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A REVISED ANNOTATED AND DISTRIBUTIONAL CHECKLIST OF CHINESE *ANDRACA* (LEPIDOPTERA, OBERTHUERINAE) WITH DESCRIPTION OF A NEW SUBSPECIES

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ABSTRACT

The Chinese *Andraca* is revised with the check-list annotated. A new bombycid geographic subspecies, *Andraca nobilorum houtuae* Wang & Zolotuhin **subsp. nov.**, is described from Damingshan National Nature Reserve, South China. The new subspecies differs from the nominate *A. nobilorum* in Central Vietnam by the darker marker at the apex of the forewing indistinct but prominent in the holotype of *A. nobilorum*, and its male genitalia with the apex of valva slenderer and pointed. A key to the Chinese *Andraca* species and *Pseudandracra flavamaculata*, and the distributional maps are given. The male holotype specimen of the new subspecies is deposited in SCAU (South China Agricultural University, Guangzhou, China).

Key Words: *Andraca*, Bombycidae, taxonomy, new subspecies, South China

RESUMEN

Se describe una nueva especie de Bombycidae, *Andraca nobilorum houtuae* Wang & Zolotuhin **sp. nov.**, de la Reserva Natural Nacional de Damingshan de la región autónoma de Guangxi en el sur de China. Las manchas en las alas de la nueva especie son muy diferentes de otras especies de *Andraca*, y los genitales masculinos son muy similares a *A. theae* Matsumura, pero se distingue por tener el uncus más ancho, el ápice de la valvula bifurcado, la 1/3 parte distal de la valvula bien esclerotizada con una proyección casi triangular en la parte basal interior de la valva, aedeago más corto y más recto. Se provee una lista de las especies del género *Andraca*. Los especímenes tipo de la nueva especie están depositados en SCAU (Universidad Agrícola del Sur de China en Guangzhou, China).

Palabras Clave: *Andraca*, Bombycidae, Taxonomía, nueva subespecie, Sur de China

The genus *Andraca* Walker, 1865 was dealt with 3 times within the last 3 yr. It was briefly reviewed with special reference to the Vietnamese fauna by Zolotuhin & Witt (2009), and 2 new species were described in their paper. Wang et al. (2011) gave a check-list of species of the Chinese fauna and described a new species from Gongshan Mountain, Yunnan Province. Recently Zolotuhin (2012) revised the group, clarified the taxonomic situation with the generotypus that led to corresponding changes in a species checklist of the Chinese fauna. The present article is especially devoted to the *Andraca* fauna of China, because of their economic importance as pests on tea. Also previous identifications are discussed, distribu-

tional maps are given for the species based on materials kept in Chinese and European collections, and a new subspecies is described herein.

Material Examined

Material for this article comprises collections kept in different Museums abbreviated here as (alphabetically listed): BMNH, British Museum, Natural History – London, UK; EIHU, Hokkaido University – Sapporo, Japan; HUNAU, Hunan Agricultural University – Changsha, China; MWM, entomological Museum Th. Witt – Munich, Germany; IZAS – Institute of Zoology, Academy of China – Beijing, China; NSMT, National Sci-

ence Museum – Tokyo, Japan; RMS, Riksmuseet Stockholm – Sweden; ZFMK, Zoologisches Forschungsinstitut und Museum Alexander Koenig – Bonn, Germany; ZMHU, Zoologisches Museum der A. Humboldt Universität – Berlin, Germany; ZSM, Zoologische Staatssammlung der Bayerisch Staaten – Munich, Germany; SMF, Senckenberg Museum – Frankfurt-am-Main, Germany. Further abbreviations used are: TL = type locality; NR= Nature Reserve.

The genitalic preparations illustrated were made using the standard dissecting techniques and mounted in Euparal on glass slides. Photographs of adult, abdomen and male genitalia were taken by a Canon EOS50D and Olympus Camedia C-750 camera with Soligor Adapter Tube for Olympus and Slide Duplicator for Digital 10 dpters modified for object glasses. Morphological terminology used in descriptions follows Lemaire & Minet (1999).

Based on the specimens preserved in the Museums and the materials collected from the field, all nine *Andraca* and *Pseudandraca* species in China were confirmed. The distributional maps of Chinese *Andraca* species and *Pseudandraca flavamaculata* are presented (Fig. 1), and a key to the *Andraca* species and *Pseudandraca flavamaculata* in China is given. Further, a new geographical subspecies of *Andraca nobilorum* is described in details.

Andraca Walker, 1865

List Spec. Lepid. Insects Colln. Br. Mus. 32: 581. Type-species: *Andraca bipunctata* Walker, 1865, List Spec. Lepid. Insects Colln. Br. Mus. 32: 582, by monotypy.

Andraca bipunctata Walker, 1865

Andraca bipunctata Walker, 1865, List Spec. Lepid. Insects Colln. Br. Mus. 32: 582. TL: [India] [Darjeeling] “Hindustan”. Lectotype: male (ZMHU) [examined].

Andraca angulata sensu Wang et al. (2011).

