

Two New Chalcosiine Moths (Lepidoptera, Zygaenidae) from Northern Vietnam¹⁾

By

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Abstract Two new moths of chalcosiine zygaenids are described from northern Vietnam. One of them, named *Eterusia nobuoi*, resembles *E. tricolor* HOPE from the Himalayas and *E. watanabei* INOUE from Tsushima, Japan. The other, named *Achelura hai* is very similar to *A. bifasciata* (HOPE) and its allied species, but is easily distinguished from them by peculiarities of wing shape, venation and genitalia.

At the end of 1992, Professor Nobuo OHBAYASHI of Ehime University kindly gave me interesting male specimens of *Eterusia*, which were collected by him at the summit of Mt. Tam Dao, about 50 km to the north-northwest of Hanoi. At a first glance, the moths resemble *E. tricolor* HOPE, 1841, in the coloration and *E. watanabei* INOUE, 1982, in the forewing maculation, but are markedly larger.

At that time, Dr. Shun-Ichi UENO of our museum had been laying his project, entitled “Investigation of the insect fauna of northern Vietnam—particularly in relation to the Japanese fauna”. The first expedition of the project was carried out in the autumn of 1994, and I was fortunate in being selected as a member. From the 24th to the 26th of September, I visited the summit of Mt. Tam Dao for collecting day-flying moths. It was cloudy and misty, the sun hardly shone, and though I was able to collect *Amesia sanguiflua* (DRURY, 1773) and *A. aliris* (DOUBLEDAY, 1847) which were circling over the summit, I failed in finding moths of the genus *Eterusia*. The second expedition was made in the next spring. On the 22nd of April, 1995, I visited the summit of Mt. Tam Dao again and stayed three days for collecting day- and night-flyers. It was fine in the daytime, which enabled me to collect several males of the moth and similar agaristine moths. They flew so very fast and high, that it was difficult to collect them by a net with a short stick. Finally, Dr. Akiko SAITO, a specialist of cerambycid beetles and one of the participants of the expedition, succeeded in collecting a female at the same place. In this paper, I will describe it as a new species.

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In addition to this discovery, I was able to collect another interesting large chalcosiine moth of *Achelura* at Ban Khoang, 15 km northwest of Sa Pa (=Chapa, DE JOANNIS, 1928–1929), where a good natural forest still remains. The moth is intermediate in coloration between those of *A. bifasciata* (HOPE, 1841) from the Himalayas and *A. sanguifasciata* HORIE, 1994 from Taiwan, and was considered to be a good species new to science.

Before going further, I wish to express my heartfelt thanks to Dr. Shun-Ichi UÉNO, a curator emeritus of the National Science Museum, Tokyo, for his kindness in giving me an opportunity of participating in the project and in reading the manuscript of this paper. I am also deeply indebted to all the members of the expedition: Dr. Akiko SAITO, Natural History Museum and Institute, Chiba, Dr. Masataka SATÔ, Nagoya Women's University, Nagoya, Dr. Yoshiaki NISHIKAWA, Otemon Gakuin University, Ibaraki, and Dr. Akihiko SHINOHARA, National Science Museum, Tokyo. My hearty thanks are also due to Professor HA Quang Hung and other staff of the Department of Entomology, Hanoi Agricultural University, and Mr. NGUYEN Thuyet, Hanoi, for their kind aid in field works, to Professor Nobuo OHBAYASHI, Ehime University, Matsuyama, for offering valuable material to our museum, and to Professor Masami HAYASHI, Saitama University, Urawa, for identifying cicadas.

