

Species Composition and Relative Abundance of Bird Fauna in Hakha and Its Environs

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Abstract

Avifauna was investigated in three study sites of Hakha and its environs from July 2018 to February 2019. A total of 48 bird species belonging to 36 genera, 26 families and nine orders were recorded. Bird species observed were represented with five migrants and 43 residents. According to IUCN (2014), all species were categorized as least concern. Species belonging to order Passeriformes were the most dominant (39 species, 81.25%), followed by Columbiformes (two species, 4.17%), and only one species each was found in Galliformes, Falconiformes, Accipitriformes, Charadriiformes, Coraciiformes, Bucerotiformes and Piciformes (2.08% each). In the present study, the largest total number of species was recorded in November, December and the lowest in July. As well as the largest total number of individuals were found in November, December and January and the lowest in July. Relative abundance indicated that six species were found as very common (vC), 13 species as common (C) and 21 species as uncommon (uC) in Site I, five species were found as very common (vC), 13 species as common (C) and eight species as uncommon (uC) in Site II and six species as very common (vC), 10 species as common (C) and 13 species as uncommon (uC) in Site III.

Keywords: Species composition, relative abundance, bird fauna, Hakha and its environs

Introduction

Among 1125 bird species recorded in Myanmar, eight species are endemic, 10 species are critically endangered and 11 species are endangered. There are 289 species of winter migrants and 199 species of water birds (Myanmar Birding Tours, 2018).

Occurrence of bird species correlates with vegetation structure (Roth 1976; Finch 1989, 1991). In turn, vegetation structure and several other factors, such as temperature and productivity, vary along the environmental gradient associated with elevation (Able and Noon 1976; Robbek 1997; Hofer *et al.*, 1999) (Cited by Waterhouse *et al.*, 2002).

Abundance of bird species is largely influenced by the spatiotemporal distribution of some key environmental resources (Mc.Cain, 2009). As a result, various studies elsewhere in the world attempted to study factors that affect bird abundance and distribution at spatial and temporal scales (Lincoln, Fredrick, Peteson, & Zimmerman, 1998; Mengesha, Mamo, & Bekele, 2011; Newton, 2008) (Cited by Girma *et al.*, 2016).

The relative abundance of a species is often associated with the vegetation community, food resources and habitat structural complexity (Rajpar and Zakaria, 2011). Determining the avian relative abundance is highly important because this variable indicates the proportion of an existing population in a particular habitat. The distance sampling point-count method is widely used and an appropriate for the estimation of bird abundance and distribution in different habitats (Thompson, 2002; Kissling and Garton, 2006; Alldredge *et al.*, 2007). Microclimate and habitat structures are major factors that influence avian survival rate, reproduction success, time of breeding, species dispersal and habitat selection (Zharokov and Zakaria, 2011) (Cited by Rajpar and Zakaria, 2015).

Hakha is the capital of Chin State and located at altitude of 1868 metres above sea level. Hakha features a subtropical highland climate. It is a good and interesting place because it is a mountainous region and possesses many habitat types for birds. Moreover, as there is no

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detailed information on bird species in Hakha, area the present study was conducted with the following objectives:

- to identify and determine the species composition of birds
- to assess the relative abundance of bird species in Hakha and its environs

MATERIALS AND METHODS

Study area and study sites

Hakha is located in the north-east in Chin State. It is situated about 75km away from Kalay, Sagaing Region. The study area is divided into three study sites based on the extent of study area and habitat types. Hakha College is designated as Site I, the western part of Hakha as Site II and the eastern part of Hakha as Site III (Fig. 1).

Study period

The present study was conducted from July 2018 to February 2019.

Bird watching and data collection

Data were collected by using point count method which involved a standing in one spot and recording all birds seen or heard at a fixed distance (25 m radius) within 10 minutes at each point. The distance between two points was 250 m. A total of 28 points were established in this study. Each study site was visited twice per month. Bird watching was made from 7:00 am to 11:00 am in the morning and 3:00 pm to 5:00 pm in the evening. Data collection was carried out using the following materials:

- (a) Binocular (Bushnell- 20×50 mm)
- (b) SONY DSC-HX 60V
- (c) Nikon COOLPIX P 900

Identification and classification of species recorded

Bird species were identified referring to the taxonomic descriptions given by King and Dickinson (1975), Smythies (2001) and Robson (2015, 2016).

