Project Update: February 2025

Field trips and Sampling

To carry out the project, four field trips have already been done in the Technical Operational Unit (TOU) Campo-Ma'an, especially: the first one took place from April 22nd to May 10th 2024 at the North side of the Campo-Ma'an National Park (CMNP), in the locality of Akom 2 (within inside park and, Efoulan I, Nlomoto and Nkongmekak villages); the second field trip took place from July 9th to August 2nd 2024 at the North side of the Park, in the locality of Akom 2 (within inside park, Awomo and NKo'ongop, villages) and at the East side of the Park, in the locality of Ma'an (within inside park and, Ebianemeyong and Oveng villages); The third field trip took place from August 10th to September 9th 2024 at the West side of the Park in the locality of Campo (within Nkoelone and Mvini villages; CAMVERT entry and, HEVECAM locality). The fourth field trip took place from November 2nd to November 10th at the West side of the park, in the locality of Campo including Dipikar island. Bat sampling took place on these localities on at least 33 captures places (Figure 1).

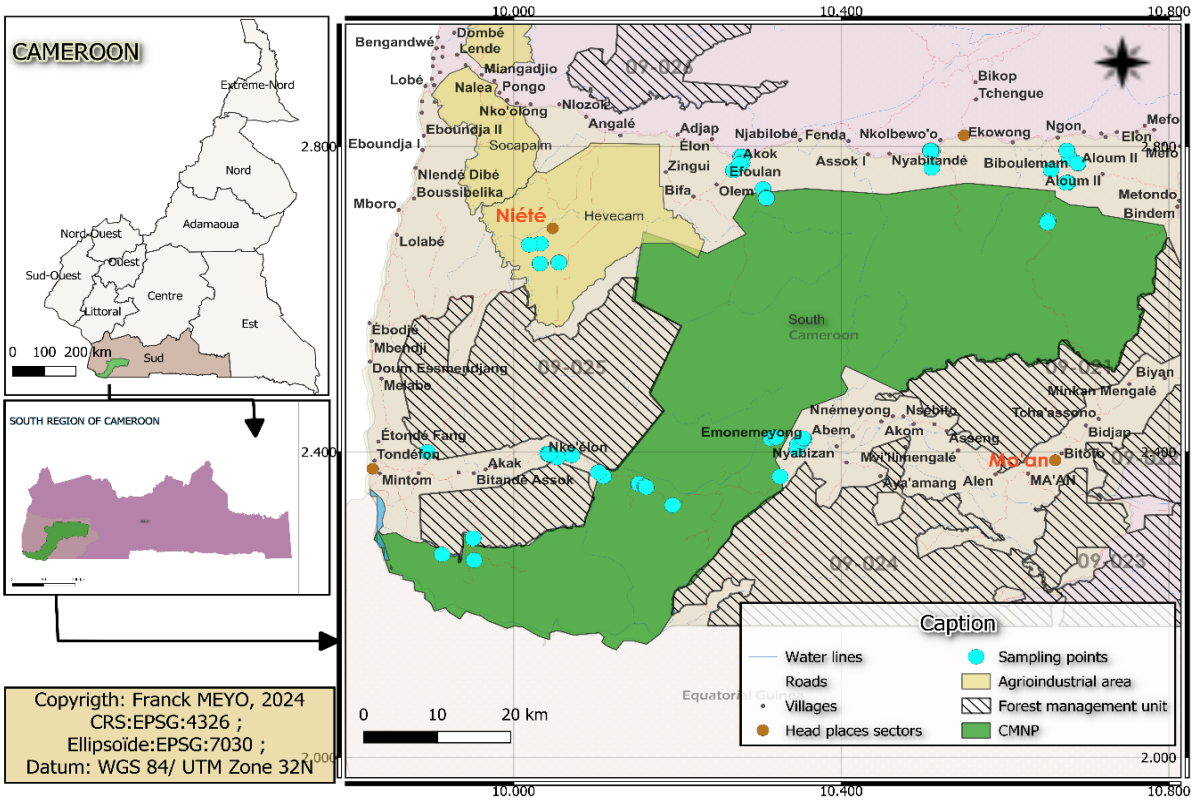


Figure 1: Sampling points on the study area (map made by Meyo, 2024©)

Methodology used

Trapping methods

During the four field trips already realized, bat captures have been carried out with three types of traps, especially, mist nets (6m, 9m, 12m and 18m) (Figure 2A), a Harp trap (Figure 2B) and, an acoustic recorder (SM4 FS) (Figure 2C). On average, 6 mist nets (sometimes more than 6, until 10); one harp trap and, an acoustic recorder was placed each night of capture on each site. Note that the canopy net we were supposed to use was damaged (stuck and twisted pole) and has been used only once.

