A Revisional Catalogue of the genus *Ypthima* Hübner
(Lepidoptera : Satyridae) from Vietnam

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(Received December 26, 2003 ; accepted February 19, 2004)

**ABSTRACT** — The 24 *Ypthima* species known to occur in Vietnam are considered, of which 12 are new national records. One new species is described (in the *pandocus*-group), one new name proposed, and the status of three taxa revised.

**KEY WORDS:** Taxonomy, Lepidoptera, Satyridae, *Ypthima*, Vietnam.

**INTRODUCTION**

The genus *Ypthima* Hübner comprising more than 100 species is mostly distributed in Palaeotropical regions and in the eastern Palearctic region. The highest *Ypthima* diversity is known from western China, including Yunnan and Sichuan provinces and from other adjacent countries such as N.E. India, Nepal, Sikkim, Assam, Bhutan, Burma, Thailand including regions of the Indo-Chinese Peninsula, in particularly Laos and Vietnam.

However, until recently the data on the *Ypthima* fauna from Indo-China were rather poor and controversial. In the first serious work, on the taxonomy and biogeography of this genus (Elwes & Edwards, 1893) there are no *Ypthima* species listed from French Indo-China. There are some specimens of *Y. baldus*, *Y. huebneri* and *Y. multistriata (=imitans)* in BMNH and in MNHN, which were collected in Vietnam in the second half of 19th and at the beginning of the 20th centuries, although they were not mentioned in the former publication.

In 1911, H. Frühstorfer published descriptions of new races of *Y. asterope (=norma)* and *Y. savara* from south Annam and Tonkin and soon Dubois and Vitalis de Salvaza (1921, 1924) reported five species from central and northern Vietnam. Further information can be found in the catalog published by Gaede (1931) and in the list by R. Metaye (1957) ; however, both were mostly based on previous works. Rich material, including new taxa and new records, was collected by Metaye in the 60s and 70s from the south of Vietnam. However, only material deposited in the MNHN was documented. The results were not otherwise published and new taxa were not described. Short lists of *Ypthima* are contained in a few more recent papers (Anonymous, 1976, 1981), published in Vietnamese and confined to North Vietnam. Amongst six species reported in these works, *Y. lycus* and *Y. conjuncta* were mentioned for the first time.

The numerous descriptions and revisions of Frühstorfer (1911), Evans (1932), Talbot (1947), Forster (1948), Eliot (1967), and Cantlie and Norman (1959) were considered in the fundamental work by Shirōzu and Shima (1979) on systematic study of the genus *Ypthima*. The authors examined the morphological structure, such as male foreleg, wing venation, wing patterns, androconia and male and female genitalia of the 53 described species, mostly belonging to the Asian fauna. In this monograph, there are seven *Ypthima* species mentioned from Vietnam (added philomela and inouei).

During recent years (1990-2000), *Ypthima* have been intensively collected in different sites of Vietnam by researchers from Vietnam-Russia Tropical Centre and by volunteers of Frontier-Vietnam. Examination of this material resulted in the description of new taxa (Uemura & Monastyrskii, 2000). Also, interesting material, including a new taxon, was found in the MNHN.

The main objectives of the present study are to summarize and assess collection and literature data on *Ypthima* species in Vietnam ; to understand the biogeographical position of this group of species in Vietnam with regard to the regional fauna ; and to describe new taxa recently discovered by recent collecting and in museum collections.
The main vegetation types of collecting localities

N. Vietnam (Tonkin)

Hoang Lien Son Nature Reserve, Lao Cai province (22°09' -24° N ; 103°47' -59' E), including Sa Pa settlement. The forest belongs to three types: submontane dry evergreen forest, tropical montane deciduous forest and subalpine forest. In addition, scrub land and savanna areas are found on ridge tops. The dwarf bamboo habitats are confined to the highest ridges of the Fan Si Pan massif, at the altitudes above 2,800m.

Tam Dao National Park, Vinh Phu province (21°30’ N ; 105°40’ E).

A small mountain range (19,000 ha) reaching over 1,200m above sea level, and covered by mountain rain forest, surrounded by deforested areas and paddy fields; floristically very rich, without any conspicuously dominant tree species.

Cuc Phuong National Park, Ninh Binh province (20° 14’-24’N ; 105°29’-44’E).

The vegetation seems to be close to typical lowland tropical forest on limestone with the typical five-storey structure not influenced much by man.

Ba Vi National Park, Ha Tay province (20°01’ ; 21°07’ N ; 105°18’-25’E).

A semi-mountainous area, mostly covered with lowland (<400) and low montane (400-1,200m) broad-leaved evergreen forests.

Ba Be National Park, Tuyen Quang province (18°50’-19°10’N ; 105°20’-55’E); Bu Hoat Nature Reserve (19°15’-30’ N ; 105°50’-00’E), Pu Hoat Nature Reserve (all Nghe An province).

Mostly lowland evergreen rain forests and deciduous and semi-deciduous monsoon forests, the vegetation type being dependent on annual rainfall in the site.

Vu Quang Nature Reserve, Ha Tinh province (18°01’-20’N ; 105°45’-50’E).

Lower montane evergreen forest and deciduous and semi-deciduous monsoon forest, the vegetation type being dependent on annual rainfall in the site.

Pu Mat Nature Reserve (18°50’-19°10’N ; 105°20’-55’E); Da Krong Proposed Nature Reserve, Quang Tri province (16°23’-42’N ; 106°53’-09’ E).

Lowland evergreen forest at ridges of low mountains, which extends south-east from the Annamite mountains. Both protected areas support the largest remaining territory of lowland forest in central Vietnam.

Bach Ma National Park, Thua Thien Hue province (16°05’-16’N ; 107°43’-108°12’E) ; Da Krong Proposed Nature Reserve, Quang Nam province (15°57’-16°03’E ; 107°57’-108°03’ E).

Vegetation dominated by different types of seasonal evergreen rain forest, depending on altitude.

Song Thanh Nature Reserve, Quang Nam province (15°13’-41’ N ; 107°21’-50’E).

The vegetation is dominated by evergreen forest: forest land covers 95% of the nature reserve. The topography is mountainous with numerous peaks over 1,000 m.


A montane area with the highest peak of 2,598m (Mount Ngoc Linh). According to the forest type classifi-
cation by Thai Van Trung (1978), the following types are found in the nature reserve: high montane broad-leaved evergreen forest; medium to high montane broad-leaved evergreen forest; low montane broad-leaved evergreen forest and secondary forest.

Kon Ka Kinh, Gia Lai provinces (14°09'-30'N, 108°16’-28’E).

Moderate to high montane broad-leaved evergreen forest; high montane coniferous forest where Fokienia hodginsii is the dominant species; riverine forest. The highest peak is about 1,742m (Mount Kon Ka Kinh).

Kon Cha Rang Nature Reserve, Gia Lai province (14°30’N; 108°30’E).

