

A preliminary study on avifauna of three sacred groves of Radhanagri Tehsil, Maharashtra, India

Birds are one of the important species in animal groups and are ecologically extremely different and occupy a wide range of habitats. Literature reports that sacred groves are excellent and protective site for all diverse groups of birds species (Deb et al. 1997; Jyothi & Nameer 2015).

In India, sacred groves are remarkably spread with around 13,720 sacred groves distributed through 19 States (Malhotra et al. 2001). Maharashtra State has recorded total of 2,820 sacred groves by Gadgil & Vartak (1975) and Deshmukh (1999). According to Gadgil & Vartak (1975) this vegetation patches are preserved for deity instead of law or act imposed by government for the protection of forest. Communities believe that harming or destructing the flora and fauna of sacred groves leads to the wrath of the deity. Sacred groves are locally called 'Devrai' in Marathi and they are named according



Image 1. Satellite map showing three sacred groves of Radhanagri Tehsil, Kolhapur, Maharashtra.

to the god being worshiped. Presently, such diverse and biological heritage sites are least concern by researcher and these habitats are successively under stress of various detrimental human activities like increasing human interference, harming flora & fauna, and other developmental activities in sacred groves.

Human activities are relatively responsible for degrading the ecological quality of sacred groves. Hence, such biological heritage habitats are needed to evaluate the ecological condition using comprehensive study of

avifauna which is one of ecological indicator species. The present study was conducted at three sacred groves of Radhanagri Tehsil, Kolhapur District, Maharashtra, viz, Lingoba (16.36250°N & 74.03611°E), Gomata (16.35778°N & 74.04361°E) and Wakighol (16.28861°N & 74.00944°E) (Image 1).

Geographically, Lingoba sacred grove measured about 0.607ha, Gomata sacred grove is about 0.405ha while comparatively Wakighol Sacred Grove was larger than rest of them, it is measured around 1.092ha.



Image 2. Sacred groves of study area.

These sacred groves were named on the basis of deity being worshiped locally. The Lingoba and Gomata sacred groves of Aini Village are well known for gods Lingoba and Gomata while Wakighol Sacred Grove of Wakighol Village is famous for lord Wakoba (Image 2 a-c).

The birds were observed using binocular (10X5) and photographed (with Canon camera of 45X (Model-SX430 IS) and identified with the field guide of Ali (2002).

Present study was conducted from September 2018 to April 2019 to study the species composition and feeding habit by using point count method in three

sacred groves. In each sacred grove, the survey was conducted between 07.00–10.00 h and after noon

from 15.00 h to 17.00 h for observation and identification (using field guide of Ali 2002) of avifauna.

The birds are grouped under two categories namely R—Resident, M—Migrants depending on their timing and duration of occurrence (Ali 2002). The abundance status of birds are categorise into four groups, HA—Highly abundance (observed in all visits), A—Abundance (observed 5–6 times), M—Moderate (observed 3–4 times), L—Lesser (observed

