Species Composition of Butterflies (Lepidoptera: Rhopalocera) at Solok Botanical Garden, Solok, West Sumatera, Indonesia.

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Abstract. The research about species composition of butterflies at Solok Botanical Garden, Solok, West Sumatera had been conducted from June - July 2020, by surveying three types of habitat; pine woods, rubber plantation and bushes. Specimen collection was conducted by walking along the paths within the surveyed habitats and butterflies were caught using insect net. A total 43 species from 24 genera and four families were collected. Nymphalidae identified as family with the highest species number (29 species), followed by Pieridae (six species), Papilionidae and Lycaenidae (four species each). *Neptis hylas*, with 11 individuals, was recorded with most individual number. About 14 species were recorded exclusively at pine woods, 11 typical species captured at bushes while only three typical species observed at rubber plantation.

Keywords: Botanical Garden; Butterflies; Insect Net; Solok

1. Introduction

Butterflies are group of insect that belongs to order Lepidoptera. Lepidoptera is composed from latin word “lepis” means scales and “pteron” which means wings. Insects of the order Lepidoptera have scales on their wing surface. According to their active time, Lepidoptera is divided into two suborders, namely butterflies (Rhopalocera) which are active during the day, and moths (Heterocera) which are night-time insects [1]. As one of megabiodiversity countries in the world, Indonesia has a high diversity of animal and plant species, including a large diversity of butterfly. Indonesian butterflies were estimated to be around 2,000 species [2]. From total 17,000 world lepidopteran species, butterflies constitute only about 10% of this number, while the rest are moths [3].

Butterflies found almost at all types of habitat. It will depend on several main factors that favourable to the presence of butterflies in a certain habitat, especially the availability of plants for feeding the adult butterflies and foraging their larvae [4]. Plants from the family Annonaceae, Fabaceae, Leguminosae and Asteraceae are known as food source for butterflies [5]. Maintaining the existence of butterflies in certain area have various benefits, such as for research, education, tourism and conservation purposes.

Solok Botanical Garden is one among botanical gardens owned by Indonesian government. It is located in Solok Regency, West Sumatera Province. Solok Botanical Garden was established in 2009 upon the approval of proposal sent by the Government of Solok Regency from the authority of Bogor Botanical Garden Plant Conservation Centre, Indonesian Institute of Science. Solok Botanical Garden...
occupied an area located in Aripan Villages, X Koto Singkarak District. This botanical garden is about 4 km from Lake Singkarak and about 25 km from the capital of Solok, Aro Suka [6]. Since its establishment, there was no information about butterflies in this area. Hence, the aim of this study was to know the species inventory and species composition of butterflies in this botanical garden.

2. Methods

2.1 Study Area and Sampling Methods

Solok Botanical Garden was located in Aripan Villages, X Koto Singkarak Sub district, Solok Regency, West Sumatra (0° 43' 03.8" S, 100° 38' 11.7" E, 599-666 m elevation). The area was about 112.6 ha, occupying the hilly area of Tampa Dado [6]. The sampling efforts were conducted at 200 m transect erected in three prominent habitat types in this botanical garden; the bushes (0° 43' 5.16" S, 100° 38' 22.44" E), pine woods (0° 43' 16.33" S, 100° 37' 53.85" E) and rubber plantation (0° 43' 8.82" S, 100° 38' 1.59" E) and (Figure 1). Butterflies were detected from 2.5 m area on left and right of the transect line. Samples were collected using insect nets from 10.30-11.30 at bushes, between 13.30-14.30 at pine woods, and between 15.00-16.00 at rubber plantation.

![Figure 1. Map of Research Location in Solok Botanical Garden (Google earth, 2020)](image)

The butterfly specimens were preserved using standard protocol. Preserved specimen then pricked on thorax section at perpendicular angle using fine needle. Its wings were positioned as open and held with the help of plastic sheet arranged with some pins. The specimens were dried inside 36-40°C oven for 3-7 days. After perfectly dried, the butterflies were positioned into collection box, labelled accordingly and given camphor as a preservative.