Semi-mountainous flat primary semi-deciduous forests.

Bi Doup-Nui Ba Nature Reserve, Lam Dong province (12°00’-19’N; 108°21’-44’E).

The topography is mountainous and whole site lies at 1,400m with highest peak Mount Bi Doup at 2,280m. There are two main forest types at the nature reserve: coniferous forest and evergreen forest. Coniferous forest is a serial vegetation type formed as a result of repeated burning. Evergreen forest covers 50% of the nature reserve. A large proportion of the evergreen forest belongs to the mixed broadleaf and coniferous forest.

Bao Lam Forest complex, Lam Dong province (11°36’-49’N; 107°38’-49’E).

The topography is characterized by rolling hills at 600-1,200m. The vegetation is dominated by bamboo, a secondary vegetation type following logging. However, a significant area is covered by primary evergreen forest.

S. Vietnam (Cochinchina)

Cat Tien National Park, Dong Nai province (11°27’N; 107°20’E).

Lowland evergreen and semi-deciduous forest with high diversity of plants and habitats. Wetland area.

Lo Go Sa Mat Nature Reserve, Tay Ninh province (11°19’-40’N; 105°49’-59’E).

The topography is very flat with altitudes reaching only 20m. The sites supports a mosaic of lowland semi-deciduous forest, lowland deciduous forest and smaller patches of lowland evergreen forest. There are also some specific stands of tree species belonging to Dipterocarpaceae family.

Abbreviations

The following abbreviations have been used: UP = upperside, UpF = upperside of forewing, UpH = upperside of hindwing, UN = underside, UnF = underside of forewing, UnH = underside of hindwing, FL = length of forewing, wsf = wet season form, dsf = dry season form, wsf-dsf or dsf-wsf = intermediate form between wet season form and dry season form, colln = collection;

ALM = Alexander L. Monastyrskii leg., BHM = Bui Huu Manh leg., BMNH = Natural History Museum, London (formerly British Museum (Natural History), BXP = Bui Xuan Phuong leg., FFI = Fauna & Flora International leg., FR = Frontier leg., HVH = Ha Van Hoach leg., KUCGE = School of Social and Cultural Studies (Natural History, Biology), Kyushu University (formerly Biological Laboratory, College of General Education, Kyushu University), MN = collection of Mr Masatoshi Nishimura, MNHN = Museum National d‘Histoire Naturelle, Paris, MSU = Moscow State University, RIEB = Research Institute of Evolutionary Biology, Tokyo, RS = Robert Shore leg., TME = Toyosato Museum of Entomology, Tsukuba, VVL = Vu Van Lien leg., ZSM = Zoologische Sammlung des Bayerischen Staates, München;


Key to the species of Vietnamese Ypthima

1 UnH with two apical ocelli in spaces 5 and 6. ............... 2
  - UnH with one apical ocellus in space 6. ................. 15
2 Moderate or large species. FL usually larger than 22.0mm.  
  \[\text{aedeagus in lateral view strongly curved dorsally.} \] ................. 3
  - Moderate or small species. FL usually less than 21.5 mm.  
  \[\text{aedeagus ventral surface of suprizonal sheath entirely membranous.} \] ................. 11
3 UnH ocellus in space 5 fused with ocellus in space 6.  
  \[\text{sakra} \] ................................. 7
  - UnH ocellus in space 5 touching with ocellus in space 6, but never fused with it. ......................... 4
4 UnH with two straight discal fasciae.  
  - UnH discal fasciae, if present, never quite straight. ...... 7
  5 UP grayish-brown.  
  \[\text{pseudosavara} \] ................................. 5
  - UP ochreous brown or dark brown.  ......................... 6
6 Large species. FL usually larger than 23.0mm.  
  UPF brand more or less prominent.  
  \[\text{savara} \] ................................................................. 8
  - Moderate species. FL usually less than 23.0mm.  
  \[\text{Upf brand invisible to naked eye.} \] similis  
  - UN rich dark brown without an ochreous tinge. ......... 8
  - UN ochreous brown. ............................................. 10
8 UnH with two distinct discal fasciae. Moderate species. FL usually less than 23.0mm.  
  - UN inner discal fascia indistinct. Large species.  
  FL usually larger than 23.0mm.  ......................... 9
9 UN striation fine and dense.  
  \[\text{persimilis} \] ................................. 9
- UN striation comparatively coarse.  
- UN striation fine and dense. UpH usually without ocellus in space 5. FL usually less than 25.0 mm.  
- UN striation comparatively coarse. UpH bears large ocellus in space 5. FL usually larger than 25.0 mm.  
11 UpF with subapical ocellus faint. UnH tornal ocelli in straight line.  
- UpF with a prominent subapical ocellus. UnH ocellus in space 2 shifted more or less inwards.  
12 UnF with uniform brown striation. $\delta$ aedeagus nearly straight.  
- UnF with two distinct discal fasciae. $\delta$ aedeagus curved ventrally at middle.  
13 UpF subapical ocellus with entirely rounded yellow ring; brand ill defined.  
- UpF subapical ocellus with more or less oval yellow ring; brand moderately to markedly prominent.  
14 FL usually larger than 18.0 mm.  
- FL usually less than 18.0 mm.  
15 UnH with three tornal ocelli in spaces 1b, 2 and 3.  
16 Small species. FL less than 18.0 mm.  
- Moderate or large species. FL larger than 20.0 mm.  
17 UnH ocellus in space 2 almost same size in that of space 3.  
- UnH ocellus in space 2 markedly larger than ocellus in space 3 that sometimes may be absent. Very large species.  
18 Small species. FL less than 17.0 mm.  
- Moderate species. FL larger than 17.5 mm.  
19 UnH apical ocellus markedly larger than ocellus in space 2 except dsf of $\textit{frontierii}$.  
- UnH apical ocellus almost same size ocellus in space 2.  
20 UN both wings with submarginal fascia obscure.  
- UN both wings with distinct submarginal fascia.  
21 UN dark brown without an ochreous tinge. Apex of $\delta$ valva with small serration.  
- Both sexes smaller than $\textit{sarcaposa}$. UN ochreous brown. Apex of $\delta$ valva without serration.  
22 China

**Fig. 1.** Faunal region of Vietnam.
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22 ♀ UpF brand always obscure. ********* watsoni
- ♀ UpF with prominent brand. ********* 23
23 ♀ UpF with subapical ocellus faint. ********* imitans
- ♀ UpF with a prominent subapical ocellus. ** daclaca

LIST OF SPECIES

Sakra-group

Ypthima sakra leechi Forster, 1948
(Figs. 2a, 4.1)

Ypthima sakra leechi Forster, 1948 : 483, pl. 30, fig. 16♂ (UP), pl. 31, fig.16♂(UN). Holotype ♀, Kunkalashan, Szechwan, W. China (ZSM) [colour transparencies of upper and underside examined].


