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A new species of *Ahlbergia* Bryk, 1946 from Guangdong, SE China

(Lepidoptera: Lycaenidae)

by

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Abstract: *Ahlbergia dongyui* **spec.nov.** is described from Guangdong, SE China. It is somewhat similar to *A. leei* Johnson, 1992 in appearance, but the species can be easily separated by its much larger size, the ♂ brand is larger, the underside hindwing ground color is a uniform cinnamon reddish brown, and the valvae are always longer. For comparison, other species of *Ahlbergia* Bryk and *Cissatsuma* Johnson, 1992 are also discussed.

Zusammenfassung: Von Guangdong, aus dem Südosten Chinas, wird *Ahlbergia dongyui* **spec.nov.** beschrieben. Die neue Art ähnelt phaenotypisch der *A. leei* Johnson, 1992, kann jedoch leicht durch die größere Spannweite, den größeren Duftschuppenfleck beim ♂, die einheitlichere rötliche zimtbraune Grundfarbe der Hinterflügelunterseite und die konstant längeren Valven von dieser unterschieden werden. Zum Vergleich werden auch Arten von *Ahlbergia* Bryk und *Cissatsuma* Johnson, 1992 herangezogen.

Introduction: On a recent collecting trip to Nanling Nature Reserve, N. Guangdong, the junior author and his friend collected four ♂ specimens of a previously unknown *Ahlbergia* species from near the summit of a subalpine area The *Ahlbergia* has never been recorded from Guangdong province of China and this discovery is clearly the most southeastern record for the genus. The species discovered looked like a large *A. frivaldszkyi* (Lederer, 1855) and was identified as such by the collectors. However, the careful examination of external features and ♂ genitalia proved that butterfly was a new species, here described.

Ahlbergia d o n g y u i spec. nov.

Description ♂ (colour plate 4: A-C)

Upperside of forewing: ground color blackish, with a bluish tint; basal half of the forewing clad with bright blue scales except for the costal area; ♂ scent brand black and rather long, about a third as long as the forewings discocellular cell.

Upperside of hindwing: basal half or even the basal two thirds of the hindwing clad with bright blue scales; outer margin of the hindwing lined with bright blue scales in at least

spaces 1a, 1b and 2; anal lobe of hindwing developed, suffused with brown.
Underside of forewing: ground color reddish brown above vein 2, greyish brown below vein 2; postdiscal line blackish brown, margined by white scales on its outer side; submarginal markings blackish brown and sagittate, the area between outer margin of the forewing and the submarginal line densely clad with whitish scales.
Underside of hindwing: ground color almost uniformly of a cinnamon reddish brown, very sparsely powdered with whitish scales in the basal disc and submarginal area, these being almost invisible to the naked eye; postdiscal area slightly paler than the basal disc and submarginal area; subbasal dark lines usually present in the middle of the discocellular cell and also space 7 but they are sometimes absent; discocellular bar always well marked; discal line dark brown, narrow and rather clear in appearance, with sparse whitish scales on its outer side of the margin throughout, more clearly with white near costa and dorsum; submarginal markings darker reddish brown, sagittate and well separated by veins; marginal line black and clear.
♂ genitalia: as illustrated, valvae very elongated in ventral view.
♀ unknown.

Diagnosis
This new species closely resembles *A. leei* JOHNSON, 1992, but can be distinguished from the latter by the following combination of characters in ♂♂.
1: Size is much larger.
2: Brand is constantly larger.
3: Underside hindwing ground color is a uniform cinnamon reddish brown, whereas in *A. leei* JOHNSON it is a greyish brown and much darker in the basal disc than in the postdiscal area.
4: Underside forewing submarginal area is more densely clad with whitish scales than in *A. leei* JOHNSON.
5: Valvae are constantly longer than in *A. leei* JOHNSON.

