

Conserving bat of Bafoussam (Cameroon West region) “Sacred forest” through community awareness raising



Winners of the bat specie drawing competition

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INTRODUCTION

Bats, commonly called bats, are an order of placental mammals with nearly 1,400 species divided into 18 families (Burgin *et al.*, 2018). Of the mammals, the order Chiroptera is the second largest group after rodents (Fenton & Simmons, 2015). In 1875, Dobson divided the bats into two subgroups: the Microchiroptera (small in size and capable of echolocation, it has several families) and the Megachiroptera (large, with a single family that do not emit ultrasound.). But recently this classification has been modified thanks to work carried out on the basis of molecular data with the aim of breaking the paraphyly of Microchiroptera into yangochiroptera and yinpterochiroptera (Teeling *et al.*, 2002; Teeling & *al.*, 2005). They are bioindicators of the quality of the environment (Medellin *et al.*, 2000). They are among the animals that are still poorly known and threatened, and are not included in programs for the conservation of flora and fauna in Central Africa (Bakwo fils, 2010). Despite their large distribution, very few studies have been carried out on chiropterofauna in the Central African sub-region (Bakwo fils, 2009) in general and in Cameroon in particular.

Bats, despite their ecological importance suffer from a very negative public perception and are often feared, misunderstood and persecuted mainly because of their strange appearance and nocturnal activity (Kunz & Parsons 2009). Some populations regard them as sacred animals while others hunt them and nail them to doors to drive out evil spirits. Sacred forests represent cultural and spiritual values for local populations. One of the major current challenges in the management of sacred forests is to involve local populations in the conservation of forest biodiversity (Kushalappa & Bhadwat, 2001) through the practices linked to them. They are considered a traditional method of conserving biodiversity and have a role in the management of natural resources (Ghosh, 2001; Ramakri-Shnan *et al.*, 1998); Less disturbed, they would therefore contribute to the stability of the present ecosystem (Solbrig, 1991). In some villages in Africa, sacred forests are considered to be largely part of their heritage. The region of West Cameroon which was previously like a plant cover (Jacques-Félix, 1950; Letouzey, 2968), but currently this cover has been transformed to give way to agriculture or urbanization (Mahmoud *et al.*, 2020).

The current context caused by Covid-19, speculations according to which bats are carriers of this virus which infect humans expose them to threats (Guo *et al.*, 2020). Bats can be hunted for food, for their medicinal properties (Tuladhar-douglas, 2008). Habitat degradation is dramatically altering ecosystems at an unprecedented rate and humans are considered the primary cause (Vitousek *et al.*, 1997; McDonald, 2008). In Africa the rate of habitat loss due to human activity is very rapid (Brooks *et al.*, 2002). In fact, agriculture occupies nearly 40% of terrestrial ecosystems (FAOSTAT, 3011). The more intensive the agriculture, including the loss of forests and perches, the greater the adverse effects on the richness, abundance and functionality of bat species (Fischer *et al.*, 2009, 2010; Jones *et al.*, 2009). Faced with all the elements stated upstream, we can see that bats are endangered animals and very few conservation strategies have been developed in Central Africa, this could be due to the fact that very few people have good information to their subject. The choice of the Western region was made because several studies nevertheless the influence of the environment on the populations



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in 2021, and it is important to know the relations which bind the local populations and the bats and their knowledge on these. latest to complete the database.

Goals

The objective of this study is to show the relationships between bats and the populations of Bafoussam while contributing to the knowledge of bats by the population of West region in general and in particular that of the village Bafoussam community; specifically of:

- Make an inventory of bats encountered.
- Evaluate the knowledge that the populations of Bafoussam community have of bats.
- Know what the perception of bats has by local populations.
- Awareness

Materials and method

❖ Project site

This study was carried out in the west region of Cameroon part of West Africa, a hotspot of bat diversity (Herkt et al., 2016) and it is important to have idea about the bat's situation in the area. This site is located in the west eastern part of the country between latitudes 5 ° and 6 ° north and longitudes 10 ° and 11 ° 30 East. The region covers a total surface area 13,892 Km². The study sites (secret forests) are isolated natural forests found around the chieftom of each village. They are the places of initiation rituals of the various clans present in the village. It is in these forests that the young village leaders who enter the throne are introduced to their new functions and are buried at their death. These forests are also recognized as shelters for "totems" of chiefs and notables; and other protective deities of the village. The sacred forests of chieftaincy are organized in Compartments and this is how we distinguish, the prince's compartment; queen's compartment; compartment of the customary court; the prison compartment; the compartment place of worship to the gods. The natural vegetation of the Bafoussam community is savannah and has given way to agricultural species (cultures, fruit trees and raffia). However, there are gallery forests including "sacred forest" in the chieftoms and a eucalyptus forest reserve. This exists due to the traditional believes that seem to protect some patches named secret forest and because deforestation has turn most of the area into grassland. This Bafoussam community population estimated at about 121 282 inhabitants made pressure on land means that bats and other animals are continually losing their habitat to expanding agriculture and urbanization, thus the urgent need to gather data on bats ecology and distribution in the area in other to support conservation measures.

