

FIRST RECORDS OF FIVE SPECIES OF INSECTIVOROUS BATS FROM THE KRUGER NATIONAL PARK

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Abstract — Five species of insectivorous bats are reported for the first time from the Kruger National Park. One of these, *Pipistrellus anchietai*, represents a new record for the southern African Subregion, and two species, *Laephotis botswanae* and *Nycteris woodi* are recorded for the first time for the Republic of South Africa. The remaining two species, *Eptesicus melckorum* and *Tadarida ansorgei* are first records of occurrence for the Transvaal. The species richness of the bat fauna of the Kruger National Park, and particularly of the Pafuri area, is reviewed.

Introduction

The small mammal fauna of the Kruger National Park was reviewed by Pienaar, Rautenbach & De Graaff (1980) who reported 29 species of bats with the highest concentration of species at Pafuri in the northern region. Subsequently Rautenbach & Espie (1982) and Rautenbach, Schlitter & Braack (1984) reported another seven species new to the park.

Rautenbach *et al.* (1984) suggested that the species richness of the bat fauna of the Pafuri area might exceed that of any other region in the Republic of South Africa. The diversity of species in that area attracted research in other disciplines such as: reproduction (Van der Merwe & Rautenbach 1986; Van

der Merwe, Rautenbach & Van der Colf *in press*); ecology (Fenton, Brigham, Mills & Rautenbach 1985); taxonomy (Rautenbach & Schlitter, unpublished data). These and other endeavours in turn increased the chances of encountering more species of bats that had remained unrecorded.

Here we report new records of occurrence of five species of insectivorous bats bringing the total number of bat species known from this area to 41 (Table 1). We follow Meester, Rautenbach & Dippenaar (*in press*) with regard to the largest of the two *Scotophilus* species as *S. dinganii*, and the smaller as *S. borbonicus*. The latter would key out as *S. leucogaster* in Hayman & Hill (1971), although the trivial name *viridis* has also been applied to this taxon.

Table 1

Checklist of the bat fauna recorded from the Kruger National Park

- ORDER CHIROPTERA
SUBORDER MEGACHIROPTERA
Family Pteropodidae
1. *Epomophorus wahlbergi* (Sundevall, 1846) Wahlberg's epauletted fruit bat
 2. *Epomophorus crypturus* Peters, 1852 Peters' epauletted fruit bat
 3. *Rousettus aegyptiacus* (E. Geoffroy, 1810) Egyptian fruit bat
- SUBORDER MICROCHIROPTERA
Family Emballonuridae
4. *Taphozous mauritanus* E. Geoffroy, 1818 Mauritian tomb bat
- Family Nycteridae
5. *Nycteris woodi* K. Andersen, 1914 Wood's slit-faced bat
 6. *Nycteris thebaica* E. Geoffroy, 1813 Common slit-faced bat
- Family Rhinolophidae
7. *Rhinolophus hildebrandtii* Peters, 1878 Hildebrandt's horseshoe bat
 8. *Rhinolophus fumigatus* Rüppell, 1842 Rüppell's horseshoe bat
 9. *Rhinolophus clivosus* Cretzschmar, 1828 Geoffroy's horseshoe bat
 10. *Rhinolophus darlingi* K. Andersen, 1905 Darling's horseshoe bat
 11. *Rhinolophus simulator* K. Andersen, 1904 Bushveld horseshoe bat
 12. *Rhinolophus landeri* Martin, 1838 Lander's horseshoe bat
 13. *Rhinolophus swinnyi* Gough, 1908 Swinny's horseshoe bat
- Family Hipposideridae
14. *Hipposideros commersoni* (E. Geoffroy, 1813) Commerson's leaf-nosed bat
 15. *Hipposideros caffer* (Sundevall, 1846) Sundevall's leaf-nosed bat
- Family Vespertilionidae
Subfamily Miniopterinae
16. *Miniopterus schreibersii* (Kuhl, 1819) Schreiber's long-fingered bat
- Subfamily Vespertilioninae
17. *Myotis welwitschii* (Gray, 1866) Welwitsch' hairy bat
 18. *Myotis tricolor* (Temminck, 1832) Temminck's hairy bat
 19. *Myotis bocagei* (Peters, 1870) Rufous hairy bat
 20. *Pipistrellus ruepellii* (Fischer, 1829) Rüppell's bat
 21. *Pipistrellus nanus* (Peters, 1852) Banana bat
 22. *Pipistrellus rusticus* (Tomes, 1861) Rusty bat
 23. *Pipistrellus kuhlii* (Kuhl, 1819) Kuhl's bat

