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Original article

## Diversity and status of avifauna in Todgarh-Raoli Wildlife Sanctuary, Rajasthan, India

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### ABSTRACT

Understanding the diversity and structure of bird communities is essential to delineate the importance of regional or local landscapes for avian conservation. Birds are very sensitive to environmental changes and are used as a “bioindicator.” The study was carried out to explore the diversity and status of avifauna in the Todgarh-Raoli Wildlife Sanctuary, Rajasthan, India, from January 2013 to December 2013. The line transect method was used to cover most of the study area. A total of 142 species of birds belonging to 45 families and 18 orders were recorded. Muscicapidae was the most dominant family with 23 species, and its relative diversity index was also found to be the highest (relative diversity index = 16.19). The analysis of data on residential status revealed that 99 species were residents, six species were winter visitors, three species were summer visitors, and 14 species were passage visitors. The analysis of feeding habits showed that a maximum number of species (44 species) were omnivorous, 42 species were insectivorous, 35 species were carnivorous, 12 species were granivorous, four species were frugivorous, four species were insectivorous–nectivorous, and one species was nectivorous. According to the International Union for the Conservation of Nature, 128 species were in the Least Concern category, one species was in the Endangered category, two species were in the Critically Endangered category, six species were in the Near Threatened category, and two species were in the Vulnerable category. Thus, the Todgarh-Raoli Wildlife Sanctuary supports a sound avifaunal diversity. Its proper management will not only improve the situation for its resident species, but will also attract more migratory and vagrant species in the future.

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### Introduction

Birds are among the best monitors of environmental changes. Changes in their population, behavior patterns, and reproductive ability have most often been used to examine the long-term effects of habitat fragmentation (Harisha and Hosetti, 2009). Forests attract a large number of avifauna because they provide suitable habitats for most birds, especially those birds that are associated with vegetation, and for most, the existence of trees is a vital component of their life cycle. The birds' level of interest on various forests depends on the age of the stands. The composition of bird species is highly related to the vegetation structure of forests (Robertson and Hackwell, 1995). Ecologically, birds are of

tremendous importance because of their key roles as pollinators and agents of seed dispersal (Bibi and Ali, 2013). Therefore, understanding the diversity and structure of bird communities is essential to delineate the importance of regional or local landscapes for avian conservation (Kattan and Franco, 2004).

The preservation of global species diversity has emerged as one of the most important issues today (Hu et al., 2011). Protected areas, such as wildlife sanctuaries, national parks, and biodiversity reserves, are increasingly recognized as critical to supporting biodiversity and play a key role in essential ecological functions, such as ecosystem services, climatic stabilization, carbon sequestration, groundwater recharge, nutrient retention, and natural disaster prevention (Heal, 2000; DeFries et al., 2007). India is one of the 12 megabiodiversity countries. Out of a total of 9702 bird species found worldwide (Sibley and Monroe, 1990), 1313 species have been identified from the Indian subcontinent (Grimmett et al., 2011). Rajasthan, the largest state in India in terms of area (Koli et al., 2013a; Kulshreshtha et al., 2013; Krishna et al., 2014), is located on its western side. Twenty-five wildlife sanctuaries and three

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national parks are located in the state (Krishna et al., 2014). Numerous ornithological studies on diversity, and its status, have been carried out in Rajasthan (Bohra and Goyal, 1992; Kumar, 1993; Sharma and Tehsin, 1994; Soni, 1994; Rahmani and Soni, 1997; Sangha, 2002; Chhangani, 2002a,b; Saxena, 2003; Sivaperuman et al., 2004; Bhatnagar et al., 2007; Sangha, 2008; Sivaperuman et al., 2009; Singh, 2009; Sivaperuman and Baqri, 2009; Koli et al., 2011; Pande, 2012; Koli et al., 2013b). However, protected areas have been less explored with regard to avian diversity and status. Some studies have been conducted in this context in several wildlife sanctuaries: Kaoladeo Ghana Sanctuary (Donahue, 1964), Sajjargarah Wildlife Sanctuary (WLS) (Sharma, 1998), Sitamata WLS (Yaseen et al., 2011), Mount Abu WLS (Sangha and Devarshi, 2006), Sariska Tiger Reserve (Sankar et al., 2006), Kumbhalgarh WLS (Chhangani, 2002a,b), and Desert National Park (Sangha, 1993).

