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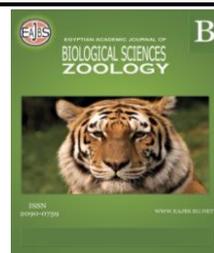


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A survey of Carnivora Diversity in Bisha district, Southwestern Saudi Arabia

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ABSTRACT

Studying the diversity of the mammalian carnivores that occupy the throne of the food pyramid is highly significant especially those living in hyper-arid desert ecosystems, where water resources are scarce. The major habitats of the study area were ecologically described and their mammalian fauna of order Carnivora were surveyed in the period from spring 2018 to summer 2021. This work represents the most extensive field survey that clarify the current situation and distribution of the carnivores of Bisha Governorate; it provides a checklist of Carnivora which includes 6 families represented by 12 species. The species recorded during the survey were: *Hyaena hyaena*, *Canis lupus arabs*, *Vulpes vulpes*, *Vulpes rueppellii*, *Vulpes cana*, *Felis silvestris*, *Felis margarita*, *Caracal caracal*, *Panthera pardus nimr*, *Mellivera capensis*, *Ichneumia albicauda* and *Genetta feline*. Canidae (n = 44) was the most common family. *Vulpes vulpes* (n = 17) recorded the highest number of events for any carnivores in the surveyed area followed by Arabian wolves *Canis lupus* (n = 15).

INTRODUCTION

Saudi Arabia is one of the most arid regions of the world and, like all arid ecosystems, the desert fauna of this region of Saudi Arabia has less expected of scientific research attention than forest ecosystems (Durant *et al.*, 2012). Although, Saudi Arabia extends on a vast size of Arabian Peninsula, and it has one of the most diverse topographies in this region, this variety reflected on the diversity of habitats and its biodiversity, but it's still needing more studies on the ecosystem and distribution of its terrestrial fauna, because it has not been explored well yet (Al-Sadoon *et al.*, 2016).

Generally, the mammals and especially carnivorous species are not well represented in the desert ecosystem including the region of Saudi Arabia. Our limited knowledge on the diversity and species richness of the desert ecosystem at this region come from the few contributions published books and literature on the Arabian terrestrial mammals by various authors for the last few decades. The Mammals of Arabia published by Harrison and Bates (1991) is the most comprehensive study in this field of the Arabian Peninsula, till now. This was preceded by many pioneers in terrestrial mammals including published descriptions of most comprehensive scientific literature on mammals of the Arabian region and the neighboring areas by Harrison (1964, 1968, 1972, 1981) and publication by Gasperetti *et al.* (1985) on the carnivores of Arabia. He followed it by

publishing a fine detailed discussion on fifteen carnivore species of Arabia (Gasperetti *et al.*, 1987). The most recent works were carried out by Bruce *et al.* (2016) who published a report on comprehensive mammalian diversity survey, and Paray and Al-Sadoon (2018) who recorded one hundred and forty mammals of fifteen different species belonging to nine families, collected during one-year survey period studying the diversity of land vertebrate fauna of the Turaif area at the northern province of Saudi Arabia.

Day by day the need increases for updating our information on the distribution and to document the species and species richness of carnivorous mammals in surrounding ecosystem to enhance the conservation efforts. The mammalian survey on carnivores in Bisha represented the first step to increase our growing knowledge of the regional mammalian fauna. The main aim of this study is to fill the gap in the list of the carnivorous mammals in this important area by updating information on mammalian distribution. A survey can be an important addition to understand the biodiversity in Bisha region and can provide important baseline information on mammals of this area.

MATERIALS AND METHODS

Study Area:

The study was carried out in different locations of the Bisha governorate at Aseer region of southwestern Saudi Arabia which is considered the largest district in the region. It lies between 18° 42' - 20° 00' N and 34° 20' - 44° 30' E, with a total area of 76,693 km², it stands at an altitude of approximately 610 meters (2,000 ft.) above sea level (Fig. 1). Bisha is a large valley in the southwest of the Arabian Peninsula, extending from the Hijaz Mountains to flow into Najd, and it is considered one of the tributaries of Wadi Al-Dawasir. It is characterized by its unique topography, geomorphology, and biodiversity, possessing several landscape types, such as Sandy habitat, Highland habitat, Mountain habitat, Sabkha habitat and Wetland habitat. In the study area the highest air temperature averages 32°C and lowest air temperature averages 9.1°C, whereas, mean annual precipitation 130 mm, while its highest in March and April 43 mm, and lowest in September and November 0 mm.

