February 1981 and December 1983. He then returned to the Kaffarian Museum to serve as Curator of Mammals from 1984 until 1997.

In 1997 Lloyd took over the position of Director of the Amathole Museum.

An interview of Lloyd Wingate by Louise Flanagan (DISPATCH 25/10/2005) asked the question "What is your philosophy? His response was "Live a good life and try to influence others to do the same." - **Sandi Sowler**, **Lucas Thibedi** (Curator Mammals, **Amathole Museum**) & **Ernest C.J. Seamark**

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Unfortunately I never had the opportunity to work with Lloyd personally; he was always very obliging when it came to museum -related queries, sharing of information and loans etc. He was one of the first Museum curators to seriously begin databasing his own collection. I recall in the late 1980's he had devised his own system which was way ahead of its time, with taxonomic synonymies, etc. -

**Dr Peter John Taylor** (Curator of Mammals, Durban Natural Science Museum).

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I first met Lloyd at Grahamstown Science Festival where we had our bat exhibit next to his Amathole exhibit which consisted of amongst other things a large and famous hippo. Lloyd was very friendly right from the beginning and extremely helpful when I did some field work in the Pierie forest a few years ago and more recently when Elizabeth [Kelly] did field work there. His passing certainly leaves a big gap in the bat world and beyond. He will be sorely missed. - **Prof David Jacobs** (University of Cape Town).

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I am also shocked and saddened to hear of Lloyd's passing and know that King Williams Town (KWT) and the entire 'bat community' are far poorer for having lost him.

I met Lloyd on my first field trip to Sandile's Cave near KWT in late November 2006. He did me the great service of guiding me in person to the cave, without which I could not have found it. From this short time with Lloyd, it was clear to me that he went very far out of his way (the hike to Sandile's cave is time consuming, strenuous and treacherous after the rain) to help others and ensure that the resources at his disposal were available to anyone who could derive benefit and knowledge from them. He also struck me as an extremely ethical scientist who held the well being and lives of the bats as a priority; electing not to enter the cave to save them unneccessary disturbance and expressing his distress that some scientists kill bats redundantly when museum specimens or shared specimens could serve just as well. Lloyd expressed such enthusiasm for his health and new found fitness which makes his passing even more tragic.

I have attached some photos that I have from our walk up to Sandiles cave and of Lloyd looking down at Maden Dam from the top. I hope they will be of some use.

I know that my study could not have been as successful without Lloyd's input and guidance and am sure I am only one of many people who's lives he enriched in this way. I hope that his ethical approach to studying bats and open, sharing approach to science will live on in our work.— **Elizabeth Kelly** (University of Cape Town)

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# OBSERVATIONS, DISCUSSIONS AND UPDATES

**Observation #: 5**

## MY MIDDAY ENCOUNTER WITH A MYOTIS WELWITCHII

Above: The *Myotis welwitschii* flew from the trees on the left of the dam on the right hand side.

Above: The trees from which the *Myotis welwitschii* flew.

Above: The side of the dam where the *Myotis welwitschii* landed.

**Submitted by:** Lynette Strijbis
**Date of observation:** 10 June 2007
**Locality:** Farm Vlakfontein JR 457, 20km NE of Bronkhorstpruit, Gauteng Province, South Africa
**GPS:** 28° 42.4' E 25° 53.5' S
**Photo:** Lynette Strijbis
**Email message:**

Sundays I spent in nature, trying to rewind, recover and refill as I work with abused women during the week. I pick up skulls, stones, feathers and enjoy identifying anything from birds to grass, fungi, footprints and insects. Always there is something special, even if it just hearing the fish eagles call and not seeing them. But one of my best encounters recently was this beautiful orange colored bat, flying over me while I was sitting in a boat on the edge of our farm dam. I said loudly to myself, I'm not crazy, this is a bat not a bird and followed it with my eyes. It went across the dam, turned around and flew too the edge, maybe 30 meters from where I was. I still don't know if it fell in the water or just wanted to go and sit down, but I saw it splash-splash-splash to the dryer parts. By now I was there and watched it for an hour. I was fascinated by the way in which it was crawling over the uneven patches, nibbling on the grass. From time to time it stopped as if resting, turned around and went to the water. I do not know if it did drink water. The beauty spots on the nose, the black border and spots on the ears, and the small bright little eyes were very clear with the full sun shining. The soft wooly back reminded me of a ginger cat.

At 13h00 I left it to prepare lunch for the family and thought it would not be there when I returned – but it was. It was very still, as if sleeping, I touched it slightly with a piece of grass, it was alive but not really moving, so I very carefully picked it up from behind. The eyes were closed and stayed closed, but his mouth he now opened to the extreme, so I could see its full dental capacity! What a sight! He kept his mouth open for very long periods, opening from time to time when I moved it. I kept it outside but safe for the night. Later the evening when I checked, there was hardly any movement anymore.

So on Monday I started the search for its name as the little information I could find in the house was not answering to its description. It took me a few days to find Teresa Kearney. I'm very happy that I now know the *Myotis welwitchii*. I will continue my Sunday ritual, maybe one day I'll find new species.

I saw the *Myotis welwitschii* on Sunday 10 June at 12H00, a Sunny, little bit windy day. We live 20km north east of Bronkhorstpruit if you follow the R25 to Groblersdal. Grassland biome. Co-ordinates: 28° 42.4' E and 25° 53.5' S. We are situated in the Vlakfontein JR 457 area. It was flying from south to north.

**Editorial response:**

This *Myotis welwitschii* is accessioned in the Transvaal Museum mammal collection as TM 47967. - **Teresa Kearney** (Transvaal Museum).

Brain material of the bat (TM 47967) was tested for the presence of a lyssavirus using the standard fluorescent antibody test (FAT) that can detect all lyssavirus genotypes – viruses that can cause rabies encephalitis. The bat tested negative for the presence of a lyssavirus and the abnormal behaviour observed from the bat were therefore not attributed to rabies. The bat was however not tested for other infectious agents. - **Wanda Markotter** (Department of Microbiology and Plant Pathology, University of Pretoria).

If it is necessary to handle a grounded bat (e.g. to move it to a higher position on top of a wall), to avoid being bitten it is advisable not to handle the bat without some covering to protect your hands. A towel or thick piece of cloth can be used to wrap around the bat while it is being moved. If the bat is dead avoid touching it with bare hands, but try and get it to your closest natural history museum, together with the date it was found and where it was found. - **Ernest C.J. Seamark**

## Correction to Observation # 4: Mauritian tomb bat in the Free State Province South Africa

**By: Erna Van Schalkwyke**

VAN SCHALKWYKE, E. 2008. Mauritian Tomb bat found in the Free State Province, South Africa. *African Bat Conservation News* **16**: 3.

This locality is on the southern side of the Vaal River (which is the border between Gauteng and Free State). Observation # 4 should be corrected as follows:

**Locality**: Plot 10, Mullersrust, between towns of Vanderbijlpark and Sasolburg, Free State Province, South Africa.
**GPS**: 26°46'47.06''S 27°46'20.91''E

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# SCIENTIFIC CONTRIBUTIONS

## BAT SURVEY IN THE UMKHUZE SECTION OF THE GREATER ST LUCIA WETLAND PARK, KWAZULU-NATAL, SOUTH AFRICA

**By: Neil C. D'Cruze[1], Zoe J. McDonell[1], Trevor Langeveld[1], Paul D. Brooks[1], Xander Combrink[2], Ernest C.J. Seamark[3] and Teresa C. Kearney[3]**

[1]*Operation Wallacea, Hope House, Old Bolingbroke, Lincolnshire, PE23 4EXl: info@opwall.com*

[2] *The Greater St Lucia Wetland Park, The Dredger Harbour, St Lucia*

[3] *Vertebrate Department, Transvaal Museum, NFI, P.O. Box 413, Pretoria, 0001, South Africa.*

**Key words**: *Epomophorous wahlbergi*, *Hipposideros caffer, Nycteris thebaica, Nycticeinops schlieffeni, Scotophilus viridis,* uMkhuze.