Diagnosis. No problems were encountered with the determination of the species from most localities, because of the strongly acute hind wings; females are characterized by festooned hind wings. In spite of external differences of populations of southern China, no real characters were found that distinguished them into separate subspecies. Therefore all are considered to belong to one species; but it seems quite possible that they might be separated later based on more refined methods of investigation.

Biology

Mountain species. In China and Thailand *A. bipunctata* seems to be a winter flier from late Aug to Feb at the altitudes from 1,000 to 2,300

m, but in Nepal and India this species develops 2 generations, which appear on the wing during Jun-Jul and Oct-Dec at altitudes from 800 to 2600 m. Preimaginal stages tend to be misidentified as *A. trilochooides* Moore and are illustrated in Zolotuhin (2012).

Distribution

China (Yunnan: northern Baoshan (Daoren Shan, Gaoligongshan), Yunxian (Dabingshan), Lancang (Fuli Mts.), Yulong (Wubaoshan); Guizhou: Jiangkou (Fanjingshan); Sichuan: Panzhihua (Daheishan); Myanmar (Chin State), northern Thailand (Chiang Mai, Nan), Northern India (Sikkim, Darjeeling, Meghalaya), Nepal. The species was absent from a list given by Wang et al. (2011) and only recently has it been noted from China by Zolotuhin (2012).

Taxonomic notes. For a long time *A. bipunctata* has been synonymized with *A. trilochooides*, and in many modern references from China, it is impossible to separate the data about these 2 taxa. This confusion was explained by Zolotuhin (2012) recently and both taxa are considered to be separate species.

Andraca trilochooides Moore, 1865

Andraca trilochooides Moore, 1865, List Spec. Lepid. Insects Colln. Br. Mus. 32: 582. TL: India, Darjiling. HOLOTYPE: male (BMNH) [examined].

Andraca trilochooides roepkei Bryk, 1944

Andraca roepkei Bryk, 1944, Ark. Zool. 35A 8: 17, pl. 3, fig. 22 (sic! not 21 as given in the text!). TL: N. E. Burma, Kambaiti, 2,000 m. Lectotype: male (RMS) [examined].

= *Andraca henosa* Chu & Wang, 1993, Sinozoologia 10: 242, fig. 26, pl. 2, fig. 26. TL: China, Yunnan, Yongshan. HOLOTYPE (by original designation): male (IZAS) [not examined].

Andraca bipunctata sensu Chu & Wang (1993) and Wang et al. (2011).

Diagnosis. Dark colored species with wing margin smooth. Somewhat similar to *A. theae*, but male genitalia are quite different (see Wang et al. 2011 for comparison), also the average size is larger.

Biology

The flight period in Vietnam occurs from Apr to Jul and again in Nov. However in China, where many more specimens are known, the species flies from late Apr to Aug and probably develops a few generations. It inhabits altitudes from 900 to 3,500 m, most typically altitudes of 1,600 to 2,400 m. Tea, *Thea sinensis* L., is recorded to be a host in India. Chu & Wang (1996: 18) recorded *Camellia japonica* L. (Theaceae) as a host of *A. henosa*,

