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Local poaching of aardvark (*Orycteropus afer*, Pallas 1766) in the Monts Kouffé Protected Forest (MKPF), Benin

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Abstract

Increasing demand for bushmeat threatens the extinction of many local animal species. The aardvark (*Orycteropus afer*) is a mammal species classified as endangered EN on the red list of Benin. The Monts Kouffé Protected Forest (MKPF) is home to one of its last populations in Benin. This research explores the process of poaching of the aardvark, the reasons for this act, and its impact on its population in (MKPF) in Benin. Semi-structured interviews were conducted with 100 people in 5 villages bordering the forest. The aardvark is poached by local populations for food (88%), the use of these organs in traditional African medicine (40%), and the sale of these organs (24%). The species were killed by local hunters in a planned fashion, and farmers killed the animals by chance. This practice of poaching affects maybe the aardvark population, which according to respondents is in great decline in the MKPF. The effective management of the MKPF aardvark population requires more in-depth research, in particular on the size of its population and the awareness of local populations.

Keywords: Aardvark, Benin, Bushmeat, Food use, Poaching

Introduction

The smuggling of illegal wildlife products has grown into a sophisticated multi-billion-dollar industry with tentacles spreading across the globe (AWF, 2014). Wildlife trafficking is one of the most lucrative illegal businesses in the world, with an estimated annual value of 23 $ billion (PNUD,

2016). It is a multi-faceted threat, with challenges unique to each country or region. Africa is at the epicenter of this crisis, as it has seen poaching increase in recent years, spurred by international demand for elephant tusks or rhino horns, among other products of wild flora and fauna (PNUD, 2016). The Poaching of elephants, rhinos, and other charismatic and lucrative African species has reached an unprecedented level and seriously threatens the future of these species and the ecosystems that support them (Henson et al., 2017). In West Africa, the problem has reached extreme levels and critically affected elephants, pangolins, rhinos, sharks, chimpanzees, gorillas, and several precious kinds of wood (USAID, 2016). Unless governments take great action against poaching, the local extinction of many species is likely. This extinction would result in the loss of an important resource for the diversification of economies, a loss which would hurt the users of wildlife and would hamper possible alternatives in terms of sustainable sources of income for governments and local populations (Banque mondiale, 2017). Hunting and the bushmeat trade are important contributors to the food and domestic economy for a large number of families living in rural areas in DR Congo (Rochette et al.,2017). In many rural areas, hunting provides a very important source of income, often more substantial than the income generated by the trade in agricultural products (Mallon et al., 2015). Although there is a substantial problem of wildlife poaching in Africa, the factors that affect its presence at the local level are still poorly explored (Wilfred & Maccoll, 2015). Myrmecophagous mammals are threatened in Benin and run the risk of extinction if current trends (habitat loss and hunting) are maintained (Akpona & Daouda, 2011). The bushmeat trade from African savannah areas can pose a real threat to aardvark populations in some countries (Taylor et al., 2016). The Monts Kouffé Protected Forest (MKPF) and its southern periphery are under pressure from rampant population growth, shifting slash-and-burn agriculture, overgrazing, poaching, and anarchic logging (Toko, 2019). Although listed as Least Concern on the IUCN Red List, the aardvark is an endangered species on Benin's list (Akpona & Daouda, 2011). The MKPF is home to one of the last populations of aardvark in Benin. The objective of this research is to identify local poaching techniques for the aardvark, the reasons for this, and their impact on its survival in MKPF.

Material and methods

Study area

The Monts Kouffé region is located between the departments of Borgou, Donga, and Collines (Teka et al., 2007). The Monts Kouffé forest complex, with an area of 180,300 ha, is located in central Benin, straddling the municipalities of Bantè, Bassila, Ouessè, and Glazoué (Akouehou, 2004). It is bounded to the north by the classified forest of Wari-Maro, to the south by the municipality of Bantè, to the east by the municipality of Ouèssè, and to the west by the municipality of Bassila (Odjoubéré