2.2 Samples Identification

The butterfly identification was carried out by looking for its specific morphological signs on the wings such as spots and certain colours, before matched with information provided in proper identification guides for the region [8,9,10,11,12,13,14,15]. Butterfly specimens then were stored in the repository of Laboratory of Animal Taxonomy, Biology Department of Universitas Andalas.
2.3 Data Analysis
Identified species were grouped by their respective genera, family then photographed. Data was displayed in tabular form before descriptively outlined.

3. Results and Discussion
The field survey collected 123 butterfly individuals, which later identified into 43 species, 23 genera and four families. The families consisted of Lycaenidae, Nymphalidae, Pieridae and Papilionidae. As many as 28 butterfly species were captured at the pine area, 25 species collected at the bushes, while 13 species were part of collection at rubber plantation (Table 1).

Table 1. The detail on butterflies collected at Solok Botanical Garden, Solok Regency, West Sumatra

| No | Families       | Genera    | Species                  | Total individuals per site | Total ind. |
|----|----------------|-----------|--------------------------|----------------------------|------------|
|    |                |           |                          | Pine | Rubber | Bush |                         |                         |
| 1  | Lycaenida      | Euchrysops| Euchrysops cnejus Fabricius 1798 | 1    | 1      |      |                         |                         |
| 2  | Jamides        | Jamides   | Jamides alecto C. Felder 1860 | 1    | 1      |      |                         |                         |
| 3  |                | Jamides   | Jamides celeno Cramer 1775 | 1    | 2      | 2    |                         |                         |
| 4  | Zizina         | Zizina    | Zizina otis Fabricius 1787 | 3    | 3      |      |                         |                         |
| 5  | Nymphalidae    | Acraea    | Acraea violae Fabricius 1775 | 1    | 1      |      |                         |                         |
| 6  | Anosia         | Anosia    | Anosia melanippus Cramer 1777 | 1    | 2      | 6    |                         |                         |
| 7  | Athyma         | Athyma    | Athyma nefte Cramer 1780 | 1    | 1      | 1    |                         |                         |
| 8  |                | Athyma    | perius Linnaeus 1758 | 1    | 1      | 3    |                         |                         |
| 9  | Cethosia       | Cethosia  | Cethosia hypsea Doubleday 1847 | 1    | 1      |      |                         |                         |
| 10 | Discophora     | Discophora| Discophora necho Felder 1866 | 2    | 2      |      |                         |                         |
| 11 | Euploea        | Euploea   | Euploea camaralzeman Butler 1866 | 1    | 1      |      |                         |                         |
| 12 |                | Euploea   | Euploea diocletianus Fabricius 1793 | 2    | 2      |      |                         |                         |
| 13 |                | Euploea   | Euploea eyndhovii C&R Felder 1865 | 1    | 1      |      |                         |                         |
| 14 |                | Euploea   | Euploea mulciber Cramer 1777 | 2    | 1      | 3    |                         |                         |
| 15 |                | Euploea   | Euploea sylvestre Fabricius 1793 | 2    | 2      |      |                         |                         |
| 16 |                | Euploea   | Euploea tulliolus Fabricius 1793 | 5    | 1      | 3    |                         |                         |
| 17 | Euthalia       | Euthalia  | Euthalia iapis Moore 1858 | 1    | 1      |      |                         |                         |
| 18 | Hypolimnas     | Hypolimnas| Hypolimnas bolina Linnaeus 1758 | 1    | 1      | 2    |                         |                         |
| 19 | Junonia        | Junonia   | Junonia almana Linnaeus 1758 | 1    | 1      | 2    |                         |                         |
| 20 |                | Junonia   | Junonia atlites Linnaeus 1763 | 6    | 6      |      |                         |                         |
| 21 |                | Junonia   | Junonia hedonia Linnaeus 1764 | 1    | 1      |      |                         |                         |
| 22 | Melanitis      | Melanitis | Melanitis leda Linnaeus 1758 | 1    | 1      |      |                         |                         |
| 23 | Mycalesis      | Mycalesis | Mycalesis fassca C&R Felder 1860 | 1    | 1      |      |                         |                         |
| 24 |                | Mycalesis | Mycalesis horsfieldi Moore 1857 | 1    | 1      | 2    |                         |                         |
| 25 |                | Mycalesis | Mycalesis janardana Moore 1857 | 2    | 2      |      |                         |                         |
| 26 |                | Mycalesis | Mycalesis mineus Linnaeus 1858 | 1    | 2      | 3    |                         |                         |
| 27 | Neptis         | Neptis    | Neptis hylas Linnaeus 1758 | 4    | 4      | 3    | 11                       |                         |
| 28 |                | Neptis    | nata Moore 1857 | 1    | 1      |      |                         |                         |
| 29 | Orsotriaena    | Orsotriaena| Orsotriaena medus Fabricius 1775 | 1    | 1      |      |                         |                         |
| 30 | Tirumala       | Tirumala  | Tirumala septentrionis Butler 1874 | 2    | 2      |      |                         |                         |
| 31 | Vindula        | Vindula   | Vindula erota Fabricius 1793 | 4    | 4      |      |                         |                         |
| 32 | Ypthima        | Ypthima   | Ypthima pandocus Moore 1857 | 2    | 2      |      |                         |                         |
| No | Families       | Genera | Species         | Total individuals per site | Total ind. |
|----|---------------|--------|-----------------|-----------------------------|------------|
|    |               |        |                 | Pine | Rubber | Bush | 5 | 6 | 7 | 8 |  |
| 33 | Papilionidae  | Ypthima philomela | Linnaeus 1763 | 1 |  |  |  |  |  | 1 |  |
| 34 | Papilionidae  | Papilio | Papilio demoleus | Linnaeus 1758 | 2 | 2 |  |  |  |  |  |
| 35 |               | Papilio | memnon          | Linnaeus 1758 | 1 | 1 |  |  |  |  |  |
| 36 |               | Papilio | nephelus        | Boisduval 1836 | 5 | 5 |  |  |  |  |  |
| 37 |               | Papilio | polythes        | Linnaeus 1758 | 5 | 1 | 6 |  |  |  |  |
| 38 | Pieridae      | Appias | Appias lyncida  | Cramer 1777 | 1 | 1 |  |  |  |  |  |
| 39 |               | Catopsilia | Catopsilia pyranthe | Linnaeus 1758 | 2 | 2 |  |  |  |  |  |
| 40 |               | Catopsilia | scylla          | Linnaeus 1763 | 1 | 2 | 3 |  |  |  |  |
| 41 | Delias        | Delias | hyperathe       | Linnaeus 1758 | 3 | 3 |  |  |  |  |  |
| 42 | Eurema        | Eurema | alitha C&R Felder 1862 | 1 | 3 | 2 | 6 |  |  |  |  |
| 43 |               | Eurema | blanda          | Boisduval 1836 | 1 | 1 |  |  |  |  |  |  |