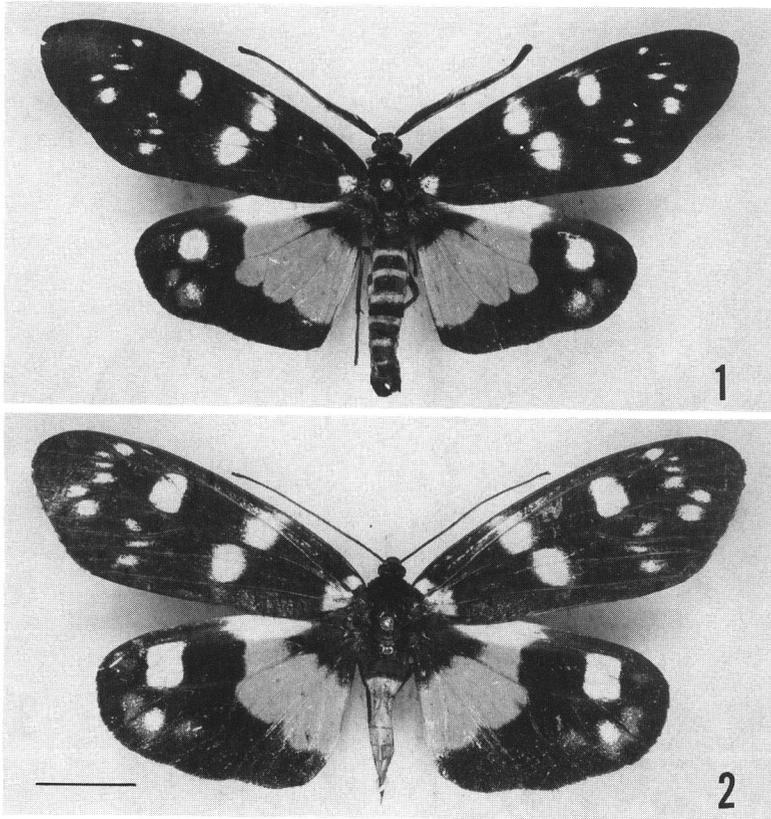
Eterusia nobuoi sp. nov.

(Figs. 1–4)

Male (Fig. 1). Length of forewing: 32–35 mm.

Antenna black, shaft tinged with turquoise lustre, bipectinate; underside of antenna tinged with reddish brown. Head and thorax black, mixed with bluish scales; abdomen purplish black, from 2nd to 6th segments each with a yellowish band; lateral sides of abdomen yellow with purplish black spiracles. Upperside of forewing black, tinged very slightly with moss-green lustre; a rather small yellow spot at basal portion; three large round yellow spots at the centre of discal cell, at the middle of CuP, and at the end of the cell, respectively; a series of small yellowish dots irregularly surrounding the discocellular spot. Upperside of hindwing black, very slightly tinged with bluish lustre; median band orange, pale ochreous yellow in costal portion, a large round yellow spot present at the end of discal cell, a small yellow spot below it; small blue shade present below apex. Underside of forewing black, veins broadly stained with blue in middle portion; yellow spots larger than those on the upperside, the central two spots fused, forming a yellow median band, a series of small dots whitish. Underside of hindwing almost of the same coloration as the upperside, marginal bluish shade larger.

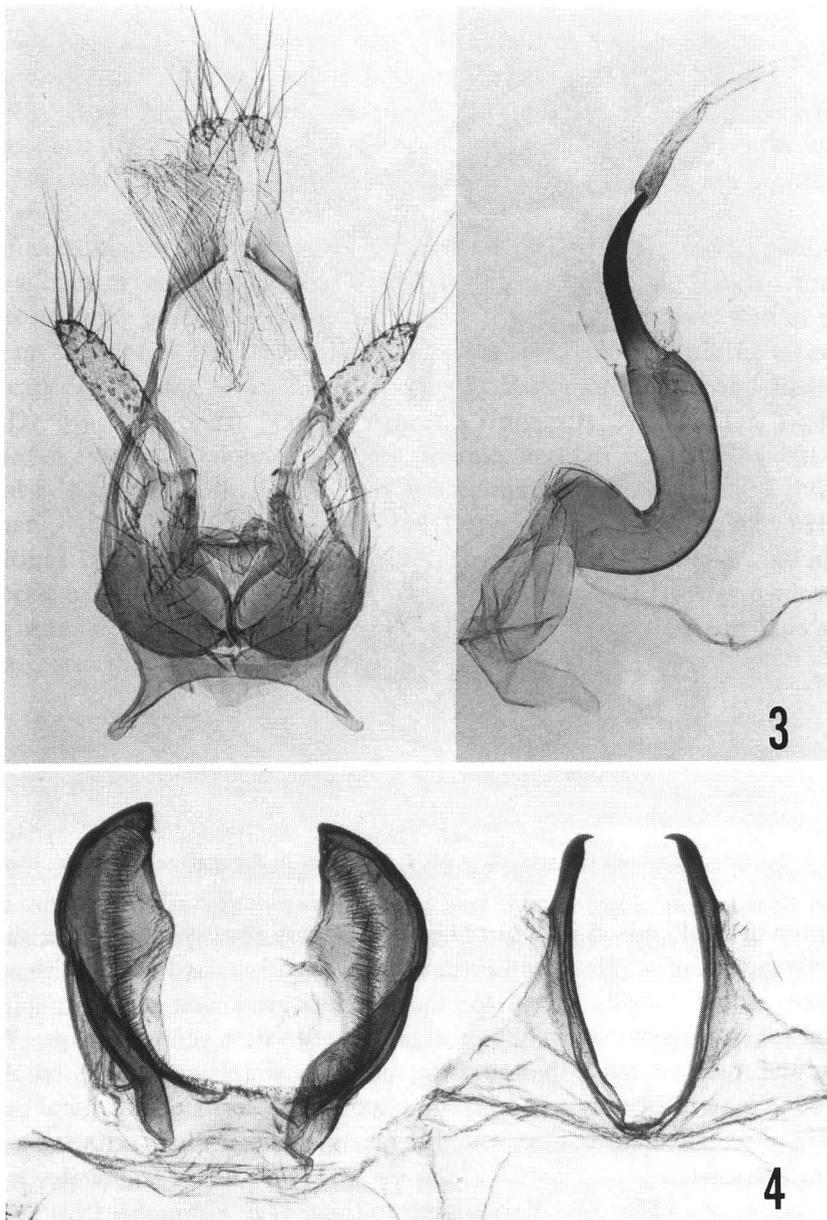
Female (Fig. 2). Length of forewing: 38 mm.