The uMkhuze section of the Greater St. Lucia Wetland Park, covers an area of 37,985 hectares (PORTER *et al.,* 1999) and is geographically defined by the Lebombo Mountain range to the west and the Mkhuze River to the north. Previously known as the Mkuzi Game Reserve (original proclamation in 1912), this protected area has been included within the Greater St Lucia Wetland Park World Heritage Site (PORTER et al., 1999; see figure 1). Located within the savannah biome (RUTHERFORD and WESTFALL, 1994), the area has a subtropical climate with warm, moist summers (mean annual temperatures exceed 21°C), and mild, dry winters (PORTER *et al*., 1999). When compared with the rest of the Greater St Lucia Wetland Park, uMkhuze is generally a much drier locality with relatively little permanent surface water (POOLEY, 1965). Rainfall averages 650mm with approximately 60% of rain falling between September and March each year (PORTER *et al.*, 1999). The vegetation remains exceptionally diverse, and consists of a mosaic of different forest, thicket, woodland and wetland types, the distribution of which is largely determined by topography, moisture regimes and edaphic conditions (POOLEY, 1965).

### HISTORICAL RECORDS

The first known record of bats from the uMkhuze area are specimens of *Scotophilus dinganii* in the Transvaal Museum collection (see Table1, Appendix 1) that were collected by Austin Roberts during a survey of the area in 1928, see ROBERTS (1934). It is possible though that these specimens did not come from within the protected area since Robert's "Mkusi Poort Camp" (Robert's field note book marked "'28", Transvaal Museum) was on the "north bank of the Mkusi River, opposite the Mkusi Game Reserve" (ROBERTS, 1934: p9). Although Austin Roberts indicates he "was out in search of specimens of mammals" (ROBERTS, 1934: p11) and he found the bats in a barbet's nest hole in a tree (Robert's field note book "'28" and skin label information), no indication was given of where the nest was relative to his camp.

DIXON (1964) published the first bat species list for uMkhuze, and reported seven species (see Table 1). Thirty years later, on information collated from museum records and published accounts, TAYLOR (1998) recorded 19 bat species occurring in the uMkhuze Game Reserve (Table 1). The collection of 167 voucher specimens (see Appendix 1) in the Durban Natural Science Museum (DNSM), Transvaal Museum (TM) and National Museum of Natural History, Smithsonian Institute (USNM), collected between 1928 and 2003 as a result of opportunistic and active collecting by a number of different individuals (see Table 2), within the uMkhuze section of the Greater St Lucia Wetland Park, confirmed the presence of 16 different bat species (see Table 1). No museum vouchers existed for the reported occurrence in the area of *Epomophorous wahlbergi* and *Rhinolophus simulator* (DIXON, 1964; TAYLOR, 1998).

### 2006 SURVEY

The bats reported here were captured during a survey conducted at the peak of the dry season (28 July and 31 August 2006), within the boundaries of the uMkhuze section of the Greater St. Lucia Wetland Park (see Figure 1). Bats were caught at six different sites (see Figure 1, and Tables 1, 2 and 3). A combination of mist and long-handled hand nets were used to capture bats. At site 9, within a riverine forest, two nylon mist nets (12 m long and 4 m high) were set across a small drainage line. Hand nets were used at all other sites, which including the interiors of thatched hides, abandoned military-style tents, and during active searching under tree bark. Each site was visited at least three times a week throughout the survey period. Species identifications in the field were made using the descriptions in TAYLOR (2000). Photographic records were made of individuals of the different species, (held by the first author) to assist species verification, and representative voucher specimens were lodged in the Durban Natural Science Museum. Species identifications from photographs and of the vouchers were made by Dr. P. J. Taylor (Durban Natural Science Museum).

Sixty-nine individuals of five species were captured from six different sites within the uMkhuze section during this survey. The capture effort at the only site mist netted (site 9) for four individuals of two species was 16.7%.

#### *Epomophorous wahlbergi* (Sundevall 1846)

Three individuals were captured in mist nets whilst foraging over a dry drainage line in riverine forest at site 9 (see Figure 2, Tables 2 and 3). Although previously reported as occurring in the area (DIXON, 1964; TAYLOR, 1998) no voucher had previously been collected for the area (Appendix 1). All individuals were captured at approximately 19h00 on two separate survey nights. The presence of *E. wahlbergi* at this site is unsurprising as the area is characterised by several tree species on which *E. wahlbergi* are known to feed on the fruit, such as *Sclerocarya birrea caffra*, *Trichelia emetica* and several members of the genus *Ficus* (TAYLOR, 2000). Although this species is known to select day roosts in tall evergreen trees and under the eaves of houses (FENTON et al., 1985; TAYLOR, 2000), no individuals were observed in such a setting during this survey.

#### *Hipposideros caffer* (Sundevall 1846)

*Hipposideros caffer* was the most commonly encountered species (Table 4). Twenty-three individuals, eight of which were taken as vouchers (see Appendix 1), were captured with hand nets at night roosts, at three different sites (see Tables 2 and 3). At sites 5 and 6 individuals were observed in large, closely packed groups of approximately 200 individuals, under the thatched roof of hides, whereas, at site 10 (see Table 2), only smaller colonies of up to 12 individuals were observed under the

Table 1: Bat species recorded for uMkhuze Game Reserve in literature and by vouchers (including those of 2006 survey) in the collections of the Durban Natural Science Museum, Transvaal Museum and Smithsonian Institution, together with their IUCN status (LC = Least concern, NT = Near threatened, VU = Vulnerable). + = present.

| Species | Literature | | Vouchers | | IUCN STATUS (2006) |
|---|---|---|---|---|---|
| | Dixon (1964) | Taylor (1998) | Prior to 2006 survey | 2006 survey | |
| **Pteropodidae** | | | | | |
| *Epomophorous wahlbergi* | + | +[1] | | + | LC |
| **Hipposideridae** | | | | | |
| *Hipposideros caffer* | + | + | + | + | LC |
| *Cloeotis percivali* | | + | + | | VU A2bc + A3bc, C1 |
| **Rhinolophidae** | | | | | |
| *Rhinolophus clivosus* | | + | + | | LC |
| *Rhinolophus darlingi* | | + | + | | LC |
| *Rhinolophus simulator* | + | +[1] | | | LC |
| **Nycteridae** | | | | | |
| *Nycteris thebaica* | + | + | + | + | LC |
| **Emballonuridae** | | | | | |
| *Taphozous mauritianus* | | + | + | | LC |
| **Molossidae** | | | | | |
| *Chaerephon ansorgei* | | + | + | | LC |
| *Chaerephon pumilus* | + [2] | + | + | | LC |
| *Mops condylurus* | | + | + | | LC |
| **Vespertilionidae** | | | | | |
| *Kerivoula lanosa* | | + | + | | LC |
| *Miniopterus natalensis* [3] | + | + | + | | NT |
| *Myotis bocagei* | | | + | | LC |
| *Neoromicia capensis* | | + | + | | LC |
| *Neoromicia nanus* | + | + | + | | LC |
| *Neoromicia zuluensis* | | + | + | | LC |
| *Nycticeinops schlieffenii* | | + | + | + | LC |
| *Scotophilus dinganii* | | + | + | | LC |
| *Scotophilus viridis* | | + | + | + | LC |
| **Total number of species** | **7** | **19** | **19** | | |

[1] TAYLOR (1998) refers to the publication by DIXON (1964) for the reported occurrence of this species in uMkhuze Game Reserve.
[2] DIXON (1964) refers to *Tadarida limbata*, this is currently synomomized with *Chaerophon pumilus* (see SIMMONS, 2005).
[3] DIXON (1964) and TAYLOR (1998) referred to *Miniopterus schreibersii*, however, southern African specimens are currently recognised as a distinct species, *Miniopterus natalensis* (A. Smith, 1833) (see SIMMONS, 2005).


