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THE COMPOSITION OF THE FORAGING HABITAT OF BATS (*PTEROPODIDAE*) IN THREE URBAN OPEN SPACES IN SOUTH TANGERANG CITY

KOMPOSISI HABITAT PENCARIAN PAKAN KELELAWAR *(PTEROPODIDAE)* DI TIGA RUANG TERBUKA HIJAU KOTA TANGERANG SELATAN

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Abstract

Pteropodidae bats play an important role in seed dispersal and plant pollination in urban areas. This study aims to identify microclimate factors and forage plant phenology that influence the selection of foraging habitats of *Pteropodidae* bats in three Green Open Spaces of South Tangerang City. Bat captures were conducted using mist nets placed purposively, for 3 nights with 2 mist nets each in 3 different habitat types. The analysis used was Canonical Correspondence Analysis (CCA) using Canoco software version 4.5. The results found 4 types of *Pteropodidae* bats, namely *Cynopterus brachyotis*, *Cynopterus horsfieldii*, *Cynopterus titthaecheilus*, and *Macroglossus sobrinus*. A total of 28 species from 18 plant families were identified that have the potential to be used as food for *Pteropodidae* bats in South Tangerang City. Based on the results of the analysis using Canonical Correspondence Analysis (CCA), the microclimate factors that influence foraging preferences are the level of disturbance and 3 groups have different tendencies in choosing foraging habitats.

Keywords*:* Foraging habitat; *Pteropodidae*; South Tangerang City

Abstrak

Kelelawar Pteropodidae memiliki peranan penting dalam penyebaran biji dan penyerbukan tanaman di kawasan perkotaan. Penelitian ini bertujuan untuk mengidentifikasi faktor mikroklimat dan fenologi tumbuhan pakan yang berpengaruh terhadap pemilihan habitat pencarian pakan kelelawar Pteropodidae di tiga Ruang Terbuka Hijau Kota Tangerang Selatan. Penangkapan kelelawar dilakukan dengan menggunakan jaring kabut yang diletakkan secara purposive, selama 3 malam dengan 2 jaring kabut masing-masing pada 3 tipe habitat yang berbeda. Analisis yang digunakan adalah Canonical Correspondence Analysis (CCA) menggunakan perangkat lunak Canoco versi 4.5. Ditemukan 4 jenis kelelawar Pteropodidae yaitu Cynopterus brachyotis, Cynopterus horsfieldii, Cynopterus titthaecheilus, dan Macroglossus sobrinus. Total teridentifikasi 28 jenis dari 18 famili tumbuhan yang berpotensi sebagai pakan kelelawar Pteropodidae di Kota Tangerang Selatan. Berdasarkan hasil analisis menggunakan Canonical Correspondence Analysis (CCA), faktor mikroklimat yang berpengaruh terhadap preferensi pencarian pakan adalah tingkat kebisingan dan terdapat 3 kelompok yang memiliki kecenderungan berbeda dalam memilih habitat pencarian pakan.

Kata kunci*: Habitat pencarian pakan; Kota Tangerang Selatan; Pteropodidae*

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INTRODUCTION

Bats have a very important role in the ecosystem as pollinators, seed dispersers, guano producers, and insect pest controllers (Fithria et al., 2020). Wijayanti et al. (2017) reported that 18 plant species from 33 families are food sources for *Pteropodidae* bats in South Tangerang City and that 13 families of plants are commonly consumed or potentially pollinated by bats. In addition to the types of plants commonly consumed or potentially pollinated by *Pteropodidae* bats, it is suspected that there are other types of *Pteropodidae* bat food, however, the area of the food source is not yet known.

Bats live in several habitat types: caves, primary forests, secondary forests, urban forests, and plantations. Habitat reduction and fragmentation are the two main threats to the existence of bats in urban areas. Research conducted by Coles et al. (2004) reported finding 12 species of bats in agricultural land and urban areas in Brunei. In another study, there were 8 species of *Pteropodidae* bats on the UI campus, Depok (Sheherazade, 2014). Based on the results of these previous studies, bats in urban areas are thought to be able to adapt to the urban environment.