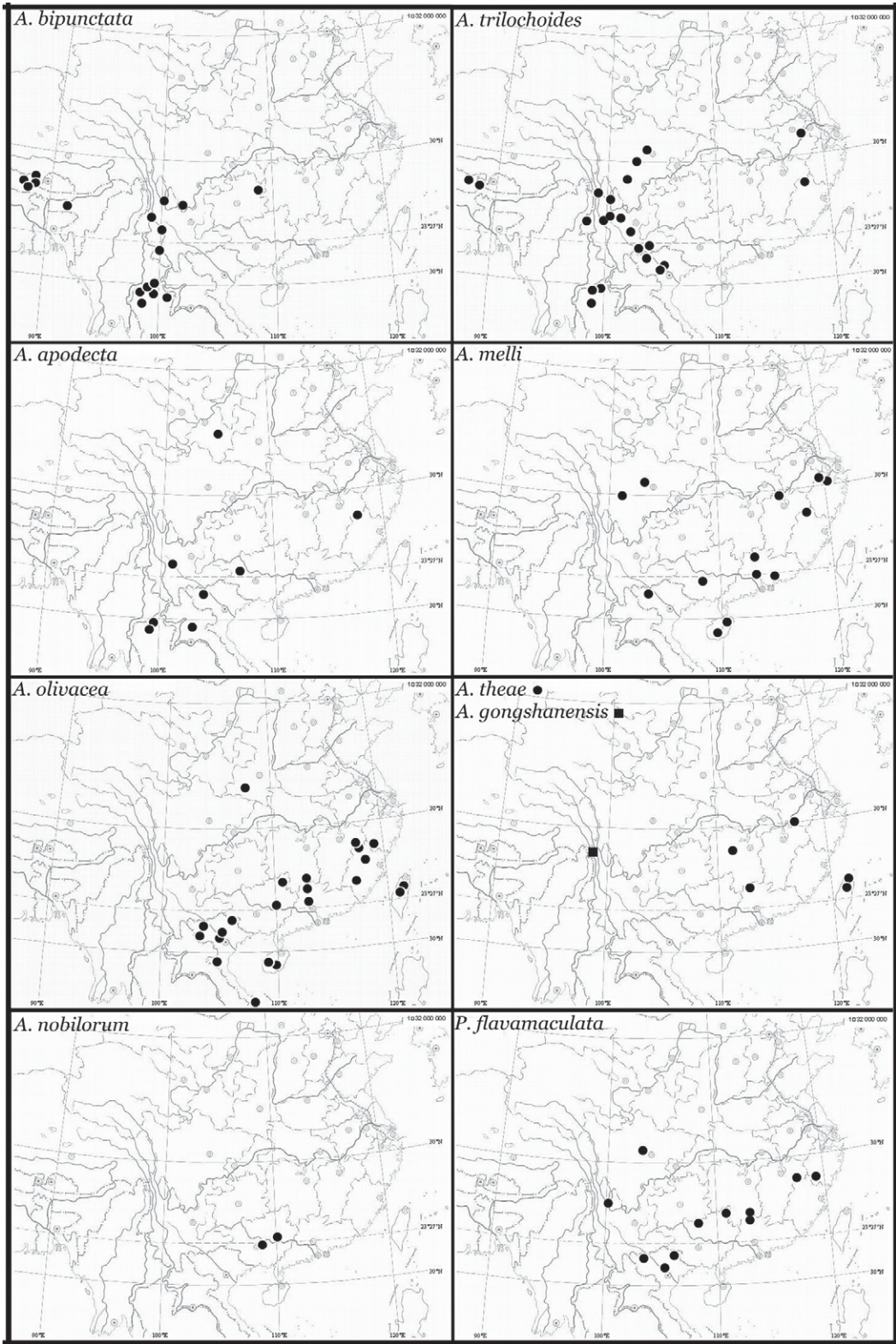


Fig. 1. Distribution maps of *Andraca* spp. and *Pseudandraca flavamaculata* in China.

and Wang et al. (2011) confirmed that the species is a serious pest on a tea tree and related *Camellia assamensis* and *C. oleifera* C. Abel.

Distribution

China (Yunnan: Gongshan (Dulongjiang), Yulong (13 km N. Caojian, Wubaoshan), Mojiang (Dajianshan Mts.), Yao'an (Sanfengshan Mts.), Yongping (Qingshan, Qiongsan), Tenchong (Gaoligong Mts.), Wenshan (Meizhiqing), Yuanyang (Baiyanzishan), Dali (Xiaguan); Sichuan: W Mianning (Daxue Shan), NW Chengdu (Qingchenghoushan Mts.), Ganzi (Qionglai Shan Mts., 31-13°N, 102-23°E); Anhui: Taihu Mountain (=Tapien Shan); Jiangxi-Fujian border: Wuyi Mts. (Zhixi)), Myanmar (north-eastern: Kambaiti), Northern Vietnam (Lao Cai: Mt. Fan-si-pan; Tam Dao; Son La), northern Thailand (Chiang Mai, Chiang Nan, Chiang Rai). The nominate subspecies is known from northern India (Sikkim, Darjeeling) and Nepal. One female with the label "China, Hainan island, Wuzhi Shan Mts., 20-II-10-IV-2001" in coll. MWM is also attributed to the species but this finding shall to be confirmed after males will be found from Hainan.

Taxonomic Notes

The species was for a long time confused with *A. bipunctata* and in many cases it is impossible to separate the data about both taxa. This confusion was explained by Zolotuhin recently (2012) and both taxa were considered separate species. The species was listed for China as *bipunctata* in Chu & Wang (1993) and in Wang et al. (2011).

Andraca apodecta Swinhoe, 1907

Andraca apodecta Swinhoe, 1907, Ann. Mag. Nat. Hist. (7)19: 49. TL: Padang, W. Sumatra. Lectotype: male (BMNH).

Diagnosis. The species is easily recognized due to large size, yellow- or reddish-brown ground color with darker vague pattern, smooth wing margin and especially by the absence of cornuti on a vesica.

Biology

The species is on the wing throughout the yr on the islands of Sumatra, Borneo and Sulawesi; and on the Asian continent it is known from Jul to mid-Sep, where it probably develops 1 generation per yr. Inhabits altitudes of 900-1,300 m on Sulawesi, 500-1,350 m on Sumatra, about 1,450 m on Borneo; on the continent it seems to be a mountain species with a preference for altitudes of about 1,600-1,800 m in Vietnam, 1,480-2,200 m in China and 1,550-2,000 m in Thailand. The caterpillars are collected on tea (*Camellia*, Theace-

ae) (Roepke, 1924) and *Thea sinensis* (Owada et al., 2002).

Distribution

China (Jiangxi-Fujian border: Wuyi Mts.; Shaanxi: Yuhuangding; Guangxi: Jinzhongshan; Yunnan: Sanfengshan), Laos, northern Vietnam (Mt. Fan-si-pan), northern Thailand (Chiang Mai; Nan), Sumatra, Borneo, Sulawesi.