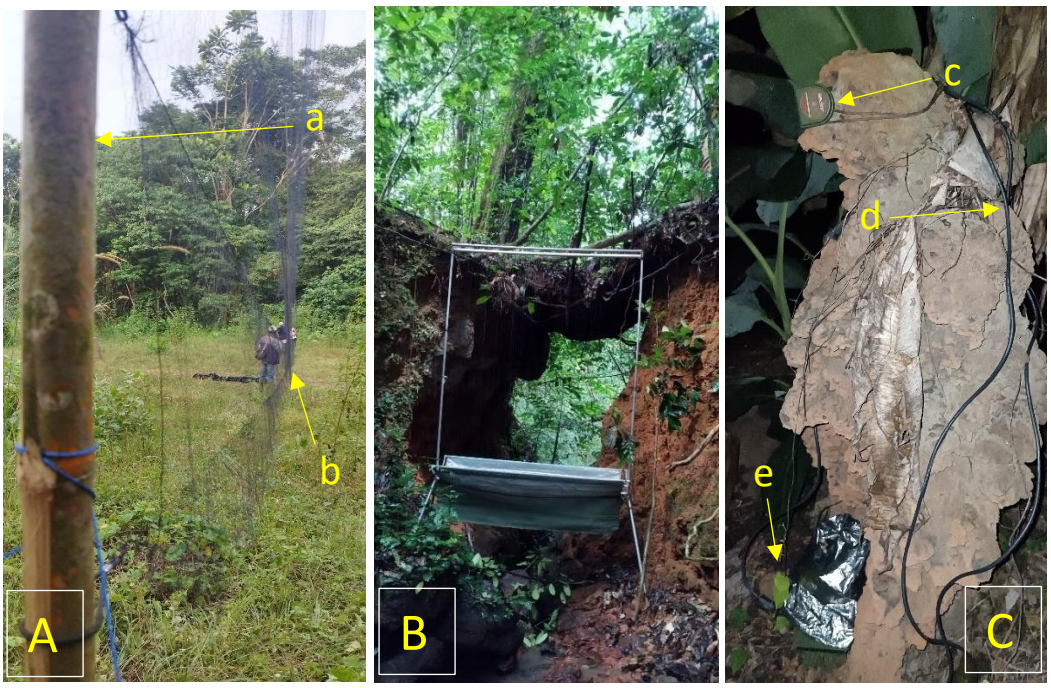


Figure 2: Various trap types used for bat sampling

(***A:*** *mist net set up;* ***a:*** *pole,* ***b:*** *mist net;* ***B:*** *Harp trap installed;* ***C:*** *acoustic detector (SM4 FS) set up;* ***c:*** *microphone;* ***d:*** *mic cable;* ***e:*** *power and control box*)

Handling of bats

All bats captured in the mist net (Figure 3A), were keep in small bags, weighted with PESOLA scales (30g, 60g, 100g, and 300g according to bat size) (Figure 3B). A wing punch was taken for barcoding and kept in swab tubes containing ethanol 90%. Morphological measurements were taken using a dial calliper (Figure 3C). Insectivorous bats seem difficult to record were released in a net for active echolocation recording, those who have an easy call emission (Hipposideridae and Rhinolophidae for example) were released and recorded free flying. Active recording was realized using an ANABAT WALKABOUT (acoustic recorder) (Figure 3D) and passive recording was realized using a SM4 FS (seen above Fig. 2C). After taking the parameters, all fruit bats were fed with sugar water before being released (Figure 3E).

Figure 3: Various handling methods of bats used

(***A:*** *bats caught in mist net;* ***B:*** *Weighing a bat contained in a small bag;* ***C:*** *principal investigator taking morphometric measurements on a bat;* ***D:*** *Meyo recording a bat with an ANABAT WALKABOUT;* ***E:*** *Meyo feeding a fruit bat before releasing)*

Preliminary results

Abundance of bats captured and number of capture nights according to seasons

These field trip carried out, helped us to cover three of the four climatic seasons encounter in the locality, especially, the small dry season (SDS) for April-May, the small rainy season (SRS) July-August and, the great rainy season (GRS) for middle August-September and November 2024 (Table 1A), and also according to various habitat types (Table 1B). Note that, number of nights represented here is about the number of nights with effective captures, indeed some nights trap were set up but there was no bat captured, and, some nights, because of bad weather, there was no set up of traps.