et al., 2013) (figure 1). The Monts Kouffé region enjoys a humid Sudanese-type tropical climate characterized by two seasons: a marked dry season that lasts 5 months (November to March) and a rainy season that lasts from April to October. The average annual rainfall is 1200 mm and the average annual temperatures are 26 or 27 ° C (Houinato & Sinsin, 2001). The dominant geological substratum in the Monts Kouffé region consists of very old crystal formations of the Dahomeen type (Toko, 2005). In the study environment, a distinction is made between crude mineral soils of non-climatic origin (clayey-sandy soils), tropical ferruginous soils, and ferritic soils. This pedological potential favors the development of lush vegetation which abounds in a diversity of animal species (Toko, 2005). The climax vegetation is the dense dry forest that has evolved under human action into wooded savannas, shrub savannas, grassy savannas, fields, and fallows (Teka et al., 2007). Open forests, dense and dry forests as well as shrub and tree savannas constitute areas of interest for mammals (Dotché, 2016).

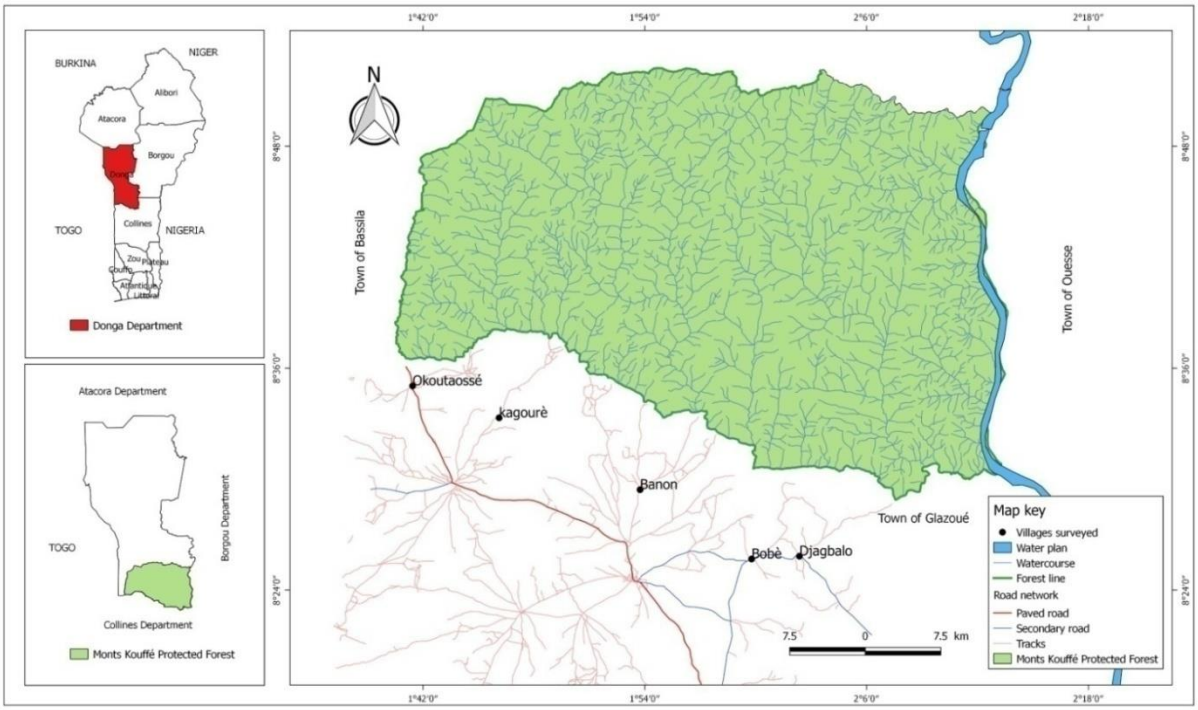

Figure 1. The geographical location of the MKPF and the survey villages

Data Collection

Data were collected during N. and D. 2020 by semi-structured interviews. This research was carried out in 5 villages bordering the south of the forest. These are the villages of Okoutaossé, Kagourè, Banon, Bobè and Djagbalo (Fig. 1). These villages served as survey villages given their proximity to the MKPF and their accessibility. To identify the knowledge of local populations on the poaching of the aardvark around the MKPF, an interview guide was developed for the people interviewed. This approach has been used in other studies for an in-depth understanding of wildlife use,