\[\sum\text{Individual} = 50 \quad 22 \quad 51 \quad 123\]
\[\sum\text{Species} = 28 \quad 13 \quad 25 \quad 43\]
\[\sum\text{Genera} = 19 \quad 11 \quad 15 \quad 24\]
\[\sum\text{Family} = 4 \quad 3 \quad 4 \quad 4\]

Nymphalidae possesses the largest number species, genera and the number of collected individuals of butterflies in this study, with 29 species, 15 genera and 83 individuals. It has been known that Nymphalidae to be one of butterfly families with most species members. The distribution range of butterflies from this family is worldwide, including at plantations and forests. Butterflies from this family like exposed areas with sufficient nectary plants as their food, although some members also forage on rotten fruits and dirt to gain minerals as part of their nutrition [16]. The existence of various butterflies at Solok Botanical Garden was also supported by the availability of cultivated plants in the study area that serve as food source for butterflies. Some of these plants identified as parts of the 26 plant families that butterflies forage on, such as Acanthaceae, Combretaceae, Compositae, Fabaceae, Leguminosae, Malvacae, Melastomaceae, Myrtaceae, Poaceae and Verbenaceae.

Each type of habitat in Solok Botanical Garden hold specific species as observed in this study. About 14 butterfly species were solely recorded at the pine area, 11 species were typical at the bushes, while 3 species were specific at rubber plantation. The rubber plantation in Solok Botanical Garden was known to be more frequently visited by surrounding community for tapping latex from rubber trees and other extracting activity, compared to pine woods and shrub [17]. It may have impacted the butterfly diversity as butterflies tend to choose area with low human activities. In addition, flowering plants were more common at pine area and bushes rather than at rubber plantation. Flowering plants provide nectar which serves as food for butterflies. The difference of flowering plant population across sites can affect butterflies’ preference to be around those site, which seemed less at rubber plantation [18].

Butterflies have become a major research topic in West Sumatra, involving data collection conducted at some prominent area in this province. Some of those studies that used similar method and habitat with the current study are as follow; 79 butterfly species recorded at Muhammad Hatta Forest Park, Padang on 2009 [19], 15 species from West Sumatra portion of Kerinci Seblat National Park on 2014 [20] and 53 species documented at Lubuk Bonta Tourist Area on 2010 [21]. Hence, it is worthwhile to compare the results from all those studies in order to see the progress of species inventory in West Sumatra. It is also useful to record new species that were not documented in the previous observations.
Table 2. Comparison of butterfly species across sites; Solok Botanical Gardens (SBG), Muhammad Hatta Forest Park (MHFP), Kerinci Seblat National Park (KSNP) and Lubuk Bonta Tourist Area (LBTA). Asterisk (*) indicates species observed only in current study