Discussion
The new species, *A. dongyui* **spec. nov.** should be attributed to the *frivaldszkyi* group [including the *ferrea* group and the *frivaldszkyi* complex (*sensu* JOHNSON, 1992)], because of the bluish upperside ground color in the ♂ and the slender valvae. Thus, a detailed discussion is needed on all members of the *frivaldszkyi* group. According to JOHNSON (1992), *A. frivaldszkyi* (LEDERER, 1855) was considered to be a one of the six groups of species. However, *A. frivaldszkyi* (LED.) shows very slight differences from members of the *A. ferrea* group (sensu JOHNSON, 1992) and cannot be excluded from the latter. In JOHNSON's revision, the type specimen of *A. frivaldszkyi* (LED.) was not traced and examined, its identification being based upon topotypical information; the species was described as exhibiting an "ellipsoid scent brand in distal area of discal cell" in the ♂♂ [in JOHNSON's paper, the figure 70B of *A. frivaldszkyi frivaldszkyi* (LED.) was actually a reprint of holotype of *A. leei* JOHNSON, 1992, this mistake probably being due to carelessness in editing]. However, in a later work by MATSUDA & BAE (1998), the type series of *A. frivaldszkyi* (LED.) was traced in "Zoologisches Museum, Humboldt University, Berlin" The series was examined and both

sexes illustrated , with the lectotype specimen designated, and those authors clearly stated that the "♂ sex-brand is absent in the forewing upperside" in *A. frivaldszkyi* (LED.). It is apparent that MATSUDA & BAE's work based upon type material is more reliable on *A. frivaldszkyi* (LED.). Judging from the original description of *A. leei* JOHNSON and the reliable re-description of *A. frivaldszkyi* (LED.) including the illustrations of type specimens, and based upon an examination of specimens from N. China, *A. frivaldszkyi* (LED.) and *A. leei* JOHNSON are most probably different species, the former having the ♂ brand absent whereas the latter has ♂ brand slender but distinct. The two subspecies described under *A. frivaldszkyi* (LED.) by JOHNSON (1992), viz. *tricaudata* and *aquilonaria* should be assigned to *A. leei* JOHNSON because both of them have ♂ brands present on upperside of forewing. Moreover, a further taxon described from Russia as *Satsuma inopinata* OMELKO & OMELKO, 1995 (perfect photos can be found in a website: http://szmn.sbras.ru/picts/butterfly/Lycaenidae/Ahlbergia_inopinata.htm) was later treated as a junior synonym of *A. tricaudata* JOHNSON by KORSHUNOV (1996). Judging from the original description and figures, *A. inopinata* (OMELKO & OMELKO) is undoubtedly conspecific with *A. leei* JOHNSON, and probably deserves a good subspecies, not a synonym of *A. leei tricaudata* JOHNSON.

In distribution, *A. frivaldszkyi* (LED.) is known from Altai (type locality: Eastern Buchtarminsk in Altai), Korea and N. China (judging from an examination of Beijing specimens), whilst *A. leei* JOHNSON is known from China (type locality: China, without exact locality; however specimens from Shaanxi have beem examined and are here illustrated) and E. Russia (OMELKO & OMELKO, 1995; KORSHUNOV, 1996; TUZOV, 1997); their distributions overlap but there is no evidence from field work that proves they are sympatric in nature. In external features, they are hardly distinguishable from each other except for ♂ brand. The new species, *A. dongyui* **spec. nov.** differs remarkably from *A. frivaldszkyi* (LED.) in having ♂ brand present, its size is much larger, the underside hindwing ground color is uniform bright reddish brown without dark coloration, the underside forewing submarginal area is broadly clad with whitish scales, and the ♂ valvae are consistently longer.

From NE China, Korea, Japan and Russian Far East, two other species are known within the genus, viz. *A. ferrea* (BUTLER, 1866) (= *A. korea* JOHNSON, 1992 synoymized by MATSUDA & BAE, 1998) and *A. arquata* JOHNSON, 1992, both belonging to the *frivaldszkyi* group. *A. korea* JOHNSON was originally described from the continental Far East including Korea as a representation of the Japanese *A. ferrea* (BTL.). However INOMATA (1994) disapproved JOHNSON's opinion, and treated *A. korea* JOHNSON as a geographical variation of *A. ferrea* (BTL.). Furthermore, according to MATSUDA & BAE (1998), the differences employed by JOHNSON to separate *A. korea* JOHNSON from *A. ferrea* (BTL.) proved to be due to normal individual variation instead of geographical variation. This treatment is accepted by the authors and *A. ferrea* (BTL.) was recorded also from N China by Chinese collectors (specimens from Beijing being examined). Both *A. ferrea* (BTL.) and *A. arquata* JOHNSON, are easily distinguishable from the new species, *A. dongyui* **spec. nov.** ♂♂ being smaller in size, the underside hindwing ground color in the postdiscal area is much paler, at least in costal half, in striking contrast to the very dark basal disc, and the underside forewing submarginal area is plain brown without powdered