Bats are nocturnal flying mammals that require specific habitat characteristics to detect their food sources. The selection of foraging habitat for *Pteropodidae* bats is not only based on the type of food that suits the physiological needs of bats. The characteristics of bats in searching for food at night, the high level of food needs, the location of flowers on tree branches that are easily accessible, bats' color-blind eyes, and sharp sense of smell affect the food chosen by bats (Massoud & Abumandour, 2020). Research Wijayanti. (2021) reported that noise level (db), oxygen level (%), and air humidity (%) are factors that influence bats in choosing nests in South Tangerang City. Lama et al. (2024) recorded six species of bats (n= 392 individuals), predominantly *Pteropodidae*, with the additional record of population size, distribution, and extent of occurrence of *Alionycteris paucidentata* Kock 1969 within Mount Kitanglad Range Natural Park (MKRNP). Canonical Correspondence Analysis (CCA) and Geographic Information System (GIS) mapping showed several variables (i.e., elevation, vegetation, and geographical characteristics) with significant associations with bat occurrence and abundance.

South Tangerang City is a buffer zone of the capital city with several green open spaces. This study was conducted in three green open space locations that are assumed to represent the foraging habitat of *Pteropodidae* bats in South Tangerang City with different vegetation types and criteria, based on Ministry of Home Affairs regulation no. 1 of 2007 (2007) concerning green open space arrangement in urban areas and Ministry of Public Works no. 5 of 2008 (2008) concerning provision and utilization of green open space in urban areas. This study aims to identify microclimatic factors and forage plant phenology that influence the selection of foraging habitats for *Pteropodidae* bats in three green spaces in South Tangerang City.

MATERIALS AND METHODS

The research locations were in three green spaces in South Tangerang City Open Space Bambu Apus, which is a type of green space for residential neighborhood parks and yards; Taman Kota 1 BSD Serpong, which is a type of green space for city parks; and Situ Gintung, which is a type of green space for situ boundaries.

Bat collection was conducted using the capture and release method using a mist net. The mist net was focused on capturing fruit-eating bats (*Pteropodidae*). Mist nets were installed along the path of the data collection location, namely the area suspected to be a bat track. Mist nets were installed by considering several factors, such as the path or close to fruiting and flowering trees with attention to canopy cover or above the river. Fog nets were set in the afternoon before sunset around 4:00 pm until the morning at 5:00 am. Traps were set for 3 nights using 2 mist nets per night at each sampling location. Captured bats were then weighed with digital scales and measured morphometrically with a push-piece. Microclimate factor measurements consisted of air temperature with a thermometer, air humidity with a weather meter, wind speed with an anemometer, light intensity with a lux meter, and noise level with a sound level meter. Microclimate factors were measured 3 times every day in the morning, afternoon, and evening, and then the average was calculated.

Search and determination of bat foraging habitat using survey method. The center point of observation is the bat roost. A belt transect was established within a 100 m radius of the bat roost which is the center point of the observation radius. Throughout the night on three different days, plants suspected of being food sources for bats were searched along the belt transect. The placement of belt transects was done purposively based on the frequency of *Pteropodidae* bats visiting their food source plants. Plants that bats most often approach as a source of food are then marked at night to record plant phenology with the categories of non-flowering, flowering, young fruit, and mature fruit during the day. Wijayanti (2021) and Suripto et al. (2001) research were used as a reference to verify whether the plant is a food source for bats.

