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# Butterfly diversity in different habitats in Simian Mountain Nature Reserve, China (Insecta: Lepidoptera)

Q.-L. Yang, Y. Zeng, Y. Yang & X.-C. Du

**Abstract**

Butterflies, as environmental indicators, can act as representatives for less well-monitored insect groups. In this study, a field survey was conducted in five fixed-distance belt transects during three years. Four indices were used to indicate the butterfly diversity. A total of 3004 individuals of 151 species belonging to 82 genera in 6 families were recorded in the survey. Among them, 67 species were recorded in Simian Mountain for the first time, and *Celastrina argiolus* (Linnaeus, 1758) was the dominant species; Nymphalidae was the dominant family. Among the five habitats, the species diversity of butterfly in Sample V was the highest, closely followed by that in Sample I in which ecological environment was relatively intact; and the diversity of butterfly in Sample IV, in which human interference was strong, was least. According to our research, the butterfly diversity in habitats with better ecological environments was higher; while the butterfly diversity in habitats with the most intact ecological environment was not the highest; strong human interference could significantly decrease the diversity of butterfly.
KEY WORDS: Insecta, Lepidoptera, butterfly diversity, Simian Mountain Nature Reserve, China.

**Diversidad de las mariposas en diferentes hábitats en la Reserva Natural de la Montaña de Simian, China (Insecta: Lepidoptera)**

**Resumen**

Las mariposas, como indicadores ambientales, pueden actuar como representantes de otros grupos de insectos peor conocidos. En este estudio, fue realizada una campaña con cinco transectos a distancia fija durante tres años. Cuatro índices fueron usados para indicar la diversidad de las mariposas. Se registraron en el estudios un total de 3.004 individuos de 151 especies pertenecientes a 82 géneros en 6 familias. Entre otros asuntos, 67 especies fueron registradas en la Reserva Natural de la Montaña de Simian por primera vez y *Celastrina argiolus* (Linnaeus, 1758) era la especie dominante; Nymphalidae fue la familia dominante. Entre los cinco hábitats, el diversidad de especie en el ejemplo V fue la más alta, seguida de cerca por el ejemplo I en el que el entorno ecológico estaba relativamente intacto; la diversidad de las mariposas fue la menor en el ejemplo IV, donde la interferencia humana en la muestra era la mayor. De acuerdo con nuestra investigación, la diversidad de mariposas en hábitats con mejores entornos ecológicos fue mayor; mientras que la diversidad de mariposas en hábitats con los entornos ecológicos más intactos, no era la más alta; la fuerte interferencia humana grande podría reducir la diversidad de las mariposas significativamente.
PALABRAS CLAVE: Insecta, Lepidoptera, diversidad de mariposas, Reserva Natural Montaña de Simian, China.

## Introduction

Nowadays, global biodiversity loss is well known and biodiversity conservation is closely relevant to human well-being (LI *et al*., 2011; MA *et al*., 2012; XU *et al*., 2012; WU *et al*., 2013; DENNIS *et al*., 2017). With urbanization and the development of tourism, the ecological environment has been destroyed, and habitats have become fragmented, which threatens the environments where butterflies and other animals live (VU, 2009; HARSH *et al*., 2015; MEI *et al*., 2015). Butterflies occupy an important position in ecosystems due to their pollinator status and their environmental indicator status (ROBBINS *et al*., 1997; ALURI *et al*., 2002; GHAZOUL, 2002; WANG *et al*., 2008; KHANDOKAR *et al*., 2013). Butterflies can respond quickly to changes in climate, humidity, temperature, light and some other factors and may act as representatives for less well-monitored insect groups (PARMESAN *et al*., 1999; FANG *et al*., 2010; MIHINDUKULASOORIYA *et al*., 2014; DENNIS *et al*., 2017). Moreover, butterfly indicator can monitor changes and assess the biodiversity status of environment (DENNIS *et al*., 2017). In addition, positive relationships have been reported between butterfly diversity and plant diversity (THOMAS & MALORIE, 1985; LEPŠ & SPITZER, 1990). Contemporarily, the existence and diversity of butterflies are facing threats from vegetation damage, habitat degradation, habitat fragmentation and human interference (KHANDOKAR *et al*., 2013; HARSH *et al*., 2015).