Within the *frivaldszkyi* group a further species, *A. hsui* JOHNSON, 2000 was added recently from Gansu based upon just ♀♀ specimens. The holotype ♀ was deposited in the Institute of Zoology, Chinese Academy of Science, Beijing and was examined by the senior author. The printing of the original description of *A. hsui* JOHNSON is too crude to show the color of wings correctly, the true ground color of the underside being more yellowish than in the original printing. (Good photos of the holotype will be published again to accurately illustrate the correct color together with the newly discovered ♂ specimen in another paper.) It is very interesting that several ♂♂ of *A. hsui* JOHNSON have been discovered recently by a Chinese collector from S. Gansu and three of them have been examined by the senior author. Thus, it is possible here to discuss the difference between *A. dongyui* **spec. nov.** and *A. hsui* JOHNSON as follows:

The ♂ of *A. husi* JOHNSON differs very much from *A. dongyui* **spec. nov.** in that its size is much smaller, the ♂ brand is absent, the underside ground color is brownish grey with a yellowish hue, all lines and markings are very clearly defined, and the valvae is stouter. A. *dongyui* **spec. nov.** shows some resemblance to some species of the *pluto* group in their reddish underside ground color, but it can be easily distinguished from *A. pluto* (LEECH, 1893), *A. clarofacia* JOHNSON, 1992, *A. aleucopuncta* JOHNSON, 1992, *A. unicolora* JOHNSON, 1992, *A. pictila* JOHNSON, 1992 and *A. distincta* HUANG, 2003 simply in that the upperside ground color is more or less bluish, at least in the basal half, and the valva is narrower at thet base and is more slender in shape. Within the *pluto* group, *A. caerulea* JOHNSON, 1992 from Gansu is still unknown in ♂; in the original description the photos of the unique holotype ♀ was incorrectly described as a ♂, a ♀ genitalia being illustrated.

Considering that the sexual dimorphism of *Ahlbergia* species is not pronounced in the wing-pattern and ground color on underside of wings, it is reasonable here to compare the ♂ of *A. dongyui* **spec. nov.** with the ♀ of *A. caerulea* JOHNSON for specific differences. On the underside *A. dongyui* **spec. nov.** differs remarkably from *A. caerulea* JOHNSON in having the ground color bright reddish brown, not grey-brown as in *A. caerulea* JOHNSON, the forewing submarginal crescents are present and the submarginal area is broadly suffused with whitish scales which are absent in *A. caerulea* JOHNSON, and the hindwing postdiscal area is only slightly paler than the basal disc. It is obvious that *A. dongyui* **spec. nov.** is not associated with the *chalybeia* group and the *leechi* group.

The remaining *circe* group is more complex and some species are rather questionably grouped. Within the *circe* group, both *A. prodiga* JOHNSON, 1992 and *A. leechuanlungi* HUANG & CHEN, 2005 are characterized by a blackish ground color on the underside, *A. circe* (LEECH, 1893) has the ♂ upperside ground color totally brown, *and A. lynda* JOHNSON, 1992 has the postdiscal markings and the submarginal area of the hindwing underside broadly clad with whitish scales; thus all of them can be easily distinguished from *A. dongyui* **spec. nov.** The remaining *A. haradai* (IGARASHI, 1973) and *A. caesius* JOHNSON, 1992 were described only from ♀♀, but both of them are much paler in the postdiscal area than in the basal disc on the underside of the hindwing; thus can be easily distinguished from *A. dongyui* **spec. nov.** *A. chalcidis* CHOU & LI, 1994 from Yunnan is very similar to *A. chalybeia* (LEECH,

1893) and *N. cibdela* JOHNSON, 1992 in external features, although its generic classification is uncertain because both, the ♂ and ♀ genitalia have not been carefully examined. However *A. chalcidis* CHOU & LI can not be confused with *A. dongyui* **spec. nov.** in external features.