Sampling:

Field trips were carried out at different locations of the Bisha region in the period from March 2018 to August 2021. Most of the areas representing different Eco-geographical regions were visited four times systematically to sample the fauna of carnivorous mammal species under various weather conditions. In general, the most promising time for the sighting was between March and October when the environmental conditions were favorable for the presence of these animals. Active ground searches were undertaken throughout the study sites. The survey was principally opportunistic and based on observations using different techniques. The collection techniques for carnivorous mammal species based on using various sizes of live traps, pitfall traps (n=30), Sherman live traps for the type of medium sized and camera traps for other large species. Species were then classified according to field guide of mammals (Gasperetti *et al.*, 1987, Harrison and Bates, 1991, Nowak, 1999).

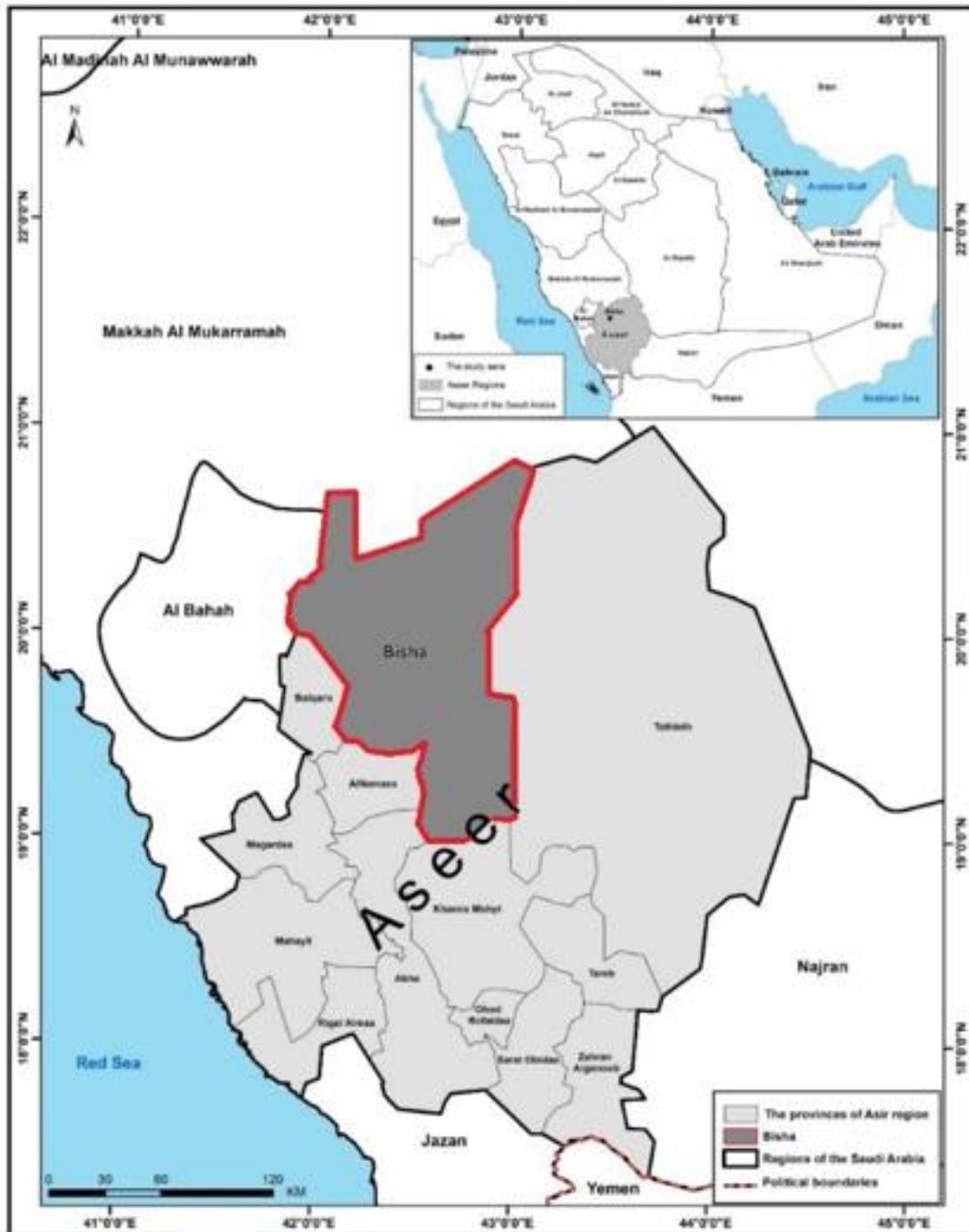


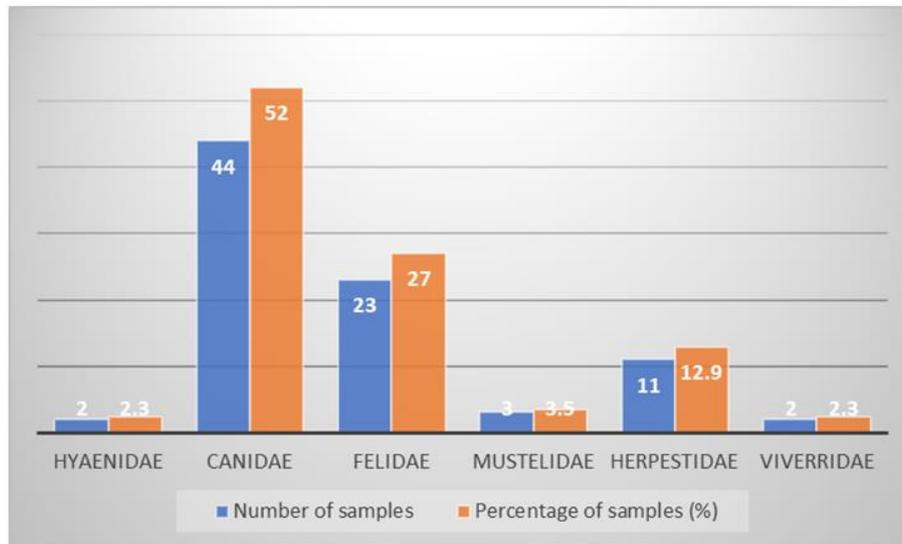
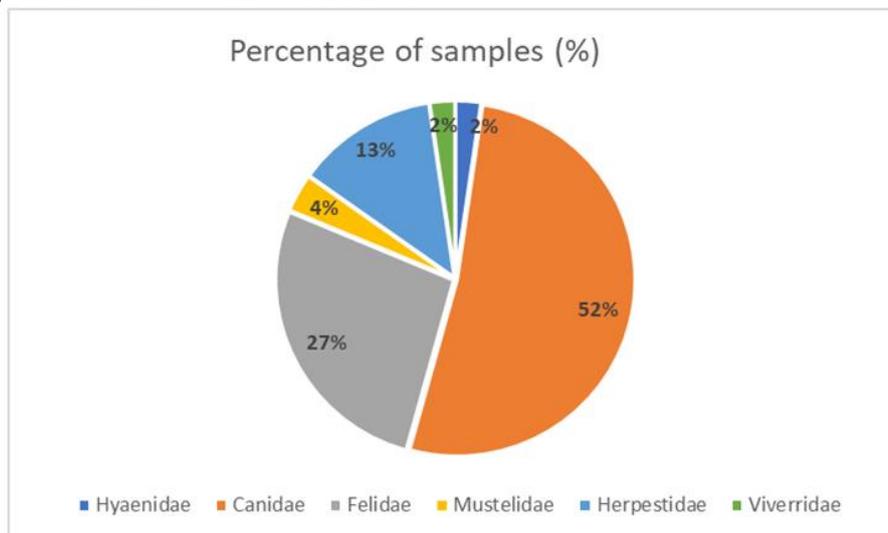
Fig. 1: The study area of Bisha governorate at Aseer region of southwestern Saudi Arabia.

RESULTS AND DISCUSSION