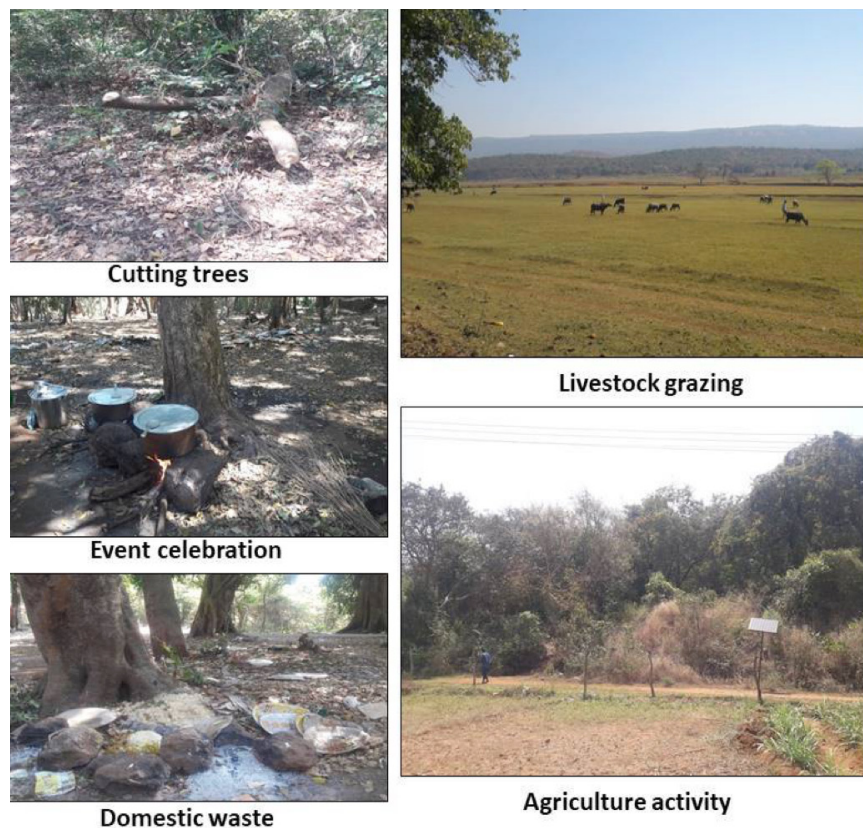


Image 3. Anthropogenic activities in and around sacred groves.

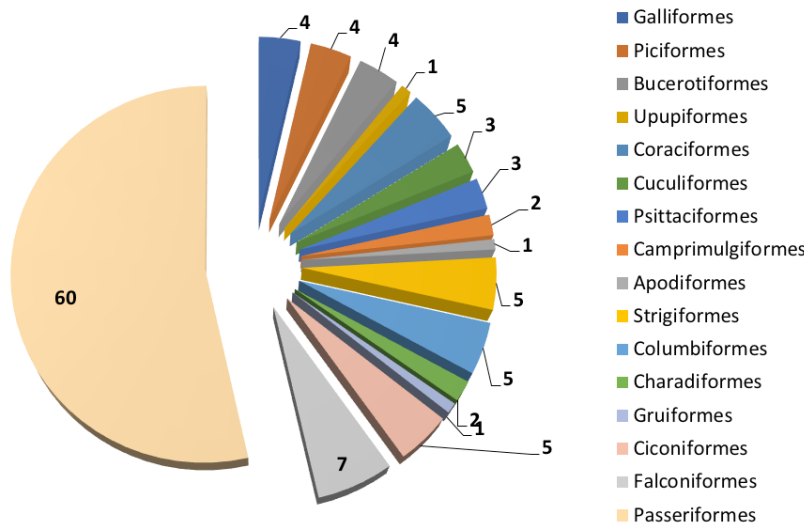


Fig. 1. Order wise distribution of birds in sacred groves.

only once). We have performed total of eight visits during the study period (September 2018–April 2019). Bird species were also assigned to a feeding guild following Salim Ali (2002), such as GV—granivorous, IV—insectivorous, CV—carnivorous, FV—frugivorous, OV—omnivorous, and PV—piscivorous.

A total of 108 bird species were observed belonging to 46 families and 16 orders (Tables 1). The order Passeriformes is dominated the list with 60 species, followed by Falconiformes with seven species and single species was recorded from order Upupiformes, Apodiformes,

and Gruiformes, respectively (Figure 1).

Among the 108 species recorded, 87.03% (94 species) were resident and 12.96% (14 species) were migratory (Figure 2). On the basis of the frequency

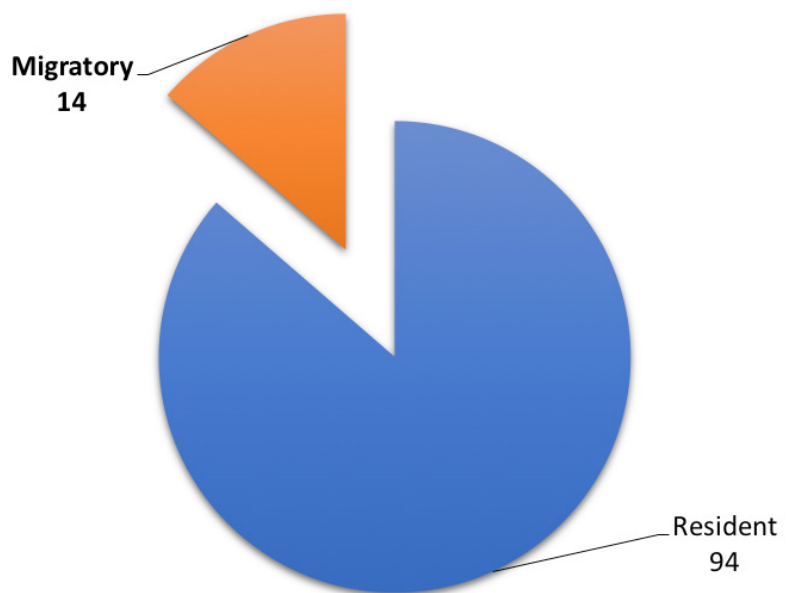


Fig. 2. Status of birds in sacred groves.