Status

The residential status was assigned by referring to Robson (2016).

Analysis of data

Collected data were analyzed by the following parameters:

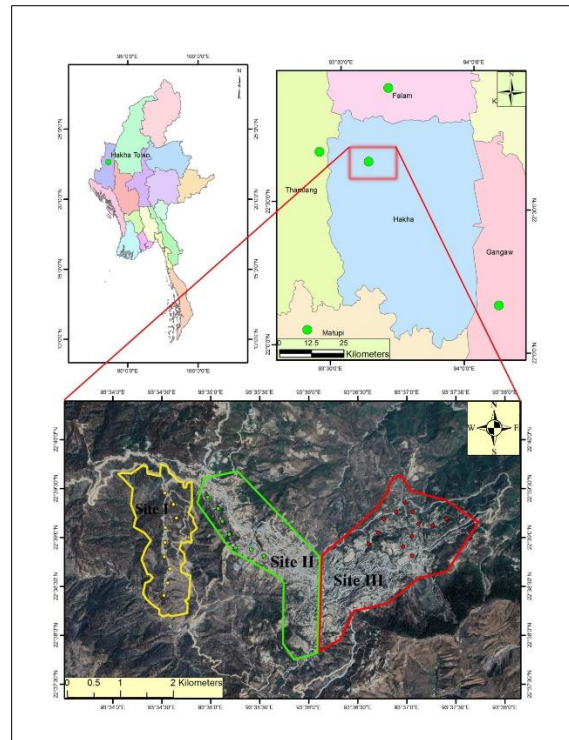
$$\text{Relative abundance} = \frac{\text{No. of individual of species}}{\text{Total no. of individuals of all species}} \quad (\text{Bisht } et al., 2004)$$

The average relative abundance was categorized as Bisht *et al.*, (2004).

uC = (uncommon) having relative abundance less than 0.0100

C = (common) having relative abundance of 0.0100 and above but less than 0.0500

vC = (very common) having relative abundance of 0.0500 and above



Source: Google Earth, 2019

Fig. 1 Location map of study sites

Results

Composition of Species Recorded

Throughout the study period from July 2018 to February 2019, a total of 48 bird species belonging to 36 genera, 26 families and nine orders were recorded from the present study area of Hkha and its environs (Table 1).

In this study, the lowest species composition was found in orders Galliformes, Falconiformes, Accipitriformes, Charadriiformes, Coraciiformes, Bucerotiformes and Piciformes (only one species, 2.08% each), Columbiformes (two species, 4.17%) and the highest in order Passeriformes (39 species, 86.67%) (Fig. 2).

Relative Abundance of Birds Recorded

Total number of 40 species and 1023 individuals were recorded in Site I. The highest number of species was found during the month of December (26 species). Regarding to the individuals, the highest total number was recorded in December (231 individuals). Among the species, the highest total number of individuals was found in *Corvus leuillanti* (246) and the lowest total number of individuals was found in *Gyps himalayensis* and *Vanellus indicus* (one individual each). Total number of 26 species and 678 individuals were recorded in Site II. The highest number of species (19 species) and the highest total number of individuals was found in the month of November. Among the species, the highest total number of individuals was found in *Passer domesticus* (152) and the lowest in *Gallus gallus*, *Pycnonotus flavescens* and *Orthotomus sutorius* (two individuals each). In Site III, total number of 29 species and 812 individuals were recorded. The highest number of species was found during the month of December (21 species), whereas the highest total number of individuals was recorded in November (177 individuals). Among the species, the highest total number of individuals was

found in *Corvus leuallantii* (166) and the lowest in *Oriolus tenuirostris* and *Phylloscopus inornatus* (two individuals each) (Table 2).

Relative abundance indicated that six species were found as very common, 13 species as common and 21 species as uncommon in Site I, five species were found as very common, 13 species as common and eight species as uncommon in Site II and six species as very common, 10 species as common and 13 species as uncommon in Site III (Fig 3).

According to three study sites, the number of 40 bird species in Site I, 26 species in Site II and 29 species in Site III were recorded during the study period (Fig 4).

