

## Short Communication

# Species Composition and Status of Urban Butterflies of University of the East Tan Yan Kee Garden, Recto Avenue Sampaloc, Manila

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## ABSTRACT

There are few research publications on butterflies in Manila. As to date, there are zero butterfly publication in Tan Yan Kee Garden Sampaloc, Manila. Method used is exhaustive sampling for four months. The aim of this study is to document species composition, abundance and status of butterflies as a baseline information. There are 15 species and subspecies of butterflies and with a relative abundance of butterflies almost the same on four (4) month of sampling period with a status of 13 common, 4 very common and 1 rare butterfly at Tan Yan Kee urban garden.

**Key words:** Crepuscular, Butterfly host plant

## INTRODUCTION

There were 22 species of butterflies identified corresponding to certain groups of nectarine food plants and larval host plants in Mehan Garden, Ermita Manila, (Nacua 2016). In La Union Botanical garden (LUBG), Cadaclan, San Fernando La Union, there were 104 species of butterflies identified. They belong to 6 families of 66 genera (Nacua *et al.*, 2015). Bulusukan, San Ildelfonso, Bulacan is a home for 21 butterfly species that belong to 19 genera, 2 were found exceptional and 2 were endemic species. (Zapanta *et al.*, 2016). Halang, Lipa Batangas is the locale habitat for 27 species of butterflies both in an open and closed canopy dipterocarp forest. (Manalo *et al.*, 2017)

A documented data of 1,615 species and subspecies of butterflies, forty-four percent (44%) of these species are endemic to the Philippines (Baltazar, 1991). "Survey of the Rhopalocera (Lepidoptera) of Mt. Makiling" (Cayabyab, 2000). important data relative to the host plant relationships (De Jong and Threadaway, 1993). A documented 142 species of butterflies at Mt. Hamiguitan, Davao Oriental, Philippines (Mohagan and Threadaway, 2010).

Butterflies are commonly found in the forest, and it is interesting to note that in urban city of Manila butterflies were also spotted. Butterflies are biological indicators for climate change. They are sensitive to too much heat in the environment. They can recognize when rain is coming and they migrate to a warmer place to hide for protection. When the temperature is too high for their body to tolerate, they hide inside the forest canopy or thick leaves of plants to cool down. Water is very important for hydration of butterflies. They were found sipping water along the sewage canal of the Tan Yan

Kee garden, moisture on the soil, stones and even in wet concrete pavement using their proboscis. It is interesting to document that butterflies also take in minerals that are embedded on the stony area of the garden. The aim of this study is to document species composition, abundance and status of butterflies as a baseline information for those who will continue with the same study for biodiversity conservation.

## MATERIALS AND METHOD

### *Exhaustive Sampling Technique*

Butterflies sampling has been carried out for four (4) months from April, May, June, July of 2019, to represent the butterflies collected during wet and dry season. Exhaustive sampling technique was applied, meaning all possible butterflies present were collected from Tan Yan Kee garden (Figure 1). Butterflies were set free as soon they had been identified and documented unharmed. Only those that are difficult to identify were collected and processed. Only one (1) individual butterfly per species were collected and identified. According to DENR, 2 to 3 species are allowed for field collection.

Insect nets were used to collect butterflies by sweeping method. All butterflies from the insect net were transferred in the paper triangle and were kept in the insect triangle case for protection. They are brought to the Biodiversity Laboratory for processing.

### *Classification and Identification*

For the identification and classification of the butterflies, Peter B. Hardy and James M. Lawrence (2017) Field Guide to Butterflies of the Philippines, Pisuth Ek Amnuay (2012) Butterflies of Thailand and Colin G. Threadaway and Heinz G. Schroeder (2012) Revised

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**Figure 1.** A. Satellite **Google map** of Tan Yan Kee garden with the coordinates of  $1^{\circ}36'7''N$   $120^{\circ}59'22''E$ , lot area of 4470 m<sup>2</sup>; B. The Actual Sampling site of Tan Yan Kee garden with many Fabaceae on the ground for Lyceanidae and Pieridae butterflies.

Checklist of the Butterflies of the Philippines were used.

#### Assessment of Status

The checklist of Butterflies in the Philippines Islands of Threadaway (1995) and Threadaway and Schroeder (2012) were used to determine the general status and distribution of collected butterflies at Tan Yan Kee garden.