Figs. 1-2. *Eterusia nobuoi* OWADA, sp. nov.; 1, holotype ♂; 2, paratype ♀. Scale: 10mm.

Antenna black, mixed with turquoise scales, very shortly bipectinate, slightly broadened at the apex. Head and thorax black, slightly mixed with bluish scales. Abdomen yellow dorsally except for the purplish black first segment; spiracles blue-black; ventral segments of abdomen blue-black with a yellowish edge. Wings broader and more roundish than in male; markings almost as in male, basal spot of forewing larger, forming a band, yellow spots at the ends of the discal cells of both wings rectangular, not so roundish as in male, median orange band of hindwing narrower.

Male genitalia (Fig. 3). Very similar to those of *E. watanabei* INOUE, 1982, *E. tricolor* HOPE, 1841 and *E. taiwana* WILEMAN, 1910 (OWADA & HORIE, 1992, figs. 7-12). The size of genitalia as large as that in *watanabei*, somewhat larger than those in the others. A paired triangular projections of vinculum well developed as in *watanabei*. In valva, distal sclerite of tegumen broader; inner sclerotized portion of sacculus not so developed as in *watanabei*; outer margin of sacculus angulate at middle; central sclerite arising from ventral margin of valva



Figs. 3-4. Male genitalia (3) and 8th segment (4) of *Eterusia nobuoi* sp. nov., genit. slide no. NSMT 2361♂.

well developed as in *tricolor*. Aedeagus similar to that of *watanabei* except for the distal horn-like process shorter. Eighth abdominal segment (Fig. 4) almost as in *watanabei*, a pair of hooked processes of tergite rather short.

