

A Comparative Study of Behaviour, Breeding and Conservation Status of Species of Sparrows Found in India: A Review

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Abstract:- Sparrows (Passeridae) are small passerines found in human-modified environments worldwide. This review examines the behavior, breeding patterns, and conservation status of three sparrow species in India: House Sparrow (*Passer domesticus*), Eurasian Tree Sparrow (*Passer montanus*), and Chestnut-shouldered Petronia (*Petronia xanthocollis*). These species exhibit unique ecological niches and behaviors, from urban adaptability in House Sparrows to arboreal tendencies in Eurasian Tree Sparrows and sociable behaviors in Chestnut-shouldered Petronias. Sparrows face significant conservation challenges due to habitat loss, pollution, climate change, and urbanization. House Sparrows and Eurasian Tree Sparrows, although globally classified as "Least Concern," experience regional declines. Chestnut-shouldered Petronias are impacted by habitat fragmentation and degradation. Conservation efforts in India include nest box installations, public education, habitat restoration, and policy advocacy. The primary factors contributing to sparrow population declines are habitat degradation and reduced food availability, exacerbated by pollution and climate change. Effective conservation requires a holistic approach, integrating habitat preservation, pollution control, and community engagement. Continuous monitoring and adaptive management strategies are essential to mitigate these threats and ensure the long-term survival of sparrows, underscoring their ecological and cultural importance. Collaborative efforts among researchers, conservationists, and policymakers are crucial to safeguarding these species and their habitats.

Keywords:- *Passeridae, Passer Domesticus, Passer Montanus, Petronia Xanthocollis, Behavioural Ecology, Breeding Biology, Population Dynamics, Conservation.*

I. INTRODUCTION

Sparrows (*Passeridae*) are small passerines deeply associated with human-modified environments. Encompassing over 40 species globally, they thrive in urban, suburban, and agricultural landscapes (Gill *et al.*, 2020). Despite their ordinary appearance, sparrows hold significant cultural and ecological value. Understanding their behavior and ecology is crucial for prioritizing conservation efforts (Perrins, 1979). The global decline in sparrow populations has emerged as a pressing conservation concern, highlighting

the need for integrated conservation initiatives (Smith & Jones, 2019).

This review focuses on three sparrow species in India: House Sparrow, Eurasian Tree Sparrow, and Chestnut-shouldered Petronia. Each occupies a unique ecological niche, distinguished by habitat preferences, foraging behaviors, and social structures (Gupta & Sharma, 2020). Investigating their dynamics is crucial for informing conservation strategies to safeguard biodiversity within their habitats.

II. BEHAVIOURAL PATTERNS

A. House Sparrow (*Passer Domesticus*)



Fig 1: https://www.allaboutbirds.org/guide/House_Sparrow/id



Fig 2: <https://avitrol.com/pages/avitrol-for-sparrow-control.html>

House Sparrows demonstrate exceptional urban adaptability, using human-made structures for nesting and scavenging for food scraps. Their gregarious nature is evident in large gatherings around food sources. During the breeding season, males exhibit aggressive behavior indicative of competition for resources and mates (Gupta & Sharma, 2020).

B. Eurasian Tree Sparrow (*Passer Montanus*)



Fig 3: https://www.allaboutbirds.org/guide/Eurasian_Tree_Sparrow/overview



Fig 4: <https://photodune.net/item/eurasian-tree-sparrow-sitting-on-the-tree-with-his-nest-and-feeding-its-child/32264195>

Eurasian Tree Sparrows display a primarily arboreal lifestyle, frequenting parks, gardens, and wooded regions. Their diet, including berries, insects, and seeds, differs from that of House Sparrows. Unlike House Sparrows, Eurasian Tree Sparrows form close-knit social groups with reduced aggression, particularly drawn to semi-arid areas and rocky landscapes with abundant trees (Gupta & Sharma, 2020).

C. Chestnut-Shouldered Petronia (*Petronia Xanthocollis*)



Fig 5: <https://www.presidentofindia.gov.in/chestnut-shouldered-petronia>



Fig 6: https://birdsofgujarat.co.in/bird_detail.php?id=15255

Chestnut-shouldered Petronias exhibit sociable behavior, favoring semi-arid and rocky habitats. Vocalizations serve as a means of communication within loosely formed colonies and for territorial display during the breeding season. They utilize unique vocal signals to facilitate communication and establish social organization (Gupta & Sharma, 2020).

Despite differences in habitat preferences and social behaviors, all three species demonstrate resilience in the face of human-induced environmental alterations, highlighting their capacity to adapt to changing surroundings. A thorough understanding of these dynamics is crucial for effective conservation management and urban biodiversity preservation (Gupta & Sharma, 2020).

III. BREEDING PATTERNS

The breeding behaviors of House Sparrows, Eurasian Tree Sparrows, and Chestnut-shouldered Petronias are marked by distinct strategies that significantly influence their reproductive success.

A. House Sparrow

House Sparrows are known for their communal breeding tendencies, often constructing nests within human-made structures in urban landscapes. This preference allows them to easily access abundant food resources (Gonzalez & Smith, 2020).

B. Eurasian Tree Sparrow

Eurasian Tree Sparrows Favor a monogamous mating system, typically selecting natural nesting sites within wooded areas. Their reliance on a diet rich in berries and insects is pivotal for sustaining breeding pairs and their progeny (Gupta & Sharma, 2020).

C. Chestnut-shouldered Petronia

Chestnut-shouldered Petronias engage in cooperative breeding within colonies, utilizing rocky crevices as nesting sites. Their survival hinges upon a diverse dietary intake comprising various seeds and insects (Gupta & Sharma, 2020).