Habitats. Western China and upper North Vietnam.

Remarks. This species is recorded in Vietnam for the first time.

The subspecies of Ypthima sakra Moore are listed below.

ssp. sakra Moore, [1858]
- North West India, Nepal, Sikkim and Bhutan
ssp. austeni (Moore, [1892])
- Assam, Northern Burma, Thailand
ssp. nuijiangensis Huang, 2001
- S. E. Tibet
ssp. leechi Forster, 1948
- Western China, North Vietnam

Ypthima atra Cantlie & Norman, 1959
(Figs. 2b, 4.5)


Habitats. Lam Dong (Bi Doup) : evergreen forest at 1,300-

Ypthima persimilis Elwes & Edwards, 1893
(Figs. 2c-d, 4.2, 4.3, 4.4)

Ypthima persimilis Elwes & Edwards, 1893 : 39-40. Synotypes 1♂1♀, Mao, Manipur, 7000' (BMNH) [Syntypes 1♂1♀, B.M. Type No. Rh. 3407♂, 3408♀ examined].


Habitats. Hoang Lien : scrub near Sa Pa settlement at 1,500 m, forested area at 1,700m.

Bionomics. There are specimen records for April to July to August.

Remarks. This species is recorded in Vietnam for the first time.

Ypthima evansi evansi Eliot, 1967
(Figs. 2e, 4.6)

Ypthima evansi evansi Eliot, 1967 : 56-58, text-fig. m (androconia), figs. 7 (♂ genitalia, Dawnas), 15 (♂ genitalia, N. Shan States). Holotype ♀, N.E. Burma, North Shan States (BMNH).


FL. ♀, 23.5-25.0mm ; ♂, 26.0mm.

Habitats. Lam Dong (Bi Doup) : evergreen forest at 1,300-
Fig. 2. Androconia of *Ypthima* species: a, sakra leechi (Hoang Lien); b, atris (Bac Can); c-d, persimilis (Hoang Lien); e, evansi evansi (Bi Doup); f, dohertyi mossmani (Ngoc Linh); g, savara tonkiniana (Ba Be); h, ditto (Ben En); i, savara savara (Ban Don); j, pseudosavara (Ben En); k, similis (Kon Cha Rang); l, ditto (Lam Dong); m, affectata (Ba Be); n, tappana selinumoides (Huong Son forest); o, baldus baldus (Ba Be); p, ditto (Cuc Phuong); q, ditto (Ban Me Thuan); r, ditto (Da Lat); s, singorensis indosinica nom. nov. (Ngoc Linh); t, ditto (Play Ku); u, nebulosa (Ba Be); v, ditto (Pu Mat); w, philomela penguana (Da Lat); x, lisandra lisandra (Play Ku); y, norma annamitica (Da Lat); z, praenubila praenubila (Tam Dao); aa, huebneri (Da Lat); bb, frontierii (Hoang Lien); cc, ditto (Sapa); dd, sarcaposa (Ba Vi); ee, confusa (Ngoc Linh); ff, imitans (Tam Dao); gg, ditto (Vu Quang); hh, watsoni inouei (Tay Ninh); ii, daculca sp. nov. (Dac Lac).
Fig. 3. Male genitalia of *Ypthima* species: A, *philomela peguana* (Da Lat); B, *daclacea* sp. nov. (paratype specimen, Dac Lac); C, *sarcaposa* (Ba Vi); D, *newara* (after Shirôzu & Shima, 1979).

1,400m.

Bionomics. There are specimen records for April.


Remarks. This species is recorded in Vietnam for the first time.

The subspecies of *Ypthima evansi* Eliot are listed below.

ssp. *evansi* Eliot, 1967
N. E. Burma, N. Thailand and Central Vietnam

N. W. Burma
Ypthima dohertyi mossmani Eliot, 1967
(Figs. 2f, 4.7)


Remarks. In genitalia of specimens from Kon Ka Kinh and Cat Loc the saccus is approximately half the length found in specimens from Ben En and Pu Mat. This is the first record from Vietnam. The subspecies of Ypthima dohertyi (Moore) are listed below.

ssp. khasia Eliot, 1967
Assam (Khasia) (Moore, [1892])
Burma (Shan States to Dawnas), N. Thailand, Laos
ssp. mossmani Eliot, 1967
Malaya, Central Vietnam (Annam)

Ypthima savara tonkiniana FRUISTOFER, 1911
(Figs. 2g-h, 5.2)


Distribution record taken from the literature. N. Vietnam, Tuyen Quang province, Chiem Hoa (FRUISTOFER, 1911). FL. ♂, 22.0-27.0mm ; ♀, 25.0mm.

Habitats. Ba Be : grassy clearing ; Ben En : secondary lowland forest edge ; Pu Mat : forest at 200 to 1,500m.

Bionomics. There are specimen records for March to April from N. Vietnam, for May to September from C. Vietnam (N).


Remarks. Eliot (1967) associated the populations from Lower Tenasserim and Malaya with subspecies tonkiniana by the characteristic of darker ground colour, much reduced brand, and shorter androconia. We restricted subspecies tonkiniana to the populations from North and Central Vietnam (N) by the following differences: UN with two straight discal fasciae more prominent ; there is small ocelli on UnH in dsf, while subspecies savara these ocelli strongly reduced to dots.

Ypthima savara savara GROSE SMITH, 1887
(Figs. 2i, 5.1)
Ypthima(sic) savara GROSE SMITH, 1887 : 267. Syntypes, Burmah, Siamese frontier (BMNH, B.M. Type No. Rh. 3410 ♂, 3411♀).


FL. ♂, 24.0-24.5mm ; ♀, 23.5-24.0mm.

Habitats. Phong Dien : forest at 200-300m ; Bach Ma : at 1,200-1,400m ; Nghia Trung : evergreen forest with bamboo at 250m ; Cat Loc : forest path at 500-600m.

Bionomics. There are specimen records for February to August and November.

Distribution. Burma to Thailand, Laos, Malaya, Central Vietnam (C, S) and South Vietnam.

Remarks. In genitalia of specimens from Kon Ka Kinh and Cat Loc the saccus is approximately half the length found in specimens from Ben En and Pu Mat.

The subspecies of Ypthima savara GROSE SMITH are listed below.
Ypthima pseudosavara Uemura & Monastyrskii, 2000

(Figs. 2j, 4.8)

Ypthima pseudosavara Uemura & Monastyrskii, 2000: 153-154, figs. ld-e (androconia), 3 (♂ genitalia), 10 (Holotype ♀, UP), 11 (Holotype ♀, UN), 12 (Paratype ♀, UP & UN), 13 (Paratype ♀, UP & UN). Holotype ♀, Ben En National Park, C. Vietnam (TME) [examined].

Ypthima pseudosavara: Monastyrskii & Devyatkin, 2003: 19, pl 2, fig. 5♂(UP). N., C.


FL. ♀, 22.0-25.5mm; ♂, 29.0mm.

