

**BUTTERFLY SPECIES LIST (LEPIDOPTERA: RHOPALOCERA)  
OF NATURAL FOREST ON MOUNTAIN OF PU MAT NATIONAL PARK,  
NGHE AN PROVINCE**

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Pu Mat National Park (NP) was founded in 2001 with its area of about 94,800ha. The Park is located in the middle of the Annamite, in Anh Son, Con Cuong and Tuong Duong districts, Nghe An Province. The park is considered as Viet Nam's great museum of animal gene pool. The climate is tropical monsoon; average annual rainfall is 1.800mm and the average temperature 23,5°C. The highest peak is Pu Mat (1,841m).

Vietnam butterfly fauna was studied from the early twentieth century. Recently, there are more studies on butterflies carried out in the National Parks and Nature Reserves of Vietnam [3, 6, 7, 10, 11]. There are less studies on butterflies of Pu Mat NP, Hill & Monastyrskii (1999) reported total 96 species of the park [6]. So far, more than 1,000 butterfly species are recorded in Vietnam.

Pu Mat National Park is the flagship park on the northern massif of the Truong Son Mountains along, rich biodiversity, very important park of Vietnam where butterfly fauna, especially mountain butterfly fauna have not been studied much. The aim of the study is to inventory species and their conservation priority of mountain forest of Pu Mat National Park.

## **I. MATERIAL AND METHODS**

### **1. Research site**

Research was carried out in a mountain natural forests of Pu Mat National Park in May and September 2008. The altitude of the study area is 800 m to 1,600 m a.s.l.

### **2. Methods**

Most butterfly specimens were collected by insect nets, the species that could not be collected were observed and recorded only. Additionally, the presence and relative abundance of butterflies were also observed and recorded to assess the presence and abundance of butterflies in the area.

Nomenclature and identification of butterfly species is followed Chou [2], AD A'brera (1982-86) [4]; Monastyrskii & Devyatkin [7]; Osada et al. (1999) [8].

Information on the geographical distribution range of each species was based on literature on geographical distribution of butterflies of Vietnam and in the region [2, 3, 4, 6, 7, 10, 11]. The geographical distribution range (R) of species was categorized on a scale from 1 to 5 (smallest to largest): (R1) Endemic: East Himalayas, South China, North Indochina; (R2) Southeast Asian mainland; (R3) Indo-Malayan region; (R4) Indo-Malayan and Australasian regions; and Palearctic, extending into the Indo-Malayan region; and (R5) Old World tropics, Holarctic, or Cosmopolitan.

## **II. RESULTS AND DISCUSSION**

Total 156 butterfly species of 5 families were recorded during the surveyed period (Table 1).

The species number is higher than the species number of Hill & Monastyrskii (1999) [6]. There is one species of conservation value, included in Decree 32 of the Government of the Socialist Republic of Vietnam and list of CITES is *Teinopalpus aureus* (Papilionidae family) [1, 11]. Two species are newly recorded for insect fauna of Vietnam, namely *Symbrenthia niphanda* and *Athyma jina* (Nymphalidae family).

Table 1

**Species, abundance and geographical distribution range of butterflies of Pu Mat National Park (May and June 2008 and September 2013)**