❖ Captures, identification and investigation

A questionnaire survey to better understand the community knowledge level on bats it is important we decided to undertake during this project a questionnaire survey community. Given the fact that they do consider bat as witch craft, and good to be killed, in some families there are people rejected because they as suspected to enter in their neighbor house in the after as from 18H 30 as bat; so with all these, the questionnaire was administered and the results was helpful to understand the community and make very good orientation in the community sensitization on the role and importance of bat in economy, conservation and the community health (as insect control). This was chosen because it enables large amounts of information to be collected from a large number of people in a short period of time and in a relatively cost-effective way. In addition, the results of the questionnaires are easily quantified. Workshops with primary school children and teachers helped sensitize them as to the role and importance



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of bats in the ecosystem, including farm ecosystem. During the project implementation period, working plan was defined in collaboration with various school administration and weekly discussion / animation session were held in each implicated class, after. At the end of each semester a bat conservation competition was organized between all the implicated schools. This was done through games, drawing, questions and answers, dances, poetry. At the end winners received prizes define by the organization committee. Community education was held in various youths, men and women associations meeting generally held one a week especially during the week end. Communication tools was made of: posters, leaflet, T-shirt and chats on which keys messages and concepts on bats conservation are mentioned. These was produced and share during all the sensitization campaign and workshop. These was very helpful because it helps impact on a good number of persons at the time. Study sites were chosen based on prior knowledge of bats activities. Bats were sampled using six mist nets, which were spread every night from 6pm to midnight across the potential flying path. For every individual captured the following external measurements were taken, forearm length, foot length, total length (head plus body), tail length, hind foot length, ear length and weight. The sex of each bat was recorded and juveniles distinguished from adults by the presence of cartilaginous epiphyseal plates in the finger bones. Photographs, hour of captures and geographical position were also noted. The morphometric measurements were used to identify species using the identification keys of Rosevear (1965), Hayman and Hill (1971), Paterson and Webala (2012), Mammals of Africa (2013 V4) and Van Cakenberghe et al. (2017). All bats individuals were later released at the site of capture. Specimens that were not be identified in the field were photographed on all the parameters identification and they were subsequently identified.

❖ Data analysis

The survey data were analyzed using SPSS version 20.0 software, which allowed us to assess the level of knowledge and perception of bats by the populations in this area.

The abundance data were analyzed using the ESTIMATE version 9.1 software.



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Figures 1: a) Deployment of the nets; b) Taking parameters

The ethnozoological data were obtained following semi-structured interviews (Bernard, 1995; Costa Neto et al., 2009) and sensitization carried out with 200 people living around sacred forest sites.

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Figure 2: Population surveys

The sensitizations were made in the classrooms in order to make known the bats and their multiple roles.

RESULTS

The inventory allowed us to capture 103 bats in 09 nights. This made it possible to have a capture success of 0.17 individuals per night net of individuals per night net for a capture effort of 600.9 net nights.

Specific wealth

From March to October 2021, we captured in the Bafoussam community 09 species belonging to 08 genera and 04 families (table 1). The genus *myonycteris* was the most captured with 79 individuals of the same species, followed by the genus *eidolon* with 04 individuals of the same species. We had 05 insectivorous species and 04 fruit-eating species.



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Table 1: species of bats captured in the area

Sub-orders	Families	Genres	Cash
Yangochiroptera	Vespertillionidae	<i>Scotophilus</i>	<i>S. dinganii</i>
		<i>Leaphotis</i>	<i>L. nanus</i>
Yinterochiroptera	Pteropodidae	<i>Eidolon</i>	<i>E. helvum</i>
		<i>Myonictoris</i>	<i>M. angolensis</i>
		<i>Roussetus</i>	<i>R. aegyptiacus</i>
		<i>Epomophorus</i>	<i>E. pusillus</i>
	Hipposideridae	<i>Hipposideros</i>	<i>H. ruber</i>
		<i>Hipposideros</i>	<i>H. fuliginosus</i>
	Rhinolophidae	<i>Rhinolophus</i>	<i>R. sp</i>

Socio-demographic parameters

298 people were interviewed in the town of Bafoussam and were mainly represented by women (56.4%). Most of them were under 15 (44%) this would be due to the fact that the interviews were done in a school; and between 31 and 60 years (39.3%) because there is a wide range of ages (Table 1) Most respondents had either a primary education level (47.3%) or had none (30.5%); We also note a strong representativeness of respondents with a secondary level (21.1%) and just 3.1% for the tertiary level (Table 1).

Table 2: Socio-demographic characteristics of the respondents

Genres	Male	Feminine			
	130 (43.6%)	168 (56.4%)			
Age	0-15 years	16-30 years	31-60 years	> 60 years	
	131 (44%)	22 (7.4%)	117 (39.3%)	28 (9.4)	
Study level	Any	Primary	Secondary	Tertiary or more	
	91 (30.5%)	141 (47.3%)	63 (21.1%)	3 (1%)	

Most of the respondents were students (34.9%) this could be explained by the fact that the number of students in the establishment was large, followed by people without a job (21.8%), We also note a strong representativeness of people practicing field work (16.1%) because we are in an area where agricultural activities contribute significantly to the economy. Almost all the people interviewed were Bafoussam (95%) this could be due to the fact that we worked in Bafoussam; to this can be added several other ethnic groups mainly originating from the western region (Table 2).