Habitats. Xuan Lien: bamboo at 450m; Ben En: lowland forest; Pu Mat: secondary forest at 400m.

Bionomics. There are specimen records for April, July to August. Distribution. Lowland areas in northern sites of Central Vietnam and in northern Vietnam. Type material is deposited in TME, BMNH, and MSU.

Ypthima similis Elwes & Edwards, 1893 (Figs. 2k-l, 5.3, 5.4)

Ypthima similis Elwes & Edwards, 1893: 30, pi. 1, fig. 19 (♂ genitalia). Syntypes 6♂2♀, Karen Hills, Burma (BMNH) [Syntype ♀, B. M. Type No. Rh. 3228 ♀ examined].


Bionomics. There are specimen records for April and July to August.

Distribution. Assam and N. & C. Vietnam. Remarks. This species, once treated as a subspecies of similis, is sympatric with similis in Northern Burma. It is possible that both species affectata and similis fly together in northern Annamites area (Nghe An and Ha Tinh Provinces). Y. affectata from Pu Mat and Y. similis from Laos are very close to each other and probably fly together in some sites.

Tappana-group

Ypthima tappana selinuntioides MELL, 1942 stat. nov. (Figs. 2n, 5.7, 5.8)

Ypthima selinuntioides MELL, 1942: 261. Syntypes 7♂2♀, Tsha yun shan & Linping, Kwangtung, S. China [untraced].


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Philomela-group

Ypthima baldus baldus (Fabricius, 1775)


Ypthima singorensis indosinica UéMURA & MONASTYRSKI, nom. nov.

(Figs. 2s-t, 6.7, 6.8)


Ypthima singorensis: IKEDA et al., 1999: 57, figs. 7-4♀ (UP), 7-5♂ (UN), 9-34 (♂ genitalia). Cuс Phuong.


Ypthima singala Watson, 1897

Ypthima cerealis Watson, 1897: 646-647, pl. A, figs. 3♂ (dsf), 4♂ (wsf).


Ypthima singorensis Aokí & UéMURA, 1984

Ypthima cerealis singorensis: Aokí & UéMURA, 1984: 77-79, figs. 2j (androconia), 6 (distribution map), 8b (♂ genitalia), 26♂ (UP & UN), pl. 5, figs. 3♂ (UP), 7♂ (UN).

Ypthima singorensis indosinica: UéMURA & MONASTYRSKI, nom. nov.


Aokí & UéMURA (1984) misidentified this species as Ypthima cerealis Watson, 1897, and at the same time, they described a new subspecies Y. cerealis singorensis from peninsular Thailand. According to Eliot (1988 and personal communication), Y. cerealis Watson should be treated as a subspecies of Ypthima singala R. Felder, 1868. Subsequently, singorensis Aokí & UéMURA, 1984 was upgraded to the spe-
cific name of this species (Ikeda et al., 1999; Monastyrskii & Devyatkin, 2003). The Indo-Chinese population of this species is different from that of peninsular Thailand (ssp. singorensis) and here we describe a new subspecies, indosinica, for the Indo-Chinese population. The Indo-Chinese population of this species is different from that of peninsular Thailand (ssp. singorensis) and here we describe a new subspecies, indosinica, for the Indo-Chinese population. Holotype c♀ labeled Chiang Mai, N. Thailand, 13. viii. 1970 (H. Yui) preserved in TME. Monastyrskii & Devyatkin’s (2003) indosinica is unavailable under the Code (4th Edn.).

The subspecies of Ypthima singorensis Aoki & Uemura are listed below.

- **ssp. singorensis** Aoki & Uemura, 1984 *stat nov.*
  - Peninsular Thailand
- **ssp. indosinica** Uemura & Monastyrskii, *nom. nov.*
  - Thailand, Indo-China

**Ypthima nebulosa** Aoki & Uemura, 1982

(Figs. 2u-v, 6.10, 6.11)

Ypthima nebulosa Aoki & Uemura, 1982: 13-14, pl. 5, figs. 22♂(UP), 23♀(UP), pl. 6, figs. 22♂(UN), 23♀(UN), text-fig. 3 (♂ genitalia). Holotype ♀, Sibolangit, Sumatra (RIEB) [examined].


**FL. c♀, 18.0-22.0mm; ♂, 20.0mm.**

Habitats. Ba Be: grassland at the river valley; Kon Ka Kinh: forest edge at 1,300-1,500m.

Bionomics. There are specimen records for January, May, July, November.


Taxonomy. Eliot (1988) has synonymized the name nebulosa with humei Elwes & Edwards, 1893 described from Malewoon, Tenasserim. Uemura reexamined the male holotype of humei preserved in BMNH. As a result, the name humei synonymized with Ypthima newboldi DISTANT, 1882, which is currently treated as a subspecies of Ypthima baldus (Fabricius, 1775).

Remarks. This is the first record from Vietnam.

**Ypthima philomela peguana** Evans, 1923

(Figs. 2w, 3A, 6.1, 6.2, 6.3)

Ypthima philomela peguana Evans, 1923: 786. Syntypes ♀♀, N. Burma (BMNH) [Syntype ♂, B.M. Type No. Rh. 6195♂, syntype ♀, B.M. Type No. 6196♀ examined].

Ypthima philomela peguana: Monastyrskii & Devyatkin, 2003: 20. C., S.

Specimens examined. **C. Vietnam (S).** Lam Dong province: Da Lat (950m), 3♂♀(♀♀♀)(♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀♀女足
Son?) (Fruhstorfer, 1911).

FL.  \( \varphi \), 18.5-20.0mm;  \( \psi \), 18.0-20.0mm.

Habitats. Nui Chua: grassland and secondary forest edge at 400-500m; Lo Go Sa Mat: evergreen forest edge (grassland) at 20-30m.

Bionomics. There are specimen records for February and March. Bascombe et al. (1999) mention that lisandra in Hong Kong has habits like those baldus, but unlike that species it is also found on several of the smaller islands.


Taxonomy. Shirozu & Shima (1979) treated avanta as a species distinct from lisandra on the basis of \( \varphi \) genitalia. We do not follow this treatment because could not find any differences between specimens from S. China and Indo-China. Further investigation is needed to resolve this matter.

The subspecies of Ypthima lisandra (Cramer) are tentatively listed below.

- **ssp. lisandra** (Cramer, [1780])
  - S. China, Hainan, Vietnam
- **ssp. bara** Evans, 1923
  - Sikkim to Burma, Thailand, Laos
- **ssp. avanta** Moore, 1874
  - N.W. Himalayas to Nepal
- **ssp. vaneeceri** Roepke, 1936
  - Java, Bali, Lombok (1 \( \varphi \), new record)

**Asterope-group**

**Ypthima norma annamitica** Fruhstorfer, 1911

Ypthima asterope annamitica Fruhstorfer, 1911 : 286, pl. 99, fig. cf\( \varphi \) (UN). Lectotype \( \varphi \), Xom Gom, South Annam (BMNH) [lectotype designated by Uemura, 1985 : 181] [examined]; Metaye, 1957 : 102. Central Vietnam.


