Short Communication

Species Composition and Status of Urban Butterflies 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 Ildel-fonso, 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 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

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 m². The host plants of the butterflies belong to the family of Rutaceae, Fabaceae, Malvaceae, Annonaceae, Areaceae, 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 (Sphagneticoila trilobata), and devil weed (Chromolaena odorata).

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

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**Figure 1.** A. Satellite Google map of Tan Yan Kee garden with the coordinates of 1°36’7”N 120°59’22”E, lot area of 4470 m²; B. The Actual Sampling site of Tan Yan Kee garden with many Fabaceae on the ground for Lyceanidae and Pieridae butterflies.

**Figure 2.** Butterfly species are composed of 5.90% Hespiriidae, 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.
Table 1. Species composition and status of butterflies identified at Tan Yan Kee Garden, University of the East, Sampaloc Manila (Nacua et al., 2019)

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

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.
(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+ solution. Adler and Pearson (1980) measured the amounts of Na+ and K+ in the bodies of Pieris rapae and found that males preferred Na+ 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. – Dece (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, Catopsis pyranthe pyranthe (Linnaeus) 1758 Host plants are Cassia alata L. (Fabaceae), Cassia fistula L. (Fabaceae), Cassia grandis L. f. (Fabaceae), (Nacua 2015),

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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REFERENCES
Brattstrom O, Kjellen N, Alerstam T, Akesson S (2008) Effects of wind and weather on red admiral,
Entomol 45:39–43
Douwes P (1976) Activity in Heodes virgaureae (Lep Lycaenidae) in relation to air temperature, solarra-
diation, and time of day. Oecologia 22:287–298
Hardy Peter B and James M Lawrence (2017) Field Guide to Butterflies of the Philippines, Published
by Siri Scientific Press, Manchester, UK
Kleckova I, Konvicka M, Klecka J. Thermoregulation and microhabitat use in mountain butterflies of
the genus Erebia: importance of fine-scale habitat heterogeneity. Journal of Thermal Biology. 2014;
41:50–58. doi: 10.1016/j.jtherbio.2014.02.002 PMID: 24679972
Nacua, Alma E. (2016) Occurrence of Butterflies in a mini-urban garden in Universidad de Manila
(UDM) including short distance migration analysis. Journal of Entomology and Zoology Studies
2016; 4(4): 86-91
Nacua, Alma E., Mohagan, Alma B., Alejandro, Grece-
Habitats of Cadaclan, San Fernando, La Union Botanical Garden of North Luzon, Philippines. IA-
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2244-1581
Nacua, Alma E., Clemente, Ken Joseph E., Soriano
Cariza Jane M. Oro, Alenine Leilanie B, Tosoc,
Nikki Rose N. Manalo Jeffrey R, Zapanta, Maria
Rowena G, Empasis, Mary Grace DC, Mendoza,
Mark Joseph E. (2017). The species composition of
butterflies (Lepidoptera: Rhopalocera) in Lipa city,
Pisuth Ek Amnuay (2012) Butterflies of Thailand Vol 2
2nd Revised Edition, Amarin Printing and Publish-
ing, Bangkok Thailand
(Rhopalocera) fauna of Maharashtra Nature Park,
Mumbai, Maharashtra, India. Journal of species
lists and distribution. ISSN 1809-127X (online edi-
tion)
Shreeve TG (1984) Habitat selection, mate location, and
microclimatic constraints on the activity of the
speckled wood butterfly Pararge aegeria. Oikos
vised Checklist of the Butterflies of the Philippine
Islands (Lepidoptera: Rhopalocera) Volume 20 of
Nachrichten des Entomologischen Vereins Apollo / Supplementum: Supplementum, Entomologischer
Verein Apollo Frankfurt am Main
Checklist of the butterflies of the Philippine Islands
(Lepidoptera: Rhopalocera). Entomologischer Verein
Apollo. Retrieved on October 28, 2014 from
http://goo.gl/E3yskw
Zapanta, Maria Rowena G., Victoria, Jonel V., Del
Rosario, Michael Prince N, Emphasis, Mary Grace
D. C, Gasat, Vanessa Joy P., Bonoan, Jonacry M,
Manalo, Flor May, Nacua, Alma E*. (2016). Di-
versity of Butterflies (Rhopalocera) in Bulusukan
(San Ildefonso, Bulacan, Philippines) International
Journal of Advanced Engineering, Management and
Science (IJAEMS) [Vol-2, Issue-9, Sept- 2016]
Infogain Publication (Infogainpublication.com)
ISSN: 2454-1311

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