Andraca melli Zolotuhin & Witt, 2009

Andraca melli Zolotuhin & Witt, 2009, Entomofauna Suppl. 16: 262, pl. 2, fig. 14; color pl. 24, figs. 11, 12.

TL: China, Prov. Guangdong, Mahn-tsi-shan. HOLOTYPE: male (ZMHU) [examined].

Andraca bipunctata sensu Chu & Wang, 1993: 241, fig. 25, pl. 2, fig. 25, and Zhu & Wang, 1996: 55, fig. 39, pl. 3, fig. 7, nec Walker, 1865.

Diagnosis. The smallest species of the genus. Shape of the hind wings of the males is diagnostic (distinctly angled at about 95°; both sides of outer margin (above and under the angle) are straight). Female can easily be identified by small size and rounded external margin of the hind wings.

Biology

Flight period in Thailand falls on Feb-May, Jul, Aug and Oct, therefore probably develops 2 or 3 generations. Inhabits altitudes of 80-1,800 m. Chu & Wang (1996: 18) recorded *Thea sinensis*, *Camellia oleifera* (Theaceae), *Fraxinus pennsylvanica* Marshall (Oleaceae), *Ternstroemia japonica* Thunb. (Ternstroemiaceae) as larval host plants for *A. bipunctata* [misidentification]. Wang et al. (2011) also listed *Pentaphylax euryoides* Gardner & Champion (Pentaphylacaceae).

Distribution

China (Zhejiang: W. Tianmushan (=Chekiang, West Tien-mu-shan), Linpingshan; Jiangxi-Fujian border: WuyiShan, 50 km SE of Yungtan, 27°55'N, 117°25'E; Jiangxi: Lushan (Kuling); Guangdong: Nanling, Luofushan (=Lo-fa-shan (Lo-fau-shan)), Ruyuan, 40 km W Guang Zhou (=Canton), Longtoushan (=Drachenkopf (Dragon Head)); Guangxi: Nanning; Hainan: Lingshan, Wuzhishan; Sichuan: Gongga Shan: 29-41°N, 101-58°E, 70 km NW Chengdu), northern Thailand (Chiang Nan: Bo Luang), Myanmar (25 E Putao). From Vietnam is known only from 2 females from Mt. Fan-si-pan therefore this finding should be confirmed by males.

Andraca olivacea Matsumura, 1927

Andraca olivacea Matsumura, 1927, J. Coll. Agric. Hokkaido Univ. 19: 50, pl. 3, fig. 7. TL: Formosa,

Horisha, Baibara. HOLOTYPE (by monotypy): male (coll. Sapporo Uni)(EIHU) [examined].

Andraca olivacea olivacens Mell, 1958

Andraca olivacens Mell, 1958, D. entomol. Z. (N.F.) 5: 211. TL: [China, Fujian] Kuatun, NW-Fukien. Lectotype: male (ZFMK) [examined].

= *Andraca hedra* Chu & Wang, 1993, Sinozoologia 10: 243, fig. 28, pl. 2, fig. 28. TL: China, Hainan, Jiannfeng. HOLOTYPE (by original designation): male (IZAS) [examined].

= *Pseudandraca ravida* Yang, 1995, Insects of Baishanzu Mountain: 354, figs. 2, 7. TL: [China] Zhejiang Prov., Mt. Baishanzu, 550 m. HOLOTYPE: male (pointed out to be in coll. of Beijing Agricultural University but absent there [Prof. Xin-Li, personal communication]).

Diagnosis. Olive-greyish ground colour is unmistakable; southern populations have distinct reddish tint.

Biology

Unknown. Flight period occurs during Feb-May, Jul-Aug, Oct and Dec, probably develops a few generations per yr. Inhabits altitudes from 950 to 1,600 m. Chu & Wang (1996: 18) recorded *Ficus benjamina* L. (Moraceae) as a larval host plant for *A. hedra*. For the nominate subspecies, the flight period occurs from Feb-mid Jul and from Aug-early Sep; probably develops a few overlapping generations per yr; inhabits altitudes from 400 to 1,160 m, mainly 470-650 m.

Distribution

China [Zhejiang: Baishanzu NR; Taiwan; Jiangxi: Guangze (Xipaihe vill.: 27-54'N, 117-20'E); Jiangxi-Fujian border; Wuyishan; Fujian: Longyan (Daimaoshan), Nanping (30 km SW); Shaanxi: Yangxian (Tsinling Mts.: 33-55'N, 107-44'E); Hunan: Yizhang (Hongxingqian-shan); Guangdong: Nanling NR, Shimentai NR; Guangxi: Mao'ershan NR, Jingxiu (100 km SE Liuzhou); Hainan: Jianfengling NR, Wuzhiahn Mts.], Vietnam, Myanmar (50 km E Putao). Surprisingly not known so far from Thailand. The nominate subspecies is endemic to Taiwan.

