
AVIAN DIVERSITY IN SHEKHAWATI REGION

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ABSTRACT

The Shekhawati region of Rajasthan may be found in the state's north-eastern corner and takes up just around 8% of the total land area. The climate of the region is characterised by two contrasting extremes: extremely warm summers and very cold winters. The location is located in a semi-arid zone and has a limited variety of plant life as a result of its sparse and erratic rainfall. Sand storms are a typical occurrence in the area, as is the high wind speed that the region experiences throughout the summer months. Sand dunes predominate over the whole of the area, particularly in the northwest corner of it. There is not much variety in the kinds of mammals that live in this portion of the Indian Thar Desert. Because of people's intrusion into the natural habitats of animals for the sake of their own beneficial activities, the number of big mammals in the Shekhawati area has seen a significant decline over the course of the last three decades. There are forty different kinds of mammals that live in the Shekhawati area. These mammals come from twenty different families and thirty one different genera. The area accounts for 58.8 percent of Thar and 9 percent of India's mammalian diversity. During the survey of mammalian species, direct techniques such as the line transect method as well as indirect approaches such as the identification of signs were used. The transformation of arid terrain into agricultural land that requires irrigation has an additional impact on the biodiversity situation in the area. The meddling and harmful actions of man are leading to the fast extinction of desert-adapted mammalian species.

Keywords: *carnivorous, diversity, sanddune*

Introduction

My doctoral dissertation on Nilgai has a supplementary component including the investigation of the animal and plant life in the Shekhawati Region. The research was carried out during the years 2012 and 2013. During the field research I did for my dissertation on "Population Dynamics, Ecology, Breeding Biology, and Pest Status of Nilgai in Shekhawati Region of Thar Desert," I also noticed several species of flora and wildlife. Because of its high level of biodiversity, the Shekhawati area is a popular destination for researchers, scientists, and biologists. Rajasthan is home to a rich and diverse array of flora and fauna despite the fact that a sizeable portion of its landmass is covered by desert and that there is a relatively low proportion of land that is covered by trees. The native flora is referred to as a Northern Desert Thorn Forest (Champion 1936). These may be seen in the form of sporadic, tiny clusters that are more or less open. As a result of the increase in rainfall, both the density of patches and their overall size have grown from west to east. Between the Thar Desert and the Aravalli Mountains is where you'll find a stretch of dense thorn scrub woods known as the Northwestern Thorn Scrub Forests. Dry deciduous woods may be found in the Aravalli and the south-eastern area, along with tropical dry broadleaf forests, which are home to trees like as teak, acacia, and other species. The mountainous area known as 'Vagad' may be found at the most southern part of Rajasthan, right on the

state line with Gujarat. The Vagad area of Rajasthan is the most densely wooded and rainiest region in the state, with Mount Abu being the only exception. The Mewar area may be found to the north of the 'Vagad' region, and it is home to the towns of Udaipur and Chittaurgarh. Hadoti is located in the southeast corner of the state, right on the boundary with Madhya Pradesh. The area known as "Dhundhar" can be found to the north of the regions known as "Hadoti" and "Mewar." This is where Jaipur, the state capital, can be found. Mewar is the most eastern part of Rajasthan, and it shares a border with both Haryana and Uttar Pradesh. All of these areas are home to a wide variety of plant and animal species that are unique to the area.