Figure 2: *Epomophorus wahlbergi* caught at uMkhuze.


Figure 3: Brown phase of *Hipposideros caffer* caught at uMkhuze.


Figure 4: Orange phase of *Hipposideros caffer* caught at uMkhuze.


Figure 5: *Nycteris thebaica* caught at uMkhuze.

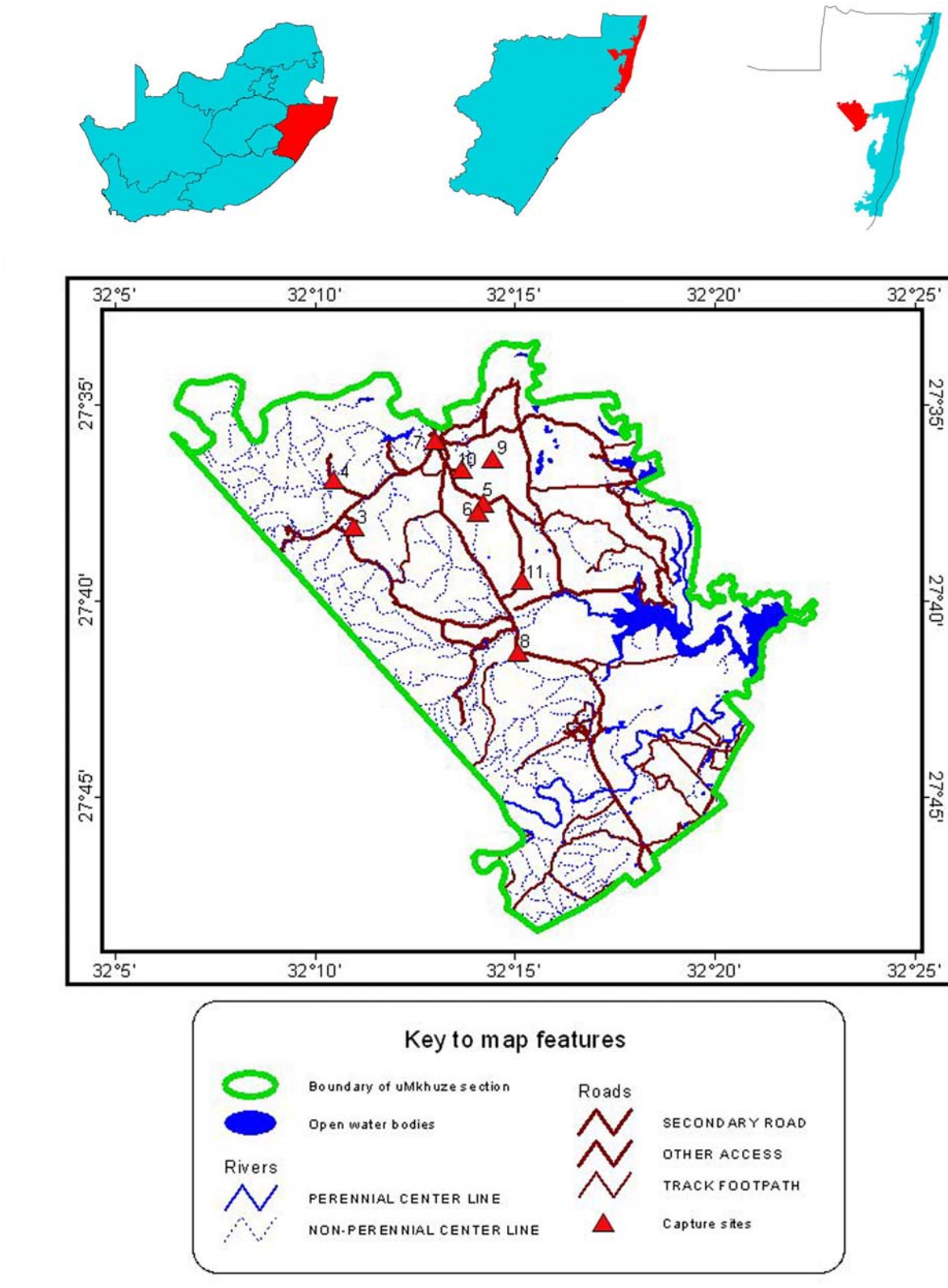


Figure 1: Maps (clockwise, from top left corner) indicating, in red, KwaZulu-Natal Province within South Africa, the Greater St. Lucia Wetland Park, the uMkhuze section, and the capture sites within the uMkhuze section. Site numbers correspond to those used in Table 2. Site 2 is not plotted on the map, as the Wardens house in 1982 is not known at this time and will need further investigation.

Table 2: Localities within uMkhuze Game Reserve from which bat specimens have been collected, including the 2006 survey reported here, together with the collectors and the year of collection.

| Site# | Locality description | Longitude / Latitude | Collector & year |
|---|---|---|---|
| | Mkuzi Game Reserve (no specific site given) | ca. 27°38'00''S 32°16'00''E | Rautenbach -1982, Tomkinson - 1983, Goodman - 1992, Goodman -1995, Kearney - 1995, Taylor and White -2003 |
| | Mkhuze River | ca. 27°37'00''S 32°07'00''E | Roberts -1928 |
| 1 | N Mtshopi, Mkhuze River | ca. 27°47'00''S 32°12'00''E | Rautenbach -1979 &1982 |
| 2 | Wardens house | ca. 27°47'00''S 32°12'00''E | Rautenbach -1982 |
| 3 | Malibali pan | ca. 27°47'00''S 32°12'00''E | Rautenbach - 1982 |
| 4 | Nhlonhela pan | ca. 27°46'28''S 32°12'00''E | Rautenbach -1982 |
| 5 | Kububе pan / hide | 27°37'29''S 32°14'12''E | Rautenbach -1982; Taylor *et al.* - 1995; (BOWIE *et al.*, 1999); Present study |
| 6 | Kumasinga pan / hide | 27°37'44''S 32°14'04''E | Rautenbach - 1982; Davis and Walker - 1985; Taylor *et al.* - 1995; (BOWIE *et al.*, 1999); Present study |
| 7 | Mantuma camp / HQ? | 32°37'00''S 32°12'00''E | Henry - 1964, Goodman - 1991, Rushworth - 1993; Taylor & White -2003 |
| 8 | Open Sand Forest | 27°41'16''S 32°15'04''E | Present study |
| 9 | Riparian Forest | 27°36'20''S 32°14'26''E | Present study |
| 10 | Environmental camp | 27°36'38''S 32°13'41''E | Present study |
| 11 | Trails Camp | 27°39'27''S 32°15'11''E | Present study |

eaves of a building. All three sites are located within mixed acacia woodland/savanna and share an association with water, which supports the theory that the availability of surface water is an essential habitat requirement for this species (SKINNER and SMITHERS, 1990). At site 6 *H. caffer* was found in close association with *Nycteris thebaica*, albeit *N. thebaica* numbers were always far fewer than those of *H. caffer.* Studies have indicated these two, morphologically similar, species whilst foraging in the same habitat by having distinctly different diets (BOWIE et al., 1999). As has been previously noted for the species (TAYLOR, 2000), the pelage of some individuals was uniformly reddish-brown to orange instead of the more typical grey-brown (see Figure 3 and 4). LANZA et al. (2002) have suggested the variation in pelage colour, which has been observed in other species of Rhinolophoidea, is part of a coat ageing process, and appears to be independent of sex.