consumption, or killing (Newing et al., 2011; Saif, 2016). The questions raised during the interviews focused on the groups of people involved in the poaching of the aardvark, the means used by these people to achieve their end and the reasons for these acts. The interviewees met the following criteria: be at least 30 years old to obtain information on the past (20 years ago) and current abundance of the animal; be a resident of the study environment so as not to provide information that is not well understood; have a good knowledge of the aardvark. The sampling technique used for the interviews is the "snowball" sampling technique. This simple technique is very practical when proceeding by reasoned choice, in the absence of a list of units of the mother population, and in knowing only very few individuals corresponding to the selected criteria (Dépelteau, 2000). The idea is to constitute the sample by asking a few initial informants to provide the names of individuals who could be part of the sample (Mouzoun et al., 2018). In total, the 100 people surveyed consisted of 66 farmers, 25 hunters, 7 housewives, and 2 sellers of animal remains. The 93 were men and 7 were women (Table 1).

Table 1. Social data of the respondents

	Categories of people surveyed				Gender	
	Farmers	Hunters	Housewives	Animal remains sellers	Male	Female
Okoutaossé	13	5	1	1	19	1
Kagourè	15	5	0	0	20	0
Banon	13	5	2	0	18	2
Bobè	13	5	2	0	18	2
Djagbalo	12	5	2	1	18	2
Total	**66**	**25**	**7**	**2**	**93**	**7**

Data analysis

The answers to the questionnaires on the aardvark poaching were analyzed, codified, entered, and processed using the Excel 2013 spreadsheet. These data were used to calculate essentially the citation frequencies of the categories of uses of the aardvark, times of the year the aardvark is killed, the tools used to kill the aardvark, moments, and times when the aardvark is often killed.

Results

Reason for poaching of the aardvark in MKPF

All the people interviewed (n = 100) considered that the aardvark is a species that is subject to poaching in the forest. The aardvark is poached in the area by two groups of people, local hunters who intentionally kill it for meat and farmers opportunistically when they cross paths with the animal or stumble upon one of these active burrows. The aardvark is killed in the study area for a variety of reasons, mainly: for consumption and use in traditional African medicine.

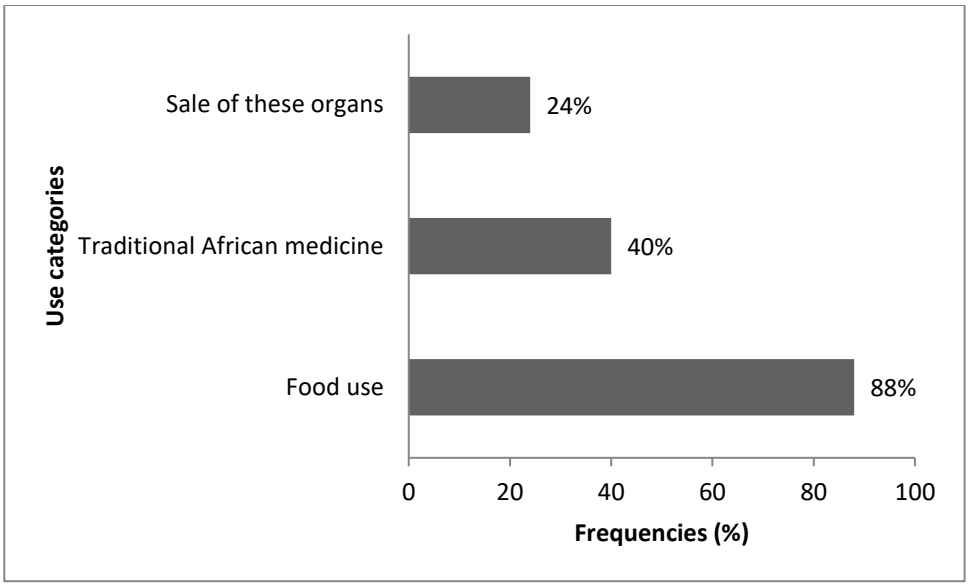

Figure 2. Frequencies of citations of the uses of the aardvark according to the respondents