Table 1. List of bird species recorded in Hakha from July 2018 to February 2019

Sr No.	Order	Family	Scientific name	Common name	Local name	Residential status (Robson, 2016)
1	Galliformes	Phasianidae	<i>Gallus gallus</i>	Red Junglefowl	Taw-Kyet	R
2	Falconiformes	Falconidae	<i>Falco tinnunculus</i>	Common kestrel	Gyo-thein	R
3	Accipitriformes	Accipitridae	<i>Gyps himalayensis</i>	Himalayan Griffon	Lin-tah	R
4	Charadriiformes	Charadriidae	<i>Vanellus indicus</i>	Red-wattled Lapwing	Tit-ti-tu	R
5	Columbiformes	Columbidae	<i>Columba livia</i>	Rock Pigeon	Kho	R
6			<i>Streptopelia chinensis</i>	Spotted Dove	Gyo-le-byauk	R
7	Coraciiformes	Coraciidae	<i>Coracias benghalensis</i>	Indian Roller	Hnget-kha	R
8	Bucerotiformes	Upupidae	<i>Upupa epops</i>	Common Hoopoe	Taung-bi-su	R
9	Piciformes	Picidae	<i>Chrysocolaptes guttacristatus</i>	Greater Flameback	Thit-tout-hnget	R
10	Passeriformes	Campephagidae	<i>Lalage melaschistos</i>	Black-winged Cuckooshrike	-	R
11			<i>Pericrocotus ethologus</i>	Long-tailed Minivet	Hnget-min-ta	R
12			<i>Pericrocotus brevirostris</i>	Short-billed Minivet	Hnget-min-ta	R
13		Oriolidae	<i>Oriolus tenuirostris</i>	Slender-billed Oriole	Hnget-wa	R
14		Dicruridae	<i>Dicrurus leucophaeus</i>	Ashy Drongo	Hnget-taw	R
15			<i>Dicrurus aeneus</i>	Bronzed Drongo	Hnget-taw	R
16		Corvidae	<i>Corvus leuallantii</i>	Eastern Jungle Crow	Taw-kyi-gan	R
17			<i>Urocissa erythroryncha</i>	Red-billed Blue Magpie	Hnget-daw-pyar	R
18			<i>Dendrocitta vagabunda</i>	Rufous Treepie	Na-hpa-gyi	R
19		Laniidae	<i>Lanius cristatus</i>	Brown Shrike	Hnget-tazat	R
20			<i>Lanius schach</i>	Long-tailed Shrike	Hnget-bilu	R
21			<i>Lanius tephronotus</i>	Grey-backed Shrike	Hnget-bilu	M
22		Nectariniidae	<i>Aethopyga gouldiae</i>	Mrs.Gould's Sunbird	Wut-yi-soke-hnget	R
23		Estrildidae	<i>Lonchura punctulata</i>	Scaly-breasted Munia	Sa-wa-di	R
24		Passeridae	<i>Passer domesticus</i>	House Sparrow	Sa	R
25			<i>Passer cinnamomeus</i>	Russet Sparrow	-	R
26		Motacillidae	<i>Anthus hodgsoni</i>	Olive-backed Pipit	Lai-gwin-me-nyaunt-sa	M
27			<i>Motacilla alba</i>	White Wagtail	Me-nyaunt-hnget	R