of occurrence of each bird species abundance, we calculated that 34 (31.48%) species were abundant followed by 31 (28.70%) moderate, 22 (20.37 %) highly abundant, and 21 (19.44%) lesser abundant respectively (Figure 3).

The data on feeding nature of bird species of scared groves were indicate that, the insectivorous and frugivorous birds were more positively associated with sacred grove than omnivorous, granivorous, carnivorous, and piscivorous (Figure 4).

Pradhan et al (2016) documented a total of 28 bird species from sacred groves

Table 1: Checklist, occurrence and distribution of birds at Sacred Groves of Radhanagari Teshii, Kolhapur.

Order	Families	Scientific Name	Common Name	Sacred Groves			Residency status	Abundance status	Feeding status
				LSG	GSG	WSG			
Galliformes	Phasianidae	<i>Coturnix coturnix</i>	Common Quail	+	+	+	M	A	GV
		<i>Perdica asiatica</i>	Jungle Bush-Quail	-	-	+	R	A	GV
		<i>Galliperdix spadicea</i>	Red Spurfowl	-	+	-	R	M	OV
		<i>Pavo cristatus</i>	Indian Peafowl	+	+	+	R	M	OV
Piciformes	Picidae	<i>Dinopium javanense</i>	Common Golden-backed Woodpecker	-	+	+	R	M	IV
		<i>Megalaima lineata</i>	Lineated Barbet	+	+	+	R	HA	FV
		<i>Megalaima haemacephala</i>	Coppersmith Barbet	+	+	+	R	HA	FV
		<i>Megalaima rubricapilla</i>	Crimson-throated Barbet	+	+	+	R	HA	FV
Bucerotiformes	Bucerotidae	<i>Ocyceros birostris</i>	Indian Grey Hornbill	+	+	+	R	M	FV
		<i>Anthracoceros coronatus</i>	Malabar Pied- Hornbill	-	-	+	R	M	FV
		<i>Ocyceros griseus</i>	Malabar Grey Hornbill	-	-	+	R	M	FV
		<i>Buceros bicornis</i>	Great Hornbill	-	-	+	R	M	FV
Coraciformes	Upupidae	<i>Upupa epops</i>	Common Hoopoe	+	+	+	M	M	IV
		<i>Coracias benghalensis</i>	Indian Roller	+	+	+	R	L	IV
		<i>Alcedo anthis</i>	Small Blue Kingfisher	-	-	+	M	L	PV
		<i>Halcyon smyrnensis</i>	White-breasted Kingfisher	-	+	+	R	L	PV
Cuculiformes	Cerylidae	<i>Ceryle rudis</i>	Lesser Pied Kingfisher	-	-	+	R	L	PV
		<i>Merops orientalis</i>	Small Bee-eater	+	+	+	R	HA	IV
		<i>Centropus bengalensis</i>	Lesser Coucal	+	+	+	R	HA	IV
		<i>Centropus sinensis</i>	Greater Coucal	+	+	+	R	HA	IV
Psittaciformes	Cuculidae	<i>Phaenicophaeus leschenaultii</i>	Sirkeer Malkoha	+	+	+	R	M	IV
		<i>Psittacula krameri</i>	Rose-ringed Parakeet	+	+	+	R	A	FV
		<i>Psittacula eupatria</i>	Alexandrine Parakeet	-	-	+	R	L	FV
		<i>Loriculus vernalis</i>	Indian Hanging-Parrot	-	-	+	R	M	FV
Apodiformes	Apodidae	<i>Apus affinis</i>	House Swift	+	+	-	M	HA	IV