Food use is mentioned by 88% (n = 88/100) of those respondents, followed by traditional African medicine 40% (n = 40/100) and sales of these organs 24% (n= 24/100) (Fig. 2). The meat of the aardvark is highly prized because of its very delicious character and these organs (skull, claw, bone) are highly sought after for their prowess in traditional African medicine according to the respondents. Local people believe that the parts of the aardvark have several medicinal and mystical properties. A state of thing that makes aardvark very vulnerable to poaching.

Poaching techniques

The techniques used by farmers to kill the animal are very simple. This involves hitting the animal on the head (vulnerable part) when you see it occasionally and setting a trap (snare) at the entrance to its burrow when you come across one of these active burrows. The techniques used by local hunters are much more complex.

Perception of local hunters on the periods favorable to the hunting of aardvark

The hunters of the study area have different knowledge about the favorable periods for poaching aardvarks in the MKPF. 44% (n = 11/25) of the hunters surveyed affirm that the aardvark is hunted all the periods of the year against 36% (n = 9/25) who think that it is more favorable in the dry season because it is when they are most abundant in the middle. The rain season is poorly cited 20% (n = 5/25) by some hunters who claim that this is the period when it is easy to see the animal's footprints on the ground (Fig. 3).

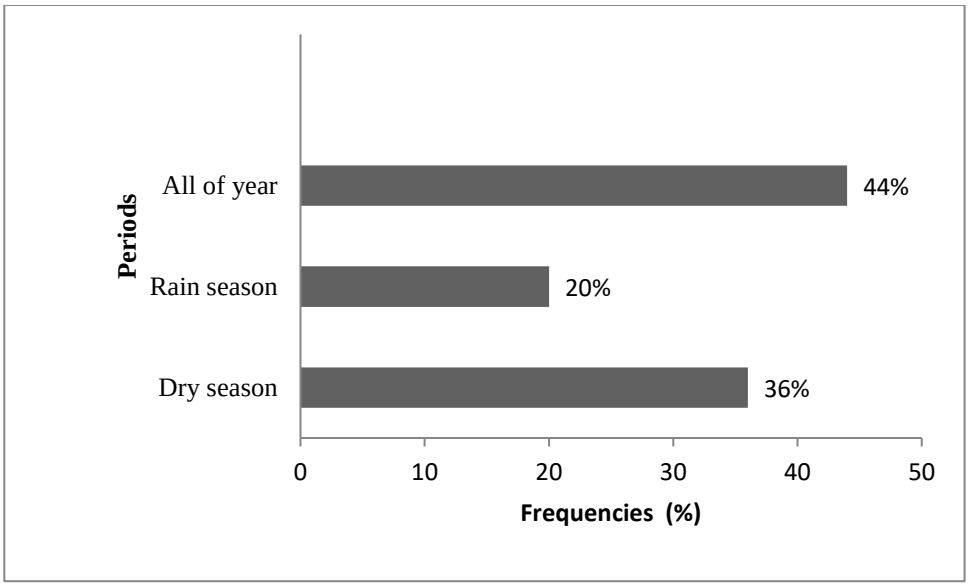

Figure 3. Frequencies of citations of favorable periods for hunting aardvarks for local hunters

Means used to kill the aardvark by local hunters

Different tools are used by the hunters in the study area to kill aardvarks. For 80% (n = 20) of the hunters surveyed, the tool most used in the community to kill aardvark is the use of shotgun, and for 20% (n = 5/25) the trapping technique (snare) which is a wire trap that catches the animal's neck.