## RESULTS AND DISCUSSION

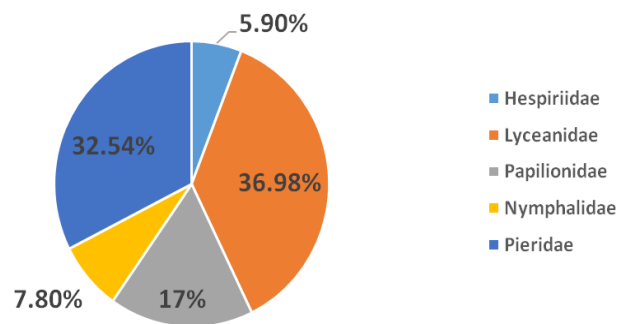
The Urban Garden of Tan Yan Kee, University of the East Manila Philippines is home for fifteen (15) species and sub species of butterflies. There are 335 individual butterflies documented in the months of April, May, June and July 2019 (Table 1, Figures 2-5). Crepuscular butterfly species were active and attracted to sunlight with 34000 LUX luminosity and a temperature of 36 degrees Celsius heat index. Contrary to *E. aethiops*, *E. medusa*, a species of more open grasslands, effectively heated up under low air temperature and linearly enhanced its body temperature up to 39°C; i.e., higher than other *Erebia* species. Kleckova (2014)

The Tan Yan Kee urban forest garden has approximately a lot area of 4470 m<sup>2</sup>. The host plants of the butterflies belong to the family of Rutaceae, Fabaceae, Malvaceae, Annonaceae, Arcaceae, Lauraceae, Poaceae, Cyperaceae, Rubiaceae, Apocynaceae, Anacardiaceae, Capparidaceae and Myrtaceae.

Papilionidae butterflies were found basking and resting on tall trees of mostly their host plants Rutaceae, while Nymphalidae rest on trees like Capparidaceae also known as butterfly host plants. Occurrence of maximum

number of species in the family Nymphalidae could be the result of high availability of food plants in the study area Raut et al (2010). Pieridae butterflies were sipping nectars on peanuts grass (*Arachis glabrata Benth*), creeping daisy (*Sphagneticola trilobata*), and devil weed (*Chromolaena odorata*).