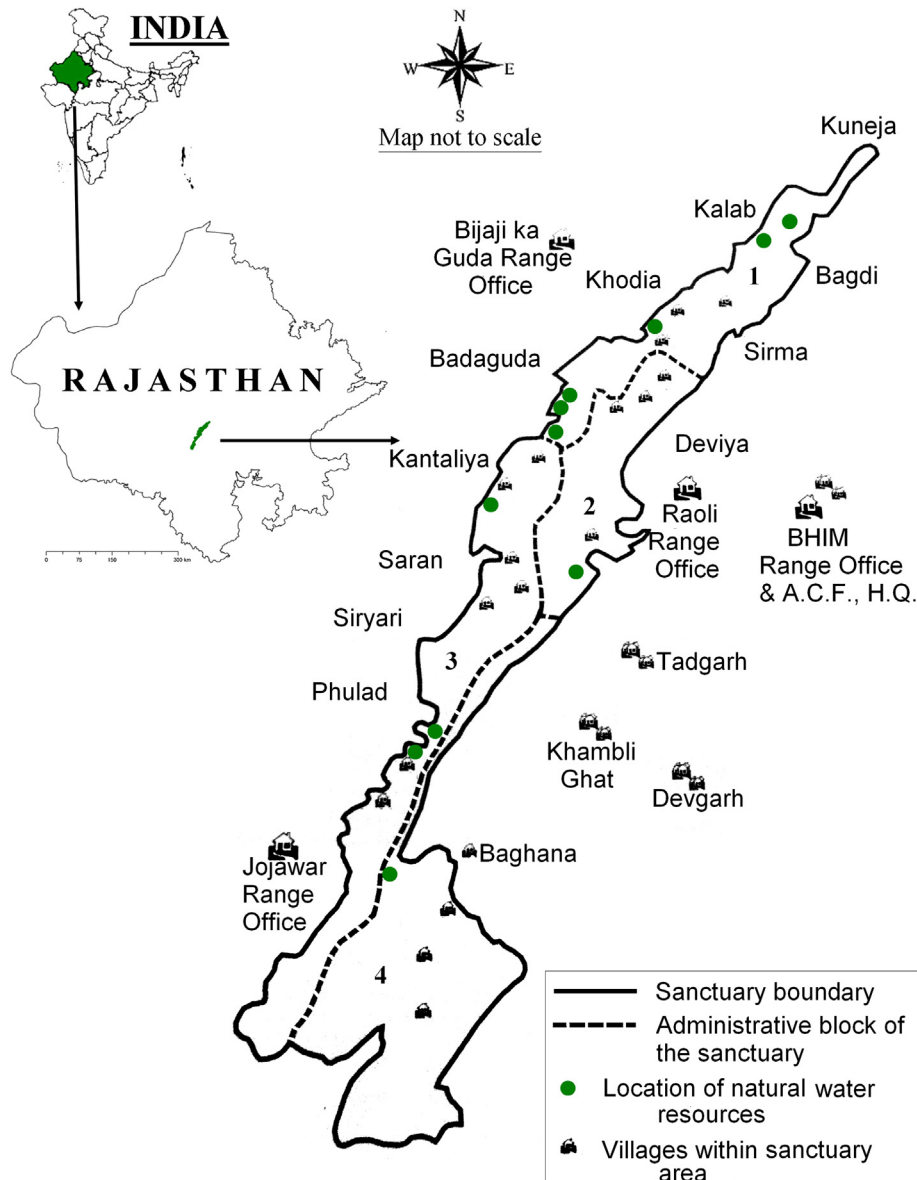
Todgarh-Raoli WLS is located in the southwestern part of the Rajasthan state. Its entire range is located within the Aravalli Mountains. The sanctuary forms an ecotone between the hilly

forests of Aravallis and the Thar Desert, which is situated in the northwest. The area has exceptional diversity and interspersed habitat that includes Dhok *Anogeissus acuminata* forests, Salar *Boswellia serrata* forests, drylands, seasonal streams, cascading mountains, newly formed sand dunes on western hill aspects, and fine grooves of mixed woodlands. These habitats provide shelter to a wide range of fauna. The present study is a first attempt to explore the diversity and status of the avifauna of this sanctuary.

## Material and methods

### Study area

Todgarh-Raoli WLS is situated ( $73^{\circ}40'–74^{\circ}10'E$  and  $25^{\circ}20'–26^{\circ}00'N$ ) in one of the world's oldest mountain ranges, the Aravalli hills, Rajasthan, India (Figure 1), and it covers an area of about  $495\text{ km}^2$ . The sanctuary extends in three districts: Rajasamand,



**Figure 1.** Location and an outline map of the study area—Todgarh-Raoli Wildlife Sanctuary, Rajasthan, India. Numbers indicate the administrative blocks of the sanctuary: 1 = Bijaji ka Guda; 2 = Raoli; 3 = Jojawar; and 4 = Bhim.

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