



Taxonomic notes on Chinese Lamiini (Coleoptera: Cerambycidae: Lamiinae)

MEI-YING LIN¹ & STEVEN W. LINGAFELTER²

¹Key Laboratory of Zoological Systematics and Evolution, Institute of Zoology, Chinese Academy of Sciences, 1-5 Beichen West Road, Chaoyang Dist., Beijing, 100101, China

²University of Arizona, Department of Entomology Insect Collection, 1140 E. South Campus Dr., University of Arizona, Tucson, Arizona 85721, U.S.A.

¹Corresponding authors. E-mail: Meiyang Lin (linmeiyang@ioz.ac.cn) & Steven W. Lingafelter (elaphidion@gmail.com)

Abstract

Paragniopsis ochraceomaculata Breuning, 1965 and *Paragniopsis* Breuning, 1965 are confirmed to be junior synonyms of *Agnioides striatopunctatus* Breuning, 1956 and *Agnioides* Breuning, 1956 respectively after comparison of types; *Monochamus fruhstorferi* Breuning, 1964 is a new junior synonym of *Annamanum lunulatum* (Pic, 1934). *Paranamera ankangensis* Chiang, 1981 and *Mimonemophas multimaculatus* Xie & Wang, 2015 are transferred to the genus *Anoplophora* Hope, and the former is newly recorded from Hunan Province.

Key words: Lamiini, new synonym, new combination, China, Vietnam, Laos, India

Introduction

While working on the Cerambycidae fauna of the Qinling Mts. of Shaanxi Province, China, the first author discovered that the species of *Paranamera ankangensis* Chiang, 1981 looked very much like a member of the genus *Anoplophora*. She visited NWFU to examine the types and discussed the issue with the second author who revised the genus *Anoplophora* (Lingafelter & Hoebeke, 2002). Based on further museum work, including examination of specimens of the genus *Paranamera* by the first author, we resolve additional systematic issues and present our conclusions on new taxonomic decisions, justifications, and synonymies below.

Materials

Types and other material studied are deposited in the following institutions:

BPBM	Bernice Pauahi Bishop Museum, Honolulu, Hawaii USA
CBWX	Collection of Wen-Xuan Bi, Shanghai, China
DJHC	Collection of Daniel J. Heffern, Houston, Texas, USA
IRSNB	Institut royal des Sciences naturelles de Belgique, Brussels, Belgium
IZAS	Institute of Zoology, Chinese Academy of Sciences, Beijing, China
NWAFU	Northwest A&F (Agriculture and Forestry) University, Yangling, Shaanxi, China
MHNL	Muséum d'Histoire Naturelle, Lyon, France = CCEC: Musée des Confluences, Lyon, France
MNHN	Muséum national d'Histoire naturelle, Paris, France
NMNH	National Museum of Natural History (Smithsonian Institution), Washington, District of Columbia, USA
SWU	Collection of Insects, Southwest University, Chongqing (ex South-west Agricultural University), Chongqing, China
YU	Yangtze University (Hubei Agricultural College), Jingzhou, Hubei, China

Other acronyms used in this work:

TD: Type depository

TL: Type locality

Results

genus *Agnioides* Breuning, 1956

Agnioides Breuning, 1956: 671. Type species: *Agnioides striatopunctatus* Breuning, 1956, by original designation.

Paragniopsis Breuning, 1965: 59. Type species: *Paragniopsis ochraceomaculata* Breuning, 1965, by original designation.

Synonymized by Roguet, 2017: 104.

Paragniopsis: Rondon & Breuning, 1970: 445.

Agnioides: Löbl & Smetana, 2010: 276.

Distribution. China, Laos, India.

Remarks. The genus *Agnioides* Breuning, 1956 contains only one species which was described from a male specimen from India, while the genus *Paragniopsis* Breuning, 1965 contains a unique species which was described from a female specimen from Laos. After the comparison of the two holotypes and other specimens from China, we agree with Roguet (2017) that *Paragniopsis ochraceomaculata* Breuning, 1965 is a junior synonym of *Agnioides striatopunctatus* Breuning, 1956 and the genus *Paragniopsis* is a junior synonym of *Agnioides*.

