

## Species Composition and Abundance of Avifauna Around Meiktila Lake, Meiktila, Mandalay Region

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### Abstract

A total of 30 bird species counting to 6449 individuals of avifauna belonging to 25 genera, 17 families and nine orders were recorded in three study sites of Meiktila Lake, during the study period from December 2019 to July 2020. Among the species observed, 15 species were aquatic birds and 15 species were terrestrial ones. A total of 10 species (33.33%) represented the order Passeriformes, seven species (23.33%) in Pelecaniformes, three species (10% each) in Gruiformes and Coraciiformes, two species each (6.7%) in Suliformes and Columbiformes and one species each (3.33%) in Anseriformes, Podicipediformes and Charadriiformes. The highest numbers of 30 species were recorded in Site I, 28 species in Site II and 22 species in Site III. Among 30 species of avifauna, 13 species were observed in the three study sites and one endemic species was recorded. When the relative abundance of bird species was recorded based on their abundance in study area, seven species were regarded as very common species (vC), 11 species as common (C), and remaining 12 species were regarded as uncommon (uC). Concern with the status of bird species, 28 species of resident and two species of winter visitors were observed.

**Keywords:** bird, relative abundance, Meiktila Lake

### Introduction

Avifauna is a general name for bird species. Birds are feathered, winged, egg-laying vertebrates. They belong to the Kingdom “Animalia” Phylum chordate and class Aves. They have a worldwide distribution, living in and around oceans, rivers, forest and mountains. They are the most noticeable group in the animal kingdom. Many people derive great pleasure from watching birds and listening to their beautiful songs. Birds are social animals that communicate with visual signs, calls and songs (Zing Biak Mawi, 2019).

Birds are truly beautiful creatures and they are also fascinating. Roosting and nesting on our buildings and feeding in our gardens and leaving the place refuse dumps, they are easy to find and fun to observe. Birds are probably the most beloved group of wild animals on the planet. The total number of birds on the planet is very difficult to estimate because their populations fluctuate seasonally, but scientists have suggested that there may be between 100,000 and 2,000,000 million adult or near adult birds on the planet at any one time (Gordon, 2016) (Cited by Zing Biak Mawi, 2019).

The avifauna is important for the ecosystem as they play various roles as scavenger, pollinators and predators of insect pest (Padmavat, *et al.*, 2010) (cited by Santosh Pawar and Amar Wanjari, 2015).

Myanmar is a rich diversity of avifauna including residents and winter visitors. Because, Myanmar has a wide range of vegetation, geographical and climatic conditions, landscapes and habitat differentiation, altitudinal variation that enhances the local and geographical distribution of avifauna (Robson, 2015).

Birds and their diversity constitute a main part of the natural environment and play a functional role as agents of flower pollination, seed dispersal, source of food chain and agents in breaking seed dormancy. Birds are good environmental indicators revealing the state of the

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ecosystems such as forest edges, wetlands and major river basins (Nason, 1992) (cited by May Thu Tun, 2016).

Species composition changes from season to season in accordance with resource availability. Species composition fluctuates regularly with the season and irregularly with climate and resource availability (Gill, 2001) (Cited by Zing Biak Mawi, 2019).

Birds have different spatial and temporal distributions in any wetland (Fletcher and Hutto, 2008). Climate influences habitats and movements of resident and migratory birds (Metzger *et al*, 2009) (Cited by Zing Biak Mawi, 2019).

Wetlands provide suitable habitats for innumerable organisms including birds. These habitats, however, are declining all over the world. Water resource development is a major cause for this decline (Kingsford 2000) (cited by Shimels Aynalem and Afework Bekele, 2008).

Although Meiktila is in the central dry zone, the climate is tropical monsoon. Meiktila is characterized by different type of vegetation and habitat heterogeneity which are reflected in a great diversity of resident birds. Meiktila stands around the Meiktila Lake and is fragmented into southern and northern parts. Southernmost and southwestern part is modified into extensive flood plains, wet grass ground and marshy area backed by paddy fields and wetlands. Moreover other separate ponds and variety of terrestrial areas such as, forest area, grass ground, scrub-covered area, paddy fields, cultivations, orchards and residential areas were found throughout Meiktila environs (Cited by Ni Ni Yin 2010).

She carried out extensive research on avifauna in Meiktila including Meiktila Lake and its environs in the past of ten years. However, current conditions of the environs of Meiktila Lake may assume to be changed and hence the present study was carried out to identify and record the bird species in Meiktila Lake and its environs and to study the species composition and relative abundance of bird species recorded in the study area monthly.

## **Materials and Methods**

### **Study Area**

Meiktila Lake is located in the Meiktila Township, Mandalay Division. Meiktila is located in the central dry zone. It lies between Latitudes 20° 52'48'' N and Longitudes 95° 50' 54'' E.

