New or little known butterflies from China - 3

(Lepidoptera: Pieridae, Nymphalidae, Riodinidae, Lycaenidae et Hesperiidae)

by

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Abstract: The *Pieris dubernardi* Oberthür - group is tentatively reviewed, with *Pieris rothschildi* ***songi*** **subspec. nov.** and *Pieris chumbiensis* ***khampae*** **subspec. nov.** described from N. Qinghai and E. Tibet respectively, and with *Pieris chumbiensis lhamo* **stat. nov.** (= *Pieris kozlovi lhamo* Kocman, 1999) recognized as a subspecies of *Pieris chumbiensis* (De Niceville, 1897). *Neptis hesione* ***luyanquani*** **subspec. nov.** is described from NW. Yunnan. *Lethe* ***luyanquani*** **spec. nov.**, *Lethe* ***changchini*** **spec. nov.** and *Lethe paraprocne* ***zhongdiana*** **subspec. nov.** are described from NW. Yunnan, with *Lethe paraprocne shunana* Lang **stat. nov.** (= *Lethe procne shunana* Lang, 2016) treated as belonging to *Lethe paraprocne* Lang & Liu, 2014. ***Tibetododona*** **gen. nov.** is erected for *Dodona moritai* Koiwaya & Shinkai, 1996. *Polycaena carmelita* ***langi*** **subspec. nov.** and *Polycaena* ***wolongensis*** **spec. nov.** are described from Sichuan. *Agriades* ***xiaodongi*** **spec. nov.** is described from S. Tibet. *Neolycaena* ***langi*** **spec. nov.** is described from Xinjiang. *Chrysozephyrus* ***changchini*** **spec. nov.**, *Chrysozephyrus* ***yingqii*** **spec. nov.** and *Chrysozephyrus* ***luyanquani*** **spec. nov.** are described from NW. Yunnan. *Pratapa* ***qingtianwawa*** **spec. nov.** is described from NW. Yunnan. *Pedesta* ***jinoae*** **spec. nov.** is described from S. Yunnan. *Pedesta hyrie* (De Niceville, 1891) is reviewed, with *P. hyrie maculata* Fan & Wang, 2010 **stat. nov.** downgraded as its subspecies, and with a new population reported from SE. Yunnan. *Sovia* ***wenhaoi*** **spec. nov.** is described from S. Tibet. Taxa previously included in *Carterocephalus christophi* Grum-Grshimailo, 1891 and *C. niveomaculatus* Oberthür, 1886 are reviewed: *C. canopunctatus* Nabokov, 1941 **spec. rev.**, treated by Evans (1949) as a synonym of *C. christophi* Gr.-Gr., is re-validated as a bona species; *C. tibetanus* (South, 1913) **stat. nov.** (= *C. chayuensis* Lee, 1979 **syn. nov.**) is considered as independent from either *C. christophi* Gr.-Gr. or *C. niveomaculatus* Oberthür; *C. zhongkui* Sakai, 2016 **stat. nov.** is raised as independent from *C. niveomaculatus* Oberthür; *C.* ***bozanoi*** **spec. nov.** is described from Gongbujiangda, Tibet.

Introduction: Most of the butterflies reported in this paper were collected by the author from Yunnan and Tibet in 2017-2018. His expeditions to Tibet and Yunnan were funded by Mr. Chang-Chin Chen, joined by Mr. Xiao-Dong Yang and Mr. Chao Wu in 2017 and by Mr. Yan-Quan Lu and Mr. Yu-Tang Wang in 2018. The other materials were provided by the friends of the author from Qinghai, Xinjiang and Sichuan.

Abbrevitions:

BMNH: Natural History Museum, London.
BSNU: Biological laboratory of Shanghai Normal University, Shanghai, P.R. China.
CB: Collection of G.C. Bozano.
CHH: Collection of Hao Huang.
CSK: Collection of Kui Song, Xining, Qinghai.
CWZJ: Collection of Zhen-Jun Wu, Fuzhou, Fujian.
HT: Holotype.
PT: Paratype.
TL: Type locality.

Pieridae

The *Pieris dubernardi* Oberthür - group (figs. 1-32, 164-173)

This group was reviewed at first by C.-S. Wu (2010) and later by Sakai (2016) and Tadokoro et al. (2016). Wu's (2010) work is insufficient in both references and specimens, making some errors in identification. Tadokoro et al.'s (2016) work is helpful in providing the photos of some important type specimens but is short in examining the specimens. Sakai's (2016) work draw to a conclusion matching with the author's opinion in specific classification, though it is short in discussion. To give a more convincing revision, far more specimens need to be examined in future; however the author has made some conclusions by an examination of the ♀ genitalia on the present material which is still very limited. The following species and subspecies are recognized, keyed, listed with reviews of the knowledge in literature and discussed.

Characters

1) Androconia. Tadokoro et al. (2016) illustrated the androconia of five taxa and pointed out some possible differences, but they admitted that the study was short in material so that these differences might be only trends. After an examination of more specimens and taxa, the author concluded that characters of androconia cannot be used solely for either specific or subspecific classification, with considerable individual and geographical variations. However, characters of androconia seem to be useful in detecting close relationships among some taxa. For example, *Pieris chumbiensis lhamo* Kocman, 1999 **stat. nov.** was originally described as a subspecies of *Pieris kozlovi* Alpheraky, 1897 and subsequently treated by Sakai (2016) as a synonym of *Pieris dubernardi kozlovi* Alpheraky, being hardly distinguishable from *kozlovi* Alpheraky in the wing-characters. However, it is now proved to be closely allied to *P. chumbiensis gyantsensis* Verity, 1911 by the characters of both androconia and ♀ genitalia. As a result, the author treated *lhamo* Kocman as a subspecies of *P. chumbiensis* (De Niceville, 1897) and in that case, the closed arms of androconia can not serve as a specific character to identify *P. chumbiensis* (De Niceville). Further on, characters of androconia may not be technically useful in subspecific classification, as for such purpose too many individuals and populations need to be examined.
2) Valva in ♂ genitalia. Both Epstein (1979) and Sugiyama (1996) used the shape of valva to separate some taxa of the *Pieris dubernardi* Oberthür-group. However, after an examination of more specimens, the author concluded that characters of valva are useless for a convincing identification.
3) Size of ♂ genitalia. Tadokoro et al. (2016) list this character in a summary of the species group. The size of the ♂ genitalia is

relevant to the size of the specimen and can be very variable in individuals. This character is generally useless as the limits for the populations are difficult to define.

4) Boundary between uncus and membranous lateral wall. Tadokoro et al. (2016) stated that "the socius is serrated" in *dubernardi* Oberthür, *kozlovi* Alpheraky, *pomiensis* Yoshino and *lixianensis* Tadokoro et al., but "is a normal shape similar to the *Pieris napi*- group" in *gyantsensis* Verity and *sherpae* Epstein, 1979. Such "socius" actually refers to the boundary between the sclerotized and pigmented uncus and the membraneous lateral wall surrounding the anus. This boundary is for sure useful in separating *P. dubernardi* Oberthür from all other species, being coarser and more irregular in *P. dubernardi* Oberthür than in all other species.

5) Tip of uncus. Tadokoro et al. (2016) stated that the tip of uncus is more sharply bent in *dubernardi* Oberthür, *kozlovi* Alpheraky, *pomiensis* Yoshino and *lixianensis* Tadokoro et al. than in *gyantsensis* Verity and *sherpae* Epstein. The author found that this character generally works for separating *P. dubernardi* Oberthür (in sense of this paper) from *P. rothschildi* Verity, 1911 with very few exceptions (for example the specimen numbered as b in this paper).However, *P. chumbiensis lhamo* Kocman **stat. nov.** possesses a more bent uncus than in *P. chumbiensis gyantsensis* Verity, making this character useless in identifying *P. chumbiensis* (De Niceville) in specific level.

6) Fenestrula and juxta. Fenestrula between tegumen and uncus is markedly longer in *P. wangi* (Huang, 1998) than in all other species. Juxta has a shorter base and a pair of longer arms in *P. wangi* (Huang) than in all other species.

7) Signum of ♀ genitalia. No constant difference can be found among the taxa in most of the structures of ♀ genitalia, except for the signum on the corpus bursae. The characters of the signum are very important, providing clues to clarify the species boundary.

Key to species and subspecies

1. Signum on corpus bursae in ♀ genitalia with its terminal part cordiform, widest near the end and concave at terminal margin 2
-. Signum of ♀ genitalia with its terminal part not cordiform, widest at median part and hardly concave at terminal margin 9
2. Hindwing underside without black smudges in postdiscal area between the black stripes on veins, or nearly so. Restricted to the Northeast of the range of the species group .....3 (*P. rothschildi*)
-. Hindwing underside with well marked black smudges in postdiscal area between the black stripes on veins. Restricted to the Southwest of the range of the species group .....4 (*P. chumbiensis*)
3. Both wings upper side with all veins less dusted by black scales, especially in basal and discal areas, and with basal dusting less developed. Forewing upper side with postdiscal spots in spaces 1b & 2 less developed, especially the spot in space 1b of ♂ usually absent .....*P. r. songi*
-. Both wings upper side with all veins more dusted by black scales, and with basal dusting more developed. Forewing upper side with postdiscal spots in spaces 1b & 2 more developed, especially the spot in space 1b of ♂ well marked .....*P. r. rothschildi*
4. Dark stripes on veins of hindwing underside even in width and color .....*P. c. chumbiensis*
-. Dark stripes on veins of hindwing underside narrower and paler in postdiscal area than in marginal or discal area 5
5. Both wings upper side more extensively dusted by black scales at base, and with black postdiscal spots on forewing underside well developed and connected in spaces 1b-3. ♂ forewing upper side with costal area black-dusted and with blackish postdiscal spot in space 2 more developed and connected to spot in space 3 6
-. Both wings upper side less dusted by black scales at base, and with black postdiscal spots on forewing underside absent in space 2 or clearly separated by veins. ♂ forewing upper side with costal area not black-dusted and with spot in space 2 if present clearly separated from spot in space 3 8
6. Hindwing underside with subbasal and discal areas less black-dusted, with a complete pale yellow stripe in space 1, with basal half of discocellular cell not entirely black-dusted, and with blackish postdiscal smudges remoter from termen, leaving a wider pale submarginal area .....*P. c. khampae*
-. Hindwing underside with subbasal and discal areas more extensively black-dusted, with no complete pale yellow stripe in space 1, with basal half of discocellular cell entirely black-dusted, and with blackish postdiscal smudges closer to termen, leaving a narrower pale submarginal area 7
7. Distributed to the east of ssp. *gyantsensis*. ♀ forewing upper side with cell spot and postdiscal spots connected by a black smudge at basal third of spaces 3-4 .....*P. c. lhamo*
-. Distributed to the west of ssp. *gyantsensis*. ♀ forewing upper side with basal third of spaces 3-4 between cell spot and postdiscal spots not entirely black-dusted .....*P. c. tsochensis*
8. Hindwing underside with blackish markings on veins more clearly defined and less suffused. Distributed in Tibetan area on north of the Himalaya .....*P. c. gyantsensis*
-. Hindwing underside with blackish markings on veins ill-defined and more suffused. Distributed in C Nepal on south of the Himalaya .....*P. c. sherpae*
9. Broad terminal (cephalic) part of signum gradually narrowed toward base, not marked off from the well pigmented belt-like basal (caudal) part of signum. Fenestrula between tegumen and uncus markedly longer. Juxta with a shorter base and a pair of longer arms. Hindwing with a wide blackish postdiscal band on upper side and no black postdiscal smudges between stripes on veins on underside. Sympatric with *P. dubernardi* at Duoxiongla but inhabiting a lower area .....*P. wangi*
-. Terminal part of signum well marked off from the less pigmented basal part of signum. Fenestrula shorter. Juxta with a longer base and a pair of shorter arms. Hindwing with interrupted markings on upper side or with smudges between stripes on underside. Sympatric with *P. wangi* at Duoxiongla but inhabiting a higher area .....10 (*P. dubernardi*)
10. Signum stouter. Distributed in the North of the range .....11 (*kozlovi* subgroup)
-. Signum slenderer. Distributed in the South of the range.....12 (*dubernardi* subgroup)
11. Forewing with a smaller postdiscal spot in space 2. Hindwing underside with a wider pale submarginal area .....*P. d. aljinensis*
-. Forewing with a larger postdiscal spot in space 2. Hindwing underside with a narrower pale submarginal area .....*P. d. kozlovi*
12. Restricted to the west of Nujiang. Individuals approaching *kozlovi* often found, with basal and discal areas more extensively black-dusted .....*P. d. pomiensis*
-. Restricted to the east of Nujiang. No individuals approaching *kozlovi* 13
13. Wingspan 48-50 mm .....*P. d. lixianensis*
-. Wingspan over 56 mm .....*P. d. dubernardi*

Remarks. The above key is proposed for a better understanding of the species boundary and the subspecies delimitation, not for an easy identification of specimens. The ♀ genitalia of *P. chumbiensis chumbiensis* (De Niceville), *P. chumbiensis sherpae* (Epstein), *P. chumbiensis tsochensis* (Kocman) and *P. dubernardi lixianensis* Tadokoro et al. have not been examined yet, so some part of the key is based on a speculation that these taxa are in common with their close affinities from the nearby areas in ♀ genitalia.

Annotated list of species and subspecies

Pieris dubernardi Oberthür, 1884

ssp. *dubernardi* Oberthür, 1884 (TL: Tsekou, NW. Yunnan).
= *lijiangensis* Funahashi, 2003 (TL: Yuelongxueshan, Lijiang, NW. Yunnan).
Distribution. NW. Yunnan (excluding Dulong Valley), W. Sichuan.
Type. Unique ♂ type (HT, BMNH) figured as a hand drawing by Oberthür (1884), as photos by Tadokoro et al. (2016).
Morphology. ♂ habitus (Verity, 1911 - Tatsienlu & Tsekou; Funahashi, 2003 - Lijiang; Tadokoro et al., 2016 - NW. Yunnan; Sakai, 2016 - N. Yunnan; Wu, 2017 - Kangding, Jiulong & Deqin; this work - Zhongdian, NW. Yunnan). ♀ habitus (Leech, 1894 - Sichuan; Verity, 1911 - Tatsienlu, Sichuan; Funahashi, 2003 - Lijiang; Sakai, 2016 - N. Yunnan; this work - W. Sichuan). ♂ genitalia (Epstein, 1979 - Tachienlu; Tadokoro et al., 2016 - NW. Yunnan; this work- Zhongdian). ♀ genitalia (Wu, 2010 - Deqin, Yunnan; this work - W. Sichuan). Androconia (Tadokoro et al., 2016,- NW. Yunnan; this work- Zhongdian).
Synonym. The author agrees to Sakai's (2016) opinion that *lijiangensis* Funahashi is a synonym of *dubernardi* Oberthür. To prove that the HT of *lijiangensis* Funahashi represents merely an individual variation, a similar ♂ from Zhongdian, NW. Yunnan (fig. 5) is figured herein, alongside with a ♂ in normal form from the same locality (fig. 4). The author has examined 14 more ♂♂ from Deqin, NW. Yunnan.
Discussion. The signa of ♀ genitalia figured by Wu (2010) are taken from the specimens from Deqin, NW. Yunnan, near the TL, matching with the signum of ssp. *pomiensis* from SE. Tibet. However, the signa of the specimens from W. Sichuan (2 ♀♀ examined) are markedly longer than in the above-mentioned specimens from Yunnan and SE. Tibet. Whether such difference is due to an individual variation or a geographical variation needs to be clarified in future. Nevertheless, the specimens from Kangding and Luding, W. Sichuan (2 ♂♂, 2 ♀♀ examined) cannot be distinguished from those from NW. Yunnan in wing pattern.

ssp. *pomiensis* Yoshino, 1998 (TL: Pomi = Bomi, SE. Tibet).
= *kachinensis* Sakai, 2016 (TL: upon Seingk Valley, Naungmon, Kachin, N. Myanmar).
Distribution. SE. Tibet (Bomi, Yigong, Milin, Chayu), NW. Yunnan (Dulong Valley only); N. Myanmar (Kachin).
Type. ♂ HT figured as photos by Yoshino (1998).
Morphology. ♂ habitus (Tadokoro et al., 2016 - nearby Pomi; Sakai, 2016 - Kachin, N. Myanmar; this work - Demula, Chayu, SE. Tibet & Dulong Valley, NW. Yunnan). ♀ habitus (Tadokoro et al., 2016 - nearby Pomi; Sakai, 2016 - Kachin; this work - Duoxiongla, Pai, SE. Tibet). ♂ genitalia (Tadokoro et al., 2016 - nearby Pomi; this work - Demula & Dulong Valley). ♀ genitalia (this work- Duoxiongla). Androconia (Tadokoro et al., 2016 - nearby Pomi; this work - Demula & Dulong Valley).
Synonym. The author considered that *Pieris dubernardi kachinensis* Sakai is a synonym of *Pieris dubernardi pomiensis* Yoshino. However, the author leaves the formal revision to a work in future, as he is not sure about the validity of ssp. *pomiensis* Yoshino which may be only a synonym of *P. d. dubernardi* Oberthür.
Discussion. The validity of *pomiensis* Yoshino is tentatively accepted in a viewpoint of the zoogeography. The populations from Demula, SE. Tibet and N. Kachin, Myanmar do have hindwing underside in both sexes more black-dusted than in the populations from Deqin, Tsekou, Zhongdian and Lijiang, NW. Yunnan. However, the populations from the more western Bomi-Milin area cannot be distinguished from the populations from NW. Yunnan. Moreover, the population from Dulong Valley is variable (figs.1-2) and covers both taxa in wing appearance. On the other hand, the populations from S. Qinghai and NE. Tibet seem to connect the populations from SE. Tibet to ssp. *kozlovi* Alpheraky from N. & C. Qinghai. If all these populations in such a vast area (from Dulong Valley and Kachin to Bomi-Milin area) need a name, the taxon *pomiensis* Yoshino should be employed. It should be noted that the dark form which is often found in ssp. *pomiensis* Yoshino has never been found in the populations of ssp. *dubernardi* Oberthür from Yunnan (except Dulong Valley) and Sichuan.

ssp. *lixianensis* Tadokoro, Inomata & Wang, 2016 (TL: Miyaluo, Lixian, Sichuan).
Distribution. N. Sichuan (Lixian area).
Type. ♂ HT and ♂ PTs figured as photos by Tadokoro et al. (2016).
Morphology. ♂ genitalia (Tadokoro et al., 2016). Androconia (Tadokoro et al., 2016).

ssp. *kozlovi* Alpheraky, 1897 (TL: Humbolt-chain, now Nanshan, Qinghai).
?= *bromkampi* (Bang-Haas, 1938) (TL: Min-shan, Gansu).
Distribution. Qinghai, SW. Gansu.
Type. ♂ and ♀ syntypes figured as hand drawings by Alpheraky (1897). A ♀ co-type (BMNH) figured as photos by Tadokoro et al. (2016).
Morphology. ♂ habitus (Verity, 1911- Robor-kozl; Tadokoro et al., 2016- Qinghai Lake; Wu 2017- Dulan, Qinghai; this work- Qilian & Ela, Qinghai). ♀ habitus (Verity, 1911- Robor-kozl; Tadokoro et al., 2016 - Qinghai Lake; Wu, 2017 - Tianjun, Qinghai; this work - Qilian & Ela). ♂ genitalia (Epstein, 1979 - S. Datung shan, Gansu; Tadokoro et al., 2016- Qinghai Lake; this work - Qilian & Ela). ♀ genitalia (this work- Qilian & Ela). Androconia (Tadokoro et al., 2016- Qinghai Lake; this work- Qilian & Ela).
Synonym. The author considered that *Synchloe dubernardi bromkampi* Bang-Haas is most probably a synonym of *Pieris dubernardi kozlovi* Alpheraky. The ♀ syntype of *bromkampi* (Bang-Haas) in BMNH, figured and mislabeled as a ♂ by Tadokoro et al. (2016), cannot be distinguished from the ♀ specimens of *kozlovi* Alpheraky from Qinghai. However, the specimens of *kozlovi* Alpheraky from Minshan, S. Gansu are not available to the author and the ♀ genitalia have not been examined yet.
Discussion. The author tentatively agrees with Sakai (2016) that *kozlovi* Alpheraky is a subspecies of *P. dubernardi* Oberthür because there are a series of transitional populations found in S. Qinghai (figs. 7 & 22) and NE. Tibet (fig. 6) between *kozlovi* Alpheraky and the other subspecies of *P. dubernardi* Oberthür. A population from Yushu, S. Qinghai looks like *kozlovi* Alpheraky but bears a slender signum of ♀ genitalia resembling that of the other subspecies of *P. dubernardi* Oberthür. A ♂ specimen, collected from Qamdo, NE. Tibet, has its wing pattern intermediate between *kozlovi* Alpheraky and *dubernardi* Oberthür and cannot be assigned to either of them by external appearance. However, there is still possibility that *kozlovi* Alpheraky is an independent species (as treated by Epstein 1979 & Tadokoro et al. 2016) if no intermediate form of signum is found in any populations when the adequate specimens are available.

ssp. *aljinensis* (R.-X. Huang & Murayama, 1992) (TL: Xashidaban, Aljin).
Distribution. SE. Xinjiang (Aljin Mts.).
Type. ♂ HT figured as a photo only on upper side by R.-X. Huang & Murayama (1992). Mr. Xin Zhang located this HT in Xinjiang University and took photos of both sides, as figured herein (fig. 8).
Morphology. ♀ habitus (Wu, 2010 - Xinjiang; this work- Xinjiang). ♀ genitalia in Wu (2010).
Discussion. Wu (2010) examined a ♀ labeled from "Kashi-daban" in Xinjiang (fig. 32) and figured its genitalia. This ♀ was collected at the same time as in the type series, probably in the same expedition by another collector. It is most likely that "Xashidaban" and "Kashidaban" refer to the same pass on the route into the Aljin Nature Reserve, currently known as "Feng-chen-kou daban", meaning the pass with big wind and dust of sand. Wu (2010) found that the signum of this ♀ specimen is quite different from that of the specimen identified by him as *P. kozlovi* Alpheraky, so he raised *Synchloe kozlovi aljinensis* Huang & Murayama into full species. However, Wu's (2010) specimen of *P. kozlovi* Alpheraky came from Chayu, SE. Tibet, actually representing a dark form of *P. dubernardi pomiensis* Yoshino. Sakai (2016) simply listed *aljinensis* Huang & Murayama as a synonym of *Pieris dubernardi kozlovi* Alpheraky, without any discussion. In te author's opinion, this taxon is valid as a good subspecies of *P. dubernardi* Oberthür, distributed to the far west of ssp. *kozlovi* Alpheraky. This taxon could be assigned to a subspecies of *P. kozlovi* Alpheraky if the latter is proved to be independent from *P. dubernardi* Oberthür in further research, as its ♀ genitalia is identical with *kozlovi* Alpheraky from Qinghai.

Pieris wangi (Huang, 1998) (TL: Duoxiongla, SE. Tibet).
= *Pieris wangi saitoi* Sakai, 2016 (TL: upon Seingk Valley, Kachin, N. Myanmar) **syn. nov.**
Distribution. SE. Tibet (Milin area); N. Myanmar (Kachin).
Type. ♂ HT and ♀ PT figured as photos by Huang (1998).
Morphology. ♂ habitus (Sakai, 2016 - Kachin & E. Tibet). ♀ habitus (Sakai, 2016 - Kachin, Myanmar). ♂ genitalia (Huang, 1998; this work). ♀ genitalia (Wu, 2010; this work). Androconia (this work).
Synonym. Sakai (2016) stated that the population from Kachin has the ♂ forewing black markings in spaces 2 & 3 and the ♀ hindwing postdiscal band are more developed than in the population from Tibet. However, such difference does not exist at all, as the type series of *Pieris wangi* (Huang) has the very extensive black markings as in the type specimens of *saitoi* Sakai. Sakai (2016) might wrongly regard some paler specimens from Tibet as the typical form of *Pieris wangi* (Huang), as he figured a less marked ♂ from E. Tibet alongside his PT ♂ of the new subspecies from Kachin.
Discussion. Wu (2010) firstly raised *Sinopieris dubernardi wangi* Huang, 1998 to full species, based upon an examination of ♀ genitalia (2 ♀♀ PTs examined). Sakai (2016) reported a sympatric record of *P. dubernardi* Oberthür and *P. wangi* Huang at Seingk Valley, N. Myanmar, and gave *wangi* Huang specific rank again. The author revealed some differences in ♂ genitalia in this work and reported a further sympatric record that a ♀ specimen of *P. dubernardi* Oberthür was collected from the TL of *P. wangi* Huang at a higher elevation.

Pieris chumbiensis (De Niceville, 1897)

ssp. *chumbiensis* (De Niceville, 1897) (TL: Chumbi = Yadong and its adjacent area in Sikkim).
Distribution. Yadong area, SC. Tibet and its adjacent Indian area.
Type. One of the ♂ syntypes figured as a hand drawing by De Niceville (1897).
Morphology. ♂ habitus (Verity, 1911 - Chumbi; Sakai, 2016 - Yadong). ♀ habitus (Sakai, 2016 - Yadong).
Discussion. The ♀ genitalia of this taxon has not been examined yet. Thus the current classification of this taxon is still uncertain.

ssp. *gyantsensis* Verity, 1911 (TL: Gyantsee, C. Tibet).
Distribution. Tibetan area from Lhasa in the east, and to Nyalam in the west.
Type. ♂ and ♀ syntypes figured as photos by Verity (1911) and Tadokoro et al. (2016).
Morphology. ♂ habitus (Tadokoro et al., 2016 - Gyantse; Sakai, 2016 - Nyalam). ♀ habitus (Tadokoro et al., 2016 - Gyantse; Sakai, 2016 - Nyalam; this work - Tsurphu, W. Lhasa). ♂ genitalia (Wu, 2010 - Dangxiong, N. of Lhasa; Tadokoro et al., 2016 - Gyantse). ♀ genitalia (Wu, 2010 as *chumbiensis* - Dangxiong, C. Tibet; this work - Tsurphu). Androconia (Tadokoro et al., 2016 - Gyantse).

ssp. *sherpae* (Epstein, 1979) (TL: 1.6 km SE. of Thorong Pass, Central Nepal).
Distribution. C. Nepal (Thorong pass, Jargeng Khola Valley, Sangda).
Type. ♂ HT and ♀ PT were figured as photos by Epstein (1979).
Morphology. ♂ habitus (Tadokoro et al., 2016, - C. Nepal; Sakai, 2016 - Nylasan, C. Nepal). ♀ habitus (Tadokoro et al., 2016 - C. Nepal; Sakai, 2016 - Nylasan, C. Nepal). ♂ genitalia (Epstein, 1979 - Sangda, C. Nepal; Tadokoro et al., 2016- C. Nepal). Androconia (Tadokoro et al., 2016- C. Nepal).
Discussion. Both, Tadokoro et al. (2016) and Sakai (2016), downgraded *Pontia sherpae* Epstein to a subspecies of *P. chumbiensis* (De Niceville). However, the ♀ genitalia of both taxa have not been examined yet. The current classification is uncertain.

ssp. *lhamo* Kocman, 1999 (TL: Chitu La- Shuga La Pass, N. Lhoka Pref., C. Tibet) **stat. nov.**
Distribution. C. Tibet (Lhasa area and its adjacent areas).
Type. ♂ HT and ♀ PT were figured as photos by Kocman (1999). Two ♂♂ PTs (fig. 12-13) and one ♀ PT (fig. 24) are figured in this work.
Morphology. ♂ genitalia (this work). ♀ genitalia (this work). Androconia (this work).
Discussion. Sakai (2016) simply listed *Pieris kozlovi lhamo* Kocman as a synonym of *P. dubernardi kozlovi* Alpheraky, without any discussion. Such treatment seems to be reasonable as these two taxa are nearly indistinguishable from each other in the wing pattern. However, an examination of androconia, ♂ and ♀ genitalia proved *lhamo* Kocman to be much closer to *P. chumbiensis gyantsensis* Verity than to *P. dubernardi kozlovi* Alpheraky. Although the knowledge on *chumbiensis* (De Niceville) is still poor, the author is sure that *gyantsensis* Verity and *lhamo* Kocman belong to the same species which is not conspecific with *P. dubernardi* Oberthür.

ssp. *tsochensis* (Kocman, 2006) (TL: Tsochen, W. Tibet).
Distribution. W. Tibet (Tsochen only).
Type. ♂ HT and ♀ PT were figured as photos by Kocman (2006).
Discussion. Sakai (2016) simply listed *Pieris kozlovi tsochensis* (Kocman) as a synonym of *P. dubernardi kozlovi* Alpheraky, without any discussion. This taxon is hardly distinguishable from ssp. *lhamo* Kocman, being a little different only in ♀. However, it can be tentatively accepted as a separate subspecies in a viewpoint of the zoogeography, as it is widely isolated from ssp. *lhamo* Kocman by the range of ssp. *gyantsensis* Verity.

***Pieris chumbiensis k h a m p a e* subspec. nov.**

Pieris dubernardi: Wu, 2017: 412, fig. 8 - ♀ from Mangkang, Tibet.

HT ♀ (fig. 23): China, Xizang Autonomous Region, on road from Batang to Mangkang, ca. 60 km west of Batang, 19.VII.2000, H. Huang leg., deposited in BSNU.

Etymology. This new subspecies is named after the tribe of Khampa living in the type locality.

Diagnosis. The difference between this new subspecies and the previously known subspecies can be found in the above key and clearly shown in the figures of habitus (figs. 23, 24 & 27). This new taxon is more similar to the sympatric *Pieris dubernardi* Oberthür in external appearance - an examination of ♀ genitalia is needed for a convincing identification. However, the following difference can be easily found in wing pattern: the blackish postdiscal smudges on hindwing underside are remoter from termen of hindwing in *P. ch. khampae* **subspec. nov.** than in *P. dubernardi* Obth., leaving a markedly broader pale submarginal area in which the veins are less black-dusted in *P. ch. khampae* **subspec. nov.** than in *P. dubernardi* Obth.

Distribution. E. Tibet (area between Mangkang and Batang).

***Pieris rothschildi* Verity, 1911**

ssp. *rothschildi* Verity, 1911 (TL: Tai-pai-chan, monts Tsing-ling = Taibaishan, Shaanxi).

= *lama* Sugiyama, 1996 (TL: SE. Minshan, N. Sichuan).

Distribution. Shaanxi (Taibaishan), NE. Sichuan (SE. Minshan), S. Gansu (Lintan).

Type. ♂ and ♀ syntypes figured as photos by Verity (1911).

Morphology. ♂ habitus (Sugiyama, 1996 - SE. Minshan; Sakai, 2016 - Taibaishan; Wu, 2017 - Lintan, Gansu & Taibaishan; this work - Taibaishan). ♀ habitus (Wu, 2017 - Lintan, Gansu & Taibaishan; this work - Taibaishan). ♂ genitalia (Sugiyama, 1996- SE. Minshan; this work). ♀ genitalia (this work). Androconia (this work).

Synonym. Wu (2010) stated *Pieris lama* Sugiyama as a synonym of *P. rothschildi* Verity, and Sakai (2016) simply listed the former as a subspecies of the latter. The author agrees with the opinion of Wu (2010).

Discussion. Sugiyama (1996) firstly recognized this species (as *Pieris lama* Sugiyama) as independent from *P. dubernardi* Obth. on his field observation that both species occur in SE. Minshan area, NE. Sichuan; Sugiyama (1996) stated and figured some differences in shape of valva of ♂ genitalia between the two species. However, there is still no sympatric record known for these two species, though the two species are closely distributed in NE. Sichuan. Moreover, the differences in ♂ valva mentioned by Sugiyama (1996) are not constant at all. Both, Wu (2010) and Sakai (2016), recognized that *P. lama* Sugiyama actually represents *P. rothschildi* Verity and raised *Pieris dubernardi* var. *rothschildi* Verity into full species rank, probably following Sugiyama (1996)'s opinion. The author examined the ♂ and ♀ genitalia of *P. rothschildi* Verity and found that this taxon possesses a peculiar signum of ♀ genitalia like in *P. chumbiensis gyantsensis* Verity and *P. chumbiensis lhamo* Kocman, instead of the closely distributed *P. dubernardi* Obth. On the other hand, *P. rothschildi* Verity is widely isolated from all of the known subspecies of *P. chumbiensis* (De Niceville) in distribution, and the former possesses quite different androconia from the latter. Therefore, it is reasonable to regard *P. rothschildi* Verity as an independent species. Wu (2010) figured a worn specimen from Barkam, N. Sichuan and identified it as *P. rothschildi* Verity, which might belong to *P. dubernardi lixianensis* Tadokoro et al.. Further specimens from Barkam are needed to be examined to confirm this record.

***Pieris rothschildi s o n g i* subspec. nov.**

Pieris rothschildi rothschildi: Sakai (2016: 2, partim on material, pl. 3, figs. 51-52 for ♀ from Qilian, Gansu).

HT ♂ (fig. 14): China, Qinghai Province, Qilian County, on road from Babao Township to Sunan County, ca. 3700 m, 14.VI.2009, K. Song leg., deposited in BSNU.

PTs: Qinghai Province: 1 ♂ (fig. 15, CHH), 1 ♀ (fig. 29, CHH), same locality as HT, 14.VI.2010, K. Song leg.; 2 ♂♂, 2 ♀♀ (CSK), same locality as HT, 14.VI.2010, K. Song leg..

Etymology. This new subspecies is named in honour of Mr. Kui Song, Xining, who collected the type series..

Diagnosis. This new subspecies can be distinguished from the nominotypical subspecies by the following combination of characters in both sexes.

1) Both wings upper side with all veins less dusted by black scales, especially in basal and discal areas.

2) Both wings upper side with black dusting less developed at base.

3) Forewing upper side with postdiscal spots in spaces 1b & 2 less developed, especially the spot in space 1b of ♂ usually absent.

Distribution. Qinghai (Qilian Mts.).

Nymphalidae

***Neptis hesione l u y a n q u a n i* subspec. nov.** (figs. 35-36, 174-J & K)

HT ♂ (fig. 35): China, Yunnan Province, Weixi County, ca. 2300 m, 22.VII.2018, H. Huang leg., deposited in BSNU.

PT: Yunnan Province: 1 ♂ (fig. 36, CHH), same locality as HT, 26.VII.2018, H. Huang leg..

Etymology. This new species is named in honor of Mr. Yan-Quan Lu who accompanied the author in his collecting trip of 2018.

Diagnosis. This new subspecies is close to the nominotypical subspecies of *Neptis hesione* Leech, 1890 from C. China (TL: Chang Yang, Hubei), E. China and the eastern part of W. China (Pingwu, Sichuan and Fanjingshan, Guizhou), but can be distinguished from the latter by the following combination of characters.

1) Forewing upper side with subapical spots near costa and postdiscal spots just above dorsum markedly broader than in ssp. *hesione* Leech.

2) Hindwing upper side with discal band 1.5 times wider than in ssp. *hesione* Leech.

3) Lower angle of distal process of ampulla in ♂ genitalia more sharply pointed in an acute angle, not in a right angle as in ssp. *hesione* Leech.

Remarks. For a long time *Neptis hesione* Leech has been considered as a species restricted to C. and E. China (including Taiwan) until Bozano (2008) reported a ♂ from Pingwu, N. Sichuan. The author reported a further ♂ from Fanjingshan, Guizhou for the nominotypical subspecies herein. It is rather astonishing to find a new subspecies from Weixi, nearly the westernmost of SW. China; this may indicate that most Chinese species of the tribe Neptini have their representatives in western Yunnan.

***Lethe l u y a n q u a n i* spec. nov.** (figs. 41-43, 175-182: B, C & I)

HT ♂ (fig. 41): China, Yunnan, Diqing Tibetan Autonomous Prefecture, Weixi County, ca. 2700 m, 26.VII.2018, Y.-Q. Huang leg., deposited in BSNU.

PTs: Yunnan Province: 5 ♂♂ (figs. 42-43, CHH), same locality as HT, ca. 2650-2800 m, 25.VII.-4.VIII.2018, Y.-Q. Huang, Y.-Q. Lu & H. Huang leg..

Etymology. This new species is named in honor of Mr. Yan-Quan Lu, who collected a part of the type series.

Diagnosis. This new species is close to *Lethe camilla* Leech, 1891, *L. privigna* Leech, 1892, *L. tengchongensis tengchongensis* Lang, 2016 and *L. tengchongensis pingpingae* Zhang & Hu, 2018, but can be distinguished from all of them in ♂ by the following combination of characters.

1) Forewing upper side without the clearly defined yellow discal band and subapical spots which are well marked in both *L. t. tengchongensis* Lang and *L. t. pingpingae* Zhang & Hu.

2) Forewing upper side with a yellow postdiscal patch at costa, which is not seen in both *L. camilla* Leech and *L. privigna* Leech.

3) Both wings upper side with ♂ brands (fig. 175) developed nearly as in *Lethe camilla* Leech: the brand on forewing less extensive than in *L. privigna* Leech but more extensive than in both *L. t. tengchongensis* Lang and *L. t. pingpingae* Zhang & Hu; the brand on hindwing markedly larger and much closer to wing-base than in *L. privigna* Leech, not beyond the submarginal ocelli.

4) Androconia (Fig. 176) markedly longer than in both *L. t. tengchongensis* Lang and *L. t. pingpingae* Zhang & Hu.

5) Pale postdiscal band on forewing underside placed more obliquely than in both *L. camilla* Leech and *L. privigna* Leech, with the part at dorsum remoter from wing-base than the part at costa, whereas in both *L. camilla* Leech and *L. privigna* Leech the parts at dorsum and costa nearly in equal distance from wing-base.

6) Pale postdiscal band on forewing underside with median part straighter than in both *L. t. tengchongensis* Lang and *L. t. pingpingae* Zhang & Hu.

7) Forewing underside with postdiscal ocellus in space 2 well marked as in both *L. camilla* Leech and *L. privigna* Leech, not obsolete as in both *L. t. tengchongensis* Lang and *L. t. pingpingae* Zhang & Hu.

8) Valva of ♂ genitalia (fig. 178) larger than in both *L. t. tengchongensis* Lang and *L. t. pingpingae* Zhang & Hu, and markedly narrower than in *L. camilla* Leech.

9) Uncus of ♂ genitalia in dorsal view (fig. 181) more sharply pointed at tip than in *L. privigna* Leech, and more widened at distal one third point than in *L. camilla* Leech, *L. t. tengchongensis* Lang and *L. t. pingpingae* Zhang & Hu.

10) Distal extension of valva (fig. 182) longer than in all above-mentioned species, less incurved in dorsal view than in *L. camilla* Leech and *L. privigna* Leech, with tip gradually contracted, not abruptly contracted before the needle-like tip as in *L. privigna* Leech.

Remarks. The very little known *Lethe "camilla" rufa* Mell, 1939 from Kuatun, Fujian, E. China possesses most of the external characters of *L. privigna* Leech, requiring a further research. It was informally recorded also from Nanling Nature Reserve, N. Guangdong by Mr. Xi-Chang Chen and Mr. Yi-Kui Luo, but the specimens are not available to the author. The relationship between *L. t. tengchongensis* Lang and *L. t. pingpingae* Zhang & Hu needs a further research on the possible intermediate populations, as the present evidences support the independence of *L. t. pingpingae* Zhang & Hu. These two taxa are slightly different not only in width of forewing band, but also in ♂ brand, androconia and tip of valva in ♂ genitalia.

As in the figured specimens (figs. 41-43), the antediscal and postdiscal lines on hindwing underside of *Lethe luyanquani* Huang are remote from each other at dorsum, not close and nearly forming a loop as in *L. camilla* Leech and *L. tengchongensis* Lang. However, this character seems not to be constant as 1 ♂ of *Lethe luyanquani* Huang (not illustrated) has the two lines close to each other at end. Beside the specimens illustrated, a good number of ♂♂ of *L. privigna* Leech from Shaanxi and Hubei have been examined.

Lethe paraprocne z h o n g d i a n a **subspec. nov.** (figs. 58-62)

HT ♂ (fig. 58): China, Yunnan, Diqing Tibetan Autonomous Prefecture, Shangri-la City (Zhongdian), ca. 3150 m, 8.VIII.2018, H. Huang leg., deposited in BSNU.

PTs: Yunnan Province: 9 ♂♂ (figs. 59-62, CHH), same locality as HT, ca. 3100-3200 m, 8.,17. & 28.VIII.2018, H. Huang leg..

Etymology. This new subspecies is named after the TL.

Diagnosis. This new subspecies is close to ssp. *kawagarboensis* Lang & Liu, 2014 from Deqin (TL: Mingyong), upper Lancang Valley (Tsekou & Badi of Weixi) and Weixi (near Pantiange area) in both external features and distributional range, but can be distinguished from the latter in ♂ by the following combination of characters.