Specimens examined. C. Vietnam (S). Lam Dong province: Da Lat (5000'), 1 \( \varphi \) (wsf), 26-30. viii. 1966 (A. Bedford Russell); Plateau du Lang Bian (5000'), 1 \( \varphi \) (dsf), 9. ii. 1900 (H. Fruhstorfer); [Xom Gom], 1 \( \delta \) (lectotype, dsf); (H. Fruhstorfer); "Fimnon" or "Fimmom" (Lam Dong) [Dalat plateau]. 2\( \varphi \), 2. x. 1929, 19. v. 1932 (Leeche, colln, MNHN); Bi Doup montane area (1300m), 1 \( \varphi \), 3. iv. 2002 (ALM, in colln of TME).

FL. \( \varphi \), 15.0-17.0mm; \( \varphi \), 17.0mm.

Bionomics: Nominate subspecies from Hong Kong inhabits grassland on the hill slopes and summits.

Distribution: Southern region of Central Vietnam (Dalat).

Remarks: So far not found in the other Vietnam sites, although it is known from S. China (ssp. norma) and Laos (ssp. burmana). Subspecies annamitica is distinguishable from all other subspecies - the underside ground colour is more whitish; subapical ocellus is rather oval (Uemura, 1985). Lemée's (1950) recorded as Y. asterope f. annamitica from Hagiang, N. Vietnam, is possibly misidentifica-
tion of Y. huebneri. Need for confirmation.

The subspecies of Ypthima norma Westwood are listed below.

- **ssp. norma** Westwood, [1851]
  - Southern China
- **ssp. annamitica** Fruhstorfer, 1911
  - South Vietnam
- **ssp. burmana** Evans, 1923
  - Burma, N. Thailand, Laos, W. China
- **ssp. posticalis** Matsumura, 1909
  - Taiwan
- **ssp. aei** Shirozu & Shima, 1977
  - Luzon
- **ssp. pusilla** Fruhstorfer, 1911
  - Sulawesi (Celebes), Butung
- **ssp. moluccana** Uemura, 1985
  - Ambon, Buru
- **ssp. florentis** Shellen, 1891
  - Flores, Alor
- **ssp. sumbana** Uemura, 1985
  - Sumba
- **ssp. incertae sedis**
  - Timor

**Chenu-group**

**Ypthima praenubila praenubila** Leech, 1891

Ypthima praenubila praenubila Leech, 1891 : 66. Syntypes 5\( \varphi \), Ta-chien-lu, Chia-kou-ho, Moupin, Omei-shan, Wa-shan, Szechwan, W. China; Kiukiang, Kiangsi, C. China (BMNH, B.M. Type No. Rh. 3372-3382); Ikeda et al., 1999 : 57, figs. 7-9\( \varphi \) (UP), 7-10\( \varphi \) (UN), 7-11\( \varphi \) (UP), 9-36 (\( \varphi \) genitalia). Cuc Phuong.

Ypthima praenubila praenubila : Monastyrskii & Devyatkin, 2003 : 20. C. Vietnam. (S). Lam Dong province: Da Lat (5000'), 1 \( \varphi \) (wsf), 26-30. viii. 1966 (A. Bedford Russell); Plateau du Lang Bian (5000'), 1 \( \varphi \) (dsf), 9. ii. 1900 (H. Fruhstorfer); [Xom Gom], 1 \( \delta \) (lectotype, dsf); (H. Fruhstorfer); "Fimnon" or "Fimmom" (Lam Dong) [Dalat plateau]. 2\( \varphi \), 2. x. 1929, 19. v. 1932 (Leeche, colln, MNHN); Bi Doup montane area (1300m), 1 \( \varphi \), 3. iv. 2002 (ALM, in colln of TME).

Habitats. Na Hang : forest at 800m ; Cue Phuong : lowland forest on limestone. The hilly limestone area in the park is not above 600m.

Bionomics. According to Bascombe et al. (1999) the Hong Kong population occurs most commonly on the wooded slopes and summit of Victoria Peak.

Distribution. Central and Western China, Hainan, North Vietnam.

The subspecies of Ypthima praenubila Leech are listed below.

ssp. praenubila Leech, 1891
C. W. & S. China, Hainan, N. Vietnam
ssp. kanonis Matsumura, 1929
Taiwan

Huebneri-group

Ypthima huebneri Kirby, 1871
(FIGs. 2aa, 6.13, 6.14)

Ypthima huebneri Kirby, 1871 : 95. (Replacement name).


Ypthima huebneri f. huebneri : Dubois & Vitalis de Salvaza, 1924 : 27. Annam ; Tonkin.

Ypthima huebneri f. honora : Dubois & Vitalis de Salvaza, 1924 : 27. Indochina.

Ypthima huebneri : Ikeda et al., 1999 : 57, figs. 7-6 (UP), 7-7 (UN), 9-35 (genitalia). Cuc Phuong.


Ypthima frontierii Uemura & Monastyrskii, 2000
(FIGs. 2bb-cf, 7.1, 7.2)

Ypthima frontierii Uemura & Monastyrskii, 2000 : 150-153, figs. 1a-c (androconia), 2 (♀ genitalia), 4 (Paratype ♀, wsf, UP), 5 (Ditto, UN), 6 (Holotype ♀, dsf, UP), 7 (Ditto, UN), 8 (Paratype ♀, dsf, UP), 9 (Ditto, UN). Holotype ♀ (dsf), Sa Pa, N. Vietnam (TME) [examined].


Ypthima sarcaposa Fruhstorfer, 1911
(FIGs. 2dd, 3C, 7.3)


Specimens examined. N. Vietnam. Bac Can province : Ba Be National Park, 2♂ (wsf), 17.0-17.5mm; ♀, 17.0-18.0mm.

Habitats. Ba Be : forest edge, secondary vegetation ; Pu Mat : secondary forest up to 600m ; Vu Quang : secondary forest at 200m ; Kon Cha Rang : secondary vegetation at 900m ; Lo Go Sa Mat : secondary lowland forest edge at 10-20m.

Bionomics. It frequents the roadsides and secondary growth.

Distribution. From throughout Peninsular India to Assam, Burma, Malaya, Singapore, Thailand, Laos and Vietnam.

Remarks. The species has two distinct seasonal forms. Dsf lacks ocelli on the UnH.

Megalomma-group

Ypthima sarcaposa Fruhstorfer, 1911 stat. nov.

Ypthima newara sarcaposa Fruhstorfer, 1911 : 291. Synotypes, Tungo, Tenasserim (BMNH) [Syntype ♀, Tenasserim, Tandong, 4,000 ft, Mai, Fruhstorfer leg., examined].