Data Analysis

Microclimatic parameters measured included air temperature, air humidity, light intensity, wind speed, and noise level. Responses of *Pteropodidae* bat species recovered from the study sites to microclimate factor parameters were tested by multivariate analysis of Canonical Correspondence Analysis (CCA) using Canonical Community Ordination (Canoco) software version 4.5. CCA was used with the forward selection method and tested using Monte Carlo Permutation with 199 random permutations. The use of the CCA method aims to determine the relationship in graphical form and expose the maximum information from a data matrix in the form of *Pteropodidae* bat species found with microclimate factors simultaneously (Greenacre & Primicerio, 2019)

RESULTS

Based on the results of the study, it is known that 4 species of bats of the *Pteropodidae* family, namely *Cynopterus brachyotis*, *Cynopterus horsfieldii*, *Cynopterus titthaecheilus*, and *Macroglossus sobrinus* are distributed in the South Tangerang City area (Table 1).

Table 1. Composition of *Pteropodidae* bat species in South Tangerang City and their protection status

Scientific name	Local name	Observation location			Conservation status		
		BA	SG	TK1	PP	IUCN	CITES
Cynopterus brachyotis (Muller, 1838)	*Codot krawar*	9	16	13	-	LC	NA
Cynopterus horsfieldii (Gray, 1843)	*Codot Horsfield*	2	0	0	-	LC	NA
Cynopterus titthaecheilus (Temminck, 1827)	*Codot besar*	1	0	0	-	LC	NA
Macroglossus sobrinus (Andersen, 1911)	*Cecadu pisang besar*	1	6	2	-	LC	NA

Note: LC= least concern; NA= non appendix; PP= PP no. 7 tahun 1999; BA= Bambu Apus; SG= Situ Gintung; TK1= Taman Kota 1 BSD

28 species of plants have the potential to feed *Pteropodidae* bats in the South Tangerang City area, 15 species are non-flowering (*Albizia saman*, *Artocarpus altilis*, *Averrhoa carambola*, *Baringtonia asiatica*, *Ficus lyrata*, *Hibiscus* sp., *Gnetum gnemon*, *Leucaena leucocephala*, *Moringa oleifera*, *Polyalthia longifolia*, *Pometia pinnata*, *Roystonea regia*, *Schefflera actinophylla*, *Tamarindus indica*, and *Tectona grandis*), 5 species in flowering stage (*Acacia auriculiformis*, *Carica papaya*, *Mangifera indica*, *Plumeria* sp., and *Syzygium aqueum*), 7 species in young fruiting stage (*Artocarpus heterophyllus*, *Cerbera manghas*, *Cocos nucifera*, *Dimocarpus longan*, *Musa* sp., *Prunus* sp., and *Psidium guajava*) and 1 mature fruiting species (*Nephelium lappaceum*) (Table 2).

Table 2. Phenology of potential food plant species of *Pteropodidae* bats in the South Tangerang City area

Family	Scientific name	Local name	Location		
			Bambu Apus	Situ Gintung	BSD
Anacardiaceae	*Mangifera indica*	*Mangga*	NF, Fl	-	-
Annonaceae	*Polyalthia longifolia*	*Glodokan*	-	-	NF
Apocynaceae	*Cerbera manghas*	*Bintaro*	-	YF, RF	YF
	Plumeria sp.	*Kamboja*	-	Fl	-