1) Size constantly smaller, with a forewing-length of 24-25mm against 27-28mm in ssp. *kawagarboensis* Lang & Liu.

2) Hindwing upper side with postdiscal ocelli constantly smaller than in ssp. *kawagarboensis* Lang & Liu.

3) Forewing upper side with ♂ brand less clearly defined than in ssp. *kawagarboensis* Lang & Liu.

4) Size of ♂ genitalia constantly smaller than in ssp. *kawagarboensis* Lang & Liu.

Remarks. As shown in the distributional map (fig. 189), four valid subspecies have been described as follows, with their diagnostic characters summarized.

1) *Lethe paraprocne paraprocne* Lang & Liu, 2014 from C. Sichuan (TL: Heizhugou, Ebian).
Size large. ♂ brand ill-defined, not dark. Forewing underside postdiscal spots small. Hindwing upper side postdiscal ocelli small.

2) *Lethe paraprocne shunana* Lang, 2016 **stat. nov.** (= *Lethe procne shunana* Lang, 2016) from S. Sichuan (TL: Gesala).
----Size variable. ♂ brand clearly defined, very dark and extensive. Forewing underside postdiscal spots large. Hindwing upper side postdiscal ocelli small.

3) *Lethe paraprocne kawagarboensis* Lang & Liu, 2014 from Deqin and Weixi, NW. Yunnan.
----Size large. ♂ brand clearly defined, dark but not extensive. Forewing underside postdiscal spots large. Hindwing upper side postdiscal ocelli large.

4) *Lethe paraprocne* ***zhongdiana*** **subspec. nov.** from Zhongdian, NW. Yunnan.
----Size small. ♂ brand ill-defined, not dark. Forewing underside postdiscal spots large. Hindwing upper side postdiscal ocelli small.

Lang (2016) described ssp. *shuana* as a subspecies of *Lethe procne* (Leech, 1891), probably judging from the similar appearance in ♂ brand. However, the author considered the shape of androconia to be more important for the taxonomy of these *Lethe* taxa than the appearance of ♂ brand. The androconia (fig. 184) can be rather variable in length and width even in a single specimen, but there seems to be a boundary in length-width ratio of lamina (terminology follows Lang, 2016) between the specimens of *L. procne* (Leech) and *L. paraprocne* Lang & Liu examined by the author and Lang (2016). The androconia seems to have a larger length-width ratio of lamina (excluding apical spines) in *L. procne* (Leech) than in *L. paraprocne* Lang & Liu. And a population of *L. procne* (Leech) from Lijiang, NW. Yunnan (figs. 63-64, 184-K) does have an elongate androconia as in the northern populations of *L. procne* (Leech) from Omei, Ebian and Lixian, C. Sichuan. Lang (2017) wrongly included this population into *Lethe paraprocne shunana* Lang, without a close examination of androconia. Therefore it is more reasonable to deduce that both, *L. procne* (Leech) and *L. paraprocne* Lang & Liu, do not change in the character of androconia throughout their ranges from C. Sichuan to NW. Yunnan.

Moreover, the author noticed that the valva of ♂ genitalia in *L. procne* (Leech) always has a blunt tip whilst that of *L. paraprocne* Lang & Liu has a blunt tip or has the tip tapered to a fine point. And the HT of *Lethe paraprocne shunana* Lang does have the tip of ♂ valva tapered to a fine point (Lang, 2016: 233, fig. 19).

***Lethe changchini* spec. nov.** (figs. 50-53)

HT ♂ (fig. 50): China, Yunnan, Lijiang City, Yulong County, ca. 2900 m, 13.VIII.2018, H. Huang leg., deposited in BSNU.
PTs: Yunnan Province: 5 ♂♂ (figs. 51-53, CHH), same locality as HT, ca. 2900-3000 m, 14-27.VIII.2018, H. Huang leg..
Etymology. This new species is named in honor of Mr. Chang-Chin Chen, who financed the author's expedition of 2018.
Diagnosis. This new species is close to *L. paraprocne* Lang & Liu, but can be distinguished from the latter in ♂ by the following combination of characters.
1) Forewing termen more concave than in *L. paraprocne* Lang & Liu.
2) Forewing upper side with ♂ brand (fig. 183) obsolete, not so extensive as in *L. paraprocne* Lang & Liu.
3) Hindwing underside with basal half inside of postdiscal band extensively and densely dusted by yellow scales, showing a resemblance to *Lethe goalpara* (Moore, [1866]).
4) Hindwing underside postdiscal band more blackish than in *L. paraprocne* Lang & Liu, being markedly narrower at vein 4, leaving inside a clearly marked yellow triangular patch beyond the end of cell, which is not seen in *L. paraprocne* Lang & Liu.
5) Apical part of valva in ♂ genitalia (fig. 187) constantly and markedly stronger than in *L. paraprocne* Lang & Liu, with its widest part constantly broader than in *L. paraprocne* Lang & Liu.
Remarks. This new species nearly falls into the range of *L. paraprocne* Lang & Liu, being found only 20 km away from the closest population of *L. paraprocne* Lang & Liu. It flies together with *L. procne* (Leech) at the same habitat. The author considered this new species as independent from *L. paraprocne* Lang & Liu, not only because there are constant differences in both wing-pattern and ♂ genitalia, but also because of the following points: 1) the two species are nearly sympatric; 2) there is no intermediate form found; 3) *L. paraprocne* Lang & Liu does not change much in external appearance throughout a vast range from C. Sichuan to NW. Yunnan. Beside the genital difference mentioned above, some other structural differences can be told as follows, requiring a further study on more material: 1) fenestrula between tegumen and scaphium (fig. 186) seem to be better defined and broader in *L. paraprocne* Lang & Liu than in *L. **changchini*** **spec. nov.** and *L. procne* (Leech); 2) basal margin of lamina of androconia (fig. 184) seems to be more arched in *L. changchini* **spec. nov.** than in *L. paraprocne* Lang & Liu and *L. procne* (Leech).

Riodinidae

***Tibetododona* gen. nov.** (figs. 33-34, 190-197)

Type species. *Dodona moritai* Koiwaya & Shinkai, 1996, here designated.
Material. 3 ♂♂, 2 ♀♀ (CHH, CWZJ), Xizang Autonomous Region, Linzhi Prefecture, Bomi County, Tongmai, ca. 2000 m, VI.2018, G.-Z. Luo leg..
Etymology. The name, gender feminine, is formed from the geographical "Tibet" and joined to the conventional generic name *Dodona* Hewitson, [1861], to denote the distributional range.

***Tibetododona* gen. nov.** contains only one species: *T. moritai* (Koiwaya & Shinkai, 1996) **comb. nov.** from SE Tibet (Tongmai).
Taxonomic position. Riodinidae: Nemeobiinae: Nemeobiini (sensu Espeland et al., 2015): Nemeobiina (sensu Espeland et al., 2015)
Closest genera. *Polycaena* Staudinger, 1886*, Takashia* Okano & Okano, 1985*, Hamearis* Hübner, 1819
Description. Size: relatively large, with a forewing-length of 27-31mm for ♂, of 31-32mm for ♀ (considerably larger than in *Polycaena* Staudinger, *Takashia* Okano & Okano, & *Hamearis* Hübner). **Antenna**: apical segments gradually widened apically, not forming a clearly defined club (club clearly defined in *Dodona* Hewitson, *Polycaena* Staudinger, *Takashia* Okano & Okano, & *Hamearis* Hübner); flagellum consisting of 30 antennomeres (much fewer than in *Dodona* Hewitson). **Legs**: ♂ with profemur and protibia slightly shorter than mesofemur and mesotibia respectively (♂ profemur less than 1/3 times shorter than ♂ mesofemur in *Dodona* Hewitson, *Polycaena* Staudinger, *Takashia* Okano & Okano, & *Hamearis* Hübner); ♂ protarsi fused into one segment, somewhat hooked at tip and spined at inner surface (♂ protarsus neither hooked nor spined in *Dodona* Hewitson, *Polycaena* Staudinger, *Takashia* Okano & Okano, & *Hamearis* Hübner); claws of meso- and meta- tarsi in both sexes bidentate (unidentate in *Dodona* Hewitson, *Polycaena* Staudinger, *Takashia* Okano & Okano, & *Hamearis* Hübner). **Wing-shape**: hindwing with termen produced into a process at end of vein Cu2 (not produced into a process in *Polycaena* Staudinger, *Takashia* Okano & Okano, & *Hamearis* Hübner). **Wing-venation**: forewing as in *Dodona* Hewitson, *Polycaena* Staudinger, *Takashia* Okano & Okano, & *Hamearis* Hübner, but with the stalk of veins M1 and R3-R5 (fig. 194: blue part) considerably longer, and with upper discocellular between veins M1 & M2 (fig. 194: yellow part) considerably shorter; hindwing with cell H present (cell H absent in *Polycaena* Staudinger, *Takashia* Okano & Okano, & *Hamearis* Hübner); hindwing with the root of vein H remote from both cell H and discocellular cell (vein H placed close to discocellular cell in *Polycaena* Staudinger, *Takashia* Okano & Okano, & *Hamearis* Hübner, rooted from cell H in *Dodona* Hewitson); hindwing otherwise as in *Dodona* Hewitson, *Polycaena* Staudinger, *Takashia* Okano & Okano, & *Hamearis* Hübner. **Androconia**: no androconial scales along vein 2A at anal margin of forewing underside (androconial scales well marked in *Dodona* Hewitson). ♂ **genitalia**: uncus flat at apex (pointed in *Dodona* Heewitson, *Polycaena* Staudinger, *Takashia* Okano & Okano, & *Hamearis* Hübner); saccus extremely developed as a large plate (weakly developed in *Dodona* Hewitson, *Polycaena* Staudinger, *Takashia* Okano & Okano, & *Hamearis* Hübner); central plate between valvae entirely absent (present in *Dodona* Hewitson, *Polycaena* Staudinger, *Takashia* Okano & Okano, & *Hamearis* Hübner); aedoeagus sharply pointed at tip (not pointed in *Dodona* Hewitson).
Remarks. The recent works on molecular phylogeny of Riodinidae (Espeland et al., 2015, Seraphim et al., 2018) proved all of the Riodinidae butterflies from the Old World belong to Nemeobiinae (sensu Espeland et al., 2015) or Nemeobiini of Nemeobiinae (sensu Seraphim et al., 2018). Only one possible synapomorphy in morphological phylogeny of Riodinidae has been introduced by Harvey (1987) and confirmed by Espeland et al. (2015) for Nemeobiinae (sensu Espeland et al., 2015): hindwing veins Rs and M1 stalked, with the only exception of *Stalachtis* Hübner, 1818 (Riodininae). (Another exception, *Dodona katerina* Monastyrskii & Devyatkin, 2000, with hindwing veins Rs and M1 not stalked, is noticed in this work). There is no doubt that the new genus, ***Tibetododona* gen. nov** belongs to Nemeobiinae, possessing this synapomorphy.
There has been no critical research on morphological phylogeny and higher classification of Nemeobiinae (sensu Espeland et al., 2015), except for very few simple works (Stichel, 1930-1931; Chou, 1998; Harvey & Hall, 2002). Stichel's (1930-1931) work is barely a catalogue; Chou's (1998) classification is only a key to tribes based upon the characters of venation solely, with some self-contradictory statements; Harvey & Hall's (2002) analysis is solely based upon an analysis of androconia. However, Espeland et

al.'s (2015) molecular research provided a stable phylogeny and higher classification as follows.

"Nemeobiinae consist of two major clades, the first which includes a polyphyletic *Abisara* (a clade including the type species *A. kausambi* being sister to the Afrotropical *Afriodinia*) together with six other tropical genera (*Saribia, Dicallaneura, Laxita, Taxila, Praetaxila, Paralaxita*), and the second containing the rest of the nemeobiine genera, including *Styx, Corrachia, Zemeros, Stiboges,* the *Abisara fylla* group, *Dodona*, and the more temperate "hamearine" genera *Hamearis, Polycaena* and *Takashia*." "The oldest available name for the second clade would be Nemeobiini Bates, [1868]." "Nemeobiini can be subdivided into Nemeobiina (*Hamearis, Polycaena, Takashia*), Stibogina Stichel, 1928 (*Stiboges* and tentatively the *Abisara fylla* group), Corrachiina Stichel, 1928 (*Corrachia, Styx*), Zemerina Stichel, 1928 (*Zemeros* only) and Dodonina Espeland & Hall subtr. n. (*Dodona* only, as the type genus). Although the subtribe Nemeobiina is not well supported here, features from morphology and biogeography support the recognition of this subtribe".

Espeland et al.'s (2015) analysis on molecular data gave the importance to Harvey & Hall's (2002) work, in which Nemeobiina is well defined by the absence of androconia, different from *Dodonina, Stibogin*a and *Zemerina*. Therefore, the new genus, ***Tibetododona*** **gen. nov** can be tentatively included into Nemeobiina, by the absence of androconia.

Espeland et al.'s (2015) classification was not completely followed by Seraphim et al. (2018), who regarded the tribe Nemeobiini (sensu Espeland et al., 2015) as the subtribe Nemeobiina (sensu Seraphim et al., 2018), leaving the interrelationships among Espeland et al.'s (2015) subtribes unresolved. The author also believed that the phylogeny or the internal relationships of Nemeobiini (sensu Espeland et al., 2015) need a further research in future which is out of the scope of this paper. To be compared with ***Tibetododona*** **gen. nov.** nearly all the Chinese species of *Dodona* Hewitson have been examined and dissected by the author. To save the space, only the very little known *D. katerina* Monastyrskii & Devyatkin, 2000 (fig. 198) and *D. kaolikon* Yoshino, 1999 (fig. 199) are illustrated herein.

Polycaena carmelita l a n g i **subspec. nov.** (figs. 68-70, 200-203: C)

HT ♂ (fig. 68): China, Sichuan Province, Aba Tibetan Autonomous Prefecture, Heishui County, ca. 2500 m, 22.VII.2017, S.-Y. Lang leg., deposited in BSNU.

PTs: Sichuan Province: 2 ♂♂, 2 ♀♀ (figs. 69-70, CHH), same data as HT.

Etymology. This new subspecies is named in honor of Dr. Song-Yun Lang, who collected the entire type series.

Diagnosis. This new subspecies can be distinguished from the nominotypical subspecies of *P. carmelita* Oberthür, 1903 (syntype localities: Tianquan, Lianglu, Baoxing, & Kangding; also known from Omei) by the following combination of characters in both sexes.

1) Hindwing underside with all veins outlined by whitish or pale yellow scales, not by reddish scales as in ssp. *carmelita* Oberthür.

2) Hindwing underside with basal half of space 7 mostly in whitish color, not entirely in blackish color as in ssp. *carmelita* Oberthür.

3) Hindwing underside with pale postdiscal markings in spaces 1-3 well marked and continuous, not obsolete as in ssp. *carmelita* Oberthür.

4) Hindwing underside with orange submarginal line less reddish and narrower than in ssp. *carmelita* Oberthür, not broadly extending distad as in ssp. *carmelita* Oberthür..

Remarks. All the known populations of *P. carmelita* Oberthür have their flight periods recorded only in July, so that the above-mentioned differences cannot be explained by the seasonal variations. 2 ♂♂ of *P. c. carmelita* Oberthür from Baoxing and Wolong have been dissected alongside the 2 ♂♂ of *P. c.* ***langi*** **subspec. nov.**, and the following genital differences have been noticed (figs. 201-203: A, B & C), indicating that the differences between these taxa are more than external. Uncus in dorsal view is markedly narrower in *P. c.* ***langi*** **subspec. nov.** than in ssp. *carmelita* Oberthür. Valva is markedly narrower in *P. c.* ***langi*** **subspec. nov.** than in ssp. *carmelita* Oberthür. Aedoeagus is markedly shorter in *P. c.* ***langi*** **subspec. nov.** than in ssp. *carmelita* Oberthür. According to S.-Y. Lang (pers. comm.), *P. c.* ***langi*** **subspec. nov.** is sympatric with *P. princeps minensis* Sugiyama, 1997 (figs. 200-203: E).

Polycaena w o l o n g e n s i s Huang & Bozano **spec. nov.** (Figs. 71, 200-203: D)

HT ♂ (fig. 71): China, Sichuan Province, Aba Tibetan Autonomous Prefecture, Wenchuan County, Wolong Nature Reserve, 2300m, 10.VII.1994, G. C. Bozano leg., deposited in BSNU.

PT: Sichuan Province: 1 ♂ (CB), same data as HT.

Etymology. This new species is named after the TL.

The authority of this taxon is attributed to Hao Huang and Gian Cristoforo Bozano.

Diagnosis. This new species is similar to *P. carmelita* Oberthür, but can be distinguished from the latter in ♂ by the following combination of characters.

1) Antenna with a white patch just inside of the club, which is entirely absent in all known subspecies of *P. carmelita* Oberthür.

2) Forewing underside with black antediscal spots in spaces 1b-2 clearly defined on their inner side by a yellow patch in ground color, not entirely merged into the black basal dusting as in *P. carmelita* Oberthür.

3) Scaphium of ♂ genitalia in dorsal view (fig. 201-D) markedly wider at base than in *P. carmelita* Oberthür (fig. 201-A, B & C).

4) Valva of ♂ genitalia (fig. 202-D) more square, with inner process of harpe at lower apex hardly seen in lateral view and obtusely angled in dorsal view, not so well marked and pointed in dorsal view as in *P. carmelita* Oberthür (fig. 202-A, B & C).

5) Central plate of ♂ genitalia (fig. 203-D) much wider in dorsal view and thicker in lateral view, with a deeper central split than in *P. carmelita* Oberthür (fig. 203-A, B & C).

6) Juxta of ♂ genitalia (Fig. 203-D) with posterior part widely divided in dorsal view, not conjoined as in *P. carmelita* Oberthür (fig. 203-A, B & C).

7) Coecum of aedoeagus in dorsal view (fig. 203-D) with a pair of lateral spines which are entirely absent in *P. carmelita* Oberthür (fig. 203-A, B & C).

Remarks. A ♂ of *P. carmelita carmelita* Oberthür (fig. 66) was captured by a friend of the author from Balangshan, Wolong in the same area as *P.* ***wolongensis*** **spec. nov.** but at a higher area. This might indicate that these two species are ecologically isolated from each other at the same locality. Moreover, *P. carmelita* Oberthür seems to be more in common with *P. princeps* (Oberthür, 1886) in ♂ genitalia than with *P.* ***wolongensis*** **spec. nov.**.

Lycaenidae

Agriades x i a o d o n g i **spec. nov.** (figs. 72-77, 205-A & B)

HT ♂ (fig. 72): China, Xizang Autonomous Region, Xigaze Prefecture, Nyalam County, 30 km north of Nyalam Town, 4430 m, 8.VII.2017, H. Huang leg., deposited in BSNU.

PTs: Xizang Autonomous Region: 11 ♂♂, 2 ♀♀ (figs. 73-77, CHH), same data as HT.

Etymology. This new species is named in honor of Mr. Xiao-Dong Yang, who accompanied the author during his expedition of 2017 to Tibet.

Diagnosis. This new species is undoubtedly close to *Agriades janigena* (Riley, 1923) from Nyalam, *A. morsheadi* (Evans, 1923) from Rongshar Valley (between Nyalam and Mt. Everest), and *A. kurtjohnsoni* Balint, 1997 from Jargeng Khola- Sabze Khola- Khangsar area, C. Nepal (to the west of Nyalam), but can be distinguished from all of them by the following combination of characters.
♂:
1) Forewing upper side ground color dark deep purplish blue (paler and silky in *A. morsheadi* (Evans) and *A. kurtjohnsoni* Balint), with a much wider black marginal border than in *A. morsheadi* (Evans).
2) Hindwing upper side with a markedly wider black marginal border than in *A. morsheadi* (Evans) and *A. kurtjohnsoni* Balint.
♀:
3) Forewing upper side without a pale discocellular spot or a patch formed by some denser pale scales, which is well marked in *A. morsheadi* (Evanss) and *A. kurtjohnsoni* Balint, usually also marked in *A. janigena* (Riley).
Both sexes:
4) Hindwing underside ground color pale brown, markedly paler than in *A. morsheadi* (Evans) and *A. janigena* (Riley), without the greenish tint of *A. kurtjohnsoni* Balint.
5) Both wings underside with all of the pale spots very obscure and ill-defined, neither clearly defined as in *A. kurtjohnsoni* Balint nor in striking contrast to the dark ground color as in *A. morsheadi* (Evans) and *A. janigena* (Riley).
6) Both wings underside with all of the pale submarginal lunules obsolete, not well marked as in *A. janigena* (Riley), *A. morsheadi* (Evans) and *A. kurtjohnsoni* Balint.
Remarks. As in other species groups of the Polyommatini, the ♂ genitalia do not work for the separation of close species. The author cannot find any well marked difference in ♂ genitalia between the new species and *A. janigena* (Riley), except for the width of labis and falx in dorsal view (fig. 205). Most of the current specific classifications of Polyommatini seem to be based on the differences in wing-characters. The new species was found only 30 km away from the locality of *A. janigena* (Riley), so that their differences cannot be simply explained by the geographical isolation. The biotopes of these two closely distributed species are quite different from each other: *A. janigena* (Riley) inhabits the slopes full of shrubs and grasses, whereas *A. **xiaodongi*** **spec. nov.** inhabits the patches of its food-plants below the bare slopes (fig. 204). Their flight periods are also different: *A. janigena* (Riley) flies abundantly in late July (only one ♂ was recorded by Riley (1922) as from late June) whilst *A. **xiaodongi*** **spec. nov.** flies abundantly in early July (presumably also at end of June) but disappeared in late July. There seems to be ecological isolation between these two species as in the case of *Luehdorfia chinensis* Leech, 1893 and *L. longicaudata* Lee, 1982 in Qinling Mts..

Neolycaena l a n g i **spec. nov.** (figs. 84-86, 206-207)

HT ♂ (fig. 84): China, Xinjiang Uygur Autonomous Region, Ili Kazakh Autonomous Prefecture, Xinyuan City (Künes), near Xinyuan Town, ca. 1000m, 20.VI.2017, S.-Y. Lang leg., deposited in BSNU.
PTs: Xinjiang Uygur Autonomous Region: 2 ♀♀ (figs. 85-86, CHH), 21 ♂♂, 23 ♀♀, same locality as HT, but 27.VI.2019, H. Huang leg., all same data as HT.
Etymology. This new species is named in honor of Dr. Song-Yun Lang, who collected the entire type series.
Diagnosis. This new species is similar to *Neolycaena (Neolycaena) gulchaensis* Weidenhoffer, 2000 from Gulcha Valley, N. Alai Mts., Kyrgyzstan, but can be distinguished from the latter by the following combination of characters.
Both sexes:
1) Both wings underside ground color darker, with hindwing veins not appearing paler as in *N. gulchaensis* Weidenhoffer.
2) Both wings underside with all white postdiscal markings more lunulate.
3) Hindwing underside with submarginal ocherous patches markedly smaller.
♂ genitalia:
4) Central split between valvae markedly deeper than in *N. gulchaensis* Weidenhoffer, reaching a point well behind the widest point of valvae.
♀ genitalia:
5) Antrum in in lateral view markedly slenderer.
Remarks. This new species undoubtedly belongs to the subgenus *Neolycaena* de Niceville, 1890, possessing the following diagnostic characters (Weidenhoffer et al., 2004, 2016): antennal club consisting of 13 segments; ciliae chequered with blackish brown and white; ♂ brand absent; hindwing underside only with a single row of black submarginal spots; apical part of valva needle-shaped. With hindwing underside ocherous submarginal spots present, this new species can be placed alongside *N. gulchaensis* Weidenhoffer, *N. churkini* Zhdanko, 2001, *N. pretiosa* (Lang, 1884), and *N. medea* Zhdanko, 1998. The new species can be easily distinguished from all of the above-mentioned species by the ♀ genital characters in antrum and signum. Actually, the new species is the closest to *N. medea* Zhdanko in ♂ and ♀ genitalia, but can be distinguished from the latter simply by the smooth ostium bursae without any teeth. The new species looks somewhat like *N. sinensis* (Alpheraky, 1881) at the first glance, but can be distinguished from the latter by having a larger size [forewing-length 14.5-15.5 mm against 12-14 mm in *N. sinensis* (Alpheraky)], the presence of ocherous submarginal patches, the shorter falx in ♂ genitalia, the deeper split between valvae of ♂ genitalia, the less marked lower cornutus of aedoeagus in ♂ genitalia, and the broader ostium in ♀ genitalia. Eventually, it is necessary to discuss the differences between the new species and the very little known *N. yiliensis* (R.-X. Huang & Murayama, 1992) from Yili, Xinjiang. According to the original description and figure (R.-X. Huang & Murayama, 1992), *N. yiliensis* (R.-X. Huang & Murayama) possesses the following different characters from the new species: 1) all of the white markings on underside of both wings narrower; 2) hindwing underside with black submarginal spots obsolete, minute or absent in some spaces; 3) falx markedly longer; 4) superzonal sheath of aedoeagus extremely slender and about 3 times as long as subzonal sheath. It should be noted that *N. yiliensis* (R.-X. Huang & Murayama) was synonymized with *N. sinensis* (Alpheraky) by Lukhtanov (1994) but kept for further judgment by Weidenhoffer et al. (2004 & 2016).

Chrysozephyrus changchini **spec. nov.** (figs. 87-89, 208- A & B)

HT ♂ (fig. 88): China, Yunnan Province, Diqing Tibetan Autonomous Prefecture, Weixi, ca. 3000 m, 3.VIII.2018, H. Huang leg., deposited in BSNU.
PTs: Yunnan Province: 1 ♂ (fig. 87, CHH), same data as HT; 1 ♂ (fig. 89, CHH), Lijiang City, Yulong County, ca. 3000 m, 6.VIII.2018, Y.-Q. Lu leg..
Etymology. This new species is named in honor of Mr. Chang-Chin Chen, who financed the author's expedition to Yunnan in 2018.
Diagnosis. This new species is similar to *Chrysozephyrus fibonacci* (Zhuang, Yago & Wang, 2015), with which it is sympatric, but can be distinguished from the latter in ♂ by the following combination of characters.
1) Forewing upper side with black marginal border markedly wider, especially at apex.
2) Forewing upper side with an additional white patch in space 3 which is entirely absent in *C. fibonacci* (Zhuang, Yago & Wang).

3) Hindwing upper side with blue marginal area and whitish submarginal spots better marked and more conspicuous.
4) Hindwing underside discal band more parallel with discocellular bar and not reaching tornal orange spots at vein 2.
♂ genitalia:
5) Falx not branched at the bent corner.
6) Aedoeagus straighter.
7) Apical process of valva in both dorsal and ventroposterior views pointed at tip, not rounded as in *C. fibonacci* (Zhuang, Yago & Wang).
8) Valva in ventroposterior view with a longer inner margin of harpe.
Remarks. *C. fibonacci* (Zhuang, Yago & Wang) was originally described on 2 ♂♂ under the genus *Shirozuozephyrus* Koiwaya, 2007 which was recently synonymized with *Chrysozephyrus* Shirôzu & Yamamoto, 1956 by Saito & Hasegawa (2016). The author agrees with Saito & Hasegawa (2016) in such generic classification and takes this opportunity to illustrate the previously unknown ♀ of *C. fibonacci* (Zhuang, Yago & Wang) herein (fig. 90). The new species was observed flying together with *C. fibonacci* (Zhuang, Yago & Wang) in all of the two known habitats (one at Weixi, another at Lijiang), but in much fewer numbers. At one habitat in Weixi, the following Theclina species were also observed flying: *C. linae* Koiwaya, 1993 (fig. 104), *C. gaoi meili* Yoshino, 1999 (fig. 102; misidentified by Zhuang et al. (2015: 143, figs. 2-3 & 28) as *C. fujiokai fujiokai* Koiwaya, 2000), *Howarthia caelestis* (Leech, 1890), *Esakiozephyrus neis* (Oberthür, 1914), and *Uedaozephyrus kuromon* (Sugiyama, 1994). At another habitat in Lijiang, the following Theclina species were found: *C. dumoides* (Tytler, 1915), *C. kirbariensis* (Tytler, 1915), and *Teratozephyrus hecale* (Leech, 1893). There have been only five species of *Chrysozephyrus* Shirôzu & Yamamoto (sensu Shirôzu & Yamamoto, 1956) published since Koiwaya (2007) published his book on Theclina (Koiwaya & Monastyrskii, 2010; Hasegawa & Saito, 2014; Zhuang et al., 2015; Saito & Hasegawa, 2016; Hsu 2018): *Shirozuozephyrus alienus* Koiwaya & Monastyrskii, 2010 from C. Vietnam, *Thermozephyrus kubotae* Hasegawa & Saito, 2014 from C. Vietnam, *Shirozuozephyrus fibonacci* Zhuang, Yago & Wang, 2015 from NW. Yunnan, *Chrysozephyrus miyagawai* Saito & Hasegawa, 2016 from C. Vietnam, and *Chrysozephyrus laoshanensis* Hsu, 2018 from Guangxi. All these taxa are not closely allied to the new species here described.

***Chrysozephyrus yingqii* spec. nov.** (figs. 95-97, 209- A & B)
HT ♂ (fig. 96): China, Yunnan Province, Diqing Tibetan Autonomous Prefecture, Weixi, ca. 2400 m, 16.VIII.2018, H. Huang leg., deposited in BSNU.
PTs: Yunnan Province: 1 ♂ (fig. 95, CHH), same data as HT; 1 ♂ (fig. 97, CHH), same locality as HT, but 27.VII.2018, H. Huang leg..
Etymology. This new species is named after Ying-Qi Huang, the son of the author.
Diagnosis. This new species is similar to *Chrysozephyrus sikkimensis* (Howarth, 1957) from Sikkim and Myanmar (Koiwaya, 2007), but can be distinguished from the latter in ♂ by the following combination of characters.
1) Both wings upper side ground color darker, with a bluish tint.
2) Both wings upper side with all veins more lined with blackish scales.
♂ genitalia:
3) Tegumen plus scaphium in lateral view with a longer dorsal margin.
4) Falx in lateral view sharply pointed at the bent corner, not broad and broadly serrate at the bent corner as in *C. sikkimensis* (Howarth).
5) Apical process of valva in ventroposterior view much broader.
The new species is also very similar to *C. yoshikoae* Koiwaya, 1993 from Shaanxi, Sichuan and NE. Yunnan, but can be distinguished from the latter in ♂ by the following combination of characters.
1) Forewing upper side with costal area densely dusted by black scales.
♂ genitalia:
2) Aedoeagus in lateral view straighter, not bent downwards as in *C. yoshikoae* Koiwaya.
3) Falx in full face view nearly right angled at the bent corner, with only a few very minute spines there, not heavily serrate as in *C. yoshikoae* Koiwaya.
4) Valva in ventroposterior view markedly stouter, with inner margin of harpe less concave, and with apical process of ampulla narrower and less rounded at tip.
Remarks. Most of the *Chrysozephyrus* Shirôzu & Yamamoto species are similar to one another in external features, thus only a dissection of ♂ genitalia or a study on larva can give a confirmed identification. The new species here-described is recognized by its ♂ genital structures, especially the peculiar feature of falx. In overall shape of the ♂ genitalia, this new species is closer to *C. yoshikoae* Koiwaya than to *C. sikkimensis* (Howarth), and *C. fujiokai* Koiwaya seems to the closest to *C. sikkimensis* (Howarth). To give a better understanding of the ♂ genital differences among the similar species, the ♂ specimens of the following species have been dissected by the author in addition to his consultation of references: *C. yoshikoae* Koiwaya, *C. marginatus* (Howarth, 1957), *C. fujiokai* Koiwaya, *C. gaoi* Koiwaya, 1993, *C. linae* Koiwaya, *C. sakula* Sugiyama, 1992, *C. haradai* Koiwaya, 2000 and *C. tatsienluensis* (Murayama, 1955). On the other hand, this new species is rather similar to *C. sandersi* (Howarth, 1957) and *C. intermedius* (Tytler, 1915), of which the specimens are unavailable to the author, but is different in ♂ genitalia.

***Chrysozephyrus luyanquani* spec. nov.** (figs. 107-108 & 210)
HT ♀ (fig. 107): China, Yunnan Province, Diqing Tibetan Autonomous Prefecture, Weixi, 2300-2400m, 23.VII.2018, H. Huang leg., deposited in BSNU.
PTs: Yunnan Province: 8 ♀♀ (fig. 108, CHH), same locality as HT, but 27.VII-24.VIII.2018, H. Huang & Y.-Q. Lu leg..
Etymology. This new species is named after Yan-Quan Lu, who collected part of the type series.
Diagnosis. This new species is very peculiar in the underside wing-pattern and is only similar to *Chrysozephyrus hisamatsusanus* (Nagami & Ishiga, 1935) from Japan and *Chrysozephyrus splendidulus* Murayama & Shimonoya, 1965 from Taiwan, but can be distinguished from both of them in ♀ by the following combination of characters.
1) Reddish spot in space 3 on forewing upper side a little larger.
♀ genitalia:
2) Lamella antevaginalis somewhat half-rounded as in C. *hisamatsusanus* (Nagami & Ishiga), but markedly broader, and not triangular as in *C. splendidulus* Murayama & Shimonoya (Kawazoe & Wakabayashi, 1969).
3) Pigmented antrum markedly closer to apex of lamella antevaginalis than in C. *hisamatsusanus* (Nagami & Ishiga) (Kawazoe & Wakabayashi, 1969).
4) Sclerite on the inner wall of ductus bursae and base of corpus bursae extending beyond the attaching point of ductus seminalis, whereas in both C. *hisamatsusanus* (Nagami & Ishiga) and *C. splendidulus* Murayama & Shimonoya (Kawazoe & Wakabayashi 1969) it restricted before the attaching point of ductus seminalis.

5) Attaching point of ductus seminalis on ductus bursae much closer to genital plates than in both C. *hisamatsusanus* (Nagami & Ishiga) and *C. splendidulus* Murayama & Shimonoya (Kawazoe & Wakabayashi, 1969).
Remarks. This new species is undoubtedly allied to C. *hisamatsusanus* (Nagami & Ishiga) and *C. splendidulus* Murayama & Shimonoya, having the broad white discal band on hindwing underside straight and not waved at sub-tornal area, by which it can be distinguished from all the remaining species of *Chrysozephyrus* Shirôzu & Yamamoto. The author tried hard to discover the ♂ of this new species but failed; the ♀♀ flew from late July to late August, but the ♂♂ remained mysterious. The ♀♀ of this astonishing new species are hardly distinguishable from those of either C. *hisamatsusanus* (Nagami & Ishiga) or *C. splendidulus* Murayama & Shimonoya by external features. However, its distribution (fig. 212) and its peculiar ♀ genitalia (fig. 211), leave no doubt that this new species is independent and widely isolated from its affinities.

Pratapa qingtianwawa **spec. nov.** (figs. 109-111, 213-216: A & B)
HT ♂ (fig. 110): China, Yunnan Province, Lijiang City, Yulong County, 2900 m, 5.VIII.2018, H. Huang leg., deposited in BSNU.
PTs: Yunnan Province: 7 ♂♂, 1 ♀ (figs. 109 & 111, CHH), same locality as HT, but 5-14.VIII.2018, H. Huang leg..
Etymology. The name comes from the name of a doll made by the author' son during the rainy days at the TL for expecting the sunny days.
Diagnosis. This new species is similar to *Pratapa icetas* (Hewitson, [1865]), but can be distinguished from the latter by the following combination of characters.
Both sexes:
1) Hindwing somewhat more elongate, with a longer dorsum in proportion to costa.
2) Both wings underside ground color much darker, with a greenish gray tint.
♂:
3) Both wings upper side with much smaller blue areas formed by the powdered blue scales, appearing much darker than in *P. icetas* (Hewitson).
♂ genitalia:
4) Lateral process of tegumen much broader than in *P. icetas* (Hewitson).
5) Juxta with upper margins of branches less concaved than in *P. icetas* (Hewitson).
Remarks. The range of this new species falls into the range of *P. icetas* (Hewitson), and the closest population of *P. icetas* (Hewitson) is found only 20 km away from the new species. However, these two close species do not fly together at the same habitat. This new species is considered as independent, not only because it is constantly different in both external features and ♂ genitalia, but also because *P. icetas* (Hewitson) does not change much in both external features and ♂ genitalia throughout a vast area (from the western Himalaya to southeastern China, up to Qinling Mts. in the north). A careful survey of literature proves that this new species has not been described as infra-specific taxon in the history and all the known taxa of *P. icetas* (Hewitson) are summarized in the following annotated list.
1) *P. icetas icetas* (Hewitson, [1865]) ---- Kangra-Kumaon, NW. India (TL: India).
Notes. Hewitson ([1865]: 44, pl. 18, figs. 6-7) described and illustrated this taxon from India, without giving the exact locality. Evans (1925) clarified this taxon from Kangra-Kumaon in W. Himalayas.
2) *P. icetas contractus* (Leech, 1890) ---- Hubei, Sichuan, Chongqing, Guangxi (TL: Leshan, Sichuan and Changyang, Hubei).
Notes. This taxon was originally described as *Iolaus contractus* Leech (1890), with type locality not specifically mentioned. However, most of the taxa described in the same paper (Leech 1890) were collected from Changyang, Hubei. It was reconsidered to be not specifically separated from *Camena icetas* (Hewitson) by Leech (1893: 350-351), with Chia-ting-fu (now Leshan, C. Sichuan), Omei-shan and Chang-yang listed as the localities. South (1902) in his catalogue of Leech's collection listed all these specimens, of which only one ♂ was from Chia-ting-fu, one normal ♀ was from Omeishan and most were from Chang-yang, Hubei. The only ♂ specimen from Chia-ting-fu in Leech's collection was figured as a photo by d'Abrera (1993: 428), labeled as "a" in BMNH, definitely belonging to the syntype series. The author examined a good number of ♂ and ♀ specimens from Wasigou and eastern area of Kangding, W. Sichuan (118-119, 121-123, 213-216: D) and a ♂ from Simianshan, Chongqing; these specimens match with Leech's description and d'Abrera's (1993) figure. Specimens from Guangxi (figs. 124-126, 213-216: E) were tentatively identified as this subspecies by having the similar wing-pattern.
3) *P. icetas extensa* Evans, 1925 ---- Indian area from Sikkim to Assam, Myanmar, N. Thailand, N. Laos, N. Vietnam, S. Yunnan (TL: Sikkim-Karens).
Notes. Specimens from S. Yunnan (figs. 120, 127-130, 213-216: F) were tentatively included into this subspecies. However, there are considerable geographical variations among the populations from Indo-China as shown in the literature.
4) *P. icetas mishmia* Evans, 1925 ---- Mishimi Hills (TL).
Notes. According to the original description (Evans 1925), this taxon possesses the following characters:
"male above blue paler and with a greenish tinge, much more extensive, entirely fills cell and extends to base 3; border not angled mid 1 or continued along dorsum".
5) *P. icetas sakaia* Corbet, 1940 ---- Malay Peninsula (TL).
6) *P. icetas* ssp. 1 ---- NW. Yunnan (Deqin, Tsekou, Weixi, Gongshan).
Notes. Specimens from NW. Yunnan (figs. 112-117, 133, 213-216: C) all have the black sub-tornal spot on hindwing underside markedly smaller than in ssp. *contractus* (Leech). They might be included into ssp. *mishmia* Evans in further research, though they have smaller blue areas on both wings upper side.
7) *P. icetas* ssp. 2 ---- Shaanxi (Ningshaan, Hanzhong).
Notes. 2 ♀♀ specimens (fig. 131) collected by Mr. Yu-Fei Li are plain dark brown on both wings upper side. One ♂ (fig. 132, , 213-216: G) collected by Mr. Si-Yao Huang from Hanzhong was dissected.
8) *P. icetas* ssp. 3 ---- Fujian (Sanming).
Notes. According to Z.-J. Wu (in C.-S. Wu & Hsu, 2017), the ♂ from Fujian seems to have a more yellowish ground color on both wings underside. Nevertheless this population might be included into ssp. *contractus* (Leech).

Hesperiidae

Pedesta jinoae **spec. nov.** (figs. 134, 217 & 219)
HT ♂ (fig. 134): China, Yunnan Province, Xishuangbanna, Jinghong, 650 m, 1.V.2018, H. Huang leg., deposited in BSNU.
PTs: Yunnan: 11 ♂♂, Gengma, 1000 m, 1.V.2019, H. Huang leg..