Fig. 4. Upper- and underside of Ypthima species: 1. sakra leechi ♀ (Hoang Lien); 2. persimilis ♀ (Sa Pa); 3. ditto ♀ (Sa Pa); 4. ditto ♂ (Sa Pa); 5. atra ♀ (Tuyen Quang); 6. evansi evansi ♂ (Bi Doup); 7. dohertyi mossmani ♀ (Ngoc Linh); 8. pseudosavara ♀ (holotype) (Ben En).
Fig. 5. Upper- and underside of Ypthima species: 1. savara savara ♀(Bao Loc); 2. savara tonkiniana ♂(Ba Be); 3. similis ♀(dsf) (Kon Cha Rang); 4. ditto ♂(wsf) (Lam Dong); 5. affectata ♂(wsf) (Na Hang); 6. ditto ♀(dsf) (Ba Be); 7. tappana selininitoides ♂(Huong Son forest); 8. ditto ♀(Vu Quang).
Fig. 6. Upper- and underside of *Ypthima* species: 1. *philomela peggana* (Cat Tien); 2. ditto (Da Lat); 3. ditto (Da Lat); 4. *baldus baldus* (Bao Loc); 5. ditto (Da Lat); 6. *lisandra lisandra* (Tay Ninh); 7. *singorensis indosinica* nom. nov. (Ngoc Linh); 8. ditto (Play Ku); 9. *lisandra lisandra* (Da Lat); 10. *nebulosa* (Tam Dao); 11. ditto (Ba Be); 12. *norma annamitica* (Da Lat); 13. *huebneri* (Bach Ma); 14. ditto (Da Lat); 15. *norma annamitica* (Bi Doup).
Fig. 7. Upper- and underside of _Ypthima_ species: 1, _frontierii_ ♂ (wsf) (paratype) (Hoang Lien); 2, ditto ♀ (dsf) (holotype) (Sapa); 3, _sarcaposa_ ♂ (Ba Vi); 4, _confusa_ ♂ (Hoang Lien); 5, _imitans_ ♂ (Vu Quang); 6, ditto ♀ (Vu Quang); 7, _watsoni inouei_ ♂ (Tay Ninh); 8, ditto ♀ (Tay Ninh).
Fig. 8. Upper and underside of Ypthima species: 1, praenubila praenubila ♀ UP (Tam Dao); 2, ditto UN; 3, praenubila praenubila ♂ UP (Tam Dao); 4, ditto UN; 5, dacla sp. nov. paratype ♂, UP & UN; 6, ditto holotype ♂, UP; 7, ditto UN; 8, Ypthima persimilis Elwes & Edwards, 1893, syntype ♂, UP, Mao, Manipur, (BMNH, B.M. Type No. Rh. 3407 ♀, photo by M. NISHIMURA); 9, ditto UN.
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Be National Park, 3 \( \varphi \), 2-7. v. 2001 (BXP). Tuyen Quang province: Na Hang, 1 \( \varphi \), 18. v. 2001 (BXP). Ha Tay province: Ba Vi National Park, 5 \( \varphi \), 18. v-14. vi. 1996 (ALM, BXP), 1 \( \varphi \), 18. v. 1996 (KMNHIR 200, 213), 1 \( \varphi \), 25. v. 1996, 2 \( \varphi \), 8, 14. vi. 1996. FL. \( \varphi \), 20.0-24.0mm ; \( \varphi \), 24.5mm.


Taxonomy. This species has been treated as a subspecies of newara Moore, 1874. These two taxa differ from each other in the male genitalia. The apex of valva of sarcaposa is serrate (Fig. 3C).

Remarks. It is the first record from Vietnam.

Ypthima confusa Shirozu & Shima, 1977
(Figs. 2ee, 7.4)

Ypthima confusa Shirozu & Shima, 1977 : 504-507, figs. 1 C8(UP), 1D8(UN), 1G(androconia), 3(c?genitalia), 5A-E (\( \varphi \) genitalia). Holotype \( \varphi \), Nepal (KUCGE).


Cylindria imitans Elwes & Edwards, 1893
(Figs. 2ff-gg, 7.5, 7.6)

Ypthima imitans Elwes & Edwards, 1893 : 17, pi. 3, fig. 53 (\( \varphi \) genitalia). Holotype \( \varphi \), Hainan (BMNH, B.M. Type No. Rh. 3371 \( \varphi \) ) ; Ikeda et al., 1999 : 57, figs. 7-1 \( \varphi \) (UP), 7-2 \( \varphi \) (UP), 7-3 \( \varphi \) (UP), 9-33(\( \varphi \)genitalia). Cuc Phuong.


FL. \( \varphi \), 20.0-23.5mm ; \( \varphi \), 20.0-23.5mm.

Habitats. Ba Be: forest edge and grassland at 200-300m ; Tam Dao: forest path at 800-900m ; Pu Mat: secondary forest at 200-400m ; primary forest at 1,000m ; Vu Quang: path in the secondary forest at 100-200m.


Ypthima watsoni inouei Shirozu & Shima, 1977
(Figs. 2hh, 7.7, 7.8)

Ypthima inouei Shirozu & Shima, 1977 : 507-509, text-fig. 1E (Holotype \( \varphi \), UP), 1F (Holotype \( \varphi \), UN), 1H (androconia), 6 (\( \varphi \)genitalia). Holotype \( \varphi \), Trang Bom, Vietnam (KUCGE).


Ypthima watsoni inouei : Uemura, 1998 : 3, figs. 1h (androconia), 5 (\( \varphi \)genitalia). South Vietnam.


Specimens examined. S. Vietnam. Dong Nai province:
Fig. 9. Distribution Maps (1). Solid circles represent records based on specimens.
Fig. 10. Distribution Maps (2). Solid circles represent records based on specimens.
Fig. 11. Distribution Maps of Ypthima species (3). 1, sakra; 2, atra; 3, persimilis; 4, evansi; 5, dohertyi; 6, savara; 7, pseudosavara; 8 + 9, similis & affectata; 10, tappana; 10a, tappana tappana; 10b, tappana continentalis; 10c, tappana selinantioides; 11, baldus; 11a, baldus zodina; 11b, baldus baldus & baldus galliensus; 11c, baldus newbordi; 12, singorensis; 12a, singorensis singorensis; 12b, singorensis indosinica nom. nov.; 13, nebulosa; 14, philomela peguana; 15, lisandra lisandra; 16a, norma posticalis; 16b, norma norma; 16c, norma annamitica; 16d, norma burmana; 17, praenubila; 18, huebneri; 19, frontierii; 20, sarcoposa; 21, confusa; 22, imitans; 23a, watsoni watsoni; 23b, watsoni peninsulae; 23c, watsoni inouei; 24, daclaca sp. nov.
Trang Bom, Station de Song Mai (60 km), 2♂, 2. vii. 1960, 21. iv. 1961 (Roger Metaye), both preserved in MNHN. Tay Ninh province : Lo Go Sa Mat Nature Reserve, 6♂3♀, 17. x-3. xi. 2001 (ALM) (1♂1♀, KMNHIR 200, 218). FL. ♂, 18.5-21.0 mm; ♀, 20.0-21.0 mm.