Species composition of butterflies in Tan Yan Kee garden for four (4) months

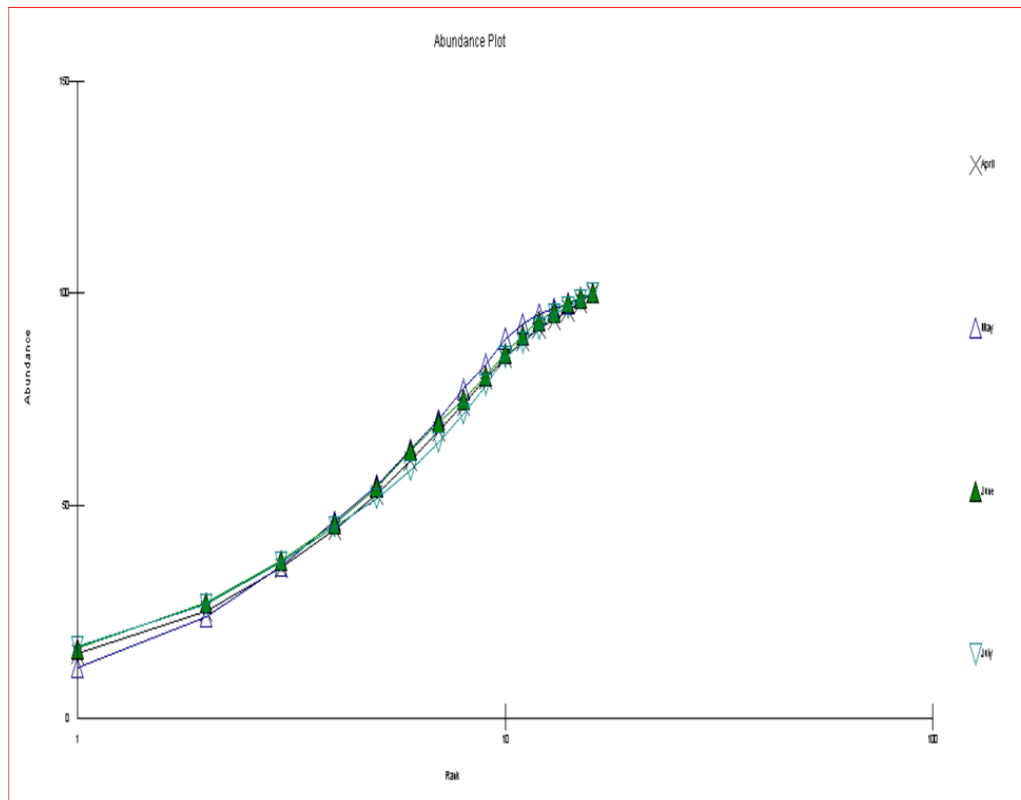


**Figure 2.** Butterfly species are composed of 5.90% Hespriidae, 36.98% Lyceanidae, 17% Papilionidae, 7.80% Nymphalidae, and 32.54% Pieridae. There are fifteen (15) species and subspecies of butterflies identified at Tan Yan Kee garden which is supported by Table 1.

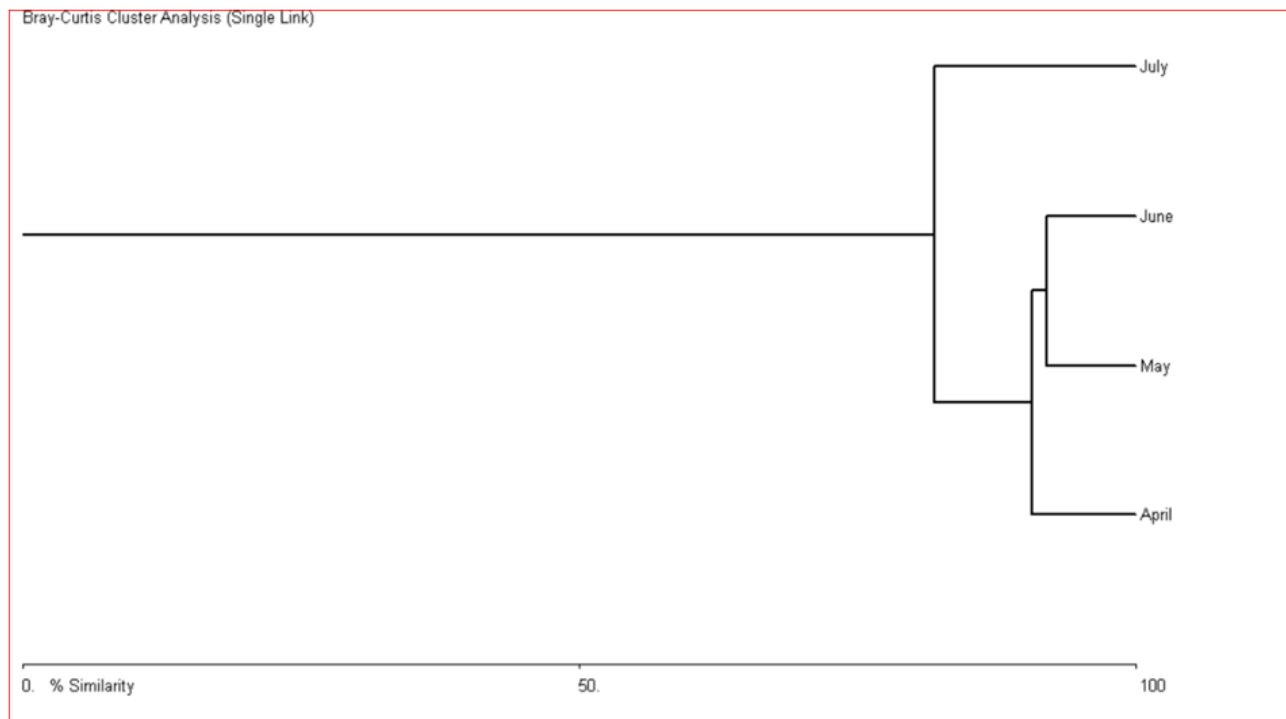
*Eurema hecabe* and *Leptosia nina* (Pieridae) are found to be resilient to rain fall and heat of the sun. They are both present on rainy and sunny season. Plants belonging to family of Fabaceae and Poaceae serves as their shield. It was also observed that coconut trees

**Table 1.** Species composition and status of butterflies identified at Tan Yan Kee Garden, University of the East, Sampaloc Manila (Nacua *et al.*, 2019)