Only six percent of the nation is covered by the Thar Desert, which is located in Rajasthan. In spite of the harsh environmental circumstances, this little region is home to around 15.8 percent (68 out of 428) of the world's mammalian species. Previous researchers have conducted a faunistic survey of Rajasthan and made substantial contributions to the study of the state's animals. Mammalian species from throughout the globe were catalogued by Wilson and Reeder (1993). Based on his findings, Agarwal (1998) estimated that India is home to 13 orders, 42 families, 180 genera, and 390 species of mammals. From among them, the Thar desert in Rajasthan has yielded records of eight orders, twenty-three families, forty-five genera, and sixty-six species (Chakarborthy et al., 2005). Alfred and Agarwal (1995) documented 68 species that belonged to 9 different orders that could be found in the Thar Desert. As an ecosystem, the Thar is now going through a process of ecological transition. This shift has been brought about in great part by the impressive Indira Gandhi Canal, and it has also been partially brought about by changes in the world climate. Drinking water is the most common use for the water that comes from the Indira Gandhi Canal in the districts of Churu and Jhunjhunu. Shadow impacts on the flora have been noted as a result of this Canal irrigation, and 42 plant species native to irrigated areas had extended their range into non-irrigated regions as a result of this expansion. The uncontrolled mining in the Aravalli mountain range and other tiny hills in the Jhunjhunu and Sikar districts are also having an effect on the richness of the region's flora and fauna. Alterations to the region's floral composition will almost certainly have an impact on the faunal composition of the area. Many species of mesic small animals are extending their range towards the Thar (Parkash, 1995), and many species of aquatic birds have lately established their territories inside the Thar (Soni, 1994; Idris et al. 2009). The current survey of animals and birds will be of use in conducting population monitoring in the years to come. When compared to the other districts of the Thar desert, the Shekhawati area does not have a very diverse population of predators or big animals. The high human population, the rapid degradation of natural habitats, industrialisation, illicit mining, irrigation, declining forest covers, and poaching are the primary factors contributing to the low animal diversity. Tal Chhapar Blackbuck sanctuary is the only protected place in the region. It is a tiny walled area that is around 7.19 square kilometres in size and has made a major contribution to the study of animals in Rajasthan. Mammalian species from throughout the globe were catalogued by Wilson and Reeder (1993). Based on his findings, Agarwal (1998) estimated that India is home to 13 orders, 42 families, 180 genera, and 390 species of mammals. From among them, the Thar desert in Rajasthan has yielded records of eight orders, twenty-three families, forty-five genera, and sixty-six species (Chakarborthy et al., 2005). Alfred and Agarwal (1995) documented 68 species that belonged to 9 different orders that could be found in the Thar Desert.

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It is mostly grassland, with the occasional tree dotting the landscape here and there. In addition to blackbucks, the refuge is home to several other kinds of predatory birds and reptiles, including harriers, lizards, snakes, and blackbucks. The desert fox, the blackbuck, the blue bull, the desert cat, the mongoose, the hedgehog, the musk shrew, the desert gerbil, the Indian gerbil, and eight species of chiropterans are among the important animals found in this area. The region is home to many venomous snakes, including the cobra, saw-scaled viper, and krait. There are a variety of lizards that call this region home, including the Varanus, Garden lizard, and Wall lizard, however turtles and tortoises are not found in this area. The districts are home to *Rana tigrina* and *Bufo melanostictus*, which are both species of common frogs. On the other hand, fish fauna is almost nonexistent owing to a lack of aquatic bodies. With the exception of the thorough research of small mammals that was carried out by the CAZRI team, no substantial work has been done on the vertebrate diversity of the Shekhawati area.

OBJECTIVES

To study avian diversity in shekhawati region

To study

Materials and Methods

The Shekhawati region of the Indian Thar desert can be found in the north-eastern part of the state of Rajasthan. It is situated between 27 degrees 24 minutes and 29 degrees 02 minutes north of the equator, between 73 degrees 4 minutes and 76 degrees 5 minutes east of the equator, and 320 metres above mean sea level. The region has a total land area of 27,529.44 square kilometres and is connected to the borders of the districts of Hanumangarh in the north, Hissar in the north-east, Bhiwani, Rohtak, and Mahendragarh in the south-east of Haryana, Jaipur and Nagaur in the south, and the district of Bikaner in the west of the region. In the Shekhawati area of the Thar desert, there hasn't been a lot of work done on surveys of the several mammalian species that live there. However, Chakraborty and colleagues (2005) [18] conducted a district-by-district assessment of the mammalian diversity of the Thar desert.