Etymology. This new species is named after the tribe of Jino living in the TL.
Diagnosis. This new species is similar to *P. xiaoqingae* (Huang & Zhan, 2004) (figs. 135 & 218) in external features, and is similar to *P. latris* (Leech, 1893) and *P. yingqii* (Huang, 2011) (fig. 220) in ♂ genital structures, but can be distinguished from both of them in ♂ by the following combination of characters.
1) Both wings underside ground color reddish brown, not yellowish brown as in *P. latris* (Leech, 1893) and *P. yingqii* (Huang).
2) Hindwing underside with a few postdiscal pale patches outside of the discal spots, which are not seen in *P. latris* (Leech).
3) Forewing upper side with discal spots in spaces 2 & 3 larger than in both *P. yingqii* (Huang) and *P. xiaoqingae* (Huang & Zhan).
4) Antenna (fig. 219) with 14 nudum antennomeres at apex [13 in *P. yingqii* (Huang) and 11 in *P. xiaoqingae* (Huang & Zhan)].
♂ genitalia:
5) Socius present at lateral sides of tegumen, longer and more sharply pointed than in *P. latris* (Leech).
6) Cornuti absent, not present as in *P. xiaoqingae* (Huang & Zhan).
7) Aedoeagus in lateral view with ventral margin abruptly produced into a sharp process.
8) Left footstalk much smaller than right footstalk, whereas in *P. xiaoqingae* (Huang & Zhan) the footstalks are similarly sized.
9) Left footstalk markedly longer than in *P. yingqii* (Huang).
10) Valva with upper process of harpe obsolete, not well marked as in *P. yingqii* (Huang).
Remarks. The closest relative of this new species is supposed to be *P. latris* (Leech), as these two species share the very peculiar characters of the footstalks and most of the characters in ♂ genitalia. It is rather astonishing that there is still new species found in the tropical forest of southern Yunnan. The molecular phylogeny and higher classification of Aeromachini was recently investigated by Z.-F. Huang et al. (2019) and the genus *Thoressa* Swinhoe, 1913 was divided into three genera, one of which comprises most of the Chinese species, applicable to the generic name, *Pedesta* Hemming, 1934 (sensu Z.-F. Huang et al., 2019). The author agrees to such higher classification and places the new species here described into the newly defined genus *Pedesta* Hemming.

Pedesta hyrie (De Niceville, 1891) (figs. 138-145, 221-222)

Pedesta hyrie hyrie (De Niceville, 1891) (figs. 138-142, 221-222: D, E & F)
Halpe hyrie De Niceville, 1891: 388 (TL: Naga Hills).
Thoressa hyrie: Evans: 1949, partim on data from Manipur, Naga Hills, Sadon, N. Shan State; Kimura, 1997: 47, Thailand; Osada et al., 1999: pl. 137, Laos; Monastyrskii & Devyatkin, 2003: 46, N. & C. Vietnam.
Material. Yunnan Province: 11 ♂♂, Honghe Prefecture, Lvchun County, Huanglianshan Nature Reserve, ca. 2000 m, 25.V.2018, H. Huang leg.
Remarks. This subspecies is characterized by: 1) ♂ brand usually well marked; 2) forewing spots in spaces 2 and 3 closer to each other, almost touching; 3) forewing spot in space 2 at most slightly overlapping cell spot. This taxon is reported from Yunnan for the first time. It was observed flying together with *P. fusca* (Elwes, [1893]) (fig. 136) and *P. serena* (Evans, 1937) (figs. 137 & 223). In wing-pattern, this taxon is very variable in the shape and the size of the discocellular spot, discal spots and subapical spots on the forewing; some individuals look like *P. h. maculata* (Fan & Wang), such as those in figs. 138 and 139.

Pedesta hyrie merea **(**Evans**, 1932)** (figs. 144-145, 221-222: A) **stat. nov.**
Halpe lucasi (sic) *merea* Evans, 1932: ♂ (TL: Pemako; fig. 145).
Pedesta naumanni Huang: 1998: 211, ♂ (TL: Aniqiao, Metok, SE Tibet; fig. 144); Huang (2010: 195) synonymy for *Thoressa hyrie* De Niceville.
Material. Xizang Tibetan autonomous Region: 2 ♂♂, Metok, SE. Tibet, 23.VII.1996, H. Huang leg..
Remarks. This subspecies is characterized by: 1) ♂ brand usually obsolete; 2) forewing spots in spaces 2 and 3 remote from each other; 3) forewing spot in space 2 not overlapping cell spot. This taxon deserves a subspecies if the next taxon is treated as a valid subspecies. As Evans (1949) pointed out, the wet season form of this species has a few dark postdiscal spots and a pale subapical spot on hindwing underside (fig. 144) whilst the dry season form has no such spots (fig. 145).

Pedesta hyrie maculata (Fan & Wang, 2010) (figs. 143, 221-222: B & C) **stat. nov.**
Thoressa maculata Fan & Wang, 2010: 439 (TL: Maoershan, Guangxi).
Material. Guangxi Province: 2 ♂♂ (CHH), no further data, E.-P. Ma leg..
Remarks. This subspecies is characterized by forewing spot in space 2 more overlapping cell spot than in other subspecies. A study of the specimens from Guangxi, Tibet and Yunnan shows that these populations have no important structural difference in ♂ genitalia. They do show some differences (described below) which are usually considered as individual or geographical variations in case of other *Pedesta* Hemming species, as all the previously known species of *Pedesta* show rather high diversity in genitalia morphology, with considerable differences in gnathos, socius, footstalks, harpe or aedoeagus. The specimens from Guangxi have each arm of uncus with a small prong on inner side, the lateral processes of coecum smaller and the apex of the harpe remoter from the ampulla (not apparent in some individuals, such as in fig. 221-B); those from Yunnan have a longer and thicker tegumen and a pair of shorter valvae. Such differences in this very limited material should not be considered as having any taxonomic value, as it is possible the species varies a lot among more populations which are not examined yet.

Sovia w e n h a o i **spec. nov.** (figs. 146-147, 224)
HT ♂ (fig. 146): China, Xizang Autonomous Region, Xigaze Prefecture, Jilong County, Jilong Town, 2740 m, 11.VII.2017, H. Huang leg., deposited in BSNU.
PTs: Xizang Autonomous Region: 4 ♀♀ (fig. 147, CHH), same locality as HT, but 13.VII.2017, H. Huang leg..
Etymology. This species is named in honour of Mr. Wen-Hao Sun, who provided many valuable specimens to the author for his study.
Diagnosis. This new species is similar to *S. grahami* (Evans, 1926) (figs. 148 & 225) in external features and is almost indistinguishable from *S. grahami miliaohuae* Huang, 2003, but can be distinguished by the following combination of ♂ genital characters.
1) Uncus in dorsal or ventral view wider at apex and flat at middle of apex, with lateral sides less contracted.
2) Valva with inner process of harpe shorter.
3) Coecum in lateral view more upturned at apex.
4) Lateral walls of aedoeagus with denticles at apex.
Remarks. Two subspecies of *Sovia grahami* (Evans, 1926) have been described: ssp. *grahami* (Evans) from Khasia Hills (TL), Sikkim and S. Tibet (Cuona); ssp. *miliaohuae* Huang, 2003 from Gaoligongshan Mts., W. Yunnan. The new species is distributed to the west of *Sovia grahami grahami* (Evans) and is separable in external features by having the cell spot remote from the spot in space 2 and directed to a point well inside of the spot in 2.

The *Carterocephalus niveomaculatus* Oberthür - group (figs. 149-163, 226-231)

This morphological group is composed of *C. niveomaculatus* Oberthür, 1886 and *C. christophi* Grum-Grshimailo, 1891, characterized by the following characters: hindwing upper side with pale central spot mid base and termen; forewing upper side with subapical markings narrow, those in spaces 4 and 5 separate from those in spaces 6 to 8; forewing upper side with all markings white, with the spot in space 2 contiguous to the cell spot, and with the spot in space 1b absent, small or set obliquely. Seven taxa involved in this group have been described, most of which were treated as subspecies or synonyms of *C. niveomaculatus* Obth. and *C. christophi* Gr.-Gr. in the literature. However, a careful study in ♂ genitalia and distributional ranges strongly suggests that most of these taxa are valid in taxonomy, deserving full specific rank. The present research is only tentative, due to the rarity of the material and the relatively lower diversity in genitalia morphology of the genus *Carterocephalus* Lederer, 1852. *C. niveomaculatus* Obth. and *C. christophi* Gr.-Gr. have been recorded as sympatric in Kangding area, W. Sichuan, thus their specific ranks can be accepted without doubt, and their external and genital differences can be used as a standard to deduce the interrelationships of all the taxa involved in this group. It became clear that most of the taxa involved have parallel differences from both *C. niveomaculatus* Obth. and *C. christophi* Gr.-Gr., thus most of them can be accepted as full species. Since all the important external characters are individually variable in some species of this group, a key to species is not appropriate and the following analysis of characters and an annotated list are presented instead.

Characters.

1) Costal spot at base of forewing upper side. This spot is entirely absent in *C. niveomaculatus* Obth. , fully developed in *C. christophi* Gr.-Gr., *C. canopunctatus* Nabokov, 1941 and *C. **bozanoi*** **spec. nov.**, and is individually variable in both *C. tibetanus* (South, 1913) and *C. zhongkui* Sakai, 2016. The variability of this character in at least two taxa indicates that this character should not be used as an important diagnostic character to define the species boundary as Evans (1949) did.

2) Discocellular white spot on hindwing upper side. This spot is narrow in *C. niveomaculatus* Obth. , *C. tibetanus* (South) and *C. zhongkui* Sakai, medium in *C. canopunctatus* Nabokov, broad in *C. christophi* Gr.-Gr., and is individually variable in *C. **bozanoi*** **spec. nov.**

3) Discocellular spot and discal spot in space 2 on hindwing underside. These two spots are usually broadly conjoined in *C. christophi* Gr.-Gr. with very few exceptions, but always well interrupted in all the remaining species.

4) Discocellular spot and discal spot in space 7 on hindwing underside. These two spots are broadly conjoined in *C. christophi* Gr.-Gr. and *C. tibetanus* (South), touching but usually not broadly conjoined in *C. niveomaculatus* Obth., *C. zhongkui* Sakai and *C. canopunctatus* Nabokov, and is individually variable in *C. **bozanoi*** **spec. nov.**.

5) Basal pale radial streaks on hindwing underside, especially the costal one and the one in space 1. Such steaks are ill-defined and very obscure in *C. christophi* Gr.-Gr., but clearly defined in all the remaining species, and are markedly longer in *C. canopunctatus* Nabokov and *C. **bozanoi*** **spec. nov.** than in all others.

6) Saccus of ♂ genitalia (figs. 226-227). Saccus is markedly longer in *C. canopunctatus* Nabokov than in all the remaining species, and is markedly narrower in *C. tibetanus* (South) than in all others.

7) Tegumen plus scaphium (fig. 226). The combined length of tegumen and scaphium is markedly smaller in *C. tibetanus* (South) than in all others.

8) Length of aedoeagus (fig. 228-left part). Aedoeagus is markedly longer in *C. canopunctatus* Nabokov and *C. zhongkui* Sakai than in all the remaining species.

9) Cornutus of aedoeagus (fig. 228-right part). Cornutus is very large in *C. niveomaculatus* Obth., rather small in *C. tibetanus* (South), and is intermediate in the remaining species.

10) Coecum of aedoeagus (fig. 228-left part). Coecum is rather long in *C. christophi* Gr.-Gr. and *C. zhongkui* Sakai, relatively short in *C. **bozanoi*** **spec. nov.**, and is intermediate and variable in the remaining species.

11) Juxta and manica conjoined together to form a ring (fig. 229). The longest diameter of this ring is markedly shorter in *C. niveomaculatus* Obth. and *C. tibetanus* (South) than in other species.

12) Valva (fig. 230). Valva is constantly smaller in *C. tibetanus* (South), medium in *C. christophi* Gr.-Gr., and is relatively larger in all the remaining species.

Annotated list of species

Carterocephalus niveomaculatus Oberthür, 1886 (figs. 160-161, 226-230: G & H)

Carterocephalus niveomaculatus Oberthür, 1886: 27, pl. II, fig. 8, ♂ (TL: Ta-Tsien-Lou); Evans, 1949: 232, record from N. Yunnan; Sakai, 2016: pl. 6, figs. 95-96 for ♂ from Barkam, N. Sichuan; Wang in Wu & Hsu, 2017: 1348, figs. 40 for ♂ from Kangding.

Distribution. W. Sichuan (Kangding, Barkam), N. Yunnan.

Material. 4 ♂♂ (CHH), Sichuan, North of Kangding, ca. 3200 m, 27.VI.2012, M.-L. Bi leg..

Notes. The ♂ genitalia of this species does not differ from those of *C. christophi* Gr.-Gr. much, except for the markedly larger cornutus of aedoeagus. However, the sympatric fact (both species are found in Kangding area and probably also N. Yunnan) makes it clear that the two species are independent from each other. In wing markings, this species differs from *C. christophi* Gr.-Gr. in having forewing upper side basal costal spot absent, hindwing upper side discocellular spot narrower, hindwing underside discal markings more interrupted and hindwing underside basal radial streaks more clearly defined. However, all these external characters are shared more or less by some other species in the *C. niveomaculatus* Obth. group.

Carterocephalus christophi Grum-Grshimailo, 1891 (figs. 158-159, 226-230: B)

Carterocephalus christophi Grum-Grshimailo, 1891: 460 (TL: montibus Sinin-Schan, now Lajishan area, S. of Xining, Qinghai - Grieshuber & Churkin, 2012); Evans (1949: 231) record from N. Yunnan; Wang in Wu & Hsu, 2017: 1348, fig. 35 for ♂ from Xunhua, Qinghai, fig. 36 for ♂ from Tengchong, W. Yunnan.

Aubertia dulcis Oberthür, 1896: 40, pl. 9, fig. 162, ♂ (TL: Ta-Tsien-Lou); Evans (1949: 231) synonymy for *C. christophi* Gr.-Gr.

Distribution. Qinghai, W. Sichuan (Kangding), Yunnan (Deqin, Tengchong).

Material. 1 ♂ (CHH), Qinghai, Xunhua, Dalijiashan, 2600 m, 24.VII.2015, K. Song leg.; 2 ♂♂ (CWJQ), Yunnan, Diqing Prefecture, Deqin, Baimaxueshan Mts., VI.2013, J.-Q. Wang & Z.-H. Zheng leg..

Notes. The ♂ syntype of *Aubertia dulcis* Obth. illustrated in the original description (fig. 158) matches with the ♂ of *Carterocephalus christophi* Gr.-Gr. from Qinghai (fig. 159) in all details. So Evans' (1949) synonymy of these two taxa is accepted by the author. The ♂ figured by Wang (in Wu & Hsu, 2017) from Tengchong, W. Yunnan has the hindwing underside discal band more interrupted than in the normal specimens from Qinghai and NW. Yunnan.

Carterocephalus canopunctatus Nabokov, 1941 (figs. 157, 226-230: A)
Carterocephalus canopunctatus Nabokov, 1941: 222, unique ♂ HT (TL: Ta-Tsien-Lu); Evans, 1949: 231, synonymy for *C. christophi* Gr.-Gr.
Distribution. W. Sichuan (Kangding, Baoxing).
Material. 1 ♂ (CHH), Sichuan, North of Baoxing, ca. 2400 m, 28.VI.2012, H.-L. Shi leg..
Notes. Probably due to its extreme rarity, Evans (1949) had not examined any specimens of this mysterious species and simply synonymized *C. canopunctatus* Nabokov with *C. christophi* Gr.-Gr. According to Nabokov (1941), this species possesses the following characters: the white spots on both wings upper side recall *C. flavomaculatus* Obth., 1886 in size and *C. christophi* Gr.-Gr. in disposition; forewing upper side with the cell spot near the base "surmounted by a small bluish-white patch"; hindwing upper side with the first spot "bar-shaped across the cell"; hindwing underside resembling *C. niveomaculatus* Obth. and, still more, *C. flavomaculatus* Obth.. In the same paper Nabokov (1941) knew about *A. dulcis* Obth. and preferred to consider it as a form of *C. christophi* Gr.-Gr.. A ♂ in the author's collection from the nearby area of Kangding matches with this description thus is identified as *C. canopunctatus* Nabokov. It does look like a mixture of *C. christophi* Gr.-Gr. and *C. niveomaculatus* Obth.. An examination of ♂ genitalia proves that *C. canopunctatus* Nabokov deserves an independent species, with more genital differences from either of the two old species than those between the two old species: saccus and aedoeagus much longer than in both *C. christophi* Gr.-Gr. and *C. niveomaculatus* Obth.; central split between branches of uncus markedly deeper than in *C. christophi* Gr.-Gr.; cornutus of aedoeagus markedly smaller than in *C. niveomaculatus* Obth.

Carterocephalus tibetanus (South, 1913) (figs. 149, 152-155, 226-230: C & D) **stat. nov.**
Aubertia niveomaculatus tibetanus South, 1913: 612, 5 ♂♂ syntypes (TL: Gon se, La gyap, & Sanga chu Dzong; see fig. 231).
Carterocephalus christophi tibetanus: Evans, 1949: 231.
Carterocephalus chayuensis Lee, 1979 **syn. nov.**: 36, pl. 1, figs. 5-6 for ♂ HT (TL: Nanxue, Chayu; see fig. 231), pl. 1, figs. 9-10 for ♂ genitalia.
Distribution. SE. Tibet (area between Demula, Chayu and Yanjing).
Material. 4 ♂♂ (CHH), SE. Tibet, East of Demula, 4280 m, 16.VI.2017, X.-D. Yang leg..
Notes. This species is externally intermediate between *C. christophi* Gr.-Gr. and *C. niveomaculatus* Obth. South (1913) described it as a subspecies of *C. niveomaculatus* Obth. probably by noticing the small discocellular spot on hindwing upper side and the interruption between discocellular spot and discal spot in space 2 on hindwing underside. However, Evans (1949) placed it under *C. christophi* Gr.-Gr. by noticing the presence of the costal spot at base of forewing upper side and the conjunction of discocellular spot and discal spot in space 7 on hindwing underside. A careful examination of ♂ genitalia supports this taxon to be independent from either of the old species, differing equally in several important characters: tegumen plus scaphium markedly shorter; valva much narrower; saccus thinner; cornutus of aedoeagus markedly smaller; juxta plus manica smaller. It is impossible to combine this taxon with either of the old species on any genital characters.
Carterocephalus chayuensis Lee was described from the same area as *C. tibetanus* (South), its author overlooked the publication of *C. tibetanus* (South) and did not mention it in his simple description. The HT (fig. 149) of this taxon deposited in Institute of Zoology, Chinese Academy of Science, Beijing has been examined.

Carterocephalus zhongkui Sakai, 2016 (figs. 162-163, 226-230: I & J) **stat. nov.**
Carterocephalus niveomaculatus zhongkui Sakai, 2016: 1, fig. 93-94, unique ♂ HT (TL: Xiahe, Gansu).
Carterocephalus niveomaculatus: Wang in Wu & Hsu, 2017: 1348, fig. 39 for ♂ from Dingxi, Gansu, fig. 41 for ♂ from Xiahe, Gansu.
Distribution. Gansu (Xiahe, Dingxi).
Material. 2 ♂♂ (CHH), Gansu, Xiahe, Xiongmaogou (Panda Valley), 3100 m, 26.VII.2015 & 24.V.2016, H. Huang leg..
Notes. This taxon is externally intermediate between *C. niveomaculatus* Obth. and *C. tibetanus* (South), with the wing-pattern on underside recalling the former and that on upper side recalling the latter. It deserves full specific rank by having the following genital differences from *C. niveomaculatus* Obth.: saccus longer; aedoeagus markedly longer; cornutus of aedoeagus much smaller; juxta plus manica longer. To receive this taxon as a subspecies of *C. niveomaculatus* Obth. will make there no genital difference between *C. niveomaculatus* Obth. and *C. christophi* Gr.-Gr.

Carterocephalus bozanoi **spec. nov.** (figs. 150-151, 226-230: E & F)
HT ♂ (fig. 150): China, Xizang Tibetan Autonomous Region, Linzhi Prefecture, Gongbujiangda County, 30 km west of Gongbujiangda Town, 3650 m, 21.VI.2017, H. Huang leg., deposited in BSNU.
PT: Xizang Autonomous Region: 1 ♂ (fig. 151, CHH), same data as HT.
Etymology. This species is named in honour of Mr. Gian Cristoforo Bozano, in gratitude for his sharing the collecting information with the author.
Diagnosis. This new species is similar to *C. christophi* Gr.-Gr., but can be distinguished from the latter in ♂ by the following combination of characters.
1) Both wings upper side with all white markings more or less smaller, sometimes with hindwing discocellular bar widely separated from the spot in space 2.
2) Forewing upper side with subbasal cell spot widely separated from costal spot.
3) Hindwing underside with basal radial streaks on costa and in space 1 more clearly defined and much longer.
4) Hindwing underside with discocellular spot narrower, sometimes not fully conjoined with the spot in space 7.
5) Hindwing underside with a clearly defined submarginal white spot in space 5.
♂ genitalia:
6) Tegumen in dorsal view markedly wider.
7) Coecum of aedoeagus much shorter.
8) Valva with a deeper gap between harpe and ampulla.
Remarks. This new species seems to be more similar to *C. tibetanus* (South) than to *C. christophi* Gr.-Gr. in external features in accordance with the distribution, differing from *C. tibetanus* (South) only by having a wider discocellular spot on hindwing upper side, a better marked submarginal white spot in space 5 and two longer basal streaks on hindwing underside. However in ♂ genitalia this new species differs from *C. tibetanus* (South) in more points than from *C. christophi* Gr.-Gr. Someone may hold the opinion to combine *C. **bozanoi*** **spec. nov.** with either *C. christophi* Gr.-Gr. or *C. tibetanus* (South), as they are allopatric in distribution. However, to receive *C. **bozanoi*** **spec. nov.** as a subspecies of either *C. christophi* Gr.-Gr. or *C. tibetanus* (South) will logically need a bigger unit of all of these three taxa into a single super species which is very variable in ♂ genitalia and external features. Considering that *C. **bozanoi*** **spec. nov.** is distributed to the farther west of *C. christophi* Gr.-Gr. than *C. tibetanus* (South), it is more reasonable to treat all of them as independent species in a viewpoint of the zoogeography. Nevertheless, *C. **bozanoi*** **spec. nov.** differs

from *C. christophi* Gr.-Gr. strikingly in ♂ genitalia having a much shorter coecum.

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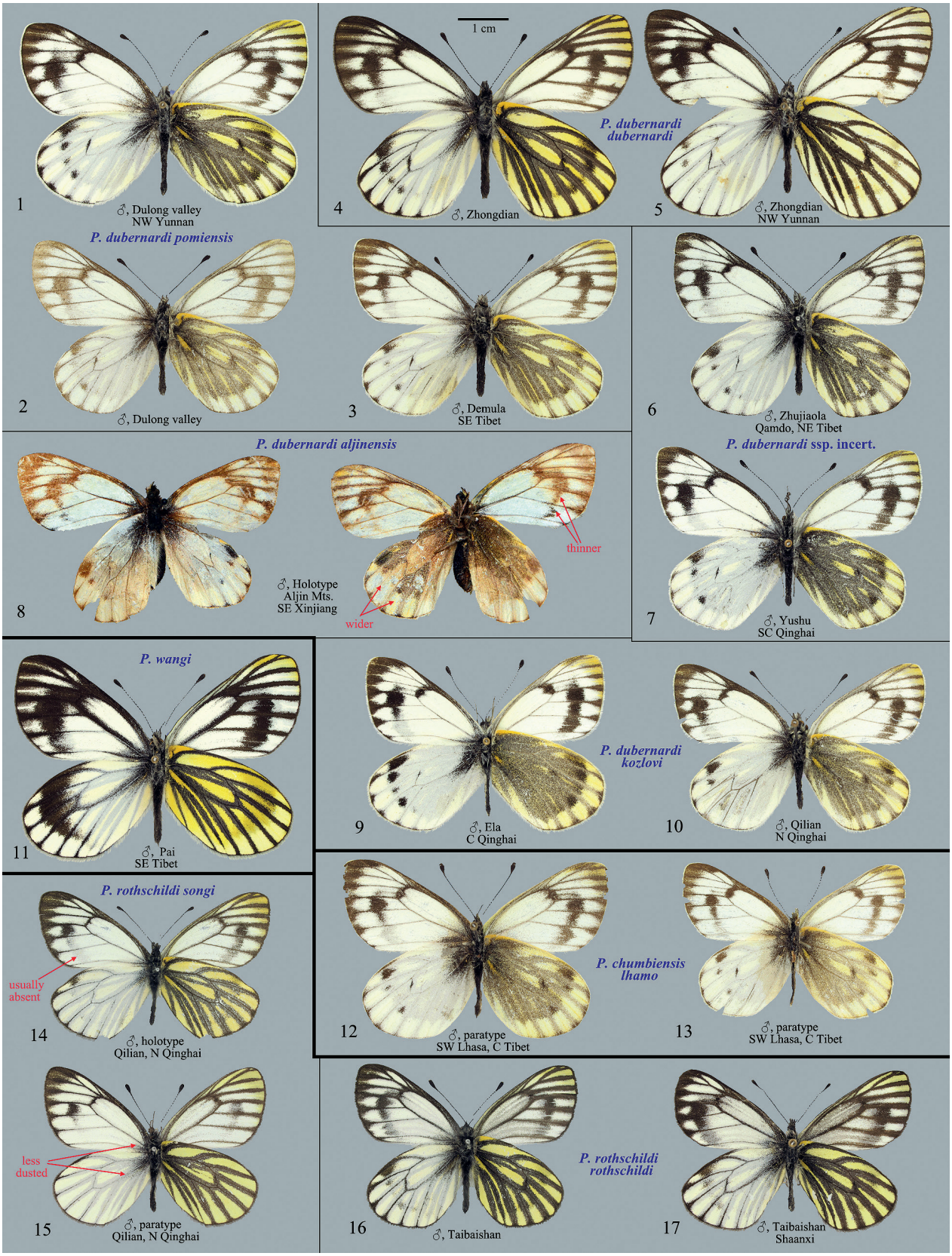
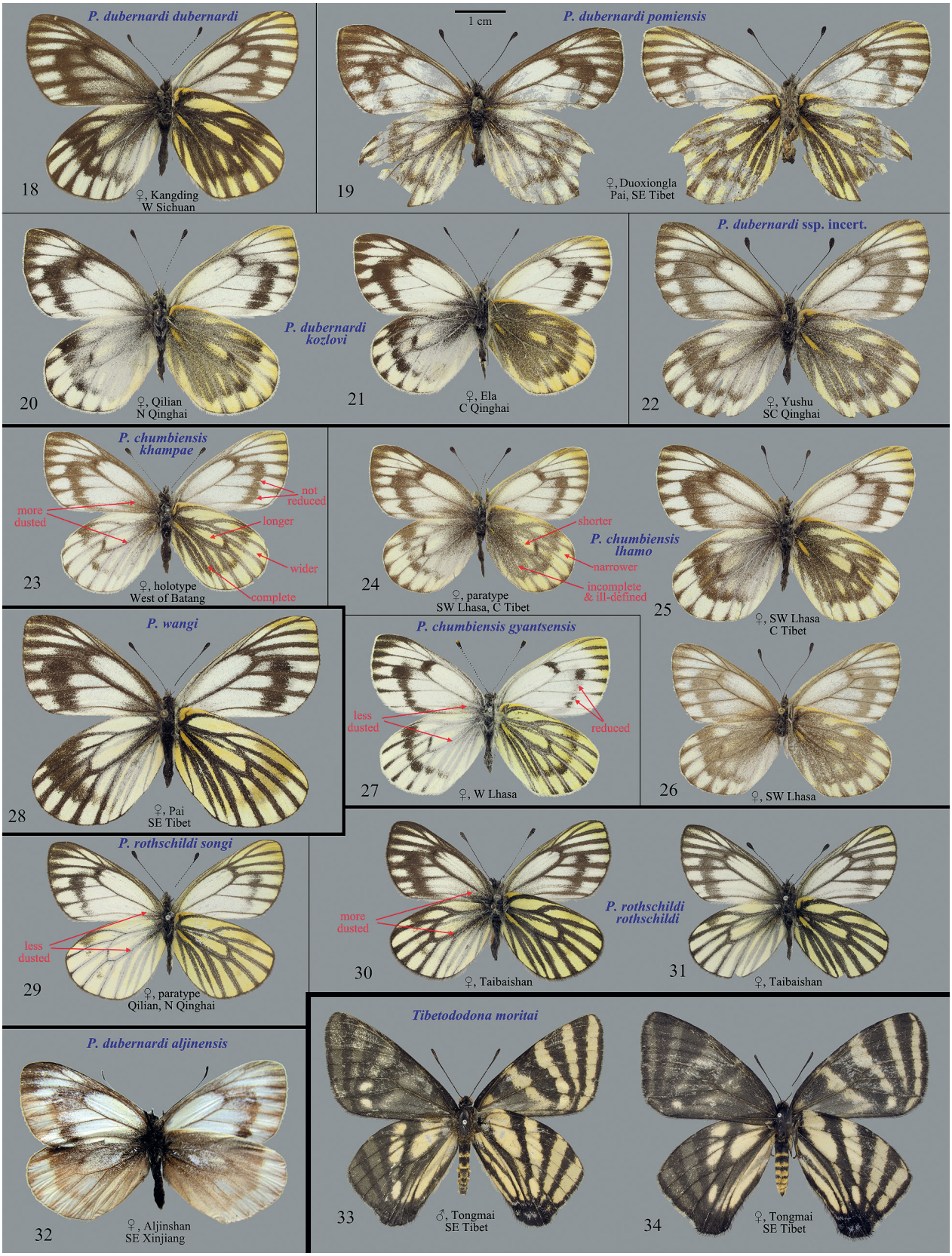


Figs. 1-17: Habitus of *Pieris* taxa ♂♂ under same scale. (1-3) *P. dubernardi pomiensis* Yoshino, 1998; (4-5) *P. dubernardi dubernardi* Oberthür,1884; (6-7) *P. dubernardi* ssp. incert.; (8) *P. dubernardi aljinensis* (Huang & Murayama, 1992); (9-10) *P. dubernardi kozlovi* Alpheraky,1897; (11) *P. wangi* (Huang, 1998); (12-13) *P. chumbiensis lhamo* Kocman, 1999; (14-15) *P. rothschildi* ***songi*** **subspec. nov.**; (16-17) *P. rothschildi rothschildi* Verity, 1911. Upper side (left half or left part) and underside (right half or right part).



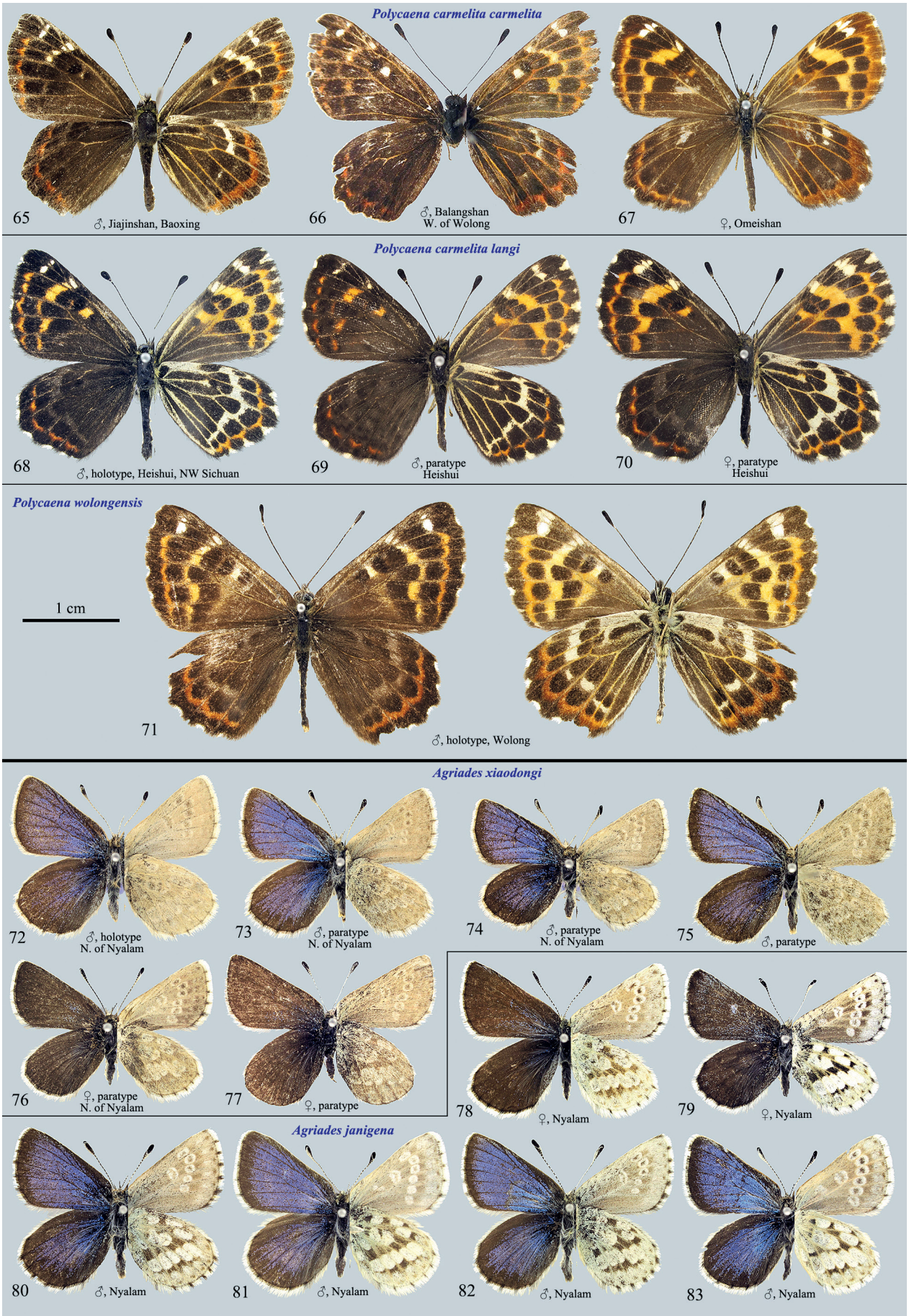
Figs. 18-31: Habitus of *Pieris* taxa ♀♀ under same scale. (18) *P. dubernardi dubernardi* Oberthür,1884; (19) *P. dubernardi pomiensis* Yoshino, 1998; (20-21) *P. dubernardi kozlovi* Alpheraky, 1897; (22) *P. dubernardi* ssp. incert.; (23) *P. chumbiensis* ***khampae*** **subspec. nov.**; (24-26) *P. chumbiensis lhamo* Kocman, 1999; (27) *P. chumbiensis gyantsensis* Verity, 1911; (28) *P. wangi* (Huang, 1998); (29) *P. rothschildi* ***songi*** **subspec. nov.**; (30-31) *P. rothschildi rothschildi* Verity, 1911; (32) *P. dubernardi aljinensis* (R.-X. Huang & Murayama, 1992).

Figs. 33-34: Habitus of *Tibetododona moritai* (Koiwaya & Shinkai, 1996) under same scale as for *Pieris* taxa. Upper side (left half or left part) and underside (right half or right part).

Figs. 35-40: Habitus of *Neptis hesione* Leech, 1890 ♂♂ under same scale. (35-36) ssp. ***luyanquani* subspec. nov.**; (37-40) ssp. *hesione* Leech, 1890.

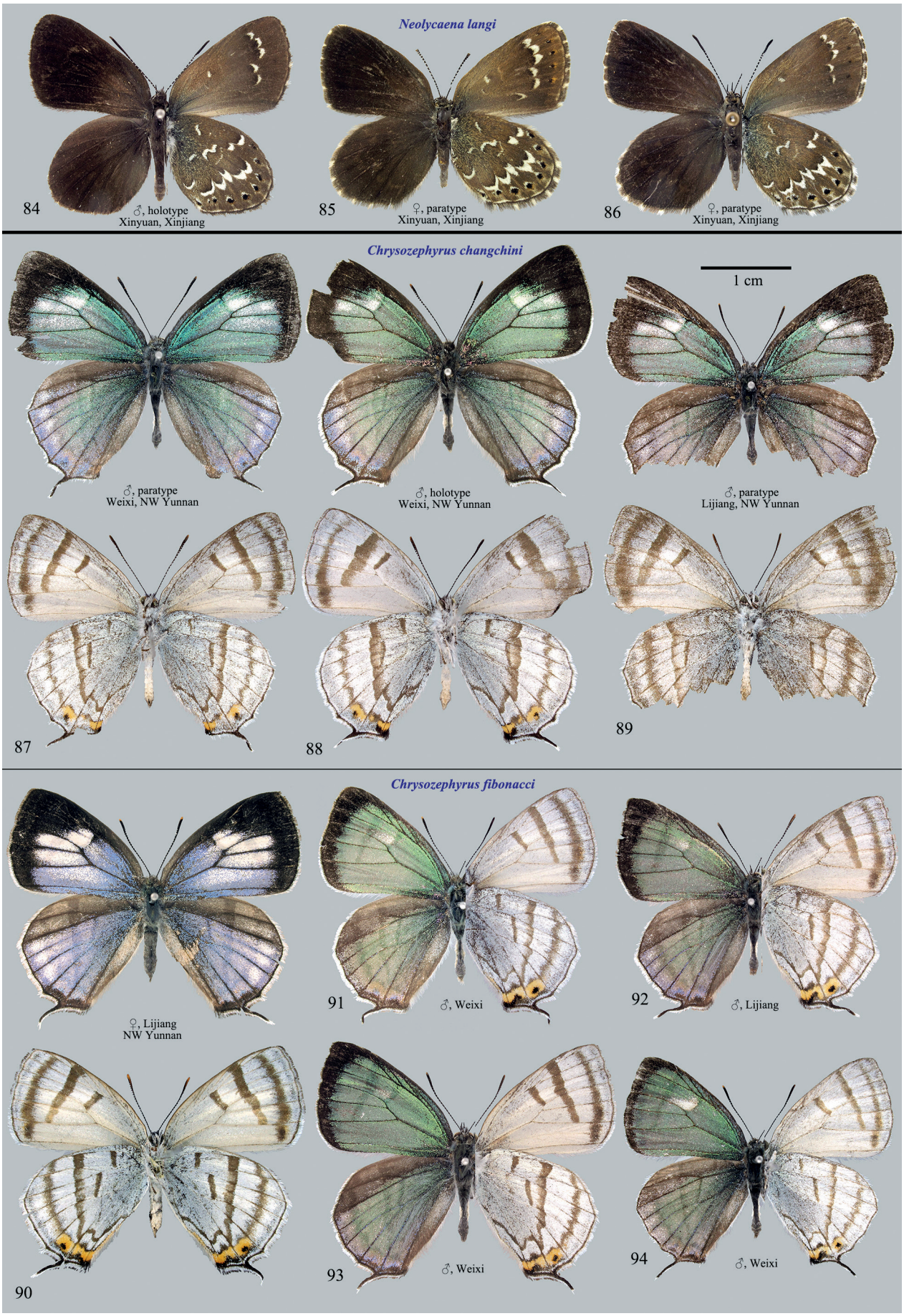
Figs. 41-49: Habitus of *Lethe* taxa ♂♂ under same scale. (41-43) ***luyanquani* spec. nov.**; (44) *camilla* Leech (1891); (45) *privigna* Leech, 1892; (46) *tengchongensis* Lang, 2016; (47-49) *pingpingae* Zhang & Hu, 2018. Upper side (left half) and underside (right half).

Figs. 50-64: Habitus of *Lethe* taxa ♂♂ under same scale. (50-53) *L.* ***changchini*** **spec. nov.**; (54-57) *L. paraprocne kawagarboensis* Lang & Liu, 2014; (58-62) *L. paraprocne* ***zhongdiana*** **subspec. nov.**; (63-64) *L. procne* (Leech, 1891). Upper side (left half) and underside (right half).