Because there is no difference in ♂ genitalia between *Ahlbergia* BRYK and *Cissatsuma* JOHNSON, 1992, it is necessary here to compare *A. dongyui* **spec. nov.** with all the known species of *Cissatsuma* JOHNSON, 1992. Generally speaking nearly all the *Cissatsuma* JOHNSON, 1992 species have the bilobed configuration of ♂ valvae remarkably broader and stouter than in *A. dongyui* **spec. nov.** Only *C. kansuensis* JOHNSON, 1992 shows a similar ♂ valvae to *A. dongyui* **spec. nov.**, but differs in having the apex of the forewing more pointed, the termen straighter below vein 4, and the ♂ upperside ground color is entirely of a rich brown color.

Type data: Holotype ♂, LF 15mm, Nanling Nature Reserve, Ru-yang, Guangdong province, China, May 2nd 2005, leg. C.-H. ZHAN. Deposited in Biological Laboratory of Qingdao Vocational and Technical College, Qingdao, China.
Paratype: 1 ♂, same data as holotype, deposited in the senior author's private collection; 2 ♂♂, same data as holotype, deposited in the junior author's private collection.
Etymology: The new species is named after the son of the junior author.
Distribution: N. Guangdong only.

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Colour plate 4, p. 284

Fig. A: *Ahlbergia dongyui* **spec.nov.** Holotype ♂ upperside (left half, with ♂ brand outlined in white) and underside (right half).

Fig. B: *Ahlbergia dongyui* **spec.nov.** Paratype ♂ upperside.

Fig. C: *Ahlbergia dongyui* **spec.nov.** Paratype ♂ underside.

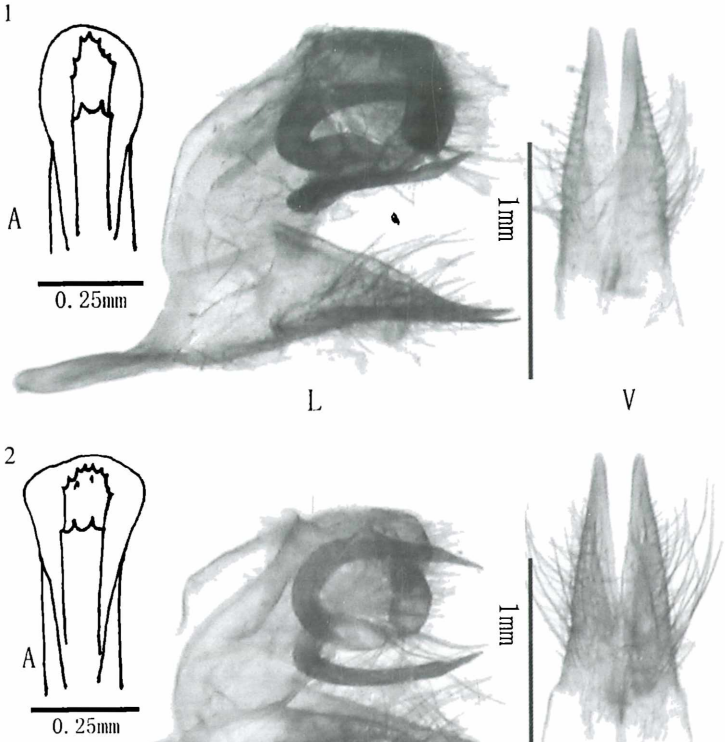
Fig. D: *Ahlbergia leei* JOHNSON, 1992 ♂ (Chang-an, Shaanxi) upperside (left half, with ♂ brand outlined in white) and underside (right half).

Explanation of the genital figures on p. 174

Fig. 1: ♂ genitalia of *Ahlbergia dongyui* **spec.nov.** taken from holotype (A: aedeagus tip enlarged; L: lateral view of whole genitalia: V: valvae in ventral view).

Fig. 2: ♂ genitalia of *Ahlbergia dongyui* **spec.nov.** taken from paratype (A: aedeagus tip enlarged; L: lateral view of whole genitalia; V: valvae in ventral view).