No.	Family, species	Abundance	Range	Hill's
	<b>Papilionidae family</b>			
1	<i>Papilio helenus</i> (Linnaeus, 1758)	C	2	x
2	<i>Papilio nephelus chaon</i> Westwood, 1845	U	2	
3	<i>Papilio polytes romulus</i> Cramer, 1775	U	3	
4	<i>Papilio protenor</i> Cramer, 1775	U	2	x
5	<i>Papilio memnon agenor</i> Linnaeus, 1758	S	2	x
6	<i>Papilio alcmenor</i> Felder & Felder, 1865	C	2	x
7	<i>Papilio dialis doddsi</i> Janet, 1896	S	2	
8	<i>Papilio arcturus</i> Westwood, 1842	S	2	
9	<i>Papilio bianor</i> Cramer, 1777	S	2	
10	<i>Papilio paris</i> Linnaeus, 1758	U	3	x
11	<i>Meandrusa lachinus</i> (Fruhstorfer, 1902)	S	2	
12	<i>Teinopalpus aureus</i> Mell, 1923	S	1	
13	<i>Graphium antiphates</i> (Cramer, 1775)	R	2	
14	<i>Graphium xenocles</i> (Doubleday, 1842)	R	2	
15	<i>Graphium sarpedon</i> (Linnaeus, 1758)	C	4	x
16	<i>Graphium doson</i> (C. Felder & R. Felder, 1864)	U	2	
17	<i>Graphium chironides</i> (Honrath, 1884)	U	2	
18	<i>Graphium agamemnon</i> (Linnaeus, 1758)	U	4	x
19	<i>Lamproptera curius</i> (Fabricius, 1787)	U	3	x
20	<i>Lampropter meges virescens</i> (Butler, [1870])	R	3	
	<b>Pieridae family</b>			
21	<i>Prioneris thestylis</i> (Doubleday, 1842)	C	2	
22	<i>Prioneris philonome</i> (Boisduval, 1836)	U	2	x
23	<i>Delias agostina annamitica</i> Fruhstorfer, 1910	R	2	
24	<i>Delias acalis acalis</i> (Godart, 1819)	R	2	
25	<i>Delias pasithoe</i> (Linnaeus, 1758)	C	3	x
26	<i>Pieris canidia</i> (Linnaeus, 1768)	U	5	x
27	<i>Cepora nadina</i> (Lucas, 1852)	C	2	x
28	<i>Appias lyncida</i> (Cramer, 1777)	U	3	x
29	<i>Appias nero</i> (Fabricius, 1793)	R	2	
30	<i>Appias albina</i> (Boisduval, 1836)	C	3	
31	<i>Appias indra</i> (Moore, 1857)	U	2	x
32	<i>Appias pandione lagela</i> (Moore, [1879])	U	3	
33	<i>Ixias pyrene</i> (Linnaeus, 1764)	C	3	
34	<i>Hobomoia glaucippe</i> (Linnaeus, 1758)	U	3	
35	<i>Dercas verhuelli</i> (van der Hoeven, 1839)	U	2	
36	<i>Catopsilia scylla</i> Linnaeus, 1763	U	4	x
37	<i>Eurema andersonii</i> (Moore, 1886)	U	2	x
38	<i>Eurema blanda</i> Boisduval, 1836	U	3	x
39	<i>Eurema hecabe</i> Linnaeus, 1758	U	4	x
40	<i>Talbotia naganum pamsi</i> (Vitalis de Salsava, 1921)	R	1	

	<b>Nymphalidae family</b>			
41	<i>Danaus genutia</i> (Cramer, 1779)	U	4	
42	<i>Tirumala septentrionis</i> (Butler, 1874)	U	3	
43	<i>Parantica aglea</i> (Stoll, 1782)	U	2	x
44	<i>Parantica melaneus</i> (Cramer, 1775)	U	3	x
45	<i>Euploea core</i> (Cramer, 1780)	R	3	
46	<i>Euploea mulciber</i> (Cramer, 1777)	C	3	x
47	<i>Euploea tulliolus</i> (Fabricius, 1793)	U	3	
48	<i>Euploea aglea</i> Godart, 1819	U	3	x
49	<i>Euploea radamanthus</i> (Fabricius, 1793)	R	2	x
50	<i>Melanitis leda</i> (Linnaeus, 1758)	C	4	
51	<i>Elymnias vasudeva</i> Moore, [1858]	R	3	
52	<i>Elymnias hypermnestra</i> (Linnaeus, 1763)	S	3	
53	<i>Elymnias melelas</i> Hewitson	R	2	
54	<i>Lethe verma</i> (Kollar, 1844)	U	2	x
55	<i>Mandarinia regalis</i> Leech	R	1	
56	<i>Ethope noirei</i> (Janet)	R	1	x
57	<i>Ragadia crisilda</i> Hewitson, 1862	R	2	x
58	<i>Mycalesia francisca</i> Stoll, 1780	U	3	x
59	<i>Ypthima baldus</i> (Fabricius, 1775)	C	3	x
60	<i>Ypthima tappana</i> Matsumura, 1909	R	1	x
61	<i>Thaumantis diores</i> Doubleday, 1845	R	2	x
62	<i>Thauria lathyi</i> (Fruhstorfer, 1902)	R	1	
63	<i>Cethosia biblis</i> (Drury, 1773)	R	3	
64	<i>Cethosia cyane</i> (Drury, 1773)	R	2	x
65	<i>Vindula erota</i> (Fabricius, 1793)	C	3	x
66	<i>Cirrochroa tyche</i> (Felder, 1861)	C	3	x
67	<i>Vagrans egista</i> (Cramer, 1780)	C	3	
68	<i>Symbrenthia lilaea</i> (Hewitson, 1864)	C	2	x
69	<i>Symbrenthia hypselis</i> Godart, 1823	C	3	x
70	<i>Symbrenthia niphanda</i> Moore, 1872	U	3	
71	<i>Junonia iphita</i> (Cramer, 1779)	R	2	
72	<i>Junonia atlites</i> (Linnaeus, 1763)	U	2	x
73	<i>Junonia almana</i> (Linnaeus, 1758)	C	3	x
74	<i>Hypolimnas bolina</i> (Linnaeus, 1764)	U	4	
75	<i>Deleschallia bisaltide</i> (Cramer, [1777])	R	3	x
76	<i>Kalima inachus</i> (Doyore, 1840)	R	2	
77	<i>Cyrestis thyodamas</i> Boisduval, 1836	U	3	x
78	<i>Chersonesia risa</i> (Doubleday, 1848)	U	2	x
79	<i>Neptis clinia</i> (Moore, 1872)	C	3	
80	<i>Neptis sappho astola</i> Moore, 1872	U	5	
81	<i>Neptis hylas</i> (Linnaeus, 1758)	C	4	x
82	<i>Neptis soma</i> Moore, 1858	S	2	x
83	<i>Neptis harita</i> Moore, [1875]	U	3	
84	<i>Neptis namba</i> Tytler, 1915	R	2	
85	<i>Neptis</i> sp.	U		
86	<i>Pantoporia sandaka davidsoni</i> Eliot, 1969	R	3	
87	<i>Athyma pravara indosinica</i> (Fruhstorfer, 1906)	R	3	x
88	<i>Athyma asura</i> Moore, 1858	U	3	
89	<i>Athyma opalina</i> (Kollar, [1844])	R	3	
90	<i>Athyma selenophora</i> (Kollar, [1844])	U	3	x
91	<i>Athyma zeroa</i> Moore, 1872	R	2	
92	<i>Athyma cama</i> Moore, 1858	R	2	
93	<i>Athyma nefte</i> (Cramer, 1780)	S	3	