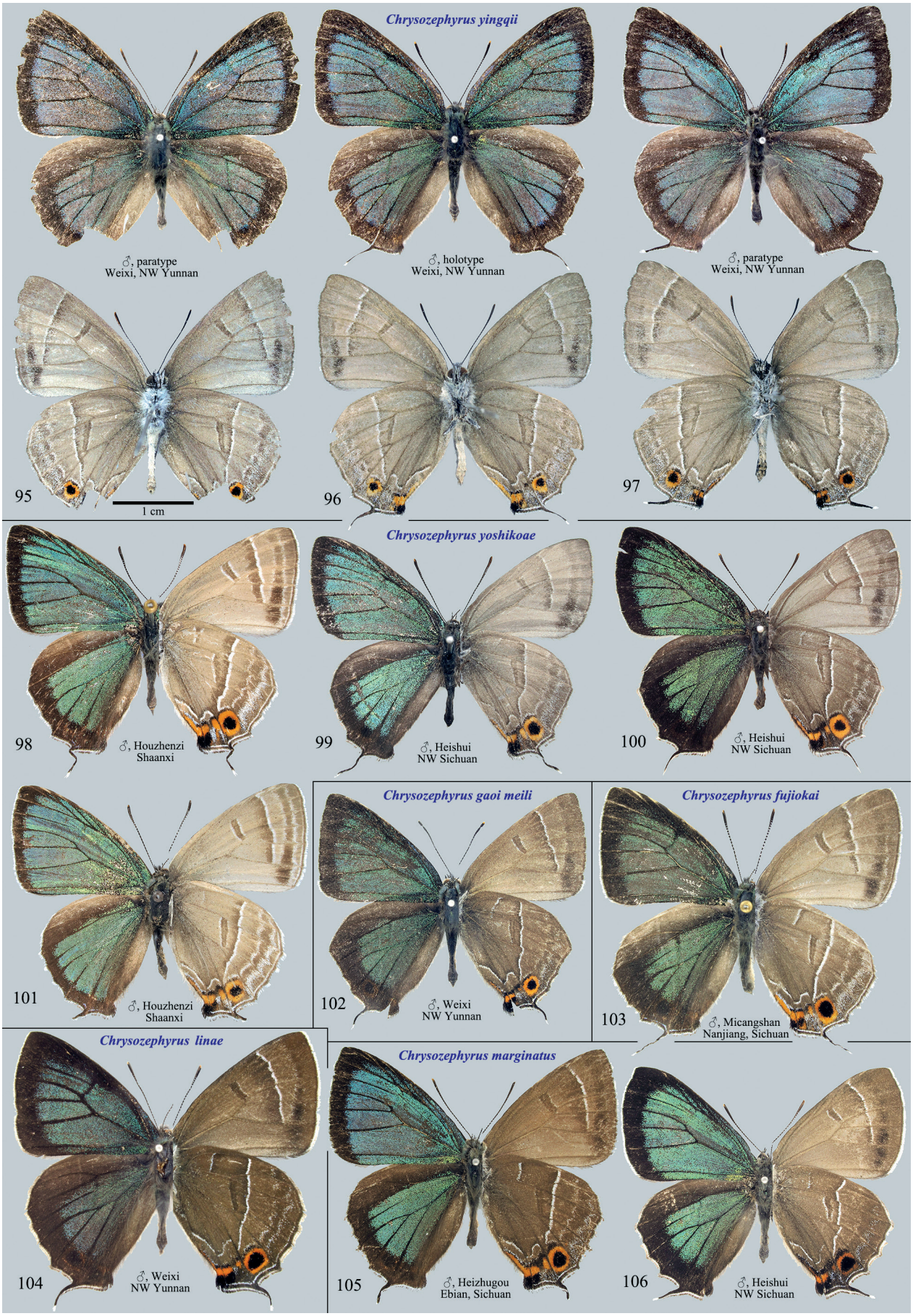


Figs. 65-71: Habitus of *Polycaena* taxa under same scale. (65-67) *P. carmelita carmelita* Oberthür, 1903 ; (68-70) *P. carmelita* ***langi*** **subspec. nov.**; (71) *P.* ***wolongensis*** Huang & Bozano **spec. nov.**

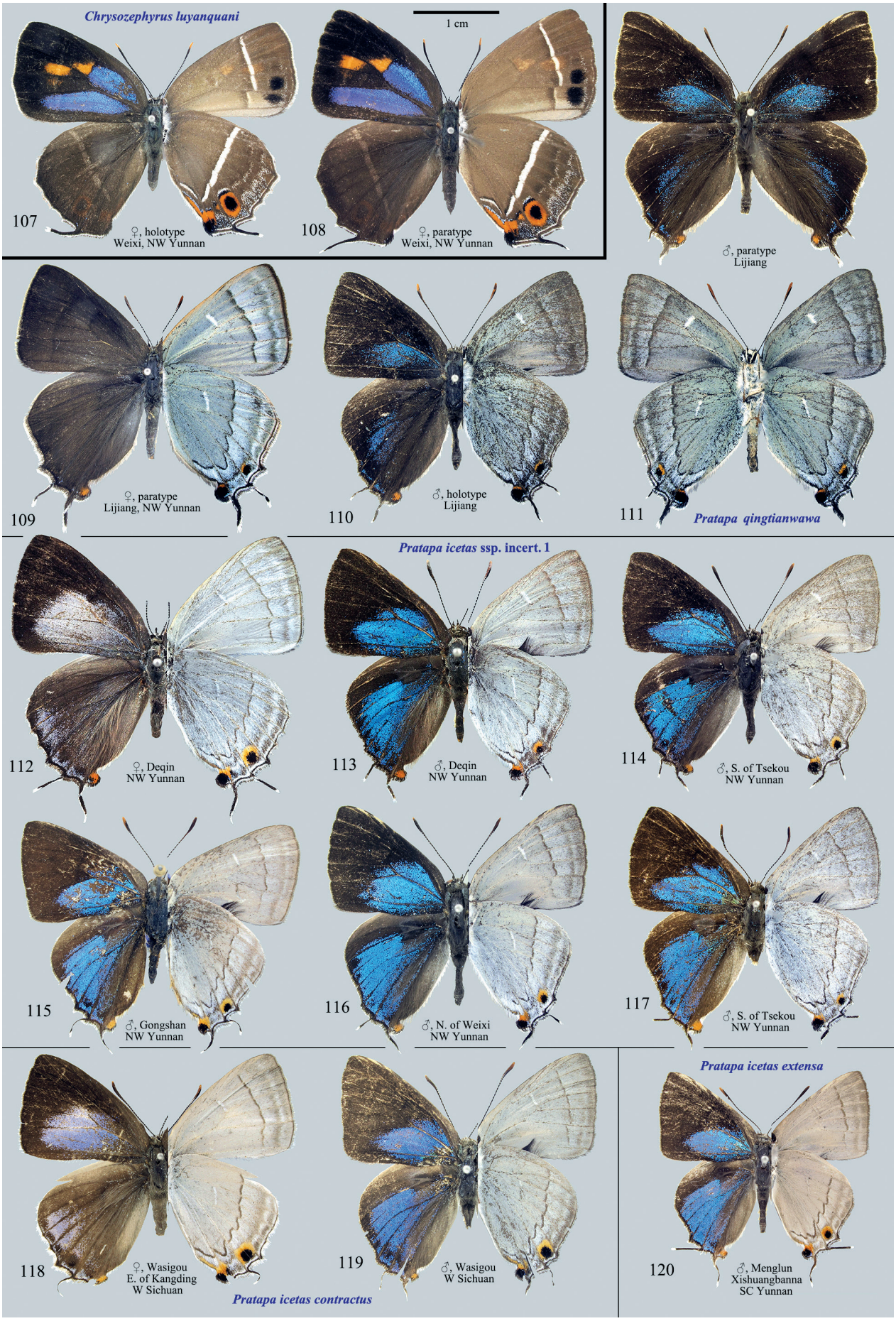
Figs. 72-83: Habitus of *Agriades* taxa under same scale. (72-77) *A.* ***xiaodongi*** **spec. nov.**; (78-83) *A. janigena* (Riley, 1923). Upper side (left half or left part) and underside (right half or right part).



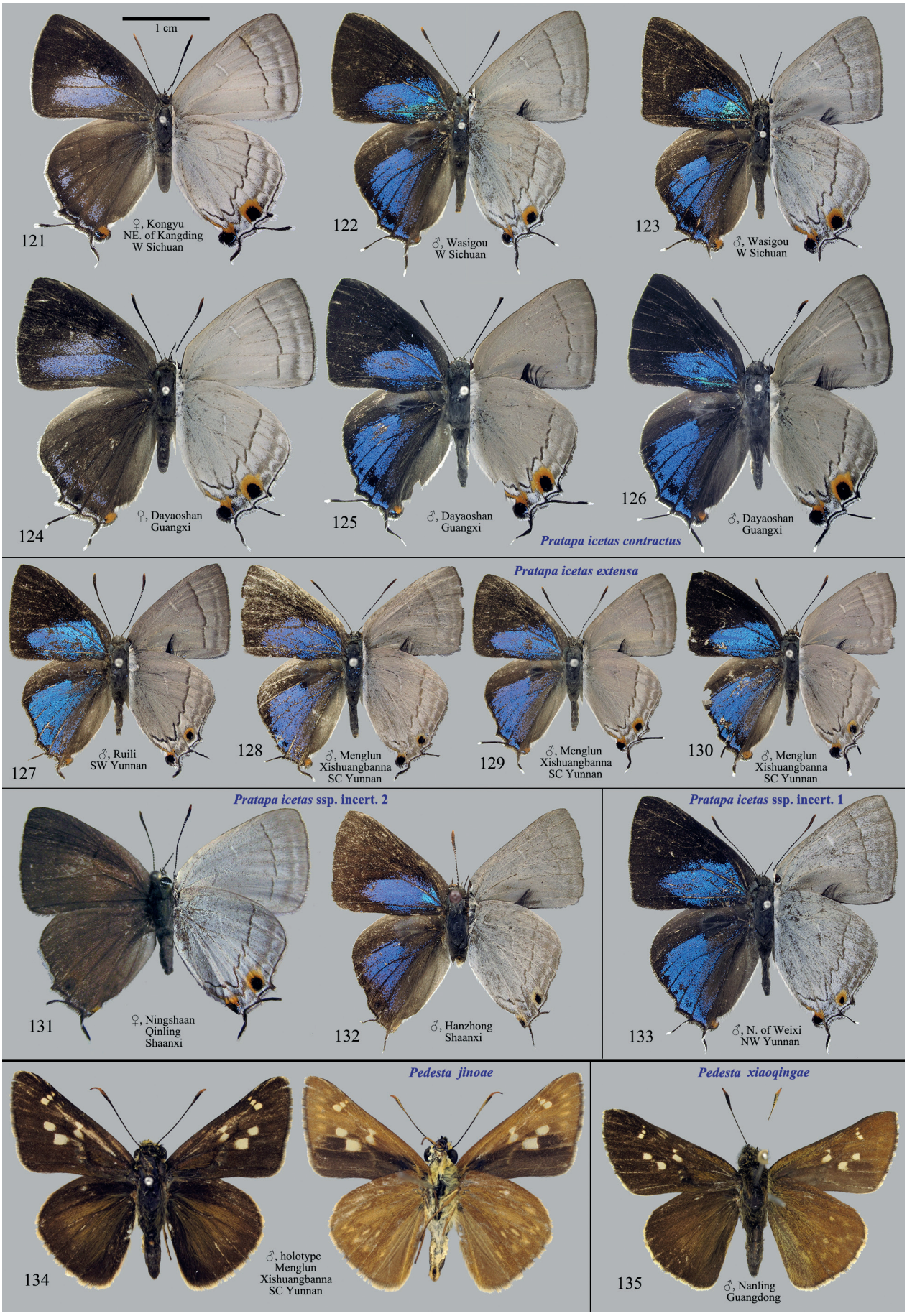
Figs. 84-86: Habitus of *Neolycaena* ***langi*** **spec. nov.** under same scale.
Figs. 87-94: Habitus of *Chrysozephyrus* taxa under same scale. (87-89) *C.* ***changchini*** **spec. nov.**; (90-94) *C. fibonacci* (Zhuang, Yago & Wang, 2015). Upper side (left half or upper part) and underside (right half or lower part).



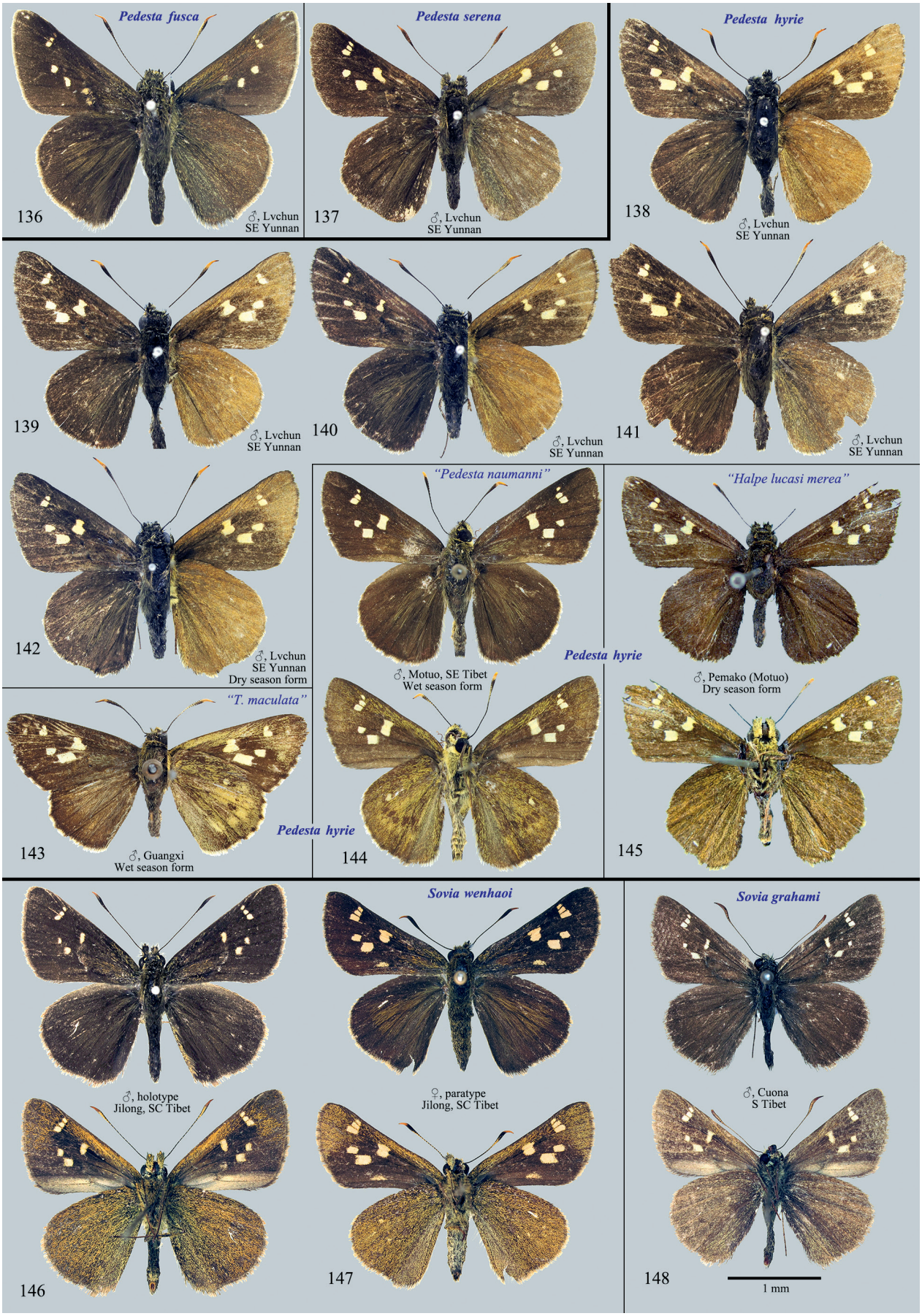
Figs. 95-106: Habitus of *Chrysozephyrus* taxa ♂♂ under same scale. (95-97) *C.* ***yingqii*** **spec. nov.**; (98-101) *C. yoshikoae* Koiwaya, 1993; (102) *C. gaoi meili* Yoshino, 1999; (103) *C. fujiokai fujiokai* Koiwaya, 2000; (104) *C. linae* Koiwaya, 1993; (105-106) *C. marginatus* (Howarth, 1957). Upper side (left half or upper part) and underside (right half or lower part).



Figs. 107, 108: Habitus of *Chrysozephyrus* ***luyanquani*** **spec. nov.**, ♀♀ under same scale.
Figs. 109-120: Habitus of *Pratapa* taxa under same scale. (109-111) *P.* ***qingtianwawa*** **spec. nov.**; (112-120) *P. icetas* (Hewitson, [1865]). Upper side (left half or upper part) and underside (right half or lower part).



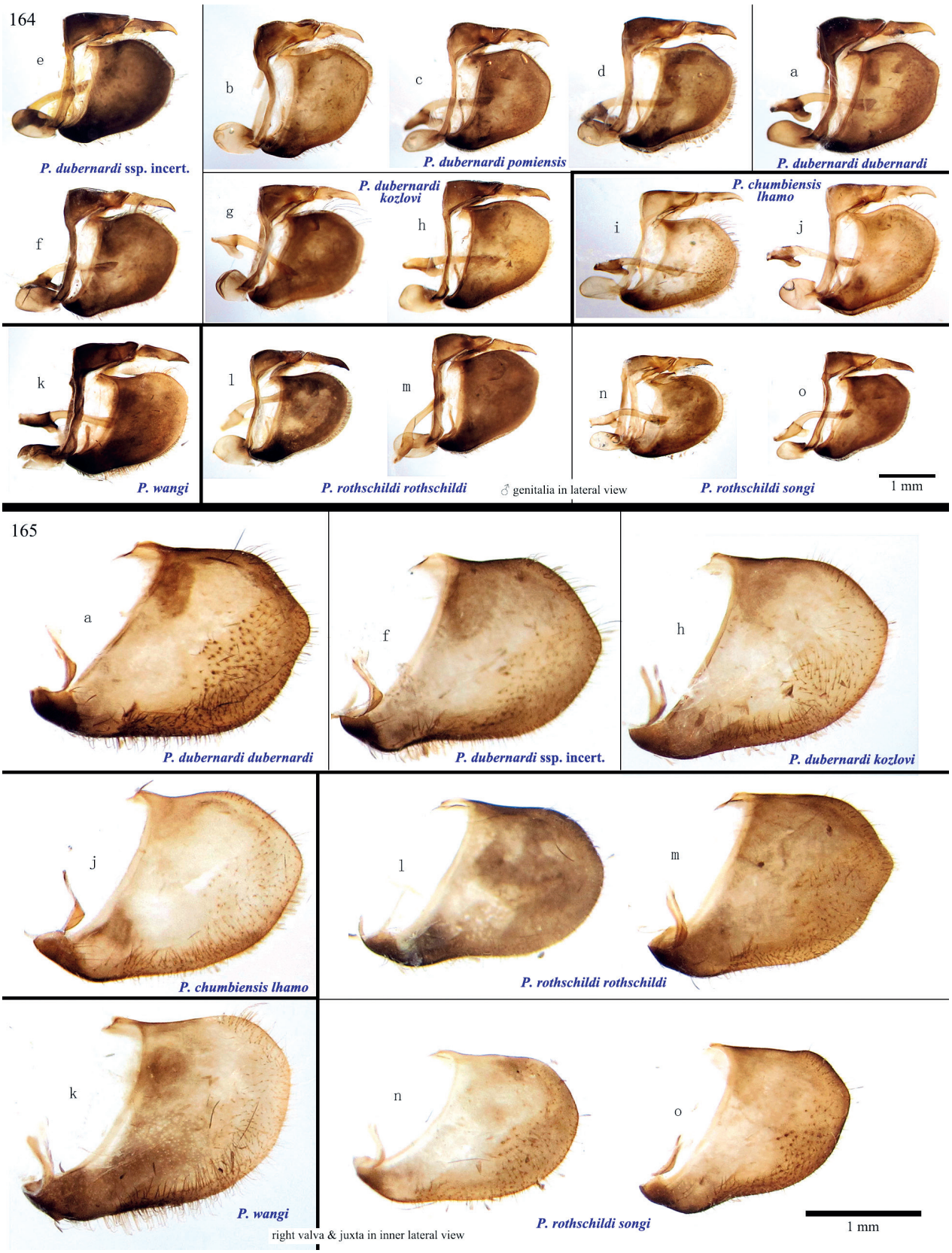
Figs. 121-133: Habitus of *Pratapa icetas* (Hewitson,[1865]) under same scale.
Figs. 134-135: Habitus of *Pedesta* taxa ♂♂ under same scale. (134) ***P. jinoae* spec. nov.**,; (135) *P. xiaoqingae* (Huang & Zhan, 2004). Upper side (left half or left part) and underside (right half or right part).



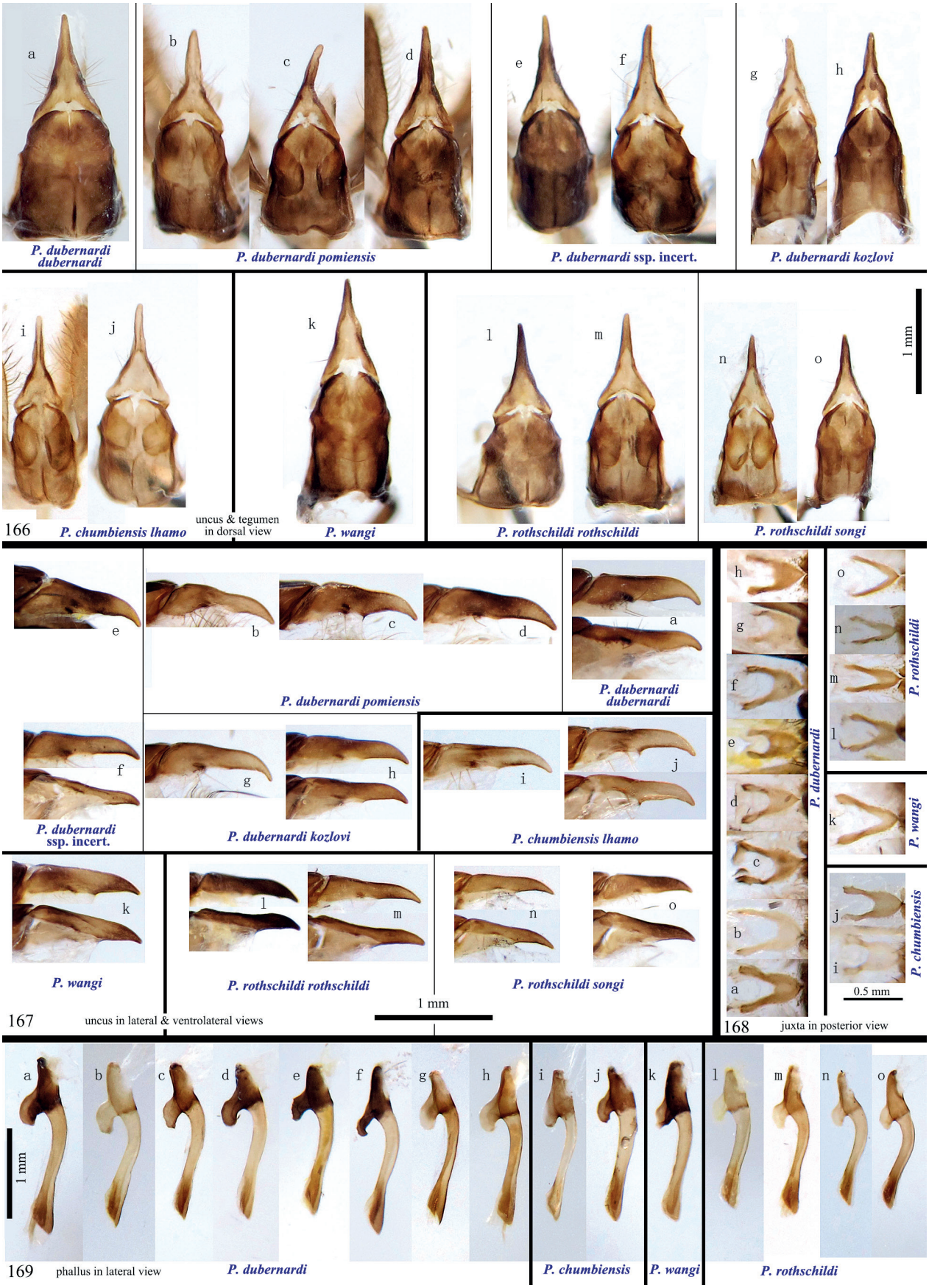
Figs. 136-145: Habitus of *Pedesta* taxa ♂♂ under same scale. (136) *P. fusca* (Elwes, [1893]); (137) *P. serena* (Evans, 1937); (138-142) *P. hyrie hyrie* (De Niceville, 1891), dry season form; (143) *P. hyrie maculata* (Fan & Wang, 2010), wet season form; (144) *P. hyrie merea* (Evans, 1932), wet season form, HT of *Pedesta naumanni* Huang, 1998; (145) *P. hyrie merea* (Evans, 1932), dry season form, HT of *Halpe lucasi merea* Evans, 1932.

Figs. 146-148: Habitus of *Sovia* taxa under same scale. (146-147) *S.* ***wenhaoi*** **spec. nov.**; (148) *S. grahami grahami* (Evans, 1926). Upper side (left half or upper part) and underside (right half or lower part).

Figs. 149-163: Habitus of *Carterocephalus* taxa ♂♂ under same scale. (149, 152-155) *C. tibetanus* (South, 1913); (149) HT of *C. chayuensis* Lee, 1979; (150-151) *C.* ***bozanoi*** **spec. nov.**; (156, 160-161) *C. niveomaculatus* Oberthür, 1886; (156) syntype, after Oberthür (1886); (157) *C. canopunctatus* Nabokov, 1941; (158-159) *C. christophi* Grum-Grshimailo, 1891; (158) syntype, after Oberthür (1896); (162-163) *C. zhongkui* Sakai, 2016. Upper side (upper part) and underside (lower part).



Figs. 164-165: ♂ genitalia of the *Pieris dubernardi* Oberthür,1884 group. (164) whole genitalia in lateral view at same scale; (165) right valva in inner lateral view at same scale. Specimens labeled alphabetically as follows: (a) specimen shown in fig. 4; (b) fig. 1; (c) fig. 2; (d) fig. 3; (e) fig. 6; (f) fig. 7; (g) fig. 9; (h) fig. 10; (i) fig. 13; (j) fig. 12; (k) fig. 11; (l) fig. 16; (m) fig. 17; (n) fig. 14; (o) fig. 15.



Figs. 166-169: ♂ genitalia of the *Pieris dubernardi* Oberthür,1884 group. (166) Uncus plus tegumen in dorsal view at same scale; (167) uncus in lateral and ventrolateral views at same scale; (168) juxta in posterior view at same scale; (169) aedoeagus in lateral view at same scale. Specimens labeled alphabetically as in figs. 164-165.

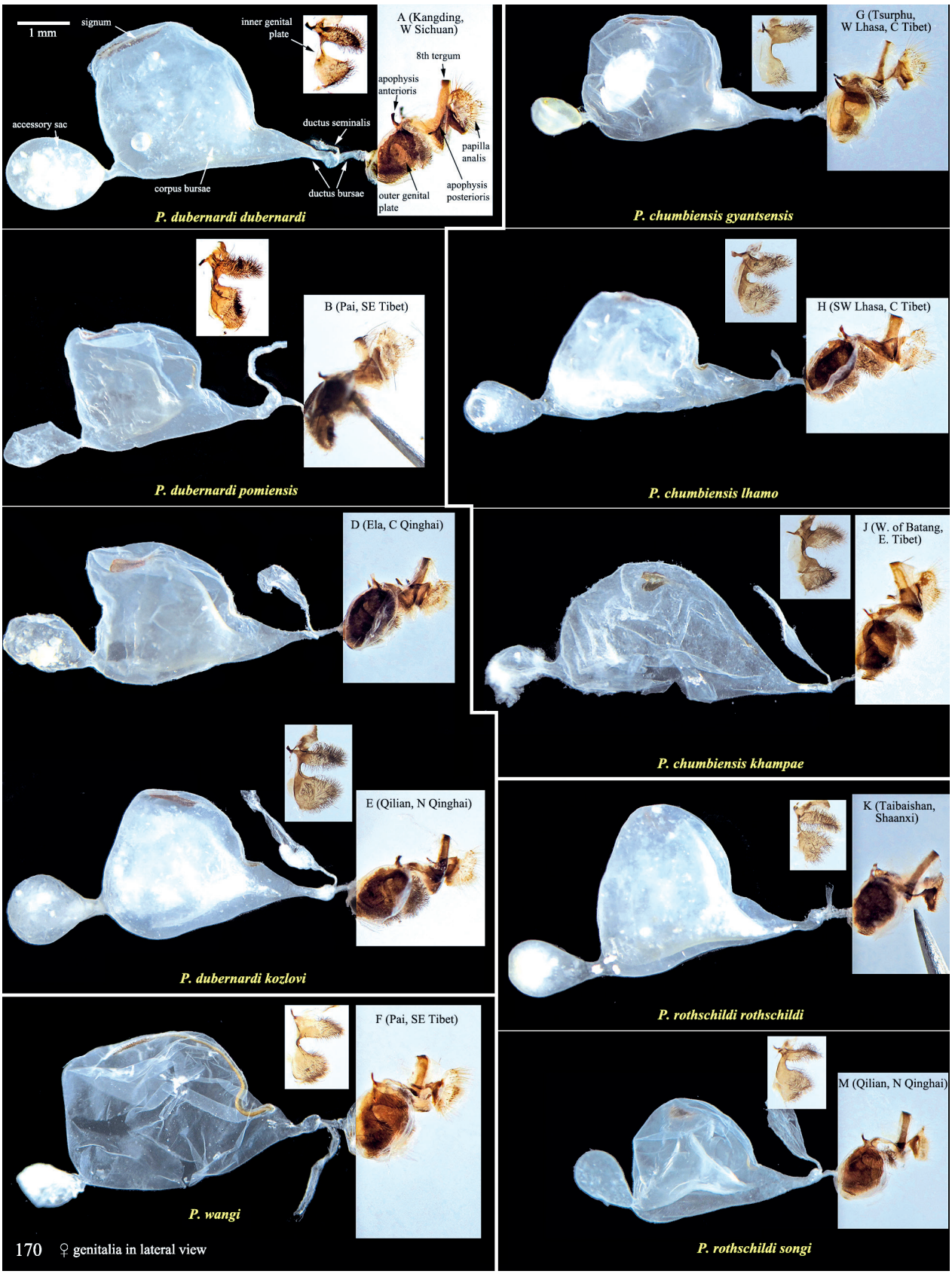


Fig. 170: ♀ genitalia of the *Pieris dubernardi* Oberthür,1884 group at same scale, consisting of whole genitalia in lateral view with corpus bursae rotated to show signum in lateral view, and of inner genital plate in lateral view (on the pale ground) with outer genital plate removed. Specimens labeled alphabetically as in fig. 171.

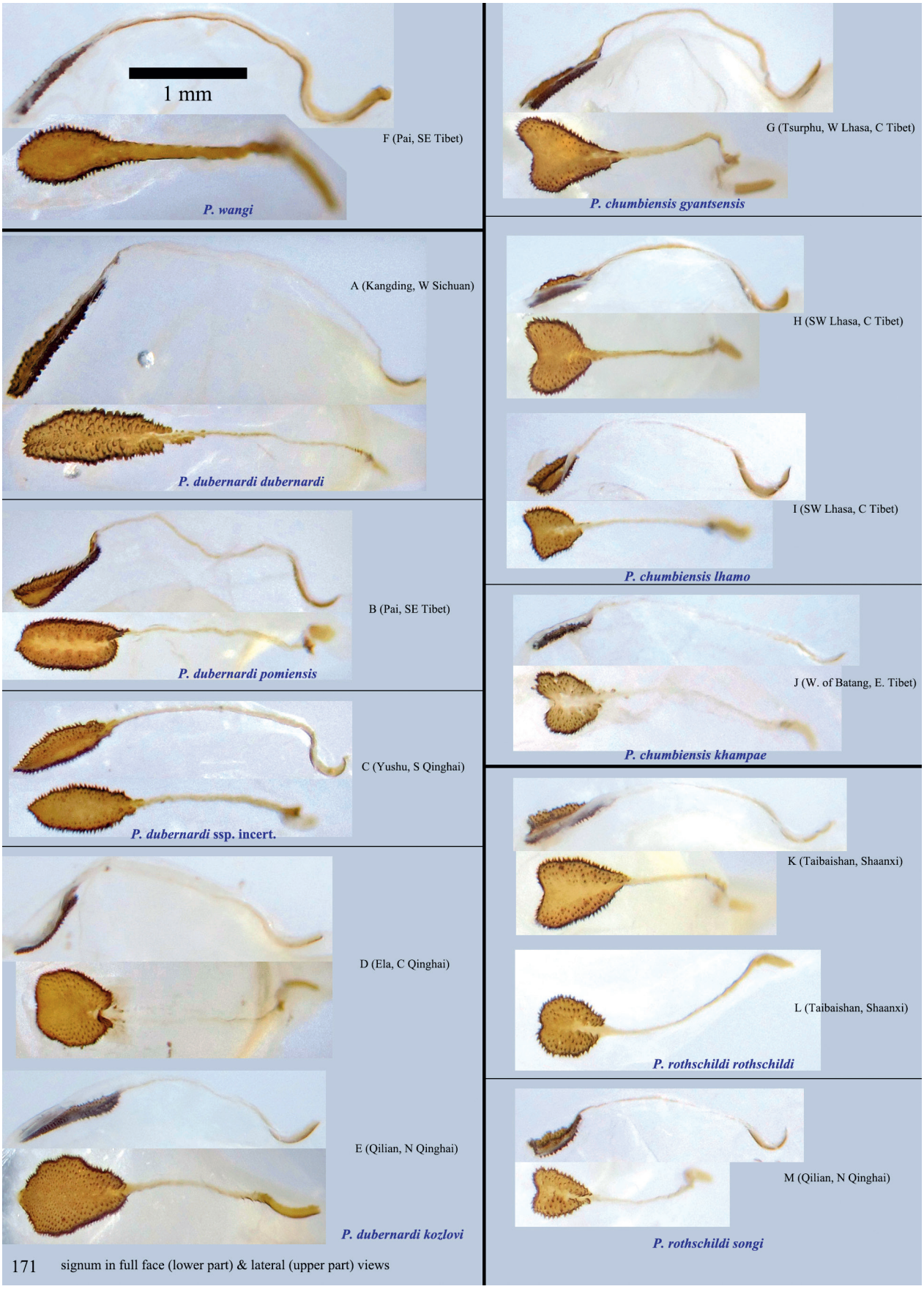
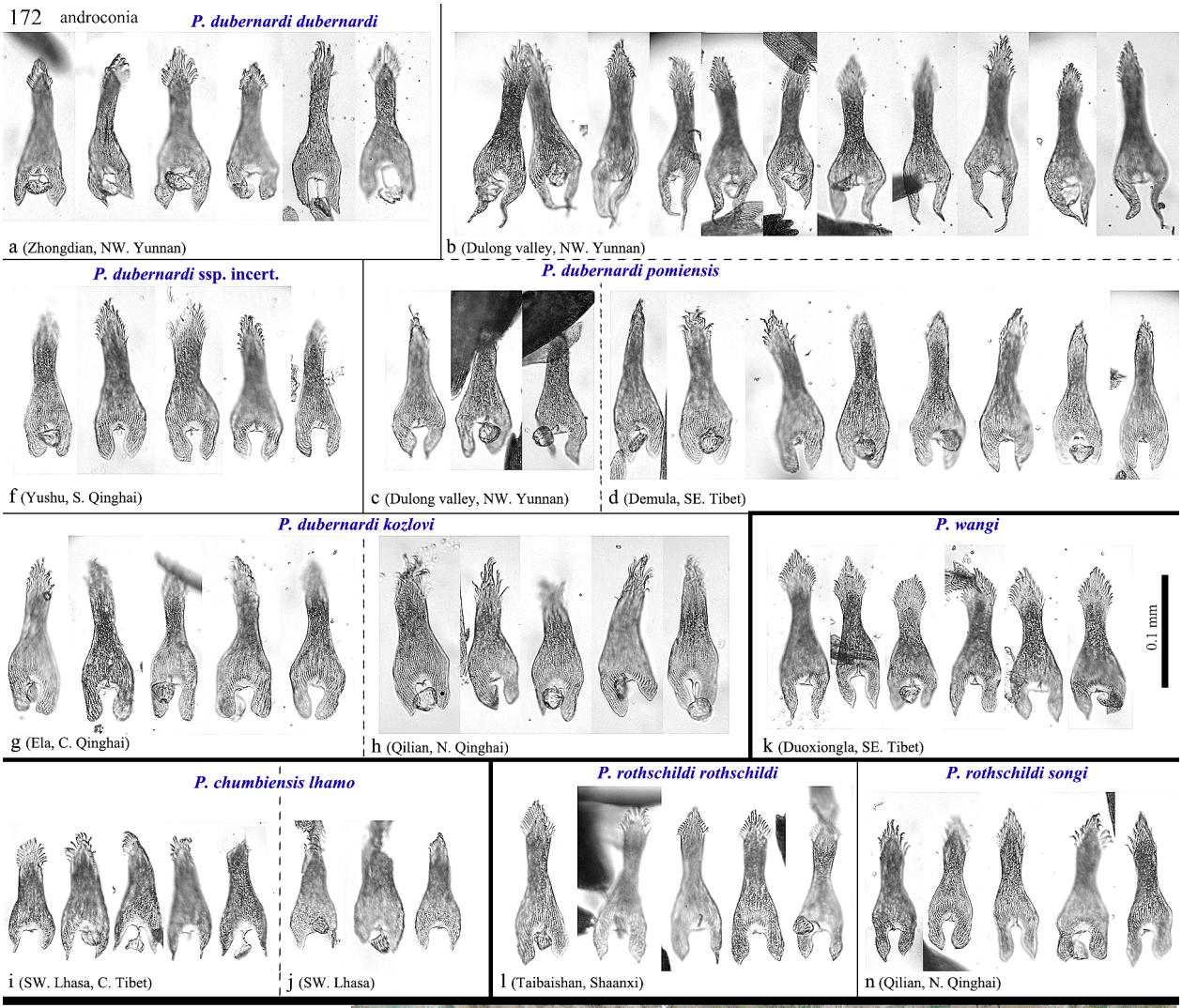


Fig. 171: ♀ genitalia of the *Pieris dubernardi* Oberthür,1884 group at same scale, consisting of signum in lateral view (upper part) and of signum in full face view (lower part). Specimens labeled alphabetically as follows: (A) specimen shown in fig. 18; (B) fig. 19; (C) fig. 22; (D) fig. 21; (E) fig. 20; (F) fig. 28; (G) fig. 27; (H) fig. 25; (I) fig. 24; (J) fig. 23; (K) fig. 30; (L) fig. 31; (M) fig. 29.



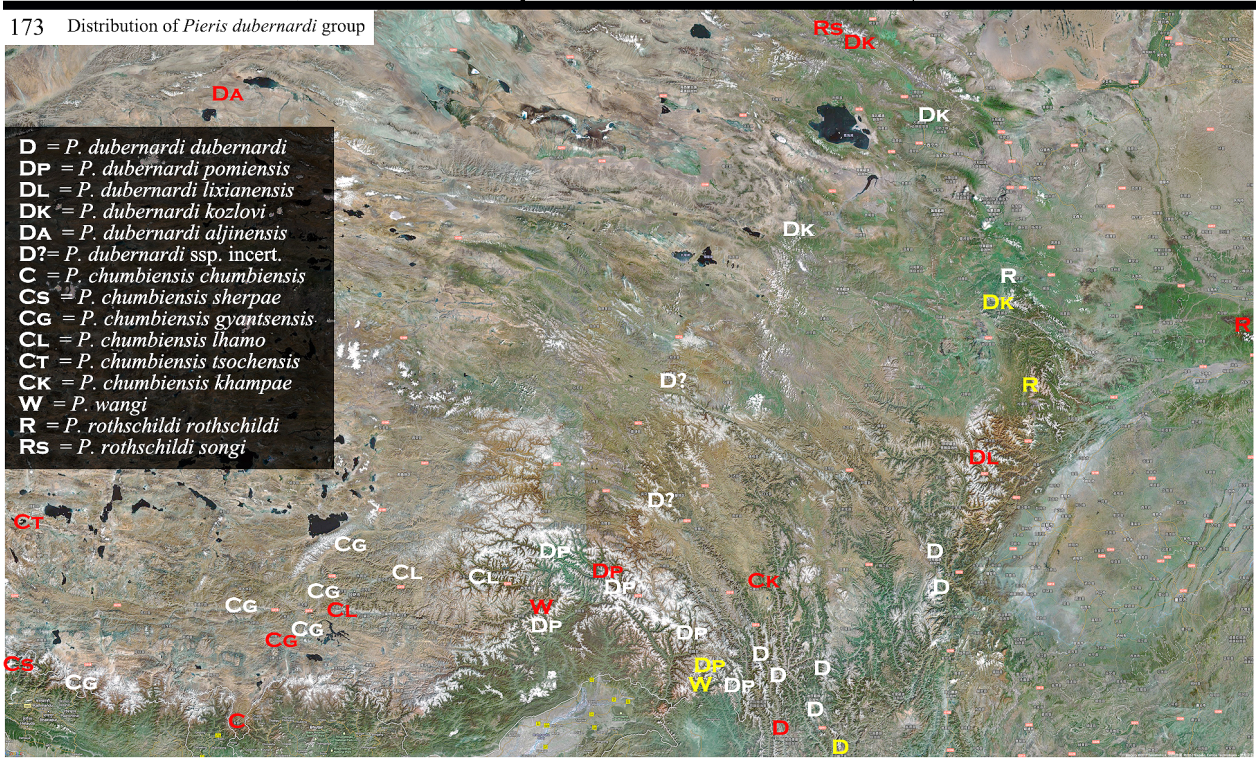


Fig. 172: Androconia of the *Pieris dubernardi* Oberthür, 1884 group at same scale. Specimens labeled alphabetically as in figs. 164-165.