Simian Mountain is a nature reserve of the forest ecosystem type and contains a well-preserved belt of subtropical, evergreen, primary, broad-leaved forest. Naturally, it is an excellent habitat for insects due to its abundant and diverse vegetation, moderate climate and plentiful rainfall (LU *et al*., 2009; YANG, 2009; HE & DU, 2013). However, it is also a tourist area and summer resort because of its beautiful scenery and cool summer, which will certainly have influence on the habitats and diversity of insects. So far, only a few studies on the species diversity or fauna of insects have been reported in Simian Mountain (CHEN *et al*., 1994; LI *et al*., 2004; HE *et al*., 2013).

This study was conducted to reveal and compare the composition and diversity of butterflies in different habitats, and to reveal the influence of ecological environment and human interference on butterfly diversity in Simian Mountain. The results would provide original data for biodiversity assessment and be constructive to conservation of butterfly diversity.

## Materials and methods

### Study area and sampling sites

The field survey was conducted in different habitats in Simian Mountain Natural Reserve (28.251~28.391 N, 106.221~106.251 E) in Jiangjin District, Chongqing, China.

The five fixed-distance belt transects, i.e., sampling sites, selected for the field survey were chosen mainly based on their vegetation, altitude and intensity of human interference and so on. Each permanent belt transect measures two kilometres long and five metres wide (POLLARD, 1977). The five belt transects were abbreviated as Sample I, Sample II, Sample III, Sample IV and Sample V, respectively, in this paper.

### Materials

The butterflies in this study were observed or collected from the five belt transects in Simian Mountain, and some photos were taken during the survey. Specimens were deposited in the College of Plant Protection, Southwest University, Chongqing, China (SWUCPP).

### Survey methods

Monthly field surveys were conducted from April to September in the five belt transects during 2016 to 2018. The intervals between two monthly observations were 20-30 days. The butterfly observations were carried out between 9:00 and 12:00 am or between 14:30 and 17:30 pm on sunny or cloudy days with temperatures above 17~25ºC and a wind speed below 2 m/s.

Butterfly species and their populations were observed and recorded along the belt transects within a five-metre-wide area and five metres above and five metres to the front of recorder (POLLARD,

1977; RAMESH & HUSSAIN, 2010; LEVANONI *et al.*, 2011; MAYUR *et al.*, 2013; NIDUP *et al.*, 2014). In general, the survey of each belt transect was finished within 1.5~2.0 hours by the observers keeping their walking speed slow and uniform. Necessary stops were made to examine and identify the species closely and to take photos. A few individuals that could not be identified accurately in the field were captured and brought to the laboratory for identification. When the butterfly population was too large to be measured exactly, the number of butterflies had to be estimated, and usually photos or videos were taken at the same time for a more accurate estimate. In addition, the habitat data for each survey, such as the date, time, temperature, humidity, weather conditions and environmental status, were recorded for further statistical analysis.

### Butterfly identification

Identification of butterfly species mainly followed CHOU (1994, 1998), WU (2001, 2010), WANG & FAN (2002), LANG (2012, 2017), YUAN *et al.* (2015), WU & XU (2017) and so on. The classification system of butterflies mainly followed CHOU (1994) and LANG (2012) in this study.

### Data analysis

The indices used in the butterfly diversity analysis are as follows. 1. Shannon-Wiener index (H´): $H' = \sum P_i \ln P_i$; 2. Pielou evenness index (J): $J = H'/\ln S$; 3. Relative abundance (Ra): $Ra = Ni/N \times 100\%$; 4. Margalef index (R): $R = (S-1)/\ln N$.

## Results and Analysis

A total of 3004 individuals of 151 species belonging to 82 genera in 6 families were recorded in our survey, and two subfamilies (Heliconiinae, Libytheinae), 22 genera and 67 species of them were recorded from Simian Mountain for the first time. *Celastrina argiolus* (Linnaeus, 1758), recorded in all belt transects and with 646 recorded individuals and a relative abundance (Ra) of 21.50%, was the dominant species in Simian Mountain. It was closely followed by *Pieris canidia* (Sparrman, 1768) with 473 individuals and a relative abundance of 15.75%, and the relative abundance of remaining species were not more than 5.13%. A total of 48 species, such as *Papilio machaon* Linnaeus, 1758, *P. polytes* Linnaeus, 1758 and *Gonepteryx maxima* Butler, 1885, etc., had only one individual observed in the three years, were very rare in this area (see the Appendix).