| No | Family      | Species                          | SBG | MHFP | KSNP | LBTA |
|----|-------------|----------------------------------|-----|------|------|------|
| 1  | Hesperiidae | Halpe fasciata Elwea & Edwards   | -   | ✓    | -    | -    |
| 2  |             | Matapa aria Moore                | -   | ✓    | -    | -    |
| 3  |             | Notocrypta pria H.Druce          | -   | ✓    | -    | -    |
| 4  |             | Potanthus hataeus Plotz          | -   | ✓    | -    | -    |
| 5  |             | Tatactrocera ziclea Evans        | -   | ✓    | -    | -    |
| 6  | Lycaenidae  | Allontinus leogoron Eliot        | -   | ✓    | -    | -    |
| 7  |             | Arhopala aedias C&R Felder      | -   | ✓    | -    | -    |
| 8  |             | Arhopala kinabala H.H Druce     | -   | ✓    | -    | -    |
| 9  |             | Caleta elna Fruhstorfer         | -   | ✓    | -    | -    |
| 10 |             | Cheritra freza H.H Druce        | -   | ✓    | -    | -    |
| 11 |             | Drupadia ethion Moore           | -   | ✓    | -    | -    |
| 12 |             | Euchrysops creas Fabricus*       | ✓   | ✓    | -    | -    |
| 13 |             | Jamides alecto C. Felder        | ✓   | ✓    | -    | -    |
| 14 |             | Jamides bochus Fruhstorfer      | ✓   | ✓    | -    | -    |
| 15 |             | Jamides celena Cramer*          | ✓   | -    | -    | -    |
| 16 |             | Jamides philatus Fruhstorfer    | ✓   | ✓    | -    | -    |
| 17 |             | Jamide zebra Druce              | -   | ✓    | -    | ✓    |
| 18 |             | Phitecops corvis Fruhstorfer    | -   | ✓    | -    | -    |
| 19 |             | Prosatas nora Fruhstorfer       | -   | ✓    | -    | -    |
| 20 |             | Ziczeria karsandra Moore        | -   | ✓    | -    | -    |
| 21 |             | Zizina otis Fabricius           | ✓   | ✓    | -    | -    |
| 22 | Nymphalidae | Acraea issoria Hübner           | -   | ✓    | -    | -    |
| 23 |             | Acraea violae Fabricius         | ✓   | ✓    | -    | ✓    |
| 24 |             | Agatasa calydoma Tsukada        | ✓   | ✓    | -    | -    |
| 25 |             | Ammosia decora Doubleday        | ✓   | ✓    | -    | -    |
| 26 |             | Anosia genuata Cramer           | ✓   | -    | ✓    | ✓    |
| 27 |             | Anosia melanippus Cramer        | ✓   | -    | -    | ✓    |
| 28 |             | Athyma asura Moore              | ✓   | ✓    | -    | -    |
| 29 |             | Athyma nefte Cramer             | ✓   | -    | -    | ✓    |
| 30 |             | Athyma perius Linnaeus          | ✓   | ✓    | -    | ✓    |
| 31 |             | Cethosa hypsea Doubleday        | ✓   | -    | ✓    | ✓    |
| 32 |             | Charaxes bernadus Fabricius     | ✓   | ✓    | -    | -    |
| 33 |             | Cirrochora clagia Fruhstorfer   | ✓   | ✓    | -    | -    |
| 34 |             | Cirrochroa emalea Guerin        | ✓   | ✓    | -    | -    |
| 35 |             | Cupha erymantis Durry           | ✓   | ✓    | -    | -    |
| 36 |             | Cynthia godartii G.R. Gray      | ✓   | ✓    | -    | -    |
| 37 |             | Discophora necho Felder        | ✓   | -    | -    | ✓    |
| No | Family | Species                        | SBG | MHFP | KSNP | LBTA |