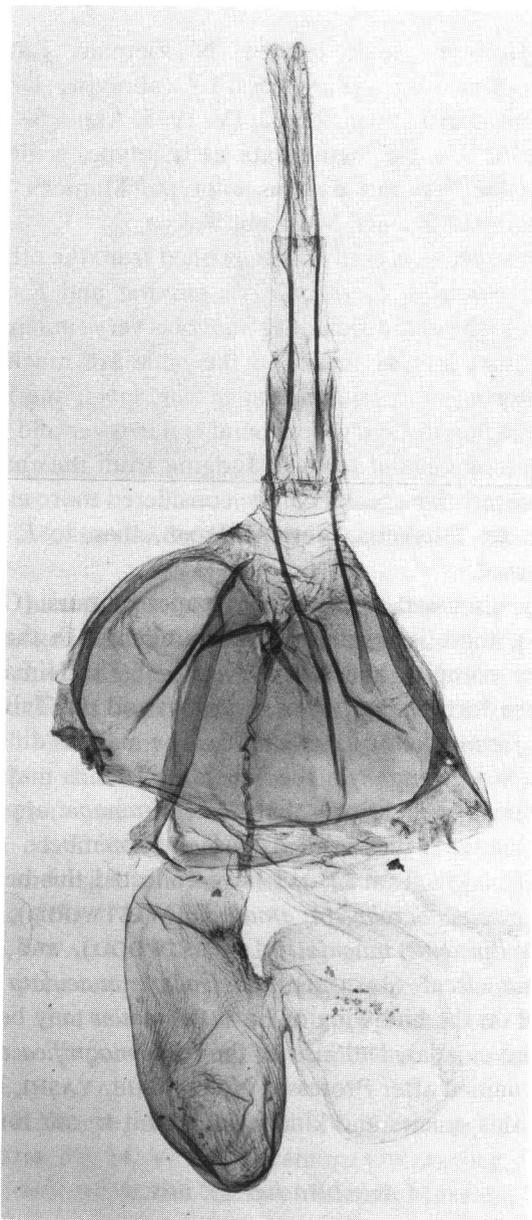


Fig. 5. Female genitalia of *Eterusia nobuoi* sp. nov., genit. slide no. NSMT 2362 ♀.

Female genitalia (Fig. 5). Very similar to those in *watanabei*, *tricolor* and *taiwana*. Eighth tergite as long as in *tricolor* and *taiwana*, not so long as in *watanabei*. Pleural areas of the 7th segment moderate, not so strongly sclerotized

as in *taiwana*.

Type series. Holotype, male, labeled "N. Vietnam, Tam Dao, 31. VII–2. VIII. 1992, N. OHBAYASHI leg.". Paratypes: 1 ♀ (allotype), labeled "N. Vietnam, Vinh Phu Prov., Tam Dao 1,230 m, 22–23. IV. 1995, Akiko SAITO leg. / Genitalia slide no. NSMT 2362 ♀"; 1 ♂, same data as holotype, genit. slide no. NSMT 2361 ♂; 4 ♂, same locality and date as allotype, Mamoru OWADA leg. All preserved in the National Science Museum, Tokyo.

Remarks. This species is easily distinguished from the other members of the *tricolor* complex of *Eterusia*, *E. tricolor*, *E. taiwana* and *E. watanabei*, by the markedly larger size. The coloration of *E. nobuoi* is very similar to that of *tricolor*, but the basal and discocellular marks in the male are much larger, the outer margin of male forewing more roundish as in *watanabei*, and in the hindwing of both the sexes the median orange yellow band is narrower and the terminal black margin broad extending beyond tornus. Judging from the characteristics of the male genitalia, however, this species can be considered more closely related to *E. watanabei* endemic to Tsushima, western Japan, than to *E. tricolor* from the Himalayas to Thailand.

As was briefly discussed in a previous paper of ours (OWADA & HORIE, 1992, pp. 405–408), there is a geographical parallelism in the wing maculation between the *tricolor* complex and *Eterusia aedea*. The Himalo-Indochinese *E. tricolor* resembles the form *magnifica* of *E. aedea*, and the Taiwanese *E. taiwana* resembles *E. aedea formosana* JORDAN, 1908. The marked difference between *E. watanabei* and *E. aedea sugitanii* in the Tsushima Islands may have arisen from the difference in their flying periods, that is, *E. watanabei* appears from June to July, and *E. aedea sugitanii* flies from August to September.

At the summit of Mt. Tam Dao, I have collected this beautiful moth with similar agaristine moths, *Scrobigerina amatrix* (WESTWOOD), *Exsula dentatrix* (WESTWOOD) and *Episteme maculatrix* (WESTWOOD), and with very similar cicadas, *Becquartina electa* (JACOBI) and *Gaeana maculata* (DRURY). The orange yellow band on the hindwing of *Eterusia nobuoi* may be mimetic to those agaristine moths and cicadas, and also to the form *magnifica* of *Eterusia aedea*.

This species is named after Professor Nobuo OHBAYASHI, Ehime University, who first collected this species and kindly donated it to our museum.

Achelura hai sp. nov.

(Figs. 6–10)

Male (Fig. 6). Length of forewing: 42 mm.

