OCCURRENCE, RICHNESS AND ABUNDANCE OF SOME AVIFAUNA IN HMANPYA HILL ENVIRONS, WAINGMAW TOWNSHIP, KACHIN STATE

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Abstract

The study on the occurrence, richness and abundance of avifauna in Waingmaw Township, Kachin State was conducted from September 2018 to January 2019. Hmanpya Hill in Maina Reserve Forest was allocated as the study area. A total of 496 individuals accounted from 30 species of birds distributed under 26 genera, representing 17 families and seven orders were recorded. Among these, the largest number of species and individuals were recorded in December and the lowest in September. Relative abundance indicated that five species were found as very common (vC), 11 species as Common (C) and 14 species as uncommon (uC). Species richness was found to be the highest (R = 3.19) in December and the lowest (R = 1.66) in October. According to the IUCN Red-list, 29 species were in Least Concern category while, *Psittacula alexandri* Red-breasted Parakeet with regarded as Near Threatened. Since, the present study area is located within the Maina Reserve Forest and harboured suitable habitats to support sufficiently large number of bird species, there is a need to maintain the friendly nature of the environment in order to safeguard the sustainability of the bird species that thrive in the area.

Keywords: Occurrence, Richness, Abundance, Avifauna, Reserve Forest

Introduction

Birds are good indicators of spatial biodiversity and sustainability, because they are high in the food chain, thus integrating changes at other levels and they occupy a broad range of ecosystems (Heath and Roument, 2001).

Birds are found in almost all types of habitats on the earth. The great diversity of habitats is reflected in a great diversity of birds. The number of bird species in a region is called species richness or species diversity. The simplest measure of species diversity is to count the number of species (Krebs, 2001).

Climate has a profound, but often indirect effect on bird distributions. Temperature and rainfall greatly influence the composition of plant communities, which, in turn, determines the availability of food, nest sites and protective cover for birds to use (Sibley, 2001).

Weather conditions have considerable influence on many aspects of bird migration. Every year, migratory birds usually fly about 26,000 kilometres from northern hemisphere, to escape from winter (Myanmar times, 2017).

In Southeast Asia, a total of 1327 species are known to occur (Robson, 2015). The avifauna of Myanmar includes a total of 1,125 species. Of these 199 species are water birds, 289 species are winter visitors and 130 species are hibernate water birds. Eight of these species are endemic species, ten are critically endangered (CR) and 11 species are endangered (MBNS, 2018).

Hmanpya Hill environs are inhabited by numerous bird species. There are various habitats such as cultivated areas and forested areas. Therefore, food sources are abundant in this area for most of the birds. However, as not much research work has been done in the study area that the present work was pursued. The objectives were to identify and record the bird species in Hmanpya Hill Environs, to investigate the composition of bird species, to determine the species richness and to evaluate the relative abundance and average relative abundance of bird species recorded.

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Materials and Methods

Study area and study site

Waingmaw Township lies between 25˚7′ N, 25˚19′ N and 97˚17′, E 97˚25′ E. It is situated on the eastern bank of the Ayeyarwady River and 146.6 m above sea level.

Hmanpya Hill was selected as the study area. It is situated in Waingmaw Township, Kachin State. It is situated at 54 km away from Myitkyina and located at 25˚24′53.7″ N and 97˚28′04.1″ E. The height of the Hmanpya Hill is approximately 443.48 m. This site is composed of cultivated areas, bushy areas, small forested habitat areas and tall grasses.

Study period

The research was conducted from September 2018 to January 2019.

Data collection

Collection of data was made using point count method according to Bird Census Techniques (Bibby *et. al.*, 2001). Twelve points were allocated randomly in the study area. At each point, observation was made by standing and recording those seen within a radius of 50 m for 10 minutes. The distance between each point was 200m apart. Field surveys were conducted once every fortnight and commenced from 9:00 am to 11:00 am in the morning and from 2:00 pm to 5:00 pm in the afternoon. Observations were carried out with the aid of 8 × 40 binoculars and immediately taken on photographs by using Nikon coolpix P900.

Identification and classification of species

Identification of bird species in the field was done after Robson (2011 and 2015), and the classification followed after Bird Life International (2017).