94	<i>Athyma ranga</i> Moore, 1857	C	3	
95	<i>Athyma jina</i> Moore, [1858]	R	2	
96	<i>Moduza procris</i> (Cramer, 1777)	U	3	x
97	<i>Tanaecia julii</i> (Lesson, 1837)	U	3	x
98	<i>Tanaecia cocytus</i> (Fabricius, 1787)	S	2	
99	<i>Tanaecia lepidea</i> (Butler, 1869) ?	R	3	x
100	<i>Euthalia monina</i> (Moore, 1859)	S	3	
101	<i>Stibochiona nicea</i> (Gray, 1846)	R	2	
102	<i>Pseudergolis wedah</i> (Kollar, 1844)	R	2	
103	<i>Lexias dirtea</i> (Fabricius, 1793)	S	3	
104	<i>Mimathyma ambica</i> Kollar, 1844	C	3	
105	<i>Rohana parisatis</i> Westwood, 1850	U	3	x
106	<i>Sephisa chandra</i> (Moore, [1858])	R	3	
107	<i>Hestina nama</i> (Doubleday, 1844)	R	2	
108	<i>Polyura athamas</i> (Drury, 1773)	C	3	x
109	<i>Polyura arja</i> (C. & R. Felder, [1867])	R	2	
110	<i>Charaxes bernardus</i> (Fabricius, 1793)	U	3	
111	<i>Charaxes aristogiton</i> Felder, 1867	R	2	x
112	<i>Charaxes marmax</i> Westwood, 1848	S	2	
113	<i>Charaxes kahruha</i> (Moore, 1895)	S	2	
114	<i>Rhinopalpa polynice</i> (Cramer, [1770])	S	3	x
115	<i>Sumalia daraxa</i> (Doubleday, 1848)	R	3	
116	<i>Sumalia zulema</i> (Doubleday & Hewitson, 1850)	R	2	
117	<i>Vanessa indica</i> (Herbst, 1794)	R	5	
	<b>Lycaenidae family</b>			
118	<i>Zemeros flegyas</i> (Cramer, 1843)	R	2	x
119	<i>Abisra fylla</i> (Westwood, 1851)	R	2	x
120	<i>Paralaxita dora</i> Fruhstorfer, 1904	R	1	x
121	<i>Curetis bulis</i> Westwood, 1851	R	2	x
122	<i>Caleta roxus</i> (Godart, 1823)	U	3	
123	<i>Lampides boeticus</i> Linnaeus, 1767	U	5	x
124	<i>Jamides bochus</i> (Stoll, 1782)	U	4	
125	<i>Jamides celeno</i> (Cramer, 1775)	R	4	x
126	<i>Jamides alecto</i> (Felder, 1860)	U	3	
127	<i>Heliophorus kohimensis delacouri</i> Eliot, 1963	C	2	
128	<i>Arhopala khamti</i> Doherty, 1891	S	2	
129	<i>Zeltus amasa</i> (Hewitson, 1865)	U	2	
	<b>Hesperiidae family</b>			
130	<i>Hasora taminatus bhavara</i> Fruhstorfer, 1911	R	2	
131	<i>Hasora malayana</i> (C. & R. Felder, 1860)	U	1	
132	<i>Hasora vitta vitta</i> (Butler, 1870)	U	3	
133	<i>Badamia exclamationis</i> (Fabricius, 1775)	U	4	
134	<i>Choaspes hemixanthus furcatus</i> Evans, 1932	S	3	
135	<i>Celaenorrhinus incestus</i> Devyatkin, 2000	R	2	
136	<i>Celaenorrhinus vietnamicus</i> Devyatkin, 1988	U	1	x
137	<i>Celaenorrhinus putra sanda</i> Evans, 1941	C	2	
138	<i>Celaenorrhinus nigricans</i> (de Niceille, 1885)	S	2	
139	<i>Celaenorrhinus aurivittatus</i> (Moore, [1879])	S	3	
140	<i>Celaenorrhinus dhanada affinis</i> Elwes & Edwards,	R	2	
141	<i>Pseudocoladenia dan fabia</i> Evans, 1949	R	2	
142	<i>Seseria</i> sp.	S		
143	<i>Tagides gana</i> Moore, 1866	R	3	x
144	<i>Iambrix salsala salsala</i> (Moore, [1866])	U	3	x
145	<i>Koruthaialos rubecula hector</i> Watson, 1893	R	3	x

