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## WILDLIFE SURVEY OF NATIONAL PARKS TO ASSESS REPTILIAN BIODIVERSITY, AJK

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### ABSTRACT

The class Reptilia belongs to phylum Chordata. This group forms a large community of the land vertebrates. However, they remain relatively under-examined. Roll et al. (2017) studied the global distribution of more than 10,000 reptiles. Nearly 194 reptilian species have been reported from Pakistan (WWF, n.d.). Five protected parks were studied from February 2008 to May 2010. Dhirkot Nature Reserve (DNR), Banjosa Nature Reserve (BNR), Tolipir National Park (TNP), Pir Chanasi National Park (PCNP) and Pir Lasura National Park (PLNP) were considered. Fifteen species of reptiles were observed in TNP. Ten species of reptiles were recorded from PCNP. Ten species of reptiles were confirmed from DNR, including 6 species of snakes. The present study could collect the evidence on the presence of 14 reptile species distributed under different habitat conditions of BGR. The total number of species of reptiles recorded in PLNP during the study was 24.

**Keywords:** Lizards, snake, turtle, wildlife, biodiversity

### INTRODUCTION

The class Reptilia belongs to phylum Chordata. This group forms a large community of the land vertebrates. However, they remain relatively under-examined. Roll et al. (2017) studied the global distribution of more than 10,000 reptiles. Socotra, New Caledonia and Antilles are global hotspots for reptiles. Nearly 194 reptilian species have been reported from Pakistan; 9 vipers and pit vipers, 14 sea snakes, 5 kraits and cobras, 40 colubrids, 1 python, 3 boas, 2 thread snakes, 6 blind snakes, 4 monitor lizards, 17 skinks, 14 sand lizards, 1 chameleon, 2 spinytail lizards, 24 Agamas, 36 eyelid and lidless geckos, 1 crocodile, 4 softshell turtles, 5 marine turtles, 2 tortoise and 4 pond and river turtles (WWF, n.d.).

It is reported that 53% of reptile species are endangered globally including 30 families with 104 genera and 156 species of reptiles. They were traditionally used as

folk medicines and even in recent medical science some species of reptiles are being used for drug production. Keeping in view the medicinal use of reptiles their conservational activities need to be planned for sustainable use of the reptiles (Alves, 2008).

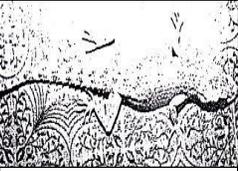
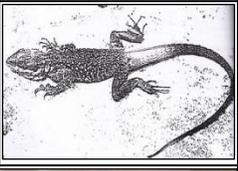
For effective conservation, targeted actions are required which further need detailed information of species distribution, ecology, systematics and other possible threats like human-induced loss of habitat should be addressed properly (Monika, 2013). Most of the species of reptiles have not yet been evaluated for their conservation status. This study hopes to provide information on the species richness of the class Reptilia in the study area which will help in planning conservation activities for them.

## **MATERIALS AND METHODS**

Five protected parks were studied from February 2008 to May 2010. Dhirkot Nature Reserve (DNR), Banjosa Nature Reserve (BNR), Tolipir National Park (TNP), Pir Chanasi National Park (PCNP) and Pir Lasura National Park (PLNP) were considered. An initial survey of the study sites was done using camera surveillance (Arc View GIS 3.3, 1992-2002), information was gathered by discussing the physical characters and possible locations of species with local inhabitants. Using literary sources (Khan, 2006) an approximate list of species likely present in the study area was formulated. Indirect indicators such as burrows, footprints, molts and droppings were also noted.

**RESULTS**

**Table 1: List of reptile species recorded from BGR, DNR, PCNP, PLNP and TNP**

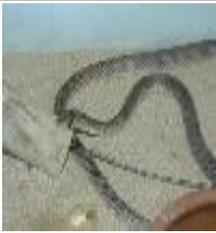
S No.	Names	Pictures	Habitat	Food	Breeding season	Remarks	Status	
							Local sightings (%)	Global *
1.	<i>Indogekko rohtasfortai</i> Rohtas reg-sang chapkali		Crevices among rocks, holes and under rocks.	Feeds on photophilic insects.	May to June. Pair of oblong eggs glued to the sides of crevices.	Distributed in south eastern AJK, nocturnal.	BGR= 31 DNR= 34 PLNP= 34 TNP= 31	LC
2.	<i>Laudakia melanura melanura</i> , Black rock agama		Rock crevices.	insects	Late March-May. 10-15 eggs	Lives in rocks of moderate elevations	BGR= 4 PLNP= 42	DD
3.	<i>Laudakia tuberculata</i> Neela kirla		Rock blocks at elevation of 1500-2500m.	Herbivorous, feeds on arthropods, leaves and flowers	April- June, 6-9 hard shelled eggs laid under rocks in more than 1 clutch.	predominantly herbivorous	BGR= 56 DNR= 31 PLNP= 29 TNP= 31 PCNP=	LRLC
4.	<i>Laudakia agrorensis</i> , Agrore wadi kirla		Crevices among rock blocks.	Insects and caterpillars.	Clutch size varies from 6-8 eggs.	Lives in crevices among rock blocks.	BGR= 41 PLNP= 27 TNP= 19 PCNP= 24	NT
5.	<i>Typhlops ductuliformes</i> Slender blind snake		Rocky pine country side with lush green grasses	-	-	-	BGR= 21 DNR= 09 PLNP= 36 TNP= 24	DD