Among the 6 families, Nymphalidae had 35 genera and 81 species recorded in the survey. It had the highest species richness (R), followed by Hesperiidae, Nymphalidae (Satyrinae), Lycaenidae, Papilionidae, Riodinidae, Pieridae, Nymphalidae (Morphinae, Amathusiini) and Nymphalidae (Danainae) and had the highest species diversity (H´(S)), followed by Hesperiidae, Nymphalidae (Satyrinae), Papilionidae, Riodinidae, Pieridae, Lycaenidae, Nymphalidae (Morphinae, Amathusiini) and Nymphalidae (Danainae). Lycaenidae had the highest genus diversity (H´(G)), followed by Hesperiidae, Nymphalidae (Nymphalinae), Nymphalidae (Satyrinae), Pieridae, Riodinidae, Papilionidae and Nymphalidae (Morphinae, Amathusiini). The species richness, species diversity, genus diversity of Nymphalidae (Heliconiinae, Acraeini) and Nymphalidae (Libytheinae) were all the least. In addition, the genus diversity of Nymphalidae (Danainae) was also the least. The results showed that Nymphalidae was the dominant group and that its community composition was more stable than that of the other families in Simian Mountain (Table 1).

In terms of butterflies in different habitats, the family diversity (H´(F)) in Sample I was the highest, followed by that in Samples II, III, IV, V; the genus diversity (H´(G)) in Sample II was the highest, followed by that in Samples III, I, V and IV; the species diversity (H´(S)) and the evenness index (J) in Sample V were the highest, followed by that in Samples I, III, II and IV; and the species richness (R) in Sample V was the highest, followed by that in Samples III, I, II, and IV. It can be concluded that most metrics of butterfly diversity were the least in Sample IV, including the genus diversity, species diversity, evenness index and species richness (Table 2). It could be concluded that the butterfly diversity were higher in those habitats with better ecological environment, while the highest diversity of butterfly was not in the habitat with the most intact ecological environment, and strong human interference could significantly decrease the diversity of butterfly.

**Table 1.–** Quantity indices of the butterfly community in Simian Mountain.

| Families | Genera | Species | Individuals | Diversity indices | | Evenness index (J) | Species richness (R) |
|---|---|---|---|---|---|---|---|
| | | | | H´(S) | H´(G) | | |
| Papilionidae | 4 | 13 | 272 | 1.828 | 1.091 | 0.713 | 2.141 |
| Hesperiidae | 16 | 20 | 89 | 2.621 | 2.718 | 0.875 | 4.233 |
| Pieridae | 6 | 9 | 986 | 1.510 | 1.677 | 0.687 | 1.160 |
| Riodinidae | 4 | 8 | 145 | 1.537 | 1.213 | 0.739 | 1.407 |
| Lycaenidae | 17 | 20 | 777 | 0.842 | 2.788 | 0.281 | 2.855 |
| Nymphalidae Libytheinae | 1 | 1 | 21 | 0 | 0 | 0 | 0 |
| Nymphalidae Danainae | 1 | 2 | 4 | 0.562 | 0 | 0.811 | 0.721 |
| Nymphalidae Morphinae Amathusiini | 3 | 4 | 24 | 0.710 | 1.040 | 0.512 | 0.944 |
| Nymphalidae Satyrinae | 10 | 23 | 208 | 2.613 | 1.820 | 0.833 | 4.122 |
| Nymphalidae Heliconiinae Acraeini | 1 | 1 | 5 | 0 | 0 | 0 | 0 |
| Nymphalidae Nymphalinae | 19 | 50 | 473 | 3.248 | 2.281 | 0.830 | 7.956 |