24. *Pipistrellus anchietai* (Seabra, 1900) Anchieta's bat
25. *Chalinolobus variegatus* (Tomes, 1861) Butterfly bat
26. *Laephotis botswanae* Setzer, 1971 Botswana long-eared bat
27. *Eptesicus zuluensis* Roberts, 1924 Aloe serotine bat
28. *Eptesicus capensis* (A. Smith, 1829) Cape serotine bat
29. *Eptesicus cf. melckorum* Roberts, 1919 Melck's serotine bat
30. *Eptesicus hottentotus* (A. Smith, 1833) Long-tailed serotine bat
31. *Scotophilus dinganii* (A. Smith, 1833) Yellow house bat
32. *Scotophilus borbonicus* (E. Geoffroy, 1803) Lesser yellow house bat
33. *Nycticeius schlieffenii* (Peters, 1859) Schlieffen's bat

Subfamily Kerivoulinae

34. *Kerivoula argentata* Tomes, 1861 Damara woolly bat
35. *Kerivoula lanosa* (A. Smith, 1847) Lesser woolly bat

Family Molossidae

36. *Tadarida (Mops) condylura* (A. Smith, 1833) Angola freetailed bat
37. *Tadarida (Mops) midas* (Sundevall, 1843) Midas freetailed bat
38. *Tadarida (Chaerephon) pumila*
(Cretzschmar, 1830) Little freetailed bat
39. *Tadarida (Tadarida) ansorgei* (Thomas, 1913) Ansorge's freetailed bat
40. *Tadarida (Tadarida) aegyptiaca*
(E. Geoffroy, 1818) Egyptian freetailed bat
41. *Tadarida (Tadarida) fulminans*
(Thomas, 1903) Madagascar freetailed bat

Materials and Methods

Tuttle traps (Tuttle 1974) and macro-mistnets (Rautenbach 1985) were used to catch most of the material reported here. All voucher specimens have been catalogued and incorporated in the Transvaal Museum's study collection, although some specimens of each of the species will be deposited in the reference collection of the Kruger National Park in Skukuza. Measurements cited were taken with digital callipers and are expressed in millimeters. Coordinates for localities are listed only for the first reference to the locality.

Accounts of species

Pipistrellus anchietai Anchieta's pipistrelle

During July 1979 a female *Pipistrellus* was netted at the water reservoir near Skukuza (24° 59'S; 31° 35'E) in the thickets of the Sabie and Crocodile rivers (landscape 4 of Gertenbach 1983). Although the specimen generally agrees with the morphometric description of *P. kuhlii*, its karyological properties did not conform with that of other *P. kuhlii* from Natal (unpublished data) or from Tunisia (Baker, Davis, Jordan & Binous 1974), leaving some doubt about its true identity. The specimen in question (TM30061, female) has been identified as *P. anchietai* by Mr. J.E. Hill of the Mammal Section, British Museum (Natural History). Mr. Hill (*in litt.*) points out that "... cranially *P. anchietai* is rather like *P. kuhlii* but has a narrower, rather elongate braincase, a lower, narrower rostrum with well developed lateral depressions just above the anteorbital foramina, and a narrower palate and basioccipital. It is larger than either *P. nanus* or *P. rusticus* (the former having anyway a hatchet-shaped tragus) and the differences from *P. ruepellii* are obvious." In size our specimen agrees well with the Angolan material reported by Hill &

Carter (1941). Selected measurements are as follows: Forearm length 31,0, alveolar condylocanine length 12,5, and alveolar length of the maxillary tooththrow 4,8.