Fig. 3: ♂ genitalia of *Ahlbergia leei* JOHNSON, 1992 taken from specimen illustrated in fig. 4 (A: aedeagus tip enlarged; L: lateral view of whole genitalia; V: valvae in ventral view; R: ring in ventral view).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A
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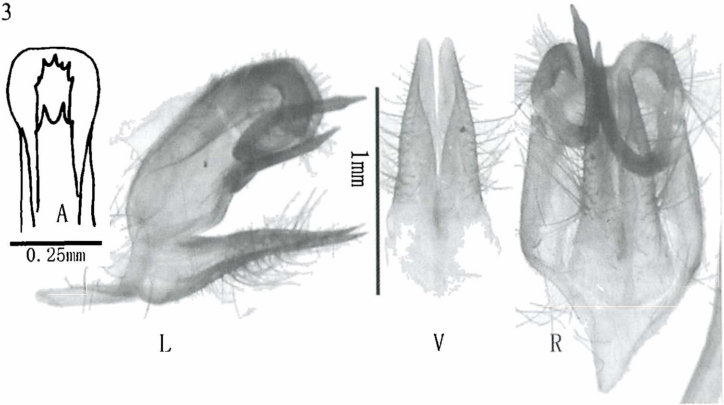


Atalanta (September 2006) **37** (1/2): 281-282, Würzburg, ISSN 0171-0079

Colour plate 3/ Farbtafel 3 (p.282)

HUANG, H. & K. SONG: New or little known elfin lycaenids from Shaanxi, China (Lepidoptera: Lycaenidae). - Atalanta (August 2006) 37 (1/2): 261-167, Würzburg

Fig. 1: *Ahlbergia luoliangi* **spec.nov.** Holotype ♂ upperside (♂ brand outlined in white on left forewing).

Fig. 2: *Ahlbergia luoliangi* **spec. nov.** Holotype ♂ underside.

Fig. 3: *Ahlbergia luoliangi* **spec.nov.** Paratype ♀ upperside (left half) and underside (right half).

Fig.4: *Ahlbergia leei* JOHNSON, 1992 ♀ (Chang-an, Shaanxi) upperside (left half, with ♀ brand outlined in white) and underside (right half).

Fig. 5: *Ahlbergia leei* JOHNSON, 1992, ♀(Chang-an, Shaanxi) upperside (left half) and underside (right half).

Fig. 6: *Ahlbergia hsui* JOHNSON, 2000, ♂ (Xing-long-sfan, S. Gansu) upperside (left half) and underside (right half).

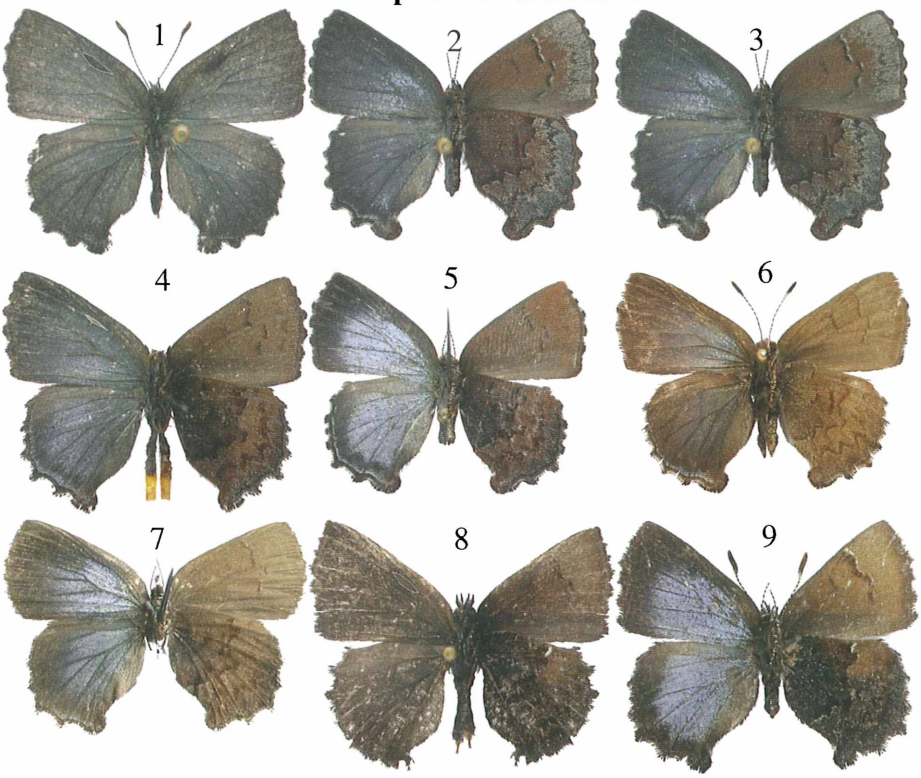
Fig. 7: *Ahlbergia hsui* JOHNSON, 2000, Holotype ♂ (Kang-xian, S. Gansu, deposited in IZAS) upperside (left half) and underside (right half).