The correlation between habitat suitability and food availability is a key factor influencing the reproductive success of these species. Conservation initiatives should focus on preserving and managing natural habitats to ensure the long-term viability of these bird populations (Gupta *et al.*, 2020).

IV. CONSERVATION STATUS

The conservation status of these sparrow species is evaluated at both national and international levels, revealing various concerns and conservation efforts.

A. House Sparrow

Although classified as "Least Concern" globally, local declines have led to conservation initiatives. Challenges such as habitat loss, pollution, climate change, and predation contribute to their decline (Gupta *et al.*, 2020).

B. Eurasian Tree Sparrow

The Eurasian Tree Sparrow is also classified as "Least Concern" globally by the IUCN. However, like the House Sparrow, it faces regional declines due to habitat loss, urbanization, and changes in agricultural practices. Conservation measures for the Eurasian Tree Sparrow include habitat preservation, promoting organic farming to reduce pesticide use, and installing nest boxes to provide additional nesting sites (Gupta & Sharma, 2020).

C. Chestnut-Shouldered Petronia

The conservation of Chestnut-shouldered Petronias faces substantial challenges due to habitat fragmentation and degradation. In India, diverse strategies are implemented, including public education initiatives, community-led habitat restoration, nest box installation programs, and advocacy for legislation to mitigate urbanization impacts (Gupta & Sharma, 2020).

Given India's evolving environmental landscape, sustained vigilance and adaptable management strategies are imperative for ensuring the long-term survival of sparrows. Continuous surveillance is crucial for monitoring population changes, detecting emerging risks, and improving conservation strategies (Kumar *et al.*, 2020).

V. REASONS FOR DECLINE

The decline in sparrow populations is a complex phenomenon, with habitat loss emerging as a key factor. Urban expansion and intensified agricultural practices have degraded and fragmented habitats, reducing suitable nesting sites and foraging grounds (Singh & Sharma, 2020). Additionally, monoculture landscapes and pesticide use have caused a decline in insect populations, the primary food source for sparrows (Gupta & Sharma, 2020).

Habitat and food source contamination from pollution, including industrial emissions, vehicle exhaust, and agricultural runoff, pose direct threats. Pollution leads to the accumulation of pesticides and toxic metals in sparrows' bodies, resulting in reproductive challenges and compromised immune systems. Urban-induced alterations, such as increased ambient noise and artificial light, disrupt sparrows' natural behaviors, negatively impacting their health and breeding success (Gupta & Sharma, 2020).

Global warming exacerbates climate variations' impact on sparrow populations. Weather fluctuations disrupt breeding cycles and reduce resource availability, leading to reproductive declines. Urgent conservation interventions prioritizing habitat management and broader climate mitigation efforts are crucial for safeguarding sparrow populations (Gupta & Sharma, 2021).

VI. DEMOGRAPHIC TRENDS

A. House Sparrow

Despite being globally widespread, House Sparrows have experienced population declines in urban regions across India due to pollution, habitat loss, and competition with invasive species. Their populations are more stable in rural and suburban habitats (Gupta & Sharma, 2020).

B. Eurasian Tree Sparrow

The Eurasian Tree Sparrow population has experienced moderate declines, particularly in areas with extensive urbanization and reduced agricultural activities. Rural habitats provide more stable populations (Gupta & Sharma, 2020).

C. Chestnut-Shouldered Petronia

Limited data is available for Chestnut-shouldered Petronia populations; however, they are known to inhabit semi-arid and rocky regions in India. Ongoing research efforts aim to understand population dynamics and address threats (Gupta & Sharma, 2020).

VII. CONSERVATION INITIATIVES FOR SPARROWS IN INDIA

➤ *Local Conservation Initiatives Rely on Grassroots Movements, Community Participation, and Partnerships to Protect Sparrows.*

Table 1: Conservation Initiatives of the Sparrows Found in India

Sr. No.	Conservation Acts	Year/status	References
1.	Save Our Sparrows (SOS) Campaign	2012-Present	www.natureforever.org/wildlife-conservation/save-our-sparrow
2.	World Sparrow Day	2010-Present	www.worldsparrowday.org
3.	Nest Box installation Programs	Varies by Region- present	www.savitahiremath.com
4.	Research and Monitoring Programs	Ongoing	https://www.birdmonitoring.in/monitoring-efforts
5.	Policy Advocacy and Habitat Conservation	Ongoing	https://www.indiabirdwatching.com/bird-conservation-in-india

➤ *Some Efforts at Local Level*

- Nest Box Installation Programs.
- Awareness Campaigns and Workshops.
- Community-led Habitat Restoration.
- School and Community Gardens.
- Citizen Science Projects.
- Advocacy and Policy Engagement.
- Community Collaboration and Networking.

VIII. CONCLUSION

Sparrows play a crucial role in maintaining ecological balance within human-dominated landscapes (Gupta & Sharma, 2020). This review highlights the importance of understanding sparrow behavior, breeding biology, and conservation concerns to ensure their continued survival. Collaborative efforts from researchers, conservationists, policymakers, and the public are essential to safeguard sparrows and their habitats. By raising awareness, implementing habitat restoration initiatives, and addressing key threats, we can work towards a sustainable future for sparrows in India. Further research is needed to fill gaps in our understanding and inform evidence-based conservation strategies (Kumar *et al.*, 2020).

In conclusion, sparrows' adaptability and resilience are notable, yet their declining populations signal broader environmental issues that require urgent attention. Conservation strategies must be holistic, integrating habitat preservation, pollution control, and public engagement to foster a conducive environment for sparrows. Continuous monitoring and proactive measures will be vital in reversing the decline and ensuring the preservation of these important avian species for future generations (Gupta & Sharma, 2020).

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