Order	Families	Scientific Name	Common Name	Sacred Groves			Residency status	Abundance status	Feeding status
				LSG	GSG	WGS			
Caprimulgi-formes	Caprimulgidae	<i>Caprimulgus indicus</i>	Indian Jungle Nightjar	+	+	-	M	L	IV
		<i>Caprimulgus asiaticus</i>	Common Indian Nightjar	+	+	-	R	L	IV
Strigiformes	Tytonidae	<i>Ketupa zeylonensis</i>	Brown Fish-Owl	-	-	+	R	L	CV
		<i>Glaucidium radiatum</i>	Jungle Owlet	-	-	+	R	L	CV
	Strigidae	<i>Athene brama</i>	Spotted Owlet	+	+	+	R	M	CV
		<i>Treron phoenicoptera</i>	Yellow-footed Green-Pigeon	+	+	+	R	A	FV
Columbiformes	Columbidae	<i>Columba livia</i>	Blue Rock Pigeon	+	+	-	R	HA	GV
		<i>Streptopelia decaocto</i>	Eurasian Collared-Dove	+	+	-	R	A	GV
		<i>Streptopelia chinensis</i>	Spotted Dove	+	+	+	R	A	GV
		<i>Streptopelia senegalensis</i>	Little Brown Dove	+	+	+	R	A	GV
		<i>Amaurornis phoenicurus</i>	White-breasted Waterhen	-	-	+	R	M	IV
		<i>Vanellus indicus</i>	Red-wattled Lapwing	-	-	+	R	M	IV
Charadriiformes	Charadriidae	<i>Vanellus malabaricus</i>	Yellow-wattled Lapwing	-	-	+	R	L	IV
		<i>Ciconia episcopus</i>	White-necked Stork	+	-	-	R	L	PV
Ciconiiformes	Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	+	-	-	R	L	PV
		<i>Pseudibis papillosa</i>	Black Ibis	+	-	-	R	L	PV
Falconiformes	Threskiornithidae	<i>Elanus caeruleus</i>	Black-shouldered Kite	-	-	+	R	HA	CV
		<i>Milvus migrans</i>	Black Kite	-	-	+	R	HA	CV
		<i>Haliastur indus</i>	Brahminy Kite	-	-	+	R	HA	CV
		<i>Accipiter badius</i>	Shikra	-	-	+	R	A	CV
		<i>Accipiter virgatus</i>	Eurasian Sparrowhawk	-	-	+	M	M	CV
		<i>Circus macrourus</i>	Pallid Harrier	-	-	+	R	M	CV
		<i>Nisaea cirrhatia</i>	Crested Hawk- Eagle	-	-	+	R	L	CV

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				LSG	GSG	WGS			
Passeriformes	Lanidae	<i>Lanius excubitor</i>	Great Grey Shrike	+	+	+	M	A	IV
		<i>Lanius vittatus</i>	Bay-backed Shrike	-	+	+	R	A	IV
		<i>Lanius schach</i>	Rufous-backed Shrike	+	+	+	R	A	IV
	Corvidae	<i>Dendrocitta vagabunda</i>	Indian Treepie	-	-	+	R	M	OV
		<i>Corvus splendens</i>	House Crow	+	-	+	R	A	OV
		<i>Corvus macrorhynchos</i>	Jungle Crow	-	+	+	R	A	OV
	Campephagidae	<i>Pericrocotus flammeus</i>	Orange Minivet	-	-	+	R	M	IV
		<i>Pericrocotus cinnamomeus</i>	Small Minivet	-	-	+	R	M	IV
		<i>Rhipidura aureola</i>	White-browed Fantail Flycatcher	+	+	-	R	M	IV
	Rhipiduridae	<i>Aegithina tiphia</i>	Common Iora	-	-	+	R	M	IV
	Irenidae	<i>Aegithina nigrolutea</i>	Marshall's Iora	-	-	+	R	M	IV
	Dicruridae	<i>Dicrurus macrocerus</i>	Black Drongo	+	+	-	R	A	IV
		<i>Dicrurus caerulescens</i>	White-bellied Drongo	+	+	-	R	A	IV
	Oriolidae	<i>Oriolus oriolus</i>	Eurasian Golden Oriole	-	+	+	M	M	IV
		<i>Oriolus xanthornus</i>	Black-headed Oriole	-	+	-	R	M	IV
		<i>Copsychus saularis</i>	Oriental Magpie-Robin	+	+	+	R	HA	IV
	Muscicapidae	<i>Saxicoloides fulicata</i>	Indian Robin	+	+	+	R	HA	IV
		<i>Monticola cinclorhynchus</i>	Blue-headed Rock-Thrush	+	-	+	M	L	IV
		<i>Myiophonus horsfieldii</i>	Malabar Whistling-Thrush	-	-	+	R	L	IV
		<i>Turdus merula</i>	Eurasian Blackbird	-	-	+	M	L	IV
Paridae	<i>Parus major</i>	Great Tit	+	-	+	R	M	IV	
Hirundinidae	<i>Hirundo rustica</i>	Common Swallow	+	+	-	M	A	IV	
	<i>Hirundo smithii</i>	Wire-tailed Swallow	+	+	-	R	AH	IV	
	<i>Hirundo daurica</i>	Red-rumped Swallow	+	+	-	M	AH	IV	