Within the study, eighty-five samples of twelve different carnivore species belonging to six families: Canidae, Felidae, Hyaenidae, Mustelidae, Herpestidae, and Viverridae were collected during three-year survey period in Aseer region of southwestern Saudi Arabia (Table 1, Figs. 2 and 3).

Table 1: Carnivore samples collected during three-year survey period in Aseer region of southwestern Saudi Arabia.

Family	Species	Habitat	Number of samples	Percentage of samples (%)
Hyaenidae	<i>Hyaena hyaena</i>	Mountains and Valleys	2	2.3
Canidae	<i>Canis lupus arabs</i>	Common	15	17.7
	<i>Vulpes vulpes</i>	Common	17	20
	<i>Vulpes rueppellii</i>	Sands and Sandy Plains	9	10.6
	<i>Vulpes cana</i>	Mountains, Hills and Valleys	3	3.5
Felidae	<i>Felis silvestris</i>	Mountainous Forests	14	16.5
	<i>Felis margarita</i>	Sands and Sandy Plains	6	7.1
	<i>Caracal caracal</i>	Mountains, Hills and valleys	2	2.3
	<i>Panthera pardus nimr</i>	Mountainous Forests	1	1.2
Mustelidae	<i>Mellivera capensis</i>	Plains and Hills	3	3.5
Herpestidae	<i>Ichneumia albicauda</i>	Mountains and Valleys	11	12.9
Viverridae	<i>Genetta genetta</i>	Mountainous Forests	2	2.3

**Fig.2:** Number and percentage of carnivore families collected during survey period from Aseer region of southwestern Saudi Arabia.**Fig. 3:** Percentage of carnivore families collected during survey period from Aseer region of southwestern Saudi Arabia.