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Table 2: Professions and ethnicities of the respondents

Professions	Proportions	Ethnicities	Proportions
Farmer	5 (1.7)	Bandjoun	2 (0.7)
Hunter	2 (0.7)	Bafang	5 (1.7)
Official	2 (0.7)	Bafoussam	283 (95)
Self employed	37 (12.4)	Baleng	1 (0.3)
Private sector	8 (2.7)	Bamoungoum	1 (0.3)
Trader	23 (7.7)	Bansoa	1 (0.3)
Unemployed	65 (21.8)	Batoufam	4 (1.3)
Farmer	48 (16.1)	Dschang	1 (0.3)
Junkyard	1 (0.3)		
Breeder	1 (0.3)		
Pupil	104 (34.9)		
Seamstress	1 (0.3)		
Machinist	1 (0.3)		

Knowledge of bats

Of those interviewed, 95% had seen a bat before and only 9.7% had any knowledge acquired at school. 36.6%, these people observed bats at least once a year (Table 3). 45.6% of people said they saw bats on trees which is quite normal because they perch there and (24.2%) in the house while for 15.1% it was in the sky and generally they saw them while going to urinate outside (30.9%) this could be in the night, period of activity of these animals and in these areas the toilets are generally external, or while cultivating (22.8%) and also during housework (29.2%) (Table 3).

Table 3: Observation of the animal

	Animal observation	Acquired knowledge At school	Annual observation
Yes	283 (95)	33 (9.7)	109 (36.6)
No	15 (5)	269 (90.3)	189 (63.4)

Observation places	Proportions	View opportunity	Proportions
Trees	136 (45.6)	By cultivating	68 (22.8)
Sky	45 (15.1)	Going to urinate outside	92 (30.9)
Post	1 (0.3)	Going to draw water	1 (0.3)
House	72 (24.2)	Playing	21 (7)



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Fields	26 (8.7)	Doing housework	87 (29.2)
Road	3 (1)	Coming back from school	2 (0.7)
School	12 (4)	While walking	17 (5.7)
TV	3 (1)	Any	10 (3.4)

A hundred people (179) have already seen about 2000 bats clumped together, followed by 44 people who see the bats isolated that is to say alone, while 04 people have seen a grouping of 1000 bats and 02 people who saw around 150 bats together. This would only be normal because bats live in colonies (Figure 1).

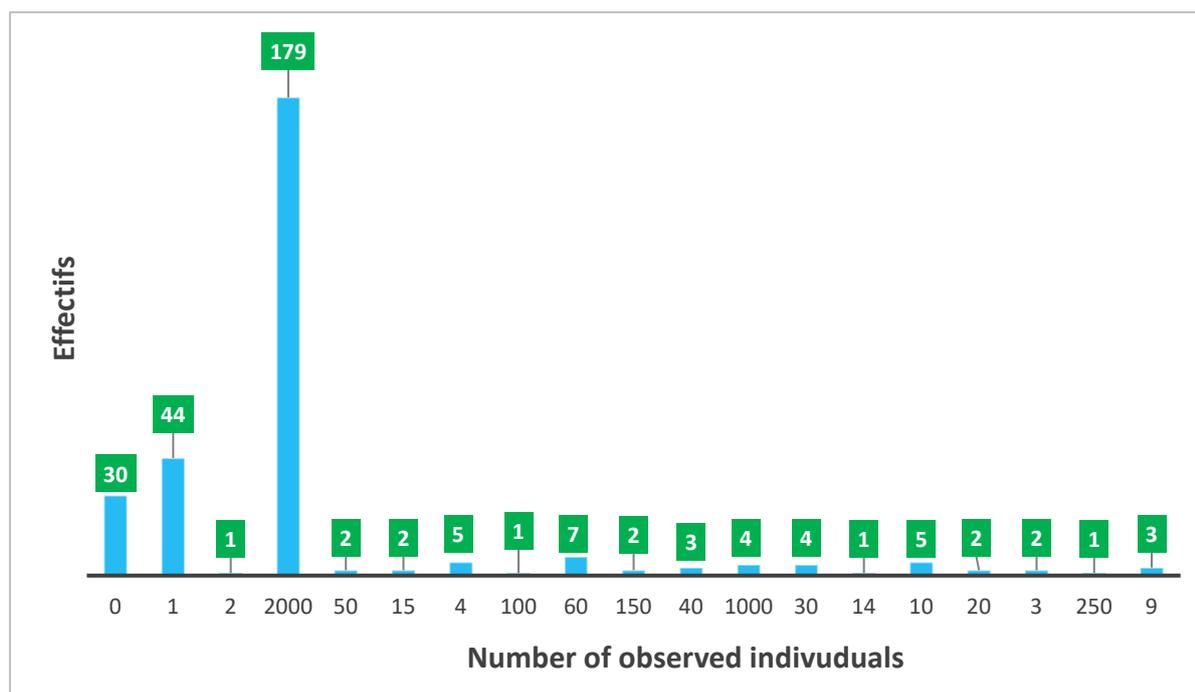


Figure 1: Abundance of bats observed

Some of the respondents (34.9%) say they have already seen small bats while 34.6% say they have seen all sizes, but others said large (24.2%) (Table 4). Most of these bats were seen grouped together (74.8%) (Table 4). They are mainly seen in the afternoon (44%) and at night (35.2%), in the dry (43.3%) and rainy (23.2%) season or during both seasons (33, 6%) (Table 4).