**Table 2.–** Diversity parameters of butterflies in the different habitats in Simian Mountain.

| Samples | Diversity indices | | | Evenness index (J) | Species richness (R) |
|---|---|---|---|---|---|
| | H´(F) | H´(G) | H´(S) | | |
| I | 1.542 | 3.577 | 3.620 | 0.815 | 12.924 |
| II | 1.513 | 3.823 | 2.802 | 0.623 | 12.605 |
| III | 1.497 | 3.644 | 3.514 | 0.797 | 13.038 |
| IV | 1.402 | 3.222 | 2.053 | 0.569 | 6.279 |
| V | 1.328 | 3.504 | 3.666 | 0.841 | 13.045 |

## Discussion

In our survey, 67 species of butterflies were recorded for the first time in Simian Mountain and 68 species recorded by LI & HOU (2004) were not found in our survey. It is possible that the fauna investigation by Li and Hou was not comprehensive and some habitats suitable for some butterflies were not included in our sampling sites; of course, other reasons might also exist. In summary, the diversity of butterfly in this area is rich.

This study showed that Nymphalidae had the highest species diversity and species richness among the 6 families, and Acraeini and Libytheinae had the least in Simian Mountain. This result was also found in other studies (MAJUMDER *et al*., 2013; QURESHI, 2014; HARSH *et al*., 2015; SHANG *et al*., 2017). It could be attributed to the following factors. First, Nymphalidae is the most speciose group of butterflies (NIDUP *et al*., 2014), while Acraeini and Libytheinae are small groups. Second, members of Nymphalidae are able to inhabit different habitats for resources owing to their polyphagous nature and their stronger ability to fly (ESWARAN & PRAMOD, 2005; KRISHNAKUMAR *et al*., 2008; RAUT & PENDHARKAR, 2010; SARKAR *et al*., 2011; HARSH *et al*., 2015; WIDHIONO, 2015). In addition, they can avoid shade and dense vegetation but frequent openings in all vegetation types, including clearings in evergreen forest (MALI *et al*., 2014).

Overall, the ecological environment of Simian Mountain is suitable for the existence of butterflies. Species diversity is closely associated with their habitats, for example, butterfly diversity can reflect the diversity of host plants in the habitat (NIDUP *et al*., 2014; HARSH *et al*., 2015). In other words, an abundance of diverse vegetation generally supports high butterfly diversity. And other factors in habitats, such as light and human activities, can also influence species diversity. These were demonstrated in our survey. Among the five belt transects, the species diversity of butterfly in Sample V was the highest, closely followed by that in Sample I. It showed that Sample I in which ecological environment was relatively intact had not the highest butterfly diversity. And it indicated that not only an abundance of diverse vegetation but also a wide field of vision with sufficient light, a feature of Sample V, was important factor for a higher species diversity of butterfly. Moreover, intermediate human interference in Sample V might be helpful for species diversity which accorded with the intermediate disturbance hypothesis (CONNELL, 1978; HU *et al*., 2010). In addition, the diversity of butterfly in Sample IV was the least because of its less and simpler vegetation and strong human interference. This result implied that the ecological environment might have been destroyed or the vegetation had become simple probably if the diversity and populations of butterflies were distinctly decreased in the habitats under normal climatic conditions. Therefore, an effective way to protect the diversity of butterflies is to protect the environment in which they live.

At present, the main threat to butterfly diversity in Simian Mountain is the influence of tourism development. Therefore, measures such as controlling the number of tourists and vehicles and stopping additional construction in the Natural Reserve must be taken to decrease human interference and protect the habitats of butterflies. Of course, continued monitoring of butterfly diversity is highly advocated for biodiversity assessment and conservation.

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Q.-L. Y., Y. Z., Y. Y., *X.-C. D.
College of Plant Protection
Southwest University
Chongqing, 400715
R. P. CHINA / *P. R. CHINA*
E-mail: duxicui@hotmail.com
https://orcid.org/0000-0002-1647-3772

*Autor para la correspondencia / *Corresponding author*

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**Appendix:** Species of butterflies in different habitats in Simian Mountain, China.

