

Interspecific Competition Between *Funambulus Pennantii* and *Psittacula Kramerii* For Nesting Site in Urban Landscape of Delhi, India

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Abstract

Behavioral traits of the species play an important role in functioning of the ecosystem, biodiversity conservation and in facilitating the species to adapt with the current environmental conditions. Microhabitats in trees provide the species to adapt their immediate environment and to thrive even in harsh condition. As micro habitats have specialized ecosystems, they play crucial role in restructuring and management of biodiversity. Here we present the note on inter-specific competition between *Funambulus pennantii* and *Psittacula krameri* for nesting site in urban landscape of Delhi, India.

Keywords: Biodiversity, micro habitats, Behavioral traits, *Funambulus pennantii*, *Psittacula krameri*, nesting, India.

Introduction

Behavioral traits of the species play an important role in functioning of the ecosystem, biodiversity conservation and in facilitating the species to adapt with the current environmental conditions. Competition is universally regarded as one of the most powerful forces shaping ecological and evolutionary processes, playing a leading role in biotic diversification. Interspecific competition is a dominant force in animal communities that induces niche shift in ecological and evolutionary time [1]. The role of interspecific competition in shaping animal and plant communities has formed one of the major issues in ecology for decades [2]. Most of the evidence for the occurrence of interspecific competition in animals has been gained from laboratory populations; however, existing indirect evidences suggests that competition may sometimes be responsible for the distribution of animals in nature [3].

The northern palm squirrel or five-striped palm squirrel (*Funambulus pennantii*) is a rodent species that belongs to the family Sciuridae. The species is native to India, Nepal, Bangladesh, Pakistan and Iran and widely distributed across the tropical and subtropical dry deciduous forests, montane ecosystems, scrublands, grasslands and agricultural fields. Besides, the species is commonly found across the urban parks and well adapted to live in close proximity to the human habitations. The species is diurnal and arboreal; however, commonly use to forage on ground. In contrast, rose-ringed parakeet *Psittacula krameri* is a native species to sub-Saharan Africa and the Indian Subcontinent. The species is highly capable to adapt to a wide array of habitats, ranging from forests, grasslands, deserts, wetlands, foothills, agricultural fields and urban environments. The species, as a highly commensal

species, also lives in close association with human beings and found across the human settlements, roadside and urban parks as well. The species is primarily an opportunistic granivore and known to feed on a wide variety of cereals & grains, seeds, fruits, berries, nectar, etc. In this note, we illustrate on an observation made on the interspecific competition between five-striped palm squirrel and rose-ringed parakeet for nesting site in an urban park of the National Capital Territory of Delhi.

Five-striped palm squirrel and rose-ringed parakeet are listed as Least Concern in IUCN Red List of Threatened Species and are protected under Schedule IV of the Indian Wildlife (Protection) Act, 1972. Both the species are adapted to nest in tree cavities, holes in tree trunks or inside the crevices in the walls of the old buildings. Such cavities are often excavated by some specialized woodpeckers like common hoopoe (*Upupaepops*), black-rumped flameback (*Dinopium benghalense*), brown-headed barbet (*Psilopogon zeylanicus*) etc.; however, later used by other species, which would have important ecosystem-level consequences in management of biodiversity. Although tree cavities play a key role in structuring and functioning of ecosystems and host rich and specialized assemblages of numerous vertebrate and invertebrate species, they have received limited research attention in India as well as in tropics (Patel et al. 2021). Microhabitats in trees provide the species to adapt their immediate environment and to thrive even in harsh condition. As micro habitats have specialized ecosystems, they play crucial role in restructuring and management of biodiversity. Tropical forests are the most biologically diverse and ecologically complex of all terrestrial ecosystems because of the presence of a wide array of microhabitats across the forest strata [4].

