

SPECIES COMPOSITION OF AVIFAUNA IN INNWA AND TADA-U ENVIRONS, MANDALAY REGION

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Abstract

Species composition of avifauna in the environs of Tada-U and Innwa, in Tada-U township, Mandalay Region conducted from December 2015 to February 2016, revealed a total of 58 species confined to 47 genera distributed among 31 families and 12 orders. The 58 species included 25 species of waterbirds, among which 13 species were winter visitors; the remaining 33 species were terrestrial birds. Six species winter visitors were common to two study sites. The highest species composition (34.48%) was that of order Passeriformes, followed by order Ciconiiformes (13.79%), Anseriformes (12.06%), Gruiformes (3.62%), Charadriiformes, Coraciiformes, Columbiformes with 6.9% each, and the lowest species was those of Podicipediformes, Pelicaniformes, Falconiformes and Cuculiformes 1.72% each. During the study two Myanmar endemic species, *Turdoides gularis* (White-throated Babbler) and *Mirafra microptera* (Burmese Bushlark) were recorded. *Amastomus oscitans* (Asian Openbill) and *Threskiornis melanocephallus* (Black-headed Ibis) were recorded as near threatened species at both study sites.

Introduction

Myanmar, an extraordinary country boasts of a rich species list of birds. Myanmar revealed a rich and diverse avifauna, amounting to more than 1027 species (Smythies, 2001). Forest Department of Myanmar reported 1200 species (Nu Nu San, 2009). In Myanmar, there are many diverse habitats for birds, such as forests, wetlands, ponds and shrub and urban areas (Zuo Wei and Mundkur, 2004).

Birds are divided into the basic groups, depending on whether they remain in the breeding grounds through the year or leave for the winter. Resident birds, that never leaves the general area of their nesting grounds. Dispersive birds, that ranged for trail often hundreds of kilometers in all direction from their nesting grounds, after breeding season (Felix, 1978) Associate Professor, Department of zoology.

In South East Asia, a total of 1,327 species are known (Robson, 2015). Myanmar contains a rich and diverse avifauna, amounting to more than 1027 species (Smythies, 2001) and Myanmar support species diversity of 1062 avifauna in which six species were endemic and 51 species were globally threatened. (<http://www.wiki.org/wiki/list-of-birds-of-Burma>; 2014).

Species composition change from season to season in accordance with resource availability, species composition fluctuates regularly with season and irregular with climate and resource availability (Gill 2001).

Tada-U township lies at the northwest of Mandalay. Tada-U and Innwa environs were suitable habitat for terrestrial and waterbirds. Moreover, Innwa is an ancient city of Myanmar, with a palace, moat and ancient buildings. These habitat types are environmentally friendly for the distribution and requirement of food resources by terrestrial and waterbirds. Therefore, the present study has been conducted in Tada-U and Innwa environs with the following of objectives:

- to identify and record the bird species of Tada-U and Innwa environs
- to determine the species composition of birds at Tada-U and Innwa environs.

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MATERIALS AND METHODS

Study area

The study area is situated in northwest of Mandalay. It is located 15.29km away from Mandalay. The Tada-U Township lies between 21°49' 56.98" N and 95°58' 27.84"E.

Study sites

Two study sites are designated as Site I and Site II. Site I (Tada-U) is located between 21°48' 53.73"N and 95°58' 27.62"E. Innwa (Site II) is located between 21°51' 16.67"N and 95°58' 44.88"E ancient city.

Study period

Study period was conducted from December 2015 to February 2016.