The present research is predicated in large part on our observations made in the field over the course of the

last six years, starting in May 2008 and ending in March 2014. In order to do this, the territory was divided into three sections according to the eco-physiological characteristics of each: 1. the plain agricultural area in the middle-eastern portion of the Shekhawati region 2. The south-eastern portion of the Shekhawati region, which includes the Arawali mountainary range, its foothill location, and many tiny hilly places. 3. The northwestern portion of the Shekhawati region, which is mostly comprised of the Thar desert. All twelve months of the year, through each and every season, observations on the mammals of the area were carried out. During the course of the research, at least one location was travelled to each month in order to compile a list of the animals and the data associated with them. Within the scope of the investigation, a total of 84 locations were explored. Both direct and indirect approaches were used in the field while conducting mammalian species surveys. The following procedures were carried out:

Approach of line transects (Rodger, 1988, 1991): In this method, line transects of one square kilometre were employed in various areas in the research area. Observations were taken by walking along the road side both on foot and by car. Rodger described this method in 1988 and 1991. The observations were carried out in the wee hours of the morning and the wee hours of the evening. It was observed that various mammalian species inhabit various environments, and this observation was recorded. Large mammals such as *Semnopithecus entellus*, *Macaca mulata*, *Boselaphus tragacamelus*, *Antelope cervicapra*, and *Gazella gazelle*, among others, that are able to tolerate the presence of humans and permit observations to be made from close quarters by necked eyes in open fields, dense forests, or hilly parts of the region are ideal candidates. Binoculars made by Olympus with a magnification of 8x40 were also used for the observation of animals. Both a Cannon Supershot and an HP 945 digital Camera were used in the taking of these photographs.

The water source method was also used to observe mammals during the middle of the day and at some point during the night during the summer. This was done because during these times the temperature reaches its peak and a water crisis begins, causing mammals to congregate near bodies of water in an effort to find water.

During the field trip in the region where mammalian species were trying to be identified, certain indirect approaches were also applied. It was determined via thorough observation and documentation that animal evidence such as pellets, scats, quills, kill, and burrows, all of which point to the presence of an animal in the region, had been photographed.

People who live in rural areas were also able to assist us in the identification process by giving pictures and identification guides in the form of visual guides and photographic images of animals that are likely to be present in the region. By submitting the images to wildlife specialists, we were able to authenticate the identity of a confusing and complex group of creatures.

Results

The region under investigation is home to a total of forty different kinds of animals. They are classified under a total of eight orders, twenty families, and thirty-one genera. In India, there are a total of 110 species belonging to the order Chiroptera; however, only eight of those species can be found in the Shekhawati area. The Thar desert in Rajasthan is home to 18 of those species. Pholidota and Lagomorpha are the two orders that include just a single species each and are the region's two smallest orders. Within the scope of this research, the order Chiroptera is represented by a maximum of six families, although the order Rodentia is the most abundant, with 14 species accounting for 35% of the total mammals (Table 2 and figure 1). Some

species of small and large mammals, such as chinkara, mongoose, and hares, were primarily observed in the desertic crop area of the north-west part of the study region. On the other hand, jackals, foxes, jungle cats, and other species were primarily seen in the community lands, hilly areas, and areas near water bodies. The blue bull, the desert cat, and a great number of other tiny rodents were found in a wide variety of ecological environments. It is interesting to note that two different primate species were seen in the vicinity of Shakambari and Loharlgarl, as well as in Kirdoli and other areas to the southeast of the Shekhawati region (Table 1). There were forty different mammalian species discovered in this study area. Of those species, six are listed in Schedule I, one is listed in Schedule III, five are listed in Schedule II, six are listed in Schedule IV, and thirteen are listed in Schedule V of the Wildlife (protection) act, 1972. The status of the remaining species is not mentioned.

The category of big mammals includes the species *Gazella bennetti*, *Antelope cervicapra*, and *Boselaphus tragocamelus*, whereas the category of small mammals includes the other species. Both the blackbuck and the chinkara are prevalent in the Thar environment, although their numbers are more or less limited in protected areas or in and near communities inhabited by the Bisnoi people. This is mostly due to the shortage of water and the pressure from poachers. *Gazella bennetti* and *Antelope cervicapra* have been spotted in all of the tehsils of Churu district, as well as in the northwestern half of Sikar and Jhunjhunu districts. *Boselaphus tragocamelus* has been seen in all three districts of the study area. Both of these species may be found in rather large numbers in and around the Tal Chhappar nature Sanctuary (Churu). It has been shown that the *Macaca mulata* lives in the eastern and southeastern parts of Rajasthan (Wada, 1984; Tehsin, 1980; Sankaran, 1992) [107, 106, 85]. Both the *Macaca mulata* and the *Semnopithecus entellus* species of monkeys have been seen in the research region, which is located in the south portion of the Jhunjhunu district and the north-east section of the Sikar district. The majority of the rodent species that have been recorded are present in all districts of the Shekhawati area, with the exception of *Hystrix indica*, which has only been spotted in the Jhunjhunu district. There are three different kinds of mongoose that live in the field and also in the area next to the homes where the *Ziziphus* soil and thorny bushes are gathered for use as firewood.