Family	Scientific name	Local name	Location		
			Bambu Apus	Situ Gintung	BSD
Araliaceae	*Schefflera actinophylla*	*Walisongo*	-	-	NF
Arecaceae	*Cocos nucifera*	*Kelapa*	YF	-	-
	Roystonea regia	*Palem Raja*	-	-	NF
Caricaceae	*Carica papaya*	*Pepaya*	Fl	-	-
Fabaceae	*Acacia auriculiformis*	*Kormis*	-	Fl, YF	-
	Albizia saman	*Trembesi*	-	-	NF
	Leucaena leucocephala	*Lamtoro*	-	NF	-
	Tamarindus indica	*Asam Jawa*	-	-	NF
Gnetaceae	*Gnetum gnemon*	*Melinjo*	-	-	NF
Lamiaceae	*Tectona grandis*	*Jati*	-	-	NF
Lecythidaceae	*Baringtonia asiatica*	*Keben*	-	-	NF
Malvaceae	*Hibiscus* sp.	*Waru*	-	-	NF
Moraceae	*Ficus lyrata*	*Biola*		-	NF
	Artocarpus altilis	*Sukun*	-	NF	-
	Artocarpus heterophyllus	*Nangka*	YF	-	-
Musaceae	*Musa* sp.	*Pisang*	NF, YF	-	-
Myrtaceae	*Psidium guajava*	*Jambu biji*	YF	-	-
	Syzygium aqueum	*Jambu air*	-	Fl	-
Oxalidaceae	*Averrhoa carambola*	*Belimbing*	-	NF	-
Rosaceae	*Prunus* sp.	*Ceri*	-	Fl, YF	-
Sapindaceae	*Dimocarpus longan*	*Lengkeng*	YF	-	-
	Nephelium lappaceum	*Rambutan*	NF, YF, RF	-	-
	Pometia pinata	*Matoa*	-	-	NF

Note: NF= no flowering; Fl= flowering; YF= young fruiting; RF= ripe fruit

The results of Canonical Correspondence Analysis (CCA) analysis with 5 parameters of microclimate factors (air temperature, air humidity, light intensity, wind speed, and noise level) are presented in Table 3. The results of the CCA analysis using the forward selection method showed that there was one microclimate parameter that influenced the selection of foraging habitat for *Pteropodidae* bats from the five parameters tested, namely noise level with the highest eigenvalue (λ= 0.2027 and P-value= 0.0200) (Table 3).

Table 3. Order of microclimatic factor parameters that influence foraging habitat selection of *Pteropodidae* bats in South Tangerang City

Microclimate parameters (code)	Order	F	λ	P-value
Noise level (db) (TK)	1	4.37	0,2027	0.0200*
Wind speed (m/s) (KA)	2	0.94	0.0441	0.4500
Light intensity (Lux) (IC)	3	0.43	0.0261	0.6900
Air temperature (°C) (SU)	4	0.41	0.0225	0.7050
Air humidity (%) (KU)	5	0.39	0.0197	0.7400

Note: F= F ratio; λ= eigenvalue; *= significantly different ($P <0.05$). Data were obtained by the forward selection analysis method and tested using Monte Carlo permutation with 199 random permutations

The results of CCA are presented in graphical form in Figure 1. The figure shows the relationship between bat species and microclimate parameters of foraging habitat. The results of the CCA analysis showed three groups of *Pteropodidae* bats based on the tendency of their foraging habitat selection patterns.

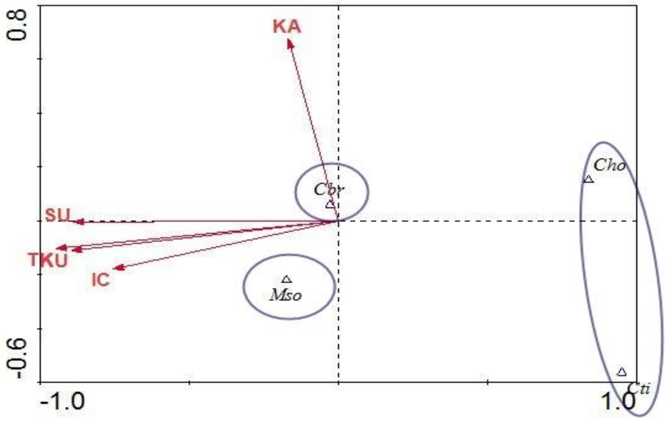

Figure 1. Canonical Correspondence Analysis (CCA) graph of bat species based on microclimate factor conditions. SU= air temperature; KU= air humidity; IC= light intensity; KA= wind speed; TK= noise level; Cbr= *Cynopterus brachyotis*; Cho = *Cynopterus horsfieldii*; Cti = *Cynopterus titthaecheilus*; Mso= *Macroglossus sobrinus*