Family Canidae:

The Canidae is a family of dog-like carnivores (dogs, wolves, jackals, foxes, etc.), it is an important component of the open-habitat as desert and it includes 16 genera and 36 species (Nowak, 1999). Family Canidae was the most common family by 44 specimens which represented four species. *Vulpes vulpes arabica* (n = 17) recorded the highest number of events for any carnivores in the surveyed area followed by Arabian wolves *Canis lupus* (n = 15) (Fig. 4).

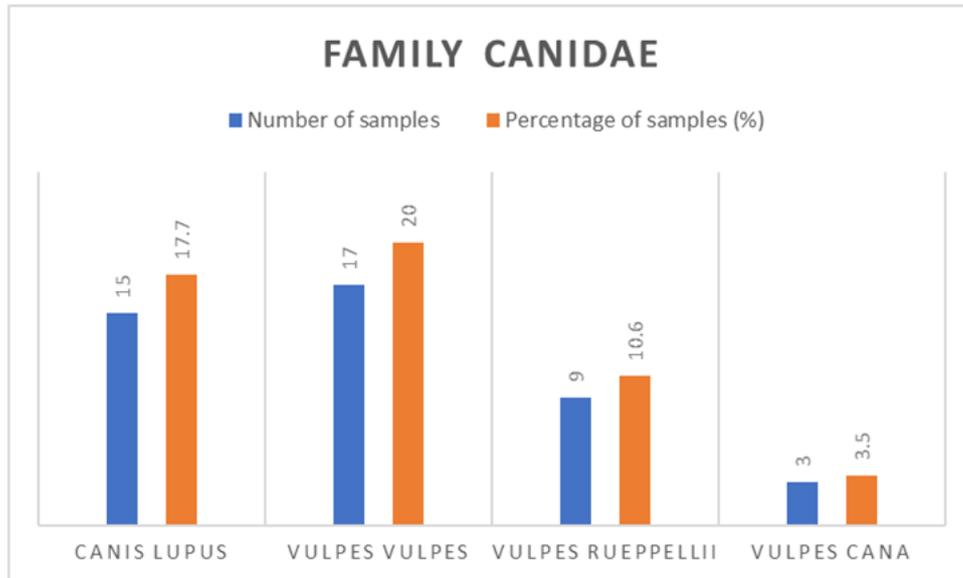


Fig. 4: Number and percentage of family Canidae species were collected during survey period from Aseer region of southwestern Saudi Arabia.

This family is represented by four species:

***Canis lupus arabs* Pocock, 1934:**

The grey wolf *Canis lupus* is one of the most widely distributed terrestrial mammal that lived on earth at one time point (Goldman, 1944), originally inhabiting variety of terrestrial habitats. Arabian wolves *Canis lupus arabs* are the largest carnivore in the peninsula and the regional IUCN assessment lists the species as "Endangered" (Mallon and Budd, 2011). The latest synthesis of wolf distribution records illustrates that they were historically widespread within the Kingdom of Saudi Arabia (Cunningham and Wronski, 2010) and although verifiable records are sparse, there is a general acceptance that the population is declining. Despite legal protection, there are no focused conservation efforts for Arabian wolves, and they persist despite active persecution and loss of natural food sources.

Fifteen specimens of Arabian wolf *C. lupus arabs* were recorded in the surveyed area and represented 17.7% of total records during the survey (Table 1). They are characterized by its long limbs with brushy tail not reach to the heel, these animals, dorsum, flanks and upper parts of legs are generally grayish yellow and black due to the black-tipped hairs with grayish sub-terminal bands and yellowish bases. In the mid-dorsal region slightly darker appearance. Muzzle and back of ears light grayish yellow. Frontal area and crown grayish yellow spotted with black. Hairs on side of neck grayish yellow with black tipped, belly and inside of legs whitish to grayish yellow. Prominent blackish stripe along anterior edge of foreleg, tail similar to the dorsum but with more black. It is a nocturnal living carnivore.

***Vulpes vulpes arabica* Thomas, 1902:**

The red fox *Vulpes vulpes* is the most widespread wild carnivore in the world

with a near universal distribution. The species is remarkably adaptable, being able to occupy a great variety of habitats throughout its vast world range. It is highly polymorphic with several subspecies having been described (Wilson and Reeder, 2005). Larivière and Pasitschniak (1996) recognized 44 subspecies of the red fox although many are doubtful. Forty-four subspecies are currently recognized (Wilson and Reeder, 2005).