Butterfly family/species	No of butterflies (4)months	Status	
		Local	National Assessment
<b>Hesperiidae</b>			
1. <i>Pothantus pava</i>	20	Common	Local
<b>Lyceanidae</b>			
2. <i>Nacaduba berenice icena</i> Frustorfer 1916	30	Very common	Common
3. <i>Spindasis syama negrita</i> Felder1862	45	Very common	Rare
4. <i>Zizinia Otis oriens</i> (Butler) 1883	20	Very common	Common
<b>Papilionidae</b>			
5. <i>Papilio demoleus libanius</i> Fruhstorfer 1908	20	Common	Common
6. <i>Graphium agamemnon</i>	18	Common	Common
7. <i>Papilio rumanzovia</i> Eschscholtz, 1821	20	Common	Common
<b>Nymphalidae</b>			
8. <i>Hypolimnas bolina</i>	15	Very common	Common
9. <i>Junonia hedonia ida</i> , B (Cramer, (1775)	10	Common	Common
<b>Pieridae</b>			
10. <i>Leptosia nina georgi</i> Fruhstorfer, 1910	30	Common	Common
11. <i>Appias olferna peducea</i> Fruhstorfer, 1910	20	Common	Common
12. <i>Catopsilia pomona pomona</i> , Fabricius, 1775	15	Common	Common
13. <i>Catopsilia pyranthe</i>	15	Common	Common
14. <i>Eurema hecabe hecabe</i> , Linnaeus, 1758	15	Common	Common
15. <i>Eurema alitha</i>	15	Common	Common



**Figure 3.** Abundance plot shown that in the four (4) months of sampling period, the number of individual butterflies were almost the same. The Relative abundance of butterflies’ species are mostly common butterflies, one (1) rare butterfly, four (4) very common. *Spindasis syama negrita* Felder1862 (Lyceanidae) rare based on the status of National Assessment which is found on Table 1.



**Figure 4.** Cluster Analysis using Bray Curtis. For the months of April, May and June 2019, the collections are closer to each other compared to the Month of July 2019, simply because July is the month of rainy season. It was observed that butterflies migrate in warm and dry places. Those which remained in the garden are found hidden in the thicker leaves and branches to protect themselves from strong pouring of rainfall.

(*Cocos nucifera*) provide shades for butterflies during sunny weather condition.

Lyceanidae butterflies like *Nacaduba berenice icena*, *Spindasis syama negrita*, *Zizinia Otis oriens* (Lyceanidae) species nectarine on species of Fabaceae on the ground. Sipping moisture on the ground. Male butterflies observed puddling on the wet stones followed by mating. It was presumed that they are attracted to minerals on the moist stones and soil on the ground. However, this issue was also studied independently with behavioral field studies, laboratory experiments on the proboscis reflex. Arms et al. (1974) first examined puddling behavior and observed in field experiments that *Papilio glaucus* preferred a 10 ppm Na<sup>+</sup> solution. Adler and Pearson (1980) measured the amounts of Na<sup>+</sup> and K<sup>+</sup> in the bodies of *Pieris rapae* and found that males preferred Na<sup>+</sup> solutions and consumed more than the females did.

Butterfly behavior responds to weather conditions, as shown by previous studies of Brattstrom et al. (2008); Brown (1970); Clench (1966); Douwes (1976) and Shreeve (1984). *Spindasis syama negrita* larva feeds on host plant like *Dioscorea batatus* cv. – Decne (Dioscoreaceae), *Psidium guajava* L. (Myrtaceae), *Papilio demoleus libanius* larva feed on host plants belong to Rutaceae like *Citrus maxima* (Burm.) Merr, *Citrus microcarpa bunge*, *Citrus nobilis* Andr. *Leptosia nina georgi* Frushtorfer 1910 host plants are *Capparis zeylanica* L. (Capparaceae), *Cleome viscosa*, *Catopsilia pyranthe pyranthe* (Linnaeus) 1758 Host plants are *Cassia alata* L. (Fabaceae), *Cassia fistula* L. (Fabaceae), *Cassia grandis* L. f. (Fabaceae), (Nacua 2015),



**Figure 5.** *Spindasis syama negrita* Felder1862

## CONCLUSION

In four months of sampling period, the number of individual butterflies were almost the same. There are **15 species and subspecies of butterflies** identified with a status of 11 common, 4 very common and 1 rare butterfly that shows a relative abundance of butterflies in the Tan Yan Kee Garden.

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