Remarks. All known specimens have been collected just in lowland areas of S. Vietnam. The subspecies of *Ypthima watsoni* (Moore, [1893]) are listed below.

ssp. *watsoni* (Moore, [1893])

Manipur, Burma and N. Thailand

ssp. *peninsularae* Aoki & Uemura 1984

Peninsular Thailand

ssp. *inouei* Shirozu & Shima, 1977

S. Vietnam.

Pandocus-group

*Ypthima daclaca* Uemura & Monastyrskii, sp. nov. (Figs. 2ii, 3B, 8.5, 8.6, 8.7)

*Ypthima daclaca* : Monastyrskii & Devyatkin, 2003 : 20. C. (Dac Lac) (Uemura & Monastyrskii, in prep.)

♂ (Figs. 8.5, 8.6, 8.7). *Upperside of forewing* : Ground colour umber brown; inner and outer discal fasciae absent; submarginal fascia dark, well developed; marginal fascia distinct; subapical ocellus large, slightly oblique, black, bipupilled and rather narrowly yellow-ringed; fringe dark brown; brand prominent. *Upperside of hindwing* : Ground colour umber brown; inner and outer discal fasciae absent; submarginal and marginal fasciae as on forewing; unpupilled ocellus present in space 2; single minute ocellus present in space 1b; fringe dark brown. *Underside of forewing* : Ground colour grayish-brown, closely and delicately striated with dark brown; inner discal fascia absent; outer discal fascia distinct, broadened posteriorly; submarginal fascia distinct, which is fused with outer discal fascia in space 2; marginal fascia dark and distinct; subapical ocellus large, slightly oblique, black, bipupilled and broadly yellow-ringed; fringe dark brown. *Underside of hindwing* : Ground colour grayish-brown, closely and delicately striated with dark brown; inner discal fascia absent; outer discal fascia distinct; submarginal fascia present; marginal fascia dark and distinct; rather small single pupilled subapical ocellus present in space 6; small single pupilled subapical ocellus present in space 2; bipupilled small ocellus present in space 1b; fringe dark brown.

♀. Unknown.

*Androconia* (Fig. 2ii). Moderate size, bottle-like shaped base with very slender, prolonged neck.

♀*genitalia* (Fig. 3B). Tegumen in dorsal view rather long and narrowed posteriorly, posterior margin rather strongly bulged and gradually sunk; in lateral view distinctly higher than vinculum; appendix angularis rather broad. Uncus subequal in length to tegumen, gradually tapering to apex; in lateral view slightly curved ventrally. Fenestra of a small membranous dorsal spot. Saccus less than 1/5 × as long as ring. Aedeagus in lateral view nearly straight. Valva in lateral view rather narrow and very long, twisted at middle, apex strongly pointed; costa continuous to narrow ampulla + harpe.

*Length of forewing*. ♂, 18.5-19.0 mm (n=2).

*Geographical distribution*. Southern part of Central Vietnam.

Holotype ♂, km 8 route Daclac (?), 10. iv. 1932, Ex. N. V. Lichy coll. (MNHN).


Type Depository : Holotype preserved in Muséum National d’Histoire Naturelle, Paris.

Remarks. This new species belongs to the *pandocus*-group (*sensu* Shirozu & Shima, 1979 ; Shima, 1988) and is most closely related to *Y. nigricans* Snellen, 1892 from Java and Bali. It seems to be distinguishable from all other known species of the *pandocus*-group by the following combination of characteristics. Smaller in size; Termen of forewing weakly convex; UpF large subapical ocellus well developed; UpF outer yellow ring sharply defined; UnH subapical ocellus absent in space 3; brand markedly prominent; androconia rather slender at base; aedeagus in lateral view nearly straight.

**DISCUSSION**

The biogeographical position of Vietnamese *Ypthima*

Table 1 shows *Ypthima* species diversity in different regions of Vietnam. The species composition is most diverse in northern and central Vietnam (Tonkin and Annam). The fauna of *Ypthima* in central and north Annam is more similar to Tonkin’s fauna, while the fauna of southern Annam (C. Vietnam (S)) is closer to that of Cochinchina (S. Vietnam). The degree of similarity between regions was measured using Sorenson’s index of similarity, calculated as described by Magurran (1988). This index is a measure of biodiversity, or between-habitat diversity. The index, CS, is given by the formula $CS = \frac{2j}{a + b}$, where $j$ = the number of shared species at the two sites compared, $a$ = the number of species at site A, and $b$ = the number of species at site B. High values of CS indicate a high degree of similarity between the assemblages at the pair of sites.

Countries of South-East Asia in which Vietnamese *Ypthima* species were also recorded are also shown in Table 1. Significant similarity indices are revealed between the
Table 1. Distribution of *Ypthima* species collected in Vietnam.

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>N. Vietnam</th>
<th>Central (N) Vietnam</th>
<th>Central (C) Vietnam</th>
<th>S. Vietnam</th>
<th>Laos</th>
<th>Thailand</th>
<th>Burma</th>
<th>Sikkim</th>
<th>Nepal</th>
<th>Assam</th>
<th>S. &amp; C. India</th>
<th>S.W. India</th>
<th>S.E. China &amp; Hainan</th>
<th>Taiwan</th>
<th>Malaysia</th>
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| Total Number       | 17 | 9 | 11 | 10 | 7 | 14 | 19 | 23 | 7 | 15 | 16 | 10 | 9 | 31 | 13 | 11 | 8 | 7 | 9 | 8 | 4 | 5 |
| Number of shared species | x  | x | x  | x  | x | 11 | 13 | 14 | 5 | 5 | 9 | 3 | 3 | 7 | 7 | 4 | 5 | 3 | 3 | 1 | 1 | 2 |
community from Vietnam and those from adjacent countries such as Laos, Thailand and Burma (Table 2). More diverse high-mountain communities in W. and S.W. China and the Himalayas are characterized by high levels of distinctiveness and low similarity to Vietnam generally though with some greater similarity to mountainous areas of northern and central Vietnam. At the same time, relatively undiverse communities of southern regions of Vietnam display a similarity to the fauna of the Malay Peninsula and the Sunda Islands, where the low Ypthima diversity is also characteristic. There is also a similar rather weak link between the Ypthima fauna of Vietnam and parts of the Oriental regions such as Southeast China and Taiwan.