Order	Families	Scientific Name	Common Name	Sacred Groves			Residency status	Abundance status	Feeding status
				LSG	GSG	WGS			
Passeriformes	Pycnonotidae	<i>Pycnonotus cafer</i>	Red-vented Bulbul	+	+	+	R	AH	IV
		<i>Pycnonotus jacosus</i>	Red-whiskered Bulbul	+	+	+	R	AH	IV
		<i>Iole indica</i>	Yellow-browed Bulbul	-	-	+	R	L	OV
	Silvidae	<i>Hypsipetes leucocephalus</i>	Black Bulbul	-	-	+	R	L	OV
		<i>Chrysomma sinense</i>	Yellow-eyed Babbler	-	+	+	R	HA	IV
		<i>Turdoides caudatus</i>	Common Babbler	-	-	+	R	HA	IV
	leiotrichidae	<i>Turdoides malcoMi</i>	Large Grey Babbler	+	+	-	R	A	IV
		<i>Turdoides subrufus</i>	Indian Rufous Babbler	+	+	-	R	A	IV
		<i>Turdoides striatus</i>	Jungle Babbler	-	+	-	R	M	IV
	Alaudidae	<i>Galerida cristata</i>	Common Crested Lark	-	-	+	R	A	IV
		<i>Galerida deva</i>	Sykes's Crested Lark	-	-	+	R	M	IV
	Zosteropidae	<i>Nectarinia zeylonica</i>	Purple-rumped Sunbird	+	+	+	R	AH	FV
		<i>Zosterops palpebrosus</i>	Oriental White-eye	-	+	+	R	M	IV
		<i>Nectarinia minima</i>	Small Sunbird	-	-	+	R	M	FV
		<i>Nectarinia asiatica</i>	Purple Sunbird	+	+	+	R	HA	FV
<i>Dicaeum erythrorhynchos</i>		Tickell's Flowerpecker	-	+	+	R	M	FV	
Passeridae	<i>Passer domesticus</i>	House Sparrow	+	+	-	R	M	OV	
	<i>Dendronanthus indicus</i>	Forest Wagtail	+	+	+	M	A	IV	
Motacillidae	<i>Motacilla flava</i>	Yellow Wagtail	+	+	+	M	A	IV	
	<i>Motacilla alba</i>	White Wagtail	+	+	+	M	A	IV	
	<i>Motacilla maderaspatensis</i>	Large Pied Wagtail	-	-	+	R	A	IV	
Ploceidae	<i>Ploceus philippinus</i>	Baya Weaver	+	-	+	R	M	GV	
	<i>Amandava amandava</i>	Red Munia	+	-	-	R	L	GV	
Estrildinae	<i>Lonchura punctulata</i>	Spotted Munia	+	+	-	R	A	GV	
	<i>Lonchura malacca</i>	Black-headed Munia	-	+	-	R	A	GV	
	<i>Lonchura malabarica</i>	White-throated Munia	+	-	-	R	A	GV	