### **Study Period**

The present study was conducted from December 2019 to September 2020.

### **Study sites**

In the present study, three study sites were allocated as different microhabitats around Meiktila Lake and its environs based on the presence of tree dominated areas, mixed habitats and human habitations.

### **Study Design**

The study area was divided into three sampling areas. Each sampling area was visited twice a month. Position and number of sample points were allocated based on the study area and better assessment of bird species and number. To avoid repeated counting, points were reasonably spaced out. Two points each were placed along the site I, site II and site III of the study area. Number of bird was counted directly. For flocks in flight or on a tree, the birds were counted in estimated blocks and then checked using photographs.

### Identification of specimens

The species recorded were identified according to reference of Smithies (2001), Kyaw Nyunt Lwin and Khin Ma Ma Thwin (2003). Classification was followed by Robson (2015).

### Data analysis

The collected data were analysed for species composition followed after Bisht *et al.*, 2004.

$$\text{Relative abundance} = \frac{\text{Total number of individuals of the species}}{\text{Total number of individuals of all the species in a particular site}}$$

The average relative abundance was categorized as by method of 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

### Status of bird species recorded

Status of bird species has been checked and different status categories are considered as resident and winter visitors.

- R = resident (birds that spend throughout the year in one place and do not migrate)  
 WV = winter visitor (the season between autumn and spring comprising in the northern hemisphere usually the month of December, January and February)

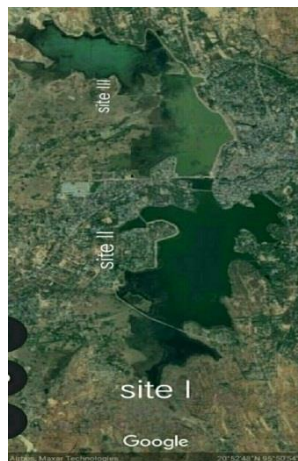


Fig.1 Location map of the study area

Source; Google Earth 2019

### Results

During the study period from December 2019 to July 2020, a total of 30 bird species of 25 genera belonging to 17 families and nine orders were recorded in Meiktila Lake and its environs. Among them, 15 species represented water birds and 15 species were terrestrial birds.

## Composition of bird species recorded

During the present study among the recorded nine order of birds, the order Passeriformes represented the highest composition of bird species (10 species, 33.33%) followed by Pelecaniformes 7 species each, 23.33%, Order Gruiformes and Coraciiformes 3 species each, 10%, Order Suliformes and Columbiformes 2 species each, 6.68% and Anseriformes, Podicipediformes and Charadriiformes were the lowest one species each, 3.33% (Fig. 2)

Among the birds recorded, the highest number of species, genus and family are found in order, Passeriformes, only one bird species comprising a single genus and family represented the order Anseriformes, Podicipediformes and Charadriiformes.

The three study sites, six species of very common and 14 species are highest in Site II and III whereas common (14 species) is lowest in Site I.

## Relative abundance and status of bird species recorded

### Study Site I

A total of 30 species and 1730 individuals are recorded in the study Site I. Among these, 15 species are waterbirds and 15 species are terrestrial birds. With regard to the number of birds, the highest number 647 is *Dendrocygna javanica* and only one bird each in *Ixobrychus sinensis*, *Ardea intermedia*. Among the bird species recorded, 28 species are residents and two species are winter visitors. The highest number of species (26) is recorded in December and the lowest number of species (10) in May and July. The highest number of birds (405) is found in April and the lowest number (99) is recorded in July. According to average relative abundance, five species are very common (vC), 14 species common (C) and remaining 11 species uncommon (uC) (Fig. 3 and 4).

### Study Site II

A total of 28 bird species with 3336 individuals are recorded in Site II. Among these 14 species are waterbirds and remaining 14 species are terrestrial ones. The highest number of birds recorded 795 individuals is *Fulica atra*, (Common Coot), 585 is *Tachybaptus ruficollis* and 542 is *Dendrocygna javanica*. However, the lowest number, one bird each in *Ixobrychus*, *Ardea intermedia* and *Tringa ochrapus*. Out of the bird species recorded, 27 species are residents, and only one species is winter visitors. The highest number of species (27) is found in December and the lowest number of species (10) in May and June. The highest number of birds (1096) is found in January and the lowest number (89) is in July. Six species are regarded as very common (vC), eight species common (C) and remaining 14 species as uncommon (uC) (Fig. 3 and 4).

### Study Site III

A total of 22 species and 1353 individuals are recorded in the study Site III. Among these, nine species are waterbirds and 13 species are terrestrial birds. The number of *Dendrocygna javanica* is 265 and *Corvus splendens* is 195 as the highest population. However, the number of *Dicrurus aeneus* is two and *Phalacrocorax carbo* and *Motacilla alba* are four as the lowest number recorded. Out of the total number of species, 20 species are residents and two species are winter visitors. The highest number of species (14) is found in March and the lowest number of species (9) in June. The highest number of birds (349) is found in February and the lowest number (71) in January. Six species are regarded as very common (vC), 11 species common (C) and remaining five species uncommon (uC) (Fig. 3 and 4).