Field techniques

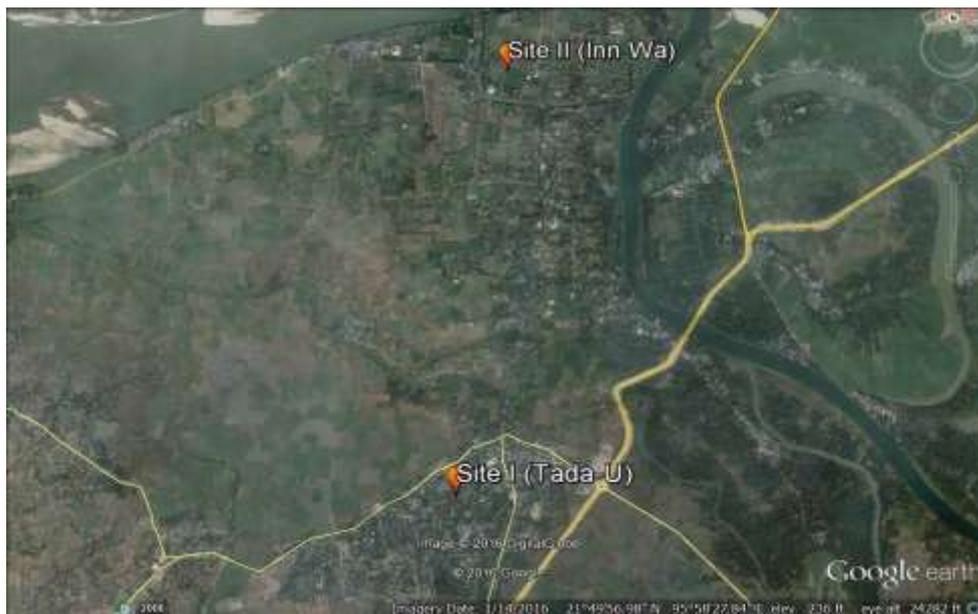
Preliminary survey were taken to select the locations and sub-sampling points in the two study areas in which eight points in Site I and five points in Site II were allocated. Each sampling site was visited once a week. Collection of the data was made using point count method according to (Bird census Technique).

Identification of species

Identification of bird species was recorded according to King and Dickinson (1975), Smythies (2001), Robson (2011) and (2015).

Data Calculation

$$\text{Species composition} = \frac{100 \times \text{no. of particular species}}{\text{Total no. of all species}} \quad (\text{Bisht } et al., 2004)$$



Results

The total of 58 species belong to 47 genera, 31 families were recorded from the study areas (Site 1 and Site II) during December (2015) to February (2016) (Fig 1).

In the study Site I, a total of 45 species were recorded during study period. Among them 17 species were waterbirds and 28 species were terrestrial birds (Table1).

A total of 44 species were recorded from the study Site II. Among them 15 species were waterbirds and 29 species were terrestrials (Table 1).

Out of the 58 species recorded, 25 species were waterbirds and included 13 species of winter visitors and 33 species were terrestrial ones. Six winter visitors were common to both the study sites (Table 1).

The highest number of species was recorded in order Passeriformes, followed by Ciconiiformes and Anseriformes, Gruiformes, Charadriiformes and Coraciiformes Columbiformes, Psittaciformes in both study sites. The lowest number of species in order Podicipediformes, Pelicaniformes, Falconiformes and Cuculiformes (only one each) were recorded.

The passerine birds were represented by 12 families, 14 genera, 20 species, out of which four was migrant (winter visitor) and 16 were resident birds (Table 4.2). On the other hand, non-passerine birds included 19 families, 33 genera, and 38 species, out of which 15 were migrant (winter visitor) and 23 were resident birds. (Table 1)

Comparison of bird species revealed that the highest number of species was found in study site I, follow by those in study site II during December (2015) to February (2016). (Table 1) Among three months, the highest number of species was found in February at study site I, and the highest number of species was occurred in January at the study site II.

In the case of species composition in orders, order Passeriformes revealed to be the highest composition (34.48 %, 20 species), followed by Ciconiiformes (13.79%, 8 species) and Anseriformes (12.06%, 7 species), Gruiformes (8.62 %, 5 species), Charadriiformes, Columbiformes and Coraciiformes (6.9% each 4 species), Psittaciformes (3.44%, 2 species) and the lowest species composition was found in four order of Podicipediformes, Pelicaniformes, Falconiformes and Cuculiformes with each 1.72% (one species) (Fig 2).