P. anchietai is known from Angola, Zambia and southern Zaire (Honacki, Kinman & Koepl 1982), and the record from Skukuza represents a considerable extension of its known range.

Laephotis botswanae Botswana long-eared bat

This African vespertilionid genus is represented by four species, of which the ranges of three extend into the southern African Subregion. These are *L. wintoni*, *L. namibensis* and *L. botswanae*. The fourth species, *L. angolensis* is known from Angola and Zaire. Recent authorities (Peterson 1973; Hill 1974; Rautenbach & Nel 1978; Smithers 1983; Meester, Rautenbach & Dippenaar *in press*) acknowledge the validity of all four species, although interspecific relationships remain obscure as result of a dearth of study material. The Botswana long-eared bat, *L. botswanae*, is known from dry woodland savanna regions of northwestern Botswana, western Zambia, southeastern Zaire and from a single locality, Sengwa, in northwestern Zimbabwe (Fenton 1975; Smithers 1983).

During June and August 1985 two male and two female *L. botswanae* specimens were netted over open water in the Malituve Wash ca. 2km north of Punda Maria (22° 41'S; 31° 02'E). This locality falls in the Punda Maria Sandveld on Waterberg Sandstone landscape as defined by Gertenbach (1983). These specimens represent a southwards range extension of ca 600 km for this species, and are the first records of occurrence within the borders of the Republic of South Africa. Selected measurements for each of the four specimens are given in brackets following the Transvaal Museum accession numbers, in the following sequence; forearm length, alveolar condylocanine length, and the alveolar maxillary tooththrow length: TM38123 male (35,2 13,5 4,7), TM38155 male (35,2 13,8 4,7), TM38153 female (37,5 13,9 4,8), TM38154 female (36,2 14,0 4,8).

Eptesicus melckorum Melck's serotine bat

Three species of the vespertilionid genus *Eptesicus* have been recorded from the Kruger National Park, namely *E. capensis*, *E. zuluensis* (Pienaar, Rautenbach & De Graaff 1980) and *E. hottentotus* (Rautenbach & Espie 1982). However, inordinate non-geographic morphometric variation observed in a series from Pafuri assigned to *E. capensis*, prompted closer taxonomic investigation. Based on morphometric multivariate analyses of skull measurements as well as karyological properties, Rautenbach & Schlitter (unpublished data) demonstrated the presence of a fourth species at Pafuri. This species is intermediate in size between *E. capensis* and *E. hottentotus*, and consequently agrees to the phenetic description of *E. melckorum*. All four *Eptesicus* species at Pafuri are karyologically distinct, but although the fourth species from Pafuri answers to the phenetic description of *E. melckorum*, it differs karyotypically from topotypical *E. melckorum*. A taxonomic revision of the genus *Eptesicus* in southern Africa is underway. Until the question of *inter alia* clinal size variation and the

possibility of intraspecific karyological variation in at least some taxa are resolved and interpreted in a taxonomic context, the fourth species from Pafuri is assigned for convenience sake to *E. melckorum*. *E. melckorum* is common at Skukuza as well as from all localities sampled in the area north of Punda Maria. *E. melckorum sensu lato* is known from the southwestern parts of the Cape Province, and again from Tanzania as well as Zambia (see Smithers 1983). Hence the Kruger National Park records are from the centre of a large distributional hiatus and represent the first records of occurrence for the Transvaal. Selected measurements from a randomly selected series of 10 specimens of each sex, with arithmetic mean and size range given in brackets, are as follows: Males: Forearm length (35,1 34,0-37,0); alveolar condylocanine length (13,9 13,6-14,3); alveolar maxillary tooththrow length (5,3 5,2-5,4). Females: Forearm length (36,5 35,0-38,0); alveolar condylocanine length (14,1 13,8-14,4); alveolar maxillary tooththrow length (5,4 5,3-5,5).