| Family | Genus | Species | The individual numbers | | | | |
|---|---|---|---|---|---|---|---|
| | | | I | II | III | IV | V |
| PAPILIONIDAE | **Atrophaneura* Reakirt, 1865 | **A. aidonea* (Doubleday, 1845) | 2 | 2 | 2 | | |
| | *Byasa* Moore, 1882 | **B. mencius* (C. & R. Felder, 1862) | | 2 | 9 | | |
| | *Graphium* Scopoli, 1777 | **G. chironides*(Honrath, 1884) | | 11 | | | 1 |
| | | *G. cloanthus* (Westwood, 1841) | 1 | | | | |
| | | *G. leechi* (Rothschild, 1895) | | 1 | | | |
| | | *G. sarpedon* (Linnaeus, 1758) | 4 | 15 | 2 | 1 | 2 |
| | *Papilio* Linnaeus, 1758 | *P. bianor* Cramer, 1777 | 16 | 36 | 17 | 12 | 17 |
| | | *P. machaon* Linnaeus, 1758 | | | | | 1 |
| | | **P. memnon* Linnaeus, 1758 | 1 | 1 | | | 2 |
| | | *P. nephelus* Boisduval, 1836 | 4 | 1 | | 1 | 4 |
| | | *P. paris* Linnaeus, 1758 | 9 | 24 | 12 | 3 | 8 |
| | | *P. polytes* Linnaeus, 1758 | | 1 | | | |
| | | *P. protenor* Cramer, [1775] | 12 | 18 | 9 | 2 | 6 |
| HESPERIIDAE | *Aeromachus* Nicéville, [1890] | **A. catocyanea* (Mabille, 1876) | | 1 | | | |
| | | *A. piceus* Leech, 1893 | | 1 | | | |
| | **Ampittia* Moore, 1881 | **A. virgata* (Leech, 1890) | 3 | 6 | | | |
| | *Bibasis* Moore, [1881] | *B. gomata* (Moore, [1866]) | | | | | 1 |
| | *Choaspes* Moore, 1881 | *C. benjaminii* (Guèrin-Mèneville, 1843) | 1 | 5 | | | |
| | *Caltoris* Swinhoe, 1893 | C. *cahira* (Moore,1877) | 1 | | | | |
| | *Celaenorrhinus* Hübner, [1819] | *C. maculosus* (C. & R. Felder, 1867) | | 9 | 5 | | |
| | | **C. patula* de Nicéville, 1889 | | 2 | | | |
| | **Capila* Moore, 1866 | **C. omeia* (Leech, 1894) | 3 | 2 | 3 | | |
| | **Ctenoptilum* Nicéville, 1890 | **C. vasava* (Moore, [1866]) | 4 | 2 | | | |
| | **Daimio* Murray, 1875 | **D. tethys* (Ménétriés, 1857) | 1 | | | | |
| | *Gerosis* Mabille, 1903 | *G. phisara* (Moore, 1884) | 1 | 1 | 4 | | |
| | *Hasora* Moore, 1881 | *H. anurade* de Nicéville, 1889 | 1 | 7 | | | 1 |
| | **Halpe* Moore, 1878 | **H. nephele* Leech, [1893] | | 2 | | | |
| | *Notocrypta* Nicéville, 1889 | *N. curvifascia* (C. & R. Felder, 1862) | | 1 | | | |
| | | **N. feisthamelii* (Boisduval, 1832) | | 2 | | | |
| | *Parnara* Moore, [1881] | *P. ganga* Evans, 1937 | | 1 | | | |
| | | *P. guttatus* (Bremer & Grey, [1852]) | | 2 | 5 | | |
| | *Polytremis* Mabille, 1904 | **P. matsuii* Sugiyama, 1999 | | 4 | 6 | | |
| | **Scobura* Elwes & Edwards, 1897 | **S. masutarai* Sugiyama, 1996 | | | 1 | | |
| PIERIDAE | *Colias* Fabricius, 1807 | *C. fieldii* Ménétrièes, 1855 | | 2 | 1 | 3 | |
| | *Dercas* Doubleday, 1847 | *D. lycorias* (Doubleday, 1842) | 43 | 35 | 21 | | 20 |
| | *Eurema* Hübner, [1819] | *E. hecabe* (Linnaeus, 1758) | 30 | 30 | 32 | 4 | 1 |
