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STUDY OF MAMMALS DIVERSITY OF PENCH NATIONAL PARK AND THEIR OCCURRENCE, MICROHABITAT SPECIALIZATIONS AND ECOLOGICAL THREATS

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ABSTRACT :- Pench National Park, located in the central Indian landscape across Madhya Pradesh and Maharashtra, is one of the most important biodiversity hotspots and tiger habitats in India. The park supports a rich diversity of mammals including carnivores, herbivores, and omnivores. The study was conducted in the years of 2024-25. The present study highlights the occurrence, microhabitat specialization and ecological threats affecting mammals in Pench Tiger Reserve. The reserve supports around 30 species of mammals including tiger, leopard, sloth bear, gaur, sambar, chital, wild dog and jackal. These mammals occupy different microhabitats such as grasslands, dense forests, riverine habitats and open woodland areas. However, ecological threats such as habitat destruction, poaching, human–wildlife conflict and tourism pressure pose serious challenges to the conservation of mammalian biodiversity. The study emphasizes the importance of habitat conservation, anti-poaching measures and sustainable management strategies for long-term survival of mammals in Pench Tiger Reserve.

KEYWORDS: Mammals, Ecology, Habitat destruction, Poaching, Conservation status, Pench Tiger Reserve.

INTRODUCTION:-

India is a most populated state in the world and constituent a major fraction of world population together with China Despite being most populated country, there are a variety of habitats and ecological niches for different types of plants, animals and wild life. There are Four hot spots of biological diversity in India namely, northern Himalayas, North-eastern India (the hot spot continues with the geographical boundaries of Burma), Sunda land (Which includes the Ganga-Bramaputra Delta and island of Andaman & Nicobar) and veryimportant geohistorical part of western ghats!

The biodiversity of the country, especially status of Indian mammal was estimated and assessed in a CAMP (conservation Assessment and Management plan), organized as a work shop in 1997. The process of CAMP was conducted by a specialist Group of the species and their Survival commission established by IUCN (Seal, 2000). The assessment was done according to the 1994 IUCN Red list Category criteria for evaluation of mammalian taxa of the country.

National parks help to take care of places with natural and historical value. Unlike humans, who are extremely good at surviving in all sorts of conditions, some plants and animals find it very difficult, or impossible, to survive in areas where their habitat has been disturbed or changed. National parks preserve habitats for a wide range of native plants and wildlife. Parks maintain biodiversity and protect endangered species. They provide people with opportunities to learn about natural flora and fauna as well as to explore and admire the beauty of diverse environments. To conduct study in an area, the most essential thing is to do a reconnense/ extensive survey of the area. Surveying the area is the familiarization of the area to collect the useful information. Pench is rich in mammalian diversity such as spotted deer (*Axis axis*), Black naped hare (*Lepus nigricollis nigricollis*), Bison (*Bos gaurus*), Langour (*Presbytis entellus*), Nilgai (*Boselaphus tragocamelus*), Porcupine (*Hystrix indica*), Sambar (*Rusa unicolor*) wildbore (*Sus scrofa*) and barking deer (*Muntiacus muntjack*).

To collect data on status and distribution of mammalian fauna the core area i.e. Karmajhiri range and Indira Priyadarshani National Park was surveyed. The core zone of PTR is divided into 4 circles, each having 4 beats. While surveying the core area density and diversity of various mammalian fauna were recorded in different administrative units (circles and beats). The efforts were made to understand the distribution of the mammalian species in the park. The PTR is very rich in the mammalian diversity, which shows the good health of the area. The assessment of mammalian population and trend of population will help the managers to make suitable management strategies for long term conservation.

The mammals are though not residing in a particular kind of geographical locality they are being used to wander in a board geographical range according to their size, food need and need of breeding.

But most mammals say small or large their broad geographical range, fidelity (geological fidelity) habitat types, sub habitat and microhabitats with few examples of niche specialization and habitat specialization is a common feature.

The most mammals are classified and can be categorized in their respective nature & being diurnal or nocturnal herbivores or carnivores, predators or prey or a common species in an area or very rare and threatened species according to biodiversity assessments and IUCN Red list categories.