Nycteris woodi Wood's slit-faced bat

In revising the systematics of *Nycteris*, Van Cakenberghe & De Vree (1985) examined a series of specimens from the Transvaal Museum study collection which was collected at Pafuri during May 1979. The series consisted mainly of *N. thebaica* whose presence at Pafuri was well known. However, Van Cakenberghe & De Vree identified three specimens of *N. woodi*. These specimens are the first records of the occurrence of this species in the Republic of South Africa. During a recent research visit to the Pafuri area a number of *N. woodi* were netted from several localities in the region whereas small colonies were located roosting in a fuel store at the WNLA depot (22° 27'S; 31° 19'E) and a cave in the Mashikiri gorge (22° 34'S; 31° 10'E). No additional specimens were collected as *N. woodi* is easily distinguishable from sympatric *N. thebaica* by its greyish fur and the fact that its forearm length of 37-42 does not overlap with that of the larger *N. thebaica* (42-52).

N. woodi is known only from five scattered localities in southern Zambia (Ansell 1978) and four localities in eastern Zimbabwe (Smithers & Wilson 1979), all in woodland savanna. Although it appears to be a rare species with a restricted range, it is not surprising to find a viable population in the dry woodland savannas of the north-eastern regions of the Kruger National Park.

Tadarida (Tadarida) ansorgei Ansorge's free-tailed bat

During November 1985 we netted a *T. (Chaerephon) ansorgei* (TM38275, male) at the Anthrax camp in the Pafuri area (22° 25'S; 31° 15'E). Live specimens of *T. ansorgei* and *T. bivitatta* are difficult to distinguish, but critical examination of the cleaned skull confirmed this identification. We compared this specimen with eight *Tadarida* males collected during October 1982 from rock crevices in a gorge 3 km SE of Nwanedzi rest camp in the Kruger National Park (24° 28'S; 31° 59'E) and determined that these specimens are also *T. ansorgei*. Eger & Peterson (1979) studied the morphometric and systematic relationships of these two morphologically similar species, and concluded that they are distinct, with *T. bivitatta* on average the larger species. Comparison of the external and skull measurements of our nine specimens with the suite of measurements listed by

Eger & Peterson (1979), confirm our identification of *T. ansorgei*. Selected measurements for the nine specimens from the park (arithmetic mean and size ranges in brackets) are as follows: Forearm length (46,6 46,0-48,0); alveolar condylocanine length (17,6 17,0-17,9); alveolar maxillar length (7,2 6,9-7,4).

The nine specimens reported here, are the first records of occurrence for *T. ansorgei* from the Kruger National Park, which is not surprising considering the fact that Rautenbach *et al.* (1984) recorded this species from Mkuze in Natal. The two localities are from the *Adansonia digitata/Colophospermum mopane* Rugged Veld (Pafuri) and the Lebombo South (Nwanedzi) landscapes defined by Gertenbach (1983), which confirms the observations of Eger & Peterson that *T. ansorgei* inhabits dry woodland savanna.

Discussion

Of the known bat fauna of the Kruger National Park (Table 1), only *P. anchietai* has not yet been recorded in the Pafuri area. Nel (1975) and Rautenbach (1978) show that in southern Africa there is a marked increase in the specific richness for all terrestrial mammals in both a northern and eastern direction. Although detailed analyses are lacking, this phenomenon appears to be more pronounced for bats. For instance, Fenton (1975, 1985) recorded 36 species of bats from the Sengwa Wildlife Research Area in Zimbabwe, whereas Rautenbach, Skinner & Nel (1980) list 14 species from Maputaland in the north of Natal and Herselman & Norton (1985) report 32 species of bats from the entire Cape Province. Considering this zoogeographical trend, it is not surprising that the Pafuri area appears to have more species of bats than any other area in the Republic of South Africa. This possibly reflects a higher intensity of research as well as the influence of the Limpopo and Luvuvhu rivers which could act as corridors of subtropical environment, allowing bats limited to this environment to enter an otherwise low rainfall area. The latter speculation is supported by the fact that species such as *Myotis bocagei* and *Pipistrellus rupeelli* are encountered only in riparian forests. However, the ecological diversity of the Pafuri region (Gertenbach 1983) is also enhanced by the mountainous terrain and the presence of baobab trees, *Adansonia digitata* which *inter alia* provide daytime sites for bats that roost in hollows.

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