Table I: Sampling effort of captures carried out *(Table A: according to habitat types; Table B: according to seasons)*

Table A

Habitat type	Number of species	Number of nights	Abundance	Sampling Effort
Primary forest	20	18	79	6x18 = 108
Secondary forest	14	19	100	6x19 = 114
Human habitations	16	22	127	6x22 = 132
Plantations	11	14	102	6x14 = 84
Total			**408**	**438**

Table B

Seasons	Number of species	Number of nights	Total
GRS	22	18	134
SRS	16	13	99
SDS	16	20	175
Total	**27**	**51**	**408**

Inventory of bats species and habitat types

The first inventory of bat species found in Campo-Ma'an National Park and around allows the capture of 6 Families, 19 Genus and 27 Species.

For Sampling of bat species in the CMNP, the study locality was subdivided into three zones according to the type of activities encountered on each, especially: park inside (low modified environment), forestry unit management (FUM) (with medium modified environment) and, agro-industrial activity zones (with a high modified environment). On them, four habitat types have been identified: including primary forest (Figure 4A), human habitations (Figure 4B), plantations (Figure 4C) and secondary forest (Figure 4D).

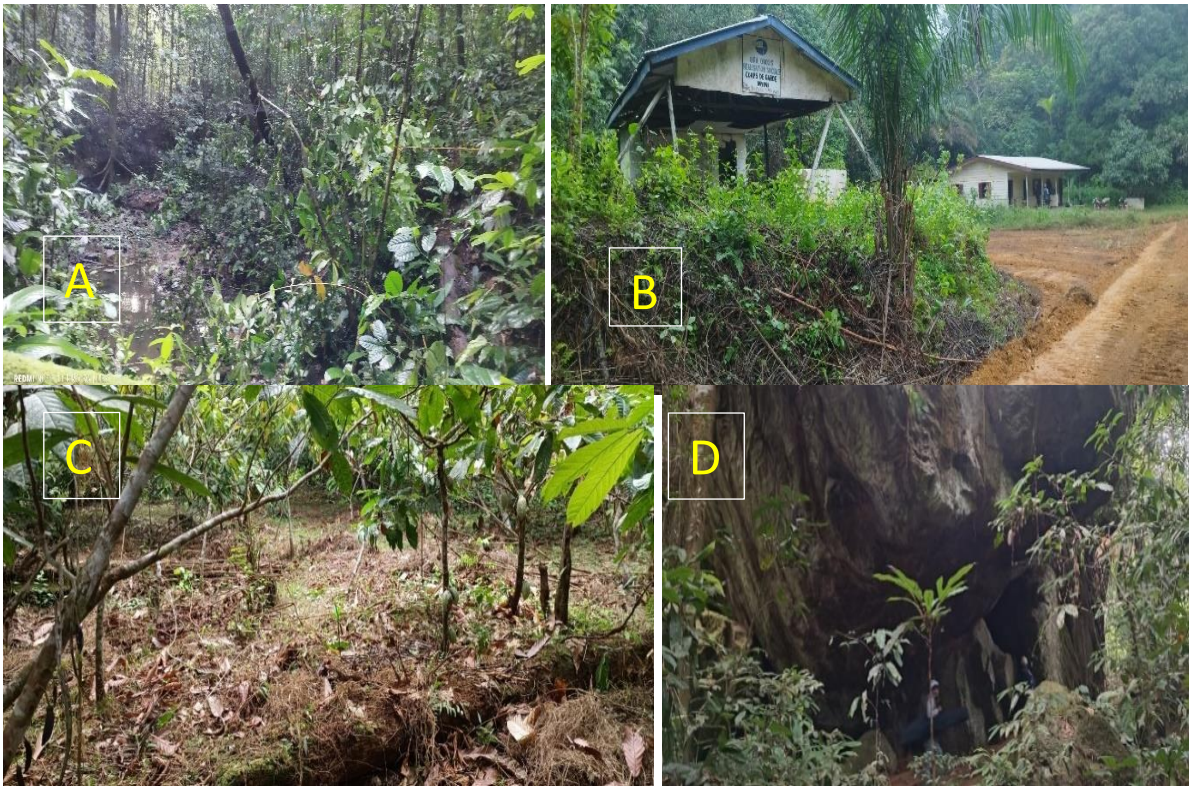


Figure 4: Various habitat types listed on the study site

*(**A:** primary forest; **B:** houses in Mvini village; **C:** cocoa plantation; **D:** cave in a secondary forest)*

- **Specific richness of bats according to habitat types**

In term of specific richness, out of a total of 27 bat species captured to date, the primary forest is the habitat type with the relevant number of species (20), followed by Human habitations (16), then, the secondary forest (14) and, finally plantations constituted the habitat type with the fewer number of species (11) (Table II).