Material and Methods

On 22nd May 2022 (1730 h), we came across an incident at Hudco Park (28.56°N, 77.22°E), wherein two individuals of rose-ringed parakeet were confronting with the individuals of northern palm squirrel for space and nesting site. Both species were making efforts to establish their dominance over each other. Parakeets were observed chasing the squirrels to drive off them away from the tree hole, where they wanted to perch. Similar efforts were also being made by the squirrels for occupying the tree hole, by running across and constantly making noisy squeaking calls to drive away the parakeets. Intermittent efforts for perching on the tree by parakeets by

making random sudden mock attacks and squirrel's effort to deter them away, was making the incident interesting. Both species also had a little fear while deterring each other.

It is worth to mention that the breeding season of both the species pronounced and overlap, which has been considered from February to September months in north India (self-observations; [5-9]). Although, there were two holes in a same tree trunk of a moderate size kadam tree (*Neolamarckia cadamba*) with having a gap of about 70 cm, species were competing for the lower side hole, the exact reason of which was unknown (Figure 1 a-c).

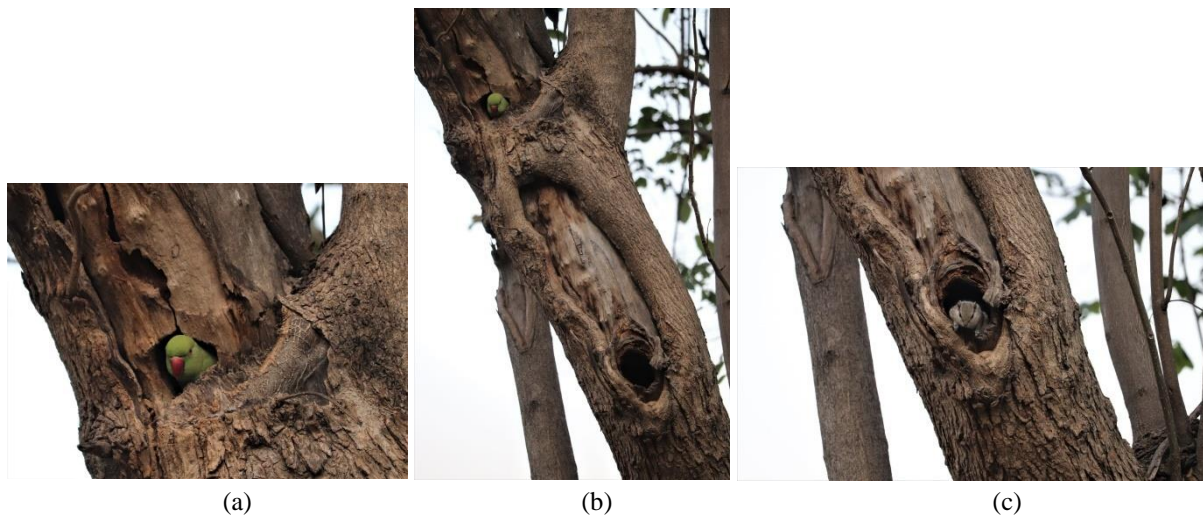


Figure 1 a & c: Rose-ringed parakeet (upper end) and northern palm squirrel (lower end) at tree holes. In figure 'b', both the tree holes can be seen together.

In order to obtain more clarity on the observations, we continued our observations for next 15-20 days. For next 2-3 days, competition continued between the species, which mainly consisted of driving each other. Later, after about one week, we saw that parakeets were perching/roosting on the tree hole located at upper end, wherein parakeets were found entering the hole and going out of the hole frequently. Most of the times it was observed that only one individual of parakeet was entering the hole while the other was guarding its comrade from a branch of the tree. However, squirrels were seen inhabiting the tree hole located at the lower end.

Conclusion

Although, competition for food was not observed between the species, squirrels were observed feeding over the grains, which felled on the ground from the parakeet's mouth. Later, after about one month, we observed litters of northern palm squirrel running on the branches. However, the chicks of rose-ringed parakeet were observed almost after two months. Documenting such records, underpinning the natural history of the species, especially in context of changing climatic conditions, would thus be of paramount importance in management of native faunal species in the urban ecosystems.

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