|----|--------|--------------------------------|-----|------|------|------|
| 40 |        | Doleschalia hisaltidae C&R Felder | -   | ✓    | -    | -    |
| 41 |        | Doleschalia polibete Cramer     | -   | ✓    | -    | ✓    |
| 42 |        | Elymnias nesaea Linnaeus        | -   | -    | -    | ✓    |
| 43 |        | Elymnias phantera Fruhstorfer   | -   | ✓    | -    | -    |
| 44 |        | Euploea camaralzeman Butler*    | ✓   | -    | -    | -    |
| 45 |        | Euploea dioctetians Fabricius   | ✓   | ✓    | -    | ✓    |
| 46 |        | Euploea eyndhovii C&R Felder*   | ✓   | -    | -    | -    |
| 47 |        | Euploea leucostatus Gmel        | -   | ✓    | -    | ✓    |
| 48 |        | Euploea midamus Moore           | -   | -    | -    | ✓    |
| 49 |        | Euploea mulciber Cramer         | ✓   | ✓    | ✓    | -    |
| 50 |        | Euploea phaenareta Schaller     | -   | ✓    | -    | -    |
| 51 |        | Euploea sylvester Fabricius *   | ✓   | -    | -    | -    |
| 52 |        | Euploea tulliolus Fabricius *   | ✓   | -    | -    | -    |
| 53 |        | Euthalia aconthea Fruhstorfer   | -   | -    | -    | ✓    |
| 54 |        | Euthalia iapis Moore *          | ✓   | -    | -    | -    |
| 55 |        | Euthalia monina Fruhstorfer     | -   | ✓    | -    | ✓    |
| 56 |        | Hestinalis nama Doubleday       | -   | ✓    | -    | -    |
| 57 |        | Hypolimnas anomala Wallace      | -   | -    | -    | ✓    |
| 58 |        | Hypolimnas bolina Linnaeus     | ✓   | -    | -    | ✓    |
| 59 |        | Ideopsis gaura Horsfield        | -   | ✓    | -    | -    |
| 60 |        | Ideopsis juventa Cramer         | -   | -    | -    | -    |
| 61 |        | Ideopsis vulgaris Fruhstorfer   | -   | ✓    | ✓    | ✓    |
| 62 |        | Junonia almana Linnaeus*        | ✓   | -    | -    | -    |
| 63 |        | Junonia altilites Linnaeus      | ✓   | ✓    | -    | ✓    |
| 64 |        | Junonia erigone Cramer          | -   | -    | -    | -    |
| 65 |        | Junonia hedonia Linnaeus        | ✓   | -    | -    | ✓    |
| 66 |        | Junonia iphita Cramer           | -   | -    | -    | -    |
| 67 |        | Junonia orythya Linnaeus        | -   | -    | ✓    | -    |
| 68 |        | Letha chandica Moore            | -   | -    | -    | ✓    |
| 69 |        | Letha confusa Fruhstorfer       | -   | ✓    | -    | -    |
| 70 |        | Lexias dirtea Fabricius         | -   | ✓    | -    | -    |
| 71 |        | Lexias pardalis Moore           | -   | ✓    | -    | -    |
| 72 |        | Melanitis leda Linnaeus         | ✓   | ✓    | -    | -    |
| 73 |        | Melanitis phedma Cramer         | -   | ✓    | -    | -    |
| 74 |        | Mycalesis fusca C&R Felder*     | ✓   | -    | -    | -    |
| 75 |        | Mycalesis hortfieldi Moore      | ✓   | ✓    | -    | ✓    |
| 76 |        | Mycalesis janardana Moore       | ✓   | ✓    | -    | ✓    |
| 77 |        | Mycalesis maianeus Hewitson     | -   | ✓    | -    | -    |
| 78 |        | Mycalesis marginata Moore       | -   | ✓    | -    | -    |
| No | Family | Species                  | SBG | MHFP | KSNP | LBTA |
|----|--------|--------------------------|-----|------|------|------|
| 80 |        | Mycalesis mineus Linnaeus | ✓   | ✓    | -    | -    |