Order	Families	Scientific Name	Common Name	Sacred Groves			Residency status	Abundance status	Feeding status
				LSG	GSG	WSG			
Passeriformes	Fringillidae	<i>Melophus lathami</i>	Crested Bunting	-	+	+	R	M	IV
		<i>Sturnus pagodarum</i>	Brahminy Starling	+	+	-	R	M	IV
	Sturnidae	<i>Acridotheres tristis</i>	Common Myna	+	+	-	R	A	OV
		<i>Acridotheres fuscus</i>	Jungle Myna	+	-	+	R	M	OV
		<i>Acridotheres ginginianus</i>	Bank Myna	-	-	+	R	M	OV
		<i>Prinia hodgsonii</i>	Franklin's Prinia	-	-	+	R	M	IV
		<i>Prinia inornata</i>	Plain Prinia	-	+	-	R	A	IV
		<i>Prinia socialis</i>	Ashy Prinia	+	+	+	R	A	IV
	Cisticolidae	<i>Prinia sylvatica</i>	Jungle Prinia	-	-	+	R	L	IV
		<i>Orthotomus sutorius</i>	Common Tailorbird	+	+	+	R	A	IV
Total = 16	46	108		57	60	80			

Abbreviations:
 Sacred Groves: LSG = Lingoba Sacred Grove, GSG = Gomata Sacred Grove, WSG = Wakighol Sacred Grove
 Occurrence: + indicate = Occurrence of birds species, - indicate = absence of bird species.
 Status: Residential = R, Migratory = M
 Abundance: Highly Abundance = HA, Abundance = A, Moderate = M, Lesser = L.
 Feeding nature: Granivorous = GV, omnivorous = OV, Insectivorous = IV, Piscivorous = PV, Carnivorous = CV, Frugivorous = FV.

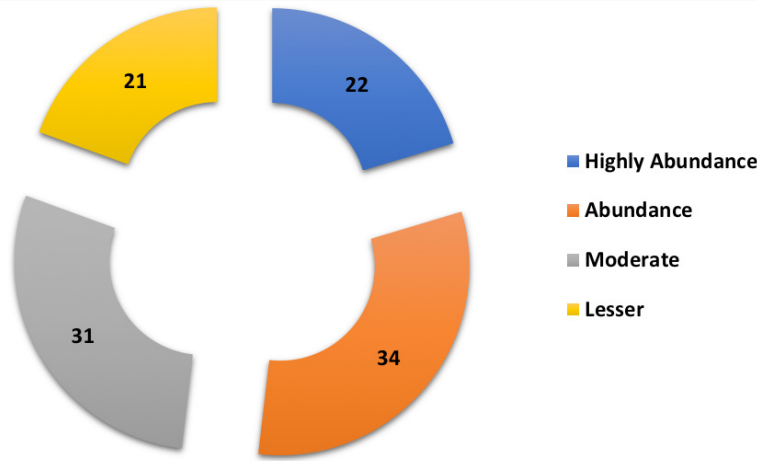


Fig. 3. Abundance of birds in sacred groves.

Figure 4. Feeding nature of birds in sacred groves

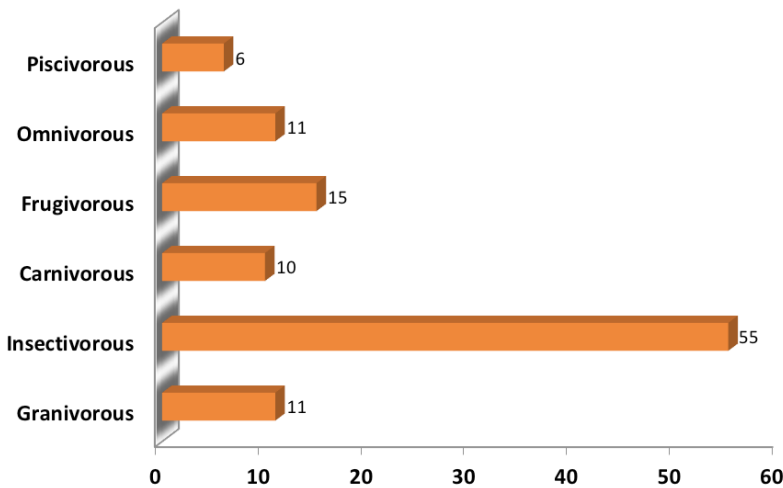


Fig. 4. Feeding nature of birds in sacred groves.

of Odisha, according to the birds' feeding habit they reported more insectivorous bird species from the study area. In tropical region, the insectivorous birds are dominant group (Harisha & Hosetti 2009). Katherina et al. (2019) also worked on different feeding guilds on their primary feeding behaviour from sacred groves of Afrotropical savanna.

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