| | *Gonepteryx* Leach, [1815] | *G. amintha* Blanchard, 1871 | | 1 | 1 | | 1 |
| | | **G. maxima* Butler, 1885 | | | | 1 | |
| | *Pieris* Schrank, 1801 | *P. canidia* (Sparrman, 1768) | 61 | 128 | 67 | 156 | 61 |
| | | *P. melete* Ménétriès, 1857 | 14 | 33 | 27 | 13 | 25 |
| | | *P. rapae* (Linnaeus, 1758) | 3 | 6 | | 9 | 3 |
| | *Talbotia* Bernardi, 1958 | *T. naganum* (Moore, 1884) | 18 | 12 | 78 | 33 | 13 |
| RIODINIDAE | *Abisara* C. & R. Felder, 1860 | *A. burnii* (Nicéville, 1895) | 2 | | 1 | | 1 |
| | | *A. echerius* (Stoll, [1790]) | 3 | | | | |
| | | **A. fylla* (Westwood, 1851) | 5 | 10 | 6 | 1 | 6 |
| | | *A. fylloides* (Moore, 1902) | 23 | 7 | 3 | | 2 |
| | *Dodona* Hewitson, 1861 | **D. maculosa* Leech, 1890 | | | | | 1 |
| | *Stiboges* Butler, 1876 | **S. elodinia* Fruhstorfer, 1914 | 3 | | | | |
| | | *S. nymphidia* Butler, 1876 | 13 | | | | |
| | *Zemeros* Boisduval, [1836] | *Z. flegyas* (Cramer, [1780]) | 30 | 10 | 12 | 1 | 5 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| LYCAENIDAE | **Amblopala* Leech, 1893 | **A. avidiena* (Hewitson, 1877) | 1 | | | | |
| | **Ancema* Eliot, 1973 | **A. ctesia* (Hewitson, 1865) | | 1 | | | |
| | *Curetis* Hübner, [1819] | *C. acuta* Moore, 1877 | 8 | 3 | 6 | 1 | 2 |
| | *Celastrina* Tutt, 1906 | *C. argiolus* (Linnaeus, 1758) | 104 | 496 | 10 | 14 | 22 |
| | | *C. lavendularis* (Moore, 1877) | 1 | | | | |
| | *Catochrysops* Boisduval, 1832 | *C. strabo* (Fabricius, 1793) | 1 | | | | |
| | **Deudorix* Hewitson, 1863 | **D. rapaloides* (Naritomi, 1941) | | | 1 | | |
| | *Everes* Hübner, [1819] | *E. argiades* (Pallas, 1771) | 1 | | 1 | 2 | 1 |
| | *Taraka* Doherty, 1889 | *T. hamada* (Druce, 1875) | | | 1 | | 1 |
| | | **T. shiloi* Tamai & Guo, 2001 | | | | | 1 |
| | **Gonerilia* Shirôzu & Yamamoto, 1956 | **G. seraphim* (Oberthür, 1886) | | | | 1 | |
| | *Heliophorus* Geyer, [1832], *in* Hübner | **H. saphir* (Blanchard, 1871) | | 1 | | 1 | |
| | *Jamides* Hübner, [1819] | *J. bochus* Cramer, 1782 | 2 | 4 | 1 | | 1 |
| | *Lampides* Hübner, [1819] | *L. boeticus* (Linnaeus, 1767) | | | | 3 | |
| | **Orthomiella* de Nicéville, 1890 | **O. rantaizana* Wileman, 1910 | | 4 | 4 | | |
| | *Rapala* Moore, [1881] | **R. micans* (Bremer & Grey, 1853) | 1 | 4 | 1 | 1 | 4 |
| | *Tongeia* Tutt, [1908] | **T. filicaudis* (Pryer, 1877) | 2 | 1 | 1 | | 1 |
| | | **T. potanini* (Alphéraky, 1889) | 1 | 2 | 2 | | |
| | *Udara* Toxopeus, 1928 | *U. albocaerulea* (Moore, 1879) | 16 | 15 | 2 | 1 | 6 |
| | *Pseudozizeeria* Beuret, 1955 | *P. maha* (Kollar, 1844) | 8 | 2 | | 2 | |
| NYMPHALIDAE LIBYTHEINAE | **Libythea* Fabricius, 1807 | **L. lepita* Moore 1857 | 6 | 11 | 3 | | 1 |