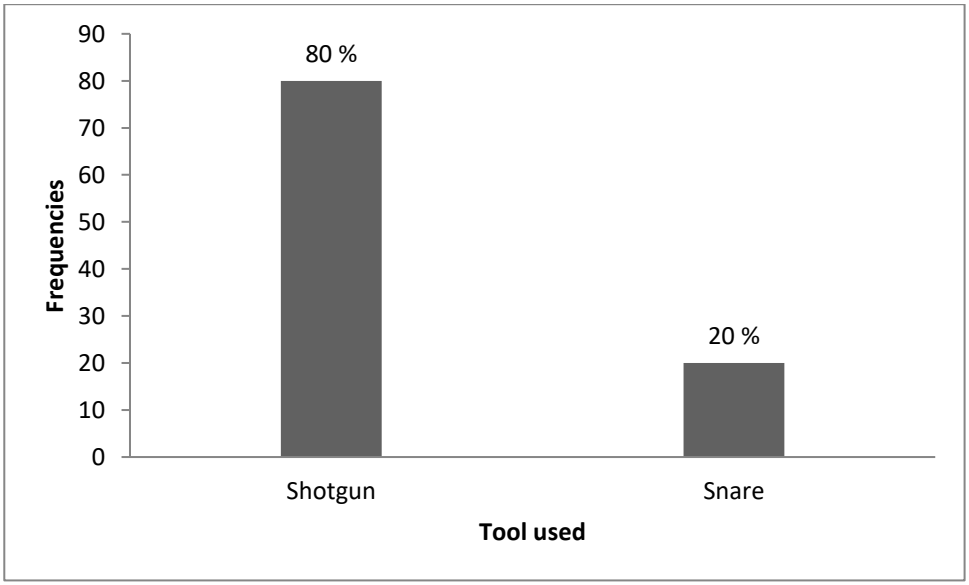

Figure 4. Tools used to kill aardvark according to hunters

Moment to hunt for aardvark according to local hunters

Aardvarks are slaughtered at different times by hunters in the MKPF, particularly when they are in their burrows and during their movement. Aardvarks are more slaughtered when moving with a citation frequency of 76% (n = 19/15) compared to 24% (n = 6/25) when they are in their burrow (Fig. 5).

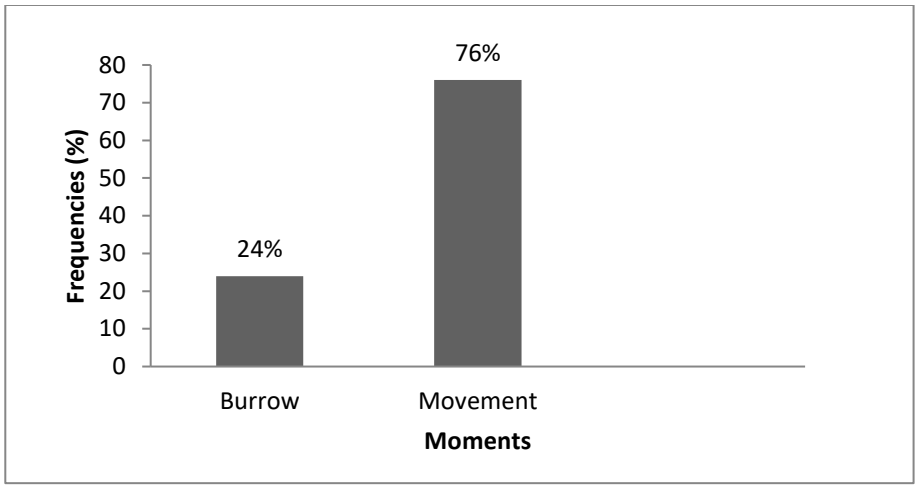

Figure 5. Citation frequencies of moments when aardvark is killed according to local hunters

As they move around, aardvarks are killed using tools (guns and traps). Less used, hunters have been made mixed groups kill aardvark in their burrows by digging the burrow until they reach the animal.

Hunters' perception of the aardvark hunting hours in MKCF

Hunting for aardvark is not practiced all day long. There are specific times when hunters kill the species as it is not active at all times. The hunting times indicated by the hunters are all nocturnal hours, which correspond to the customs of the species.