- **Abundance of bats according to habitat types**

Human habitations are the habitat type with the most important relative abundance of bats occurrence (31,13%), followed by plantations (25,00%), secondary forest (24,51%), and, finally, primary forest with 19,36% constitute the habitat type that presented the lowest occurrence of bats (Table II).

Table II: Abondance and specific richness of bats according to habitat types

Family	Genus	Species	Habitat types				Total
			Primary forest	Secondary forest	Human habitations	Plantations	
Hipposideridae	*Dorhyrina*	*Dorhyrina cyclops*	2	4	3	0	9
	Hipposideros	*Hipposideros beatus*	3	0	0	3	6
		Hipposideros ruber	30	53	6	12	101
Miniopteridae		*Miniopterus cf. fraterculus*	1	0	0	0	1
Nycteridae	*Nycteris*	*Nycteris arge*	1	0	0	0	1
		Nycteris grandis	2	0	2	0	4
		Nycteris hispida	0	1	0	0	1
Pteropodidae	*Casinycteris*	*Casinycteris cf. campomaanensis*	1	0	0	0	1
	Epomops	*Epomops franqueti*	5	10	25	26	66
	Hypsignatus	*Hypsignatus monstrosus*	3	1	1	0	5
	Megaloglossus	*Megaloglossus woermanni*	1	1	29	38	69
	Myonycteris	*Myonycteris angolensis*	0	0	1	0	1
		Myonycteris torquata	9	3	4	7	23
	Rousettus	*Rousettus aegyptiacus*	7	10	46	9	72
	Scotonycteris	*Scotonycteris zenkeri*	6	2	1	2	11
Rhinolophidae	*Rhinolophus*	*Rhinolophus alcyone*	0	2	0	1	3
		Rhinolophus cf. blasii	1	2	0	2	5
		Rhinolophus cf. clivosus	0	0	3	1	4
		Rhinolophus landeri	1	3	0	0	4
Vespertilionidae	*Afronycteris*	*Afronycteris nana*	1	0	1	0	2
	Glauconycteris	*Glauconycteris alboguttata*	1	0	0	1	2
		Glauconycteris cf. humeralis	1	2	1	0	4
	Kerivoula	*Kerivoula lanosus*	0	0	1	0	1
	Neoromicia	*Neoromicia sp.*	0	0	1	0	1

	Pipistrellus (Pipistrellus)	*Pipistrellus (Pipistrellus) nanulus*	2	0	0	0	2
	Pseudoromicia	*Pseudoromicia roseveari*	1	0	0	0	1
	Scotophilus	*Scotophilus nux*	0	6	2	0	8
Taxa_S			**20**	14	16	11	
Individuals			79	100	**127**	102	
Dominance_D			0,1812	0,3098	0,2274	0,232	
Simpson_1-D			0,8188	0,6902	0,7726	0,768	
Shannon_H			2,281	1,756	1,853	1,76	
Total							**408**

- **Trophic guilde**

Diet have also been evaluated and, to date, in term of abundance, Insectivorous bats have the greatest value (179 individuals), frugivorous bats have the second greatest abundance (160 individuals) and the lowest abundance of individuals account (69 bats captured) was for Nectarivorous bats (Figure 5A). Otherwise, Insectivorous bats (I) with 19 species have the most important number of species, 7 species of frugivorous bats showed the second most important species account and, we recorded only one Nectarivorous bat species (Figure 5B).