| NYMPHALIDAE DANAINAE | *Parantica* Moore, [1880] | **P. melaneus* (Cramer, [1775]) | | | 1 | | |
| | | *P. sita* (Kollar, 1844) | | | 2 | 1 | |
| NYMPHALIDAE MORPHINAE AMATHUSIINI | *Aemona* Hewitson, 1868 | *A. amathusia* (Hewitson, 1867) | | 3 | | | |
| | | **A. oberthueri* Stichel, 1906 | | 1 | | | |
| | *Faunis* Hübner, [1819] | *F. aerope* (Leech, 1890) | 5 | 2 | 11 | 1 | |
| | *Stichophthalma* C. & R. Felder, 1862 | *S. howqua* (Westwood, 1851) | | | | | 1 |
| NYMPHALIDAE SATYRINAE | *Acropolis* Hemming, 1934 | *A. thalia* (Leech, 1891) | | | 1 | | |
| | *Lethe* Hübner, [1819] | **L. baucis* Leech, 1891 | | 1 | 5 | 1 | 3 |
| | | **L. chandica* (Moore, [1858]) | | | | | 1 |
| | | **L. christophi* Leech, 1891 | | | | | 1 |
| | | *L. lanaris* Butler, 1877 | 1 | 1 | 1 | 1 | |
| | | *L. satyrina* Butler, 1871 | | | 1 | | |
| | | *L. syrcis* (Hewitson, 1863) | | | | | 1 |
| | | *L. verma* (Kollar, [1844]) | 9 | 9 | 2 | | 7 |
| | *Mycalesis* Hübner, [1818] | *M. francisca* (Stoll, [1780]) | | | 1 | 1 | 3 |
| | **Melanitis* Fabricius,1807 | **M. leda* (Linnaeus 1758) | 1 | 2 | | | |
| | *Mandarinia* Leech, [1892] | *M. regalis* (Leech, 1889) | | 1 | | | 3 |
| | *Neorina* Westwood, [1850] | *N. patria* Leech, 1891 | | | | | 1 |
| | *Neope* Moore, [1866] | **N. pulahoides* (Moore, [1892]) | | 7 | 2 | | 9 |
| | *Penthema* Doubleday, [1848] | *P. adelma* (C. & R. Felder, 1862) | | 4 | 2 | | 3 |
| | *Ragadia* Westwood, [1851] | *R. crisilida* Westwood, [1851] | 11 | 3 | 1 | | 1 |
| | *Ypthima* Hübner, [1818] | *Y. baldus* (Fabricius, 1775) | 2 | 6 | 10 | | 3 |
| | | *Y. chinensis* Leech, 1891 | | | 1 | | |
| | | *Y. conjuncta* Leech, 1891 | | 4 | 6 | | 1 |
| | | **Y. megalomma* Bulter, 1874 | 4 | 17 | 7 | | |
| | | *Y. multistriata* Butler, 1883 | 8 | 8 | 12 | | 4 |
| | | *Y. praenubila* Leech, 1891 | | 1 | 5 | | |
| | | **Y. pratti* Elwes, 1893 | | | 4 | | 2 |
| | | **Y. sinica* Uémura & Koiwaya, 2000 | 1 | | | | |
| NYMPHALIDAE HELICONIINAE ACRAEINI | **Acraea* Fabricius, 1807 | **A. violae* (Fabricius, 1793) | | | 1 | | 4 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| NYMPHALIDAE | **Araschnia* Hübner, [1819] | **A. doris* Leech, [1892] | 1 | | 1 | | |
| NYMPHALINAE | | **A. prorsoides* (Blanchard, 1871) | 1 | | | | |
| | *Argyreus* Scopoli, 1777 | *A. hyoerbius* (Linnaeus, 1763) | 2 | 9 | 2 | 24 | 4 |
| | *Athyma* Westwood, [1850] | **A. asura* Moore, [1858] | 11 | 4 | | | 1 |
| | | *A. fortuna* Leech, 1889 | 2 | | | | 1 |
| | | *A. jina* Moore, [1858] | 15 | 11 | 3 | | 6 |
| | | *A. opalina* (Kollar, [1844]) | 2 | 4 | 4 | | 1 |
| | | **A. ranga* Moore, [1858] | 1 | | | | |