Analysis of data

To assess species richness index the data accumulated was analyzed by using Margalef's (1958) method.

$$\text{Species richness index (R)} = \frac{S-1}{\text{In N}} \text{ (Margalef's, 1958)}$$

R = Margalef's index of species richness

S = Total number of species

N = Total number of individuals

This method incorporates the total number of individuals and is measure of the number of species present for a given number of individuals.

Relative abundance was also evaluated as follows:

$$\text{Relative abundance} = \frac{\text{No.of individuals of a species}}{\text{Total no.of individuals of all species}}$$

Relative abundance was categorized accordingly: (Bisht, *et. al.*, 2004)

uC (uncommon) = having relative abundance less than 0.01

C (common) = having relative abundance of 0.01 and above but less than 0.05

vC (very common) = having relative abundance of 0.05 and above

Results

From September 2018 to January 2019, a total of 30 species belonging to 26 genera, 17 families and seven orders were recorded in the study area (Table 1).

According to the monthly occurrence, the highest number of 18 species was recorded in December and the lowest number of 8 species in October. With respect to the monthly number of species and individuals recorded per species were taken into consideration it was found that, three species were encountered in every month of the five months study period and five species were encountered only once during a single month and represented by a single individual each and only one species although encountered only once during a single month is represented by two individuals. The remaining 21 species were encountered at least two months and the number of individuals ranged from 3 to 108 individuals (Table 2).

Among the bird species recorded the composition of bird species was the highest in order Passeriformes with 16 species (53%), followed by the three orders Coraciiformes, Falconiformes and Psittaciformes (3%) (Fig.1).

Richness and relative abundance of bird species

The results of Marglf's index (R) revealed that the highest richness index R = 3.19 was in December and the lowest R = 1.66 in October.

Relative abundance indicated that five species appeared as very common (vC), 11 species as common (C) and the remaining 14 species as uncommon (uC) species (Table 2).

Status of bird species

The residential status revealed that out of the 30 species recorded, 26 species were residents (R) and the remaining four species were winter visitors (WV), however, most are local migrants.

According to IUCN Red-List (2017), *Psittacula alexandri* Red-breasted Parakeet is catagorised as the Near Threatened (NT) and 29 species as in Least Concern (LC) (Table 2)

Table 1 List of recorded bird species in Mount Hman Pya during September 2018 to January 2019

Sr. No.	Order	Family	Genus	Species	Common Name
1.	Columbiformes	Columbidae	*Spilopelia*	*S. chinensis* (Scopoli, 1786)	Spotted Dove
2.			*Treron*	*T. curvirostra* (Gmelin, 1789)	Thick-billed Green-pigeon
3.				*T. phonicopterus* (Latham, 1790)	Yellow-footed Green-pigeon
4.			*Ducula*	*D. aenea* (Linnaeus, 1766)	Green Imperial Pigeon
5.	Accipitriformes	Accipitridae	*Pernis*	*P. ptilorhynchus* (Temminck, 1821)	Oriental Honey-buzzard
6.			*Spilornis*	*S. cheela* (Latham, 1790)	Crested Serpent-eagle
7.			*Accipiter*	*A. badius* Gmelin, 1788	Shikra
8.			*Buteo*	*B. refectus* Portenko, 1929	Himalayan Buzzard
9.	Coraciiformes	Meropidae	*Nyctyornis*	*N. athertoni* (Jardine & Belby, 1830)	Blue-beared Bee-eater
10.	Piciformes	Megalaimidae	*Psilopogon*	*P. lineatus* (Vieillot)	Lineated Barbet
11.				*P. asiaticus* (Latham, 1790)	Blue-throated Barbet
12.		Picidae	*Chrysocolaptes*	*C. quttacristatus* (Tickell, 1833)	Greater Flameback
13.	Falconiformes	Falconidae	*Microhierax*	*M. caerulescens* (Linnaeus, 1758)	Collared Falconet
14.	Psittaciformes	Psittacidae	*Psittacula*	*P. alexandri* (Linnaeus, 1758)	Red-breasted Parakeet
15.	Passeriformes	Eurylaimidae	*Psarisomus*	*P. dalhousiae* (Jameson, 1835)	Long-tailed Broadbill
16.		Oriolidae	*Oriolus*	*O. traillii* (Vigors, 1832)	Maroon Oriole
17.		Campephagidae	*Pericrocotus*	*P. flammeus* (Rorster,1781)	Scarlet Minivet
18.		Dicruridae	*Dicrurus*	*D. aeneus* Vieillot, 1817	Bronzed Drongo
19.				*D. hottentottus* (Linnaeus, 1766)	Hair-crested Drongo
20.		Cisticolidae	*Prinia*	*P. polychroa* (Temminck, 1828)	Brown Prinia
21.		Locustellidae	*Megalurus*	*M. palustris* Horsfield, 1821	Striated Grassbird
22.		Sturnidae	*Gracupica*	*G. contra* (Linnaeus, 1758)	Asian-pied Starling
23.				*G. nigricollis* (Paykull, 1807)	Black-collared Starling
24.			*Acridotheres*	*A. albocinctus* Godwin-Austen & Walden, 1875	Collared Myna
25.			*Saroglossa*	*S. spilopterus* (Vigors, 1831)	Spot-winged Starling
26.			*Gracula*	*G. religiosa* Linnaeus, 1758	Common Hill Myna
27.		Muscicapidae	*Eumyias*	*E. thalassinus* Swainson, 1838	Verditer Flycatcher
28.			*Cyornis*	*C. rubeculoides* Vigors, 1831	Blue-throated Flycatcher
29.		Nectariniidae	*Arachnothera*	*A. longirosta* (Latham, 1790)	Little Spiderhunter
30.		Emberizidae	*Emberiza*	*E. pusilla* Pallas, 1776	Little Bunting