***Nycteris thebaica* E. Geoffroy St.-Hilaire 1818**

Forty-one *Nycteris thebaica* (Figure 5) were captured

Table 3: Field measurements (mm) and mass (g) of five bat species, caught at uMkhuze Game Reserve, Kwazulu-Natal, South Africa during the 2006 survey.

| Species | Sex | Forearm | Wingspan | Tibia | Mass |
|---|---|---|---|---|---|
| | | x̄(n) Range | x̄(n) Range | x̄(n) Range | x̄(n) Range |
| *E. wahlbergi* | ♂ | 84 (1) 84 | – | 22 (1) 22 | 119 (1) 119 |
| | ♀ | 77 (1) 77 | 405 (1) 405 | 33.5 (1) 33.5 | 114 (1) 114 |
| *H. caffer* | ♂ | 46.3 (11) 44.5-48 | 195 (2) 190-200 | 19.3 (6) 18.9-22 | 7.8 (11) 6-11 |
| | ♀ | 43.5 (12) 40.5-47 | 255.5 (2) 246-265 | 19.8 (3) 18.5-21 | 9 (12) 4-11 |
| *N. thebaica* | ♂ | 44.6 (23) 39-52 | 227.5 (4) 180-290 | 22.3 (22) 19-24 | 11 (22) 4-14 |
| | ♀ | 45.4 (18) 38-52 | – | 23.8 (17) 21-29 | 11 (16) 6-19 |
| *Nyc. schlieffeni* | ♂ | 27.5 (1) 27.5 | 180.5 (1) 180.5 | 11.5 (1) 11.5 | 7 (1) 7 |
| | ♀ | – | – | – | – |
| *S. viridis* | ♂ | 42 (1) 42 | 300 (1) 300 | 18 (1) 18 | 20 (1) 20 |
| | ♀ | – | – | – | – |

with hand nets at two different sites (see Tables 2 and 3). A large colony, of over 100 individuals, was observed at site 11 where a disused military style tent was being utilised as a day roost (Figure 6). This species was also observed night roosting in smaller groups of 4 to 10 individuals, in close association with *Hipposideros caffer*, under the thatched roof of a hide at site 6 (see Table 2). As with prior observations, see SKINNER and SMITHERS (1990), individuals at both sites roosted in scattered groups and appeared to favour the darkest parts of these shelters. MONADJEM (2001) recorded sexual dimorphism and sex ratios that varied seasonally in *N. thebaica* occurring in Swaziland.

Of the 41, randomly caught, adult, *N. thebaica* the sex ratio of females to males was 1:1.28 (18 females, 23 males), which does not differ significantly from parity ($X^2$ = 0.610, df = 1, p = 0.435). In contrast MONADJEM (2001) reported a higher ratio of adult females to males (2.8:1), with a significant difference from parity, for a larger sample, of 234, adult, *N. thebaica* studied at a site in Swaziland. Three measurements (forearm, tibia and mass) were tested for significant difference between the 18 female and 23 male *N. thebaica* from uMkhuze. Of the measurements tested only tibia length was significantly different between the sexes at 95 % probability, with females having significantly longer tibia than males (t = 2.53, d.f. = 39, p = 0.015). Again, these results are different to those obtained by MONADJEM (2001), where females had significantly larger masses and forearm lengths than males.

***Nycticeinops schlieffeni* (Peters 1859)**

A solitary individual, which was taken as a voucher (see Figure 7, Appendix 1), was discovered day roosting under the bark of a dead tree in an open area of Sand Forest at site 8 (see Tables 2 and 3). Despite a thorough search of the site no other bats were observed. This observation is noteworthy because, although this behaviour has been


Figure 6: *Nycteris thebaica* day roost in an abandoned army tent at site 11.


Figure 7: *Nycticeinops schlieffeni* (DNSM 8738)


Figure 8: *Scotophilus viridis* (DNSM 8739)

documented for the species in West Africa (TAYLOR, 2000), such behaviour had not been reported for the species in southern Africa.

***Scotophilus viridis* (Peters 1852)**

A single individual, which was taken as a voucher (see Figure 8, Appendix 1), was captured in a mist net whilst foraging over a dry drainage line in riverine forest at site 9 (see Tables 2 and 3). This capture was unsurprising as this species is typically found in lower-lying savannah woodland, and in drier areas within riverine habitats (SKINNER and SMITHERS, 1990).

**SPECIES RICHNESS**

Fifty bat species (excluding vagrants) are currently known to occur in South Africa, 38 of which have been reported to occur in KwaZulu-Natal (TAYLOR, 1998; FRIEDMANN and DALY, 2004; TAYLOR *et al.*, 2004). The uMkhuze section of the Greater St. Lucia Wetland Park World Heritage Site, having a bat species richness of 19, as recorded by voucher specimens, has 50 % of the species complement recorded within KwaZulu-Natal, which emphasizes the conservation importance of uMkhuze. The five species recorded during this survey represent 26% of the 19 species recorded for the protected area. The species richness is also higher than previously reported figures for other protected areas in KwaZulu-Natal, where nine bat species have been recorded from Ndumu (DIXON, 1966), 13 from Hluhuwe-Umfolozi Park (BOURQUIN *et al.*, 1971) 13 from Ithala (SEAMARK and KEARNEY, 2004), six from Oribi Gorge (BOURQUIN and MATHIAS, 1984) and six from Tembe Elephant Park (MONADJEM *et al.*, 2007).

The value of voucher specimens that "should be deposited for posterity in a longstanding, legitimate collection so that they can be re-examined should any question arise subsequently regarding their nature, provenance or taxonomic identification" (RUEDAS *et al.*, 2000), is emphasized by the lack of support, even with subsequent collecting over the past 78 years (see Table 2), for the occurrence of *R. simulator* at uMkhuze reported by DIXON (1964) and subsequently followed by TAYLOR (1999). However, these survey results have contributed to our knowledge of bat activity in the dry season, and have documented for the first time in southern Africa a day roost site of *N. schlieffeni*.