Fig. 8: *Novosatsuma collosa* JOHNSON, 1992, ♂ (Chang-an, Shaanxi) upperside (left half, with ♂ brand outlined in white) and underside (right half).

Fig. 9: *Novosatsuma collosa* JOHNSON, 1992, ♂ (Chang-an, Shaanxi) upperside (left half) and underside (right half).

Fig. 10: Costal area of forewing showing ♂ brand. C: *A. clarofacia* JOHNSON; Le: *A. leei* JOHNSON, 1992; Lu: *A. luoliangi* **spec.nov.**; H: *A. hsui* JOHNSON, 2000; A: *Cissatsuma albilinea* (RILEY, 1939); D: *A. dongyui* HUANG & ZHAN, 2006.

Colour plate 3/ Farbtafel 3



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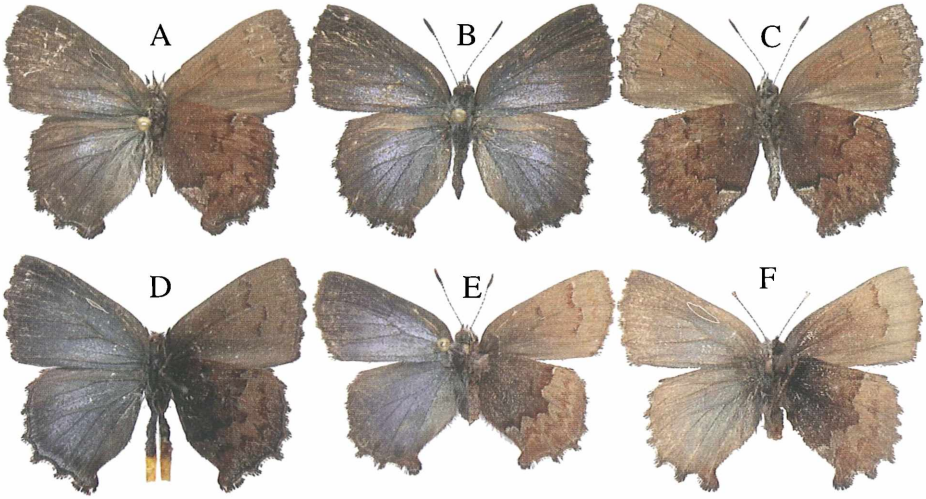
Colour plate 4/ Farbtafel 4