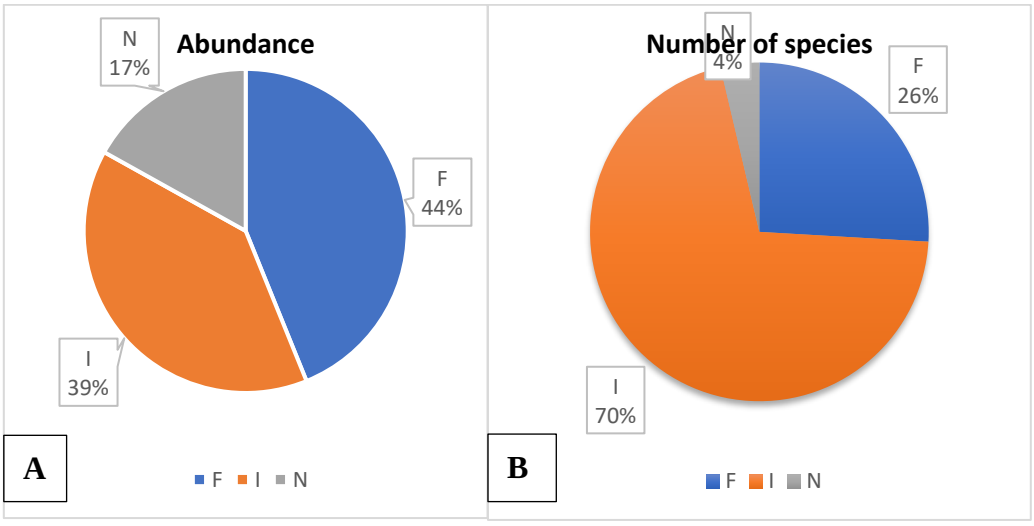


Figure 5 : Occurrence and specific richness of bats according to diet

*(**A:** Abundance; **B:** Number of species)*

Acoustic diversity

We should note that all acoustic data recorded (around 155 Gigabytes of data) are still being analysed and, cannot already be presented here.

Awareness campaigns in some villages near capture sites

In some villages, after bat captures, peoples were allowed to see how to handle bats (Figure 6). During this, we were able to answer all questions and, preoccupations of riverside population as our best, also, we were talking and showing to them various ecosystem roles of bats and their importance.

Figure 6: Meyo showing to riversides people how handle a bat and explaining roles of bats

Pictures of captured bats

- ***Afronycteris nana***

A : latteral view **B :** frontal view (picture of Meyo, 2024©)

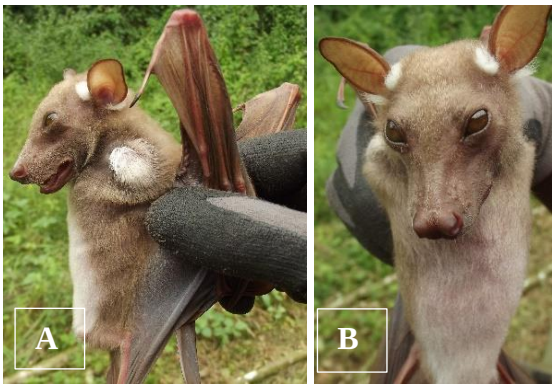
- ***Casinycteris cf. campomaanensis***

A: frontal view; **B:** latteral view (picture of Meyo, 2024©)

- ***Dorhyrina cyclops***

A : frontal view; **B :** latteral view (picture of Meyo, 2024©)

- ***Epomops franqueti***



A : frontal view of a male **B :** latteral view of a male (picture of Meyo, 2024©)

- ***Glauconycteris alboguttata***

A : frontal view **; B :** dorsal view illustring the caracteristic marks (picture of Meyo, 2024©)

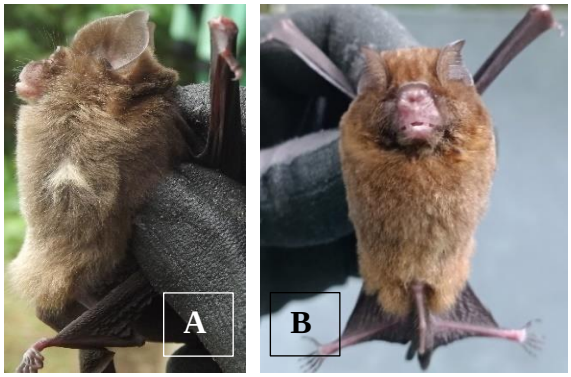
- ***Glauconycteris cf. humeralis***

A: frontal view; **B:** latteral view (picture of Meyo, 2024©)

- ***Hipposideros beatus***

A: latteral view; **B:** frontal view (picture of Meyo, 2024©)

- ***Hipposideros ruber***



A: latteral view; **B:** frontal view (picture of Meyo, 2024©)

