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Species Richness and Habitat Associations of Birds in the Central Region of Maharashtra

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Abstract: ***The present study investigates the avifaunal diversity in and around the Reserve Forest and Aquatic habitat of the Balaghat hill ranges, documenting a total of 69 bird species distributed across 5 orders and 15 families. This rich assemblage reflects the region's ecological heterogeneity, encompassing deciduous forests, scrublands, and water bodies that collectively support a wide range of bird communities. The order Passeriformes dominated the species composition, with families such as Alaudidae, Sturnidae, and Ploceidae frequently represented, indicating the significance of open and cultivated landscapes. Insectivorous species like the Ashy Prinia and Drongo highlighted the health of the understory and insect prey base, while forest specialists such as the Indian Grey Hornbill and Crested Serpent Eagle signaled intact woodland patches. Water-associated birds, including egrets and wagtails, underscored the ecological value of riparian zones. Seasonal migrants, notably the Red-rumped Swallow and Yellow Wagtail, were recorded in winter, confirming the site's importance along migratory routes. Local reports of declining House Sparrow populations were consistent with broader regional trends linked to habitat loss and pesticide use, while Indian Peafowl populations appeared stable due to sociocultural protection. The study also recorded nectarivores like the Purple Sunbird, highlighting their role in plant-pollinator dynamics. These findings affirm the Balaghat hill ranges as a critical habitat for diverse avian guilds and call for sustained ecological monitoring, community engagement, and targeted conservation initiatives to safeguard this biologically significant landscape.***

Keywords: Avifaunal Diversity, Habitat Heterogeneity, Reserve Forest, Water bodies Migratory Birds, Conservation Ecology

1. Introduction

Avifauna, or bird diversity, serves as an important bioindicator of the health and stability of forest ecosystems. India, owing to its diverse geography and climate, harbors more than 1,300 bird species, with rich avian diversity documented across various ecological zones including forests, wetlands, grasslands, and coastal habitats (Ali and Ripley, 1987; Grimmett et al., 2007). The Western Ghats, Eastern Ghats, and their connecting ranges in the Deccan Peninsula form critical corridors for avian diversity, contributing significantly to India's bird species richness. Peninsular India, including the Balaghat hill ranges, lies in a transitional zone between the Eastern and Western Ghats. This region has long been noted for its ecological richness and endemism (Ganeshiah and Uma Shaanker, 1998). The Balaghat hills, part of the Deccan Plateau, are characterized by tropical deciduous forests, diverse vegetation cover, and topographical variations ranging from 550 to 825 meters in elevation. These hills form an important watershed between the Godavari River to the north and the Bhima River to the south, creating varied microhabitats that support a wide range of bird species.

The present study was carried out in the Reserve Forest area, Water bodies of Ashti Taluka, situated in the central region of Maharashtra. This landscape receives an average annual rainfall of approximately 536 mm, influenced by both the southwest and retreating northeast monsoons. Such climatic conditions have fostered rich floral growth, which in turn supports a diverse community of birds and other wildlife. Bird communities in other parts of the Western Ghats have been well-documented by researchers such as Daniels (1991), who emphasized the importance of tropical forests in sustaining avian diversity. Similarly, studies by Somasundaram and Balakrishnan (2000) in the Kalakad-Mundanthurai Tiger Reserve, and by Raman et al. (2005) in the Anamalai Hills, have revealed strong correlations between habitat complexity and bird species richness. In Maharashtra, work by Pramod Patil and Narayana et al. (2004) in the Western Ghats and Satpura ranges highlighted the significance of secondary forests and traditional landscapes in harboring endemic and migratory bird populations. Despite this, certain regions such as the Balaghat hills in central Maharashtra remain underexplored in terms of avifaunal assessments. The lack of baseline data hampers conservation efforts, especially as anthropogenic pressures such as deforestation, pesticide use, and habitat fragmentation continue to impact bird habitats (Sharma and Rai, 1991; Jathar and Rahmani, 2006).

This study aims to fill this gap by documenting the forest bird community of the Balaghat hill ranges. Covering a full annual cycle from June 2022 to May 2023, the study provides insights into seasonal variations, species abundance, and the presence of both common and rare birds. A total of 69 bird species were recorded, many of which are closely tied to the deciduous forest ecosystem and nearby water sources. This documentation not only contributes to regional biodiversity knowledge but also serves as a baseline for long-term monitoring and conservation planning.

2. Methodology

The present study was conducted over a year (June 2022–May 2023) to document avifaunal diversity in the Deovali Reserve Forest, Ashti Taluka, within the Balaghat hill ranges of Maharashtra. This time frame ensured seasonal representation, accounting for fluctuations in bird abundance and composition (Ali, 2002; Grimmett et al., 2007). Regular field surveys were conducted during peak bird activity hours—early mornings and late evenings (Sutherland, 2006). Line transects covering approximately 133 km were laid across forests, water bodies, and adjoining habitats (Bibby et

al., 2000). Birds were observed using 8x50 binoculars, and each sighting was recorded for species, number, behavior, and habitat. Double counting was minimized through mapped field notes (Bibby et al., 1998; Kumar et al., 2005). Species were identified using standard field guides: *The Book of Indian Birds* (Ali, 2002), *Birds of the Indian Subcontinent* (Grimmett et al., 2007), and *The Illustrated Encyclopedia of Birds of the World* (Alderton, 2006). Photographic documentation with a Nikon FE camera supported identification and educational outreach. Birds were categorized as common, frequent, occasional, or rare based on encounter frequency, following protocols from Thirumalai (1999) and Dinakaran & Anbalagan (2007). Special attention was paid to microhabitats like water sources and fruiting trees, especially during dry seasons, where bird activity intensified (Kumar & Singh, 2009).

