Status of five species of predators in Thar Desert, Jodhpur District, Rajasthan (India)

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Abstract
Five species of carnivores were sighted and studied. Distribution and status of the Asiatic jackal (*Canis aureus aureus* Linn), wolf (C*anis lupus pallipes Sykes*), striped hyaena (*Hyaena hyaena* Linn), desert fox (*Vulpus vulpus Pusilla*) and the common mongoose (Herpestes edwardsii Geofroy) are described. Of 19 species of carnivore recorded in India, 7 species have been earlier reported in this area. But three species-jungle cat (*Felis chasu Gray*), caracal (*Felis caracal Fischer*) and the common civet *(Viverricula indica*) have not been sighted during present study. All the five species sighted here are regarded rare and kept under schedule I of the Wildlife (Protection) Act-2003. The numbers of these five predators have been declining steadily due to habitat destruction and consequently, the distributional ranges of these species have been reduced. They are in need of complete protection. The present studies are near Osian village of Jodhpur district in Rajasthan state became very important and a suitable site for study these species in details of ecology and behaviour. Our recommendation that such important patches of rare wildlife species should be monitored regularly and state government should take some steps for conservation and preservation of such kind of reserves of endangered species of carnivores with the cooperation of the local people. The provisions of the Wildlife (Protection) Act should be strictly imposed against illegal hunting of these animals.
Key Words: Distribution, status, Predators, Rajasthan

Introduction
The Thar desert has resulted from geo-tectonic and climatic changes in the past and almost continues into the 'Sahara' through middle eastern deserts. The biodiversity of the Thar desert is important from biogeographic point of view as it presents an admixture of Palaearctic and Indo-Malayan elements (Prakash, 1974).

The 'Thar' desert is a biologist's paradise with respect to the types of wild animals in general and the carnivores in particular. The carnivores of India as well as all the other large mammalian species have suffered greatly with the introduction of motor vehicles and firearms at the beginning of 20th century, and from habitat destruction.

Nineteen species of carnivores have been recorded from India and during the late 19th century, the Thar desert, in the Northwest part of India, supported excellent mammalian faunal diversity due to low human density (Blanford, 1888-91; Jerdon, 1874; Prater, 2005). And ten of these 19 species of carnivores have been reported in this desert area out of 45 mammalian species (Chhangani and Mohan, 2010). But for the last three decades only seven species viz., Asiatic jackal (*Canis aureus aureus*), wolf (*Canis lupus pallipes*), striped hyaena (*Hyaena hyaena*), desert fox (*vulpus vulpus*), Indian fox (*Vulpes bengalensis*), jungle cat (*Felis chaus*), caracal (*Felis caracal*) and the common mongoose (*Herpestes edwardsii*), are reported (Rajpurohit, 1988). As a result of almost continuous hunting and poaching, and due to the gradual degradation of their preferred natural habitats, the number of species and the individuals of particular species have been reduced.

Study Area
Sixty percent of the desert is located in northwestern part of Rajasthan state. The 'Thar' desert is situated in the west of the Aravali ranges and lies between 24^0 and 35^0 5' N latitude and 70^0 7' and 76^0 2' E longitude.(Husain, 2010) The present human population of this arid region is 22.57 million (census data 2001, GOI) and the density is 133 persons per km^2, making the 'Thar' one of the most densely populated deserts in the world (Baqri and Kankane 2001). Along with the human population increase, there has also been a steady increase in the presence of livestock and the present density is 145 animals per km^2. Though the desert environment is inhospitable for plants, wild and domestic animals and human beings. Yet it possesses a spectacular and vivid fauna and flora.