| 81 |        | Mycalesis orseis Hewitson | -   | ✓    | -    | -    |
| 83 |        | Neptis hylas Linnaeus     | ✓   | ✓    | -    | ✓    |
| 84 |        | Neptis nata Moore         | ✓   | ✓    | -    | -    |
| 85 |        | Orsotriaena medus Fabricius | ✓   | ✓    | -    | -    |
| 86 |        | Parantica aspasia Fruhstorfer | -   | ✓    | -    | ✓    |
| 87 |        | Parantica luzonensis C&R Felder | ✓   | -    | ✓    | -    |
| 88 |        | Polyura athamas Drury     | -   | ✓    | -    | -    |
| 91 |        | Bagadia makata Horsfield  | -   | ✓    | -    | ✓    |
| 92 |        | Symbrenthia hipplocus Cramer | ✓   | -    | -    | -    |
| 94 |        | Tanaecia aruna C&R Felder | -   | ✓    | -    | -    |
| 96 |        | Tirumala septentrionis Butler | ✓   | -    | -    | -    |
| 97 |        | Vagrans sinha Kollar      | -   | -    | -    | ✓    |
| 98 |        | Vindula erta Fabricius    | ✓   | -    | ✓    | -    |
| 99 |        | Xanthotaenia busiris West | -   | ✓    | -    | -    |
| 100|        | Yphima pandocus Moore     | ✓   | -    | -    | -    |
| 101|        | Yphima philomela Linnaeus* | ✓   | -    | -    | -    |
| 102| Papilionidae | Athropaneura sycorax Grose-Smith | -   | ✓    | -    | -    |
| 103|        | Graphium agamemnon Linnaeus | -   | -    | ✓    | -    |
| 104|        | Graphium sarpedon Linnaeus | -   | -    | ✓    | ✓    |
| 105|        | Losaria nephturus Rothschild | -   | -    | -    | ✓    |
| 106|        | Meandrusa payeni Boisdval  | -   | ✓    | -    | -    |
| 107|        | Pachliopta aristolochiae Fabricius | -   | -    | -    | ✓    |
| 108|        | Papilio demoleus Linnaeus  | ✓   | -    | ✓    | ✓    |
| 109|        | Papilio demolion Cramer    | -   | ✓    | ✓    | ✓    |
| 110|        | Papilio helenus Linnaeus   | ✓   | ✓    | ✓    | ✓    |
| 111|        | Papilio memnon Linnaeus    | ✓   | ✓    | ✓    | ✓    |
| 112|        | Papilio nephelus Boisdval  | ✓   | ✓    | -    | ✓    |
| 113|        | Papilio palinurus Fabricius | -   | -    | -    | -    |
| 114|        | Papilio polythes Linnaeus  | ✓   | -    | ✓    | ✓    |
| 115|        | Troides amphrysus Fruhstorfer | -   | -    | -    | ✓    |
| 116| Pieridae | Appias cardena Hewiston | -   | ✓    | -    | -    |
| 117|        | Appias indra Moore        | -   | ✓    | -    | -    |
| 118|        | Appias lyceda Cramer*     | ✓   | -    | -    | -    |
| 119|        | Appias olferna Swinhoe    | -   | -    | -    | ✓    |
| 120|        | Catopsilia pomona Fabricius | -   | -    | -    | ✓    |
| 121|        | Catopsilia pyranthe Linnaeus | ✓   | -    | ✓    | ✓    |
| 122|        | Catopsilia scylla Linnaeus | ✓   | -    | -    | ✓    |
| 123|        | Cepora nadina Hewitson    | -   | -    | ✓    | -    |
Combination of all of these studies bring about 136 butterfly species recorded from national park and botanical gardens in West Sumatra. This number presents an opportunity regarding butterfly species conservation and management, as national park and botanical garden have been already managed with steady system. In which the data on butterfly diversity should add the biodiversity baseline in each location and later integrated with current management work and can be involved in any decision made in relation to the biodiversity.