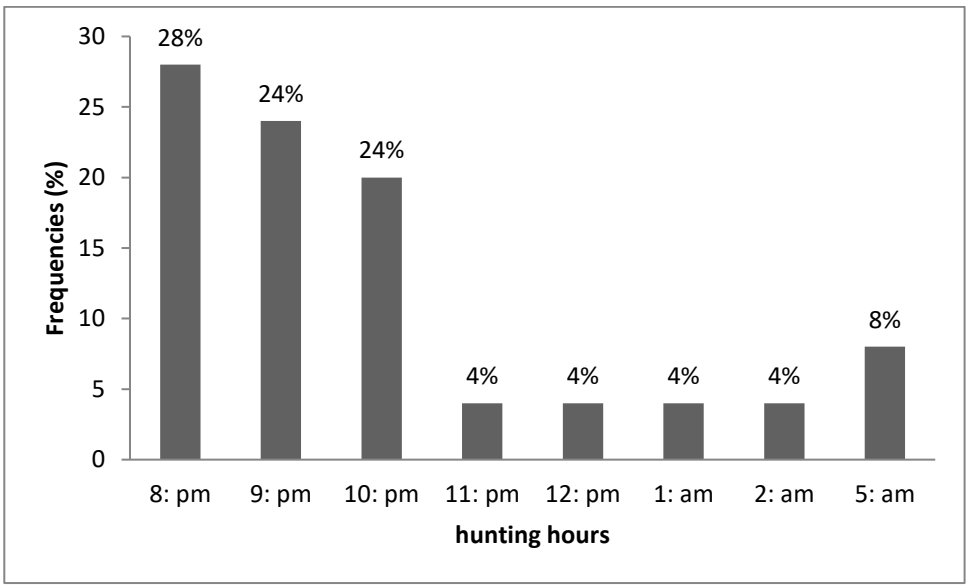

Figure 6. Favorable hours for the hunting of aardvark according to local hunters

The most cited times are 8 pm, 9 pm, 10 pm with respective frequencies of 28% (n = 7/25), 24% (n = 6/25) and 24% (n = 6/25) (figure 6). It should be noted that these times correspond to the times when the aardvark leaves its burrow to go to feed. The hunters therefore hide on the lookout in front of the animal's burrow to wait for these hours of outings to kill it with guns or set up snares so that they catch the animal once it comes out. The other hours of the night have a low frequency of citation because these hours correspond to the hours when the animal is encountered by chance.

Perception of local populations of the effects of poaching on the aardvark population

The knowledge of the people surveyed on the past and current abundance of aardvark provided information on the trend of the aardvark population (increase, stable or decrease) in the study area.

Table 2. Knowledge of those surveyed on the trends of the aardvark in MKPF.

	Abundant	Few abundant	Rare	Don't know	Total
Past (twenty years ago)	n=83	n=17	n=0	n=0	100
Currently	n=0	n=0	n=89	n=11	100

Twenty years ago for (n = 83) of those interviewed the aardvark was an abundant species and for (n = 17) few abundant in the MKPF. Currently for (n = 89) the aardvark is considered rare, and for (n = 11) don't know. This could suggest that the aardvark populations in the MKPF has been greatly reduced during the twenty last year and if nothing is done will likely see a local extinction of the species. Aardvark parts were observed in villages around the MKPF for local use, evidence of aardvark poaching in villages (Fig 7).