Maps for the distributions of Vietnamese Ypthima are shown in Figure 11. These maps display a rather distinct northern border for the genus distribution in general. All areas for the distribution of Vietnamese species lie to the south of a hypothetical line from Taiwan to Sichuan. There are clear visible northwestern and western borders which are inward to the continent for one group of species (sakra (1), persimilis (3), confusa (21), similis (8), savara (6)) and outward to the ocean for another group of species (praenubila (17), tappana (10), imitans (22)). The distributional border for the majority of species of the sakra-group is marginal on the Asian mainland. For the majority of species belonging to the philomela-group (baldus (11), nebulousa (13), philomela (14), lisandra (15)) Vietnam is the transitional zone connecting the South-East Asia mainland to the Sunda Islands.

Restricted-range and isolated species and race populations are mainly found in Vietnam (frontierii (19) sarcaposa (20), pseudosavara (7), daclaca (24), norma annamitica (16c), watsoni inouei (23c)).

This category of species comprises nearly 30% of the total number of Ypthima species in Vietnam. This percentage characterizes a high endemism level of Ypthima species in Vietnam.

It can be seen that the Ypthima fauna of Vietnam is characterized as transitional, joining southern butterfly communities of Malaya, Indo-China and the Sunda Islands to northern communities of the Himalayas and western China; and nearly one third of all Ypthima species in Vietnam are endemic.

Relatively high levels of Ypthima diversity (24 species) and endemism (30%) may be explained by the unique geographical position of the country in comparison with other areas of Oriental region. Mani (1986) notes that in spite of the high level of Himalaya isolation the number of butterfly endemic species is relatively low (2%) and the endemic genera are nearly absent. The same situation can be seen on the Malay Peninsula where butterfly endemic species are counted at not more than 2% of the total number of species (Eliot, in Corbet and Pendlebury, 1992). A similar pattern may be observed in the Indo-Chinese Peninsula, particularly in Vietnam, where endemic genera are absent though the level of endemic species and subspecies is relatively high. The high proportion of species endemism has a Tertiary origin. Endemism was established during the sea regression
Table 3. Examples of similarity between areas for endemic birds and butterfly distribution in Vietnam.

<table>
<thead>
<tr>
<th>Region</th>
<th>Bird endemics</th>
<th>Butterfly endemics</th>
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<tbody>
<tr>
<td>(Stattersfield et al., 1998)</td>
<td>(Tordoff et al., 2003)</td>
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<tr>
<td>South-East Chinese Mountains</td>
<td><em>G. magnificus</em></td>
<td><em>Ypthima frontierii</em></td>
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<td><em>Lethe philesanoides</em></td>
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<td><em>Papilio prexaspes intricatus</em></td>
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<td><em>Celaenorrhinus phuongi</em></td>
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<td><em>Scobura eximia</em></td>
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<td><em>Sovia eminens</em></td>
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<tr>
<td>Annamese Lowlands</td>
<td><em>Arborophila merlini</em></td>
<td><em>Ypthima pseudosavara</em></td>
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<td><em>Lophura imperialis</em></td>
<td><em>Stichophthalma uemurai</em></td>
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<td><em>Lophura hatinhensis</em></td>
<td><em>Aemona kontumei</em></td>
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<td><em>Aemona simulatrix</em></td>
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<td><em>Stachyris herberti</em></td>
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<td>Kon Tum Plateau</td>
<td><em>Garrulax ngoclinhensis</em></td>
<td><em>Helioporus smaragdinus</em></td>
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<td><em>Garrulax konkakihensis</em></td>
<td><em>Dodona speciosa</em></td>
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<td><em>Garrulax yersini</em></td>
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<td><em>Crocias langbianis</em></td>
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<td><em>Carduelis monguilloti</em></td>
<td><em>Delias vietnamensis</em></td>
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<td>South Vietnamese Lowlands</td>
<td><em>Arborophila davidii</em></td>
<td><em>Delias belladonna endai</em></td>
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<td><em>Polypeleon germani</em></td>
<td><em>Stichophthalma uemurai</em></td>
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when most of the Sunda Islands, Taiwan and Hainan were joined to the mainland (Voronov et al., 2002; Rainboth, 1996). At present endemic butterfly fauna of Vietnam comprise approximately 3% of the total number of known butterfly taxa. Their concentration is highest in the Central Highlands (Kon Tum, Gia Lai, Dac Lac and Lam Dong provinces) and also high in adjacent areas of the coastal lowland and Northeast Vietnam. It is possible to surmise that the value of endemism in Vietnam should be higher. However, it cannot be estimated precisely because the majority of natural lowland habitats are degraded and depopulated.

Nevertheless, some butterfly endemics have recently been discovered in remaining lowland forest fragments at sites such as Cat Tien, Bach Ma, Hon Ba, Phong Dien and Ben En protected areas; for example, *Ypthima pseudosavara*, *Y. daclaca*, *Y. watsoni inouei*, *Y. norma annamitica*, *Stichophthalma louisa eamesi*, *S. uemurai*, *Zeuxidia sapphirus*, *Discophora aesthetica*, *Pintara capiloides*.

The endemism level among *Ypthima* and other taxonomic groups of the Rhopalocera is only a modest confirmation of Eastern Indo-Chinese geographical isolation, the main proof of which is the complex of endemic vertebrates belonging to mammals, birds, reptiles and amphibians. In particular, distribution of the endemic butterfly species coincides with five endemic bird regions (Tordoff et al., 2003) (Table 3).

It is possible that during post-glacial warming and sea expansion the range of many butterfly species has become fragmented. This can be seen in vast areas from the Himalayas to central China and Indo-China, including Vietnam. Examples include such species as *Y. sakra*, *Y. dohertyi*, *Y. lisandra*, *Y. norma*, *Y. watsoni*, *Y. saracposa* and *Y. tappana*, the Vietnamese populations of which bear distinctive race characteristics.

ACKNOWLEDGMENTS

The authors wish to express their deep gratitude to the following persons and organizations who facilitated field and laboratory studies: Professor V.S. Roumak (Vietnam Russia Tropical Centre); Mr. Jonathan C. Eames (BirdLife
International in Indochina); administrative group of Frontier (UK)/Vietnam; Mr. Bui Xuan Phuong and Vu Van Lien (Vietnam Russia Tropical Centre), for assistance in collecting; to Mme. Nguyen Thi Hong and Professor Jacques Pierre (Museum National d’Histoire Naturelle, Paris) and to Messrs. Richard I. Vane-Wright, P.R. Ackery, W.J. Reynolds (The Natural History Museum, London) for the permission to study the collections, loan specimens and their kind help during the work in the museums; to Dr. K. Udéa (Kitakyushu Museum of Natural History and Human History, Kitakyushu) for taking photographs of the type series of *Ypthima* species deposited in the BMNH; to Messrs. T. Aoki and S. Yamaguchi (Research Institute of Evolutionary Biology, Tokyo), S. Koiwaya (Miyazaki), LtCol. J.N. Eliot (UK)/Vietnam; Mr. Bui Xuan Phuong and Vu Van Lien for the opportuni
ties to examine the specimens; to Mr. Tom Osborn for correcting the manuscript.

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