6.	<i>Lissemys punctata andersoni</i> Moonji kunchwa		Muddy ditches, lakes, marshes, vegetation, salt, rivers, ponds, streams, rice fields	Adult frogs, tadpoles, fishes, crustaceans, fish larvae, carrion, water plants, bivalve mollusks and snails.	May-June. Eggs lain in summer. Clutch size varies from 6-14 eggs.	Inhabits wide variations of environment and habitats, hibernates in winter	BGR= 13 DNR= 01 PCNP= 09 PLNP=24 TNP= 16	LRLC
7.	<i>Eurylepis taeniolatus</i> Common mole skink Maidani reg-mahi		Loose sandy soil, loamy with scrubby vegetation, mostly close to water courses.	Different kinds of arthropods and worms.	March to may. 4-8 oval eggs with pliable shells is laid under stones.	Almost deserticolous habitat.	BGR=29 TNP= 49	DD
8.	<i>Naja oxiana</i> Brown cobra Bhoora naag		Dry wasteland, lives in holes and crevices in uneven ground, carrions and holes in rocks.	Rodents, birds, snakes, lizard and mice.	-	Inhabits dry wastelands, lives in holes and crevices in unlevelled ground. Carnivores.	BGR= 35 DNR= 19 PCNP=24 TNP= 37	NT
9.	<i>Bioga trigonata</i> Common cat snake		Thick jungles, plantations and grasslands with moderately thick bushes.	Tree lizards, birds, eggs, nestlings, grasshoppers and mice.	Breeds from march to may. 7-10 eggs lain under tree bark and under stones.	Thick jungles, grasslands with moderately thick bushes. Typically arboreal. Nocturnal, carnivorous.	DNR= 13 TNP= 33	C
10.	<i>Bungarus caeruleus caeruleus</i> Common krait		Grasslands, semi deserts with alluvial soil, vegetation, barns, farms, groves and gardens.	Toads, frogs, snakes, lizards and mice.	Breeding march to july. 6-8 eggs lay at some protected place.	Krait frequents grasslands, common in marginal vegetation along tilled fields, lives in holes and crevices, deadliest snake, nocturnal,	DNR= 20 PLNP= 33 TNP= 40	FC

11.	<i>Eublepharis macularius</i> Leopard geko Korh kirli		Rocky stony terrain, mudflats with sparse grass and bushes in mesic to xeric condition.	Beetles, grasshoppers, spider and scorpions.	Breeding march to may. 2-6 oval eggs with smooth pliable shells lain in more than 2 clutches in a season. Eggs lain in the humid environs of a crevice.	Inhabits rocky stony terrains, mudflats with sparse grass, and bushes. Gregarious, nocturnal. hibernates in winter.	DNR= 32 TNP= 60	C
12.	<i>Platyceph rhodorachis kashmiriensis</i> Kashmir koluber saamp		Sub mountainous stony habitats with hard reddish soil, pine tree and hedges.	Skinks, lizards, eggs and nestlings.	-	Lives in sub mountainous stony habitats with reddish soil, forages around, Climbs on tress for feeding on eggs.	DNR= 42 PLNP= 34 TNP= 54	C
13.	<i>Psammophis leithii leithii</i> Sindi teer mar (Pakistan ribbon snake)		Frequents deserts, grasslands with scrubby vegetation near marshy areas.	Lizard, mice birds and eggs.	Breeding march to june. 4-10 eggs lain in burrows of fields.	Inhabits scrubby vegetation near marshy areas. Diurnal, feeds on lizards and mice, breeding period March-June.	DNR= 24 TNP= 40	FC
14.	<i>Typhlops madgemintonae</i> (Kashmir patla kainchwa saamp)		-	-	-	Inhabits litter at the roots of a pine tree on a rocky slope	PLNP= 33 PCNP= 15 TNP= 45	DD
15.	<i>Eryx johnii</i> (Common sand boa)		Inhabits moderate deserts of loose soil with sparse vegetation, invades houses	Mice, rat	March-May	Nocturnal, slow moving.	PLNP= 35 PCNP=15	DD