Table 2 Monthly occurrence and relative abundance index of recorded bird species in study area during September 2018 to January 2019

Sr. No.	Scientific Name	Sept	Oct	Nov	Dec	Jan	Total	RA	IA	IUCN Status	Residential Status
1	*Spilopelia chinensis*	20	21	20	22	25	108	0.218	vC	LC	R
2	*Treron curvirostra*		7				7	0.014	C	LC	R
3	*Treron phonicopterus*	8			25		33	0.067	vC	LC	R
4	*Ducula aenea*				5	6	11	0.022	C	LC	R
5	*Pernis ptilorhynchus*				2	1	3	0.006	uC	LC	R
6	*Spilornis cheela*				1		1	0.002	uC	LC	R
7	*Accipiter badius*	1					1	0.002	uC	LC	R
8	*Buteo refectus*			1		1	2	0.004	uC	LC	WV
9	*Nyctyornis athertoni*				2		2	0.004	uC	LC	R
10	*Psilopogon lineatus*	2	8	4	3	5	22	0.044	C	LC	R
11	*Psilopogon asiaticus*	2	3	3	4		12	0.024	C	LC	R
12	*Chrysocolaptes quttacristatus*				3		3	0.006	uC	LC	R
13	*Microhierax caerulescens*	1	3			3	7	0.014	C	LC	R
14	*Psittacula alexandri*				3	4	7	0.014	C	NT	R
15	*Psarisomus dalhousiae*			6			6	0.012	C	LC	R
16	*Oriolus traillii*			4	4	3	11	0.022	C	LC	R
17	*Pericrocotus flammeus*	4	7	5	22		38	0.077	C	LC	R
18	*Dicrurus aneneus*		3		5	4	12	0.024	C	LC	R
19	*Dicrurus hottentottus*					3	3	0.006	uC	LC	R
20	*Prinia polychroa*	1	1				2	0.004	uC	LC	R
21	*Megalurus palustris*			2			2	0.004	uC	LC	R
22	*Gracupica contra*	13	14	15	12	14	68	0.137	vC	LC	R
23	*Gracupica nigricollis*	11		16	20	12	59	0.119	vC	LC	R
24	*Acridotheres albocinctus*				3		3	0.006	uC	LC	R
25	*Saroglossa spilopterus*				58		58	0.117	vC	LC	WV
26	*Gracula religiosa*				10		10	0.020	C	LC	R
27	*Eumyias thalassinus*					2	2	0.004	uC	LC	R
28	*Cyornis rubeculoides*	1					1	0.002	uC	LC	WV
29	*Arachnothera longirosta*				1		1	0.002	uC	LC	R
30	*Emberiza pusilla*			1			1	0.002	uC	LC	WV
	Total number of individuals	64	67	77	205	83	496				
	Total number of species	11	8	11	18	12					

LC (Least Concern) = 29 NT (Near Threatened) = 1 R (Resident) = 26 WV (Winter Visitor) = 4