Table 4: Description and observation period of the animal

Animal size	Fat	Small	Medium	All sizes
	72 (24.2)	104 (34.9)	19 (6.4)	103 (34.6)
Distribution	Grouped	Isolated		
	223 (74.8)	75 (25.2)		
Daily observation period	Morning	Afternoon	Night	All day
	14 (4.7)	131 (44)	105 (35.2)	48 (16.1)



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Season	Dried	Rainy	Both	
	129 (43.3)	69 (23.2)	100 (33.6)	

Some people (47.3%) said they were afraid at the sight of a bat while others in the same proportions kept their calm, some closed their ears (2.7%) at the sight of this can be because bats frighten (48%) and for others it could cause them hearing loss (5%) and those who kept their calm it is probably because they do not frighten them (12, 8%) (Table 5).

Table 5: Behavior at sight of the animal

Reaction to sight	Proportions	Reasons	Proportions
Fear	141 (47.3)	It does not scare	38 (12.8)
Calm	141 (47.3)	It scares	143 (48)
Happy	4 (1.3)	First time	20 (6.7)
Admiration	3 (1)	The number	5 (1.7)
Close ears	8 (2.7)	Habit	36 (12.1)
Wanted to catch	1 (0.3)	Only	2 (0.7)
		Causes hearing loss	15 (5)
		Has no interest	7 (2.3)
		Looks like a human	5 (1.7)
		Scream a lot	16 (5.4)
		The distance	3 (1)
		The tradition	1 (0.3)
		To eat	1 (0.3)
		Mysterious	5 (1.7)
		Position on the shaft	1 (0.3)

Almost all the respondents said that there are two types of bats (97%) of black and brown (97%) or only one (1.7%) of black (1.7%) (Table 6)).

Table 6: Abundance of species observed

Number of species seen	Proportions	Colors	Proportions
1	5 (1.7)	Noir	5 (1.7)
2	289 (97)	Black and brown	289 (97)
3	2 (0.7)	Black, brown, earth color	3 (1)
4	1 (0.3)	White	1 (0.3)
0	1 (0.3)		

The individuals were called bats in their mother tongue: “ntigime” (186) and “nwok” (69), others used both (15) (Figure 2). Some gave no answer (16) probably because they did not know (Figure 2).



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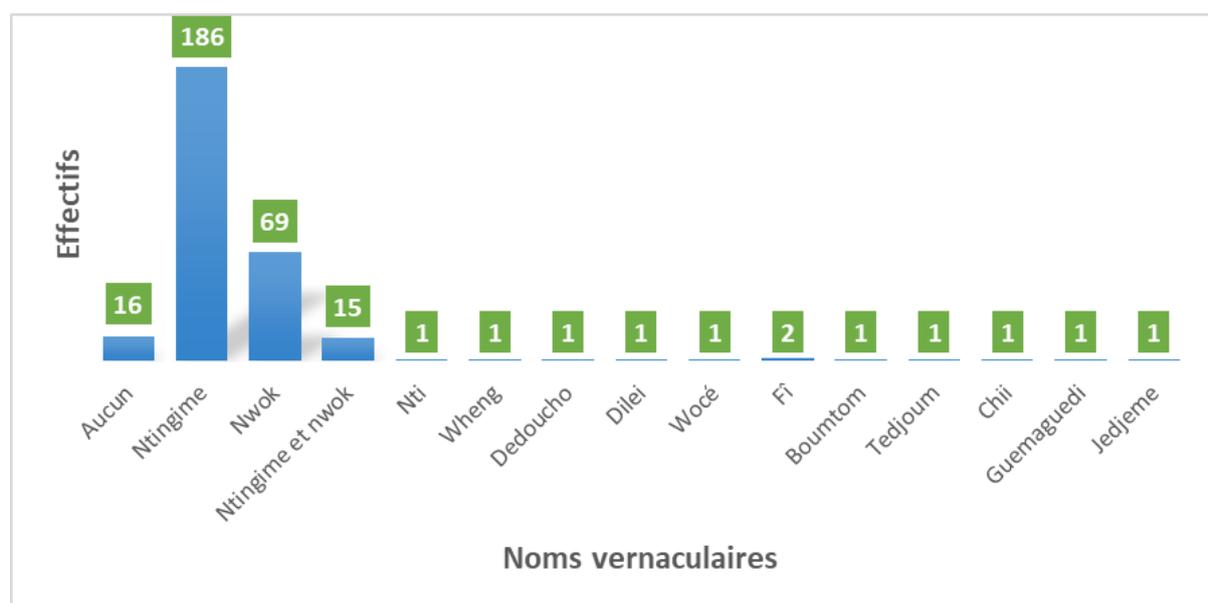


Figure 2: Vernacular names

Perception of bats

The majority of respondents (69.8%) said bats do not transmit disease and others said it does (30.2%). Almost all respondents (70.5%) did not know the diseases they transmit which is normal, because an almost identical proportion say that bats do not transmit diseases (Table 7) For the other respondents they are responsible for cough (21.5) %, Ebola (1%), earache (2.3%) and rabies (1.3%) (Table 7).