Agnioides striatopunctatus Breuning, 1956

Agnioides striatopunctatus Breuning, 1956: 671, fig. 3. TL: India, West-Bengal (Darjeeling District) [British Bootang]. TD: MHNL.

Paragniopsis ochraceomaculata Breuning, 1965: 59, fig. page 59. TL: Laos, Phou Khao Khoay. TD: BPBM. Synonymized by Roguet, 2017: 104.

Agnioides striatopunctatus: Pu, 1991: 250; Löbl & Smetana, 2010: 276.

Paragniopsis ochraceomaculata: Rondon & Breuning, 1970: 445.

Distribution. China: Yunnan; Laos, India.

Type specimens examined. Holotype of *Agnioides striatopunctatus* Breuning, 1956, male (Figs 1a–c), British Bootang, Maria Basti (MHNL= CCEC, examined through images). Holotype of *Paragniopsis ochraceomaculata* Breuning, 1965, female, Laos, region de Vientiane, Phou Khao Khoay, 1963.VIII, leg. J. A. Rondon (BPBM 8628, ex Collection J. A. Rondon, examined through images).

Other specimens examined. China: 1 male 1 female, Yunnan, Xishuangbanna, Damenglong, 1958.IV.24 (IZAS).

Remarks. The type locality of *Agnioides striatopunctatus* Breuning, 1956, British Bootang was often misrepresented as Bhutan (Pu, 1991). However, British Bootang is in fact located in West-Bengal, India (Lin, 2012), while Maria Basti is now Kalimpang environs. This species has not been recorded from Bhutan. The holotype of *Paragniopsis ochraceomaculata* Breuning, 1965, was misidentified as a male (Breuning, 1965). However, it is a female, which can be identified based on the shorter antennae with the sixth antennomere not extending to the elytral apex, while in males the sixth antennomere distinctly extends beyond the elytral apex. These two holotypes represent a male and female of the same species and therefore the synonym is confirmed.

Annamanum lunulatum (Pic, 1934)

(Figs 3–4)

Urecha lunulata Pic, 1934: 34. TL: Vietnam, Tonkin. TD: MNHN.

Annamanum lunulatum: Breuning, 1944: 402.

Monochamus fruhstorferi Breuning, 1964: 2. TL: Vietnam, Tonkin. TD: IRSNB. **Syn. nov.**

Uraecha longzhouensis Wang & Chiang, 2000: 46, figs 1–4. TL: China, Guangxi. TD: SWU. Synonymized by Lin & Ge, 2017: 893, figs. 10–12.



FIGURES 1–2. *Agnioides striatopunctatus* Breuning, 1956. 1. Holotype of *Agnioides striatopunctatus* Breuning, 1956 (photographed by Harold Labrique), male, from India. a. Dorsal view, b. Lateral view, c. Labels. 2. Holotype of *Paragniopsis ochraceomaculata* Breuning, 1965 (photographed by Nobuo Ohbayashi), female, from Laos. Scale 4 mm. 1c. Not to scale.

Distribution: China: Guangxi, Yunnan; Vietnam.