Taxonomic Notes

A mysterious *Pseudandraca ravida* Yang, 1995, described from Mt. Baishanzu is considered here as a synonym of the species; the same conclusion is given by Kishida & Wang (2011: 139) without any explanation. It was described with a scarce diagnosis in English - "Male length of body 17-19 mm, expanse of wings 45 mm, greyish yellow to greyish brown. Allied to the type species of the genus *P. gracilis* (Butler) from Japan, but differs by the postmedial line of forewing distinctly oblique,

not nearly vertical to the inner margin as the latter species, and others". The type specimens were not found in spite of a special search, but genitalic illustration given (of a very bad quality) and number of topotypical specimens (Fig. 2H) collected at the same location by Xing Wang in Apr and Jul 2011 allow us to confirm this synonymy. In any case, studying the type material, or at least its photo of sufficient quality, is necessary to define the status of the taxon more precisely.

Andraca gongshanensis X. Wang, Zeng & M. Wang, 2011

Andraca gongshanensis X. Wang, Zeng et M. Wang, 2011, ZooKeys 127: 36, fig 1E, 2E. TL: China, Yunnan Province, Gongshan Mt. HOLOTYPE: male (SCAU) [examined].

Diagnosis. Generally resembles *A. olivacea*; darker grey ground color with lighter yellow stripes on the wings are diagnostic. Male genitalia with uncus apex wedge-shaped, apex of valva constricted and truncate, sacculus without a strong dorsal spike.

Biology

Mountain species, collected from 2,100 m in July.

Distribution. The species is known from Southwest China (Prov. Yunnan). Maybe an endemic of Gongshan Mts.

Andraca theae (Matsumura, 1909)

Oreta theae Matsumura, 1909, Thous. Insects Japan, Suppl. 1: 134, pl. 13, fig. 10. TL: Formosa, [Beipu]. Lectotype: male (Sapporo University) [examined], here designated.

Diagnosis. Expanse males from 35 mm, mostly 42-43 mm, females 42-46 mm, forewing length - (18) 21-22 in males and 22-25 in females. Male genitalia are diagnostic.

Biology

Thea sinensis, *Camellia* spp., *Cleyera ochracea* DC, *Eurya japonica* Thunb. (Theaceae) and *Melastoma candidum* D. Don (Melastomataceae) are host plants (Sonan, 1937). Caterpillar of the nominate population was illustrated by Wang (1995: 20) and for mainland China—by Wang et al. (2011).

Distribution

Being formerly considered as endemic to Taiwan (Pingtung, Tai-tung, Taipei, Taoyuan, Nan-Tou, Ilan, Taichung, Hsinchu), the species is also known now from Mainland China (Anhui: Huangshan; Hunan: Wuyunjie NR; Guangdong: Nan-