Study Site:-

The study was conducted in Karmajhiri range of PTR or Indira Priyadarshini National Park, Madhya Pradesh (Fig.1). The Reserve is located in the Satpura Maikal Landscape in the Seoni and Chhindwara districts (78^{o} 55'E – 79^{o} 35'E and 21^{o} 35'N -22^{o} N). It was the 19th Tiger Reserve declared, in the year 1992. It has a total area of 757.85 sq. km, which includes the Sanctuary (183 sq. km), the National Park (245.85 sq. km) and Reserved Forest (229 sq. km). Pench Tiger Reserve belongs to the Indo-Malayan phyto-geographical region. Ecologically, Pench is categorized as a tropical moist deciduous (TMD) tiger habitat. Floristically, the Tiger Reserve can be classified, according to Champion and Seth (1968), as, Tropical moist deciduous forests and Tropical dry deciduous forests. The area has 4 seasons: Summer (March-June), Monsoon (July-August), Post-monsoon (September-October) and winter (November-February), with temperature ranging from 00C in peak winter to 45^{0}C in the peak summer; it receives an average annual rainfall of 1400 mm (Sankar et al. 2000).

The current study of mammals and the major ecological and geographical area of their occurrence, macro habitat and sub-habitats, microhabitats and Niche specialization in central India range of Pench national park district Seoni with as a Heart land of Historical "Mowgli's Land". It also deals with the number of mammalian species and genera occurring in the area and assessment of threats to these fascinating but endangered collection of Tetrapod.

Objective of study:-

The objective of this paper is to study of mammals of Pench Tiger Reserve and their occurrence, microhabitat specializations and ecological threats.

REVIEW OF LITERATURE:-

Evaluation of mammals of Pench National park was conducted in the years of 2025 and current year of 2026 (Jan to March). Citing and observation was managed in day time, night time, midnight and noon time in different months from January to December in 3 different seasons namely winter, Summar and also in rainy-monsoon season. There are many mammals which falls in different categories of diurnal for example antelopes, gazella, chital, sambhar, deer, Nilgai etc. Nocturnal are wild cats, Jackals, foxes, wild boars fruit bats, cave bats, Indian mole rat, hyenas, Indian porcupine etc.

For identification purpose, checklist was prepared from the checklist of Indian Mammals (Nameer, 2000) and also used the Fauna of British India (Pocock, 1939, 41; Blanford 1891,). Nomenclature and Taxonomical treatment of mammalian diversity was done by the help of the Taxonomy and mammals (Wilson and Reeder, 1993) and vertebrates (R.L.Kot pal 2024).

METHODOLOGY:-

(A) Methodology for Primary Data Collection

Mobile camera, Olympus binocular (840) and relevant field guides Taxonomic literature(above mentioned in last para) were used for proper citing and reference purposes photography was done by mobile camera & Nikon cameras.

(a) Direct method:

Small mammals were also observed by the transect / quadrate/sample method &estimation of their population parameters was done.

(b) Indirect method:

during the zoological trips & excursions identification was also conducted by indirect methods like, scats, quills, dung pellets and dung piles, identification pugmarks and footprints, and imprinted path ways, tree trunk methodology.

(B) Secondary

Data Collection

(a) Villagers/cattle herders Observation based interview and questionnaire methodology because they are familiar and very much experienced in the geographical locality and usual citing places for mammals. Interaction with these guys through a flesh back on the story.

(b) Data of wild life experts & forestry wildlife expert views & interviews, forest department report and annual report was also referred.