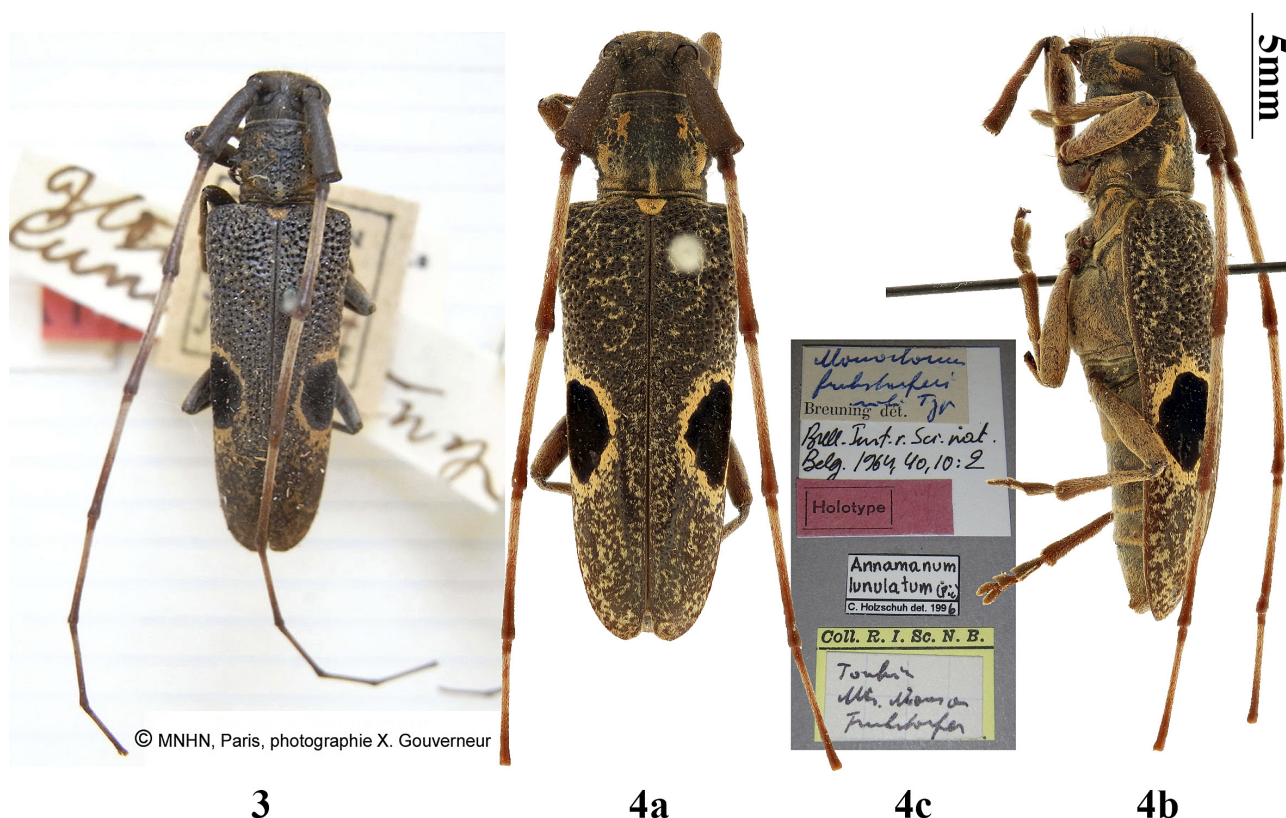
Type specimens examined. Holotype of *Urecha lunulata* Pic, 1934, female (Fig. 3), Vietnam, Tonkin, Chapa (MNHN, examined through images). Holotype of *Uraecha longzhouensis* Wang & Chiang, 2000, male, China, Guangxi (SWU, examined through images). Holotype of *Monochamus fruhstorferi* Breuning, 1964, female (Figs 4a–c, not male as reported in the original paper), Vietnam, Tonkin, Monts Mauson, leg. Hans Fruhstorfer (IRSNB, examined through images).

Other specimens examined. China: 1 male, Yunnan, Jinghong, Menghai county, Nabanhe Nature Reserve, Guomenshan, alt. 1114 m, 100.60610°E, 22.24644°N, 2009.V.26, leg. L.Z. Meng by Malaise trap (IZAS, IOZ(E)1858627).

Vietnam: 4 males 4 females, Vinh Phuc Prov., Tam Dao National Park, 965 m, 21°28.4'N, 105°38.8'E, Sante

Canopy Malaise Trap, 2011.VI.15–25, leg. Steven W. Lingafelter (NMNH); 2 females, Vinh Phuc Prov., Tam Dao National Park, 955 m, 21°28.408'N, 105°38.816'E, 2011.VI, leg. Long (NMNH); 1 male, Cao Bang Prov., Phja-Den environs, 948 m, 22°32.433'N, 105°52.012'E, Sante Canopy Malaise Trap, 2011.V.25–VI.5, leg. Steven W. Lingafelter (NMNH).

Remarks. The holotype of *Monochamus fruhstorferi* Breuning, 1964 was misidentified as a male (Breuning, 1964), but it is a female and it can be easily identified by the darker apices from antennomeres III to XI and the shape of ventrite V. It matches with the holotype female of *Urecha* (sic) *lunulata* Pic, 1934 very well and is herein synonymized, although it was identified as *Annamanum lunulatum* (Pic, 1934) by Carolus Holzschuh in 1996 (Fig. 4c). And the series of specimens collected from Vietnam confirmed that males of this species are identical to the holotype male of *Uraecha longzhouensis* Wang & Chiang, 2000 from Guangxi, China.