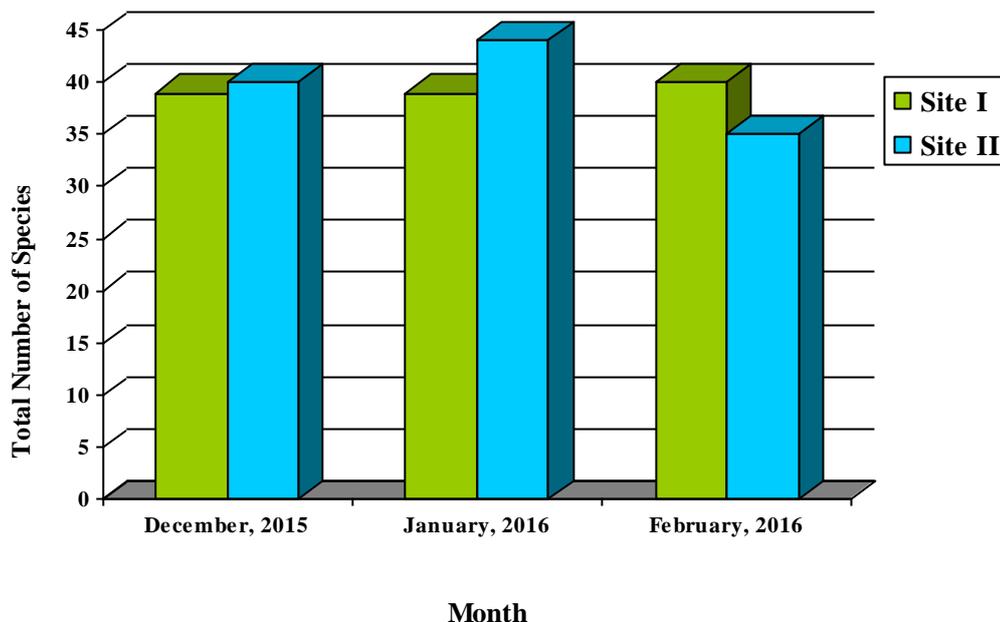


Fig. 1 Relative monthly number of bird species recorded from Site I and Site II

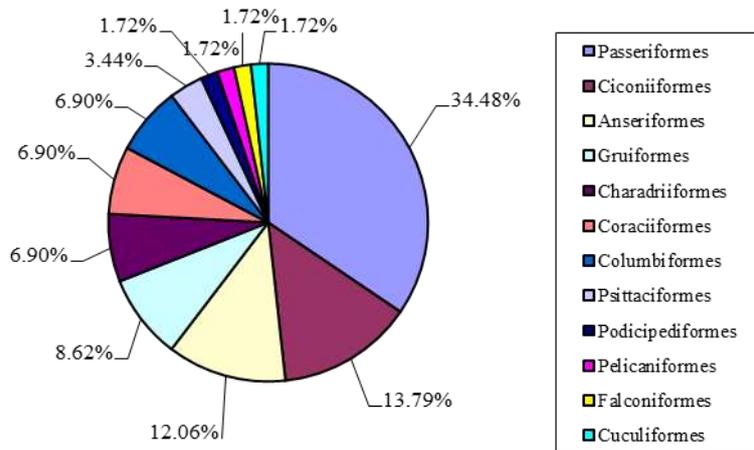


Fig. 2 Composition of bird species in different orders during the study period

Table 1 Relative total number of bird species recorded from Site I and Site II

No.	Species	Site I	Site II
1	<i>Dendrocygna javanica</i> *	-	✓
2	<i>Sarkidiornis melanotos</i> *	-	✓
3	<i>Todorna ferruginea</i> *	-	✓
4	<i>Anas poecilorhyncha</i> *	-	✓
5	<i>Anas clypeata</i> *	✓	-
6	<i>Anas querquedula</i> *	✓	-
7	<i>Aythya fuligula</i> *	✓	-
8	<i>Tachybaptus ruficollis</i> *	✓	-
9	<i>Anastomus oscitans</i> *	-	✓
10	<i>Threskiornis melanocephalus</i> *	✓	-
11	<i>Plegadis falcinellus</i> *	✓	✓
12	<i>Ardeola bacchus</i> *	✓	✓
13	<i>Bubulcus coromandus</i> *	✓	✓
14	<i>Ardea cinerea</i> *	-	✓
15	<i>Mesophoyx intermedia</i> *	✓	-
16	<i>Egretta garzetta</i> *	✓	✓
17	<i>Phalacrocorax niger</i> *	✓	✓
18	<i>Accipiter badius</i>	-	✓
19	<i>Amaurornis phoenicurus</i> *	-	✓
20	<i>Porzana fusca</i> *	✓	-
21	<i>Gallinula chloropus</i> *	✓	✓
22	<i>Fulica atra</i> *	✓	-
23	<i>Grus grus</i>	✓	-
24	<i>Himantopus himantopus</i> *	✓	-
25	<i>Vanellus indicus</i> *	✓	-
26	<i>Charadrius dubius</i> *	-	✓
27	<i>Tringa ochropus</i> *	✓	✓
28	<i>Columba livia</i>	✓	✓
29	<i>Streptopelia decaocto</i>	✓	✓
30	<i>Streptopelia tranquebarica</i>	✓	-
31	<i>Streptopelia chinensis</i>	✓	✓
32	<i>Psittacula krameri</i>	✓	✓
33	<i>Psittacula roseata</i>	-	✓
34	<i>Centropus sinensis</i>	-	✓
35	<i>Coracias benghalensis</i>	✓	✓
36	<i>Halcyon smyrnensis</i>	✓	✓
37	<i>Alcedo atthis</i>	✓	✓
38	<i>Upupa epops</i>	✓	✓
39	<i>Dicrurus macrocercus</i>	✓	✓
40	<i>Corvus japonensis</i>	✓	✓
41	<i>Lanius collurio</i>	✓	✓

Table 1 Continued

No.	Species	Site I	Site II
42	<i>Lanius cristatus</i>	✓	✓