Seventeen specimens of Arabian red foxes *V. vulpes arabica* were recorded in the surveyed area and represented 20% of total records during the survey (Table 1). Arabian Red foxes were recorded by the highest number of events for any carnivores in the surveyed area, Arabian red foxes inhabiting a wide range of habitats including desert areas, plains, valleys and near residential areas. They are the largest of the *Vulpes* species. Coloration of red foxes ranges from pale yellowish red to deep reddish brown on the upper parts and white, ashy, or slaty on the underside. The lower part of the legs is usually black and the tail usually has a white or black tip. Two color variants commonly occur. Red foxes are solitary animals and do not form packs like wolves. They are essentially omnivores and a nocturnal living carnivore. They are common carnivores and listed as "Least Concern" by the IUCN.

***Vulpes rueppellii* (Schinz, 1825):**

Rueppell's foxes *Vulpes rueppellii* are widespread. They are found in desert regions of North Africa and the Arabian Peninsula, from as far east as Pakistan, to as far northwest as Jordan. Subspecies are often named based on their geographical distribution (Larivière and Seddon, 2001). They are highly adapted to their desert habitats. They inhabit a wide range of habitats but are most common in areas with sandy or dry, stony desert substrate. Due to competition with red foxes, Rueppell's foxes have been pushed to more extreme habitats that red foxes do not dominate (Cuzin and Lenain, 2004; Kingdon, 1997).

Nine specimens of Arabian Rueppell's foxes *V. rueppellii* were recorded in the surveyed area and represented 10.6 % of total records during the survey (Table 1). Arabian Rueppell's foxes are small foxes with a predominately sandy-colored coat, they are slender and has a long, bushy tail with a white tip. The legs and muzzle are both short. The dominate color is "buff", which is a sand-like color, but there are white hairs that make up the dense undercoat. Gray markings on the face are quite diagnostic of this fox (Alderton, 1994; Diller and Haltenorth, 1980). Rueppell's foxes are sociable and nocturnal, sometimes venturing out at dawn and dusk. They are dwelling rocky and sandy plains, feeding on almost anything that crosses their path. They are omnivores, partaking in anything from insects and small mammals to roots (Lindsay and MacDonald, 1986). They are common carnivores and listed as "Least Concern" by the IUCN.

***Vulpes cana* (Blanford, 1877):**

Blanford's fox, *Vulpes cana*, is found in the mountainous regions of the middle east to Afghanistan. They are known from Iran, Pakistan, Afghanistan, Turkistan, Palestine, Oman, United Arab Emirates, and Saudi Arabia (Yom-Tov and Geffen, 1999), its home range extended to south Eastern Desert of Egypt (Saleh *et al.*, 2018).

Three specimens of Blanford's foxes, *V. cana*, were recorded in the surveyed area and represented 3.5 % of total records during the survey (Table 1). Members of this species are small foxes with large ears and long, bushy tails with long, dark guard hairs. The snout is slender. Coloration is black, brown, or grey, and is sometimes blotchy. The flanks are lighter than the back, which has a black stripe running down it, and the underside is yellow. The tip of the tail is usually dark but can be white. *V. cana* is found in semi-arid steppes and mountains. This species prefers areas with steep, rocky slopes,

cliffs, and canyons (Yom-Tov and Geffen, 1999). Blanford's foxes are strictly nocturnal, solitary hunters. They do not exhibit a change in their daily activity with season. They generally become active soon after dusk and are active throughout the night (Geffen *et al.*, 2005; Geffen *et al.*, 1992; Nowak, 1999). They remain fairly common throughout their range and listed as "Least Concern" by the IUCN.

Family Felidae:

Felidae is the cat-like mammals, the most morphologically specialized hunters of all carnivores, unlike other carnivores, felids rely almost exclusively on prey that they have killed themselves. They are agile hunters, hunting mostly at night, with diets consisting of fresh meat or carrion. Felids are found nearly in all terrestrial habitats except treeless tundra and polar ice caps. Most species are habitat generalists and can be found in a wide range of environments (Clutton-Brock and Wilson, 2001; Grzimek *et al.*, 2003; Vaughan *et al.*, 2000). Family Felidae was the second most common family by 23 specimens which represent four species, *Felis silvestris*, *Felis margarita*, *Caracal caracal* and *Panthera pardus nimr* (Fig. 5).