Fig. 173: Distribution of the *Pieris dubernardi* Oberthür, 1884 group. Letter in red: type locality of the valid taxon. Letter in yellow: type locality of the synonym of the valid taxon. Letter in white: other localities of the valid taxon.

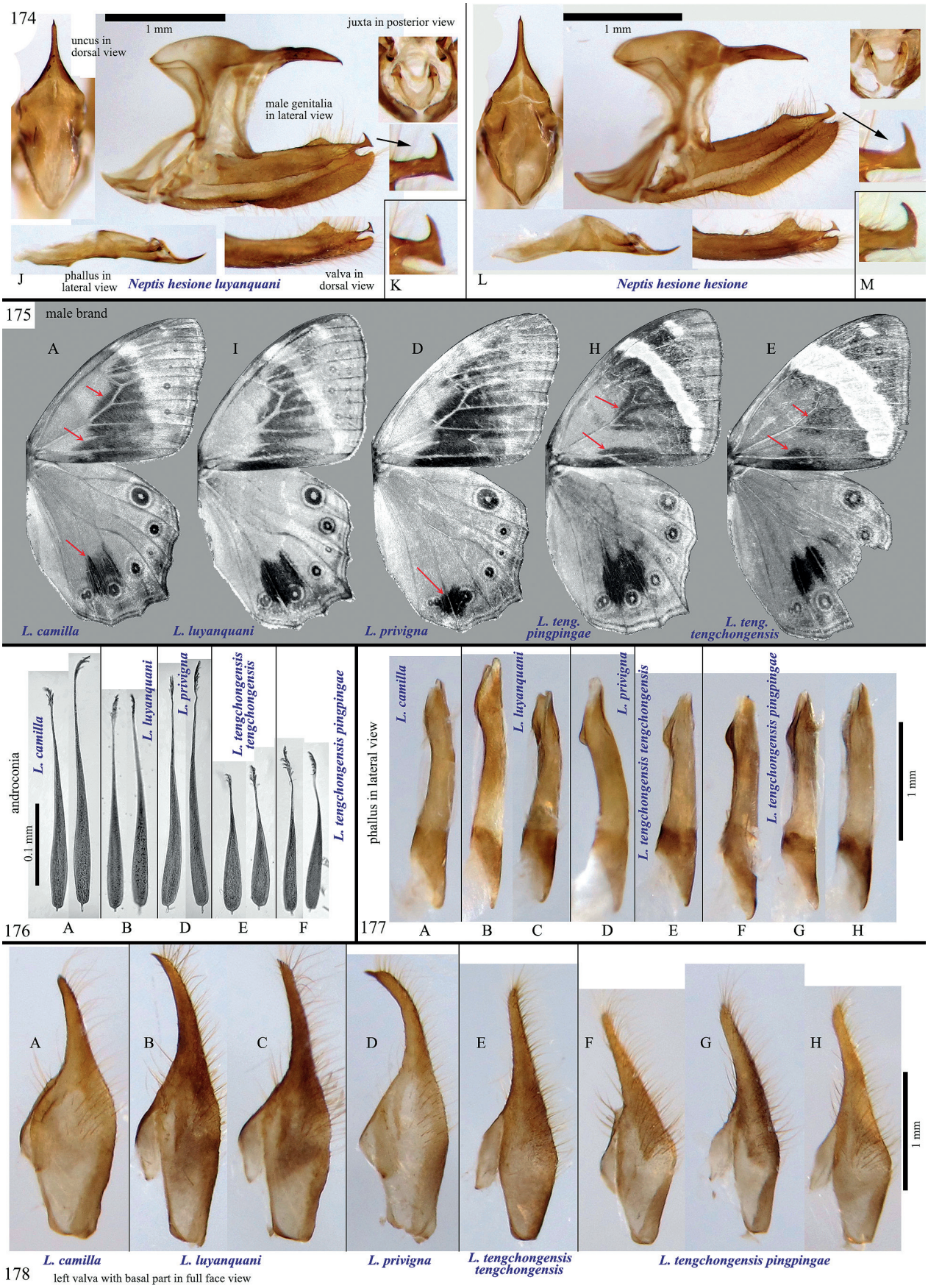
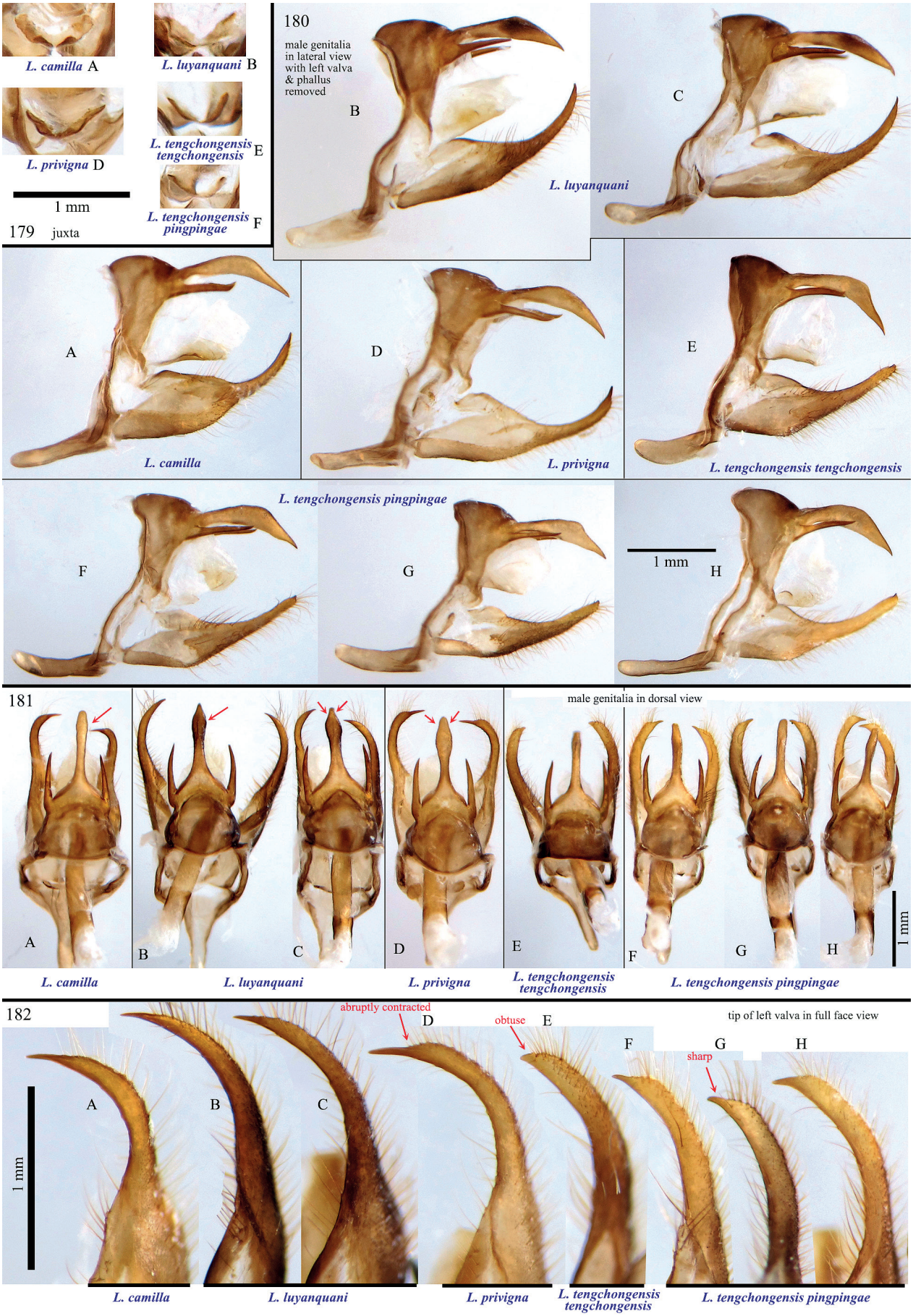
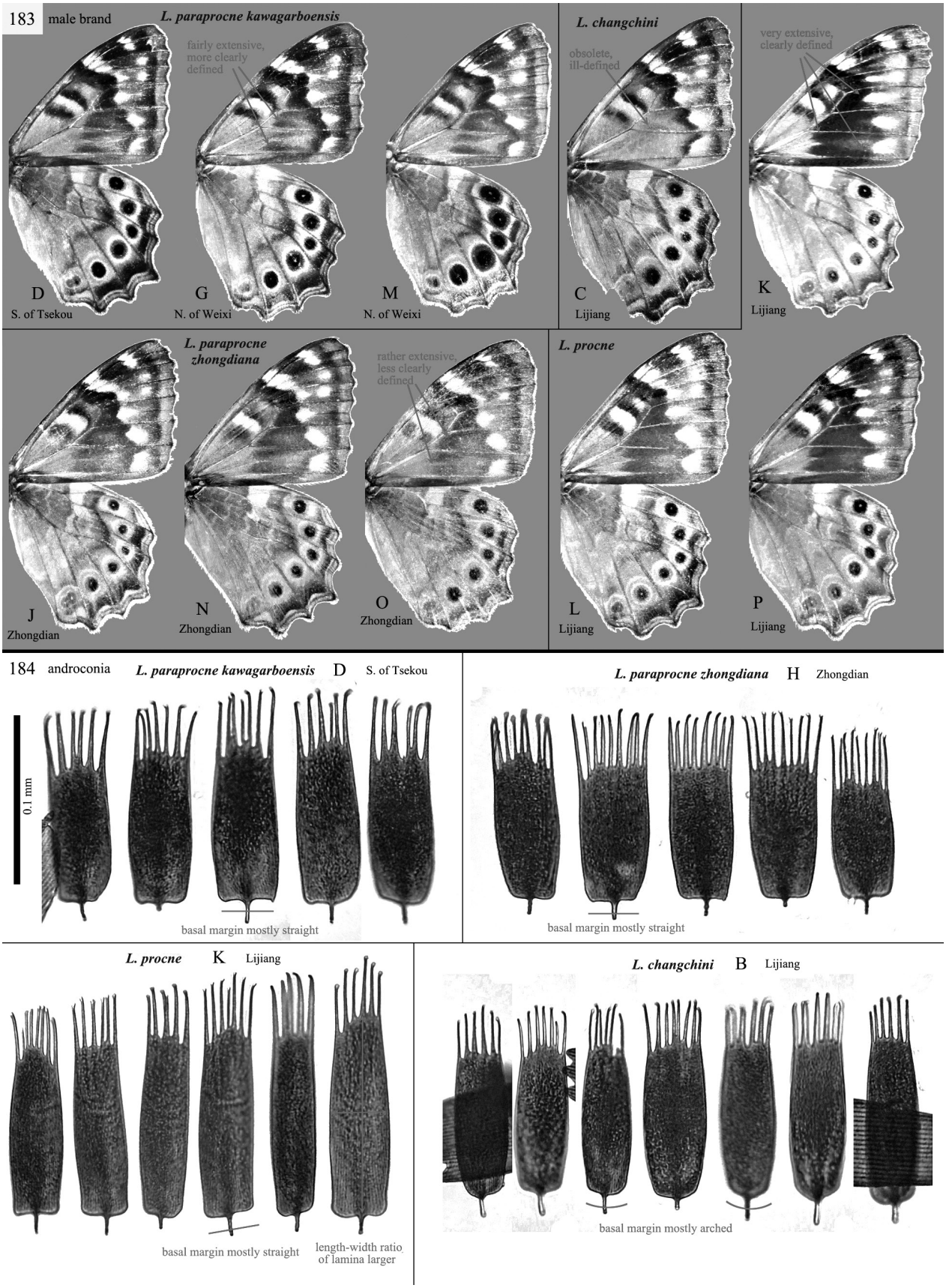


Fig. 174: ♂ genitalia of *Neptis hesione* Leech, 1890 at same scale. Specimens labeled as follows: (J) specimen shown in fig. 35; (K) fig. 36; (L) fig. 37; (M) specimen from Tianmushan, not figured.

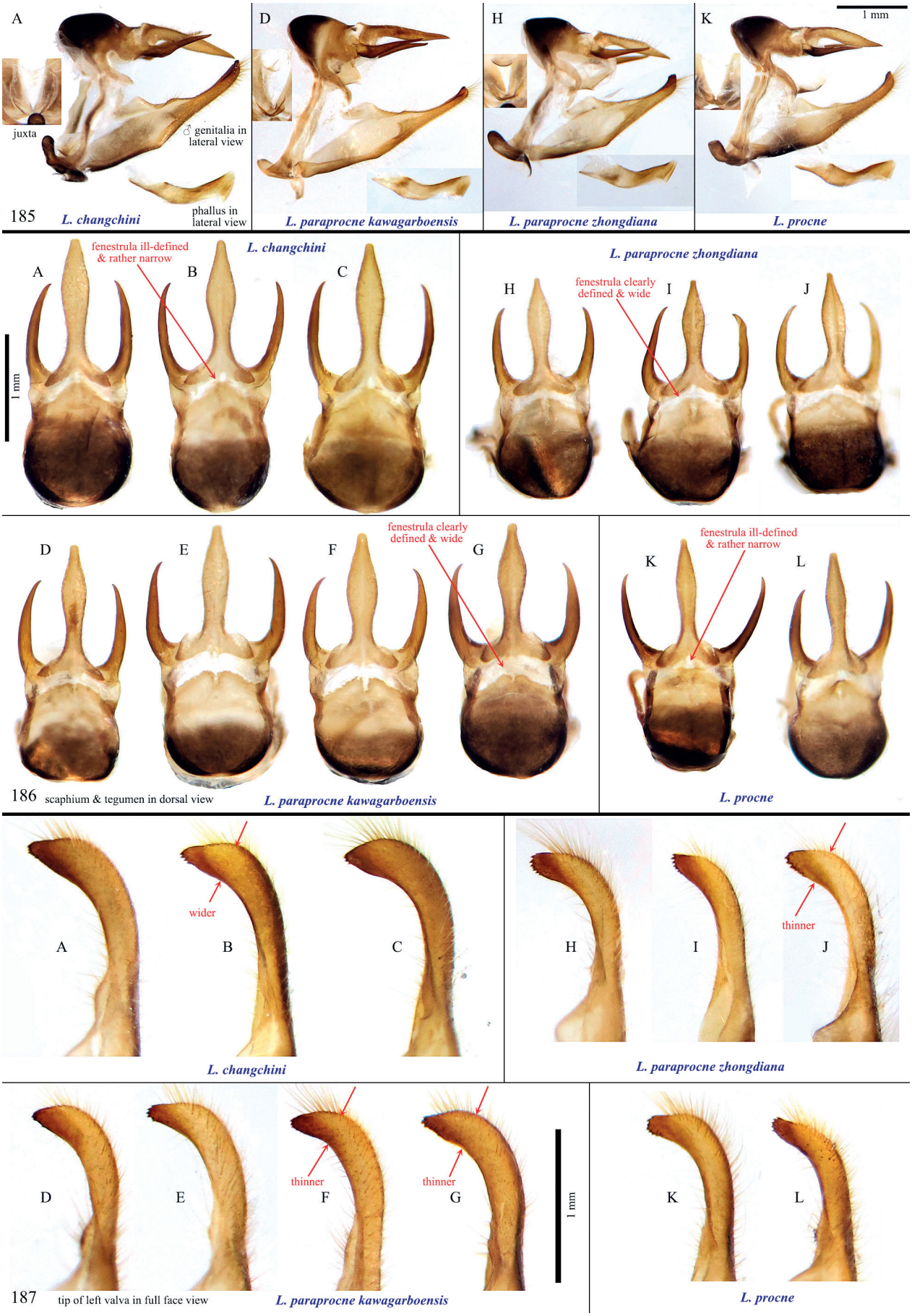
Figs. 175-178: Characters of *Lethe* taxa. (175) ♂ brand; (176) androconia; (177) aedoeagus of ♂ genitalia in lateral view; (178) left valva of ♂ genitalia with basal part in full face view. Specimens labeled as follows: (A) fig. 44; (B) fig. 41; (C) fig. 42; (D) fig. 45; (E) fig. 46; (F) fig. 47; (G) fig. 48; (H) fig. 49.



Figs. 179-182: ♂ genitalia of *Lethe* taxa at same scales. (179) juxta in anterior view; (180) whole genitalia in lateral view with left valva and aedoeagus removed; (181) whole genitalia in dorsal view; (182) tip of left valva in full face view. Specimens labeled alphabetically as in figs. 175-178.



Figs. 183-184: Characters of *Lethe* taxa. (183) ♂ brand; (184) androconia at same scale. Specimens labeled as follows: (B) fig. 51; (C) fig. 52; (D) fig. 54; (G) fig. 57; (H) fig. 58; (J) fig. 60; (K) fig. 63; (L) fig. 64; (M) not figured; (N) fig. 61; (O) fig. 62; (P) not figured.



Figs. 185-187: ♂ genitalia of *Lethe* taxa at same scales. (185) whole genitalia in lateral view with aedoeagus and left valva removed (at center), juxta in posterior view (at left) and aedoeagus in lateral view (at bottom); (186) scaphium and tegumen in dorsal view; (187) tip of left valva in full face view. Specimens labeled as follows: (A) fig. 50; (B) fig. 51; (C) fig. 52; (D) fig. 54; (E) fig. 55; (F) fig. 56; (G) fig. 57; (H) fig. 58; (I) fig. 59; (J) fig. 60; (K) fig. 63; (L) fig. 64.

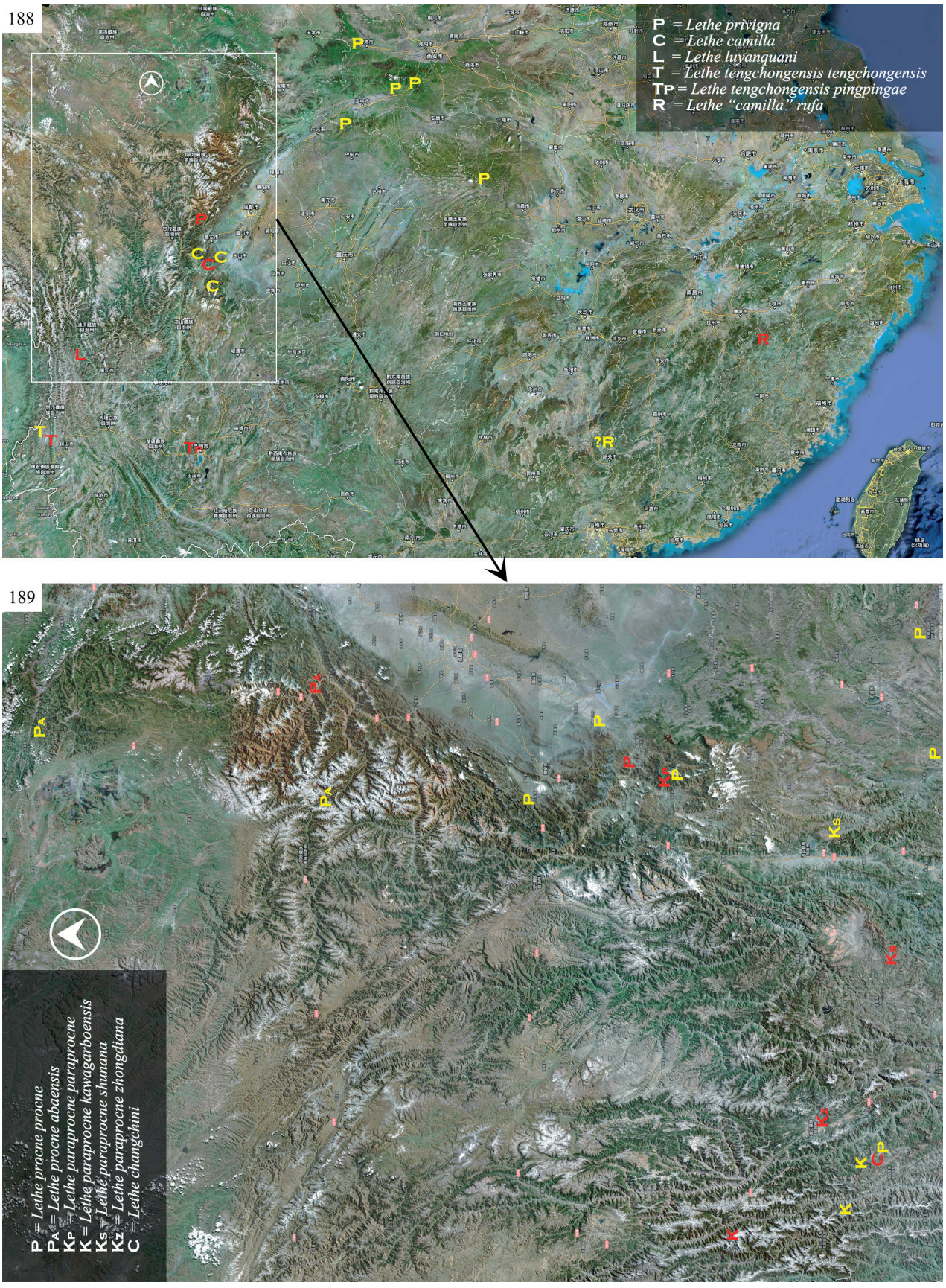
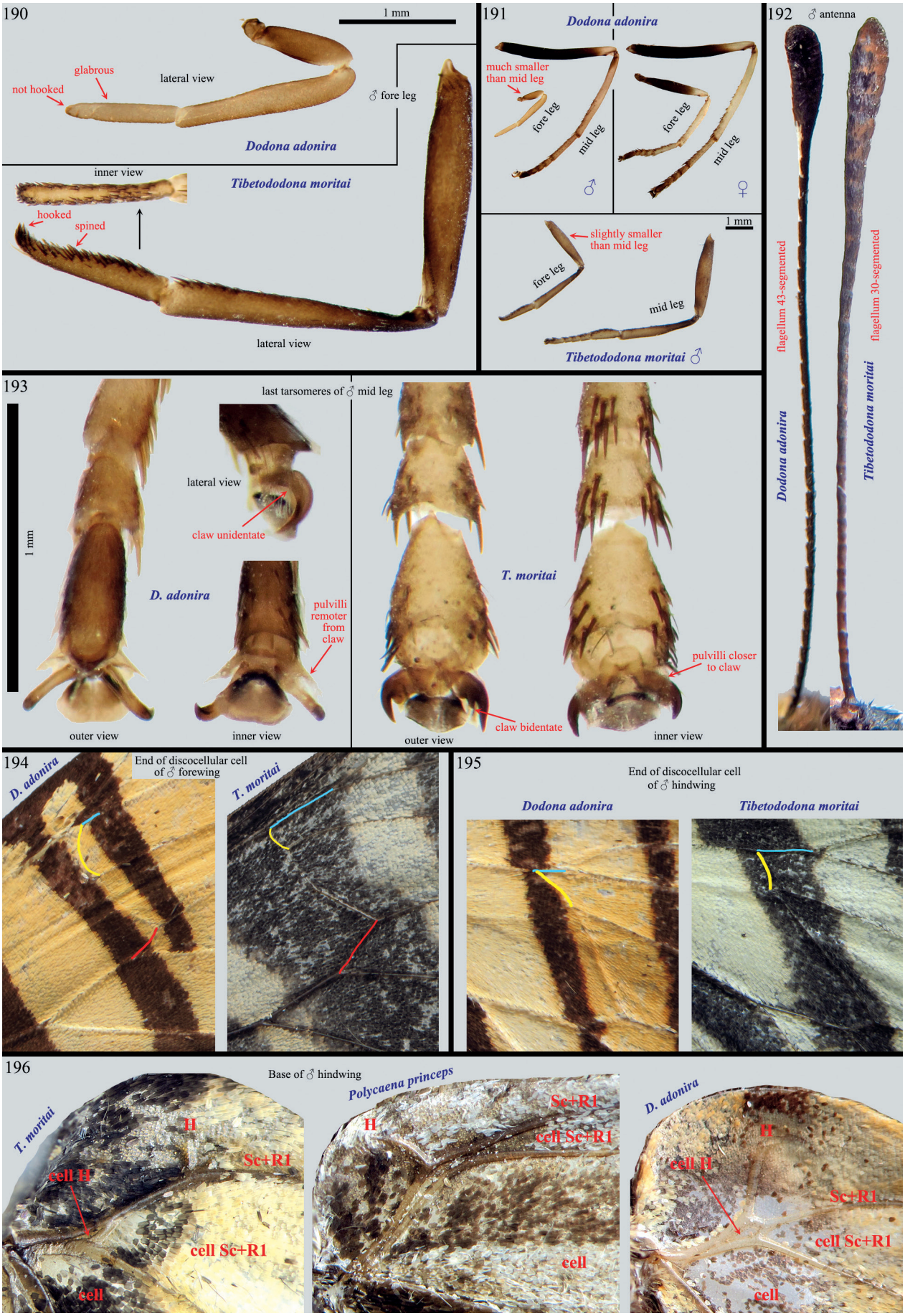


Fig. 188: Distribution of *Lethe camilla* Leech, 1891 and its affinities. Letter in red: type locality. Letter in yellow: other localities.
Fig. 189: Distribution of *Lethe procne* (Leech, 1891) and its affinities. Letter in red: type locality. Letter in yellow: other localities.



Figs. 190-196: Characters of *Tibetododona* HUANG and its allied genera. (190) ♂ fore leg at same scale; (191) fore leg and mid leg at same scale; (192) antenna; (193) last tarsomeres of ♂ mid leg in outer and inner views; (194) venation at end of forewing discocellular cell in ♂, with main differences marked by blue, yellow and red; (195) venation at end of hindwing discocellular cell in ♂; (196) venation at base of hindwing in ♂.

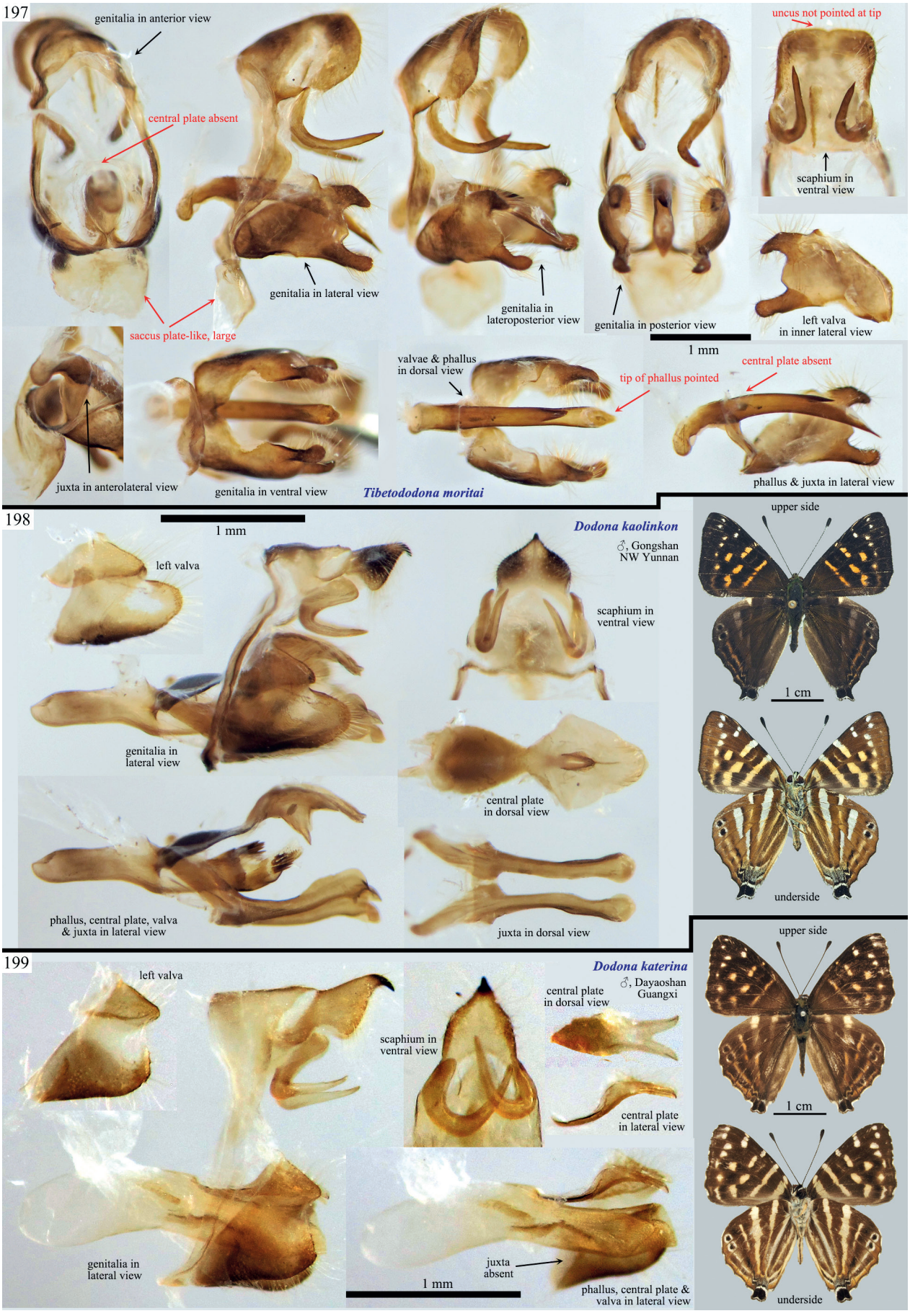
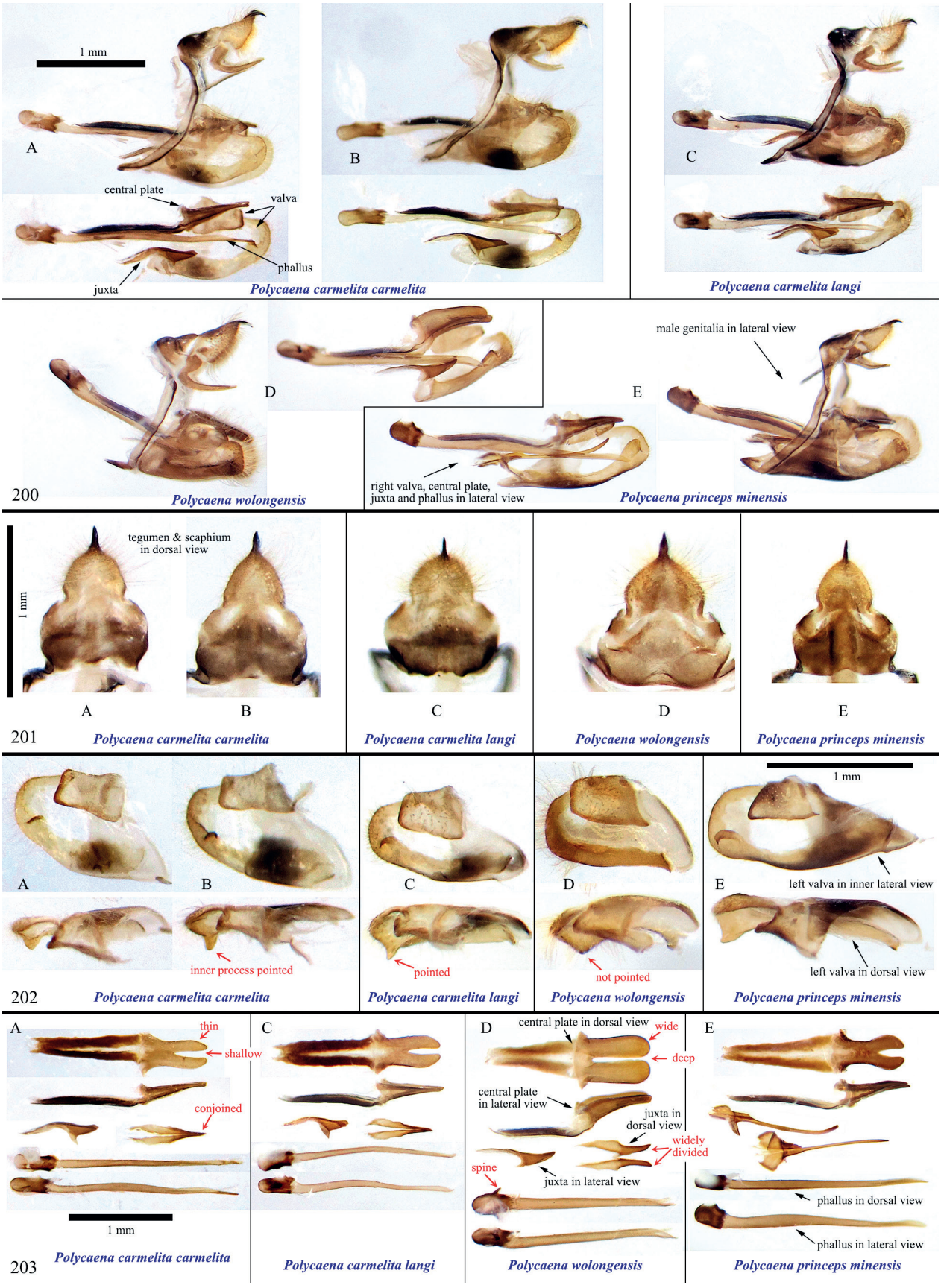


Fig. 197: ♂ genitalia of *Tibetododona moritai* (Koiwaya & Shinkai, 1996).
Fig. 198: ♂ genitalia and habitus of *Dodona kaolinkon* Yoshino, 1999.
Fig. 199: ♂ genitalia and habitus of *Dodona katerina* Monastyrskii & Devyatkin, 2000.



Figs. 200-203: ♂ genitalia of *Polycaena* taxa with structures at same scales. (200) whole genitalia in lateral view and right valva, central plate, juxta plus aedoeagus in lateral view; (201) tegumen and scaphium in dorsal view; (202) left valva in inner lateral and dorsal views; (203) central plate in dorsal and lateral views, juxta in lateral and dorsal views, and aedoeagus in dorsal and lateral views. Specimens labeled as follows: (A) fig. 65; (B) fig. 66; (C) fig. 68; (D) fig. 71; (E) specimen from Heishui, not figured.

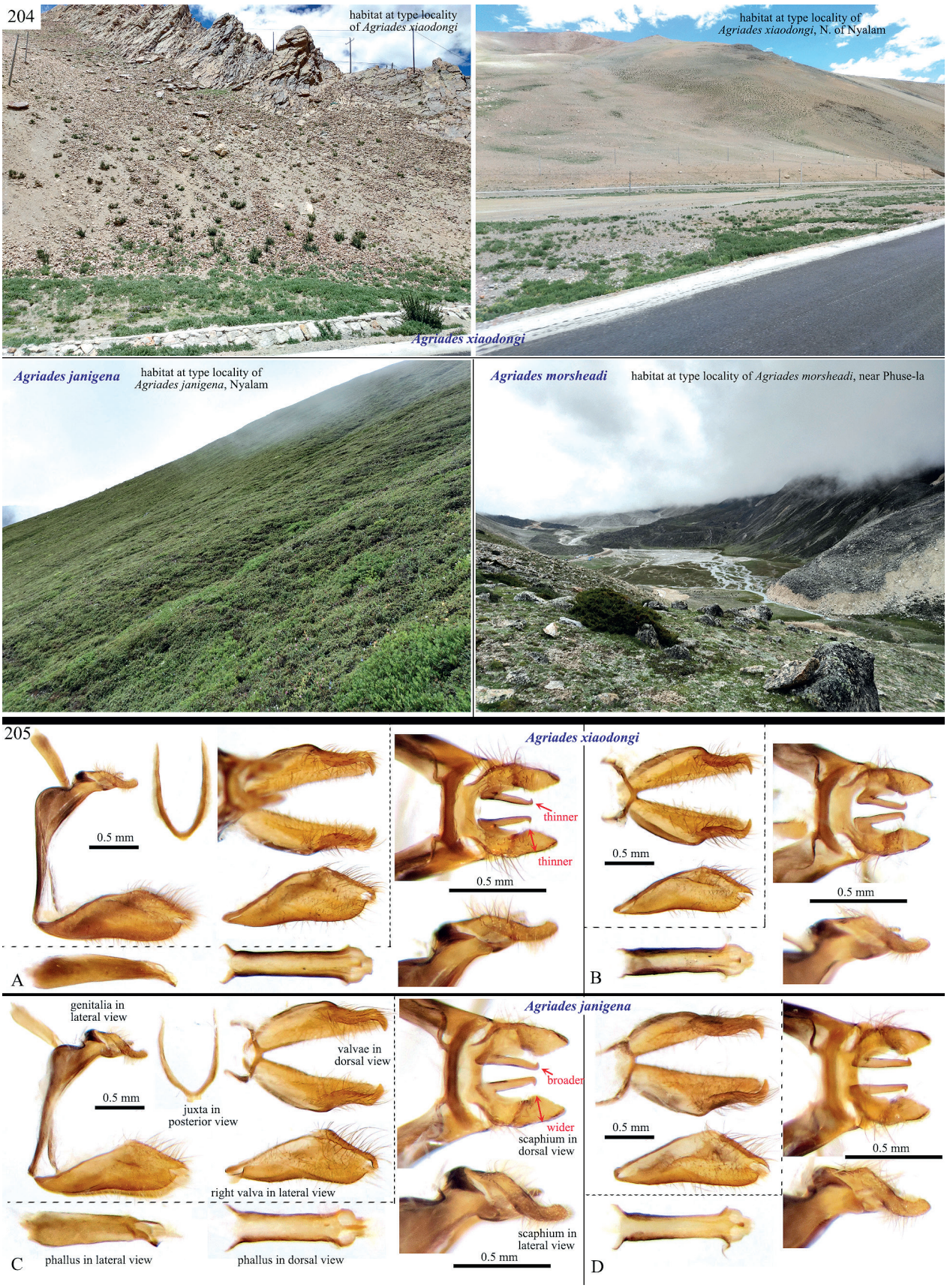


Fig. 204: Habitats of *Agriades* species in SC. Tibet.
Fig. 205: ♂ genitalia of *Agriades* species. Specimens labeled as follows: (A) fig. 72; (B) fig. 73; (C) fig. 80; (D) fig. 81.

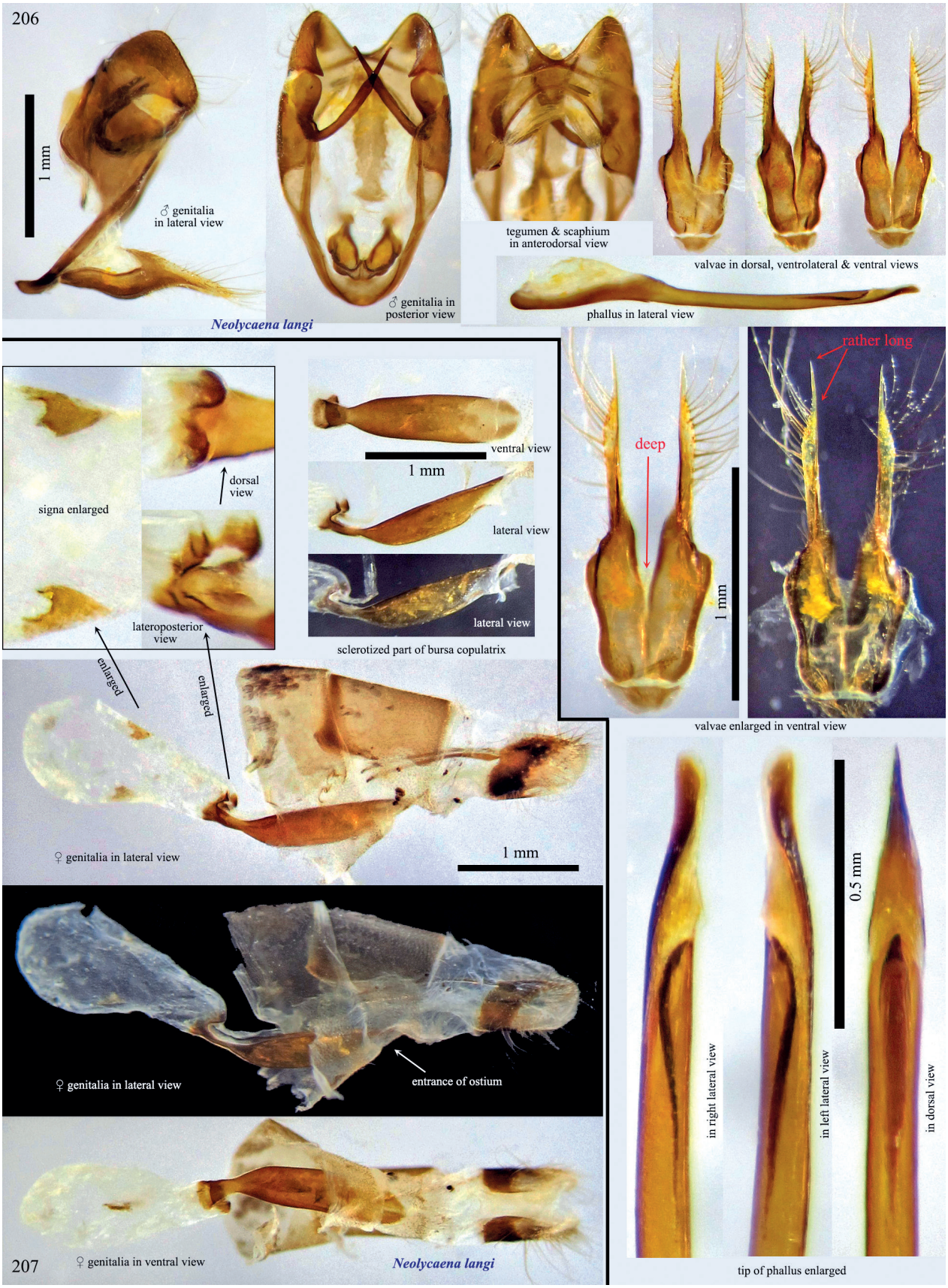


Fig. 206: ♂ genitalia of *Neolycaena* ***langi*** **spec. nov.**, HT.
Fig. 207: ♀ genitalia of *Neolycaena* ***langi*** **spec. nov.**, PT shown in fig. 85.