DISCUSSION

Plants that are often visited by *Pteropodidae* bats in the observation location are plants that consist of phases of non-flowering, flowering, and fruiting. This is to the research of da Silva et al. (2024) that plants that are a source of food for bats are flowering and seed plants, the location for foraging and the composition of bat food is influenced by the flowering and fruiting season of trees that are a source of food. Some bat species perform seasonal migrations, following the fruiting season of certain plant species (Altringham, 2011). Sudhakaran and Doss (2012) reported that 37 plant species have the potential to feed *Pteropodidae* bats in Tirunelveli and Tuticorin Districts, India. Sheherazade (2014) reported that 26 plant species are food trees for fruit-eating bats at the UI Depok campus. According to da Silva et al. (2024), the botanical families *Piperaceae* (35.52%) and *Solanaceae* (19.71%) were the ones most preferred by the bats. Regarding species richness, the general bat-plant interaction network included 15 botanical families and 26 species of bats. The general interaction network was nested (WNODF= 29.8), with low specialization (H"= 0.27), connectance (0.17), and modularity corresponding to M= 0.21.

Plants that are in the condition of young fruit or ripe fruit provide a source of energy for *Pteropodidae* bats. Based on observations of cherry plants (*Prunus* sp.) that are flowering and bearing young fruit are often visited by *Pteropodidae* bats. The selection of fruit conditions consumed by *Pteropodidae* bats is influenced by several factors, according to Fajri et al. (2023) some fruits are difficult to detect visually by fruit-eating bats with the same leaf color, to be able to distinguish young or ripe fruit bats rely on their sensory abilities. *N. Lappaceum* fruits that were in the ripe fruit phase were also observed to be visited by *Pteropodidae* bats. *Pteropodidae* bats' foraging preferences are mainly based on morphological characteristics and fruit palatability. *Cynopterus sphinx*, *Rousettus leschenaultii*, and *Pteropus giganteus* was conducted in Tirunelveli and Tuticorin districts of Southern Tamil Nadu, India. The preference for fruits by *Pteropodids* varied according to the developmental stages of fruits namely, immature, unripe, and ripe. There is a relationship between the foraging activities of bats and the moon phase. Bats exhibit a varied foraging pattern and flight height. A variation in the foraging flight height was observed in *C. sphinx* and *R. leschenaultii*. *R. leschenaultii* was observed to have a higher foraging echelon than that of the *C. sphinx*. *C. sphinx* forages normally at the canopy level (up to 3.5 m), *R. leschenaultii* forages at upper canopy levels (up to 9 m), and *P. giganteus* at a height above the canopy area (>9 m). (Sudhakaran & Doss, 2012).

According to Krishnarathi and Isaac (2016). These plants provide fruits or their parts, leaves, flowers, nectar, and pollen for pteropodid bats including *C. sphinx*, *R. leschenaulti*, and *P. giganteus* in his study. The bats fed on fruits, leaves, nectar, and pollen. A variation of food selection was observed within the pteropodid bats. Out of the 10 species of plants preferred by *C. sphinx*, one provides leaves, one provides flowers, three provides leaves and flowers, and five provides leaves and fruit. Out of the 8 species of plants preferred by *R. leschenaultii*, one provides fruit, one provides flowers, two provides leaves and flowers, and two provide leaves and fruits. Of the 6 species of plants preferred by *P. giganteus*, one provides leaves, three provides leaves and fruit, and two provide leaves and flowers. Opportunities in bat nutrition abound and given the diversity of the species, the information derived would improve not only our understanding of nutrient requirements and dietary husbandry of bats but also of other species with similar habits and feeding strategies.