43	<i>Cinnyris asiaticus</i>	✓	✓
44	<i>Passer flaveolus</i>	✓	✓
45	<i>Motacilla alba</i>	✓	✓
46	<i>Motacilla citreola</i>	✓	✓
47	<i>Motacilla tschutschensis</i>	-	✓
48	<i>Acridotheres grandis</i>	✓	✓
49	<i>Acridotheres tristis</i>	✓	✓
50	<i>Acridotheres burmanicus</i>	✓	✓
51	<i>Gracupica nigricollis</i>	✓	-
52	<i>Saxicola maurus</i>	-	✓
53	<i>Copsychus saularis</i>	✓	✓
54	<i>Mirafra microptera</i>	✓	-
55	<i>Pycnonotus blanfordi</i>	✓	✓
56	<i>Pycnonotus cafer</i>	✓	✓
57	<i>Hirundo rustica</i>	✓	✓
58	<i>Turdoides gularis</i>	✓	✓
Total		45	44

✓ = present
 - = absent
 * = aquatic bird, remaining terrestrial



A. *Dendrocygna javanica*



B. *Sarkidiornis melanotos*



C. *Todorna ferruginea*



D. *Anas poecilorhyncha*



E. *Anas querquedula*



F. *Anas querquedula*



G. *Aythya fuligula*



H. *Tachybaptus ruficollis*



I. *Anastomus oscitans*



J. *Threskiornis melanocephalus*



K. *Plegadis falcinellus*



L. *Ardeola bacchus*

Plate 1 Bird species of the order Anseriformes, Podicipediformes and Ciconiiformes



M. Fulica atra



N. Grusgrus



O. H. himantopus.



P. Vanellus indicus



Q. Charadrius dubius



R. S. tranquebarica



S. Psittacula roseata



T. Lanius collurio



U. Lanius cristatus



V. A. burmanicus



W.G. nigricollis



X. M.citreola

Plate 2 Bird species of the order Charadriiformes, Columbiformes, Psittaciformes, Coraciiformes and Passeriformes

Discussion

A total of 58 bird species belonging to 47 genera, 31 families and distributed among 12 orders were recorded from both the study sites during December 2015 to February 2016 .

A total of 25 species were waterbirds which included 13 species winter visitors along with 33 species of terrestrial birds were recorded. Six winter visitors were common to both sites. The highest number of species was observed in order Passeriformes .