16.	<i>Amphiesma stolatum</i> (Striped keelback)		Open damp grasslands, common in tilled fields, barns, under heaps of reaped crops and fallen leaves, logs, heaps of debris etc.	Frogs, toads, fishes, lizards, mice, nestlings	March-May	Gentle snake, seldom bites, a good pet.	PLNP= 26 PCNP=10	DD
17.	<i>Oligodon arnensis arnensis</i> (Banded kukri snake)		Mesic to semi desert, with bushy to dense forest, lives in caves, crevices, tree holes	Special liking for eggs	April-July	Does not attempt to bite, when handled.	PLNP= 17	DD
18.	<i>Oligodon taeniolatus taeniolatus</i> (Streaked kukri snake)		Flat clay deserts, oases, and suburban gardens, lives in crevices and holes in earth, under stones and rocks or in brick walls, hides under piles of wood trash.	Eggs of lizards and snakes, even its own eggs, small arthropods.	March- August	Nocturnal, when cornered flattens against the substratum and spirals its tail.	PLNP= 14	DD
19.	<i>Xenochrophis piscator piscator</i> (Checked keelback)		Large ponds with thick vegetation, confined to side pools rather than main stream.	Fishes, frogs, tadpoles.	February- May	Bad tempered, strikes with determination and rapidity, viciously	PLNP= 15	DD
20.	<i>Bungarus sindanus razai</i> (Northwestern Punjab krait)		Dry open plains, termite mounds, burrows of small rodents, beneath debris.	Toads, frogs, snakes, lizards, mice.	-	-	PLNP= 18	DD
21.	<i>Eublepharis macularius</i> , (Korrh kirli)		Rocky stony terrain, mudflats with sparse grass, bushes in mesic to xeric condition.	Beetles, grasshoppers, spider, scorpions.	March –may, 2-6	Gregarious, nocturnal	PLNP= 38	RLC

					crevices.			
22.	<i>Hemidactylus brookii</i> , (Barani chipkali)		Chopped vegetations, logs, crops, dark uninhabited huts, leaf litter, fallen trees.	Soft bodied arthropods.	March- October; 1 clutch, a pair of white hard shelled eggs.	Frequent tilled areas, forests, oases, under leaf litter, fallen trees or any shelter.	PLNP= 36 TNP= 31	LRC
23.	<i>Eurylepis taeniolatus</i> , (Common mole skink)		Loose sandy soil, loamy with scrubby vegetation, mostly close to water courses.	Arthropods, worms.	March – May, 4-8 oval eggs with pliable shells laid under stones.	Almost desert colour habitat.	PLNP= 42	DD
24.	<i>Varanus bengalensis</i> (Bengal monitor)		Moderately dry forests, extends into cultivated land, burrows in hard soil, or in rainy season lives in tree holes.	Arthropods, larvae, worms, frogs, lizards, snakes, birds, mammals.	April-June	When alarmed, it slips away unnoticed, inflicts a powerful bite with long and strong teeth.	PLNP= 38	LC
25.	<i>Varanus griseus koniecznyi</i> (Indo-Pak desert monitor)		Sandy fields with uneven surfaces, tracts of hard soil with sparse vegetation, excavates burrows in roots of trees and bushes	Invertebrates (especially beetles), lizards, reptile eggs, toads, small mammals	July- August, eggs: September-October	Does not hibernate, seen throughout the day during winter, and only in early morning and late afternoon during summer.	PLNP= 30	DD
26.	<i>Cyrtopodion dattanensis</i> (Plump banded gecko)		Crevices among rocks and roots of pine trees.	Soft bodied insects and larvae.	March-May	-	PLNP= 29	DD

27.	<i>Ophisops jerdonii</i> (Rugose spectacled lacerta)		Grassland and desert habitats usually live in rocky, arid areas.	-	-	Small lacertids, transparent lower eyelids completely or partially fused with upper lids to form cap over eye.	PLNP= 41	LC
28.	<i>Eutropis dissimilis</i> (Striped grass skink)		Moist grass fields	Arthropods, mostly crop pests, insect larvae, earthworms, soil nematodes.	Eggs: March-July, Juveniles: May- August	Terrestrial, adapted to survive in flooded areas.	PLNP= 40	DD
29.	<i>Lygosoma punctata</i> (Spotted garden skink)		Grass and fields with moderate moisture and shade, gardens, orchards, lawns, backyards.	Arthropods and their larvae, earthworms, millipedes.	March- July	Slipping habit , difficult to catch	PLNP= 34	DD
30.	<i>Siwaligekko dattanensis</i> (Khan's bow-fingered gecko)			Soft bodied insects and larvae	March-May	Crevices among rocks and roots of pine trees.	PCNP= 15	DD
31.	<i>Boiga melanocephala</i> (Dark head cat-snake)			Food consists mainly of lizards, arthropods, eggs and birds	May and June	Inhabits desert fields with bushy vegetation and rocky areas with loose soil: it has occasionally been collected from low to moderately high bushes and gardens.	5	DD
32.	<i>Ptyas mucosus mucosus</i> (Rope-snake)			Food consists mainly of lizards, toad ,birds, eggs and rodents	From march through August and September.	Good swimmer and climbs into branches of trees and roofs.	PCNP= 10	DD