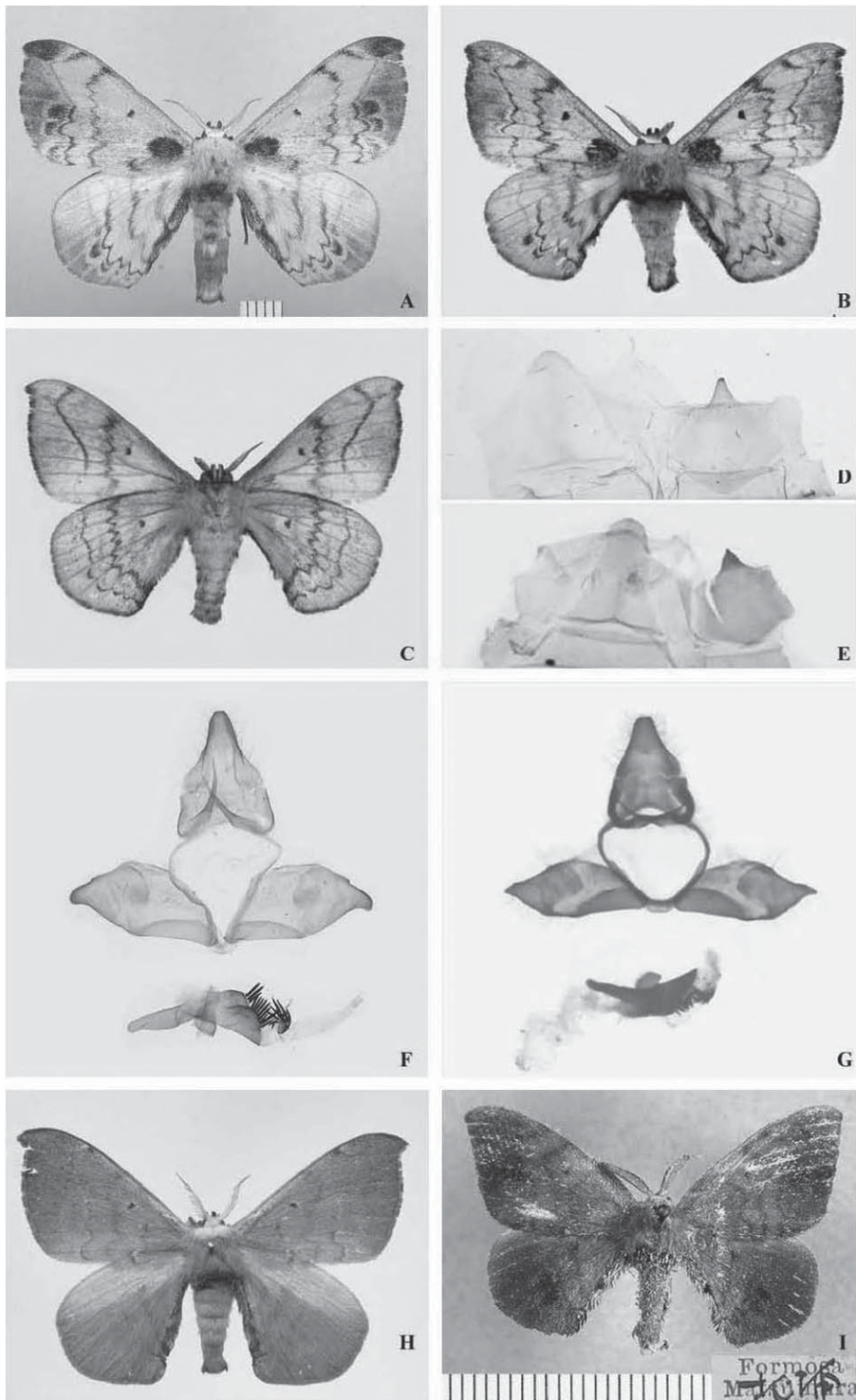


Fig. 2. *Andraca* spp.. A, D, F. *A. nobilorum nobilorum* Zolotuhin, 2012, male, HOLOTYPE (A. Adult; D. Abdomen; F. Genitalia); B-C, E, G. *A. nobilorum houtuae* Wang & Zolotuhin **subsp. nov.** male, HOLOTYPE (B. Adult, upperside; C. Adult, underside; E. Abdomen; G. Genitalia); H. *A. olivacea* from Baishanzu Mts.; I. *A. theae* from Taiwan, the lectotype. This plate in color can be seen in the Supplementary Material at Florida Entomologist 95(3) (2012) online at <http://purl.fcla.edu/fcla/entomologist/browse>

gling NR). Also, 2 conspecific males are known from West-Nepal (10 km N of Surkhet, 2,000 m, 7-VIII-1996, leg. M. Hreblay & B. Szin—MWM) but probably they might be mislabelled.

Taxonomic Notes

An original Matsumura series of moths was examined in Sapporo University by V. Zolotuhin. The species is designated by the original Matsumura ground label with inscription "*Andraca bipunctata* Wk. var. *Theae* Mats.". Most specimens originated from J. Sonan's collection and were collected from Taihoku in 1918; and therefore they are automatically rejected from the syntypic series. Only one male (Fig. 2I) satisfied the required data, and its label also bears an additional ink inscription in Taiwanese "Beipu" that in interpreted to mean Beipu town in Hsinchu County. This specimen is considered here as a lectotype of the species. At the same time, the specimen illustrated in the original description of Matsumura seems to be a female. The problem shall not be solved now. Subspecific separation is not clear, but only 2 bp are different between Taiwanese and South Chinese individuals in the COI sequences (658 bp).

Andraca nobilorum Zolotuhin, 2012

Andraca nobilorum Zolotuhin, 2012, Zootaxa 3262: 32, figs. 21, 22. TL: Central Vietnam, Prov. Kon Tum, Distr. Kom Plong, vill. Mang Canh, 1,250 m. HT: male (MWM) [examined].

Diagnosis. Light yellow ground colour and black basal patches on the fore wings are diagnostic.

Biology

Mountain species, collected from 1,250 m in Jun.

Distribution

The nominate subspecies is known from Central Vietnam (Prov. Kon Tum). Maybe endemic of Annam Mts. or Tay Nguyen Plateau. Another population is known from Guangxi and described here as a new subspecies.

Andraca nobilorum houtuae Wang & Zolotuhin, **subsp. nov.** (Figs. 2B-C, 2E, 2G)

Diagnosis. This new geographical subspecies differs from the nominate *Andraca nobilorum* (Fig. 2A, 2D, 2F) by the absence of an indistinct darker marker in the apex of the forewing, the apex of valve being thinner and pointed.

Male

Medium sized moths with forewing length 18-19 mm (Figs. 2B-C). Head. Small; antennae

brown, bipectinate except distal 1/3; vertex covered with short pale gray scales; compound eyes dark brown, naked and large; labial palpi upturned and correct, covered with brown scales except for orange scales ventrally.