Table1: Checklist of Mammals of the Shekhawati region

A	B	C	D	E	F
Order – Insectivora					
Family – Erinaceidae					
1.	Indian Hedgehog	<i>Paraechinus micropus</i>	–	C	O
Family – Soricidae					
2.	Grey Musk Shrew	<i>Suncus murinus</i>	–	VC	O
Order – Chiroptera					
Family - Pteropodidae					
3.	Flying Fox	<i>Pteropus giganteus</i>	V	C	F
Family – Megadermatidae					
4.	Greater False Vambire Bat	<i>Megaderma lyra</i>	–	VR	C
Family – Rhinolophidae					
5.	Blyth’s Horse shoe Bat	<i>Rhinolophus lepidus</i>	–	R	I
Family – Rhinopomatidae					
6.	Greater mouse-tailed Bat	<i>Rhinopoma</i>	–	C	I

		microphyllum			
7.	Lesser mouse-tailed Bat	Rhinopoma hardwickei	–	C	I
Family – Emballonuridae					
8.	Egyptian tomb bat	Taphozous perforatus	–	R	I
Family – Vespertilionidae					
9.	Common Pipistrellus	Pipistrellus pipistrellus	–	C	I
10.	Asiatic Yellow House Bat	Scotophilus heathi	–	C	I
Order – Primates					
Family - Cercopithecidae					
11.	Hanuman Langur	Semnopithecus entellus	II	R	H
12.	Rhesus Macaque	Macaca mulata	II	R	H
Order – Carnivora					
Family – Canidae					
13.	Jackal	Canis aureus	II	R	C
14.	Desert Fox	Vulpes vulpes	I	C	C
Family – Viverridae					
15.	Small Indian Civet	Viverricula indica	II	VR	O
Family – Herpestidae					
16.	Small Indian Mongoose	Herpestes javanicus	IV	R	C
17.	Grey Indian Mongoose	H. edwardsi	IV	C	C
18.	Ruddy Mongoose	H. smithi	IV	R	C
Family – Felidae					
19.	Desert Cat	Felis silvestris	I	R	C
20.	Jungle Cat	F. chaus	II	VR	C

Abbreviations used in Table 1

A = S. No., B = Common name, C = Scientific name, D = Wildlife status, E = Abundance status or conservation status, F = Foraging status

Wildlife status: I = Schedule I; IV = Schedule IV; V = Schedule V; NLA = Not listed in act; 0 = Information not available

Abundance status or conservation status: R = Rare, VC = Very common, C = Common, VR = Very Rare,

Foraging status: O = Omnivores, H = Herbivores, C = Carnivores, I = Insectivores, G = Grainivores, S = Scavenger, N = Nectivore, F = Frugivores

Table 2: Order and Family-wise distribution of genera and species of mammals in the Shekhawat region.

S.No.	Orders	Family	Genera	No. of species	% of the Species
1.	Insectivora	2	2	2	5
2.	Chiroptera	6	6	8	20
3.	Primates	1	2	2	5

4.	Pholidota	1	1	1	2.5
5.	Carnivora	5	6	9	22.5
6.	Artiodactyla	1	3	3	7.5
7.	Lagomorpha	1	1	1	2.5
8.	Rodentia	3	10	14	35
Total	8	20	31	40	100