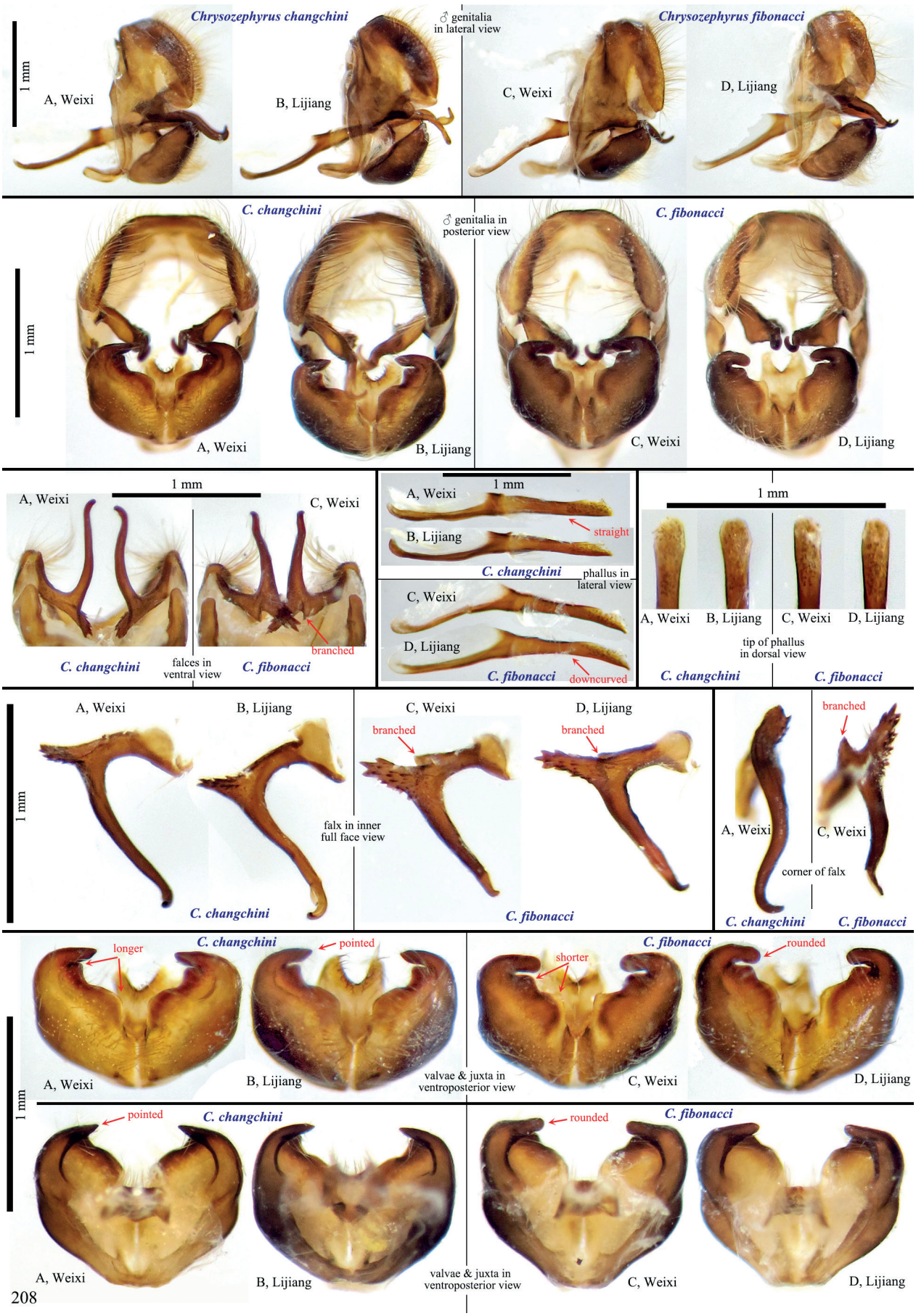


Fig. 208: ♂ genitalia of *Chrysozephyrus* ***changchini*** **spec. nov**. and *C. fibonacci* (ZHUANG, YAGO & WANG, 2015) with structures at same scales. Specimens labeled as follows: (A) fig. 88; (B) fig. 89; (C) fig. 91; (D) fig. 92.

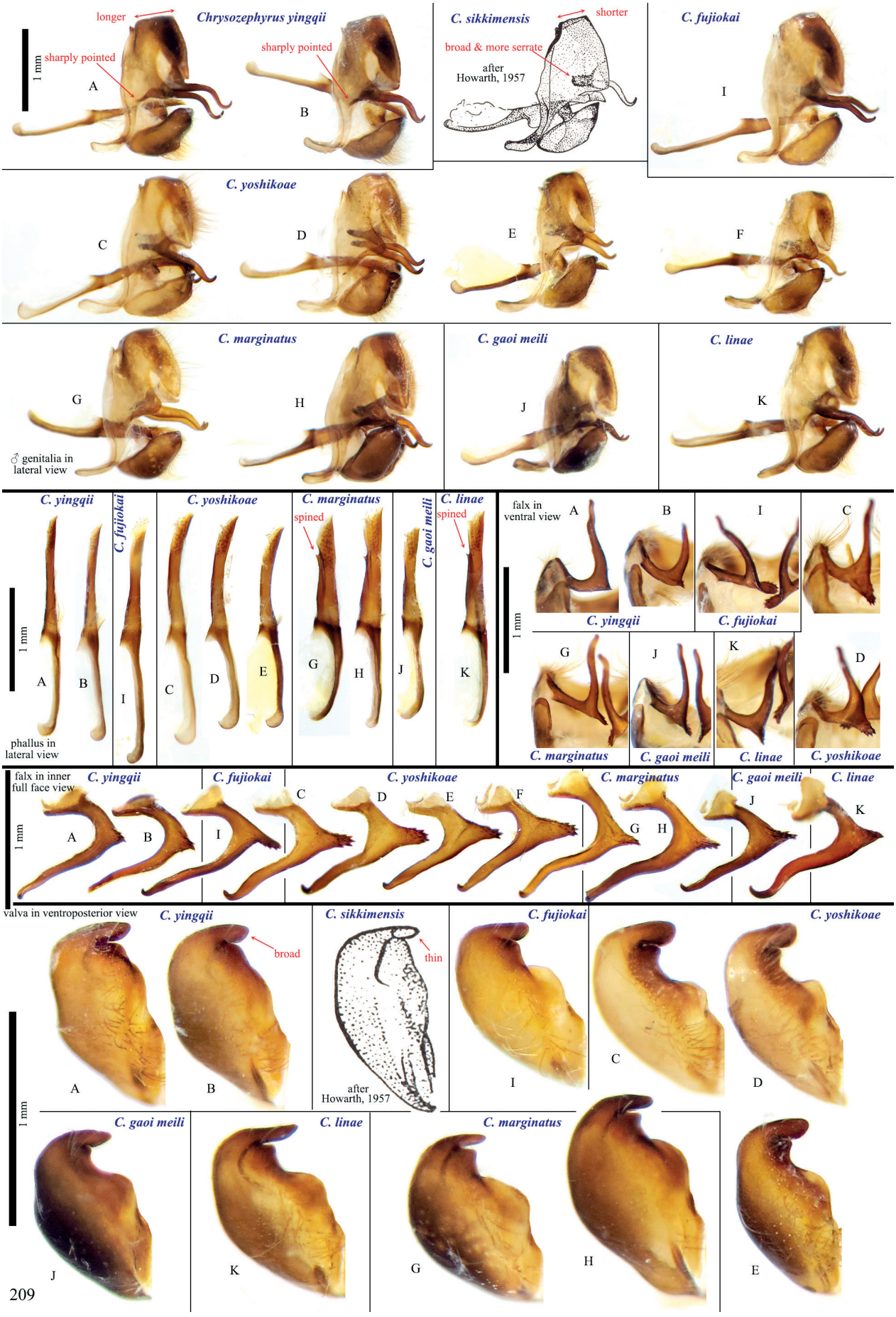


Fig. 209: ♂ genitalia of *Chrysozephyrus* taxa with structures at same scales. Specimens labeled as follows: (A) fig. 95; (B) fig. 96; (C) fig. 98; (D) fig. 101; (E) fig. 99; (F) fig. 100; (G) fig. 106; (H) fig. 105; (I) fig. 103; (J) fig. 102; (K) fig. 104.

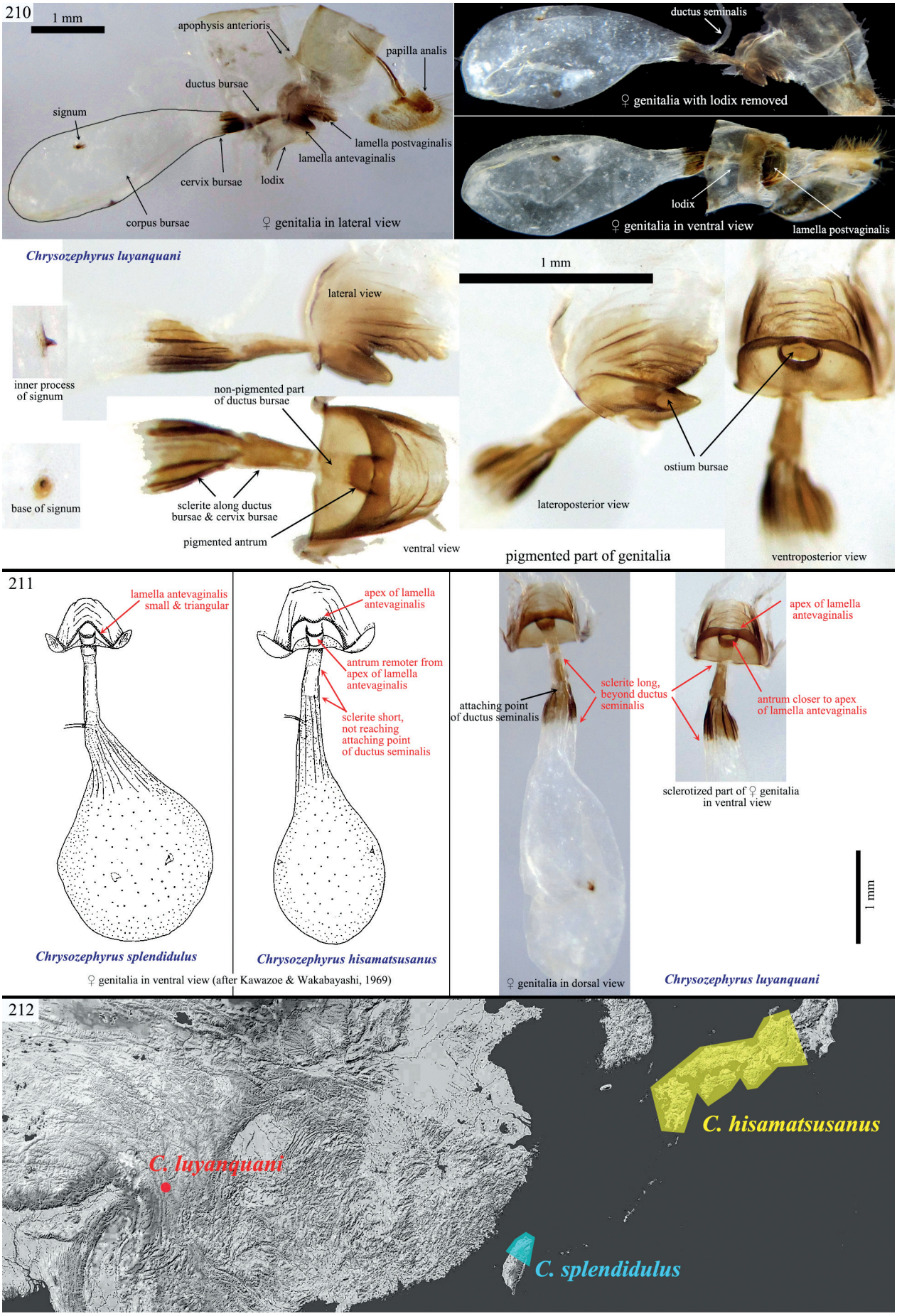
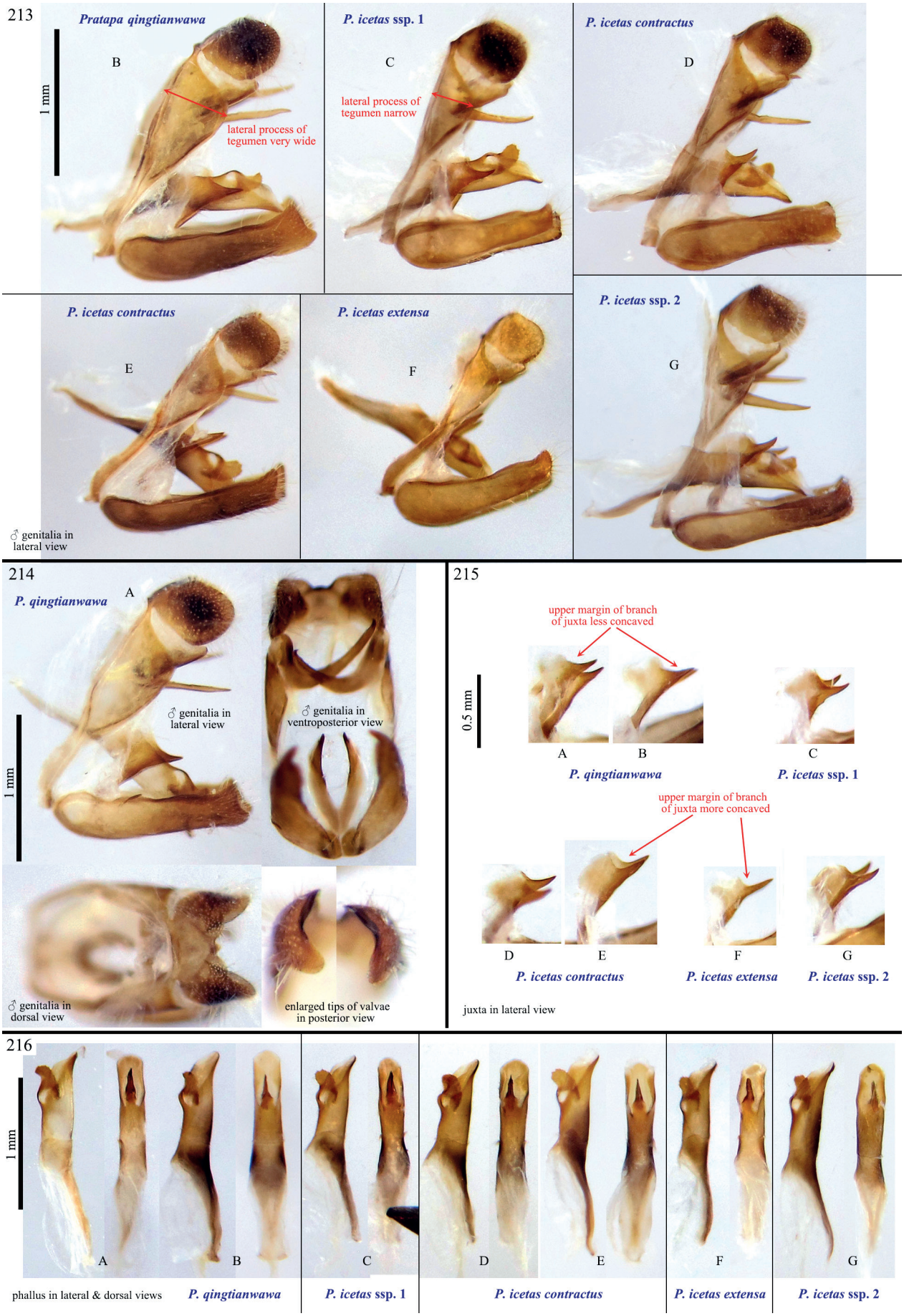


Fig. 210: ♀ genitalia of *Chrysozephyrus* ***luyanquani*** **spec. nov**.,HT.
Fig. 211: ♀ genital differences between *Chrysozephyrus* ***luyanquani*** **spec. nov**. and its affinities at same scale.
Fig. 212: Distribution of *Chrysozephyrus* ***luyanquani*** **spec. nov**. and its affinities.



Figs. 213-216: ♂ genitalia of *Pratapa* taxa at same scales. (213) whole genitalia in lateral view; (214) ♂ genitalia of *P.* ***qingtianwawa*** **spec. nov.** in details; (215) juxta in lateral view; (216) aedoeagus in lateral and dorsal views. Specimens labeled as follows: (A) fig. 110; (B) specimen not figured; (C) fig. 117; (D) fig. 119; (E) fig. 125; (F) fig. 128; (G) fig. 132.

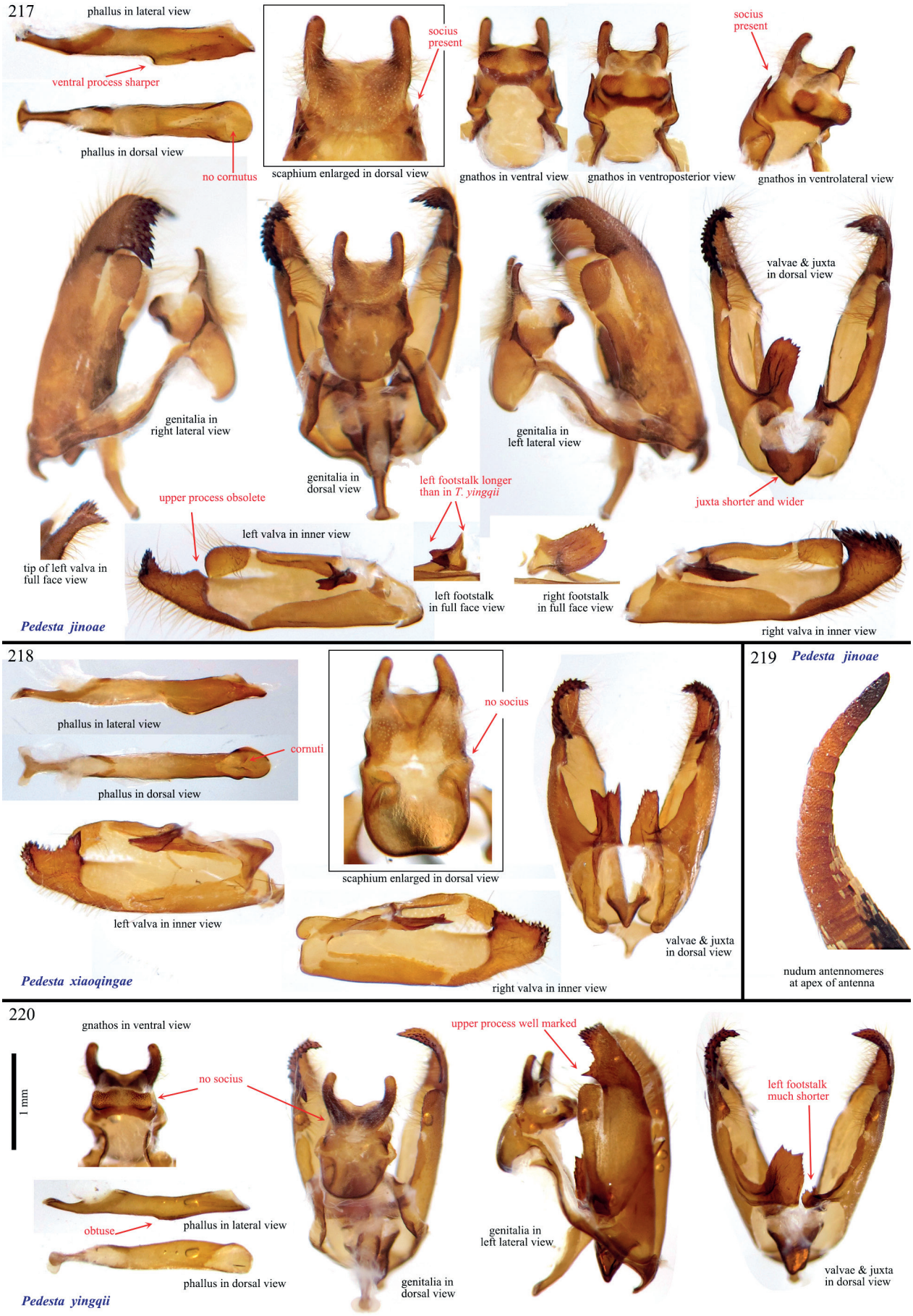


Fig. 217: ♂ genitalia of *Pedesta* ***jinoae*** **spec. nov.**, HT.
Fig. 218: ♂ genitalia of *Pedesta xiaoqingae* (Huang & Zhan, 2004).
Fig. 219: Nudum antennomeres of *Pedesta* ***jinoae*** **spec. nov.**, HT.
Fig. 220: ♂ genitalia of *Pedesta yingqii* (Huang, 2011).

Fig. 221: ♂ genitalia of *Pedesta hyrie* (De Niceville, 1891) with structures at same scales.
Fig. 222: ♂ brand of *Pedesta hyrie* (De Niceville, 1891) on forewing upper side. Specimens labeled as follows: (A) fig. 144; (B) fig. 143; (D) fig. 140; (E) fig. 142; (C, F, G, H) specimens not figured.

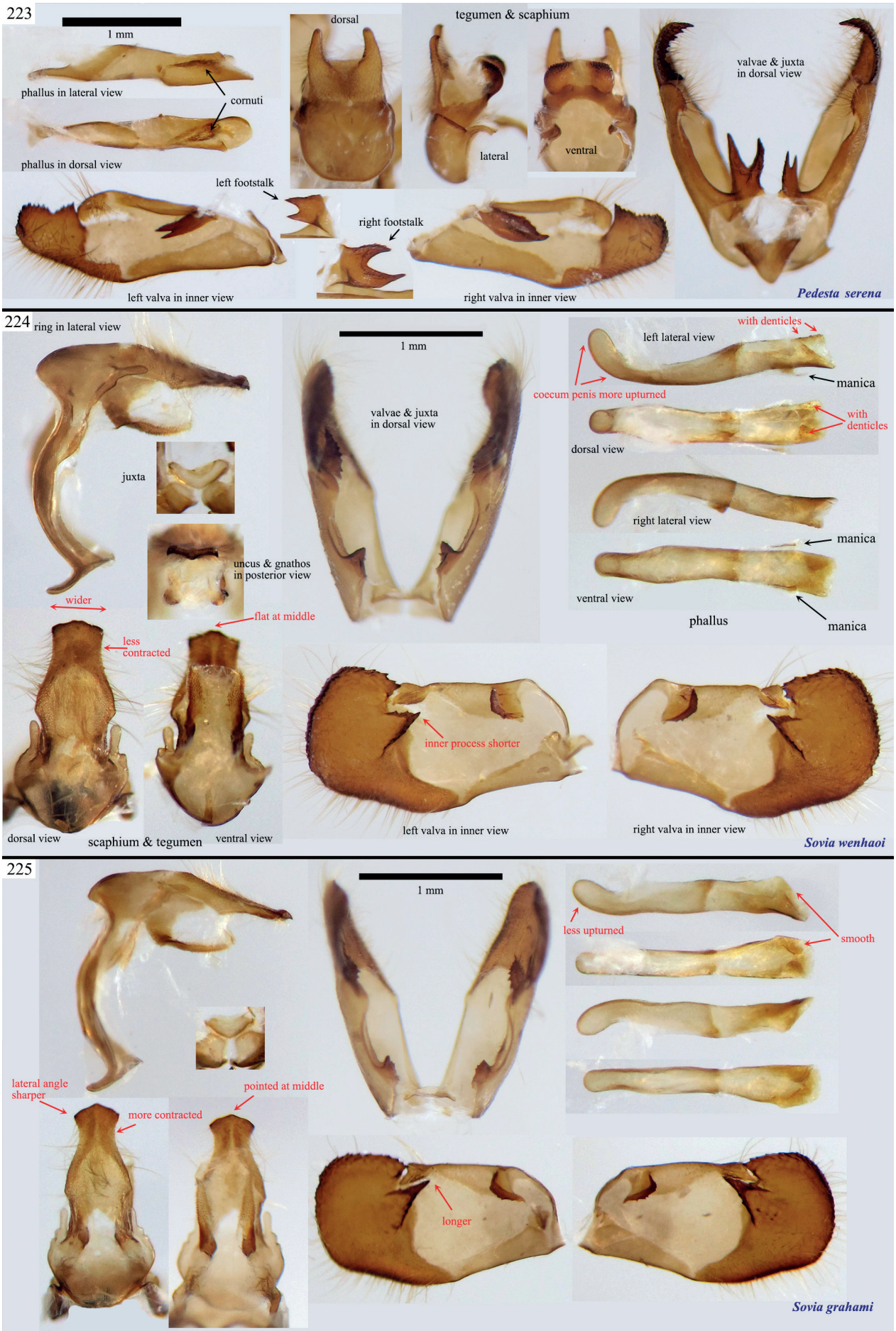


Fig. 223: ♂ genitalia of *Pedesta serena* (Evans, 1937), specimen shown in fig. 137.
Fig. 224: ♂ genitalia of *Sovia* ***wenhaoi*** **spec. nov.**, HT.
Fig. 225: ♂ genitalia of *Sovia grahami grahami* (Evans, 1926), specimen shown in fig. 148.

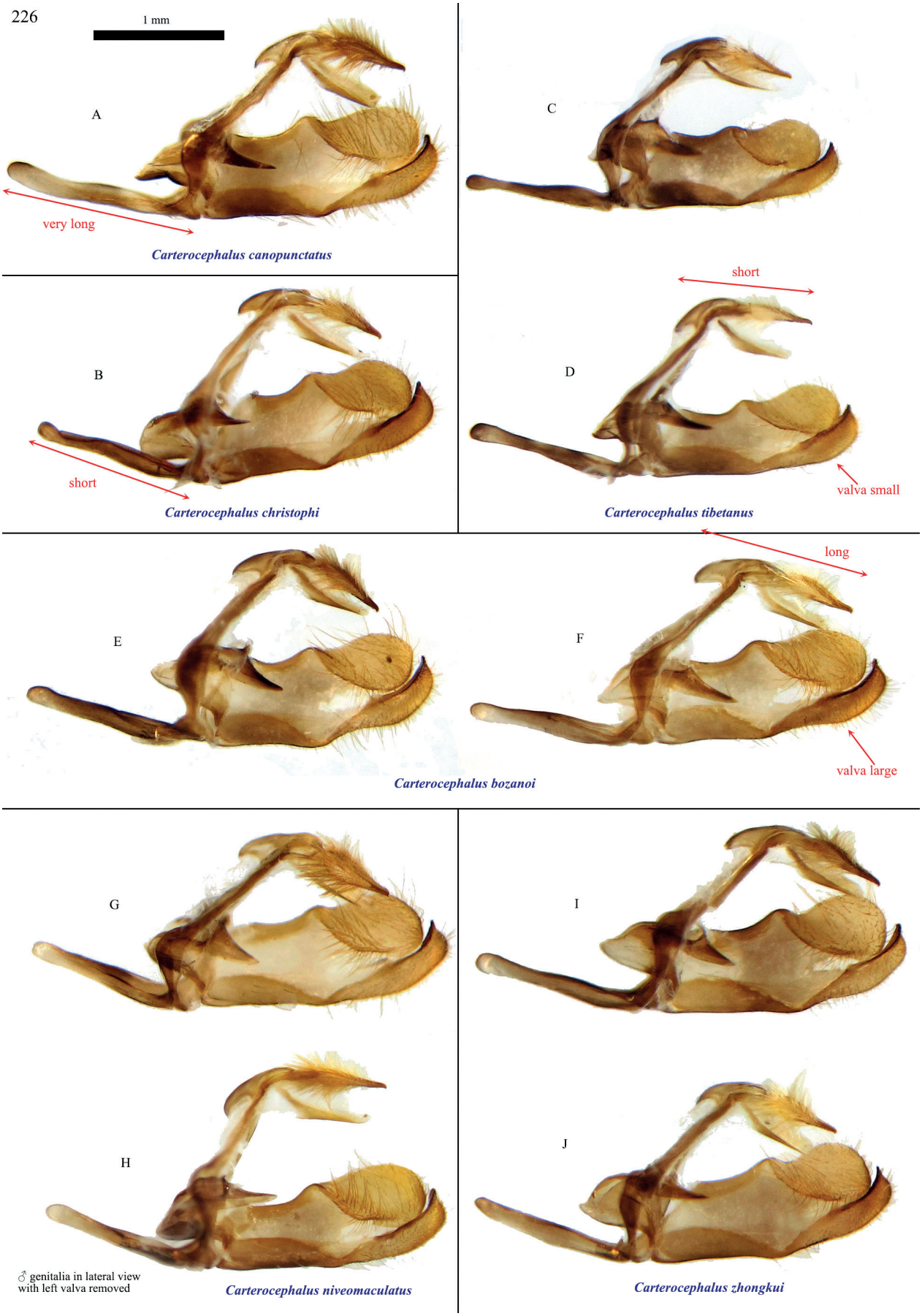


Fig. 226: ♂ genitalia of *Carterocephalus* species in lateral view at same scale, with aedoeagus and left valva removed. Specimens labeled as follows: (A) fig. 157; (B) fig. 159; (C) fig. 152; (D) fig. 153; (E) fig. 150; (F) fig. 151; (G) fig. 160; (H) fig. 161; (I) fig. 162; (J) fig. 163.

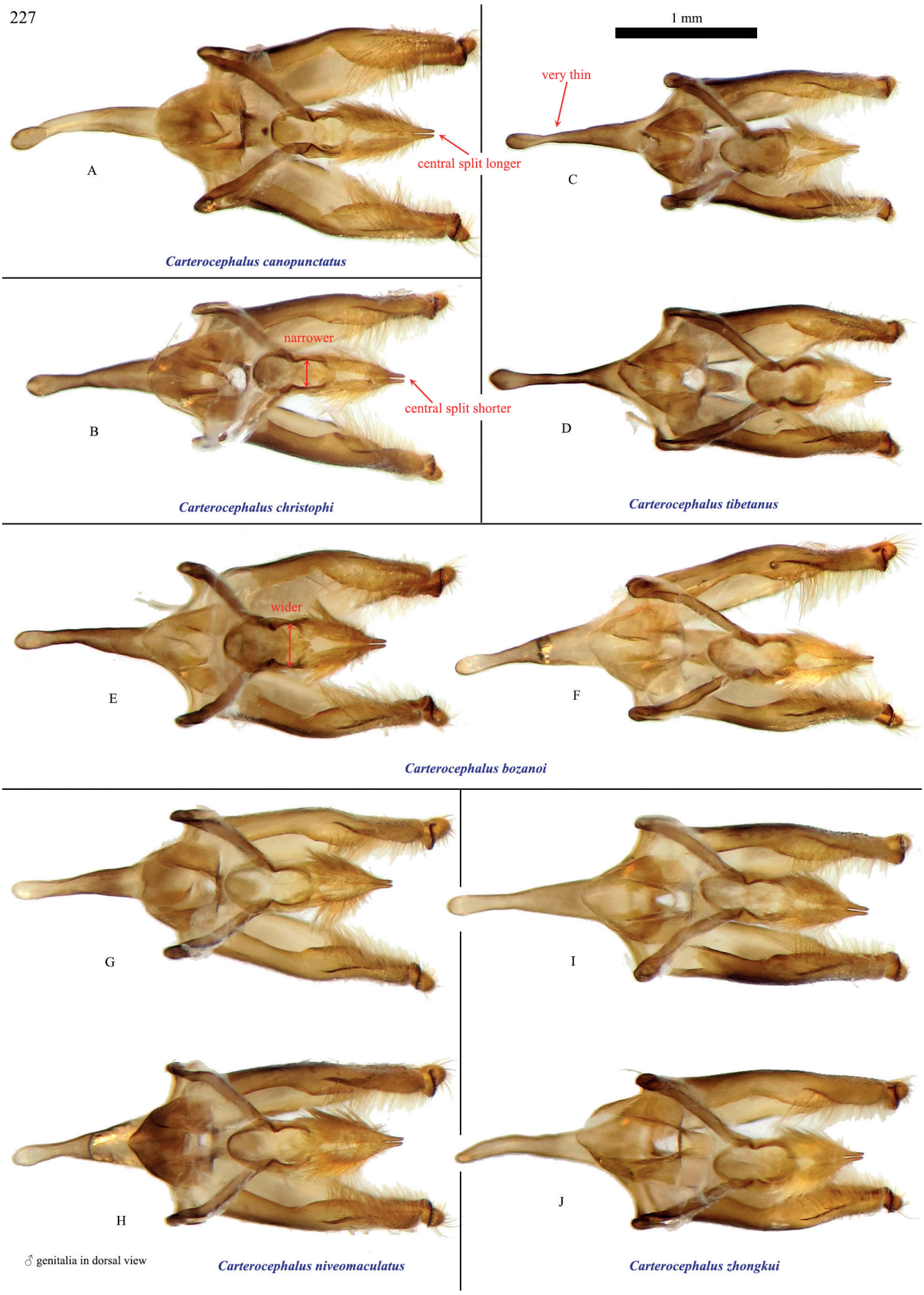
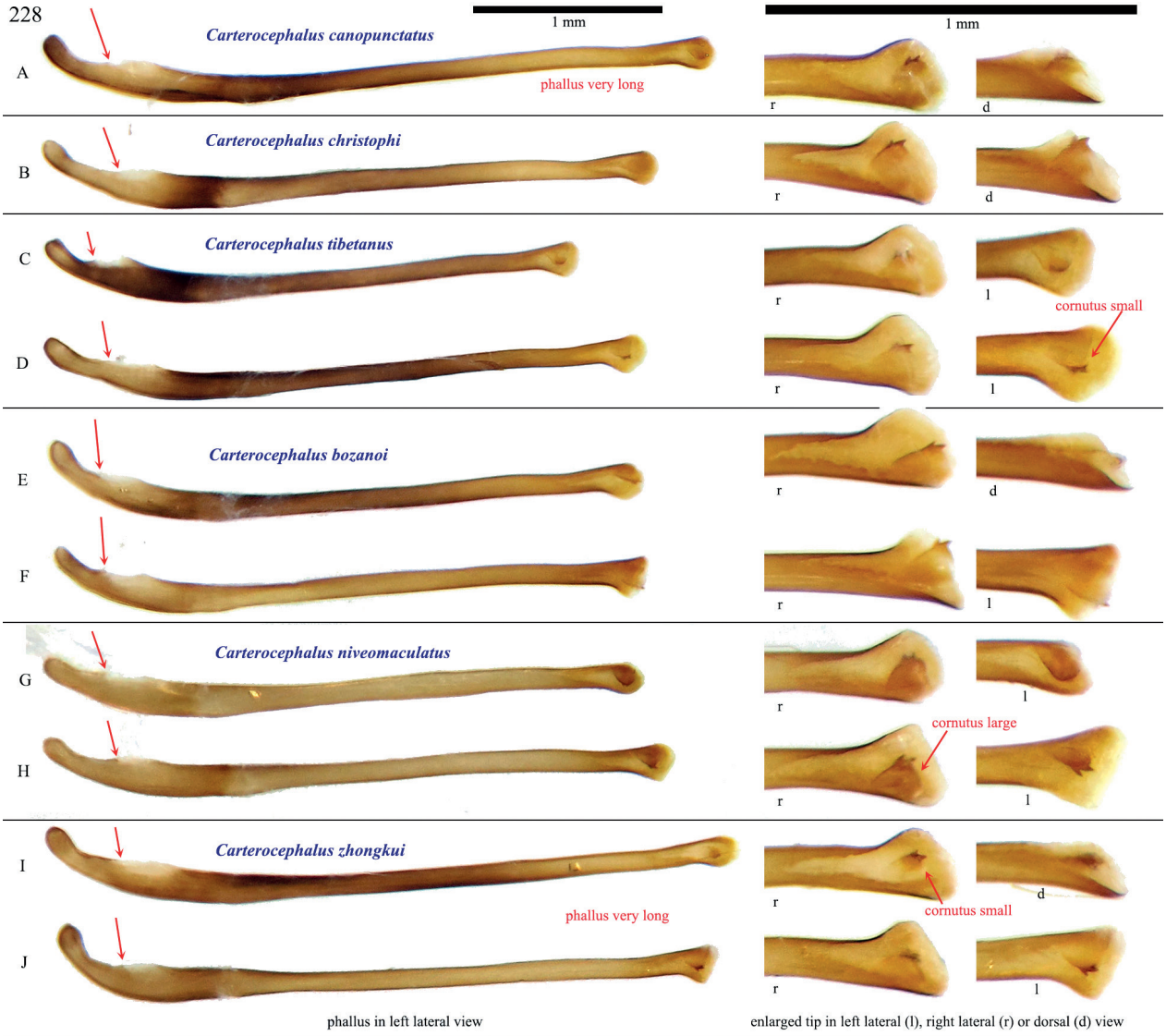


Fig. 227: ♂ genitalia of *Carterocephalus* species in dorsal view at same scale, with aedoeagus removed. Specimens labeled as in fig. 226.