FIGURES 3–4. *Annamanum lunulatum* (Pic, 1934). 3. Holotype of *Urecha* (sic) *lunulata* Pic, 1934 (photographed by Xavier Gouverneur), female, from Vietnam, Tonkin, Chapa. 4. holotype of *Monochamus fruhstorferi* Breuning, 1964, female, from Vietnam, Tonkin, Mauson, photographed by Camille Locatelli. a. Dorsal view, b. Lateral view, c. Labels. 3 & 4c. Not to scale. 4a & 4b. Scale 5 mm.

***Anoplophora ankangensis* (Chiang, 1981) comb. nov.**

(Figs 5–9)

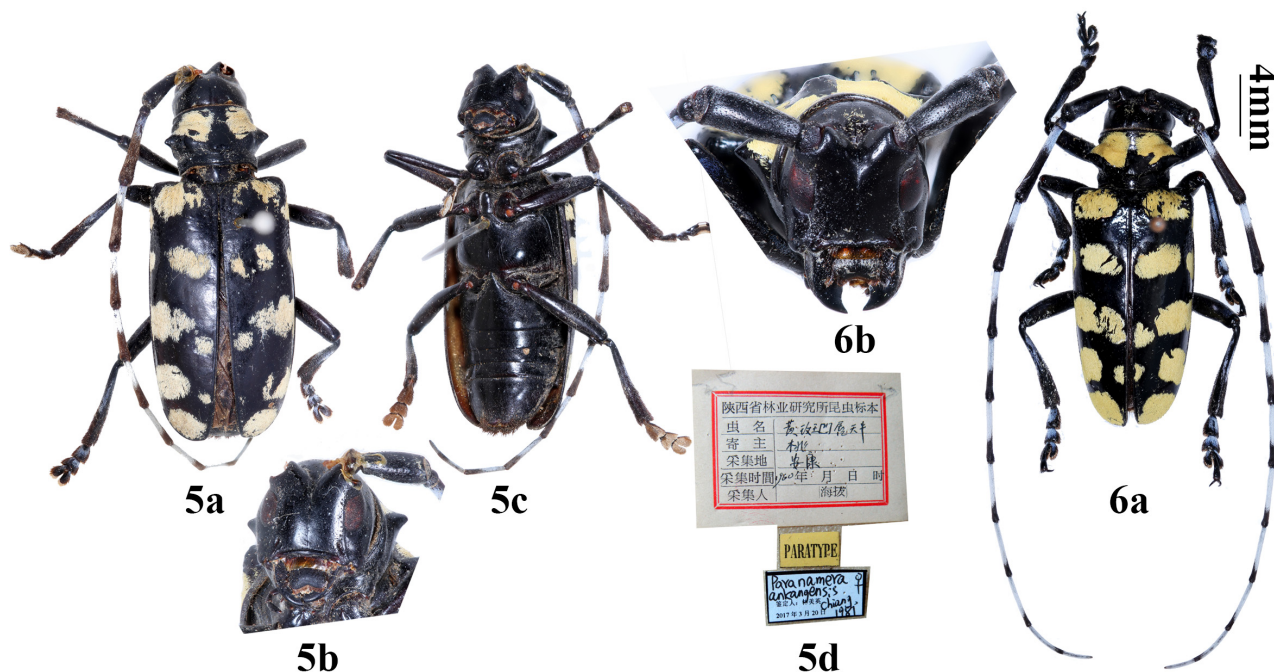
Paranamera ankangensis Chiang, 1981: 82, 84, pl. 1, fig. 10. TL: China, Shaanxi. TD: NWAUFU.

Paranamera ankangensis: Chiang *et al.*, 1985: 134, pl. IX, fig. 152; Löbl & Smetana, 2010: 284; Lin, 2017: 338, pl. 29, fig. 8.