Current study recorded 13 species that were not observed in the three previous studies. It emphasizes the importance of doing continuous work in species inventory, as it will give complete picture on the overall species of certain taxon group. On the other hand, other 30 species recorded at Solok Botanical Garden were also found at other research locations. As many as 18 similar species were also recorded at Muhammad Hatta Forest Park, 7 similar species were also observed at West Sumatra portion of Kerinci Seblat National Park, and 22 similar species with those documented at Lubuk Bonta Tourist Area.

As it may be expected from the vast Indonesian archipelago that there are various environmental factors work affecting each part of the region. There two factors that work in almost every habitat; abiotic factors that include temperature, humidity, rainfall, light intensity; as well as biotic elements such as vegetation and predators. It creates the difference in habitat type and any species it can accommodate, including the butterflies. Distributional range and adaptability of the species are critical in determining the reach of that species across geographical region [5]. Certain species can be found across a range of habitats due to their ability in adapting to various habitat components [22]. Neptis hylas from the Nymphalidae (Table 1, Appendix 1) was the example of this that observed at Solok Botanical Gardens. It was found at three types of habitat surveyed, with numerous individuals found flying low and easy to catch.

4. Conclusion
The overall 43 butterfly species recorded from Solok Botanical Garden were summarized from 28 species collected at the pine area, 25 species captured at the bushes and 13 species netted at rubber plantation. Solok Botanical Garden garnered 13 species that were never recorded in previous studies in West Sumatra. It was either indicating that Solok Botanical Gardens indeed had unobserved species or the work of species inventory is far from finished.
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Appendix 1. Pictorial documentation of butterflies collected at Solok Botanical Garden. 1-4 (Lycaenidae), 5-33 (Nymphalidae), 34-37 (Papilionidae) and 38-43 (Pieridae).

1. Euchrysops cnejus
2. Jamides alecto
3. Jamides celeno
4. Zizina otis
5. Acraea violae
6. Anosia melanippus
7. Athyma nefte
8. Athyma perius
9. Cethosia hypsea
10. Discophora necho
11. Euploea camaralzeman
12. Euploea diocletianus
13. Euploea eyndhovii
14. Euploea mulciber
15. Euploea sylvester
16. Euploea tulliolus
17. Euthalia iapis
18. Hypolimnas bolina
19. Junonia almana
20. Junonia atlites
21. Junonia hedonia
22. Melanitis leda
23. Mycalesis fusca
24. Mycalesis horsfieldii
Appendix 1 (Cont.)

25. *Mycalesis janardana*  

26. *Mycalesis mineus*  

27. *Neptis hylas*  

28. *Neptis nata*  

29. *Orsotriaena medus*  

30. *Tirumala septentrionis*  

31. *Vindula erota*  

32. *Ypthima pandocus*  

33. *Ypthima philomela*  

34. *Papilio demoleus*  

35. *Papilio memnon*  

36. *Papilio nephelus*  

37. *Papilio polythes*  

38. *Appias lyncida*  

39. *Catopsilia pyranthe*  

40. *Catopsilia scylla*  

41. *Delias hyperathe*  

42. *Eurema alitha*  

43. *Eurema blanda*