**CONSERVATION IMPLICATIONS**

Of the 19 species recorded for the protected area two, *Miniopterus natalensis* and *Cloeotis percivali*, are listed in threatened categories in the 2006 IUCN List of Threatened Species. No day roost sites within the boundaries of the protected area are known for either of these species and it is not known if the species occurrence in the area was merely for foraging or passing through. *Miniopterus natalensis* is known to be a migratory species (TAYLOR, 2000) and the closest known day roost to uMkhuze is Pongola Dam (MILLER-BUTTERWORTH et al., 2003). The disappearance of *Cloeotis percivali* from known roost sites at certain times has suggested this species moves about, but it is not known whether these are local or long distance migrations (suggested by absence of the species from known roost sites at certain times of the year). The closest known roost for *Cloeotis percivali* is also the Pongola Dam, ca. 28 km North-North-West of uMkhuze. Conservation management of these species would be assisted if the roost sites of these species were known; hence additional surveys within uMkhuze would be useful to ascertain if day roosts for these species do exist within the protected area.

**ACKNOWLEDGEMENTS**

This research was conducted in partnership with the Greater St Lucia Wetland Park – Rare, Threatened & Endemic Species Project and Operation Wallacea. We are also grateful to Ezemvelo KZN Wildlife and the Greater St Lucia Wetland Park Authority for permitting us to carry out our research and to Dr. P. J. Taylor at the Durban Natural Science Museum for making his mist nets available for us, as well as confirming field identifications of the species. Thanks also extended to the Transvaal Museum, Dr Scotty Kyle, Paul Haveman, Dennis Kelly, Dylan Panos, Johnny Minnaar, Susan Combrink and to all the volunteers whose work, effort and boundless enthusiasm made this study possible. Professors' David Jacobs and Ara Monadjem for helpful comments and suggestions on the MS.

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**APPENDIX 1: Voucher specimens from the uMkuhze section of the greater St Lucia Wetland Park**

DNSM - Durban Natural Science Museum, NM – Natal Museum (housed in the Durban Natural Science Collection), TM - Transvaal Museum, and USNM - National Museum of Natural History, Smithsonian Institute. Underlined individuals were caught during the 2006 survey reported here.

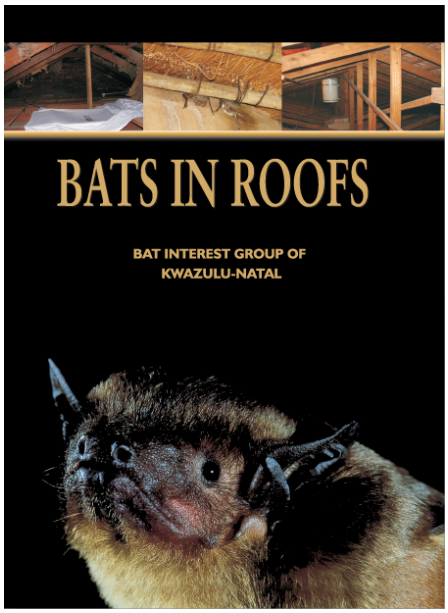
* Possibly not from within the boundary of the protected area, see text for explanation.

*Epomophorus wahlbergi*: (DNSM 8740)
*Hipposideros caffer*: TM 35300-35308, 35343-35350; DNSM 4572, 4575, 4579-4581, 4584, 4586-4588, 4592, 4593, 8746-8752, 8755.
*Cloeotis percivali*: DNSM 1616, 4071.
*Rhinolophus clivosus*: DNSM 2134.
*Rhinolophus darlingi*: TM 37156.
*Nycteris thebaica*: TM 35295-35299, 35333-35342; DNSM 4026, 4576-4578, 4582, 4583, 4585, 4589-4591, 4742, 7522, 8741-8745.
*Taphozous mauritianus*: TM 38107.
*Chaerephon ansorgei*: TM 35351.
*Chaerephon pumilus*: USNM 351409 -351433.
*Mops condylurus*: TM 35261-35265, 35271-35272.
*Kerivoula lanosa:* NM 1033.
*Miniopterus natalensis*: TM 35273.
*Myotis bocagei*: DNSM 7528, 7529.
*Neoromicia capensis*: DNSM 5380, 5400; TM 35246, 35247, 35249, 35270, 35309-35314, 35322- 35326.
*Neoromicia nanus*: TM 35279-35294; DNSM 5371.
*Neoromicia zuluensis*: TM 35248.
*Nycticeinops schlieffeni*: DNSM 5401, 8738; TM 35321.
*Scotophilus dinganii*: TM 5567-5570*, 35274, 35275, 35315-35317, 35327, 35328, 35352.
*Scotophilus viridis*: TM 35250-35260, 35276, 35277, 35318-25320, 35329-35332; DNSM 7513, 8739.

*Submitted: 22 September 2006*
*Accepted: 9 June 2008*

# RECENT LITERATURE

## BOOKS




### BATS IN ROOFS

The Bat Interest Group of KwaZulu-Natal is pleased to announce the publication of "Bats In Roofs", a booklet compiled as a practical guide for all people who may have to deal with bats living in roof spaces. It's aim is to enable householders, pest controllers, and others to identify various species of bats that may occur around buildings, to live harmoniously with bats, and to deal with bat nuisance problems in an effective and bat-friendly manner.

Although predominantly about bats living in roof spaces this booklet also deals with bats such as fruit bats and tomb bats which may roost or forage in outside areas such as eaves and garden trees. It seeks to foster a more tolerant attitude towards bats and an appreciation of the ecological and economic benefits of these intelligent, long-lived, and misunderstood mammals.

"Bats In Roofs" is available from all leading booksellers or can be purchased directly from the Bat Interest Group (allandurban@mweb.co.za) for ZAR 50.00 including postage and packaging (SA only, international price on request).

## REPORTS

### AFRICAN CHIROPTERA REPORT. 2008. African Chiroptera Project, Pretoria. i - xiv + 1868 pp.

ISSN 1990-6471

The *African Chiroptera Report 2008* is currently most comprehensive in the presentation of information on all known synonyms, or presently accepted taxa of African bat species. The 2008 report has also included information on fossil / extinct taxa.

The incorporation of information other than taxonomic information has been slow, and is currently patchy in its execution across the taxa. Information that may answer specific requirements of a user, i.e. more information about the voucher specimens, or specimen collectors, has been drawn from across the database and is presented in separate appendices. Published identification keys for African bat species, have, where necessary, been updated to include current names, and are presented in an appendix 5. A start has also been made, in an appendix 6, to make images available of type specimens. Many of the original descriptions have been made available in an appendix 3e, although due to copyright law issues only those older than 50 years are included in the current report.

The report can be downloaded free of charge from http://www.Africanbats.org/ACR.html

Download sections of the African Chiroptera Report 2008:

**Main report -** www.africanbats.org/docs/ACR2008 - main.pdf [9.79Mb]
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**Appendix 2: Voucher specimens -** www.africanbats.org/docs/Appendix 2 - ACR2008.pdf [1.69Mb]
**Appendix 3: Synonyms -** www.africanbats.org/docs/Appendix 3 - ACR2008.pdf [1.99Mb]
**Appendix 4: Collector Information -** www.africanbats.org/docs/Appendix 4 - ACR2008.pdf [4.8Mb]
**Appendix 5: Keys from the Literature -** www.africanbats.org/docs/Appendix 5 - ACR2008.pdf [722kb]
**Appendix 6: Images of Type Specimens -** www.africanbats.org/docs/Appendix 6 - ACR2008.pdf [2.96Mb]
**Appendix 7: Summary of Characteristic Information -** www.africanbats.org/docs/Appendix 7 - ACR2008.pdf [72.3kb]

Any mistakes, misrepresentation of data, or omitted publications can be reported to the managing editors of the database (AfricanChiropteraReport@Africanbats.org). This will allow corrections and updates to be made in the next report (July 2009).