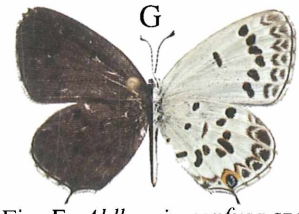
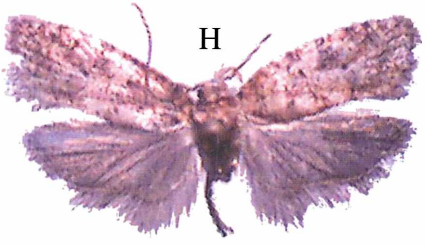
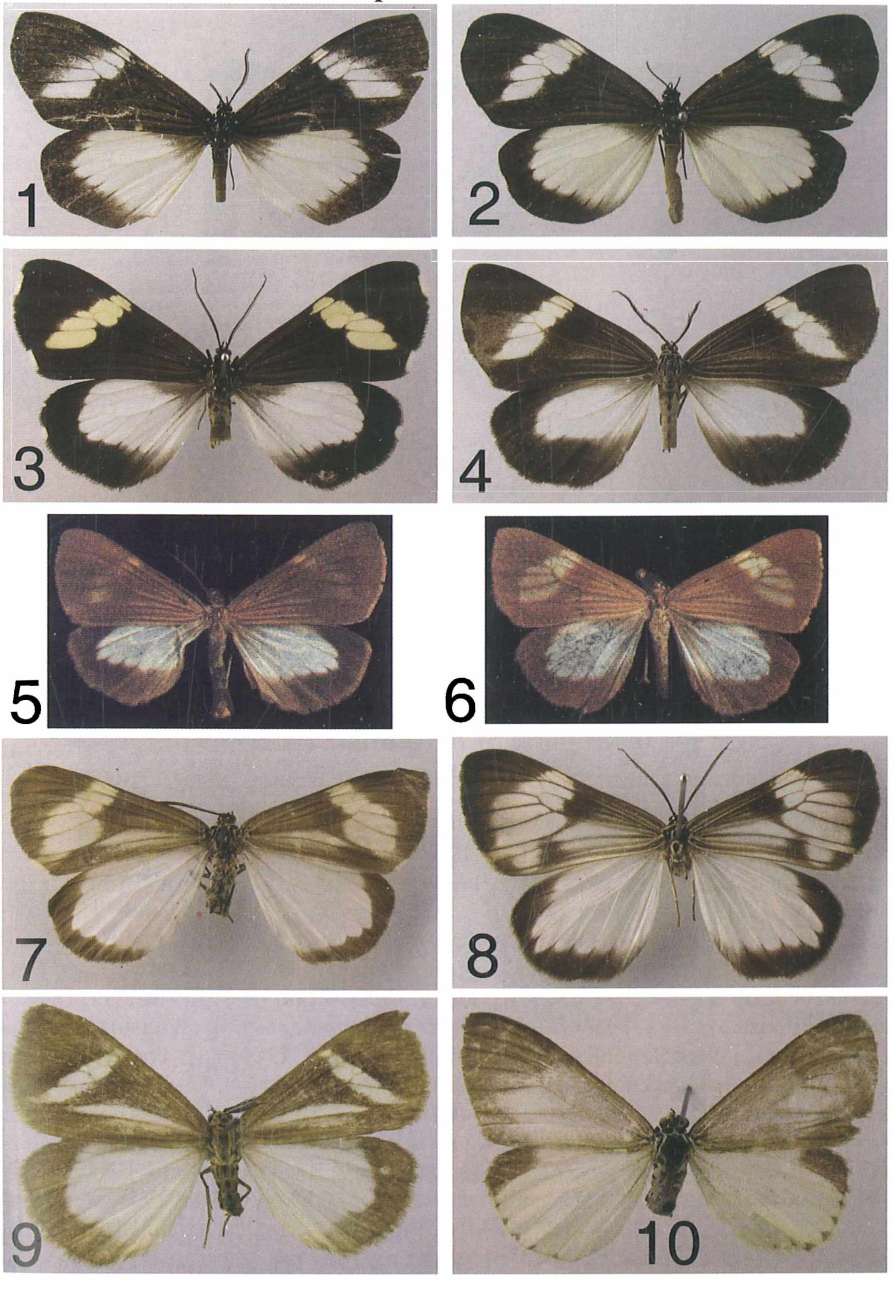


Fig. A: *Ahlbergia dongyui* **spec.nov.** Holotype ♂ upperside (left half, with ♂ brand outlined in white) and underside (right half).
Fig. B: *Ahlbergia dongyui* **spec.nov.** Paratype ♂ upperside.
Fig. C: *Ahlbergia dongyui* **spec.nov.** Paratype ♂ underside.
Fig. D: *Ahlbergia leei* JOHNSON, 1992 ♂ (Chang-an, Shaanxi) upperside (left half, with ♂ brand outlined in white) and underside (right half).
Fig. E: *Ahlbergia confusa* **spec.nov.** Holotype ♀ upperside (left half) and underside (right half).
Fig. F: *Ahlbergia confusa* **spec.nov.** Paratype ♂ upperside (left half, with brand outlined in white) and underside (right half).
Fig. G: *Tongeia dongchuanensis* **spec.nov.**, Holotype ♂ upperside (left half) and underside (right half).