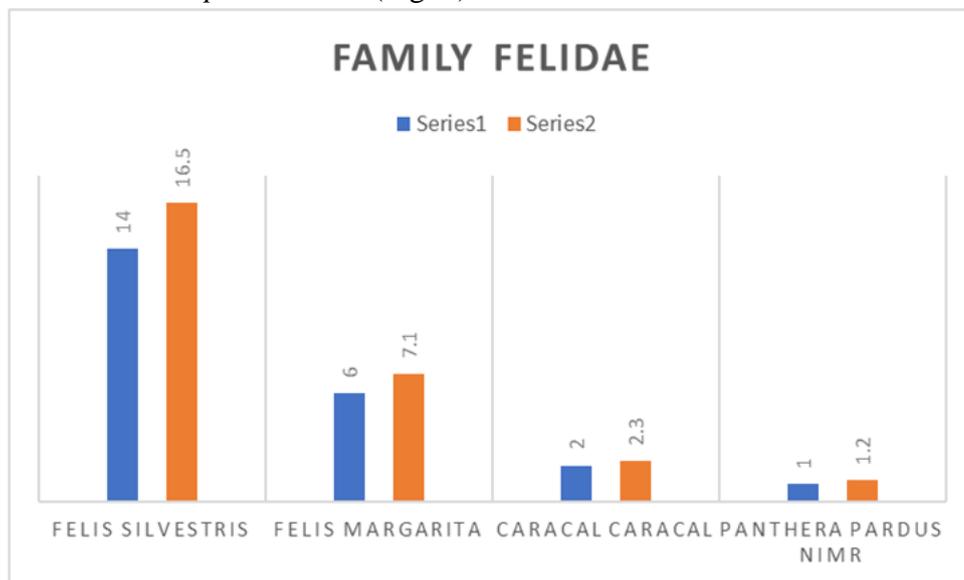


Fig. 5: Number and percentage of family Felidae species collected during survey period from Aseer region of southwestern Saudi Arabia.

This family is represented by four species:

***Felis silvestris* Schreber, 1777:**

Wild cats are found throughout continental Europe, southwestern Asia, and the savannah regions of Africa. Wild cats *Felis silvestris* are found in appropriate habitat throughout Africa and the Arabian Peninsula. Wild cats primarily inhabit scrub desert, but can be found also in a wide variety of habitats. They are absent from alpine and steppe grasslands. They can be found up to 3000 m in mountains and are usually found in areas near water sources.

Fourteen specimens of Arabian Wild cat *F. silvestris* were recorded in the surveyed area and represented 16.5 % of total records during the survey (Table 1). They are generally grey-brown with bushy tails and a well-defined pattern of black stripes over their entire body. Their fur is short and soft. Their coloration is similar to that of a domestic cat and makes them difficult to see in their forested habitats. Wild cats are usually active at night or at dusk and dawn, although they are also active during the day, particularly in areas with little human disturbance. Asiatic wild cats in particular are often active during the day. They are primarily solitary animals. They remain fairly

common throughout their range and listed as "Least Concern" by the IUCN.

***Felis margarita* Loche, 1858:**

Sand cat *Felis margarita* is found in three distinct areas of the world: Sahara Desert of Africa, the Arabian Peninsula and parts of Central Asia (Cunningham, 2002). Six specimens of sand cat *F. margarita* were recorded in the surveyed area and represented 7.1 % of total records during the survey (Table 1). Members of this species are sand dwelling, occurring in very arid, dry habitats such as deserts. They are found in desert habitats ranging from plains with little vegetation to rocky valleys with shrubs and trees. They live in extreme conditions with daily surface temperatures reaching up to 51°C during the daytime, while nighttime temperatures can drop as low as -0.5°C, hence they are generally nocturnal cat (Cunningham, 2002; Goodman and Helmy, 1986).

F. margarita is the smallest of all wild cats, their most distinctive characteristic is their large ear pinnae, which protect the ears from blowing sand. The most highly developed senses of this species are hearing and smelling. Thick fur of medium length covers the body and protects it from the harsh nighttime temperatures. Coat colors range from pale yellow to grey. They have dark brown to black stripes covering the tail and limbs and the eyes are accented with reddish-orange stripes, the chest and chin are always white, and the wiry, black fur covers the pads of their feet, protecting them from the desert's hot surfaces (Garman, 1997). Sand cats are listed as "Near Threatened" according to the IUCN World Conservation Union.

***Caracal caracal* (Schreber, 1776):**

Caracal caracal is distributed over much of Africa, Central Asia and southwestern Asia. Their range limits are the Saharan desert and the equatorial forest belt and correspond with the distribution of several small desert gazelles. Caracals occupy diverse habitats. Caracals are typically found in woodlands, thickets, and scrub forest, plains and rocky hills are also common habitats. An arid climate with minimal foliage cover is preferred (Breitenmoser et al., 2008; Kingdon, 2004; Sunquist and Sunquist, 2002).