# PUBLISHED PAPERS

**ALBAYRAK, I., ASAN, N., and YORULMAZ, T., 2008. The Natural History of the Egyptian Fruit Bat, *Rousettus aegyptiacus*, in Turkey (Mammalia: Chiroptera). *Turkish Journal of Zoology* 32(1): 11-18.**

Aspects of the ecology, karyology, and taxonomic status of the Egyptian fruit bat, *Rousettus aegyptiacus*, in the Mediterranean region of Turkey were investigated based on 41 specimens obtained between 1977 and 2003. Distribution, external and cranial morphometrics, pelage coloration, baculum morphology, karyology, colony size, roosting and feeding ecology, and conservation and management issues were recorded. The fruit bat in Turkey is represented by the nominate subspecies, *R. a. aegyptiacus*. Sexual dimorphism was recorded in pelage coloration and morphometric data. The diploid number of chromosomes (2n) is 36. Records of feeding behavior were obtained from both field and laboratory studies. Seasonal changes in diet were recorded in both wild and cultivated fruits, including Persian lilac (*Melia azadirachta*), rubber tree (*Ficus elastica*), plum (*Prunus* sp.), loquat (*Eriobotrya japonica*), apple (*Malus* sp.), fig (*Ficus carica*), pomegranate (*Punica granatum*), grape (*Vitis viniferia*), persimmon (*Diosyros kaki*), date (*Phoenix dactylifera*), mulberry (*Morus* sp.), cherry (*Prunus* sp.), peach (*Prunus persica*), apricot (*Prunus sp*.), and citrus (*Citrus* sp.). It was determined that the fruit bats in Turkey reproduce in late August.

**CANTRELL, M. A., SCOTT, L., BROWN, C. J., MARTINEZ, A. R., and WICHMAN, H. A., 2008. Loss of LINE-1 activity in the Megabats. *Genetics* 178(1): 393-404.**

**CARTER, A. M., GOODMAN, S. M., and ENDERS, A. C., 2008. Female reproductive tract and placentation in Sucker-footed bats (Chiroptera: Myzopoda) endemic to Madagascar. *Placenta* 29: 484-491.**

The reproductive tract was examined in four non-pregnant and two gravid specimens of Myzopoda. The ovaries had little interstitial tissue. The uterus was bicornuate and the lenticular placental disk was situated mesometrially in one horn. The interhaemal barrier of the placental labyrinth was of the endotheliomonochorial type. There was a single layer of trophoblast cells. The cells of the maternal endothelium were large and basophilic, contained abundant rough endoplasmic reticulum, and rested on an irregular basement membrane. Blunt projections of endometrium extended into the placental disk and clusters of large cells occurred between the endometrial stroma and labyrinth. At the margins of the disk folds of trophoblast occurred and at the cranial end they formed an haemophagous region. The folds lateral to the disk included some peculiar tubular-appearing structures. There was a persistent yolk sac containing large endodermal cells around a largely collapsed lumen. Several features of placentation, such as the interhaemal barrier and the haemophagous region, are consistent with an association of Myzopodidae with Emballonuridae. No support was found for alternative hypotheses that include Myzopodidae in the noctilionoid or vespertilionoidlineages.

**GOODMAN, S. M., BRADMAN, H. M., MAMINIRINA, C. P., RYAN, K. E., CHRISTIDIS, L. L., and APPLETON, B., 2008. A new species of *Miniopterus* (Chiroptera: Miniopteridae) from lowland southeastern Madagascar. *Mammalian Biology* 73: 199-213.**

Based on morphological, mensural and molecular characters, a new species of bat of the genus *Miniopterus* is described from Madagascar, *M. petersoni.* While showing some morphological convergence to the recently named *M. sororculus*, the species described herein possesses a number of external and cranial characters that separates the two. Further, molecular data indicate that these two taxa are not closely related and are from different portions of the *Miniopterus* clade. Based on current information, *M. petersoni* appears to have a distribution in the southeastern portion of Madagascar associated with littoral, lowland and transitional humid-dry forest formations. Populations in the far north of its range, at Montagne d'Ambre in the lower end of montane forest and near Maroantsetra in a lowland zone, are tentatively assigned to *M. petersoni*.

**GOODMAN, S. M., CARDIFF, S. G., and RATRIMOMANARIVO, F. H., 2008. First record of *Coleura* (Chiroptera: Emballonuridae) on Madagascar and identification and diagnosis of members of the genus. *Systematics and Biodiversity* 6(2): 283-292.**

The genus *Coleura* contains two species: *C. seychellensis* restricted to the Seychelles Archipelago and *C. afra* broadly distributed on the African continent and the Arabian Peninsula. We recently captured and collected specimens of *Coleura* from Madagascar, an island from which it was previously unknown. Using museum specimens and the new material from Madagascar, we review morphological variation in members of this genus and present characters for species identification. On the basis of these comparisons, specimens from Madagascar are referable to *C. afra*. We present information on the natural history of the recently discovered Malagasy population.

**GUNNELL, G. F., SIMONS, E. L., and SEIFFERT, E. R., 2008. New bats (Mammalia: Chiroptera) from the late ecocene and early Oligocene, Fayum depression, Egypt. *Journal of Vertebrate Paleontology* 28(1): 1-11.**

Paleogene bats from Africa are rare with only scant records from Tunisia, Egypt, and Tanzania having been described in the past. Four new genera and six new species of microchiropteran bats are described here from the late Eocene (37–34 Ma) of the Fayum Depression in northern Egypt. Included among these new taxa are the first and only African record of a fossil rhinopomatid and the earliest African records of megadermatids, emballonurids, and vespertilionids. Additionally, a new genus and two new species of the Afro-Arabian bat family Philisidae are described. The new Fayum philisids are the oldest representatives of this family, are represented by the largest species thus far recorded for the group, and include one of the largest fossil bats known. Previous biogeographic reconstructions suggest that most Old World bat families had their origin in Laurasia but several modern bat families may have diversified only after their initial dispersal into Africa. Bats and primates may have entered Africa during the same dispersal event early in the Paleogene.

**HAYMAN, D. T. S., FOOKS, A. R., HORTON, D., SUU-IRE, R., BREED, A. C., CUNNINGHAM, A. A., and WOOD, J. L. N., 2008. Antibodies against Lagos Bat Virus in Megachiroptera from West Africa. *Emerging Infectious Diseases* 14(6): 926-928.**

To investigate the presence of Lagos bat virus (LBV)-specific antibodies in megachiroptera from West Africa, we conducted fluorescent antibody virus neutralization tests. Neutralizing antibodies were detected in *Eidolon helvum* (37%), *Epomophorus gambianus* (3%), and *Epomops buettikoferi* (33%, 2/6) from Ghana. These findings confirm the presence of LBV in West Africa.

**HORÁCEK, I., FEJFAR, O., and HULVA, P., 2006. A new genus of vespertilionid bat from Early Miocene of Jebel Zelten, Libya, with comments on *Scotophilus* and early history of vespertilionid bats (Chiroptera). *Lynx* 37: 131-150.**

A well preserved mandible of a vespertilionid bat is described from the MN4-5 site Jebel Zelten MS2, Libya. The bat shows a greatly derived state in most of dental characters, but it differs from the Recent genera with corresponding degree of dental reduction (*Eptesicus*, *Scotomanes*, *Hesperoptenus*), in shape of molars and symphyseal region. In certain respects it reminds the recent *Scotophilus* and the Late Paleogene African genus *Philisis*. A possibility that *Philisis* and the Jebel Zelten bat, described here as *Scotophilisis libycus* gen. nov et sp. nov, form a stem line of *Scotophilus* is discussed in context with recent molecular data on position of the genus.