Based on observations at each location, *Pteropodidae* bats do not only consume ripe and unripe fruits. Bats that eat pollen from some flowers such as banana plants are also utilized. Banana plants (*Musa* sp.) were observed to be frequented by *Macroglossus sobrinus* bats during the study. Research by Saridan (2010) reported that the crown factor for male *M. sobrinus* is strongly influenced by the shape of the crown of the butterfly (*papilionaceus*), tube (tubulus), and star (*stellatus*). The pollen eaten by bats can also help the pollination process of these plants. Soegiharto et al. (2009) reported that the *E. spelaea* male has an interest in *personatus corolla*-type flowers, while the female is in disk type. Furthermore, the male of *M. sobrinus* is interested in *rotatus*, *tubulosus*, and *perferesence*, *corolla* types. Whereas the female has an interest in the *campanulatus* type. The *campanulate* and *papilionaceous* types have the potential to be visited by *C. minutus* males and females *of C*. sphinx; *the Uceolatus* type is important for a female of *C. titthaheileus* and *C. brachyotis.* The male of *M. sobrinus* and female of *Eonycteris spelaea* are interested in visiting the flower with *sub oblate* and *prolate spheroidal* pollen types; *prolate* pollen type has importance for the male of *E. spelaea*; *oblate* type for the male of *C. minutus*, *C. brachyotis,* and *C. titthaheileus*; *oblate spheroidal* for the female of *R. amplexicaudatus* and male of *C. sphinx.* The male of *C. titthaheileus* and female of *M. sobrinus* have interests in the gigantic type (>200 ì m), while the female of *C. sphinx, C. brachyotis,* and *R. amplexicaudatuslike* permagnae type (100–200 ì m). The food supply available throughout the year, both temporally and spatially, and the foraging habits of bats are shaped by the types of plants that bats feed on. Sritongchuay et al. (2019) reported that bats tend to pollinate 31 genera of flowering plants and are thought to disperse the majority of fruit seeds consumed. Plant-eating bats eat a variety of non-commercial and commercial fruiting plants including figs, *kapok*, pepper, mango, banana, peach, and even young coconut and cocoa pods. There are 188 species from 64 genera pollinated by the family *Pteropodidae*. In tropical forests, trees that bear fruit throughout the year, and are well distributed, provide a constant food supply for bats. Pollination networks were then created based on network level indices (number of interactions and specialization) and species level indices (strength dependence of plant on each bat and generalized degree, the number of interactions per species divided by the number of possible interacting partners) for each bat group at each orchard. We found that specialization in low-season networks was higher than those in peak season. Nectarivorous bats showed higher levels of normalized degree and strength than frugivorous bats. The normalized degree of frugivorous bats, but not nectarivorous bats increased with the proportion of urban areas within a 30 km radius. The strength of bats was positively correlated with the proportion of plantations within a 2 km radius. Our results show that both bat guilds are strongly integrated into pollination networks where they occur and provide evidence that increasing the area of plantation and urban alters the degree of generalization of pollinators which can significantly impact the pollination success of plants (Sritongchuay et al., 2019)

Plants that were not flowering or fruiting during the study were *Albizia saman*, *Artocarpus altilis*, *Averrhoa carambola*, *Baringtonia asiatica*, *Ficus lyrata*, *Hibiscus* sp., *Gnetum gnemon*, *Leucaena leucocephala*, *Moringa oleifera*, *Polyalthia longifolia*, *Pometia pinnata*, *Roystonea regia*, *Schefflera actinophylla*, *Tamarindus indica*, and *Tectona grandis* (Table 2). During the observation of the foraging habitat of *Pteropodidae* bats in Taman Kota 1 BSD, plants that were in the non-flowering phase, namely the *Javanese asem* plant (*Tamarindus indica*) were also utilized by *Pteropodidae* bats as temporary roosts before looking for plants that were flowering or fruiting. During the observation, many plants that were in the phase of not yet flowering or fruiting, namely king palm (*Roystonea regia*) in Taman Kota 1 BSD, became bat nesting sites or temporary roosting sites after bats obtained fruit from other locations.