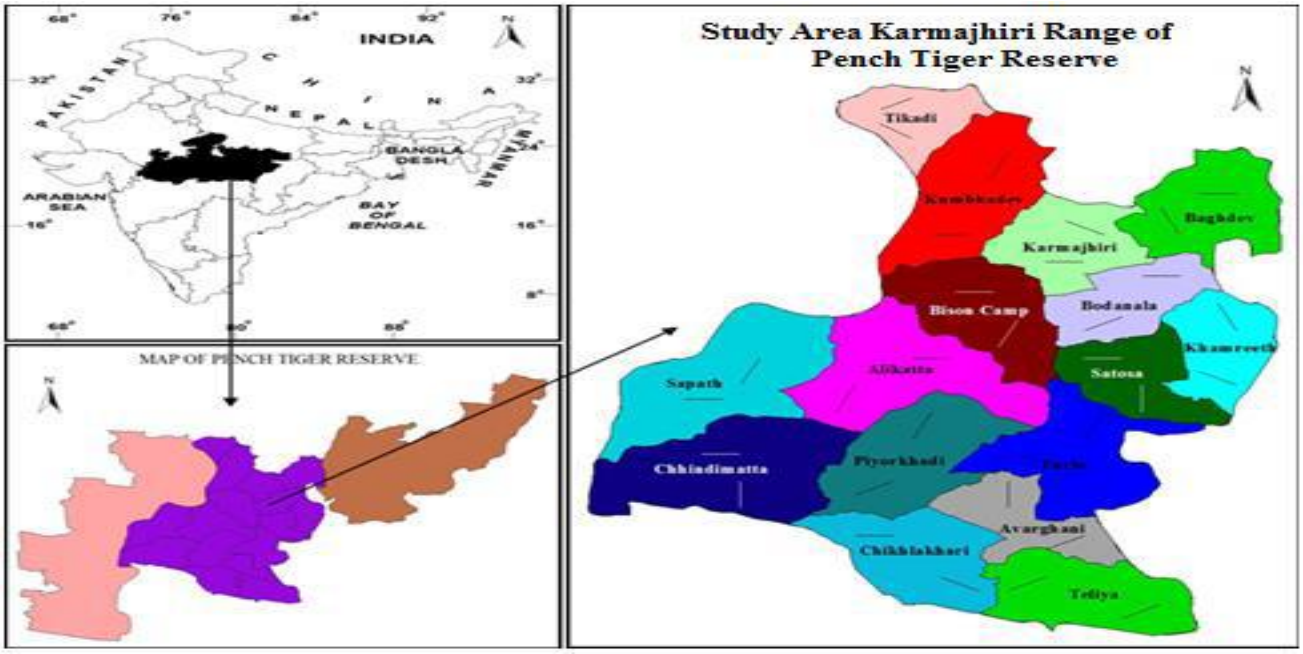

Fig 1: Map of Study Area showing location of transects in different administrative beats of Pench Tiger Reserve

Table:- 1 Observation of Mammals Diversity of Pench National Park Seoni (M.P.)

Sr. No.	Common Name	Scientific Name	Occurrence	Microhabitat specialization	Major Threats	Conservation Status
1.	Panther (leopard)	*Panthera pardus*	Rocky Forest	Tree grooves/Rocks caves	Habitat loss	Vulnerable
2.	Tiger	*Pantthera tigris*	Rocky Forest	Tree grooves/Rocks caves	Habitat loss	Vulnerable
3.	Ban Bilav (wild cat)	*Felis silvestris*	Forest/Rocks	Oran grooves	Habitat loss	Near threatened
4.	Bush rat	*Golunda ellioti*	Shruby area	Burrowing under bushes	Oran destruction	Least concern