Diagnosis (Lin, 2017). This species is similar to *Anoplophora elegans* (Gahan, 1888) (Lingafelter & Hoebeke, 2002: 77, pl. 8, fig. a) but without annular pubescence at the apex of each antennomere. It is similar to *A. stanleyana* Hope, 1839 (Lingafelter & Hoebeke, 2002: 217, pl. 31, figs. d, e, f) and *A. birmanica* Hüdepohl, 1990 (Lingafelter & Hoebeke, 2002: 80, pl. 10, fig. a), but the yellowish pubescent markings on the pronotum terminate near the middle prothoracic lateral tubercles and lack such yellow pubescence at the basal half. Compared with *A. horsfieldii* (Hope, 1842) (Lingafelter & Hoebeke, 2002: 86, pl. 13, figs. a, b), the pronotal yellow pubescent

markings are larger and only at the apical half, and the yellow elytral pubescent markings have five transverse lines instead of four.

Specimens examined. China: 1 female, paratype, Shaanxi, Ankang, host: *Prunus persica* (Linnaeus) Batsch, 1960 (NWAUFU, ex entomological collection of Shaanxi Forestial Research Institute); 1 male, Shaanxi, Xunyang, 1981.VIII.27, leg. Fangfang She, Congde Lu (NWAUFU, CO025460); 1 female, Shaanxi, Xunyang, 1981.VIII, leg. Congde Lu (NWAUFU, CO027073); 1 female, Hunan, Hupingshan, Xiangbizigou, 2005.VII.20, leg. Zhao & Li (CBWX).



FIGURES 5–6. *Anoplophora ankangensis* (Chiang, 1981) comb. nov. 5. Paratype of *Paranamera ankangensis* Chiang, 1981, female, from Shaanxi, Ankang. 6. Male, from Shaanxi, Xunyang. a. Dorsal view, b. head, frontal view, c. Ventral view, d. Labels. Scale 4 mm.

Distribution. China: Henan, Shaanxi, Hunan (new Province record).

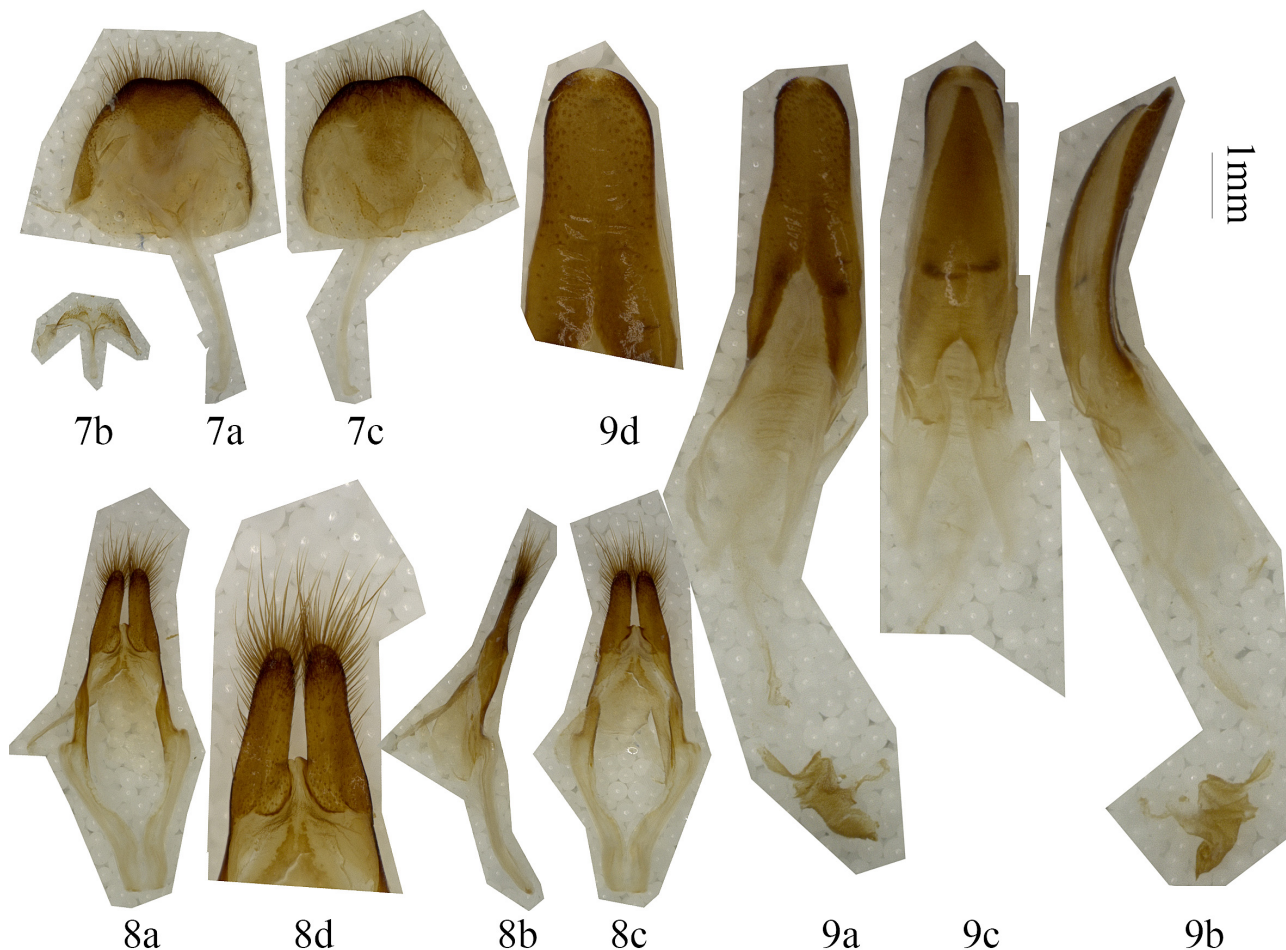
Host plants (Chiang, 1981; Tavakilian & Chevillotte, 2018). *Prunus persica* (Linnaeus) Batsch (Rosaceae).