Antenna black, bipectinate. Head, thorax and abdomen black, terminal portion of abdomen amber. Forewing rather broad, apical portion not protruded, M_1 bifurcate in distal portion; somewhat hyaline; ground colour on the upperside

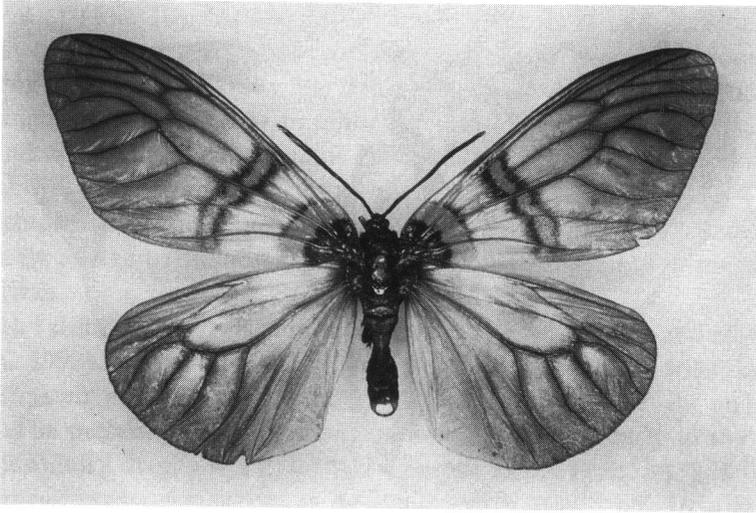


Fig. 6. *Achelura hai* OWADA, sp. nov., holotype ♂. Natural size.

pale cream yellow, mixed densely with blackish scales in distal half, veins black, basal black mark edged with a broad orange band which is margined externally with slender black shade, median orange band slenderer than the basal one, edged with broader black shades on both sides, running straight from costa to CuP and obtusely angulate. Hindwing broad, round; discocellular cross vein, which connects Rs and M₁, situated rather internally (Fig. 9); M₂ and M₃ separated (Fig. 9); ground colour and veins as in forewing, basal black mark present, very small and obtuse, edged externally with faint orange shade in costal portion. Coloration of the underside of wings almost as on the upperside.

Male genitalia (Fig. 7). Similar to those of *A. bifasciata* (see ALBERTI, 1954, pl. 10, fig. 6; OWADA, 1992, fig. 15; HORIE, 1994, fig. 6). Uncus broader, shorter, bifurcate projections shorter, central margin between the projections markedly swollen. In valva, basal sclerite of costa not so developed as in *bifasciata*. Bifurcate process of gnathos somewhat robust. Aedeagus more sinuate.

Type series. Holotype, male, labeled "N. Vietnam, Lao Cai Prov., Sa Pa, Ban Khoang 1,400 m, 12, 14. V. 1995, Mamoru OWADA leg. / Genitalia slide no. NSMT 2360♂", preserved in the National Science Museum, Tokyo.

Remarks. This species is confusingly similar to *A. bifasciata* (HOPE) from the Himalayas and *A. sanguifasciata* HORIE from Taiwan, but can be separated from them by the following characteristics: the pecten of male antenna decisively shorter; the apical portion of forewing not so protruded as in the others; in hindwing the cross vein between Rs and M₁ situated more internally (Fig. 9) than in *bifasciata* (Fig. 8), and connected with the cross vein between M₁ and M₂ in