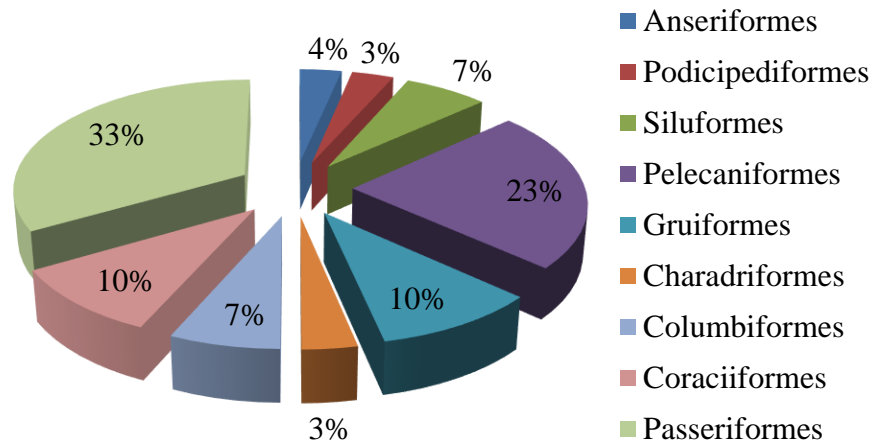


Fig. 2 Percentage composition of bird species in different orders

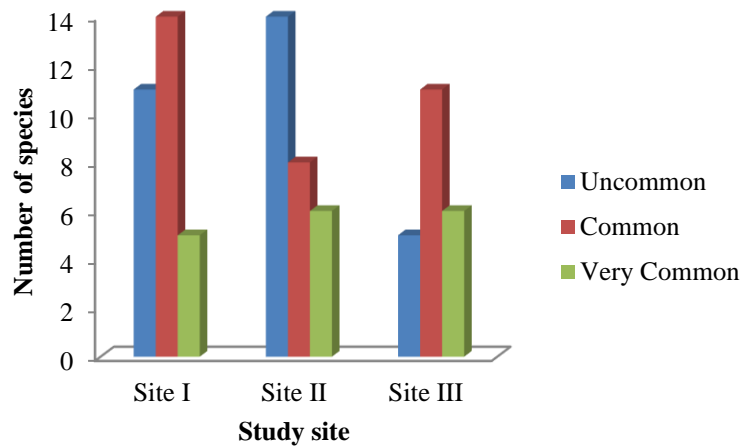


Fig. 3 Comparison of average relative abundance of bird species in each study site

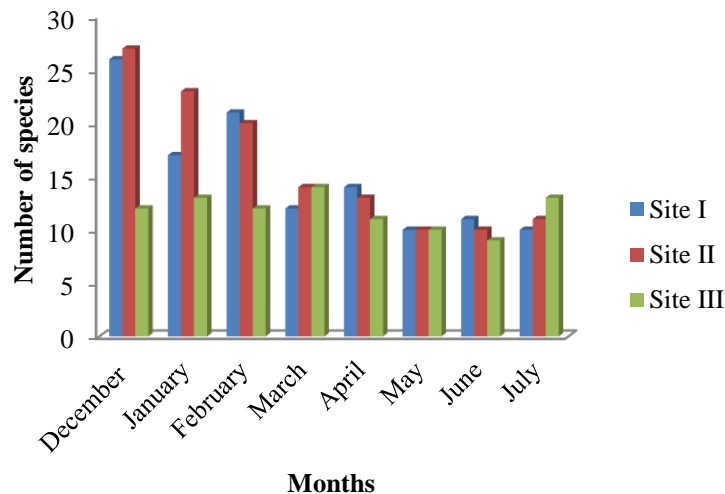


Fig. 4 Comparison of monthly occurrence of bird species recorded in each study site