Table 7: Transmission and transmitted diseases

Disease transmission	Proportions	Names of diseases	Proportions
Yes	90 (30.2)	Any	210 (70.5)
No	208 (69.8)	Ebola	3 (1)
		Cough	64 (21.5)
		Corona	9 (3)
		Earache	7 (2.3)
		Headache	1 (0.3)
		Rage	4 (1.3)

Almost half of the people questioned are in favor of not eradicating bats (50.3%) because they help trees to grow (40.9%), thanks to pollination or the dissemination of seeds. Others say they should be protected because they are endangered (5.7%), or just are useful (37.9%) (Table 8). 49.7% of those questioned are in favor of eradication because they are dangerous (27.2%) or are not useful (10.7%) and for the most part (61.4%) no reason is necessary for their eradication (Table 8).



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Table 8: Eradication of bats

Eradiation	Proportions	Reasons for eradication	Proportions	Reasons for non-eradication	Proportions
Yes	148 (49.7)	Any	181 (61.4)	Help in growing trees	122 (40.9)
No	150 (50.3)	Scares them	1 (0.3)	Mosquito protection	19 (6.4)
		Disturb	1 (0.3)	Useful	113 (37.9)
		Dangerous	81 (27.2)	Help in growing trees	1 (0.3)
		Not useful	32 (10.7)	Genoa not	26 (8.7)
				Endangered	17 (5.7)

It should be noted that 94% of those questioned had no knowledge of feeding bats and 64.4% are for the conservation of bats and the others (35.6%) for non-conservation (Table 9). Those of the people questioned find that they should not be kept because they do not find them useful (58.1%), moreover they disturb (8.1%) while those who want conservation have for argument the fact that they are part of nature (6%) or use them for their nutrition (3%), but a large proportion said that they are useful (16.1%) (Table 9). 5.4% said they kept in cages or did not kill them (5.7%), but most (81.2%) had no storage method (Table 9).

Table 9: Conservation of bats

Food knowledge	Yes	No
	18 (6)	280 (94)
Conservation	Yes	No
	106 (35.6)	192 (64.4)

Reasons for retention	Proportions	Preservation method	Proportions
Useful	48 (16.1)	Any	242 (81.2)
Not useful	173 (58.1)	Keep men away	9 (3)
Any	1 (0.3)	Eating	6 (2)
Disturb	24 (8.1)	Cages	16 (5.4)
Part of nature	18 (6)	Public and individual responsibility	3 (1)
Fear	9 (3)	Do not kill	17 (5.7)
Nutrition	9 (3)	Create a habitat	5 (1.7)
For research	1 (0.3)		
Hard to catch	1 (0.3)		
Makes sick	1 (0.3)		



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To make the remedies	2 (0.7)		
Endangered	11 (3.7)		

Among those surveyed, 36.9% had a negative perception of bats and classify them as pests and others not (69.1%) (Table 10). Several of the respondents (96%) say that they do not capture them because they are important (45.3%), for others, they are scary (4.4%) and some had no reason to do so (85.9%) while 10.4% capture them to eat. Some respondents said that they use them to make remedies (1%) (Table 10).

Table 10: Harm and capture of the animal

Negative perception	Yes	No
	110 (36.9)	188 (63.1)
Animal capture	Yes	No
	12 (4)	286 (96)

Reasons for capture	Proportions	Reasons for non-capture	Proportions
Any	256 (85.9)	Any	144 (48.3)
For protection	1 (0.3)	They have important	135 (45.3)
Are important	4 (1.3)	Fears	13 (4.4)
Nutrition	31 (10.4)	Do not have the age	2 (0.7)
To make the remedies	3 (1)	Not useful	1 (0.3)
Just to see	3 (1)	Dangerous	1 (0.3)
		Hard to catch	2 (0.7)

Most (96.3%) do not consume bats and only 3.7% consume them (Table 11). Only a portion of people (17.1%) say that bats are useful because they are great pollinators and seed dispersers (6%), they protect against mosquitoes (2.3%), they are divine creatures (1.7%) or so are used to make medicine (2.7%). The majority of respondents (96.3%) say that they are not useful because they contribute to the destruction of fields (4.69%), others consider them dangerous (1%) (Table 11).

Table 11: Consumption and utility of the animal

Animal consumption	Yes	No
	11 (3.7)	287 (96.3)
Usefulness of the animal	Yes	No
	51 (17.1)	247 (82.9)

Reasons for utility	Proportions	Reasons for non-utility	Proportions
Any	251 (84.2)	Spoil the fields	14 (4.69)
Create forests	18 (6)	Dangerous	3 (1)
Protects against insects	7 (2.3)	Any	281 (94.29)



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Kill harmful insects	3 (1)		
Divine creature	5 (1.7)		
Nutrition	4 (1.3)		
Researches	1 (0.3)		
Deter theft	1 (0.3)		
To make the remedies	8 (2.7)		

Almost all of the never respondents (83.6%) had seen the bat droppings. Most (96.6%) said that the droppings were unimportant and 6.4% said they were important as soil fertilizers (Table 12). For those who had already used these droppings (6.4%), 5.4% had a satisfactory yield. For many (31.2%), bats defecate through the mouth and for the great majority (68.8%), through the anus; they chew (49.7%) their food or suck it (48%) (Table 12).