3. Results & Discussion

The present study recorded a rich assemblage of avifauna with a total of 69 bird species belonging to 11 orders and 27 families in and around Reserve Forest area, Water bodies of Ahmednagar and Beed district, situated in the central region of Maharashtra. of Balaghat hill ranges. This diversity reflects the ecological heterogeneity of the region, which encompasses deciduous forest, scrubland, and water bodies. Such habitats are known to support varied bird communities, a pattern consistent with previous studies across the Indian subcontinent (Ali, 2002; Grimmett et al., 2007).

Species Richness and Habitat Association

The order Passeriformes was the most dominant group in terms of species richness, comprising families such as Alaudidae, Sturnidae, Muscicapidae, Pycnonotidae, and Ploceidae. The high occurrence of passerine birds indicates the mosaic of open grasslands, bushy patches, and cultivated lands near forested areas that provide feeding and nesting grounds (Daniels, 1991). Species like the *House Sparrow* (*Passer domesticus*), *Indian Robin* (*Saxicoloides fulicatus*), and *Baya Weaver* (*Ploceus philippinus*) were recorded frequently, though a noticeable decline in sparrow numbers was reported by local villagers, attributed to habitat loss and overuse of pesticides a trend similarly reported by Thakur et al. (2012) and Garg & Jain (2014).

The presence of insectivorous species such as the *Ashy Prinia* (*Prinia socialis*), *Tailor Bird* (*Orthotomus sutorius*), and *Drongo* (*Dicrurus macrocercus*) indicates healthy insect populations and complex understory vegetation, as these birds rely on such niches for foraging. Their abundance aligns with findings from other studies in central India, where insectivore richness is closely tied to monsoonal productivity and vegetative cover (Somasundaram & Balakrishnan, 2000).

Forest and Woodland Specialists

Species such as the *Indian Grey Hornbill* (*Ocyceros birostris*), *Crested Serpent Eagle* (*Spilornis cheela*), *Greater Coucal* (*Centropus sinensis*), and *Spotted Owlet* (*Athene brama*) were primarily observed in dense woodland or forest patches. These birds are generally indicators of mature forest ecosystems and require tree cover for nesting and feeding (Jathar & Rahmani, 2006). The *Asian Paradise Flycatcher* (*Terpsiphone paradisi*) and *White-browed Fantail Flycatcher* (*Rhipidura aureola*) further support this, as they are associated with semi-evergreen and moist deciduous habitats (Raman et al., 2005).

Water-Associated Species

Water-dependent species like *Pond Heron* (*Ardeola grayii*), *Cattle Egret* (*Bubulcus ibis*), *White-breasted Kingfisher* (*Halcyon smyrnensis*), and *Wagtails* (*Motacilla spp.*) were predominantly sighted near streams and agricultural fields. These birds play crucial roles in insect control and aquatic food chains. Their presence indicates the importance of maintaining water bodies and riparian zones for sustaining avifaunal diversity (Kumar & Singh, 2009).

Seasonal Patterns and Migration

Several species such as the *Red-rumped Swallow* (*Hirundo daurica*), *Yellow Wagtail* (*Motacilla flava*), and *Black Redstart* (*Phoenicurus ochruros*) are known seasonal migrants. Their sightings predominantly during winter months align with broader migratory trends observed in peninsular India (Sharma & Rai, 1991). Migratory behavior offers valuable insight into broader climatic patterns and resource availability in tropical habitats.

Declining and Increasing Trends

A significant observation was the decline in *House Sparrow* populations. Villagers attributed this to modern building practices, reduced nesting cavities, and excessive insecticide usage—factors also cited by Singh et al. (2013) and Khera et al. (2010). In contrast, *Indian Peafowl* (*Pavo cristatus*) populations appear stable or increasing, likely due to religious and cultural protection in the region.

Ecological Importance

The recorded diversity also includes pollinators such as *Purple Sunbird* (*Nectarinia asiatica*) and *Purple-rumped Sunbird* (*Nectarinia zeylonica*), which play key roles in plant reproduction. Their frequent sightings during flowering periods indicate their ecological role and dependency on floral resources, as reported by Ali (2002) and Daniels (1991).

4. Conclusion of Discussion

The composition of bird species recorded reflects the ecological richness and habitat diversity of the Balaghat hill ranges. The presence of a mix of resident, migratory, insectivorous, granivorous, and nectarivorous birds highlights the importance of this forest landscape as a refuge for avifauna. However, pressures such as habitat degradation, pesticide use, and changing land-use patterns pose significant threats. The findings emphasize the need for long-term monitoring and habitat conservation strategies in this ecologically significant yet underexplored region.