- ***Hypsignatus monstrosus (female)***

A: latteral view; **B:** frontal view (picture of Meyo, 2024©)

- ***Kerivoula lanosus***

A: latteral view of noseleaf ; **B:** frontal view (picture of Meyo, 2024©)

- ***Megaloglossus woermanni (male)***

A: frontal view; **B:** latteral view (picture of Meyo, 2024©)

- ***Miniopterus cf. fraterculus***

Tragus illustration (picture of Meyo, 2024©)

- ***Myonycteris torquata***

A: latteral view of a male; **B:** frontal view of a female (picture of Meyo, 2024©)

- ***Neoromicia sp.***

A: latteral view; **B:** frontal view (picture of Meyo, 2024©)

- ***Nycteris arge***

A: latteral view; **B:** frontal view (picture of Meyo, 2024©)

- ***Nycteris hispida***

A: frontal view; **B:** latteral view (picture of Meyo, 2024©)

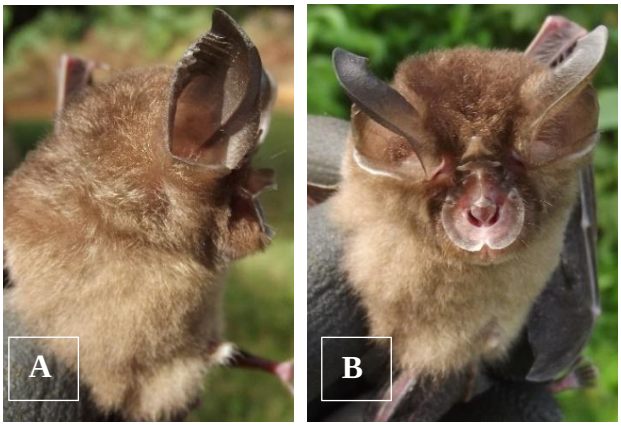
- ***Rhinolophus alcyone***

A: latteral view of noseleaf ; **B:** frontal view (picture of Meyo, 2024©)

- ***Rhinolophus cf. blasii***

A: latteral view of noseleaf ; **B:** frontal view (picture of Meyo, 2024©)

- ***Rhinolophus clivosus***

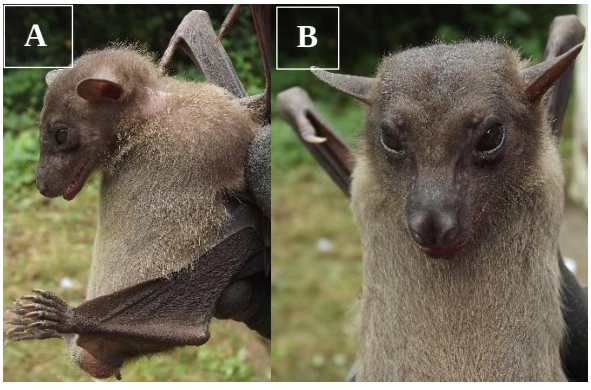


A: latteral view; **B:** frontal view (picture of Meyo, 2024©)

- ***Rhinolophus landeri***

A: latteral view; **B:** frontal view (picture of Meyo, 2024©)

- ***Roussetus aegyptiacus***



A: latteral view; **B:** frontal view (picture of Meyo, 2024©)

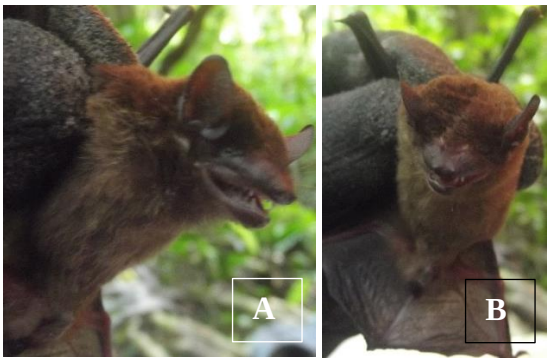
- ***Scotonycteris zenkeri***

A: latteral view of noseleaf ; **B:** frontal view (picture of Meyo, 2024©)

- ***Scotophilus nux***

A: latteral view; **B:** ventral view (picture of Meyo, 2024©)

- ***Pipistrellus (Pipistrellus) nanulus***



A: latteral view; **B:** frontal view (picture of Meyo, 2024©)

- ***Pseudoromicia roseveari***

A: latteral view; **B:** frontal view (picture of Meyo, 2024©)