Thorax. Dorsal surface brown with a pale yellow semi-circular spot interiorly. Forewing ground color pale yellow-brown, apex slightly falcate, with a small, obscure, irregular spot; termen slightly arched, curved near apex, fringe dark fuscous; inner margin slightly prominent at basal 1/3; antemedian fascia arched, short, near inner margin; discocellular and postmedian fasciae wavy, postmedian fascia with upper 1/2 liking a lying horizontally "V"; a bigger black spot at basal area and a smaller one at the end of the discal cell; submargin with a brown kidney-shaped spot. Hind wing ground colour pale yellow-brown with densely scaled basally; antemedian fascia black brown, upper half part vague; discocellular and postmedian fasciae black brown, wavy, upper part of postmedian absent; two black dots near middle of submargin; inner margin brown with black markings. Underside of forewing with distinct discocellular fascia, discal cell with a black dot. Underside of hindwing with distinct, well defined discocellular and postmedian fasciae, discal cell with a black dot.

Abdomen. Slender, yellowish brown, each segment with dark brown band posteriorly. Tergite VIII bell-shape, sternite VIII irregularly hexagonal (Fig. 2E).

Male genitalia (Fig. 2G). Uncus broader, duck beak-shaped with long sparsely hairs; gnathos consists of 2 elongate, inflated median arms; valva shuttle-shape with long hairs sparsely, apex very acute, distal 1/3 valva well sclerotized with a nearly triangular inner projection inwards basal valva; sacculus strongly sclerotized, folded upwardly; saccus short and broad; aedeagus slight arched with stronger densely apical spines.

Female

Unknown.

HOLOTYPE ♂ Damingshan National Nature Reserve, Guangxi Zhuang Autonomous Region, China, 2011-VIII-09, 1,200 m, Min Wang & Hou-Shuai Wang leg., deposited in Department of Entomology, SCAU; **PARATYPES**, 1 ♂, same data as holotype, deposited in Institute of Entomology, HUNAU. 1 ♂, male, Dayaoshan Nature Reserve (23°45'N, 109°45'E, 1,200 m in altitude), Jingxiu, Guangxi, China, 2005-IV, V. Siniaev leg., deposited in MWM.

Biology

Type specimens were collected in Damingshan National Nature Reserve on 9-VIII-2011 by the

light trap in the field surveys conducted. Hosts and preimaginal instars are unknown.

Distribution

China (Guangxi).

Etymology

In the Chinese mythology, Houtu is a Godness of the Earth. Her color was yellow and she was patronized under the Temple of Sun and under most constellations.

Remarks

The images of adult and of the genitalia of the holotype *Andraca nobilorum* from Central Vietnam (Fig. 2A, 2D, 2F) are provided here for comparing with the new subspecies. Zolotuhin (2012) reported a specimen of *A. nobilorum* from Dayao Shan, Guangxi with a differing by more than 2% in mitochondrial COI gene partial sequences (658 bp) from the holotype. In this paper, we consider that the specimen from Dayao Shan should belong to this new subspecies and define it as a paratype.

Pseudandraca Miyata, 1970

Tinea, Tokyo 8: 190.

Type-species: *Andraca gracilis* Butler, 1885, by original designation.

Pseudandraca flavamaculata (Yang, 1995)

Andraca flavamaculata Yang, 1995, Ins. Baishanzu Mt.: 354, figs. 3, 8. TL: [Mt. Baishanzu, 1,100 m, Zhejiang Prov., China]. HOLOTYPE: male (asserted to be in coll. Beijing Agricultural University, not it is not found there).

Andraca nabesan Kishida & Owada, 2002, Spec. Bull. Jap. Soc. Coleopt. 5: 467, figs. 4, 7. TL: Vietnam, Cao Bang, Cao Lang. HOLOTYPE: male (NSMT).

Diagnosis. The species is characterised in external characters by distinct contrasting citrus-yellow spots of the greyish ground color of the wings especially distinct in R-Cu cell of the forewing. Male genitalia are also very characteristic, especially in the shape of the valva and in the presence of a strong sharpened basal inner process.

Biology

Flight period from Mar to beginning of Sep. Inhabits altitudes from 1,100 to 3,200 m. Preimaginal stages, females and food plants unknown. For the subspecies *nabesan*, flight period was given by Owada et al. (2000) to be only in Feb; in MWM, the moths were collected from Apr to Jul and again in Nov and Jan, probably develops 2 generations. Inhabits altitudes from 1,600 to 2,250 m, but mainly 1,600-1,800 m. Preimaginal stages, females and hosts are still unknown.

Distribution

Known only from the southern China (Zhejiang: Mt. Baishanzu; Jiangxi: Guangze (Xipaihe vill); border Jiangxi/Fujian: WuyiShan; Fujian [Fukien]: Kuatun; Yunnan: Yunlong (Fengshuining Mts.); Sichuan: Gongga Shan, 70 km NW Chengdu; Guangdong: Nanling NR; Guangxi: Mao'ershan NR, Jiuwandashan NR; Hunan: Mangshan NR) and Vietnam (Tam Dao; Lao Cao; Cao Bang; Mt. Fan-si-pan).