Table 12: Roles of bats

Observation of droppings	Any	Yes	No
	1 (0.3)	48 (16.1)	250 (83.6)
Importance of droppings	Yes	No	
	28 (9.4)	270 (96.6)	
Importance name	Any	Fertilization	
	279 (93.6)	19 (6.4)	
Use of droppings	Yes	No	
	19 (6.4)	279 (93.6)	
Yield	100%	Any	
	16 (5.4)	282 (94.6)	
Way of defecation	Stuffy	Anus	
	93 (31.2)	205 (68.8)	
Fashion nutrition	Any	Chew	Suck
	2 (0.7)	148 (49.7)	143 (48)

Almost all respondents (81%) associated the sight of bats with loss of orientation, others with unhappiness (12%) and witchcraft (7.2%) (Figure 3). This could be explained by the fact that many have based their judgment on existing prejudices on these animals, or by their appearances, their position at rest (upside down) (Figure 3).



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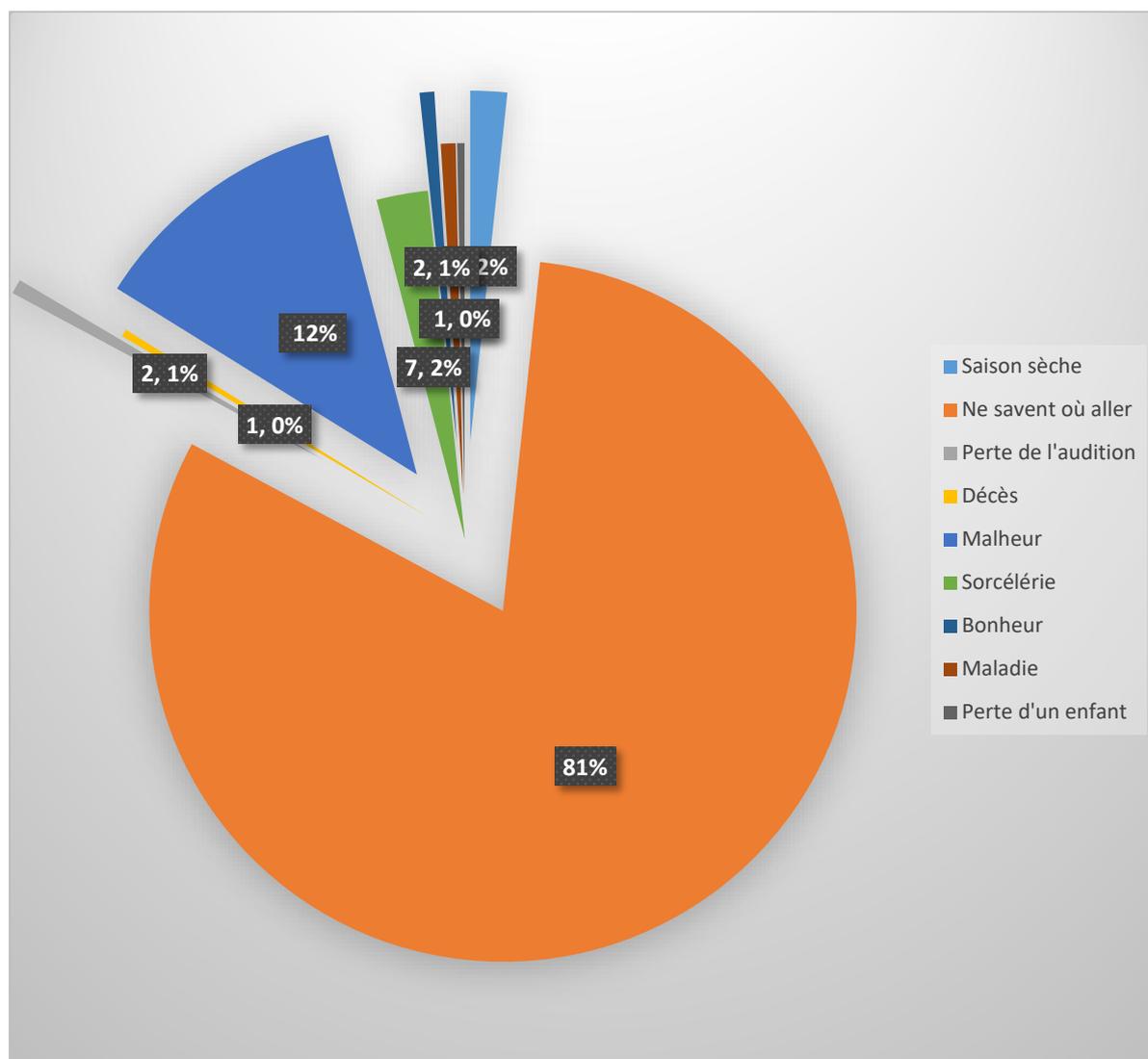


Figure 3: Myths about bats

More than half (52.7%) of the respondent's state for the non-eradication of bats in the houses and 47.3 for the eradication (Table 13). In majority, 71.8% of the respondents said that bats are not useful in the manufacture of traditional remedies because they transmit diseases (83.2%) or else these people were not suited to the manufacture of remedies (0.3%). Respondents who said they were helpful either cured illnesses (13.8%) or gave no reason at all. Most (82.6%) do not know how they are useful (Table 13).