5.	Field mouse	*Mus boodunga*	Agriculture plains	Crop fields	None	LC
6.	Common Indian mongoose	*Herpestes edwardsii*	Plains/sand duries	Fellow land forest patches	Habitat loss	LC
7.	Fruit bats	*Pteropus rodricensis*	Tree patches	Large Figs/ Fruit trees	Loos of tree covers	LC
8.	Short nose fruit bats	*Cynopterus sphinx*	Tree patches/ Forest	Forest/ Fruit trees	Loos of tree covers	LC
9.	Flying fox	*Pteropus giganteus*	Rocky Hills/Grooves	Rocky caves/cervices	Loss of Habitat	LC
10.	Chuchunder	*Bandicota bengalensis*	Human settlements	Store houses/ware houses	None	LC
11.	Five stripped palm Squirrel	*Funum bulus pennanti*	Human settlements/tree patches	Acacia/Neem	Loss of trees	LC
12.	Indian sehi	*Hystrix indica*	Forest	Forest/shrub land/Rocks	Habitat loss/Poaching	Vulnerable
13.	Pangolin	*Manis crassicaudela*	Rocky forest	Rocky caves	Poaching	Vulnerable
14.	Hare	*Lepis nigricois*	Oran/Shub land	Grooves of Euphorbia	Poaching/Habitat loss	LC
15.	Lakarbagga (hyna)	*Hyaena hyaena*	Forest land	Forest grooves	Habitat destruction	Vulnerable
16.	Indian gour	*Bos gaurus*	Forest land	Forest/near waterholes	Habitat Loss/ Poaching	Vulnerable
17.	Chinkara	*Gazella benetti*	Forest land	Sandy grooves	Poaching/Habitat	Near threatened
18.	Chital	*Axis axis*	Plains/Human settlement	Agricultural fields	Poaching	Not evaluated
19.	Sambar,	*Rusa unicolor*	Forest near water	Forest/shrub land	habitat loss, poaching	Vulnerable
20.	Barasingha,	*Rucervus duvaucelii*	Forest/ marshy grasslands	wet grasslands	habitat loss, poaching	Vulnerable
21.	Black buck,	*Artilope cervicapra*	Forest land	Sandy dures/Tree patches	Poaching/ habitat loss	Near threatened
22.	Barking deer	*Muntiacus muntjak*	Forest	Dense multilayered vegetation	Habitat loss	LC
23.	Chousingha	*Tetracerus quadricornis*	Forest near water bodies	Dense shrub	Habitat loss	Vulnerable
24.	Langur	*Macacs mulata*	Forest	Tree trunks/arboreal	Tree loss/deforestation	LC
25.	Monkey	*Semnopithecus entellus*	Macaca mulatta	Tree trunks/arboreal	Tree loss/deforestation	LC
26.	Wild pig	*Sus scrofa*	Oran/Agriculture fields	Near Human settlement	Poaching for meat	LC
27.	Jackal (Siyar)	*Canis aureus*	forest fringes	Forest/ agricultural edges	Habitat Loss	LC
28.	Sloth bear	*Melursus ursinus*	Rocky forest	Rock cervices/ Caves	Habitat Loss	Critically Endangered
29.	Wild dog (Dhole)	*Lycaon pictus*	Dense Forest	Forest/ open grasslands	Habitat Loss	Endangered

30.	Nilgai	*Boselaphus tragocamelus*	Forest	patchy environments	Habitat Loss/ Poaching	LC

RESULT & DISCUSSION:-

Total 30 large and small mammals included carnivores and herbivores mostly are nocturnal few are diurnals. Major threats were assessed poaching for meat and body parts like furs, skin, nails and habitat destruction & changing land use pattern are major ecological risks & threats evaluated.

Methods to estimate population abundance are broadly classified as direct and indirect. Direct methods are based on surveys or counts of the animals (Focardi *et. al*., 2002; Ward *et al*., 2004) and generally allow estimating their population structure in addition to abundance, whereas, indirect methods only give an estimate of the overall population abundance (Putman, 1984). Indirect methods for ungulates are frequently based on faecal pellet counts (Ilyas and Khan, 1998, Marques *et. al*., 2001; Ilyas, 2001, Smart *et. al.*, 2004, Haleem *et.al*. 2014a, 2014b). Pellet group/faecal matters are considered to be one of the best indicators for the species presence (Ilyas and Khan, 1998, 2005, Ilyas, 2001). To investigate the population abundance of mammalian species present in the tiger reserve, entire National park was surveyed using indirect evidences at administrative beat level and the data were further pooled up at different administrative circles level for further analysis.

CONCLUSION:-

Zoological trips and excursions were conducted in the years of 2022, 2023, 2024 and the current years of the 2025 (up to February). The mammalian diversity encountered and evaluated in the area includes total 30 species of large and small mammals including carnivores, herbivores. Most of them are very important species of forested areas, few are of rocky terrain and others are found in Rocky orans/Dev vans in the concerned area of study. Large Herbivores are Nilgai, Sambhar, Kala Hiran, Chinkara, chital, wild boar etc. while small herbivores are five striped squirrel, s hrews, rats, mole, hare, Hedge Hog, Porcupines etc. Large carnivores included Predatory and top carnivores like panther (Leopard), Jackal, Lakkarbagga, and Honey bagger. Small ones are civets, pangolins, and Gerbils, Desert fox, desert cat, wild cat, caracal etc. Arboreal (tree dwellers) included monkeys, Langurs, Flying foxes, squirrels etc. Cave dweller included Panthers, sloth bears, pangolins, Porcupines & Hedge hogs, flying mammal included Flying Foxes, Fruit bats, cave bats and short nose fruit bats.

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