| | **Cethosia* Fabricius, 1807 | **C. biblis* (Drury, [1773]) | | | 1 | | |
| | *Cyrestis* Boisduval, 1832 | *C. thyodamas* Boisduval, 1846 | 8 | 6 | 1 | | 1 |
| | *Euthalia* Hübner, [1819] | **E. bunzoi* Sugiyama, 1996 | | | | | 4 |
| | | *E. kardama* (Moore, 1859) | | | 1 | | 3 |
| | | **E. omeia* Leech, 1891 | | | | | 3 |
| | | **E. patala* (Kollar, [1844]) | | 1 | | | 6 |
| | | **E. thibetana* (Poujade, 1885) | 1 | | | | |
| | **Hestina* Westwood, [1850] | **H. assimilis* (Linnaeus,1758) | | | | | 1 |
| | | **H. nama* (Doubleday, 1844) | 1 | 1 | | | |
| | **Helcyra* Felder, 1860 | **H. subalba* (Poujade, 1885) | | 0 | | | 2 |
| | **Junonia* Hübner, [1819] | **J. iphita* (Cramer, [1779]) | | 2 | | | |
| | *Kallima* Doubleday, [1849] | *K. inachus* (Boisduval, 1846) | | 1 | | | |
| | **Mimathyma* Moore, [1896] | **M. schrenckii* (Ménétriés, 1859) | | 1 | | | |
| | *Neptis* Fabricius, 1807 | *N. ananta* Moore, 1857 | 5 | 5 | 1 | | 1 |
| | | *N. antilope* Leech, 1890 | | | 1 | | |
| | | *N. armandia* (Oberthür, 1876) | 2 | | 1 | 1 | 1 |
| | | *N. clinia* Moore, 1892 | 6 | 5 | 1 | | 7 |
| | | **N. hesione* Leech, 1890 | 2 | | | | |
| | | *N. hylas* (Linnaeus, 1758) | 5 | 4 | 1 | | 8 |
| | | **N. kuangtungensis* Mell, 1923 | 2 | | | | |
| | | **N. mahendra* Moore, 1872 | | | 1 | | |
| | | **N. manasa* Moore, 1857 | 3 | 1 | 3 | | 2 |
| | | **N. meloria* Oberthür, 1906 | | 1 | | | |
| | | *N. miah* Moore, 1857 | 1 | 1 | 2 | 1 | |
| | | **N. namba* Tytler, 1915 | | 1 | | | |
| | | **N. nata* Moore, [1858] | | | 1 | | |
| | | **N. noyala* Oberthür, 1906 | | | | | 1 |
| | | **N. sankara* (Kollar, 1844) | 9 | 2 | 3 | | 2 |
| | | *N. sappho* (Pallas, 1771) | 13 | 7 | 8 | | 11 |
| | | *N. soma* Moore, 1858 | 8 | 7 | 6 | | 7 |
| | | **N. speyeri* Staudinger, 1887 | 1 | | | | |
| | | **N. thestias* Leech, [1892] | 1 | | | | |
| | | *N. yerburii* Bulter, 1886 | | | | | 2 |
| | *Phaedyma* Felder, 1861 | *P. aspasia* (Leech, 1890) | 2 | 4 | 1 | | 1 |
| | *Polyura* Billberg, 1820 | *P. narcaea* (Hewitson, 1854) | 1 | 10 | 2 | | 2 |
| | **Rohana* Moore, [1880] | **P. parisatis* (Westwood, 1850) | 1 | | | | |
| | *Pseudergolis* C. & R. Felder, [1867] | *P. wedah* (Kollar, 1848) | 22 | 13 | 13 | 3 | 6 |
| | *Symbrenthia* Hübner, [1819] | **S. brabira* Moore, 1872 | 10 | 2 | | 5 | |
| | | *S. lilaea* (Hewitson, 1864) | 4 | 6 | 4 | 4 | 2 |
| | *Stibochiona* Butler, 1869 | *S. nicea* (Gray, 1846) | 4 | 6 | 2 | | 2 |
| | *Vanessa* Fabricius, 1807 | *V. cardui* (Linnaeus, 1758) | | | 1 | | 1 |
| | | *V. indica* (Herbst, 1794) | 7 | 3 | 3 | 2 | 4 |

**Note.–** The symbol (*) indicates the taxon which was recorded for the first time in Simian Mountain, Chongqing, China.