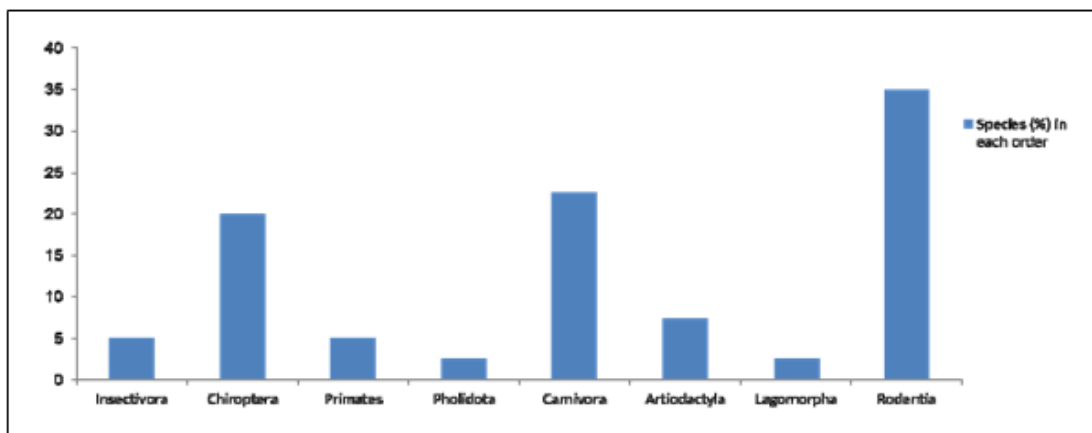
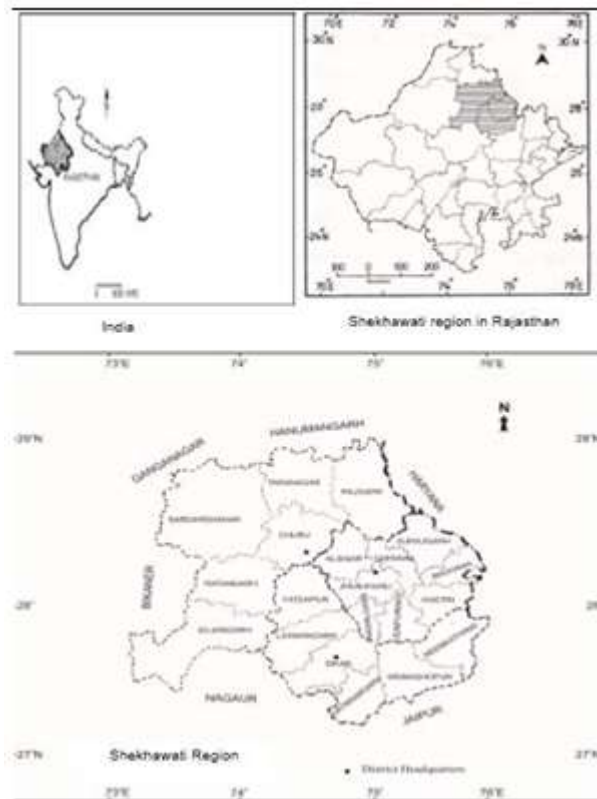


Fig1:Species number (in percentage) in each mammalian order



Map1:ShekhawatiregionDiscussion&Conclusions

CONCLUSION

The present conservation status of the mammalian species found in India that fall under the category of Threatened Species is steadily improving. There is no denying that the Thar Arid's biodiversity is shifting as a result of the introduction of a few new species in, surrounding, or within irrigated regions; nevertheless, this growth comes at the expense of species that are native to desert environments. It was discovered that the uncontrolled use of pesticides in agricultural areas, transportation, and deforestation have the greatest influence on the ecology of the forest as well as the mammalian species that lives there. Should we be happy with the rise in mammalian variety, even when it comes at the expense of species that are better able to survive in arid environments? The fact is that desert-adapted animals in this delicate but distinctive habitat, such as desert foxes, jackals, desert cats, and others, will go extinct in the near future. Farmers in the area may be indirectly affecting herbivores and ultimately predators by their use of pesticides in agricultural techniques. This may have a direct influence on herbivores.

Road accident instances are also serious risks to wild animals. During the course of the current investigation, we observed incidents involving palm striped Squirrels, little Indian Mongooses, Jungle cats, Indian Foxes, Pale Hedgehogs, and Black bucks. According to the findings of the research, the natural habitats of the area under investigation should be preserved in order to ensure the survival of the region's mammalian species.

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