146	<i>Astictopterus jama</i> Felder, 1860	S	3	x
147	<i>Notocrypta curvifascia curvifascia</i> (C.&R.Felder,	R	3	
148	<i>Notocrypta clavata theba</i> Evans, 1949	R	3	x
149	<i>Creteus cyrina cyrina</i> (Hewitson,1876)	S	3	
150	<i>Potanthus</i> sp.	S		
151	<i>Cephrenes acalle oceanica</i> (Mabille, 1904)	R	3	
152	<i>Parnara bada bada</i> (Moore, 1878)	R	4	
153	<i>Pelopidas assamensis</i> (de Niceville, 1882)	S	2	
154	<i>Polytremis lubricans</i> (Herrich-Schaffer, 1869)	U	2	
155	<i>Baoris farri</i> Moore, 1878	S	3	x
156	<i>Caltoris cormasa</i> (Hewitson, 1876)	S	3	

Note: Hill's: the species listed in Hill & Monastyrskii (1999) [6]; C: more than 50 individuals; U: from 10 - 50 individuals; R: 4 - 9 individuals; S: 1 - 3 individuals. Geographical distribution range: (R1) endemic to Indochina region including Eastern Himalayas, South China, North Indochina; (R2) Southeast Asia mainland; (R3) Indo-Malayan region; (R4) Indo-Malayan and Australasian regions; and Palaearctic, extending into the Indo-Malayan region; and (R5) Old World tropics, Holarctic, or Cosmopolitan.

The most important record in the study is the record of species *Teinopalpus aureus* (Papilionidae family). This species is high conservation priority as it has been over-collected, rare and only distributed scatterly on high mountain. It distributes in Hainan, South and South West China, North West Laos, and Vietnam. In Vietnam, it flies in Vinh Phuc, Ha Tinh, Dak Nong, Lam Dong, and Khanh Hoa province.

There are two subspecies of *Teinopalpus aureus* in Vietnam. *T. aureus shinkai* flies in North to the Central Vietnam (until Ha Tinh), and *T. aureus eminens* flies in centre from Khanh Hoa to the Central highland (Lam Dong, Dak Nong) [11].

Many species in this study are not recorded in the area before, such as *Papilio dialis*, *P. arcturus*, *P. bianor*, *Graphim doson*, *Meandrusa lachinus*, *Graphium antiphates*, *G. xenocles*, *G. doson*, *G. chironides*, *Lamproptera meges*, *Teinopalpus aureus*, *Prioneris thestylis*, *Delais acalis*, *D. agostina*, *Talbotia naganum*, and other species as in the Table 1.

Species with special consideration are *Mimathyma ambica* and *Elymnias vasudeva*. The subspecies *Mimathyma ambica claribella* recorded in Pu Mat is only distributed in Vietnam. *Elymnias vasudeva* distributes from Nepal and North East India, Sikkim, Assam through Burma and Thailand to Indochina and the Malay Peninsula. The species is mentioned from Vietnam by Pinratana & Eliot (1988) but is not collected in Vietnam [7]. The species is firstly collected in Vietnam from this study.