Table 13: perception in the protection of bats

Eradication in the house	Yes	No	
	141 (47.3)	157 (52.7)	
Storage in the house	Yes	No	
	15 (5)	283 (95)	

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Utilities in the pharmacopoeia	Yes	No	
	84 (28.2)	214 (71.8)	
Reasons for utility	Any	To cure illnesses	For protection
	254 (82.6)	41 (13.8)	3 (1)
Reasons for non-utility	Any	Transmit diseases	Not suitable for making remedies
	49 (16.4)	248 (83.2)	1 (0.3)

A number of respondents said that large bats are used to make the remedies and others (1.7%) said both (large and small) are used. Some say that the other species are not used because they are not mature (58.4%) or are not the animals of the village (1.3%) (Table 14). Most (92.6%) said that the parts used to make these remedies are the teeth, udders, head and heart, the rest (5%) said instead that all parts are used; most of the diseases treated are mystical (96.6%) or poison (2%) diseases. Most of the people questioned (95%) did not know with which elements these parts are associated for the manufacture of remedies, but the others (3.7%) said the king of herbs and pierces goal or so (0.7%) cola, jujube and salt. 3.7% had a satisfactory yield (Table 14).

Table 14: Traditional pharmacopoeia

Species used in the pharmacopoeia	Proportions	Reason for non-use	Proportions	Body parts used	Proportions	Diseases treated	Proportions
Any	163 (54.7)	Any	116 (38.9)	All	15 (5)	Poison control	6 (2)
Small	3 (1)	Not the village animals	4 (1.3)	Head, heart, udders, teeth	276 (92.6)	Mystical diseases	288 (96.6)
Fat	125 (41.9)	Not mature	174 (58.4)	Head, wings, claws	4 (1.3)	Typhoid	2 (0.7)
Both	5 (1.7)	The big ones start the diseases	2 (0.7)	All except the head	3 (1)	Malaria	1 (0.3)



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Black	2 (0.7)	Hard to catch	2 (0.7)			Stomach ache	1 (0.3)
Usefulness of associated elements	Yes	No					
	11 (3.7)	287 (96.3)					
Names of associated elements	Any	Cola, jujube, salt	King of herbs and goalie holes			The black stone	
	283 (95)	2 (0.7)	11 (3.7)			2 (0.7)	
Yield of remedies	100%	Any					
	11 (3.7)	287 (96.3)					

Few of those interviewed (10.1%) considered bats to be birds, which generally feed on fruits (96.3%), insects (1.3%). This could be explained by the fact that the damage caused to the fruits is more visible (Table 15).

Table 15: Lifestyle and nutrition of bats

Way of life	Proportions	Fashion nutrition	Proportions
Poultry	30 (10.1)	Insects	4 (1.3)
Any	268 (89.9)	Fruits	287 (96.3)
		Herbs	2 (0.7)
		Palm kernel and corn	5 (1.7)

Specific wealth

From March to October 2021, he was captured in the locality (village) Diengbou-melam I 09 species belonging to 08 genera and 04 families. The genus *Myonycteris* was the most captured with 79 individuals of the same species, followed by the genus *Eidolon* with 04 individuals of the same species. We had 05 insectivorous species and 04 fruit-eating species.

The inventory allowed us to capture 103 bats in 09 nights. This made it possible to have a successful capture of 2.28 individuals per net-night for a capture effort of 1073.8 net-nights.

Table 16: Capture effort and capture success

	Site 1	Site 2	Site 3	Total
Number of fillets	07	07	03	17
Thread length	12m (2) and 6m (5)	12m (2) and 6m (5)	12m (1) and 6m (2)	7 girls
Net surface	327.6	327.6	62.4	717.6
Number of hours of capture	28	28	7	63



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Number of nights of capture	04	04	01	09
Capture effort	509.6	509.6	54.6	1073.8
Capture success	0.2	0.2	1.88	2.28

Sampling effort

In this village, we obtained 09 species, which gave a sampling effort of 69.23%. The rarefaction curves (Figure 1) showed that even more sampling is needed in the village because the plateau of the curve has not been reached.