(A) *Dendrocygna javanica*



(B) *Tachybaptus ruficollis*



(C) *Microcarbo niger*



(D) *Phalacrocorax carbo*



(E) *Plegadis falcinellus*



(F) *Ixobrychus sinensis*



(G) *Ardeola bacchus*



(H) *Bubulcus coromandus*

Plate 1. Bird species recorded from study area





(I) *Ardea alba*



(J) *Ardea intermedia*



(K) *Egretta garzetta*



(L) *Amaurornis phoenicurus*



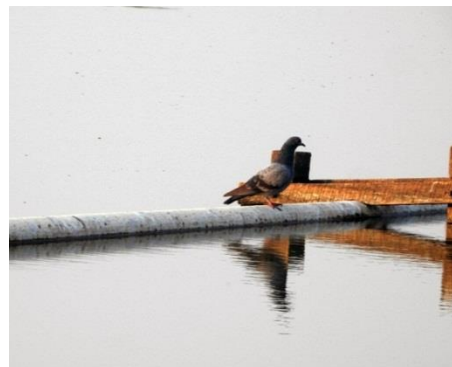
(M) *Gallinula chloropus*



(N) *Fulica atra*



(O) *Tringa ochropus*



(P) *Columba livia*



(Q) *Spilopelia chinensis*



(R) *Halcyon smyrnensis*



(S) *Halcyon pileata*



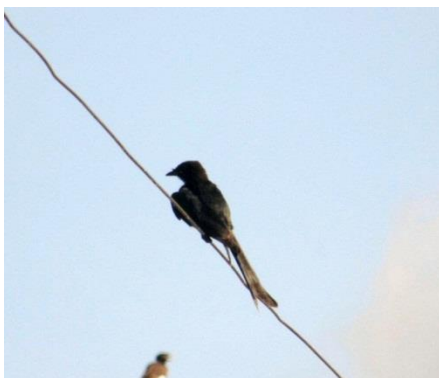
(T) *Merops orientalis*



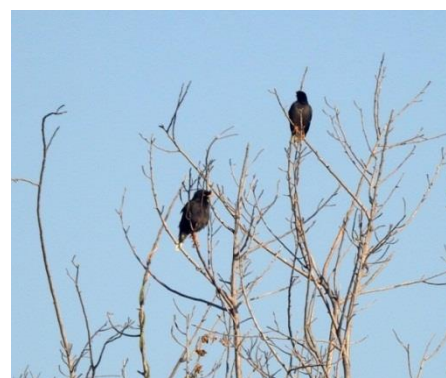
(U) *Lanius cristatus*



(V) *Dicrurus macrocercus*



(W) *Dicrurus aeneus*



(X) *Acridotheres fuscus*



(Y) *Acridotheres tristis*(Z) *A.burmannicus*(AA) *Corvus splendens*(AB) *Motacilla alba*(AC) *Passer domesticus*(AD) *Turdoides gularis*

## Plate 1. Contd

**Discussion**

A total of 30 species of avian fauna belonging to 25 genera, 17 families and nine orders were recorded in Meiktila Lake and its environs during December 2019 to July 2020. Out of the total species, 15 species were waterbirds comprising under 14 genera, seven families and six orders whereas 15 species of terrestrial birds belonging to 11 genera, 10 families and three orders were recorded.

In the present study, out of the recorded nine orders, the order Passeriformes showed the highest species composition (10 species, 33.33%). According to Smythies (2001) and Robson (2015), Passeriformes represent the largest species composition among the recorded order in South-east Asia. In the present study, largest species composition are found in order

Passeriformes in which most of the common terrestrial birds are recorded. Therefore, the present results agree with the finding of the above authors.

Akoism *et al.* (2008) stated that the highest number of species, abundance and richness of Ardeidae may be due to the present of more generalist species such as *Egretta garzetta*, *Mesophoyx intermedia*, *Bubulcus ibis*, *Ardeola bacchus* and *Ixobrychus cinnamomeus* as noticed in the wetland agro-ecosystems. This concept agrees with the present result in which the highest percentage of species composition was (20%) in the family Ardeidae.

When the result of present study is compared with Thiri Win Han (2018), *Fulica atra* (Common Coot) is not found in Meiktila University Campus but it has been recorded as the highest population in the present research. When the result of present study was compared with Thiri Win Han (2018), *Fulica atra* (Common Coot) is not found in Meiktila University Campus but it has been recorded as the highest population in the present research.

In the present study, when comparison was made on three study sites, 6 very common species and 14 species are found to be the highest in Site II and III whereas common (14 species) of common are found to be the lowest in Site I. The relative abundance of a species is often associated with the vegetation community, food resources and habitat structural complexity (Rajpar and Zakaria, 2011).

According to average relative abundance, the numbers of very common species were slightly difference among the three study sites. However, Lesser Whistling Duck and House Sparrow were very common species at three study sites. It can be suggested that these species live in flocks and hence the number of these birds are found to be higher than remaining species.

Average relative abundance indicated that seven species were very common, 11 species were common and 12 species were uncommon in the study period. Among the recorded species, two species were winter visitors and 28 species were residents and one endemic species of *Turdoides gularis* (White-throated babbler) was recorded.

### Conclusion

In conclusion, the present study was carried out eight month survey around Meiktila Lake. Even in this short term period, 30 species of birds and 6449 individuals were recorded. If long term monitoring will be carried out, more bird species and number may be recorded.

### Acknowledgements

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