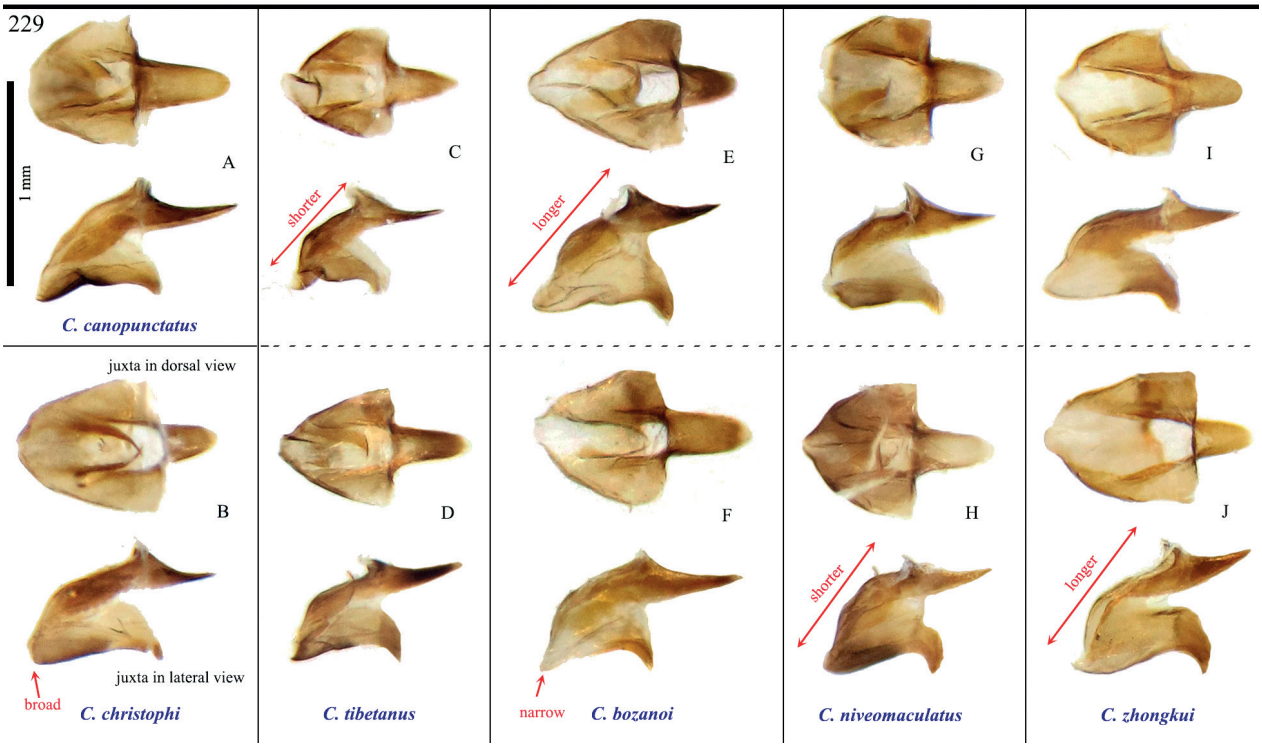
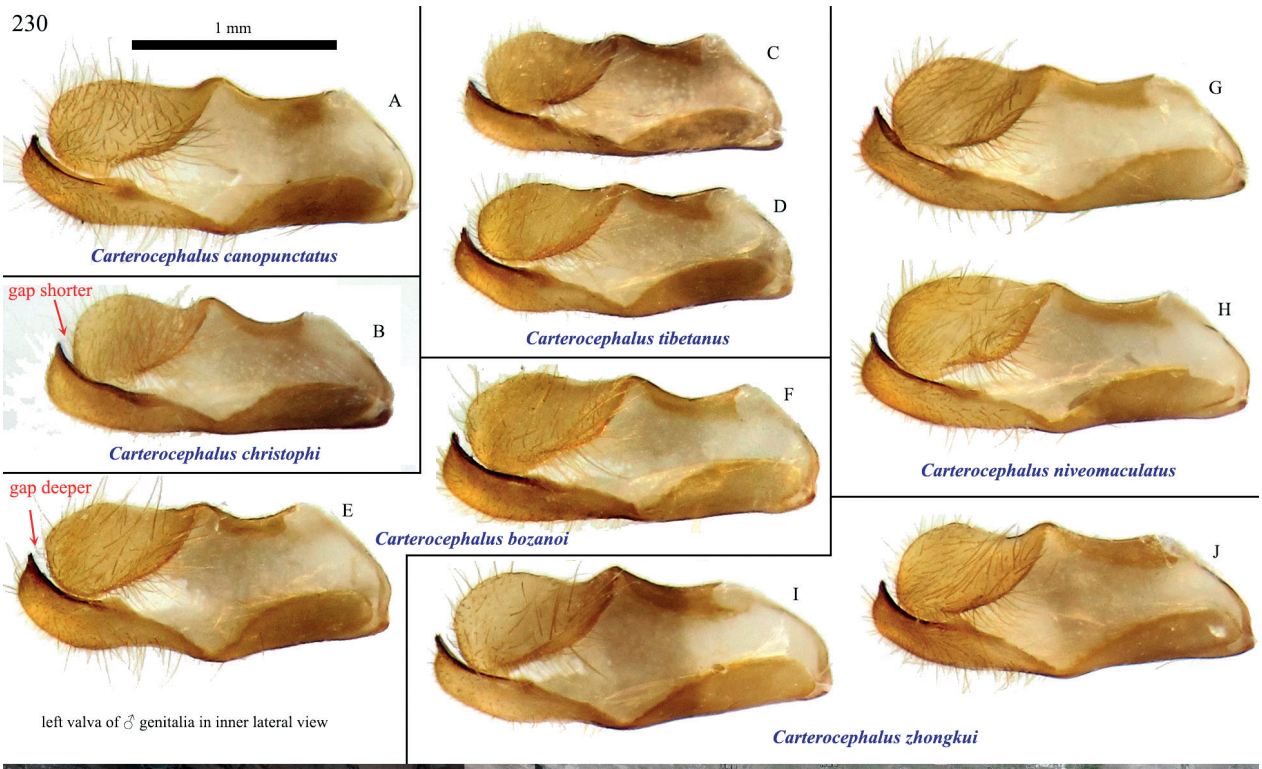


Fig. 228: Aedoeagus of *Carterocephalus* species in lateral view at same scale, with tip in left lateral (l), right lateral (r) or dorsal (d) view enlarged. Specimens labeled as in fig. 226.

Fig. 229: Juxta plus manica of *Carterocephalus* species in dorsal and lateral views at same scale. Specimens labeled as in fig. 226.



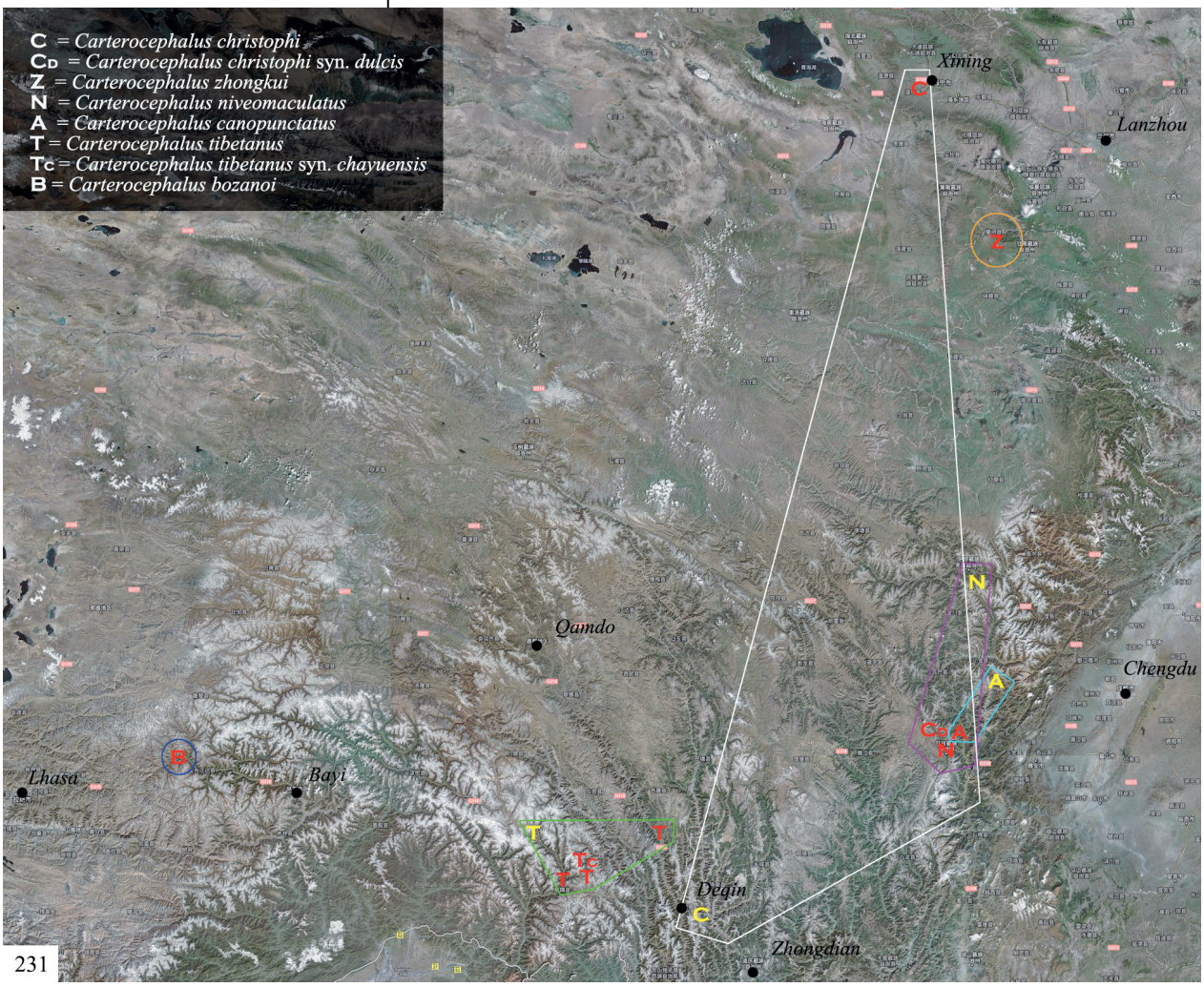


Fig. 230: Left valva of *Carterocephalus* species in inner lateral view at same scale. Specimens labeled as in fig. 226.
Fig. 231: Distribution of the *Carterocephalus niveomaculatus* Oberthür, 1886- group. Letter in red: type locality. Letter in yellow: other localities.

A new species of *Caerulea* Forster, 1938 from W. Guizhou

(Lepidoptera: Lycaenidae)

by

Hao Huang & Feng Cao

received 16.I.2019

Abstract: The genus *Caerulea* Forster, 1938 is reviewed, with *C. **guizhouensis*** **spec. nov.** described from W. Guizhou.

Introduction: Hemming (1931) first noticed the genital differences between this group and its affinities in the genus *Maculinea* van Eecke, 1915 (this genus was recently merged into *Phengaris* Doherty, 1891 by Fric et al., 2007). Based upon these differences, Forster (1938) erected *Caerulea* as a subgenus of *Glaucopsyche* Scudder, 1872 to receive this group. Eliot (1973) raised *Caerulea* Forster to full genus and placed it into the *Glaucopsyche* section of the tribe Polyommatini Swainson, 1827. Hemming's (1931) notes can be regarded as the definition of the genus *Caerulea* Forster in genital characters and we quote them as follows: "the clasps (valvae) are relatively very short and broad"; "the clasps are much wider at their distal end than at the base"; "the distal margin of the clasp is irregularly incurved and the terminal spine is broader at the base and more rounded and tapering". In external features, the genus *Caerulea* Forster is easily distinguishable, as the two known species are much closer to each other than to species within other genera.

Hemming (1931) actually reviewed this genus and recognized two close species: *Caerulea coeligena* (Oberthür, 1876) and *C. coelestis* (Alpheraky, 1897). However, the genital difference in valvae between these two species mentioned by Hemming (1931) is now proved by our work as useless in taxonomy, falling into individual variation, as Hemming apparently dissected very few specimens. These two species seem to be sympatric in nature, as Hemming (1931) found that both species had been recorded from Moupin, Ta-Tsien-lou and "Frontiere orientale de Thibet" in BMNH. However, these old specimens might be roughly labeled and their correct collecting data are untraceable. On the contrary, we do not find any reliable sympatric record for these two species by any Chinese collectors, though these two species might have their ranges overlapping a little around the Baoxing area.

Unexpectedly, the junior author observed two different species occurring at the same locality of Caohai, Weining, W. Guizhou: one flew in early May, with larva feeding on *Gentiana sutchuenensis* Franchet, 1890 (Gentianaceae), representing *Caerulea coelestis sora* Sugiyama, 1999; another on the wings in mid and late June, with larva feeding on *Gentiana praticola* Franchet, 1896, representing a scientifically unknown species, described herein.

Abbrevitions:

BMNH:	Natural History Museum, London.
BSNU:	Biological laboratory of Shanghai Normal University, Shanghai, P.R. China.
CHH:	Collection of Hao Huang, Qingdao, China.
CCF:	Collection of Feng Cao, Hunan, China.
HT:	Holotype.
PT:	Paratype.
TL:	Type locality.

Taxonomic accounts of *Caerulea* taxa

Caerulea coeligena (Oberthür, 1876)

Diagnosis for species. The following characters are considered to be useful in distinguishing this species from the others: 1) ♂ upper side ground color more silvery and paler (deeper blue in the other two species); 2) ♀ forewing upper side black marginal band usually narrower (this character is not constant); 3) ♀ upper side with discal area in purer bluish ground color, not black-dusted (in powdered blue ground, extensively black-dusted in the other two species); 4) aedoeagus markedly thinner near the tip, just before the distal end of dorsal wall (thicker in the other two species).

Caerulea coeligena coeligena (Oberthür, 1876) (figs. 11-12, 47: L)

Lycaena coeligena Oberthür, 1876: 21, pl. 1, figs. 3a-b for unique ♂ (TL: Moupin, now Baoxing).

Iolana caligena (sic!): Bethune-Baker, 1914: 162.

Maculinea coeligena coeligena: Hemming, 1931: 329, type deposition in BMNH, records from Ta-Tsien-lou, "Frontiere orientale de Thibet", pl. 11, fig. 5 for valva.

Glaucopsyche (*Caerulea*) *coeligena*: Forster, 1938: 108. (Subgenus *Caerulea* raised to full genus by Eliot 1973).

Caerulea coeligena: Bridges, 1988: II. 18; d'Abrera, 1993: 482.

Material. **Sichuan**: 1 ♂ (CHH), Ya'an City, Yingjing County, Siping, 1100 m, 22.IV.2014, H. Huang leg.. Dissected.

Remarks. Its range overlaps that of *C. c. coelestis* (Alpheraky) in Baoxing area, but at a lower elevation. The ♂ of this taxon differs from that of the possibly sympatric population of *C. c. coelestis* (Alph.) by having a broader black patch at apex of forewing upper side, in addition to the characters mentioned above (under "**Diagnosis for species**").

Caerulea coeligena pratti (Hemming, 1931) (figs. 13-17, 32-34, 47: M, N & O)

Lycaena coeligena: Leech, 1893: 312.

Maculinea coeligena pratti Hemming, 1931: 329 (TL: Chang-Yang, Hubei).

Caerulea coeligena pratti: Bridges, 1988: II. 18; d'Abrera, 1993: 483, figs. for ♂ & ♀ (probably type specimens) from Ichang and Chang Yang, Hubei.

Caerulea coeligena: Wang & Fan, 2002: cp. 24, figs. 9-14 for specimens from Shaanxi and Henan.
Caerulea coelestis coelestis: Wang & Fan, 2002: cp. 24, figs. 15-18 for specimens from Henan. (Misidentification).
Material. **Hubei**: 1 ♂ (CHH), Xiangyang City, Baokang County, Wudaoxia, Makeng-linchang, 1000 m, 1.V.2015, M. Ye leg.. **Chongqing**: 4 ♂♂, 3 ♀♀ (CHH), Chengkou County, near Huang'anba, Dabashan Mts., 1500 m, 21.-27.IV.2008, H. Huang leg.. **Gansu**: 5 ♂♂, 3 ♀♀ (CHH), Huixian, Fuzhen, 1300 m, 27.IV.2017, H. Huang leg.; 4 ♂♂, 2 ♀♀ (CHH), Kangxian, 1200-1400 m, 29.IV.2017 & 2.VI.2016, H. Huang leg.. **Shaanxi**: 2 ♂♂, 1 ♀ (CHH), Ningshaan, Pingheliangding, 2200 m, 1.V.2008, H. Huang leg.. 6 ♂♂ dissected.
Remarks. The populations from Hubei (TL) belong to ssp. *pratti* (Hemming) without doubt, being different from the nominotypical subspecies by having a more metallic blue and less whitish ground color on upper side of both sexes. However, the populations from Shaanxi, Chongqing and S. Gansu are intermediate between the two known subspecies, being variable in ground color and apical patch on forewing upper side of ♂. They are tentatively included into ssp. *pratti* (Hemming) by having the veins less outlined with dark scales on forewing upper side of ♀, and by a viewpoint of the zoogeography (the areas around Qinling Mts. and Dabashan Mts. usually share more in butterfly fauna with the Changyang area of Hubei than with W. Sichuan). A population from Lingbao, Henan (Wang & Fan, 2002) goes even farther by having wider marginal band and darker blue ground color on both wings upper side of ♀, closely resembling that of *C. coelestis* (Alph.) (This can explain why Wang & Fan (2002) misidentified a part of their specimens from Henan as *C. coelestis* (Alph.)). It might be more reasonable to include all the populations and subspecies of *C. coeligena* (Obth.) into one taxon, without a subspecific separation.

Caerulea coelestis (Alpheraky, 1897)
Diagnosis for species. ♂ upper side ground color deeper blue and less silvery than in *C. coeligena* (Obth.). ♀ forewing upper side black marginal band usually wider than in *C. coeligena* (Obth.). ♀ upper side ground color darker bluish and powdered, not so pure as in *C. coeligena* (Obth.). Both sexes with discal spots on both wings underside nearer termen than in *C.* ***guizhouensis*** **spec. nov.**. Aedoeagus markedly thicker than in *C. coeligena* (Obth.) just before the distal end of dorsal wall. Valva (not counting apical process) more rectangular in shape than in *C.* ***guizhouensis*** **spec. nov.**, with inner margin evenly curved or obtusely angled, not nearly right-angled as in *C.* ***guizhouensis*** **spec. nov.**.

Caerulea coelestis coelestis (Alpheraky, 1897) (figs. 18-20, 46: J-K)
Lycaena coeligena var.? *coelestis* Alpheraky, 1897: 113, unique ♂ (TL: Kham (Kang) - area between Kangding and Batang, nearer Kangding).
Lycaena coeli Oberthür, 1908: 311, pl. 5, figs. 1 for ♂, 2 for ♀ (TL: NW. Ta-Tsien-Lou); Hemming, 1931: 330, synonymy for *coelestis* Alph.
Maculinea coelestis: Hemming, 1931: 329, pl. 11, figs. 6-7 for valva & aedoeagus taken from PT.
Iolana (an error in editing, should be *Maculinea*) *coelestis coelestis*: Hemming, 1931: 330, records from "Moenia" (now Jiulong), "Frontiere orientale de Thibet", "Moupin" (now Baoxing), "Ta-pin-tze" (now Heqing, N. Yunnan- this record should belong to *dubernardi* Hemming).
Glaucopsyche (*Caerulea*) *coelestis*: Forster, 1938: 108. (Subgenus *Caerulea* raised to full genus by Eliot, 1973).
Caerulea coeligena coelestis: Bridges, 1988: II. 18.
Caerulea coelestis: d'Abrera, 1993: 482, 483, figs. for both sexes from Ta Tsien Lu.
Material. **Sichuan**: 2 ♂♂ (CHH), Ganzi Tibetan Autonomous Prefecture, Jiulong County, 2600 m, 25-26.IV.2014, H. Huang leg.. All dissected.
Remarks. Hemming (1931) stated that the unique HT of *C. coelestis* (Alph.) was taken in "the neighbourhood, and presumably to the west of Batang by Kachkarow, the assistant of G.N. Potanine". However, according to Alpheraky (1897), Potanine left Tatsienlu to Batang on 2-14 May 1893 and returned to Tatsienlu on 10-24 June and the HT was collected on 20 May. Thus, the HT is more likely to be collected from the route between Tatsienlu and Batang and much nearer Tatsienlu than Batang.

Caerulea coelestis dubernardi (Hemming, 1931) (figs. 21-25, 35-39, 47: G-I)
Maculinea coelestis dubernardi Hemming, 1931: 330 (TL: Tsekou).
Caerulea coeligena dubernardi: Bridges, 1988: II. 18.
Material. **Yunnan**: 8 ♂♂, 7 ♀♀ (CHH), Lijiang, Yulongxueshan, 2800m, 13.-14.V.2014, H. Huang leg.; 6 ♂♂, 4 ♀♀(CHH), Diqing Prefecture, Zhongdian, Tuguancun, 2500 m, 15.V.2014, 20.IV.-3.VI.2015, H. Huang leg.; 2 ♀♀ (CHH), Diqing, Zhongdian, Baishuitai, 2400 m, 23.-24.VI.2004, H. Huang leg.; 1 ♀ (CHH), Diqing, Zhongdian, Hutiaoxia, 1800 m, 21.IV.2005, H. Huang leg.; 4 ♂♂, 3 ♀♀ (CHH), Diqing, Weixi, 2900 m, 19.V.2014 & 29.IV.2015, H. Huang leg.; 1 ♂ (CHH), Chuxiong, Dayao, Santai, 2500 m, 18.IV.2015, H. Huang leg.. 7 ♂♂ dissected.
Remarks. Hemming (1931) described this subspecies on 4 ♂♂, 3 ♀♀ from Tsekou, a very limited material, thus some of his diagnostic characters for distinguishing this subspecies may not work, such as the more purplish ground color on the upper side which is chiefly caused by the worn condition of the specimens. This subspecies can be distinguished from the nominotypical subspecies by the following combination of characters: 1) size frequently much smaller [but still the specimens as large as in ssp. *coelestis* (Alpheraky) can be found)]; 2) underside ground color in both sexes darker; 3) both wings upper side of ♀ with much less blue scaling.

Caerulea coelestis chengmaica Murayama, 1993 **stat. nov.** (fig. 10)
Caerulea coeligena chengmaica Murayama, 1993: 34, fig. 1 for ♂ and ♀ (TL: Chengmai, Fang, N. Thailand).
Material. None.
Remarks. This taxon is considered herein as a subspecies of *C. coelestis* (Alph.) instead of *C. coeligena* (Obth.) by the very broad dark marginal band on forewing upper side of ♀, and by its range which is widely isolated from *C. coeligena* (Obth.) by the populations of *C. coelestis* (Alph.). It differs from all other subspecies by having a larger black apical patch on forewing upper side of ♂ and a less black-dusted blue ground color on forewing upper side of ♀.

Caerulea coelestis sora Sugiyama, 1999 (figs. 1-2, 5-7, 26-28, 40, 44, 46: D-F)
Caerulea coelestis sora Sugiyama, 1999: (TL: Qujing, NE Yunnan).
Material. **Yunnan**: 1 ♂ (CHH), Qujing, 1.V. 1993, X.-S. Mo leg... **Guizhou**: 9 ♂♂, 7 ♀♀ (CCF, CHH), Weining, Caohai, 2400 m, 10.V.2016 & 1.-2.V.2017, F. Cao leg.. 4 ♂♂ dissected.

Remarks. This subspecies is only slightly different from ssp. *dubernardi* (Hemming) by having a wider black marginal band and a larger black apical patch on forewing upper side of ♂.

Caerulea guizhouensis **spec. nov.** (figs. 3-4, 8-9, 29-31, 41, 43, 46: A-C)
HT ♂ (Figs. 31, 45-A; Length of forewing 21.7 mm): CHINA, **Guizhou**: Weining County, Caohai, Xinhe, 2300 m, 23.-24.VI.2017, F. Cao leg., deposited in BSNU. Dissected.
PTs: **Guizhou**: 4 ♂♂ (CCF, CHH), same data as HT; 4 ♂♂, 3 ♀♀ (CCF, CHH), Weining, Caohai, Dashancun, 2260 m, 19., 27.-28. VI.2017, F. Cao leg.; 3 ♂♂, 2 ♀♀ (CCF), Weining, Caohai, Dashancun, 20.VI.2018, F. Cao leg.. 3 PTs dissected.
Etymology. This new species is named after the Guizhou Province where the type series came from.
Diagnosis. This new species can be distinguished from *C. coeligena* (Obth.) and *C. coelestis* (Alph.) by the following combination of characters:
♂:
1) Both wings upper side ground color deep blue, not so silvery and pale as in *C. coeligena* (Obth.).
♀:
2) Both wings upper side ground color dark blue and black dusted, not so clean as in *C. coeligena* (Obth.).
Both sexes:
3) Both wing underside ground color much darker than in *C. coeligena* (Oberthür).
4) Discal spots on both wings underside markedly nearer wing-base than in both *C. coeligena* (Obth.) and *C. coelestis* (Alph.).
5) Both wings underside with submarginal area less marked by pale and dark markings than in both *C. coeligena* (Obth.) and *C. coelestis* (Alph.).
♂ genitalia:
6) Aedoeagus thicker than in *C. coeligena* (Obth.) just before the distal end of dorsal wall.
7) Valva (not counting apical process) less rectangular than in both *C. coeligena* (Obth.) and *C. coelestis* (Alph.), with inner margin incurved nearly in a right angle, not in an obtuse angle as in *C. coeligena* (Obth.) and *C. coelestis* (Alph.).
Discussion. This new species is sympatric with *C. coelestis* (Alph.). However, there is apparent ecological isolation between these two species: *C. coelestis* (Alph.) flies on wings chiefly in early May, with larva feeding on *Gentiana sutchuenensis* Franchet, whilst the new species flies in mid and late June, with larva feeding on *Gentiana praticola* Franchet. Besides the morphological differences in adults as stated above, the ovum of the new species has the micropyle markedly smaller and most of the pits on the surface slightly larger than in *C. coelestis* (Alph.).
Host plant. *Gentiana praticola* Franchet in nature.
Bionomics. Univoltine. Adults emerged by mid June in nature. Eggs were present by the end of June, laid singly on petal or calyx of the host plant.

Acknowledgments: Mr. Hai-Feng Cao identified the host plants. Mr. Wen-Hao Sun and Mr. Ren-Bin Zhu helped in communicating with Mr. Hai-Feng Cao. Mr. Mao Ye helped to collect the specimen of *Caerulea coeligena pratti* (Hemming) from Hubei.

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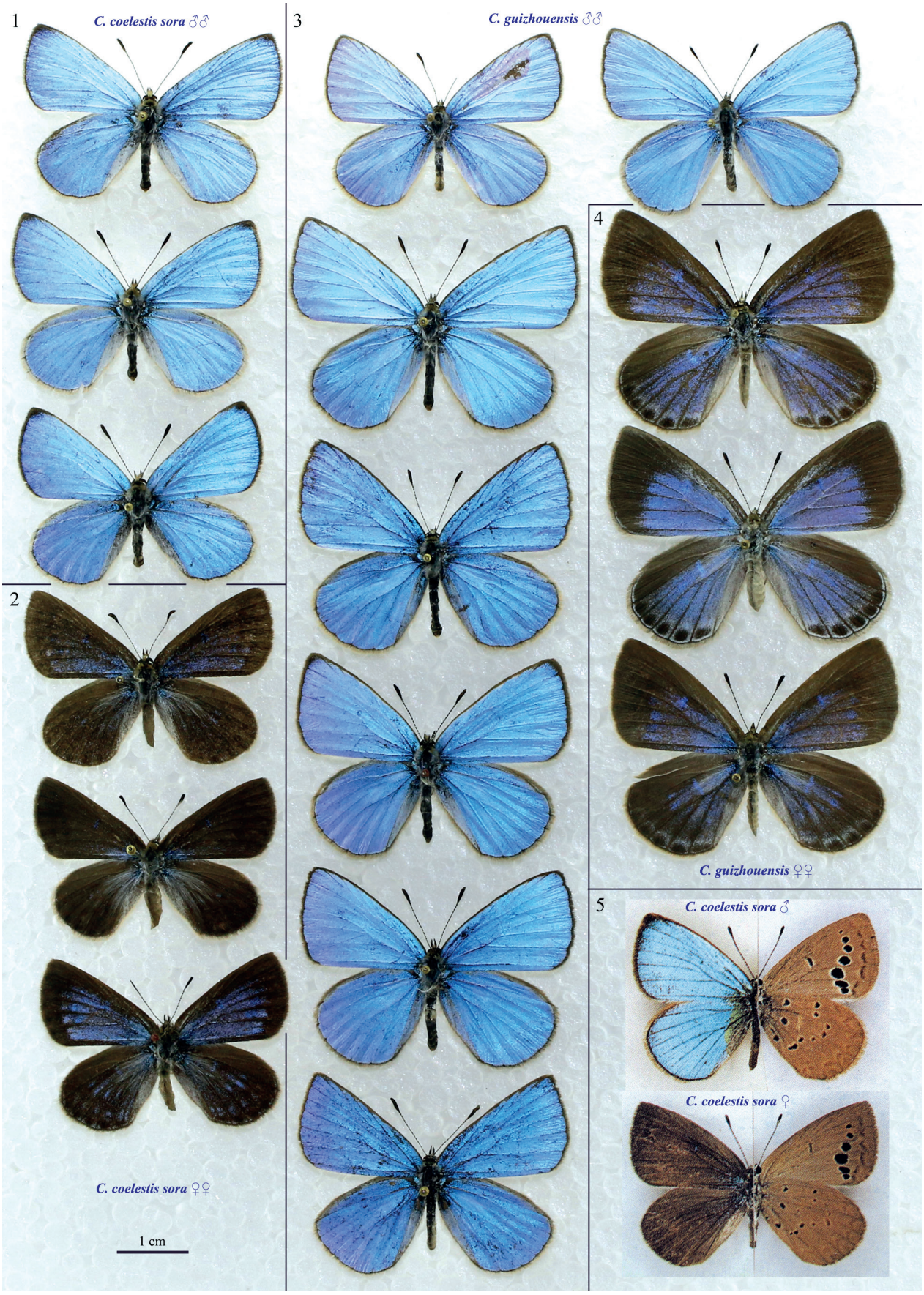
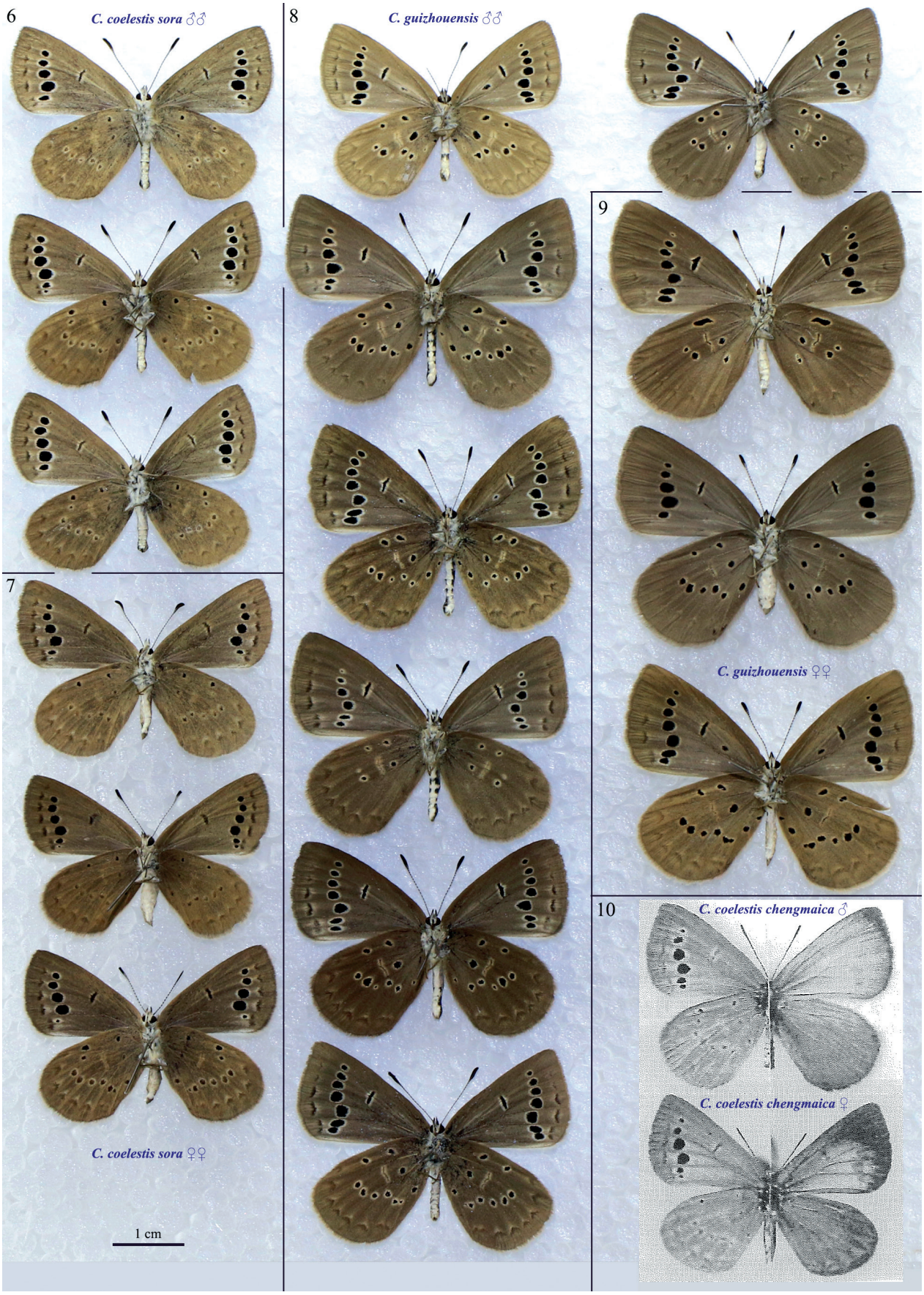
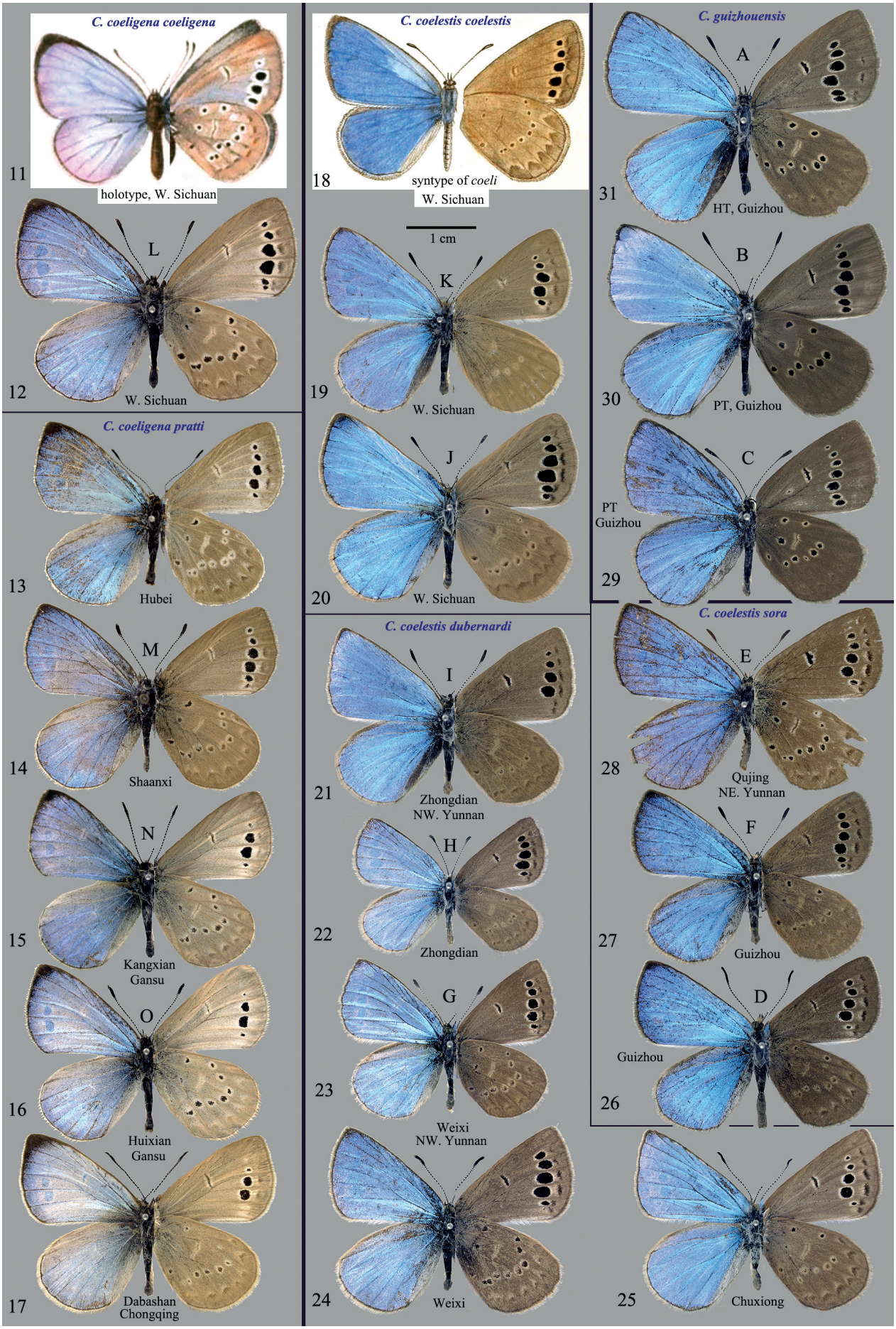


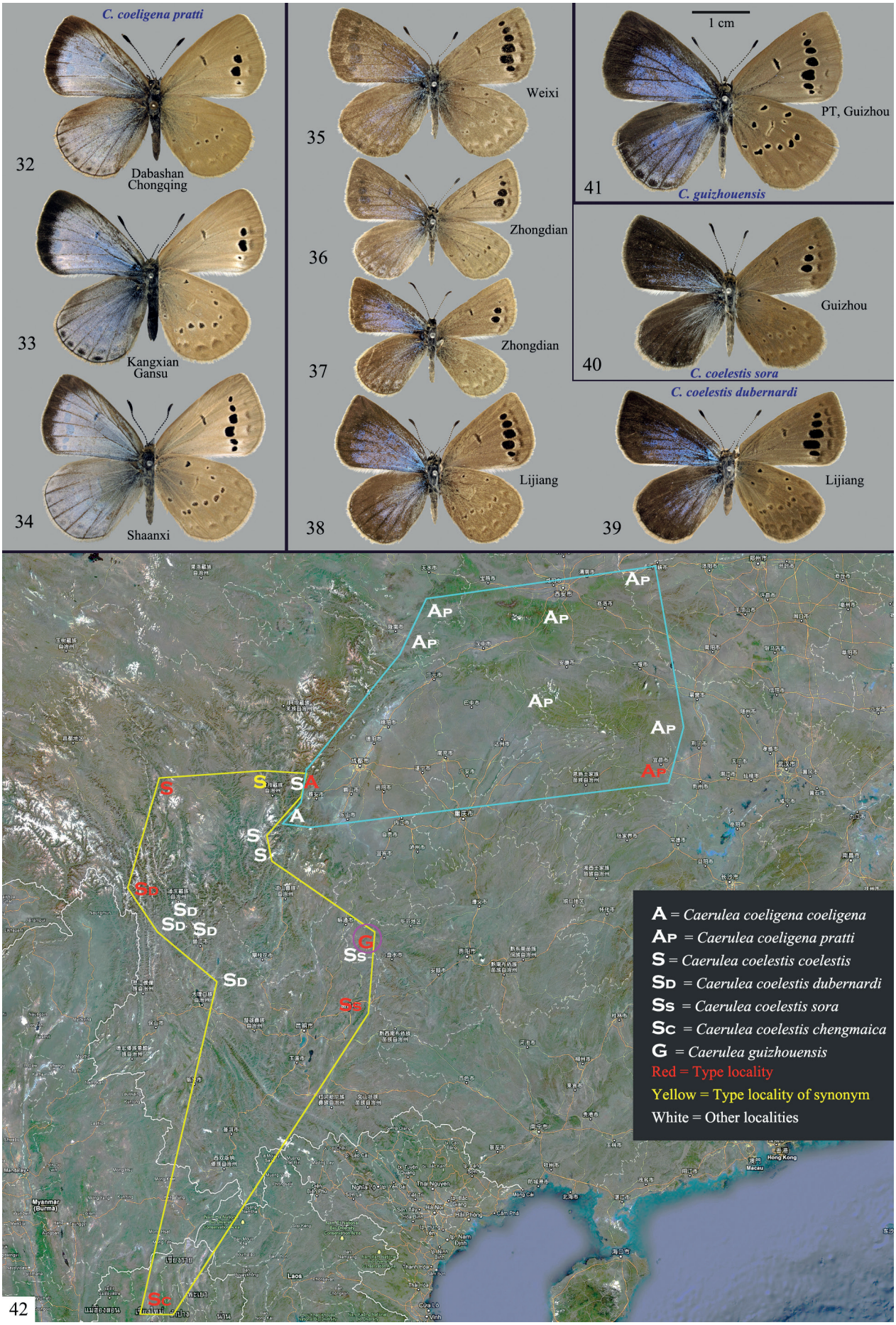
Figs. 1-5: Habitus of *Caerulea* taxa. (1-2) *C. coelestis sora* Sugiyama, 1999 (Weining, Guizhou, 2400 m, 1.-2. V. 2017), upper side; (1) ♂; (2) ♀; (3-4) *C.* ***guizhouensis*** **spec. nov.** (Weining, Guizhou, 2260 m, 19.-20. VI. 2017 & 2018), upper side; (3) ♂; (4) ♀; (5) *C. coelestis sora* Sugiyama, 1999, HT ♂ and PT ♀, after Sugiyama (1999) (left half- upper side, right half- underside).



Figs. 6-10: Habitus of *Caerulea* taxa. (6-7) *C. coelestis sora* Sugiyama, 1999 (Weining, Guizhou, 2400 m, 1.-2.V.2017), underside; (6) ♂; (7) ♀; (8-9) *C. **guizhouensis*** **spec. nov.** (Weining, Guizhou, 2260 m, 19.-20.VI.2017-2018), underside; (8) ♂; (9) ♀; (10) *C. coelestis chengmaica* Murayama, 1993, HT ♂ and PT ♀, after Murayama (1993) (right half- upper side, left half- underside).



