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Utilization of *Ficus benjamina* by Birds at Urban Habitat in Depok

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Abstract

Most of the research about the relationship of birds and figs were conducted at natural habitat. We conducted a research about this relationship at urban habitat in Depok and specifically studied utilization of *Ficus benjamina* by birds as feeding and nesting tree. The objective of our research was to describe the *F. benjamina* utilization by urban birds in Depok. Scans sampling and nest counting were used during this study. Our research shows that *F. benjamina* was used as feeding tree by most of birds which lives at urban habitat in Depok. Our research also shows that some birds used this fig species as nesting tree.

Key Words : birds, Ficus benjamina, urban, Java

INTRODUCTION

Birds and figs (*Ficus* spp.) have mutualistic relationship. Birds disperse seeds of figs, while figs provides fruits for birds (Lok and Lee, 2009). The relationship between birds and figs has been studied by several scientists such as Lambert and Marshall (1991), Midya and Brahmachary (1991), Kinnaird *et al.* (1996), also Mardiastuti *et al.* (2000). Those research were mainly conducted at natural habitat

Ficus benjamina is one of figs species that usually can be found in several urban habitats in Java Island. This fig species can be found at Jakarta, Bogor (Arifin and Nakagoshi, 2011), Depok, Bandung (personal observation), and Yogyakarta (Nugroho *et al*., 2005).

Utilization of *Ficus benjamina* by urban birds as feeding tree was recorded by Lok and Lee (2009). Meanwhile, use of this fig species as nesting tree were recorded by Hilaluddin *et al.* (2003) and Nugroho *et al.* (2005). Those research were not specifically studied about utilization of *F. benjamina* by birds in urban habitat.

We conducted a research about the utilization of *Ficus benjamina* by birds at urban habitat. We used Universitas Indonesia Depok campus parks as a case study. The research questions of this study was: Do birds at urban habitat use this fig species as feeding and nesting tree?

METHODS

This research was conducted on 6 campus parks that existed in faculties and rectorate building of Universitas Indonesia Depok Campus from August to September 2009. *Ficus benjamina* only could be found in these 6 parks and each parks had different number of *F. benjamina* trees. Parks which had higher number of trees had higher number of sampling units, and vice versa. The number of *F. benjamina* tree which we observed were 12 trees.

Scans sampling method with 5 minutes interval (Muzaffar, 2004) and 12 numbers of interval (scan sample) was used for observing bird activities on *Ficus benjamina* trees between 06.00 and 08.00 a.m. and also between 15.30 and 17.30 p.m. The observations were aided by 10 x 42 mm binocular. The activities that we observed were feeding, perching, and preening. We counted the percent of time (Altman, 1974) of each bird activity using this formula :

% of i-activity = (total number of scan samples in which i-activity observed /total number of scan samples) x 100%

We compared the percent of time of feeding activity to other activities for each species. We excluded granivores and terrestrial birds from this analysis because they do not eat fruits or forage on trees. For utilization of *F. benjamina* as nesting tree data, we only counted number of nest on each sampling units i.e., *F. benjamina* trees, and included all birds we found during data collection.

RESULTS AND DISCUSSION

We found 14 bird species on *Ficus benjamina* and most of the species were insectivore, only 2 species that were frugivores i.e., *Pycnonotus aurigaster* and *Dicaeum trochileum*. Total of scan samples were 288 samples and the most common species that we observed during research was *P. aurigaster*, observed in 129 scan samples (Table 1). Bird species that we found were species which usually can be found in urban habitats. Those species also can be found in Jakarta (Kristanto and Momberg, 2008), Bogor, Bandung (personal observation), and Yogyakarta (Taufiqurrahman *et al*., 2015). This result may also describe the utilization of *F. benjamina* by birds in other urban habitats in Java Island. Indeed, further study is needed.