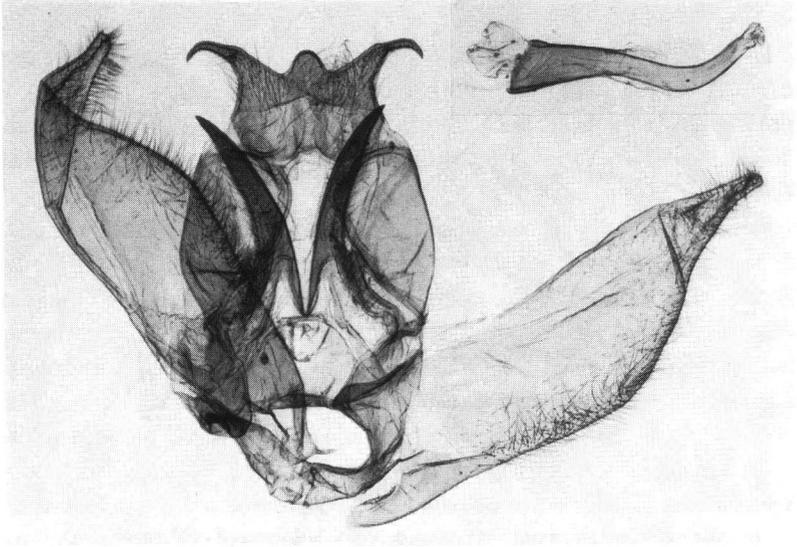
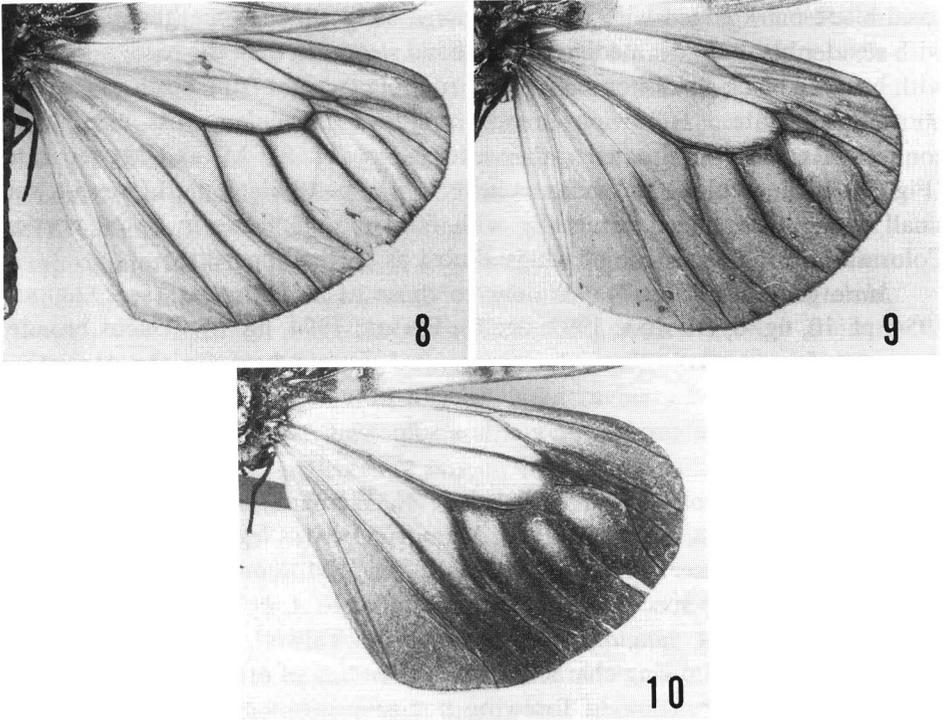


Fig. 7. Male genitalia of *Achelura hai* sp. nov., holotype, genit. slide no. NSMT 2360♂.



Figs. 8-10. Hindwing venation (σ^7); 8, *Achelura bifasciata*; 9, *A. hai* sp. nov.; 10, *A. sanguifasciata*.

sanguifasciata (Fig. 10); M_1 and M_2 separated (Fig. 9) as in *bifasciata* (Fig. 8), while they anastomose near cross vein in *sanguifasciata* (Fig. 10); ground colour of forewing pale cream yellow, while it is greyish white in *sanguifasciata*; the basal band orange instead of yellow in *bifasciata* and of bright red in *sanguifasciata*. The round wing shape of *A. hai* is much more similar to that of *A. javana* AURIVILLIUS, 1894, from Java (HERING, 1922, cf. *Agalope olgae*).

Judging from the male genitalic characters, this species is considered to be more closely related to *A. bifasciata* from the Himalayas than to *A. sanguifasciata* from Taiwan.

When I discussed the relationship among the genus *Agalope* and allied genera (OWADA, 1992), I stressed similarity of the life cycle and the foodplant in the genera *Elcysma* and *Achelura*, that is, they are autumnal flyers and *Prunus*-feeders. The present new species was, however, collected early in the summer, and was a solitary flyer, while *E. westwoodii* (VOLLENHOVEN, 1863), *A. bifasciata* and *A. sanguifasciata* are known as mass-flyers (OWADA, 1992; HORIE, 1994).

The immature stage and foodplant of *A. hai* are unknown. The collecting site of this species is an open place just beside a natural forest of evergreen broad-leaved trees, and I found a large *Prunus* tree there. I sought for additional moths enthusiastically, but in vain. Dr. Akiko SAITO told me that she encountered this moth once near the collecting site, though missed it.

This species is named after Professor HA Quang Hung, Hanoi Agricultural University, who has very kindly aided our field researches in northern Vietnam in 1994 and 1995.

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