Agonopterix ferocella (CHRÉTIEN, 1910)

Colour plate 5/ Farbtafel 5



Colour plate 6/ Farbtafel 6

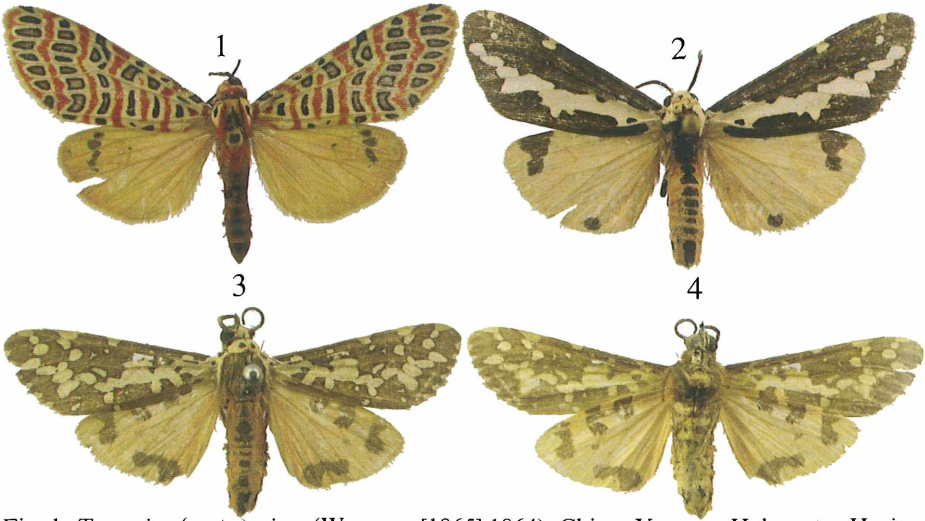


Fig. 1: *Tatargina* (s. str.) *picta* (WALKER, [1865] 1864), China, Yunnan, Haba mts., Hutiao vill., h=2100 m, 21-26.VI.1996, S. MURZIN leg.
Fig. 2. *Tatargina (Hindargina) pannosa* (MOORE, 1879), Nepal, Mahakali, Banku, 660 m, 20.VI 1995, anonymous leg.
Fig. 3-4. *Tatargina (Hindargina) sipahi* (MOORE, 1872), lectotype, India, Bombay, upperside (3) and underside (4).

Colour plate 5/ Farbtafel 5 (p. 285)

Atalanta (September 2006) **37** (1/2): 284-285, Würzburg, ISSN 0171-0079

DUBATOLOV, V. V.: On the generic status of the Afrotropical *Nyctemera* species (Lepidoptera, Arctiidae). - Atalanta (August 2006) **37** (1/2): 191-205, Würzburg.

Fig. 1: *Podomachla antinorii* (OBERTHÜR, 1880), ♂, Tanzania, 5 km S from Bukoba, Forest Kibira, 1.VI.1912, TROITSKII leg. (ZIN).
Fig. 2: *Podomachla antinorii* (OBERTHÜR, 1880), ♀, Cameroun, Bitye Ja River, 2000 ft, X-XI.1910 (MMUM). **Fig. 3**: *Podomachla apicalis* (WALKER, 1854), ♂, South Africa, Natal, Weenen, coll. by G.H. BURN (MMUM). **Fig. 4**: *Chiromachla restricta* (BUTLER, 1894), ♂, Kenya, Kibwezi, 31.VII.1917 (MMUM). **Fig. 5**: *Chiromachla torbeni* (WILTSHIRE, 1983), ♂, holotype, Yemen Arab Republic (N Yemen): Wadi Dhabab, 19.X.1981, TORBEN B. LARSEN leg., from: WILTSHIRE (1983). **Fig. 6**: *Chiromachla torbeni* (WALKER, 1983), ♀, allotype. Yemen Arab Republic (N Yemen): Wadi Annah, 1400 m, 22.V.1980, TORBEN B. LARSEN leg., from: WILTSHIRE (1983). **Fig. 7**: *Chiromachla insulare* (BOISDUVAL, 1833), ♂, [Madagascar], without label (MMUM). **Fig. 8**: *Chiromachla perspicua* (WALKER, 1854), ♂, without label, probably from West Africa (MMUM). **Fig. 9**: *Afronyctemera itokina* (AURIVILLIUS, 1904), ♂, Rwanda, Butare, XII.1976, A. POPOUDINA leg. (SZMN). Fig. **10**: *Xylecata hemixantha* (AURIVILLIUS, 1904), ♂, Rwanda, Butare, I.1977, A. POPOUDINA leg. (SZMN).