The abundance of species is presented in table 2. The most number is the species with 4 to 9 individuals (54 species, 34.62% total species). The least number is species with more than 50 individuals (24 species, 15.38% total species). Among the common species, *Papilio alcmenor* and *Mimathyma ambica* are unusually uncommon or rare species (personal information); but in the study, these species are very common.

The species with individuals less than 10 (both single and rare species) are 80 species (51.29 % total species). This result is consistent with results on butterfly studies tropical regions that the majority of species have low individual number (rare species) [5, 9]. Temperate regions, where have low species diversity, but individuals of each species are high, whereas, in the tropics there are many species, but the individual number of each species is low [5]. It can be seen as an ecological rules on the relationship between species diversity and abundance of species, the diversity of species increases, the abundance of each species decreases and vice versa.

Table 2

**Number of butterfly species and their percentage by abundance levels**

No.	Abundance	Number of species	Percentage (%)
1	1-3 individuals (S)	26	16,67
2	4-9 individuals (R)	54	34,62
3	10-50 individuals (U)	52	33,33
4	More than 50 individuals (C)	24	15,38
	Total	156	100

Number of species by geographical distribution range is presented in Table 3. The most species number is in the Indo-Malayan region (R3) with 66 species (41.14% total species); followed by Southeast Asia mainland (R2) with 62 species (40.52% total species). There are 4 species in Old World tropics, Holarctic, or Cosmopolitan (2.62% total species) (R5). Species with the smallest geographical distribution range (Indochina) (R1) are 9 species (5.88% total species).

The total species distributed inside Indo-Malaysia region (including species in the Indochina, Southeast Asian mainland, and Indo-Malayan region) is 137 species (accounting for 89.55% total species). Thus, Pu Mat butterfly fauna is characterized for the butterfly fauna of Indo-Malaysia.

Table 3

**Number of species by geographical distribution range**

Species number and percentage	Geographical distribution range (smallest to widest)				
	R1	R2	R3	R4	R5
Species number	9	62	66	12	4
Percentage (%)	5,88	40,52	41,14	7,84	2,62

Note: The geographical distribution range as in the Table 1.

**III. CONCLUSION**

Total 156 butterfly species are recorded on mountain forest of Pu Mat National Park, Nghe An province in May and September 2008. The species number is higher than that reported in the previous species list of the area. *Teinopalpus aureus* is the conservation species; two species are newly recorded for Vietnam, namely *Symbrenthia niphanda* and *Athyma jina*. Butterfly species of Pu Mat is characterized by Indo-Malaysia with 89.55% total species distributed in this region. The mountain natural forest of Pu Mat is high value for conservation of butterflies, especially rare and specious butterfly species *Teinopalpus aureus*. It is essential to preserve the mountain natural forest of Pu Mat.

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## THÀNH PHẦN LOÀI BƯỚM (LEPIDOPTERA: RHOPALOCERA) Ở RỪNG TRÊN NÚI VƯỜN QUỐC GIA PÙ MÁT, NGHỆ AN

VŨ VĂN LIÊN

### SUMMARY

Nghiên cứu bướm ngày được tiến hành ở các sinh cảnh rừng tự nhiên trên núi độ cao 800-1600m thuộc Vườn Quốc gia Pù Mát, tỉnh Nghệ An, thời gian nghiên cứu vào tháng 5 và 9 năm 2008. Tổng số 156 loài bướm trên núi Pù Mát được ghi nhận trong thời gian nghiên cứu. *Teinopalpus aureus* là loài có giá trị bảo tồn; ghi nhận mới 2 loài cho khu hệ côn trùng Việt Nam là *Symbrenthia niphandia* và *Athyma jina*. Phần lớn các loài có số lượng cá thể dưới 10 (80 loài, chiếm 51, 29% tổng số loài); loài phổ biến (trên 50 cá thể) ít nhất (24 loài, chiếm 15,38% tổng số loài). Các loài bướm ghi nhận được ở Pù Mát phân bố chủ yếu ở khu vực Indo-Malaysia với 89,55% tổng số loài của Pù Mát. Pù Mát là nơi rất có giá trị bảo tồn các loài bướm núi, đặc biệt là loài quý, hiếm *Teinopalpus aureus* chỉ phân bố rải rác ở các khu rừng tự nhiên trên núi miền Bắc và Trung Việt Nam.