The large variety of plants and their different phenology in each observation location increases the diversity of bats in determining the food needed every day. Research by Tan et al. (2000)

explained that the consumption of fruits that are available throughout the year or seasonal fruits is thought to be an important factor in maintaining the population stability of *C. brachyotis* bats. Differences in seasonal phenology between congeneric plant taxa (*Ficus* spp. and *Eugenia* spp.) lead to stable fruit production throughout the year.

Noise level is a microclimate parameter that is significantly correlated with foraging habitat selection of *Pteropodidae* bats. High noise levels are thought to affect *Pteropodidae* bats in their search for food sources. Based on Boonman et al. (2014) reported that two species of noncolocating bats (*Eonycteris spelaea* and *Cynopterus brachyotis*) use click-like sounds produced from their wings to detect and distinguish objects in pitch-dark conditions.

The influence of microclimate parameters on bat species can be seen from the length and direction of the arrows. The distance between the tip of the arrow and the bat species points indicates how much influence the microclimate parameter has relative to the bat species. The direction of the arrow shows the correlation between vegetation parameters and bat species. The length of the arrow indicates the strength of the correlation between the variables. Variables with the same arrow direction are positively correlated, opposite arrow directions are negatively correlated, and arrow directions perpendicular to the variable are not correlated. The value of the angle between two arrows describes the correlation of the two variables. The narrower the angle made between two variables, the higher the positive correlation. Meanwhile, if the angle is obtuse (opposite direction), the correlation is negative.

The first group is the *Pteropodidae* bat species whose foraging habitat selection pattern is influenced by wind speed. *Cynopterus brachyotis* is a bat whose presence is influenced by wind speed. Based on the results of observations, this species is the most common species found with 38 individuals from the three observation locations. This indicates that the condition of the foraging environment with wind speed is a desirable condition for these bats to forage in urban areas.

The second group is the *Pteropodidae* bat species whose presence is influenced by light intensity, air humidity, noise level, and air temperature. Based on Figure 1, air temperature is positively correlated with noise level, air humidity, and light intensity. The bat species found was *Macroglossus sobrinus* with a total of 9 individuals found in all three observation locations (Table 1). Based on this, *M. sobrinus* bats tend to want environmental conditions in foraging habitats that are cold, noisy, humid, and bright. So far there has been no research that explains the foraging habitat selection tendencies of *Pteropodidae* bats in urban areas.

The third group is *Pteropodidae* bats whose presence in foraging habitat selection is not influenced by the five microclimate factors. Based on Figure 1, the bats *Cynopterus horsfieldii* and *Cynopterus titthaecheilus* are far from the direction of the microclimate factor variable arrows. The results of this study explain that the variables of air temperature, air humidity, light intensity, wind speed, and noise level do not have a significant effect on the selection of bat foraging habitat, so it is suspected that several other variables determine *Pteropodidae* bats in choosing their foraging habitat. Roost location, night flying activity, and roaming power are thought to be one of the factors of *C. horsfieldii* bats searching for food. The daily roost sites of *C. horsfieldii* are sparsely distributed and found mainly in palm plants. Flight activity for foraging begins 2 hours after sunset and then gradually decreases during the night and then increases again three hours before sunrise. *C. horsfieldii* forages throughout the year in plantation areas and secondary habitats near forest edges (Campbell & Kunz, 2006).

CONCLUSION

Characteristics of foraging habitat of *Pteropodidae* bats in three green spaces in South Tangerang City based on plant phenology there are 28 types of plants from 18 families that have the potential as food for *Pteropodidae* bats, 15 types of non-flowering, 5 types of flowering, 7 types of young fruit and 1 type of mature fruit. Based on the results of analysis using Canonical Correspondence Analysis (CCA), the noise level is the most influential microclimate parameter on the selection of foraging habitat for *Pteropodidae* bats and 3 groups of bats have different tendencies in choosing foraging habitat. Green open spaces in urban areas need to be planted with fruiting plants so that they can become a source of food for *Pteropodidae* bats, especially in the inner part of green open spaces that are far from noise.

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