**HULVA, P., HORÁCEK, I., and BENDA, P., 2007. Molecules, morphometrics and new fossils provide an integrated view of the evolutionary history of Rhinopomatidae (Mammalia: Chiroptera). *BMC Evolutionary Biology* 7: 165.**

**Background:** The Rhinopomatidae, traditionally considered to be one of the most ancient chiropteran clades, remains one of the least known groups of Rhinolophoidea. No relevant fossil record is available for this family. Whereas there have been extensive radiations in related families Rhinolophidae and Hipposideridae, there are only a few species in the Rhinopomatidae and their phylogenetic relationship and status are not fully understood.

**Results:** Here we present (a) a phylogenetic analysis based on a partial cytochrome *b* sequence, (b) new fossils from the Upper Miocene site Elaiochoria 2 (Chalkidiki, Greece), which represents the first appearance datum of the family based on the fossil record, and (c) discussion of the phylogeographic patterns in both molecular and morphological traits. We found deep divergences in the *Rhinopoma hardwickii* lineage, suggesting that the allopatric populations in (i) Iran and (ii) North Africa and the Middle East should have separate species status. The latter species (*R. cystops*) exhibits a shallow pattern of isolation by distance (separating the Middle East and the African populations) that contrasts with the pattern of geographic variation in the morphometrical traits. A deep genetic gap was also found in *Rhinopoma muscatellum* (Iran vs. Yemen). We found only minute genetic distance between *R. microphyllum* from the Levant and India, which fails to support the sub/species distinctness of the Indian form (*R. microphyllum kinneari*).

**Conclusion:** The mtDNA survey provided phylogenetic tree of the family Rhinopomatidae for the first time and revealed an unexpected diversification of the group both within *R. hardwickii* and *R. muscatellum* morphospecies. The paleobiogeographic scenario compiled in respect to molecular clock data suggests that the family originated in the region south of the Eocene Western Tethyan seaway or in India, and extended its range during the Early Miocene. The fossil record suggests a Miocene spread into the Mediterranean region, followed by a post-Miocene retreat. Morphological analysis compared with genetic data indicates considerable phenotypic plasticity in this group.

**HULVA, P., BENDA, P., HANÁK, V., EVIN, A., and HORÁCEK, I., 2007. New mitochondrial lineages within the *Pipistrellus pipistrellus* complex from Mediterranean Europe. *Folia Zool.* 56(4): 378-388.**

In this study we are adding further information to phylogeography of *Pipistrellus pipistrellus* complex by discovery of isolated mitochondrial lineages in Europe, from the island of Crete (Greece) and central Mediterranean (Sicily, Corsica) and by adding new data about geographicdistribution of clades within the complex. We performed phylogeographic study with aid of partial sequence of cytochrome *b* and with focus to the radiation centre of this group in the Mediterranean Basin. Within the clade *P. pygmaeus* s.l., we have discovered isolated lineage from Crete, which is sister taxon to *P. hanaki* from Libya. We have detected the occurrence of *P. pygmaeus* s.str. in northern Iran. In the clade *P. pipistrellus* s.l. we have discovered isolated cluster represented by populations from Sicily and Corsica, with phylogenetic relation to Moroccan lineage. This is a first evidence of separated phylogroup within the complex from central Mediterranean. We refer the occurrence of *P. pipistrellus* s.str. from the island of Cyprus. These data represent further arguments for importance of the Mediterranean region in phylogeny of the *P. pipistrellus* species complex. Proposed allopatric speciation scenario considers the role of environmental fragmentation during the Messinian Salinity Crisis, strengthen by preference of mountain habitats in Mediterranean populations. The species status of Cretan and central Mediterraenan forms is also discussed.

**PUERMA, E., ACOSTA, M. J., BARRAGÁN, M. J. L., MARTÍNEZ, S., MARCHAL, J. A., BULLEJOS, M., and SÁNCHEZ, A., 2007. The karyotype and 5S rRNA genes from Spanish individuals of the bat species *Rhinolophus hipposideros* (Rhinolophidae; Chiroptera). *Genetica*.**

**LAMB, J. M., RALPH, T. M. C., GOODMAN, S. M., BOGDANOWICZ, W., FAHR, J., GAJEWSKA, M., BATES, P. J. J., EGER, J. L., BENDA, P., and TAYLOR, P. J., 2008. Phylogeography and predicted distribution of African-Arabian and Malagasy populations of giant mastiff bats, *Otomops* spp. (Chiroptera: Molossidae). *Acta Chiropterologica* 10(1): 21-40.**

*Otomops martiensseni* is sparsely distributed throughout sub-Saharan Africa and southwestern Arabia (Yemen). *Otomops madagascariensis* from the dry portions of Madagascar is widely recognised to be a distinct species. Based on mitochondrial DNA sequences of the cytochrome *b* gene (1,004 base pairs; *n* = 50) and the control region (D-loop, 290 base pairs; *n* = 52), two Oriental outgroup species (*O. wroughtoni* and *O.* cf. *formosus*) formed a monophyletic clade that was the sister group to the Afro-Malagasy taxa, composed of *O. martiensseni* and *O. madagascariensis*. Within the Afro-Malagasy clade, we discovered three well-supported but genetically similar clades (inter-clade genetic distances of 3.4-4.4%) from 1) north-eastern Africa and Arabia, 2) African mainland except northeast Africa, and 3) Madagascar. Taken together, haplotype networks, estimated divergence times, regional species richness and historical demographic data tentatively suggested dispersal from Asia to Africa and Madagascar. To understand ecological determinants of phylogeographic, biogeographic and genetic structure, we assessed the potential distribution of *O. martiensseni* throughout sub-Saharan Africa with ecological niche modelling (MaxEnt) based on known point localities (*n* = 60). The species is predicted to occur mainly in woodlands and forests and in areas of rough topography. Continuity of suitable habitats supported our inferred high levels of continental gene flow (relatively low genetic distances), and suggested that factors other than habitat suitability have resulted in the observed phylogeographic structure (e.g., seasonal mass migrations of insects that might be tracked by these bats). Based on a Bayesian relaxed clock approach and two fossil calibration dates, we estimated that African and Oriental clades diverged at 4.2 Mya, Malagasy and African clades at 1.5 Mya, and African clades 1 and 2 at 1.2 Mya. Integrating phylogenetic, phylogeographic, population genetic and ecological approaches holds promise for a better understanding of biodiversity patterns and evolutionary processes.