Table 1. Continued

Sr No.	Order	Family	Scientific name	Common name	Local name	Residential
						status (Robson, 2016)
28			<i>Motacilla cinerea</i>	Grey Wagtail	Me-nyaunt-mwe	M
29		Fringillidae	<i>Chloris spinoides</i>	Yellow-breasted Greenfinch	-	R
30		Sittidae	<i>Sitta nagaensis</i>	Chestnut-vented Nuthatch	Hnget-pyar-chauk	R
31		Muscicapidae	<i>Phoenicurus leucocephalus</i>	White-capped Water Redstart	-	R
32			<i>Monticola solitarius</i>	Blue Rock Thrush	Hnget-ta-kho	R
33			<i>Monticola rufiventris</i>	Chestnut-bellied Rock Thrush	-	R
34			<i>Saxicola ferreus</i>	Grey Bushchat	Hnget-kya	R
35			<i>Saxicola maurus</i>	Eastern Stonechat	-	R
36			<i>Saxicola caprata</i>	Pied Bush Chat	Hnget-kya	R
37			<i>Saxicola jerdoni</i>	Jerdon's Bushchat	-	R
38			<i>Ficedula albicilla</i>	Taiga Flycatcher	-	M
39			<i>Copsychus saularis</i>	Oriental Magpie-robin	Ta-baik-lwe	R
40		Paridae	<i>Parus monticolus</i>	Green-backed Tit	-	R
41		Pycnonotidae	<i>Pycnonotus flavescens</i>	Flavescent Bulbul	-	R
42			<i>Pycnonotus cafer</i>	Red-vented Bulbul	But-phin-ni	R
43		Hirundinidae	<i>Delichon dasypus</i>	Asian House-martin	Pyan-hlwa	R
44			<i>Cecropis striolata</i>	Striated Swallow	Pyan-hlwa	R
45		Phylloscopidae	<i>Phylloscopus xanthoschistos</i>	Grey-hooded Warbler	-	R
46			<i>Phylloscopus inornatus</i>	Yellow-browed Warbler	-	M
47		Zosteropidae	<i>Zosterops palpebrosus</i>	Oriental White-eye	-	R
48		Cisticolidae	<i>Orthotomus sutorious</i>	Common Tailorbird	Hnan-pyi-soke	R

R = Resident 43, M = Migrant 5

Table 2. Bird species and individuals recorded in different months of each site from July 2018 to February 2019

Site	Recorded birds	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
I	Individuals	45	62	100	117	164	231	171	133	1023
	Species	7	11	21	23	23	26	20	25	
II	Individuals	49	76	77	91	124	107	86	68	678
	Species	6	14	17	17	19	17	17	17	
III	Individuals	41	51	80	109	177	142	125	87	812
	Species	7	13	16	18	20	21	15	18	

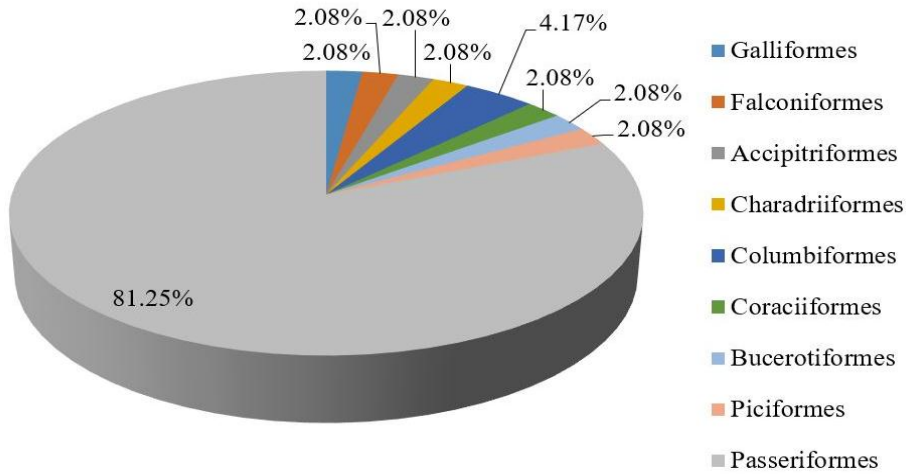


Fig.2 Percent composition of bird species in different orders in Hakha from July 2018 to February 2019