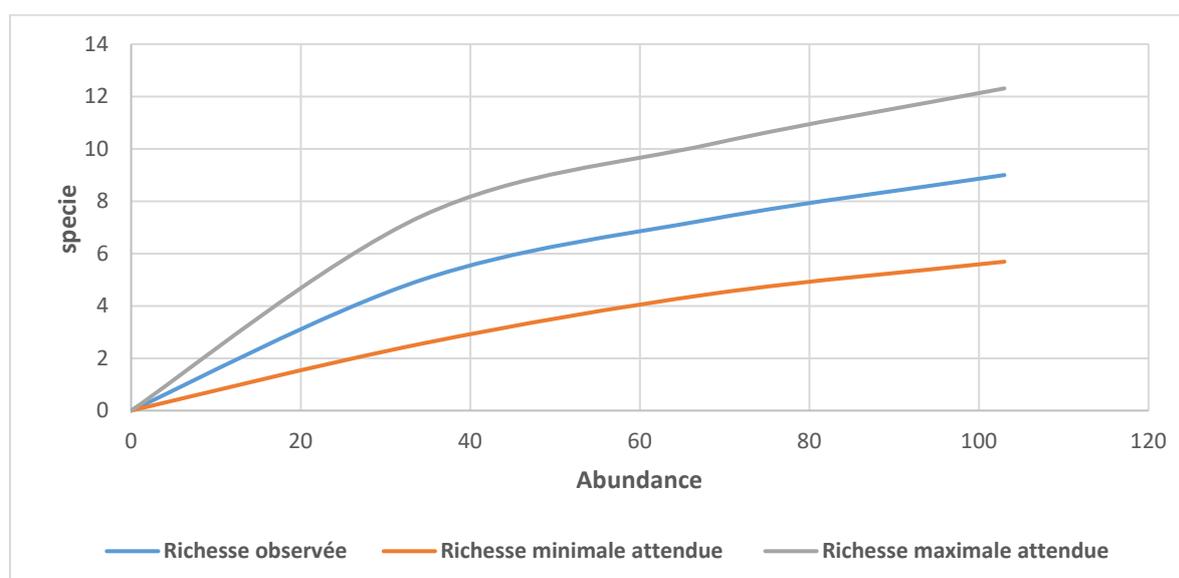


Figure 4: Specific rarefaction curves showing the variation in species richness as a function of the abundance of catches.

The classic Jaccard index (table2), shows us that of the 03 sites, very few present a high similarity. However, a similarity equal to 50% (Jaccard Classic = 0.5) is observed between sites 1 and 2 despite having the same number of species. Sites 1 and 3 (Jaccard Classic = 0, 286), 2 and 3 (Jaccard Classic = 0, 286) have a very low similarity (Table 17).

Table 17: Illustration of the comparative index of Jaccard Classic.

Site (s)	Site 1	Site 2	Site 3
Site 1	1	0.5	0.286
Site 2	0.5	1	0.286
Site 3	0.286	0.286	1

AWARENESS

The sensitization was done with the aim of making the bats known to the populations, by explaining to them the ecological, economical roles and presented to them a specimen of a bat.



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This was done in:

In schools



Drawing game



Figure 5: Sensitization in a school

From the local administration (Ministry of basic education and Sub divisional Officer)

The awareness here to consists of the presented project to the local administration their very good understanding led to the approval to allow us to go to the community and to the public primary schools of the community

Future plans as follow-up to this project

1. More sensitisation sessions to have much more people aware on bat role and importance in conservation.
2. Working with local populations to develop project proposal to restore sacred forest adequate bat habitat to date destroyed for human needs
3. Scientific papers to be published in peer-reviewed journals.



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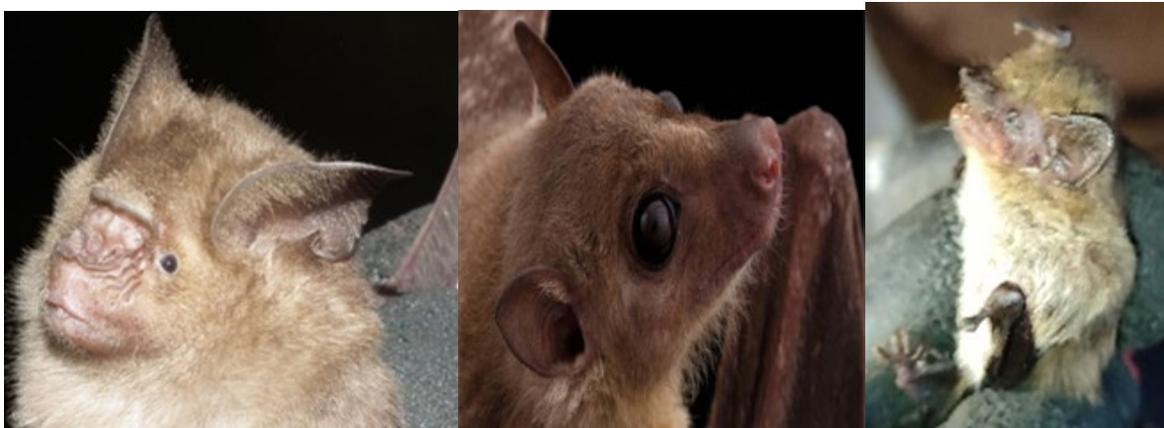
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Photos of captured bat species



Left to right: *Eidolon helvum*, *Epomophorus pusillus*, *Hipposideros ruber*



Left to right: *Hipposideros fuliginosus*, *Rousettus aegyptiacus*, *Laephotis nanus*



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Left to right : *Myonycteris angolense*, *Rhinolophus sp.*, *Scotophilus dinganii*

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Table: measurements of species

Cash	Mass	Forearm	Tibia	Total length	Hear	Tragus	Tail	Number
<i>Eidolon helvum</i>	175.5	91.07	41.21	108.53	19.85	/	11.01	07
<i>Myonycteris angolensis</i>	68.66	72.94	27.01	69.45	19.26	/	11.19	79
<i>Roussetus aegyptiacus</i>	90.5	72.5	29.8	101	23.8	/	13	01
<i>Rhinolophus sp</i>	66	50.2	21.8	52.2	19.5	/	26.9	01
<i>Hipposideros ruber</i>	11.66	51.26	22.4	48.03	12	/	32.6	03
<i>Hipposideros fuliginosus</i>	69.65	65.15	27.8	63.6	13.17	/	20.75	02
<i>Leaphotis nanus</i>	4	28.3	11.9	31.8	7.5	3.8	19.4	01



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<i>Scotophilus dinganii</i>	30	56.1	24.9	63.1	11.1	7	47.6	01
<i>Epomophorus pusillus</i>	12/26	50.12	21.9	54.98	9.58	/	1.87	08