Two specimens of sand cat *C. caracal* were recorded in the surveyed area and represented 2.3 % of total records during the survey (Table 1). Caracals have brown to red coats, with color varying among individuals. Females are typically lighter than males. Their undersides are white. The face has black markings on the whisker pads, around the eyes, above the eyes and faintly down the center of the head and nose. The trademark features of caracals are their elongated and black-tufted ears. The legs are relatively long and the hind legs are disproportionately tall and well-muscled, the tail is short. Caracals are solitary, primarily nocturnal, caracals can be seen during the day, especially in undisturbed regions (Grzimek et al., 2003; Kingdon, 2004; Sunquist and Sunquist, 2002). They are fairly common throughout their range and listed as "Least Concern" by the IUCN.

***Panthera pardus nimr* (Hemprich and Ehrenberg, 1833):**

There are nine subspecies of *Panthera pardus* distributed in different regions in the world; the Arabian leopard *Panthera pardus nimr* is distributed in Arabia (Breitenmoser et al., 2008).

One specimen of the Arabian leopard *P. pardus nimr* was seen by the local community and its traces were recorded in the highlands southwestern Bisha. The Arabian leopard inhabits a variety of terrain. It occupies mountainous, scrub, and desert habitats, many sites were found to have shrubs, trees and waterholes, because these sites provide habitat for the leopard's prey, such as hyrax, ibex and others (Al-Johany, 2007). The Arabian leopard has short legs relative to their long body. It has a broad head, and their massive skull allows for powerful jaw muscles. It has small round ears. The

Arabian leopard's coat varies from pale yellow to deep golden, tawny or grey and is patterned with rosettes. It has solid black spots on its chest, feet, and face and rings on its tail. Each individual has a unique coat, which can be used for identification (Hunter and Hinde, 2005; Nowell and Jackson, 1996). Leopards are solitary, nocturnal carnivores. When hunting, leopards move with a slow, crouching walk. They can run at bursts of up to 60 km/hour, jump more than 6 m horizontally and 3 m vertically (Friedman and Case, 2002; Macaskill, 2009). It has been listed as "Critically Endangered" according to the IUCN Red List.

Family Hyaenidae:

The family Hyaenidae contains four species, found in Africa, South Western Asia, and India. Three species, which include the animals we usually think of as hyaenas, hunt and scavenge large vertebrate prey. They have a bushy tail, rounded ears, and three of the four species have stripes or spots on their coats and the brown hyaena is unmarked. This family is represented by only one species:

***Hyaena hyaena* (Linnaeus, 1758):**

Striped hyena, *Hyaena hyaena* is found in Northern and Eastern Africa, the Middle East and India. The striped hyena lives in arid, mountainous regions with scrub woodland. It dens in rocky hills, ravines, and crevices (Fox, 1971; Van Aarde, 1988). Two specimens of striped hyena *H. hyaena* were recorded in the surveyed area and represented 2.3 % of total records during the survey (Table 1). They are long-haired hyenas with large, pointed ears. The striped hyena can erect the long hair on its mane and appear 38% bigger, which it does when it feels threatened. They are gray to straw-colored with a black muzzle and black stripes on their head, torso, and legs. The striped hyena is generally considered solitary, the striped hyena is predominantly a scavenger; its diet is consisting mainly of carrion and human refuse. It scavenges large and medium-sized mammals, such as zebras, wildebeests, gazelles, and impalas, even eating bones from carcasses if the meat has been picked off (Fox, 1971; Van Aarde, 1988). It has been listed as "Near Threatened" according to the IUCN Red List.

Family Mustelidae:

Mammals of family Mustelidae are described by elongate bodies with short legs and rostrum. They are tetrapod animals with five fingers limbs and the first one (Thumb) on the front end grow well and in contact with the ground. The fingers of Mustelidae have non-retractile claws. This family is represented by only one species:

***Mellivora capensis* (Schreber, 1776):**

Honey badger, *Mellivora capensis*, has an expansive geographic range, spanning most of sub-Saharan Africa as well as the Arabian Peninsula, the Indian peninsula and parts of the western Asian nations. Honey badgers are terrestrial animals that inhabit a wide variety of habitats, including tropical and subtropical green forests, open woodlands, riparian forests or grasslands, arid steppes, rocky hills, and deserts. Honey badgers occupy elevations ranging from sea level to 4,050 meters. They require habitats with burrows, rock crevices, or other places in which they can shelter. (Begg *et al.*, 2008; Gupta *et al.*, 2012; Rosevear, 1974; Vanderhaar and Hwang, 2003).