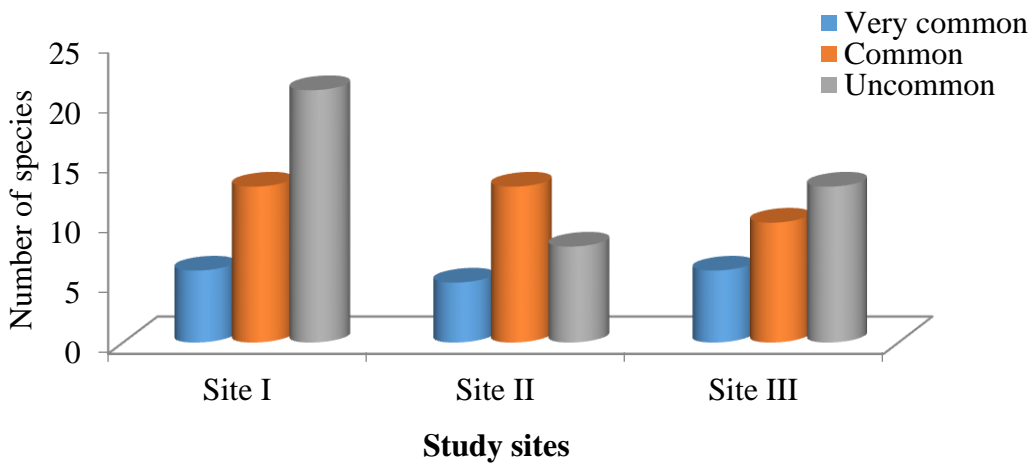


Fig. 3 Comparison on the relative abundance of bird species among study sites of Hakha from July 2018 to February 2019

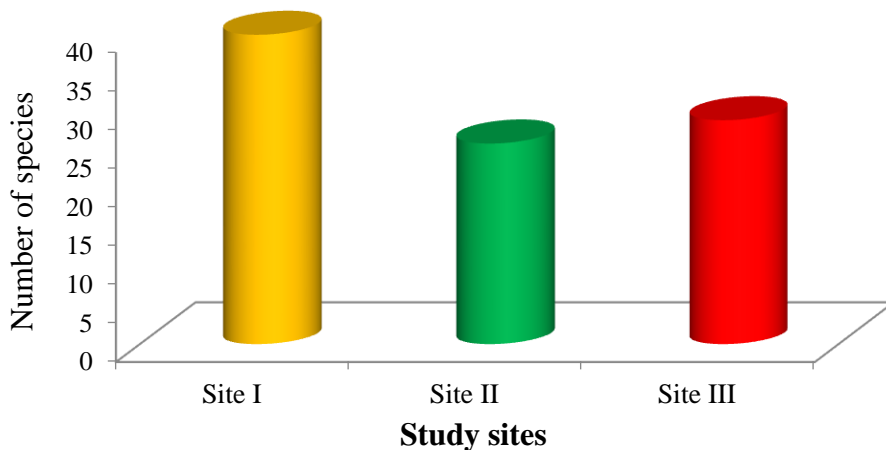


Fig. 4 Comparison on the numbers of bird species among different study sites of Hakha from July 2018 to February 2019



A. *Gallus gallus*



B. *Falco tinnunculus*



C. *Gyps himalayensis*



D. *Vanellus indicus*



E. *Columba livia*



F. *Streptopelia chinensis*



G. *Coracias benghalensis*



H. *Upupa epops*



I. *Chrysocolaptes guttacristatus*



J. *Lalage melaschistos*



K. *Pericrocotus ethologus*



L. *Pericrocotus brevirostris*



M. *Oriolus tenuirostris*



N. *Dicrurus leucophaeus*



O. *Dicrurus aeneus*

Plate 1 Recorded bird species



P. *Corvus leuillantii*



Q. *Urocissa erythrorhyncha*



R. *Dendrocitta vagabunda*



S. *Lanius cristatus*



T. *Lanius schach*



U. *Lanius tephronotus*



V. *Aethopyga gouldiae*



W. *Lonchura punctulata*



X. *Passer domesticus*



Y. *Passer cinnamomeus*



Z. *Anthus hodgsoni*



AA. *Motacilla alba*



AB. *Motacilla cinerea*



AC. *Chloris spinoides*



AD. *Sitta nagaensis*

Plate 1 Continued



AE. *Phoenicurus leucocephalus*



AF. *Monticola solitarius*



AG. *Monticola rufiventris*



AH. *Saxicola ferreus*



AI. *Saxicola maurus*



AJ. *Saxicola caprata*



AK. *Saxicola jerdoni*



AL. *Ficedula albicilla*



AM. *Copsychus saularis*



AN. *Parus monticolus*



AO. *Pycnonotus flavescens*



AP. *Pycnonotus cafer*



AQ. *Delichon dasypus*



AR. *Cercropis striolata*



AS. *Phylloscopus xanthoschistos*

Plate 1 Continued

AT. *Phylloscopus inornatus*AU. *Zosterops palpebrosus*AV. *Orthotomus sutorius*

Plate 1 Continued

Discussion

Throughout the study period from July 2018 to February 2019, a total of 48 bird species confined to 36 genera belonging to 26 families of nine orders were identified and recorded from three study sites in the environs of Hakha. In these study sites, the highest number of 40 bird species and 1023 individuals were found in Site I, followed by 29 species and 812 individuals in Site III and the lowest 26 species and 678 individuals in Site II.