The study area falls near village Osian of Jodhpur district in Rajasthan state. Today, Osian is a developing town of about 30-35 thousands inhabitants, situated about 62 km. north of Jodhpur and lies at 328.8 meters above sea level; 26^0 45' N latitude and 73^0 02' E longitude. The area encompasses sand dunes, sandy plains, sand hills and together constitute an open scrub forest. And, this semi arid habitat receives about 20 to 35 cm of annual rainfall and 90% of its occurs during monsoon period i.e. July to September. The temperature ranges from 0^0 C in December-January to as high as 48^0 C in May-June. The relative humidity ranges from 25 to 60 percent. The natural vegetation is open scrub dominated by xerophytic plants such as *Prosopis cineraria*, *Acacia senegal*, *Caparis decidua*, *Prosopis juliflora*, *Tecomella spp.*, *Calotropis procera*, *Calligonum polygonoides*, *Ziziphus spp*. Recently few agriculture farms (tube well-irrigated) have been raised. Over 30 species of mammals have been recorded from this region of desert. Apart from carnivores likes Asiatic jackal, wolf, hyaena, desert fox, Indian fox and the common mongoose, other wild animals in the area include Indian gazelle (*Gazella bennetti*), blackbuck (*Antelope cervicapra*), blue bull or nilgai 'Rojh' (*Boselaphus tragocamelus*), jungle hare (*Lepus nigricollis*), squirrel (*Funambulus pennanti*) hedgehog (*Hemiechinus auritus*), Indian porcupine (*Hystrix indica*), common bat (*Rhinopoma spp.*) and fruit bat (*Pterophus giganteus*). Among birds, Indian peafowl (*Pavo cristatus*), blue rock pigeon (*Columba livia*), ring dove (*Streptopelia decaocto*), red turtle dove (*Streptopelia tranguebarica*), grey partridge (*Francolinus pondicerianus*), Indian sandgroose (*Pterocles exustus*), pariah kite (*Milvus migrans*), house sparrow (*Passer domesticus*), house crow (*Corvus splendens*), common myna (*Acridotheres tristis*), white cheeked bulbul (*Pynonotus leneogenys*), red vented bulbul (*Pynontus cafer*), sun bird (*Nectarinida asiatica*), common babbler (*Turdoides caudatus*), large grey babbler (*Turdoides malcolmi*), Indian robin (*Saxicoloides fulicata*), red wattled lapwig (*Vanellus indicus*), white backed vulture (*Gyps bengalensis*), black drongo (*Dicrurus adsimilis*), eagle (*Circactus gallicus*), cuckoo (*Cuculur micropterus*), parakeet parrot (*Psittacular cyanocephala*), common owl (*Bubo bubo*), spotted owlet (*Athene brama*), scavenger vulture (*Nephron percnopterus*), bee eater (*Merops spercilliosus*), cattle egret (*Bubulus ibis*), etc.

The reptiles found in this area are calotes (*Calotes versicolor*), uromastix (*Uromastix hardwicki*), varanus or moniter lizard (*Varanus bengalensis*), house gecko (*Hemidactylus flaviviridis*), sand lizard (*Acanthodactylus cantonis*), sand fish (*Ophiomorus tridactylus*), cobra (*Naja naja*), viper (*Echis carinatus*), Russel's viper (*Vipera russelli*), earth snake 'dumai' (*Eryx johnii*) and Dhaman

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Fig 1. Location of Study Site in Rajasthan

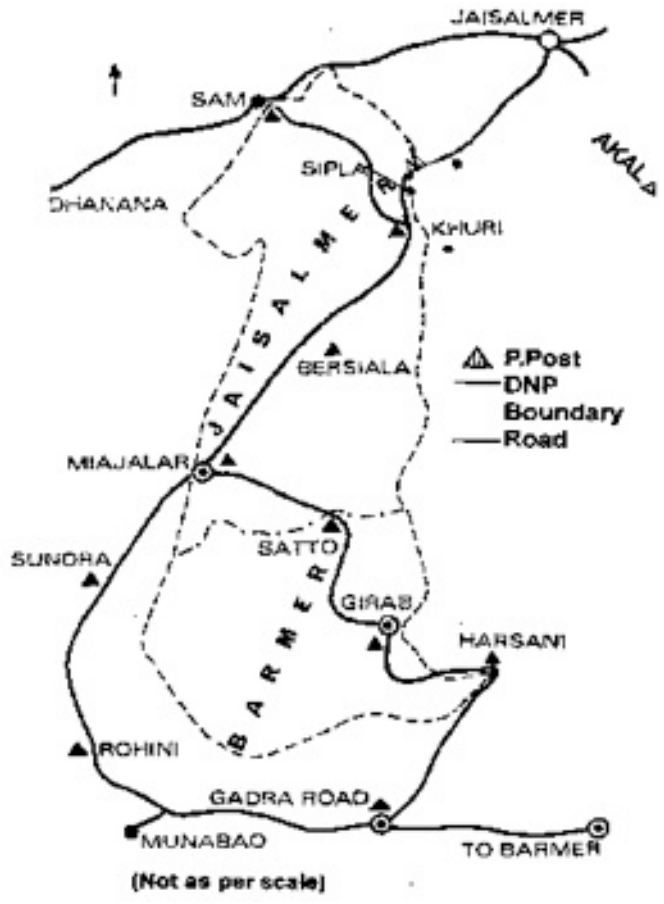

Fig 2. Desert National Park

(*Ptyas mucosus*). During rains Agma toad (*Phrynocephalus sp.*) could be seen.