33.	<i>Spalerosophis diadema diadema</i> (surakh chittra chua)			Diet consists of frogs, rats, birds, eggs and lizards	March September	To	Inhabits forests along water courses, and open fields with scrubby vegetation and moderately hard soil. In rocky area it lives in crevices in loose rock	PCNP= 10	DD
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\* 2008 IUCN Red List Category (<http://www.iucnredlist.org/apps/redlist/details/>)

Lower Risk-least concern\*\*\* = LRLC, Least Concern = LC, Critically Endangered= CE, Data Deficient = DD, Not evaluated = NE

## DISCUSSION

Fifteen species of reptiles were observed in TNP. Ten species of reptiles were recorded from PCNP. Ten species of reptiles were confirmed from DNR, including 6 species of snakes. The present study could collect the evidence on the presence of 14 reptile species distributed under different habitat conditions of BGR, as detailed in Table 1. Moonji Kachwa was a rarely sighted reptile, living in muddy ditches, lakes marshes and ponds/ streams. This species is internationally regarded as low risk least concerned.

There were 6 species of snakes, the common cat snake (living in thick forested plantation and grasslands with moderately thick shrubs) being the most prevalent (64% sightings) in BGR. Two species, poisonous to man, i.e., common krait (grasslands, barns, farms) and brown cobra (dry wasteland, bold and can attack man), are also frequent. Slender blind snake (rocky pine country), Kashmir koluber saamp (sub-mountainous stony habitat) and Sherman's slender blind snake are three other species, which also presented good sightings. Both the human poisonous species along with common cat snake have been internationally categorized as near threatened, while the other three species appear in data deficient category.

BGR holds seven species, viz., neela kirla (more frequent sightings), korrh kirli, barani chipkali, Rohtas ragsang chapkali, black rock agama, Agor wadi kirla and common mole skink or maidani ragmahi, of lacertiles, giving moderate sightings. Agor Wadi kirla is internationally regarded as near threatened, neela kirla, barani chipkali and korrh kirli are low risk least concerned, while the other four species are data deficient.

The total number of species of reptiles recorded in PLNP during the study was 24. Moonji Kachwa (*Lissemys punctata*

*andersoni*) presented average sightings (24%), living in muddy ditches, lakes marshes and ponds/ streams. The species is regarded as Low risk least concerned on international level.

There were 10 species of snakes, 2 of these are poisonous to man. Northwestern Punjab krait (*Bungarus sindanus razai*) and Common krait (*Bungarus caeruleus caeruleus*) both had moderate sightings (18% to 33%) and are near endangered species demanding conservation. The other 8 species were non-poisonous, which included Kashmir patla kainchwa saamp (33%), Slender blind snake (36%), Kashmir koluber saamp (34%), black rock agama (42%), common sand boa (35%), striped keelback (26%), banded kukri snake (17%), streaked kukri snake (14%) and checkered keelback (15%).

PLNP also holds several species of lizards which include, agore wadi kirla (27%), rohtas reg-sang chapkali (34%), common mole skink (42%), spectacled lacerta (41%), striped grass skink (40%), spotted garden skink (34%), Bengal monitor (38%), Indo-Pak desert monitor (30%), plump banded gecko (29%). These species presented frequent sightings.

Rais et al. (2012) reported thirty reptiles belonging to 13 families from specific areas of Chakwal, Islamabad and Rawalpindi. Safi and Khan (2014) conducted a study at aquatic regions of Chrasadda, KPK and reported two families of turtles; Geoemydidae and Trionychidae. They report greatest population size for *Lissemys punctata* (30.95%) which was also observed in all the national parks considered in this study. Hashmi and Khan (2013) observed sun-bathing activity of *Varanus bengalensis* in Thatta, Sindh.

## CONCLUSION

Fifteen species of reptiles were observed in TNP. Ten species of reptiles were recorded from PCNP. Ten species of reptiles were confirmed from DNR, including 6 species of snakes. Fourteen reptile species distributed under different habitat conditions of BGR were observed. The total number of species of reptiles recorded in PLNP during the study was 24.

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