The highest number of species were recorded in order Passeriformes (39 species, 81.25%) and the lowest number of species was found in order Galliformes, Falconiformes, Accipitriformes, Charadriiformes, Coraciiformes, Bucerotiformes and Piciformes (only one species, 2.08% each) during the study period.

Baker (2014) described that passerine or perching bird (order-Passeriformes) comprises one half of all bird species. According to Smythies (2001) and Robson (2015, 2016), the largest order was found as Passeriformes in Southeast Asia. The members of Passeriformes are widely distributed than the other orders during this study period because the habitat types were more preferred by Passeriformes. Moreover, this order of bird species constitute largest group of birds.

The distribution and habitats of many species are determined by the composition of the vegetation that forms a major element of their habitats. As vegetation changes along complex geographical and environmental gradients, a particular bird species may appear increase or decrease in number, and disappear as the habitat changes (Lee and Rotenberry, 2005) (cited by Aynalem and Bekele, 2008).

Suut Muan Tung (2016) recorded 17 species were residents and one species is winter migrant from Suang pi Village, Tedim Twonship, Northern Chin State. Khup Sian Pau (2017) studied 24 species of residents and six species of winter migrants from Lamzang Village, Tedim Township, Northern Chin State. Niang Tawi Lun (2017) recorded 30 bird species, represented with 25 species residents and five species winter migrants from Shiapho Village and its environs, Kalay Township. According to Michael *et al.* (1986), species composition and abundance and behavior of birds are known to vary seasonally. Some species are permanent, residents in an area, other occupy an area only during winter or summer.

Based on the relative abundance of species, six species were classified as very common, 13 species as common and 21 species as uncommon in Site I, five species as very common, 13 species as common and eight species as uncommon at Site II and six species as very common, ten species as common and 13 species as uncommon at Site III. The variation of status in bird species may be related to the chance encountered during field surveys and fluctuations of population in this study area. The occurrence of the bird fauna depend on

several factors like type of habitats, climate, time and season of survey, nature of particular bird species and experience of observer.

In the present study from July 2018 to February 2019, Eastern Jungle Crow, *Corvus levaillantii* (246) showed the highest relative abundance and the least in Himalayan Griffon, *Gyps himalayensis* and *Vanellus indicus*(one) in Site I. House Sparrow, *Passer domesticus* (152) and Eastern Jungle Crow, *Corvus levaillantii* (148) showed the maximum relative abundance and the lowest in Red Junglefowl, *Gallus gallus*, Flavescent Bulbul, *Pycnonotus flavescens* and Common Tailorbird, *Orithotomus sutorious* (two individuals each) in Site II. Eastern Jungle Crow, *Corvus levaillantii* (166) and House Sparrow, *Passer domesticus* (149) were found as the greatest relative abundance and the minimum in Slender-billed Oriole, *Oriolus tenuirostris* and Yellow-browed Warbler, *Phylloscopus inornatus* (two individuals each) in Site III. Therefore, these species are considered as predominant and rare species respectively in this study area.

When the occurrence of bird species among three study sites was compared, out of 48 species, the maximum number of 40 species and 1023 individuals were recorded in Site I, followed by 29 species and 812 individuals in Site III and the minimum number of 26 species and 678 individuals were recorded in Site II during the study period. The variation in the numbers and individuals of birds depend on the heterogeneous vegetation that provides diversity of food resources suitable for foraging and adequate shelter in this study area.

In conclusion, this study showed that 47 species of terrestrial birds and only one species of water bird was recorded in this study area. This may be related to the unavailability of water sources in this study area for water birds. Moreover the habitat types of this study area were more favored for land bird species and were also suitable for food, shelter and reproduction. The variation in the number of species and individuals among different study months and study sites may relate to the factors such as topography, habitat condition, availability of food resources, environmental conditions and habitat sensitivity of some birds.

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