Plate 1 Location map of study area

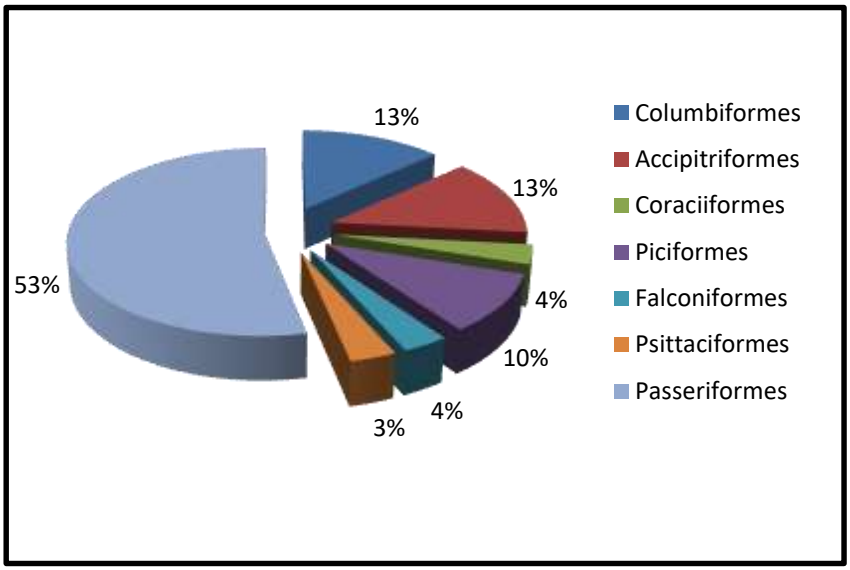

Figure 1 Orderwise relative species composition of bird species recorded during the study

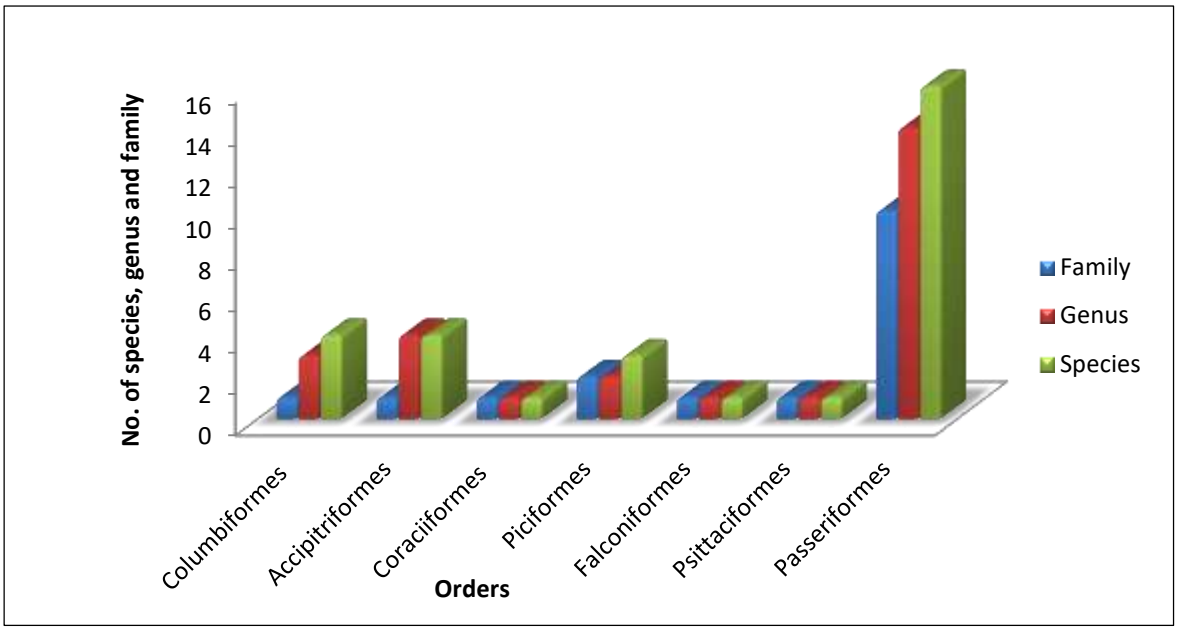

Figure 2 Relative number of species, genus and family of birds recorded during the study