Figs. 11-31: Habitus of *Caerulea* taxa ♂♂. (11-12) *C. coeligena coeligena* (Oberthür, 1876); (11) HT (after Oberthür, 1876); (12) Yingjing, Sichuan; (13-17) *C. coeligena pratti* (Hemming, 1931); (13) Xiangyang; (14) Ningshaan; (15) Kangxian; (16) Huixian; (17) Dabashan; (18-20) *C. coelestis coelestis* (Alpheraky, 1897); (18) syntype of *coeli* Oberthür (after Oberthür, 1908); (19-20) Jiulong; (21-25) *C. coelestis dubernardi* (Hemming, 1931); (21-22): Tuguancun; (23-24) Yulongxueshan; (25) Dayao; (26-28) *C. coelestis sora* Sugiyama, 1999; (26-27) Weining; (28) Qujing; (29-31) *C. **guizhouensis*** **spec. nov.**; (29-30) PTs; (31) HT.



Figs. 32-41: Habitus of *Caerulea* taxa ♀♀. (32-34) *C. coeligena pratti* (Hemming, 1931); (35-39) *C. coelestis dubernardi* (Hemming, 1931); (40) *C. coelestis sora* Sugiyama, 1999; (41) *C.* ***guizhouensis*** **spec. nov.**. (Left half- upper side, right-half- underside).
Fig. 42: Distribution of *Caerulea* taxa.

Biotope of *C. guizhouensis* (Caohai, Weining, 2260m)

Biotope of *C. coelestis sora* (Mazha, Weining)

Biotope of *C. coelestis sora* (Caohai, Weining, 2450m)

Living female of *C. guizhouensis*

Ovum of *C. coelestis sora* on petal of host plant

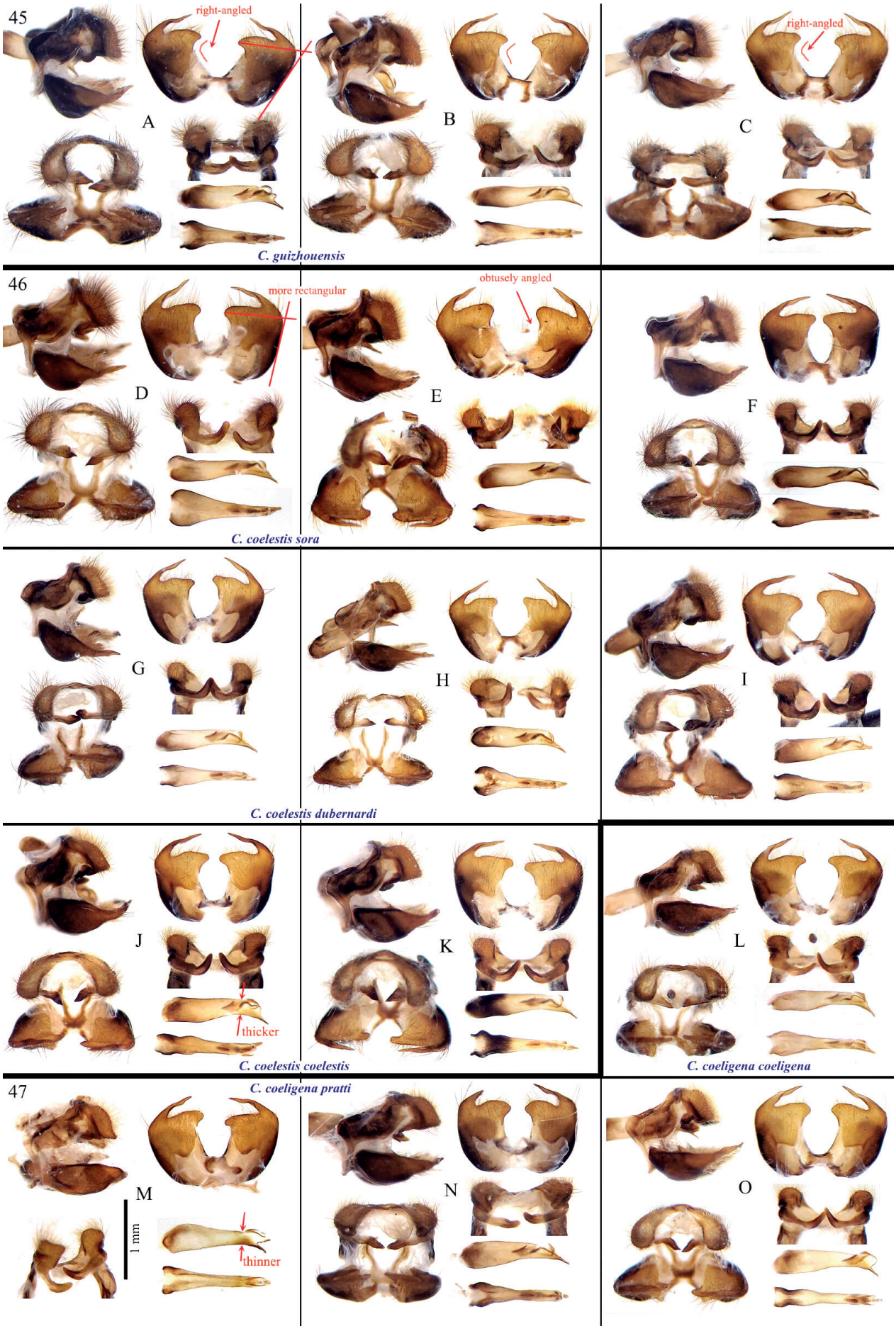
Living female of *C. coelestis sora* on host plant

Host plant of *C. guizhouensis* (*Gentiana praticola*)

Ovum of *C. guizhouensis* on calyx of host plant

Host plant of *C. coelestis sora* (*Gentiana sutchuenensis*)

Figs. 43-44: Field observations. (43) *C.* ***guizhouensis*** **spec. nov.**; (44) *C. coelestis sora* SUGIYAMA, 1999.



Figs. 45-47: ♂ genitalia consisting of whole genitalia in lateral view (left top), of genitalia in posterior view (left bottom), of valvae in dorsal view (right top), of scaphium in ventral view (right center), and of aedoeagus in lateral and dorsal views (right bottom). (45) *C.* ***guizhouensis*** **spec. nov.**; (46) *C. coelestis* (Alpheraky, 1897); (47) *C. coeligena* (Oberthür, 1876). Specimens alphabetically labeled as in Figs. 11-31.

Supplements and amendments to the Chinese butterflies recently described or discussed

(Lepidoptera: Nymphalidae & Lycaenidae)

by

Hao Huang

received 23.I.2019

Abstract: *Aulocera jingxiaomeiae* Huang & Wang, 2017 was rediscovered from NW. Yunnan and W. Guizhou, with ♀♀ reported for the first time. ♂ syntypes of *A. loha japroa* Tytler, 1939 and *A. padma thawgawa* Tytler, 1939 are illustrated for the first time. A new synonym is recognized: *A. padma thawgawa* Tytler, 1939 **syn. nov.** (= *A. padma verres* Fruhstorfer, 1911). Some of Huang's (2017) treatment on the *Eugrumia* taxa are corrected: the specimens from Honglashan, SE Tibet actually belong to *E. koenigi* (Goltz, 1939), due to an overlooked lectotype designation made by Goltz (1940). The true taxonomic position of *E. discalis* (South, 1913) is still uncertain, probably independent or conspecific with *E. koenigi* (Goltz), requiring a further research on ♂ genitalia. A further new species of *Eugrumia* from Jiangda, NE. Tibet is described: *E. xuejila* **spec. nov.**. A further ♂ of the very rare *Sinthusa confusa* Evans, 1925 is reported from Tengchong, W. Yunnan, with habitus and ♂ genitalia illustrated. The type locality of *Pieris stoetzneri* (Draeseke, 1924) is clarified and the following taxonomic changes are given: *Synchloe nigricans* Talbot, 1932 **syn. nov.** (= *Synchloë stötzneri* Draeseke, 1924), *Pieris shangrilla koidesia* Tadokoro, Wang & Bozano, 2013 **syn. nov.** (= *Synchloë stötzneri* Draeseke, 1924), *Pieris stoetzneri shangrilla* Tadokoro, Shinkawa & Wang **stat. nov.** (= *Pieris shangrilla* Tadokoro, Shinkawa & Wang, 2013).

Introduction: After publishing the papers on *Eugrumia, Aulocera* and *Sinthusa* (Huang, 2017; Huang & Wang, 2017; Huang & Zhu, 2018), the author had the opportunity to examine more materials on these taxa. So that some supplements and amendments are presented in this paper. In addition, *Pieris stoetzneri* (Draeseke, 1924) was discussed repeatedly by some authors during the last years, but there was still a mistake in referring to the original description, thus a brief discussion is made herein.

Abbrevitions:

BMNH:	Natural History Museum, London.
BSNU:	Biological laboratory of Shanghai Normal University, Shanghai, P.R. China.
CHH:	Collection of Hao Huang, Qingdao, China.
CCF:	Collection of Feng Cao, Hunan, China.
HT:	Holotype.
LT:	Lectotype.
PT:	Paratype.
TL:	Type locality.

Nymphalidae

Aulocera jingxiaomeiae Huang & Wang, 2017 (figs. 1-6, 11-16)

Remarks. 1 ♂, 3 ♀♀ of this species were collected by the author from Lijiang and Zhongdian in August 2018. This species (figs. 5-6) was observed flying with *A. loha chinensis* Sakai, Aoki & Yamaguchi, 2001 (figs. 7-8) at the slopes of a hill near Zhongdian. The ♀ does not differ much from the ♂, being usually a little larger in size with broader wings and blunter apex of forewing, sometimes with a little broader discal band on forewing.

In addition, Mr. F. Cao collected this species from a locality of Caohai, Weining, W. Guizhou in large number. *A. loha chinensis* Sakai, Aoki & Yamaguchi (figs. 9-10; CCF) was observed flying together with this species (figs. 1-2, 11-16; CCF) in a much smaller number. These two sympatric species are easily distinguishable from each other, with no intermediate form found.

Aulocera loha japroa Tytler, 1939 (fig. 17)

Remarks. The photos of a ♂ syntype kept in BMNH are published herein (fig. 17). This syntype matches with the original description by Tytler (1939). It looks like the ♂ of *A. loha chinensis* Sakai, Aoki & Yamaguchi very much, but differs from the latter in having hindwing discal band not entering space 1b. It became clear that all the populations from China including those from Dulong valley and Nujiang valley belong to *A. loha chinensis* Sakai, Aoki & Yamaguchi. On the other hand, *Aulocera loha japroa* Tytler is probably restricted to Indian areas.

Aulocera padma verres Fruhstorfer, 1911 (figs. 18-19)

Aulocera padma verres Fruhstorfer, in Seitz, 1911: 309, from "West China"; Gross, 1958: 282, neotype designation, pl. 5, fig. 2 for ♂ neotype (TL: Tsekou, NW. Yunnan); Sakai, Aoki & Yamaguchi, 2001: 40, figs. 22-23, ♂ from Paomashan, Kanding; Huang & Wang 2017: 212, fig. 4 from Weixi, 216, fig. 21 (neotype reproduced from Gross, 1958).

Aulocera padma thawgawa Tytler, 1939: 247, 3 ♂♂, 1 ♀ (TL: Hthawgaw, N.-E. Burma). **syn. nov.**

Remarks. The photos of a ♂ syntype of *Aulocera padma thawgawa* Tytler kept in BMNH are published herein (fig. 18). This syntype matches with the original description (Tytler, 1939). It can not be distinguished from the ♂ of *Aulocera padma verres* Fruhst. from NW. Yunnan (fig. 19). It is possible that Tytler (1939) when describing his *thawgawa* Tytler as new, overlooked the publication of *verres* Fruhst.

Eugrumia koenigi (Goltz, 1938)

Erebia discalis South, 1913: 351, partium on ♂ from Kiala (now Honglashan).

Erebia koenigi Goltz, 1938: 46 (TL: Atuntse, now Deqin).

Paralasa batanga: d'Abrera, 1990 (nec Goltz, 1939): 190, fig. for ♂ syntype (actually a mislabeled syntype of *Erebia koenigi* Goltz).
Eugrumia koenigi: Della Bruna et al., 2000 b: 297; Della Bruna et al., 2002: 34, figs. for syntypes from Atuntse.
Eugrumia discalis: Huang, 2017: 205, figs. for specimens (Honglashan) and ♂ genitalia.
Eugrumia discalis batanga: Huang, 2017: 206, fig. 11 for ♂ syntype (actually a mislabeled syntype of *Erebia koenigi* Goltz).
Distribution: NW. Yunnan (Deqin area), SE Tibet (Honglashan).

Eugrumia discalis (South, 1913)
Erebia discalis South, 1913: 351, partim on ♀ from Rong se la, east of Batang; Goltz, 1940: 117, LT designation, ♀ from Rong se la (TL) as LT.
Paralasa batanga Goltz, 1939: 37 (TL: Batang); Goltz, 1940: 117, synonymy for *Erebia discalis* South.
Eugrumia discalis: Della Bruna et al., 2000b: 297.
Eugrumia discalis batanga: Huang, 2017: 205, partium on checklist only.
Distribution: W. Sichuan (Batang area).
Remarks. Goltz's (1940) LT designation, fully introduced by Della Bruna et al. (2000 a, 2002), was entirely overlooked by the author. And again, d'Abrera's (1990) illustration of a mislabeled syntype of *Erebia koenigi* Goltz was published by the author (Huang, 2017) as syntype of *Paralasa batanga* Goltz.
However, *Eugrumia discalis* (South) is a local species restricted to Batang area. It differs from *E. dabrerai* Huang, 2017 from Qinghai and Gansu by having a larger size and a less extensive reddish discal patch, not entering space 1b on forewing upper side. *E. discalis* (South) is probably separable from all other taxa in specific level or is conspecific with *E. koenigi* (Goltz), as a ♂ of the latter (Huang, 2017: 206, fig. 4) is transitional to the former in the small subapical ocellus on forewing upper side. So far, *E. discalis* (South) is the only species with ♂ genitalia not examined yet.
The biodiversity of *Eugrumia* Della Bruna et al., 2000 seems to be far richer than we can even imagine. And a further new species is described from a NE Tibetan area near Qamdo as follows.

Eugrumia xuejila **spec. nov.** (figs. 20-21)
HT ♂ (fig. 20): China, Xizang Tibetan Autonomous Region, Qamdo Prefecture, Jiangda County, Xuejila Pass, 4246 m, 13. VI. 2017, H. Huang leg., deposited in BSNU.
PT: 1 ♀ (fig. 21; CHH), same data as HT.
Etymology. This name, refers to the name of the TL, Xuejila Pass.

Diagnosis. This new species is similar to *Eugrumia koenigi* (Goltz) in external features, but is closer to *E. bozanoi* (Della Bruna et al., 2000) than to all others in ♂ genitalia and distribution. It can be distinguished from all the known species, except the sympatric *E. herse* (Grum-Grshimailo, 1891), by the following combination of characters.
1) Size larger than in *E. dabrerai* Huang, but smaller than in *E. bozanoi* (Della Bruna et al.).
2) Forewing upper side with discal patch entering a little into space 1b as in *E. bozanoi* (Della Bruna et al.), different from that of other species [occupying full width of space 1b in *E. dabrerai* Huang, not entering space 1b in both *E. koenigi* (Goltz) and *E. discalis* (South)].
3) Forewing upper side with the pale discal patch more or less reddish, not so bright yellow as in *E. bozanoi* (Della Bruna et al.).
4) Subapical ocellus on forewing upper side markedly larger than in both *E. discalis* (South) and *E. dabrerai* Huang.
5) Irregular patches of pale and dark scales on hindwing underside like in *E. dabrerai* Huang, but much larger and coarser than in the remaining species.
♂ genitalia [unknown for *E. discalis* (South)]:
6) Tegumen in lateral view abruptly descending before uncus.
7) Upper margin of uncus in lateral view strongly upturned.
8) Uncus like in *E. dabrerai* Huang, markedly shorter than in *E. koenigi* (Goltz) and *E. bozanoi* (Della Bruna et al.).
9) Socius like in *E. bozanoi* (Della Bruna et al.), more broadly protruded than in *E. koenigi* (Goltz) and *E. dabrerai* Huang.
10) Juxta like in *E. koenigi* (Goltz), with base wider than in *E. bozanoi* (Della Bruna et al.) at posterior view, entirely different from that of *E. dabrerai* Huang.
11) Valva shorter and more upturned at apex than in all other species, with apical extension markedly shorter than in *E. koenigi* (Goltz) and more coarsely serrate than in *E. dabrerai* Huang, and with more teeth at inner apex than in *E. bozanoi* (Della Bruna et al.).
12) Aedoeagus with subzonal sheath thicker than in all other species.

Remarks. Although the ♂ genitalia of *E. discalis* (South) remain unknown, the new species can be easily distinguished from *E. discalis* (South) by the much larger subapical ocellus on forewing upper side. There seems to be intense parallel differentiation of species among the genus by geographical isolation. And the new species is distributed much nearer *E. bozanoi* (Della Bruna et al.) than all the remaining species. In external features, the new species is closer to *E. koenigi* (Goltz) than to all the others, but these two species are very different in ♂ genitalia. It is possible that each small area of the Tibetan plateau has its own species of *Eugrumia* Della Bruna et al.. And an undescribed species has been known from Yushu, Qinghai (K. Song, pers. com.).
The new species is sympatric with *E. herse* (Grum-Grshimailo) at Jiangda area.

Lycaenidae

Sinthusa confusa Evans, 1925 (figs. 26-27)
Remarks. This interesting species was recorded by Huang & Zhu (2018) from Tengchong, W. Yunnan and Chayu, SE. Tibet. At that moment the ♂ specimen from Tengchong was unavailable to them so that only ♀♀ were illustrated. Recently a ♂ was collected by Mr. H. Lu from Datang, Tengchong and was dissected by the author (figs. 26-27). The ♂ from Tengchong matches with the ♂ from SE. Tibet in most of the genital structures except the markedly broader lateral extensions of the conjoined basal part of valvae.

However, such difference seems to fall into the individual variations commonly found in other species of *Sinthusa* Moore, 1884. As for *S. chenzhibingi* Huang & Zhu, 2018, the ♂ of fig. 52 in Huang & Zhu (2018) has the lateral extensions of valvae much broader than in the ♂♂ of figs. 50-51. As for *S. zhejiangensis* Yoshino, 1995 the ♂ of fig. 55 in Huang & Zhu (2018) has the lateral extensions of valvae broader than in the ♂ of fig. 54.
In external features, the ♂ from Tengchong differs remarkably from that from SE. Tibet by having a smaller size, an additional black dusting in lower discal area of hindwing upper side, and the more interrupted discal markings on both wings underside. To give a convincing subspecific classification, the specimens from Nagaland, NE. India should be examined.

Pieridae

Pieris stoetzneri (Draeseke, 1924) (TL: Kangding, not Lou-tse-kiang)
Aporia davidis: Leech, 1894: pl. 36, fig. 1. for ♀ from Tatsienlu (actually holotype of *Synchloe nigricans* Talbot, 1932); Röber in Seitz, 1907: pl. 17-d for ♀ (reproduced from Leech, 1894).
Pieris davidis ab. *nigricans* Verity, 1905-1911: pl. 29, fig. 16 (reproduced from Leech, 1894). **Infrasubspecific**.
Synchloë stoetzneri Draeseke, 1924: 6; 8 ♂♂ (TL: Tat. = Tatsienlu); Watkins, 1927: 335, synonymy for *Pieris davidina* Oberthür, 1891 (incorrect synonymy).
Aporia davidis ab. *nigricans*: Bollow in Seitz, 1930: 94.
Synchloe nigricans Talbot, 1932 (nec Verity, 1907): 279, catalogue with references. **syn. nov.**
Pieris (*Synchloe*) *stoetzneri* (sic!): Bridges, 1988: II-86.
Pieris stoetzneri: Wu, 2010: 314; Sugiyama, 2015: 29, pl. 1, figs. 4 & 20.
Pieris shangrilla koidesia Tadokoro, Wang & Bozano, 2013: 87, figs. 1, 3-left, 5-left (TL: Tianquan); Tadokoro, 2017: 119, synonymy for *Synchloe nigricans* Talbot, 1932. **syn. nov.**

Pieris stoetzneri shangrilla Tadokoro, Shinkawa & Wang, 2013 (TL: Zhongdian) **stat. nov.**
Pieris davidis: Verity, 1905-1911: pl. 30, fig. 46 for ♂ from Lou-tse-kiang (Nujiang).
Pieris davidina: Watkins, 1927 (nec. Oberthür ,1891): 335, 5 ♂♂, 1 ♀ from Yungning and Kari, NW. Yunnan.
Sinopieris stoetzneri: Huang, 2003: 77, material from Nujiang area.
Pieris stoetzneri: Wu, 2010: 314, material from Yunnan; Sugiyama, 2015: 29, pl. 1, figs. 1-3 & 17-19.
Pieris shangrilla Tadokoro, Shinkawa & Wang, 2013: 3, fig. 1 for ♂ (TL: Zhongdian district); Tadokoro, 2017: 119, synonymy for *Synchloe stoetzneri* Draeseke, 1924.

Remarks. In a recent paper to deal with the synonyms of *Pieris stoetzneri* (Draeseke), Tadokoro (2017) wrongly regarded Lou-tse-kiang (Nujiang, NW. Yunnan) as the TL of *Pieris stoetzneri* (Draeseke). In an earlier paper, Tadokoro, Shinkawa & Wang (2013:7, fig. 13) published the photos of a ♂ of *Aporia martineti* (Oberthür, 1884) from Sunpanting kept in "Senckenberg Naturhistorische Sammlungen, Dresden" as "Type specimen of *stoetzneri* Draeseke, 1924". However, Draeseke (1924) described two taxa using the species group name "*stoetzneri*": one as *Aporia martineti stötzneri* Draeseke on a single ♂ from "Sump." (= Sumpanting, now Songpan) on page 3, another as *Synchloë stoetzneri* Draeseke on 8 ♂♂ from Tat. (Tatsienlu) on page 6. Draeseke (1924) obviously knew about the differences between *Aporia* and his *Synchloe*, as he placed all the species, later included by Huang (1995, 1998, 2003) into *Sinopieris* (currently treated as a synonym of *Pieris*: Wu, 2010; Tadokoro & Wang, 2014), into *Synchloe* and in the same paragraph. Draeseke's (1924) description is clear and he finally stated: "Verity replicates this species in his plate 30, fig. 46 as *davidis*"; that does not mean that Verity's specimen represents the type specimen. It is obvious that the type specimen of *stoetzneri* Draeseke, illustrated by Tadokoro et al. (2013:7, fig. 13), belongs to *Aporia martineti stoetzneri* Draeseke which is later treated as an aberration of *Aporia martineti* (Oberthür) (Bollow, in Seitz 1930; Della Bruna, Gallo & Sbordoni, 2004, 2013). Watkins (1927) was the first who knew correctly about the relationships of these taxa in old publications, he made only one mistake on *Pieris davidina* Oberthür, 1891 which was proved to be a synonym of *Pieris venata* Leech by Tadokoro, Shinkawa & Wang (2013). Huang (2003) followed Draeseke (1924) and Watkins (1927) on this matter but he doubted Watkins' (1927) opinion to treat *Synchloe stoetzneri* Draeseke as synonym of *Pieris davidina* Oberthür.
This species was recently discussed also by Sugiyama (2015), and a further subspecies, *soedai* Sakai, 2015 was described from the NE. Tibetan area between Jomda and Dege.

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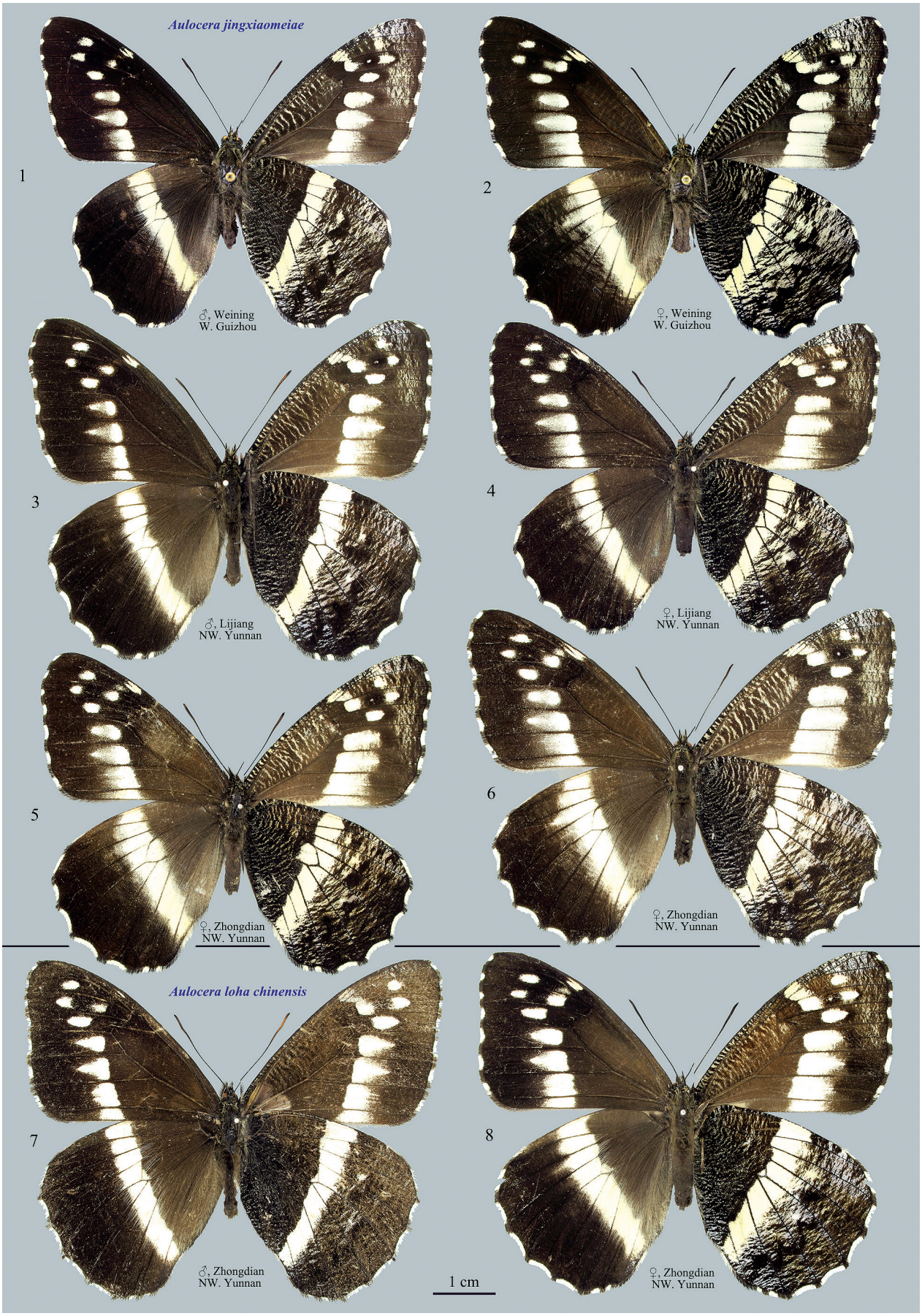
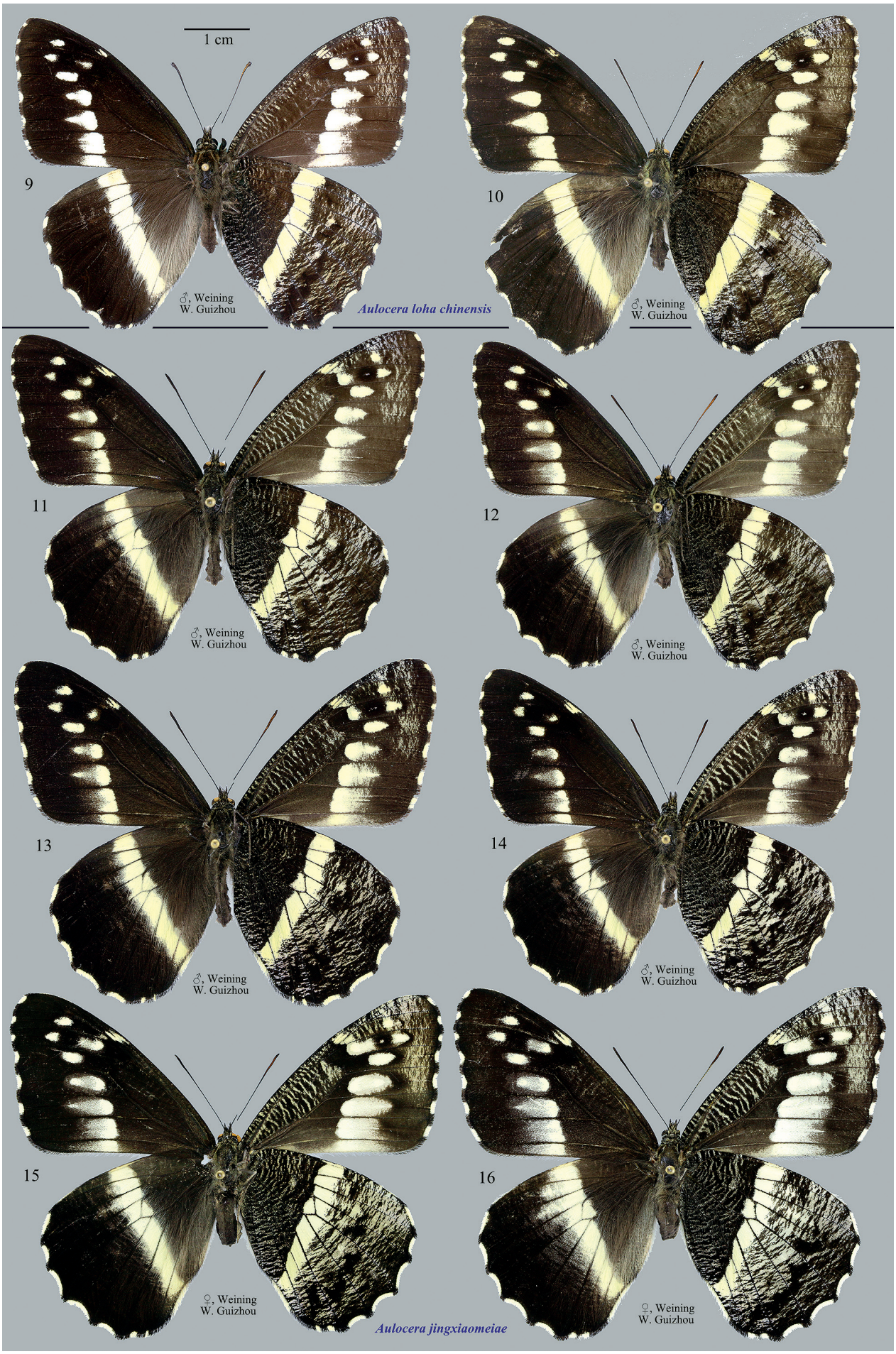
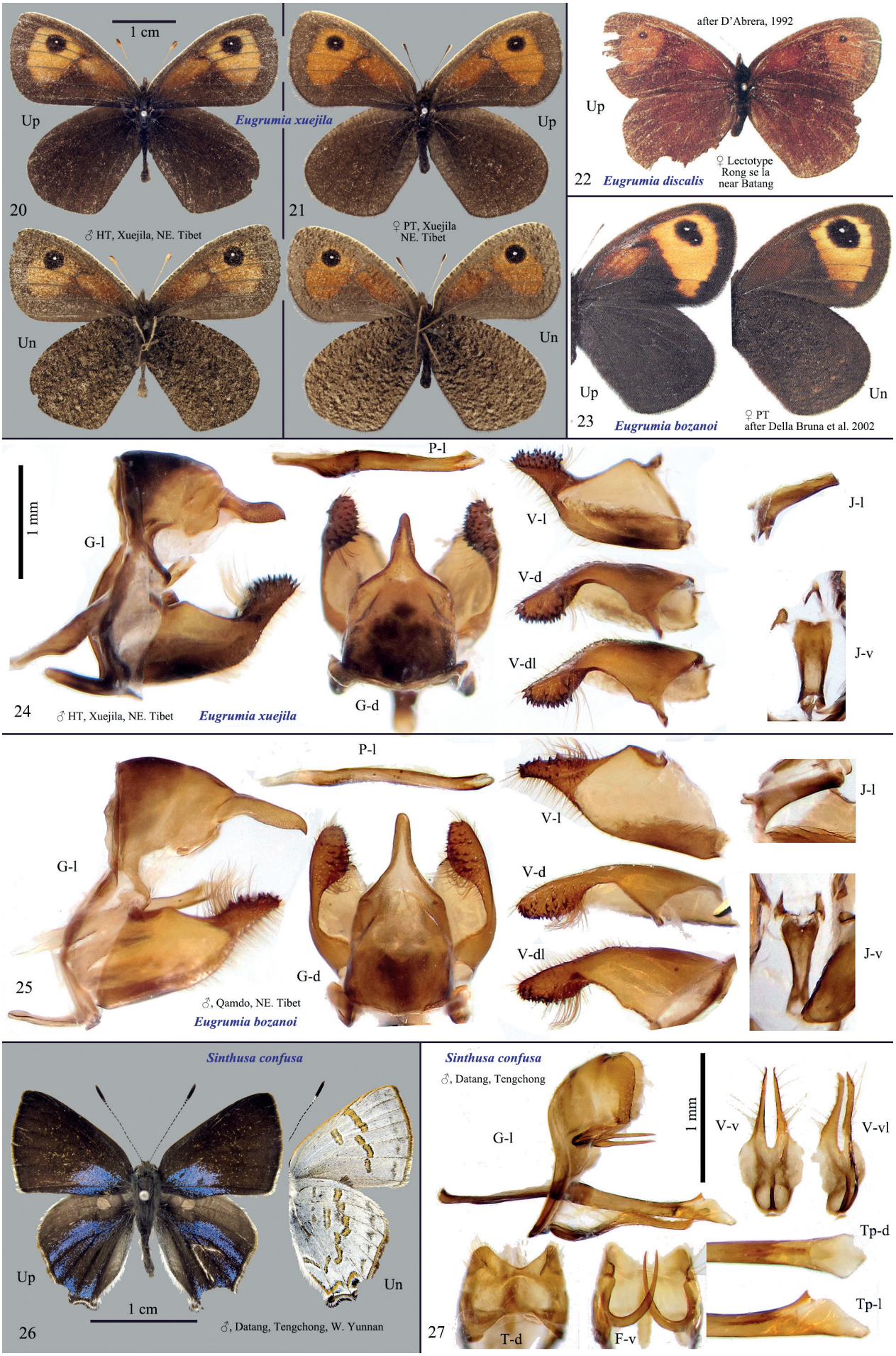


Figs. 1-8: Habitus of *Aulocera* species at same scale. (1-6) *A. jingxiaomeiae* Huang & Wang, 2017; (7-8) *A. loha chinensis* Sakai, Aoki & Yamaguchi, 2001. (left half- upper side, right half- underside)



Figs. 9-16: Habitus of *Aulocera* species at same scale. (9-10) *A. loha chinensis* Sakai, Aoki & Yamaguchi, 2001; (11-16) *A. jingxiaomeiae* Huang & Wang, 2017. (left half- upper side, right half- underside).

Figs. 17-19: Habitus of *Aulocera* species at same scale. (17) *A. loha japroa* TYTLER, 1939, syntype, © NHM; (18) *A. padma thawgawa* Tytler, syntype, © NHM; (19) *A. padma verres* FRUHSTORFER, 1911. (Up- upper side, Un- underside).



Figs. 20-23: Habitus of *Eugrumia* taxa. (20-21) *E. xuejila* **spec. nov.**; (20) HT ♂; (21) ♀ PT; (22) *E. discalis* (South, 1913), ♀ LT; (23) *E. bozanoi* (Della Bruna et al., 2000), ♀ PT.
Figs. 24-25: ♂ genitalia of *Eugrumia* taxa. (24) *E. xuejila* **spec. nov.**; (25) *E. bozanoi* (Della Bruna et al., 2000). (G-l: genitalia in lateral view; P-l: aedoeagus in lateral view; G-d: genitalia in dorsal view; V-l: left valva in inner lateral view; V-d: left valva in dorsal view; V-dl: left valva in dorsolateral view; J-l: juxta in lateral view; J-v: juxta in ventral view).
Figs. 26-27: *Sinthusa confusa* Evans,1925. (26) Habitus; (27) ♂ genitalia (V-v: valvae in ventral view; V-vl: valvae in ventrolateral view; T-d: tegumen in dorsal view; F-v: falces in ventral view; Tp-d: tip of aedoeagus in dorsal view, enlarged; Tp-l: tip of aedoeagus in lateral view, enlarged).

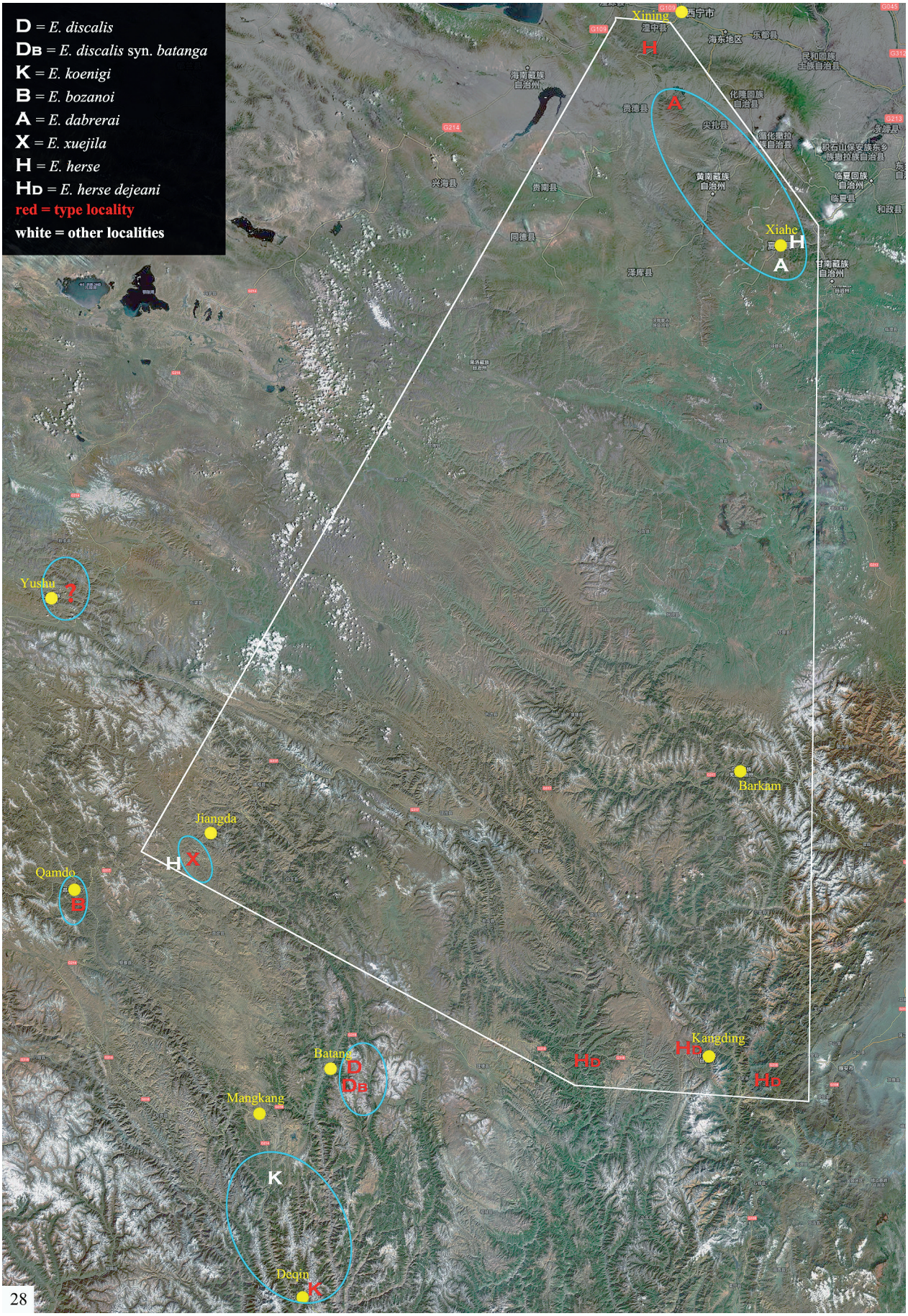


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Fig. 28: Distribution of *Eugrumia* species.