**RICHTER, H. V., and CUMMING, G. S., 2008. First application of satellite telemetry to track African straw-coloured fruit bat migration. *Journal of Zoology, London* 275(2): 172-176.**

Despite long-standing awareness of the potentially important ecological role of fruit bats, we know little about the ecology of the vast majority of species. Here we report the results of a pilot satellite tracking study aimed at establishing the scale of movement of the straw-coloured fruit bat *Eidolon helvum*. This was the first ever attempt to track African fruit bats using satellite telemetry. We tagged four bats with solar-charged 12 g satellite transmitters at Kasanka National Park in December 2005 and obtained a combined total of 104 different location fixes over a 149-day period. Before migrating, bats foraged as far as 59 km from the roost in a single evening; by contrast, one migrating individual moved 370 km in one night. Bats travelled an average 29 km day-1 over the period of study, with bats that appeared to be migrating moving north-west from Kasanka at an average 90 km day-1. The greatest cumulative distance travelled by a single bat was 2518 km in 149 days. The results show conclusively that the straw-coloured fruit bat *E. helvum* is capable of migrating thousands of kilometres across central Africa on an annual basis, implying that the fruit pulse in northern Zambia is richer than anything on offer in the Democratic Republic of the Congo at the same time of the year.

**RUSSELL, A. L., GOODMAN, S. M., and COX, M. P., 2008. Coalescent analysis support multiple mainland-to-island dispersals in the evolution of Malagasy *Triaenops* bats (Chiroptera: Hipposideridae). *Journal of Biogeography* 35: 995-1003.**

**Aim** We investigate the directionality of mainland-to-island dispersals, focusing on a case study of an African-Malagasy bat genus, *Triaenops* (Hipposideridae). Taxa include *T. persicus* from east Africa and three *Triaenops* species from Madagascar (*T. auritus, T. furculus*, and *T. rufus*). The evolution of this bat family considerably post-dated the tectonic division of Madagascar from Africa, excluding vicariance as a viable hypothesis. Therefore, we consider three biogeographical scenarios to explain these species' current ranges: (A) a single dispersal from Africa to Madagascar with subsequent speciation of the Malagasy species; (B) multiple, unidirectional dispersals from Africa to Madagascar resulting in multiple, independent Malagasy lineages; or (C) early dispersal of a proto-species from Africa to Madagascar, with later back-dispersal of a descendant Malagasy taxon to Africa.

**Location** East Africa, Madagascar, and the Mozambique Channel.

**Methods** We compare the utility of phylogenetic and coalescent methodologies to address the question of directionality in a mainland-to-island dispersal event for recently diverged taxa. We also emphasize the application of biologically explicit demographic systems, such as the non-equilibrium isolation-with migration model. Here, these methods are applied to a four-

species haploid genetic data set, with simulation analyses being applied to validate this approach.
**Results** Coalescent simulations favour scenario B: multiple, unidirectional dispersals from Africa to Madagascar resulting in multiple, independent Malagasy bat lineages. From coalescent dating, we estimate that the genus *Triaenops* was still a single taxon approximately 2.25 Ma. The most recent Africa to Madagascar dispersal occurred much more recently (c. 660 ka), and led to the formation of the extant Malagasy species, *T. rufus*.
**Main conclusions** Haploid genetic data from four species of *Triaenops* are statistically most consistent with multiple, unidirectional dispersals from mainland Africa to Madagascar during the late Pleistocene.

**SÁNCHEZ, F., KOTLER, B. P., KORINE, C., and PINSHOW, B., 2008. Sugars are complementary resources to ethanol in foods consumed by Egyptian fruit bats. *The Journal of Experimental Biology* 211: 1475-1481.**

Food resources are complementary for a forager if their contribution to fitness is higher when consumed together than when consumed independently, e.g. ingesting one may reduce the toxic effects of another. The concentration of potentially toxic ethanol, [EtOH], in fleshy fruit increases during ripening and affects food choices by Egyptian fruit bats, becoming deterrent at high concentrations (1%). However, ethanol toxicity is apparently reduced when ingested along with some sugars; more with fructose than with sucrose or glucose. We predicted (1) that ingested ethanol is eliminated faster by bats eating fructose than by bats eating sucrose or glucose, (2) that the marginal value of fructose-containing food (food+fructose) increases with increasing [EtOH] more than the marginal value of sucrose- or glucose-containing food (food+sucrose, food+glucose), and (3) that by increasing [EtOH] the marginal value of food+sucose is incremented more than that of food+glucose. Ethanol in bat breath declined faster after they ate fructose than after eating sucrose or glucose. When food [EtOH] increased, the marginal value of food+fructose increased relative to food+glucose. However, the marginal value of food+sucrose increased with increasing [EtOH] more than food+fructose or food+glucose. Although fructose enhanced the rate at which ethanol declined in Egyptian fruit bat breath more than the other sugars, the bats treated both fructose and sucrose as complementary to ethanol. This suggests that in the wild, the amount of ethanol-containing fruit consumed or rejected by Egyptian fruit bats may be related to the fruit's own sugar content and composition, and/or the near-by availability of other sucrose- and fructose-containing fruits.

**SÁNCHEZ, F., KORINE, C., KOTLER, B. P., and PINSHOW, B., 2008. Ethanol concentration in food and body condition affect foraging behavior in Egyptian fruit bats (*Rousettus* aegyptiacus). *Naturwissenschaften* .**

Ethanol occurs in fleshy fruit as a result of sugar fermentation by both microorganisms and the plant itself; its concentration [EtOH] increases as fruit ripens. At low concentrations, ethanol is a nutrient, whereas at high concentrations, it is toxic. We hypothesized that the effects of ethanol on the foraging behavior of frugivorous vertebrates depend on its concentration in food and the body condition of the forager. We predicted that ethanol stimulates food consumption when its concentration is similar to that found in ripe fruit, whereas [EtOH] below or above that of ripe fruit has either no effect, or else deters foragers, respectively. Moreover, we expected that the amount of food ingested on a particular day of feeding influences the toxic effects of ethanol on a forager, and consequently shapes its feeding decisions on the following day. We therefore predicted that for a food-restricted forager, ethanol-rich food is of lower value than ethanolfree food. We used Egyptian fruit bats (*Rousettus aegyptiacus*) as a model to test our hypotheses, and found that ethanol did not increase the value of food for the bats. High [EtOH] reduced the value of food for well-fed bats. However, for food-restricted bats, there was no difference between the value of ethanol-rich and ethanol-free food. Thus, microorganisms, via their production of ethanol, may affect the patterns of feeding of seed-dispersing frugivores. However, these patterns could be modified by the body condition of the animals because they might trade-off the costs of intoxication against the value of nutrients acquired.

**SÁNCHEZ-VILLAGRA, M. R., SEIFFERT, E. R., MARTIN, T., SIMONS, E. L., GUNNELL, G. F., and ATTIA, Y., 2007. Enigmatic new mammals from the late Eocene of Egypt. *Paläontologische Zeitschrift* 81(4): 406-415.**

**STOFFBERG, S., 2008. *Rhinolophus capensis* (Chiroptera: Rhinolophidae). *Mammalian Species*(810): 1-4.**

*Rhinolophus capensis* Lichtenstein, 1823 is a medium-sized rhinolophid commonly called the Cape horseshoe bat. It has a characteristic horseshoe-shaped nose leaf that surrounds its nostrils but does not cover the entire muzzle. This species is endemic to South Africa and is typically found in caves along the coastal parts of Northern, Western, and Eastern Cape provinces. It is a gregarious species that is often found roosting with *R. clivosus* and *Miniopterus schreibersii natalensis*. From a conservation standpoint, *R. capensis* has been listed as vulnerable until recently, when its listing was changed to near threatened.

**TAMUNGANG, S. A., MPOAME, B., and JAFF, E. M., 2008. Foraging and feeding behaviour of fruit bats in Dschang, Cameroon. *African Journal of Ecology* 46(2): 230-231.**

# 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.*

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