A. *Spilopilia chinensis*

B. *Treron curvirostra*

C. *Treron phonicopterus*

D. *Ducula aenea*

E. *Pernis ptilorhynchus*

F. *Spilornis cheela*

G. *Accipiter badius*

H. *Buteo refectus*

I. *Nyctyornis athertoni*

J. *Psilopogon lineatus*

K. *Psilopogon asiaticus*

L. *Chrysocolaptes quttacristatus*

Plate 2 Bird species recorded

A. *Microhierax caerulescens*

B. *Psittacula alexandri*

C. *Psarisomus dalhousiae*

D. *Oriolus traillii*

E. *Pericrocotus flammeus*

F. *Dicrurus aeneus*

G. *Dicrurus hottentottus*

H. *Prinia polychroa*

I. *Megalurus palustris*

J. *Gracupica contra*

K. *Gracupica nigricollis*

L. *Acridotheres albocinctus*

M. *Saroglossa spilopterus*

N. *Gracula religiosa*

O. *Eumyias thalassinus*

P. *Cyornis rubeculoides*

Q. *Arachnothera longirosta*

R. *Emberiza pusilla*

Plate 2 Continued

Discussion

Hmanpya Hill is situated in Waingmaw Township, Kachin State and the surrounding environ is composed of cultivated areas, bushy areas, small forested habitat and tall grasses area.

During the study, a total of 30 species belonging to 26 genera, 17 families and seven orders were recorded in the study area. Among the bird species recorded, five species were considered as very common, 11 species were considered as common and 14 species were considered as uncommon species. Out of the 30 species, 26 species were residents and four species were winter visitors.

Ei Ei Phyu (2017) studied on species composition and abundance of birds in Myingyan Degree College Campus, Myingyan Township and recorded 50 species belonging to 40 genera, 29 families and 11 orders. In her study, the highest species composition was that of Passeriformes. Hkawn Seng (2017) recorded a total of 48 species under 35 genera, 26 families and 11 orders in Myitkyina University Campus, Myitkyina. In her study, the highest number was in order Passeriformes. According to Robson (2015), Passeriformes represent the largest order among all recorded orders in South-east Asia. In the present study, the order Passeriformes also represented the highest number (16) of bird species. Therefore, this finding agrees with Robson (2015).

Regarding the status, only one species *Psittacula alexandri* Red-breasted Parakeet was noted as near threatened species (NT) based on the IUCN Red-list (2017).

Comparing the data of the previous workers, Ni Ni Yin (2011) worked on community ecology of avian fauna in Meiktila environs and a total of 128 species belonging to 37 families and 12 orders were observed. Of these, two endemic species *Turdoides gularis* White-throated Babbler and *Mirafra microptera* Burmese Bushlark were recorded in her study. Robson (2015) also reported that *Turdoides gularis* White-throated Babbler was common resident in central and southern part of Myanmar and *Mirafra microptera* Burmese Bushlark was common resident in Central and North of Southern region, West of Eastern region. In this study, however, no endemic species was recorded and alluded to the differences in location and habitat.

Bauk Ra (2016) worked on species composition of birds in Waimaw Township, Kachin State with emphasis on foraging and richness of birds and a total of 182339 individuals and 113 bird species distributed under 80 genera, 50 families and 15 orders were observed from July 2013 to June 2016. In this research, only 496 individuals and 30 species were recorded from September 2018 to January 2019. The relative difference in terms of number of species and the number of individuals recorded was Bauk Ra (2016) did her study in four sites while the present study was centered on a single location and the disparity in the duration of the study periods. The present study was conducted only for duration of four months and Bauk Ra (2016) did her surveys for three consecutive years.

Soe Hein (2017) worked on species composition, richness and relative abundance of avifauna in Pyu Lake and environs, Tada-U Township. He recorded the highest richness index was R =6.94 in January. In the present study, the highest richness index was R = 3.19 in December. Since, it embodied a vast expanse of Pyu Lake and its environ where the arrival of winter visitors elevate the number of bird species already inhabited the area. In contrast, the present study area harbors no extensive surface body water. Therefore, it is alluded that abundance of bird species was due to arrival of local migrants with respect to the availability of food sources and season wise habitat compatibility and habitat heterogeneity during the cold season.

Conclusion

Hmanpya Hill is located within the Maina Reserve Forest harboured suitable habitats and support sufficiently number of bird species. Nevertheless, there is a need to maintain the eco-friendly nature of the study area in order to safeguard not only the avifauna that thrives in the environs of Hmanpya Hill but also the heterogeneity of the study area.

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