

SCIENTIFIC CONTRIBUTIONS

HIPPOSIDEROS COMMERSONI (E. GEOFFROY, 1813, HIPPOSIDERIDAE) ROOSTING IN TREES IN LITTORAL FOREST, SOUTH-EASTERN MADAGASCAR

By: Irma M. O. Raharinantenaina^{1,2}, Amyot F. Kofoky^{1,3}, Tsibara Mbohoahy⁴, Daudet Andriafidison^{1,2}, Félicien Randrianandrianina¹, Olga R. Ramilijaona² and Richard K. B. Jenkins^{1,5,6}



¹Madagasikara Voakajy, B.P. 5181, Antananarivo (101), Madagascar. Email: voakajy@moov.mg

²Département de Biologie Animale, Faculté des Sciences, Université d'Antananarivo, B.P. 906, Antananarivo (101), Madagascar.

Email: nantysse@yahoo.fr, oramilij@yahoo.fr. ³Current address: Association Vahatra, B.P. 3972, Antananarivo (101),

Madagascar. Email: amyot320@yahoo.fr. ⁴Département des Sciences Biologiques, Faculté des Sciences, Université de Toliara,

B.P. 185, Toliara (601), Madagascar. Email: tmbohoahy@yahoo.fr. ⁵School of Biological Sciences, University of Aberdeen AB24

2TZ, United Kingdom. Email: r.jenkins@abdn.ac.uk. ⁶Corresponding author. Email: jenkins@moov.mg

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Bats use a variety of habitats for roosting and feeding (KUNZ, 1982). Roosting sites can include hollow tree, caves, rock crevices, mines, tombs, tree foliage, and human-built structures (KUNZ and LUMSDEN, 2003) and they play an important role in the ecology and evolution of bats. Bat use of day roost can vary on a seasonal basis (BARCLAY *et al.* 1988) and detailed investigations of roost selection and occupancy are needed to understand potentially the limiting aspects in their life history.

Hipposideros commersoni (E. Geoffroy St.-Hilaire, 1813) or Commerson's leaf-nosed bat is endemic to Madagascar (SIMMONS, 2005) and is the largest microchiropteran species on the island (PETERSON *et al.*, 1995). It is usually reported roosting in caves (e.g. CARDIFF, 2006; GOODMAN, 2006) but has also been observed roosting in trees (RAZAFIMANAHAKA, 2006). *Hipposideros commersoni* was formerly listed as "Least Concern" (HUTSON *et al.*, 2001) and it is not considered to be dependent on intact forest (GOODMAN, 2006). However, growing evidence of intensive hunting and roost disturbance resulted in a revised status of "Near threatened" during the IUCN Global Mammal Assessment workshop in Antananarivo, Madagascar, April 2005.

This preliminary study aimed to determine the roosting habits of *H. commersoni* in a forest without any known rock outcrops or associated caves. The study was conducted in the Anosy Region of southeastern Madagascar, in the S9 fragment of Sainte Luce littoral forest (fragment S9; 24°47'-24°48'S and 47°11'-47°12'E) during May 2005.

On 6 May 2005, six *H. commersoni* and one *Myzopoda aurita* Milne-Edwards and Grandidier, 1878 were captured in mist nets set inside relatively intact littoral forest. We fitted one

juvenile male *H. commersoni* with a radio tag (Holohil Systems Ltd, Canada), weighing 0.52g. As required the transmitters represented a load < 5% of the bat's body weight (ALDRIDAGE and BRIGHAM, 1988). To locate diurnal roost sites, we attempted to locate the bat each morning using a Regal 2000 receiver and a 3 element hand held Yagi antenna for the duration of the radio transmitter battery life or until the transmitter became detached from the bat. We report here on data obtained between 8 and 19 May 2005. When roosts were found we noted the vernacular and scientific names, height (m), and circumference at breast height (CBH, m) of plants the animal roosted in, as well as the roost height (m) from the ground.

Twelve-day roosts were located in mature trees within the littoral forest consisting of six plant species from four families (Table 1). One of the tree species is endemic to the littoral forest in the Anosy Region, four are exploited by local communities for construction timber and three for their medicinal properties (Table 1). The mean height of roost trees was 13.7 m ± 1.11 and the mean CBH was 0.75 m ± 0.17. The bat roosted a few meters below the top of the tree at a mean height from the ground of 9.3 m ± 0.80. No other *H. commersoni* were observed roosting in the same tree as the individual with the transmitter. The area encompassing the six roost sites occupied a surface area of 1.4 ha (Figure 1). All of the roosts were situated in relatively intact forest, 25 m north of a marsh habitat and between 203 m and 330 m east of the capture site. Two tree species (*Phylloxylon xylophyloides* and *Canthium medium*) were used for two and three consecutive nights but otherwise the roost site changed on a daily basis. Three of the trees were used on more than one occasion (Table 1), when the same branch was utilized as perch.

Table 1 A description of the trees roosts used by a single *Hipposideros commersoni* in a littoral forest of south-eastern Madagascar. Endemicity and community use are identified: regional endemic (E), used by local people for construction (B) and medicinal plant (M). CBH = circumference at breast height. Frequency and order of use are given for consecutive days between 8/5/05 and 19/5/05.

| Families | Species | Malagasy names and status/use | Frequency and order of use | Tree height (m) | CBH (m) | Perch height (m) |
|-----------|-----------------------------------|-------------------------------|----------------------------|-----------------|---------|------------------|
| FABACEAE | <i>Phylloxylon xylophyloides</i> | sotro ^B | 1, 3, 5, 6 | 15 | 1.50 | 13 |
| LILIACEAE | <i>Casearia nigrescens</i> | tapinandro ^{B,M} | 2 | 10 | 0.64 | 8 |
| OLEACEAE | <i>Noronhia</i> sp. | belavenoky ^M | 4, 8 | 14 | 0.36 | 9 |
| FABACEAE | <i>Cynometra cloiselii</i> | mampay ^B | 7 | 13 | 0.62 | 8 |
| FABACEAE | <i>Eligmocarpus cynometroides</i> | hazomainty ^E | 9 | 18 | 0.96 | 10 |
| RUBIACEAE | <i>Canthium medium</i> | fatsikahitra ^{B,M} | 10, 11, 12 | 12 | 0.40 | 8 |

As in Sainte Luce, *H. commersoni* in littoral forest in Tampolo roosted individually and frequently returned to the same part of the same tree to roost on a number of occasions (RAZAFIMANAHAKA, 2006). Mean roost (5.1 m \pm 0.21) and tree (7.8 \pm 0.38) height was lower in Tampolo than Sainte Luce (RAZAFIMANAHAKA, 2006). RAZAFIMANAHAKA, (2006) recorded *H. commersoni* roosting on 42 different tree species in littoral forest, including *Cynometra*, *Noronhia* and *Canthium*. BOLLEN and DONATI (2006) listed 189 tree species from Sainte Luce littoral forest and it is clearly important to increase our sampling in the future to determine if there are additional forest plants used by *H. commersoni*. It is nevertheless clear that large trees within relatively intact forest are used by roosting *H. commersoni* and, in the absence of alternative cavity roosting sites such as caves, the bats are probably dependent on the forest for roosting and foraging. The extent to which the bats and local people require the same trees also needs to be investigated further as this will have a direct impact on the conservation status of *H. commersoni* in littoral forests.

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