Material and Methods

The study area near town Osian, comprises of a 3 to 2 km. strip of about 5 km^2, 3-5 km. south to town Osian. The area having open scrub, plains, hills and a few irrigated farms is very important from wildlife species point of view. All the above five carnivore species have been sighted very often. Many of the times jackal or desert foxes corpses found crushed on road (Jodhpur-Osian).

The number of particular species individuals and their sightings at a distance from the point were recorded. A 10 x 50 mm prismatic field binocular was used for direct observation of the animals in the field. Scanning and *Ad Libitum* methods (Altmann, 1974) were used. Dens of hyaena and wolves were identified with the help of local people especially the shepherds being victims as their goats and sheep are killed/dragged by hyaena and or wolves.

Observation and Results

In our survey of winter-2009 in the study area, we encountered and observed six different sightings of jackals. There were two duos, three packs of 3-4 individuals and a solitary animal. We had also heard night crying of jackals during late evenings. The jackals are omnivorous and eat vegetables, fruits, birds, small mammals and carrion.

We have observed wolves on nine incidences, four of solitary animal, three duo and two packs of 3 animals each. Wolves do kill and eat sheep and goats killing sometimes more than they can eat. They attck on shepherds or their families are not uncommon. And these incidents lead to the killing of wolves. In three months (December-February, 2009), there are about a dozen local people reports of goat or sheep killing by wolves in this area. One case of wolf killing by shepherd during sheep herd attack has been reported.

During this predator sighting study, we have seen hyaena on seven occasions. And every time we found solitary animal. Four dens of hyaena were identified with the help of local people. All of them are either at foothills or in between the valley of two hills. The striped hyaena is one of the largest carnivores in India. No accurate number of the hyaena population are available in this region. However, they are estimated 8-10 animals within this isolated habitat. This animal is on the list of Red Data Book of IUCN. Hyaena does not only feed on carrion, but it also prey on sheep, goats and calves. It also eats vegetables and fruits. There has been an intense human pressure on the hyaena in recent years. In last 2 years, three causalities have been reported when a mad male hyaena attacked a 12-year old boy and a buffalo. Later that animal was killed by local people.

Desert fox also observed in this area on several occasions in open scrub lands. And every time solitary animal was seen. Two burrows of desert foxes were excavated those were 2-2.5 meters long and having 3-4 openings. Three foxes' corpses have been found crushed by road accidents during 2007-08. Similarly, the common mongoose has been observed in this area and on road sides.

Discussion and Recommendation

The wildlife in general and the carnivores in particular have suffered greatly with the introduction of motor vehicles and firearms in the last century as well as from habitat destruction. However, there is no estimation of these five carnivore species viz. Asiatic jackal, wolf, hyaena, desert fox and the common mongoose in this area during this study, but the present observations in this region indicate that a viable population of these species. Rajpurohit (1988) have reported an attack on human being by a mad hyaena which was later killed by local people in the same area. Similar case reported in present study.

The small patch of about 10 km^2 near Osian of district Jodhpur (Rajasthan) can be a ideal wildlife reserve area

which preserved some of the faunal diversities placed in Schedule-I of Wildlife (Protection) Act-1972. For the study of desert biodiversity and mix biodiversity, it is very important suitable site. It is recommended to Government Authorities to make some efforts to preserve this microhabitat of mammalian fauna.

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Announcement : Positions available for research assistants:

PROJECT: Gap analysis of the Periyar - Agasthyamalai landscape for arboreal mammal conservation (CEPF-ATREE Western Ghats Grant)

Position 1: Research assistant for field surveys for 12 months.
Description: Presence – absence surveys for arboreal mammals will have to be undertaken across various sites in southern Tamilnadu and Kerala. This requires spending long periods of time in the field and the person must be willing to camp in remote areas. Candidates with some prior experience in carrying out surveys and who will be able to work independently in the field are encouraged to apply. The recruited person has to work under the overall supervision of the Principal Investigator to whom monthly progress reports have to be communicated. Basic computer skills are a requirement.

Position 2: Research assistant for questionnaire surveys for 3 months.
Description: This job requires the candidate to undertake questionnaire based surveys in the field. The candidate is expected to meet Forest Department officials in this landscape, other NGOs who are working in Periyar-Agasthyamalai landscape and local communities to collect data on occurrence of arboreal mammals, threats to them and anthropogenic activities in the landscape. Working knowledge of Malayalam and Tamil is an absolute requirement and a background in social sciences is preferable. He/she has to work under the overall supervision of the Principal Investigator to whom monthly progress reports have to be communicated. Basic computer skills are a requirement.

Interested candidates may send their resumés to:
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