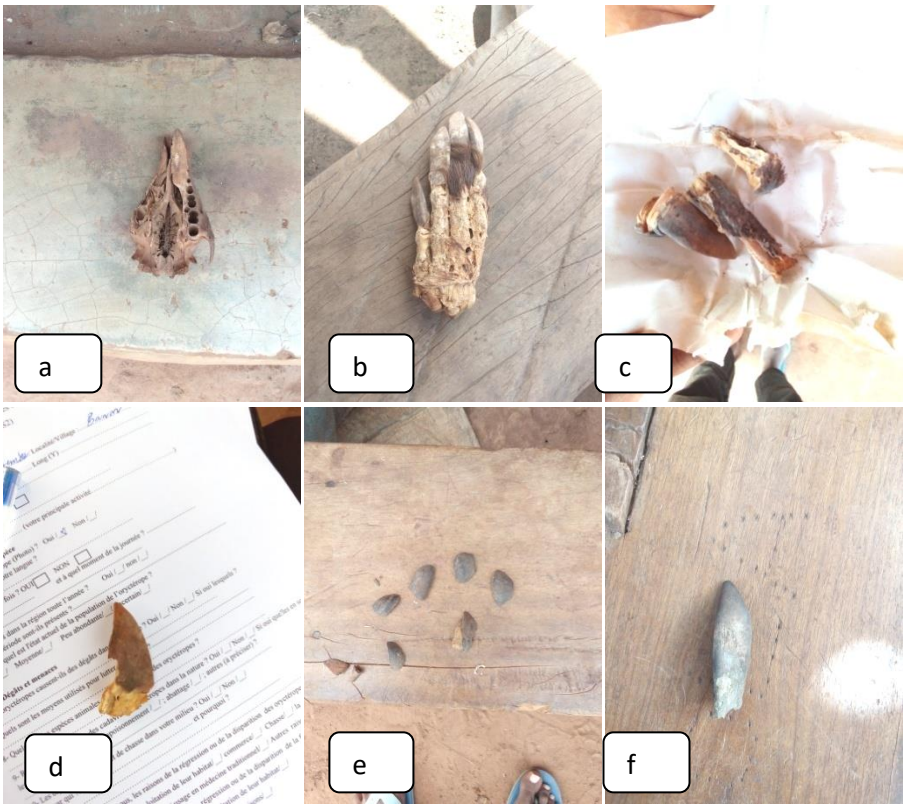

Fig 7. Aardvark Part observed during the surveys: skull (a); hand (b); claw and bone (c); claw (d, e, f).

All these parts of the animal were obtained according to the people who owned them after poaching in the MKPF. They also noted that it is currently rare to find parts of aardvarks due to the decline of its populations; it is why those they still have in their possession are jealously guarded.

Discussion

The obtained and analyzed data showed that aardvark is a species poached by the populations of the study area for main food and the use of these organs in traditional African medicine. Different hunting techniques are therefore put in place to poach the species mainly the use of weapons (shotgun) and trap (snare). According to Knapp (2012), Poverty stands as the major driver of illegal hunting as households vie for income and sustenance. The livelihoods of illegal hunters have been augmented considerably through revenue generated from bushmeat sales. Illegal hunters use bushmeat both for supplementing household protein and for economic gain. Aardvarks are killed for claws, teeth, and skins, and used in traditional medicine or for curios in South Africa (Taylor et al., 2016).

Illegal exploitation of wildlife for bushmeat is a widespread problem affecting many ecosystems, especially in the Tropics (Wilfred & Maccoll, 2015). Understanding the factors associated with such exploitation may help in the management of the problem by conservationists (Wilfred & Maccoll, 2015). Poaching has been one of the major threats to the survival of the rhinoceros, an endangered species in Nepal (Poudyal, 2005). In western Kenya, local hunters flooded burrows to kill aardvarks for food (Rathbun 2011). Poaching has been the major problem in Cameroon's protected areas due to the poverty level of villages around protected areas (Fuashi et al., 2019). Poachers were observed to use a diversity of poaching weapons with guns and wire snares being the principal weapons in use (Fuashi et al., 2019). According to Siako and Kedowide (2018), in the W Biosphere Reserve, the organs of aardvark are highly sought after by villagers for traditional mixtures of strength and combat. The practice of poaching in protected areas has a negative impact on the correct structuring of the age classes of fauna species, disrupts the age pyramid of populations, and will compromise, in the long term, the fertility of the populations that are subjected to it. Because of the abusive collection of sub-adults who will not have the opportunity to become adults, and to contribute to the development of the workforce (Tchabi et al., 2012).

Conclusion

The aardvark is a species suffering the effects of the practice of poaching in the MKPF for the consumption of its meat which is highly prized by the local populations and the use of these organs in traditional African medicine and for mystical beliefs. To prevent the local extinction of the aardvark, effective conservation measures are essential. This aardvark population lives in a protected area and it will be necessary to ensure, through conservation programs, the sustainable development of the population and the use of the species as a long-term food resource.

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