KEY TO THE CHINESE *ANDRACA* SPECIES AND *PSEUDANDRACA FLAVAMACULATA*

1. Forewing with a prominent black basal spot. *A. nobilorum houtuae*
- Forewing without the prominent black basal spot 2
2. Hindwings angled 3
- Hindwings rounded. 4
3. Termen of hindwings festooned *A. bipunctata*
- Termen of hindwings smoothed *A. melli*
4. Ground color brown. 5
- Ground color grayish 7
5. Head covered with reddish brown hairs *A. apodecta*
- Head covered with dark brown hairs 6
6. Costa of forewing ornamented with silver scales distinctly; Uncus long with basal narrowing and

- apical cut *A. trilochoides*
- Costa of forewing ornamented with silver scales indistinctly; Uncus short without basal narrowing and pointed apically. *A. theae*
7. Forewings with distinctly reddish yellow patterns. 8
- Forewings without reddish yellow patterns *A. olivacea*
8. Apex of forewing with two distinct reddish yellow spots. R-Cu cell contrastly yellowish.
. *P. flavamaculata*
- Apex of forewing without the distinct reddish yellow spot. R-Cu cell so-coloured with a ground color *A. gongshanensis*

CONCLUSION AND DISCUSSION

The phylogenetic position of the genus *Andraca* is still disputed. Traditionally, it was considered to be within the Bombycidae (Zolotuhin & Witt 2009; Zolotuhin 2012). Recently, Zwick et al. (2011) transferred it to the family Endromidae based on phylogenetic analysis using molecular data, but only a few samples were included in their study. No doubt the genus *Andraca* is close to *Mustilia* Walker, 1865 and *Mustilizans* Yang, 1995 belonging to ‘the *Mustilia* lineage’ of the Prismostictinae (Lemaire & Minet 1999; Wang et al. 2011), but the phylogenetic position of the subfamily Prismostictinae must be confirmed in the future work. In this paper, we placed the genus *Andraca* in the family Bombycidae.

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REFERENCES CITED

BRYK, F. 1944. Entomological results from the Swedish expedition 1934 to Burma and British India. Lepidoptera: Saturniidae, Bombycidae, Eupterotidae, Uraniidae, Epilemidae und Sphingidae. Arkiv för Zoologi 35A(8): 1-55.

CHU, H. F., AND WANG, L. Y. 1993. Bombycidae of China. Bulletin of Zoology. Science Press, Beijing.10: 211-238. (in Chinese)

CHU, H. F., AND WANG, L. Y. 1996. Fauna Sinica Insecta V, Lepidoptera: Bombycidae, Saturniidae, Thyrididae. Science Press, Beijing, 302 pp. (in Chinese)

KISHIDA, Y., AND WANG, X. 2011. Bombycidae, pp. 137-139 In M. Wang and Y. Kishida [eds.], Moths of Guangdong Nanling National Nature Reserve. Goecke & Evers, Keltorn. 373 p.

LEMAIRE, C., AND MINET, J. 1999. The Bombycoidea and their relatives, pp. 321-354 In N. P. Kristensen [ed.]. Lepidoptera, Moths and Butterflies. 1. Evolution, systematics and biogeography. Handbook of Zoology 4(35): 1-491. Walter de Gruyter, Berlin & New York.

MATSUMURA, S. 1909. Thousand Insects of Japan, Supplement 1: 134. (in Japanese).

MATSUMURA, S. 1927. New species and subspecies of moths from the Japanese Empire, 9(1): 1-91. (in Japanese).

MELL, R. 1958. Zur Geschichte der ostasiatischen Lepidopteren Deutsche Entomologische Zeitschrift (N. F.) 5: 210-211.

OWADA, M., KISHIDA, Y., THINH, T. H., AND JINBO, U. 2002. Moths of the genus *Andraca* (Lepidoptera, Bombycidae, Prismostictinae) from Vietnam. Special Bull. Japanese Soc. Coleopterology 5: 461-472.

SONAN, J. 1937. Saturniidae and Bombycidae of Formosa. Proc. Taiwan Nat. Hist. Soc. 27: 202-215. (in Japanese).

WALKER, F. 1865. List of the specimens of lepidopterous insects in the collection of the British Museum. Part 32. Suppl. Part 2. London. 706 p.

WANG, H. Y. 1995. Guide Book to Insects in Taiwan: Bombycidae, Thyatiridae, Limacodidae, Lasiocampidae and Sphingidae. Shuhsing Publishing, Taipei. 10-11. (in Chinese).

WANG, X., ZENG, L., AND WANG, M. 2011. The genus *Andraca* (Lepidoptera, Endromidae) in China with descriptions of a new species. ZooKeys 127: 29-42. doi: 10.3897/zookeys.127.928

YANG, C. 1995. Lepidoptera: Bombycidae, In H. Wu (ed.), Insects of Baishanzu Mountain, Eastern China. Beijing, China Forestry Publishing House, pp. 353-358. (in Chinese).

ZOLOTUHIN, V. 2012. Taxonomic remarks on *Andraca* Walker, 1865 (Lepidoptera: Bombycidae) with descriptions of five new species. Zootaxa 3262: 22-34.

ZOLOTUHIN, V., AND WITT, T. J. 2009. The Bombycidae of Vietnam. Entomofauna (Suppl. 16): 231-272.