According to Smythies (2001) and Robson (2015), Passeriformes represent the largest order among all recorded in South East Asia. Out of recorded 12 orders, the order Passeriformes showed the highest species composition and most are terrestrial in habit. Therefore, the highest species number of composition (34.48%) was recorded in order Passeriformes; followed by the order Ciconiiformes with eight species and (13.79 %). This is followed by Anseriformes with seven species (12.06 %); and five species of Gruiformes (8.62 %). Four to Charadriiformes, Coraciiformes, Columbiformes were represented by four species each (6.9 %) and Psittaciformes with only two species (3.44%). The lowest were those of Podicipediformes, Pelicaniformes, Falconiformes and Cuculiformes with a single species each (1.72 %) (Fig 2).

Migratory birds frequently move to the other area depending on the climatic condition and availability of food resources. (Thin Thin Mar, 2014).

In the present study, several number of migrant birds species were incised in at the study site I. As this is embodied cultivated fields, mango orchards, woody trees and lake, it is assumed that the migrant bird species are well adapted in this environment because of availability food resources and places to take refuge and for reproduction.

In Site I, out of 45 species, 31 species were residents. *Porzana fusca* (Ruddy-breasted Crake) under Gruiformes and *Streptopelia decaocto* (Eurasian Collared Dove) of the order Columbiformes were observed in large numbers as resident birds in January and February. *Anas clypeata* (Northern Shovel), *Anas querquedula* (Garganey), *Aythya fuligula* (Tufted Duck), *Fulica atra* (Common Coot), *Motacilla alba* (White Wagtail) and *Ardeola bacchus* (Chinese Pond Heron) were recorded throughout the three months study period. However, *Threskiornis melanocephalus* (Black-headed Ibis) and *Motacilla citreola* (Citrine Wagtail) were encountered only during one month. *Grus grus* (Common Crane) was abundantly found in December and scarcely in February. *Himantopus himantopus* (Black-winged Stilt) and *Tringa ochropus* (Green Sandpiper), *Alcedo atthis* (Common Kingfisher), *Plegadis falcinellus* (Glossy Ibis) and *Lanius cristatus* (Brown Shrike) were observed during two months (Table 2.). They are recorded as winter visitors at Site I. These factors may be related to the sorts of habitat used and particularly their availability of food in this area.

Among the 12 orders and 44 species (of birds recorded) two species represented Anseriformes, three of Ciconiiformes, two *Charadriiformes*, one *Coraciiformes* and four *Passeriformes* appeared as migrant in the study Site II. *Tadorna ferruginea* (Ruddy Shelduck), and *Anas poecilorhyncha* (Indian Spot-billed Duck), *Charadrius dubius* (Little-ringed Plover) and *Tringa ochropus* (Green Sandpiper) were observed in December and January. The remaining migrant bird species occurred through the study period. However, higher number of migrant bird species were found in the study site I than the study site II. The different results may be due to the habitat difference in these two study sites.

Birds are situated near the top of food chains, so their distribution and abundance is often sensitive to environmental changes (Weller, 2009). Out of the 44 species in Site II, 32 species were residents among which *Sarkidiornis melanotos* (Comb Duck) and *Streptopelia decaocto* (Eurasian Collared Dove) appeared to be rare only one month since it was only encountered in Site II. Therefore, it is assumed that the species of winter visitor and resident species were decline in the study period due to a variety of environmental effects.

In Myanmar has six endemic bird species, namely *Crypsirina cucullata* (Hooded Treepoe), *Turdoides gularis* (White-throated Babbler), *Mirafra microptera* (Burmese Bushlark), *Pericrocotus albifrons* (Jerdon's Minivet), *Aegitholos sharpie* (Burmese Bushtit) and *Sitta victoriae* (White-browed Nuthatch). Except the last named, which is restricted to southern Chin Hill, the other five are concentrated in the central dry zone. In the present study, among endemic species, two species of *Turdoides gularis* (White-throated Bobbler) and *Mirafra microptera* (Burmese Bushlark) were recorded at both study sites.

Regarding the status of bird species according to IUCN, two near threatened species were recorded in this study period. *Anastomus oscitans* (Asian Openbill) and *Threskiornis melanocephalus* (Black-headed Ibis) are classified as near threatened species (Birdlife International, 2012).

During the study, the number of bird species showed fluctuation period and this condition may be related to the environmental condition, habitat condition, availability of food resources, disturbances encountered and habitat sensitivity of some species.

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