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Appendix- 1: Check list of birds recorded at around Forest area. Ahmednagar and Beed district, situated in the central region of Maharashtra

Order	**Family**	Species
Ciconiformes,	Ardeidae	Pond Heron -*Ardeolagrayii.* Cattle Egrate - *Bubulcus ibis* .
Falconiformies	Accipitridae.	Black Shouldered Kite – ***Elanuscaeruleus .*** Black Kite – *Milvusmigrans* . Brahminy Kite **– *Haliastur Indus.*** Crested serpent Eagle -*Spilornischeela* . **BesraSparrowhawk- *Accipiter virgatus .***
Galliformes	Phasianidae.	Indian Peafowl–*Pavocristatus* . Read watted Lapwing. –*Vanellusindics* . Grey Francolin -*Francolinuspondicerianus* . Painted Francolin -*Francolinuspictus* . Rain Quail - *Coturnixcoromandelica*
Columbiformes	Columbidae	Rock pigeon -*Columaliva* . Red dove -*Streptopeliatranquebrica* . Little Brown dove --*Streptopeliasenegalensis* . Eurasia Collared Dove - -- *Streptopeliadecaocto* Spotted Dove --- *Streptopeliachinensis* .
Cuculiformes	Cuculidae	Asian Koel- *Eudynamysscolopace* *Greater Coucal -Centropussinensis* .
Psittaciformes	Psittacidae	Parrot –Rose ringed -*Psittaculakrameri* . Pulm- Headed Parakeet – *Psittaculacyanocephala*

Strigiformes	Strigidae	Spotted Owlet – *Athenebrama* . Jungle owlet –*Glaucidiumradiatum*
Caprimulgiformes	Caprimulgidae	Franklin's Nightjar -*Caprimulgusaffinis* .
Corciiformes	Alcedinidae	White breasted Kingfisher - *Halcoyonsmyrnensis*
	Meropidae	Bee Eater – *Meropsorientalis*

Order	Family	Species
Corciiformes	Coraciidae	Indian Roller – *Coraciasbenghalensis*
	Upupidae	Common Hoop – *Upupaepops*
	Bucerotidae	Indian GreyHornbill -*Ocycerosbirostris* .
Piciformes	Capitonidae	Coppersmith Barbet - *Megalaimahaemacala* *Crimson-Thorated Barbet-Megalaimarubricapilla.*
Passeriformes	Alaudidae	Ashy Crowned Sparrow Lark – *Eremopterixgrisea* . RufousTailed Lark -*Ammomanesphoenicurus* . Skye's Crested Lark -*Galerida deva* . Orinted Sky Lark – *Aladuagulgula.*
	Hirundinidae	Red Rumped Swallow – *Hirundodaurica* . Wire Tailed Swallow -*Hirundosmithii* .
	Daniidae	Bay Backed Shrinke- *Laniusvittatus* . Long Tailed Shrinke – *Laniusschach* .. Southern Grey Shrink – *Laniusmeridionalis.*
	Sturnidae	Lesser hill myna – *Graculaindica* Brahminy Myna – *Sturnuspagodarum* . Common Myna –*Acridotherestritis* . Bank Myna - *Acridotheresginginianus*
		House crow -*Corvussplendens* . JungaleCrow -*Corvusmacrorhynchos* .
	Campephagidae	White Bellied Minivet - *Pericrocotuserythropygius*
	Pycnonotidae	Redvented Bulbul - *Pycnotuscafer* . Grey headed Bulbul - *Pycnotuspriocephalus*
	Cisticolidae	Ashy Prinia-*Priniasociialis* . Common Tailor Bird -*Orthotomussutorius*
	Muscicapidae	Black Redstart -*Phoenicurusochruros* .
	Muscicapidae, Sub.Family-Timaliinae	Black Drongo -*Dicrurusmacrocercus* . Common Babbler -Turdoidescaudatus . Jungle Babbler - *Turdoidesstriatus* .
	Sub.Family-Muscicapinae	Asian Paradise Flycatcher - *Terpsiphone paradise* . White Browed Fantail Flycatcher -*Rhipiduraaureola* .
	Sub.Family-Turdinae	Indian Robin – *Saxicoloidesfulicata* Oriented Magpie Robin – *Cpsychussaularis*. Baya Weaver bird – *Ploceusphilippinus* .
	Paridae, Sub. Family-Parinae	Great Tit- *Parus major* .
	Motacillidae	Large Pied Wagtail -*Motacillamaderaspatensis* . White Wagtail -*Motacilla alba* . Yellow Wagtail- *Motacillaflava.*
	Nectariniidae	Purple sunbird -*Nectariniaasiatica* . Purple Rumped Sunbird – *Nectariniazeylonica* . Lotin's Sunbird - *Nectarinialotenia*
	Ploceidae, SubFamilyPasserinae	House Sparrw- *Passer domesticus* .
	SubFamilyPloceinae	Streaked Weaver – *Ploceusmanyar* Baya Weaver bird – *Ploceusphilippinus* .