Three specimens of honey badger *M. capensis*, were recorded in the surveyed area and represented 3.5 % of total records during the survey (Table 1). Members of this species are characterized by having coloration varies slightly, in general the ventral half of the body is a dark black, with an upper mantle that is either grey or bright white. The lighter coloring extends the entire length of the body, stopping at the base of the tail. The fore feet are strong and wide, with large claws that are useful for grasping prey and running. In contrast, the hind feet are small with short claws. Honey badgers have very thick, loose skin which prevents a predator from getting a firm grasp on them and

enables them to easily twist and bite the attacker (Begg *et al.*, 2003; Rosevear, 1974; Vanderhaar and Hwang, 2003; Verwey *et al.*, 2004). Honey badgers are solitary and nomadic. They occupy a large range, moving around daily to forage. The IUCN Red List identifies the species as "Least Concern".

Family Herpestidae:

Family Herpestidae or Mongooses are small carnivores, tend to have small heads, pointed snouts, and short, rounded ears that are not erect or pointed. Many have anal glands that secrete a foul-smelling substance. Male herpestids have a baculum. Most herpestids are predators, feeding on a wide range of animals including small mammals and birds, reptiles, a wide variety of insects, and crabs. Their ability to kill poisonous snakes such as cobras and adders is legendary. Their success is due to speed and agility, for they are not immune to the snake's poison. Some species also include vegetable material in their diets (Feldhamer *et al.*, 1999; Vaughan *et al.*, 2000). This family is represented by only one species:

***Ichneumia albicauda* (G. Cuvier, 1829):**

White-tailed mongooses *Ichneumia albicauda* are found in most areas of sub-Saharan Africa, areas of southern Arabia and found on Farasan Kabir Island in the Red Sea. Within their known geographic range they are fairly common. White-tailed mongooses are found in a variety of terrestrial habitats including savannahs, woodlands and grasslands, but they are most commonly found in woodland areas with substantial coverage (Admasu *et al.*, 2004; Estes, 1991).

Eleven specimens of white-tailed mongooses *I. albicauda*, were recorded in the surveyed area and represented 12.9% of total records during the survey (Table 1). Members of white-tailed mongooses are a rather large species of mongoose, they have gray or gray-brown under fur, which is thickest along their tail and hindquarters. Projecting out from them under fur are long black and white banded guard hairs. The terminal end of the tail is normally pure white. White-tailed mongooses have 5 toes on each foot, with stout curling claws (Estes, 1991; Taylor, 1972). White-tailed mongooses are normally solitary and primarily nocturnal they are more active on cloudy overcast nights than on clear nights. The IUCN Red List identifies the species as "Least Concern".

Family Viverridae:

Viverrids are medium-sized carnivores with long bodies and relatively short legs. Most species have relatively small heads with short, pointed, erect ears and a relatively long, pointed muzzle. Most species have stripes, spots, or bands on their bodies, and their tails are often ringed with contrasting colors. Their claws can be retracted. Most have perianal glands that produce a strong-smelling substance; in some species the odor is sufficiently potent to ward off predators. Most viverrids are nocturnal hunters, feeding on small vertebrates (including carrion), insects, and other invertebrates including worms, crustaceans, and molluscs (Feldhamer *et al.*, 1999; Vaughan *et al.*, 2000). This family is represented by only one species:

***Genetta genetta* (Linnaeus, 1758)**

The common genet *Genetta genetta* inhabits a wide range, including savannah parts of sub-Saharan Africa, North Africa, Mediterranean Islands, Arabia, Oman and Yemen. This species favors dry areas like Mediterranean woodland and rocky hills where crevices in the trees and rocks provide food, shelter and security from predators. These animals tend to live where there is a plentiful supply of its favorite prey, the wood mouse (Grzimek, 1990; Nowak, 1999).

Two specimens of genets *G. genetta*, were recorded in the surveyed area and represented 2.3 % of total records during the survey (Table 1). Genets are long, slim carnivores with a tail usually at least as long as the body. They appear catlike, except for

their longer faces. They usually have a dark spotted or marbling pattern over a cream to buff colored background. Their fur is incredibly soft. They have semi-retractable claws. They are extremely flexible and can enter very small spaces. Genets are carnivorous and eat most small animals that they can catch, such as rats, mice, insects, small reptiles, and birds (Grzimek, 1990; Nowak, 1999). The IUCN Red List identifies the species as "Least Concern".

Conclusion

This study establishes a baseline for updating our information on the distribution and species richness of carnivorous mammals in Bisha ecosystems to enhance the conservation efforts. The mammalian survey on carnivores in Bisha is represented by eighty-five samples of twelve different carnivore species belonging to six families: Canidae, Felidae, Hyaenidae, Mustelidae, Herpestidae, and Viverridae. Carnivore samples were collected during three-year survey period in Aseer region of southwestern Saudi Arabia.

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