Table 1. Checklist of bird species that were observed on *Ficus benjamina* including the food they ate based on observation

Famili	Scientific name	Number of scan samples**	Type of food***
Columbidae	*Streptopelia chinensis**	1	-
Picidae	*Picoides moluccensis*	2	-
Campephagidae	*Pericrocotus cinnamomeus*	3	I
Chloropsidae	*Aegithina tiphia*	6	I
Pariidae	*Parus major*	1	-
Pycnonotidae	*Pycnonotus aurigaster*	129	I, F
Sylviidae	*Gerygone sulphurea*	14	I
	Orthotomus sutorius	6	I
	O. sepium	15	I
Nectarinidae	*Anthreptes malacensis*	40	I
Dicaeidae	*Dicaeum trochileum*	20	-
Zosteropidae	*Zosterops palpebrosus*	9	I
Ploceidae	*Lonchura punctulata**	4	-
	*Passer montanus**	1	-

**excluded from feeding activities analysis*
***total of scan samples in which each of bird species observed in scans sampling*
****I: insects or other arthropods; F: Ficus benjamina fruit; - : feeding activity was not observed*

From 11 bird species which we included in analysis, 7 species were observed feeding on *Ficus benjamina* and 3 of them had higher feeding activity than other activities (Table 2). Of those species, only *P. aurigaster* that was observed ate the fruit of *F. benjamina* (Table 1). Our result shows that *F. benjamina* was used as feeding tree by most of birds which lives at urban habitat in Depok. This finding shows the importance of *F. benjamina* for urban birds in Depok, especially as food source. In urban parks of Singapore, *F. benjamina* is also a food source for urban birds (Lok and Lee, 2009; Lok *et al.*, 2013). On the contratry, this fig species was not a food source for urban birds in Hong Kong because it is not a native fig species (Corlett 2006).

D. trochileum did not observed feeding on *F. benjamina* (Table 2) because this species usually

eats fruit of mistletoe (MacKinnon *et al*., 2000; Cheke and Mann, 2016). The mistletoe which we found on 3 *F. benjamina* trees did not bears fruits. This flowerpecker probably also feeding on *F. benjamina* if there were mistletoe fruits. *D. trochileum* seem to have a preference for mistletoe fruits because other flowerpecker in Singapore urban area, *Dicaeum cruentatum*, has been observed feeding on *F. benjamina* fruit (Lok *et al*., 2013).

There were 3 insectivore that were not observed feeding on *F. benjamina* during scans sampling i.e., *Zosterops palpebrosus, Parus major,* and *Picoides moluccensis* (Table 2). *Z. palpebrosus* was observed ate insect on *F. benjamina,* but the observation was not during data collection. *P. major* probably also feeding on *F. benjamina*, but was not observed because the number of scan sample of this species was very low (Table 1). On the contrary, *P. moluccensis* most probably is not feeding on *F. benjamina*. According to MacKinnon *et al.* (2000), this woodpecker species usually feeding on dead trees.

Table 2. Mean percent of time of each activities

Scientific name	Feeding (mean±SD)	Perching (mean±SD)	Preening (mean±SD)
Picoides moluccensis	0	100	0
Pericrocotus cinnamomeus	50±70.71	100±0	0
Aegithina tiphia	50±50	50±50	0
Parus major	0	100	0
Pycnonotus aurigaster	13.78±20.39	86.22±20.39	0
Gerygone sulphurea	69.45±40.02	30.55±40.02	0
Orthotomus sutorius	100±0	0	0
O. sepium	87.5±23.15	12.5±23.15	0
Anthreptes malacensis	36.33±41.68	62.08±43.42	1.59±4.77
Dicaeum trochileum	0	88.75±31.82	0
Zosterops palpebrosus	0	100±0	0

We found one active nest, belonging to *Zosterops palpebrosus*, and 2 inactive nests on 3 different trees. The active nest of *Z. palpebrosus* was found on 27 August 2009. One of the two inactive nest had different structure with the nest of *Z. palpebrosus*, the inactive nest was a suspended nest (Figure 1) while the nest of *Z. palpebrosus* was a cup nest. The inactive nest probably was nest of sunbird (Bas van Balen, 2009, personal communication; Karyadi Baskoro, 2009, personal communication). We concluded that there were at least 2 different species which build their nests on *F. benjamina*.

Figure 1. One of the inactive nest which was probably nest of sunbird

This result may not describe the real condition of utilization of *F. benjamina* as nesting tree. Birds in tropical region usually breeds in December, when heavy rains usually begin (Gill, 2000), while this research conducted from August to September. Furthermore, in Amroha, one of urban area in India, *F. benjamina* was preferred by birds as nesting tree. About 20 active nests were found on this fig species (Hilaluddin *et al*., 2003). To know the real condition of this kind of utilization, further research has to be conducted in December.

CONCLUSION

Our study shows that most of birds which lives at urban habitat in Depok utilized *Ficus benjamina* as their feeding tree. This study also shows that some urban birds of Depok used *F.*

benjamina as nesting tree, but this result may not describe the real condition and need a further study.

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