Remarks. The holotype is a female from Shaanxi, Ankang, collected in 1960.VII and was deposited in Northwestern Agriculture college (Chiang, 1981). It should be deposited in NWAUFU, but the first author did not find the holotype in the main collection of NWAUFU during her visit in 2017. It could be in another collection hosted by the Agriculture College (personal communication with Lin Lü, 2017.III.30). Fortunately she found the paratype female, which is also from Shaanxi, Ankang (reported in the Chinese description but missing in the English summary by Chiang, 1981), which indicated that the entomological collection of Shaanxi Forestry Research Institute is deposited in NWAUFU.

Specimen of *Paranamera malaccensis* Breuning, 1935 examined. Malaysia: 1 male, Sabah, Crocker Range, vic. Trus Madi, 2000.III.18, leg. Local collector (DJHC). Our examination of the type species of *Paranamera* Breuning, 1935, *P. malaccensis* Breuning, 1935, shows that it lacks the common features present in *Anoplophora*. It lacks a posteromedial pronotal callus (present in most *Anoplophora* and *P. ankangensis* Chiang, 1981), it has narrow-based lateral pronotal tubercles that are elevated apically (broad-based lateral pronotal tubercles that are not or very weakly elevated apically are present in most *Anoplophora* species and *P. ankangensis*), the scape is cylindrical with a reduced cicatrix and as long as the third antennomere (the scape is enlarged apically with a pronounced cicatrix and distinctly shorter than the third antennomere in *Anoplophora* and *P. ankangensis*), the sutural elytral apex is sub-spiniform or acute (rounded apically in *Anoplophora* and *P. ankangensis*), and the body is nearly uniformly covered in pubescence (distinct glabrous regions are present in *Anoplophora* species and *P. ankangensis*). One additional feature, a strongly emarginate labrum that is present in species of *Paranamera* (and mentioned in the original description of the genus by Breuning (1935), was the basis for placing *P. ankangensis* in

that genus by Chiang (1981). In most *Anoplophora* the labrum is shallowly emarginate medially. However, this character is variable among and within species (Lingafelter & Hoebeke, 2002) and should not be used as a basis to exclude *P. ankangensis* from *Anoplophora*. Therefore, based on these features, *Paranamera ankangensis* Chiang, 1981 is transferred to *Anoplophora* as a new combination.

The genus *Paranamera* Breuning, 1935 now includes three species: *P. malaccensis* Breuning, 1935 (Malaysia, Malacca, Penang), *P. excisa* Breuning, 1942 (Indonesia, West Sumatra) and *P. oculata* Hüdelpohl, 1994 (Myanmar, Tenasserim; Thailand, Pak, Chong). We consider that the species *P. oculata* Hüdelpohl, 1994 may need to be transferred from this genus due to its different pronotum and elytral apices, however, we reserve that decision for future study.



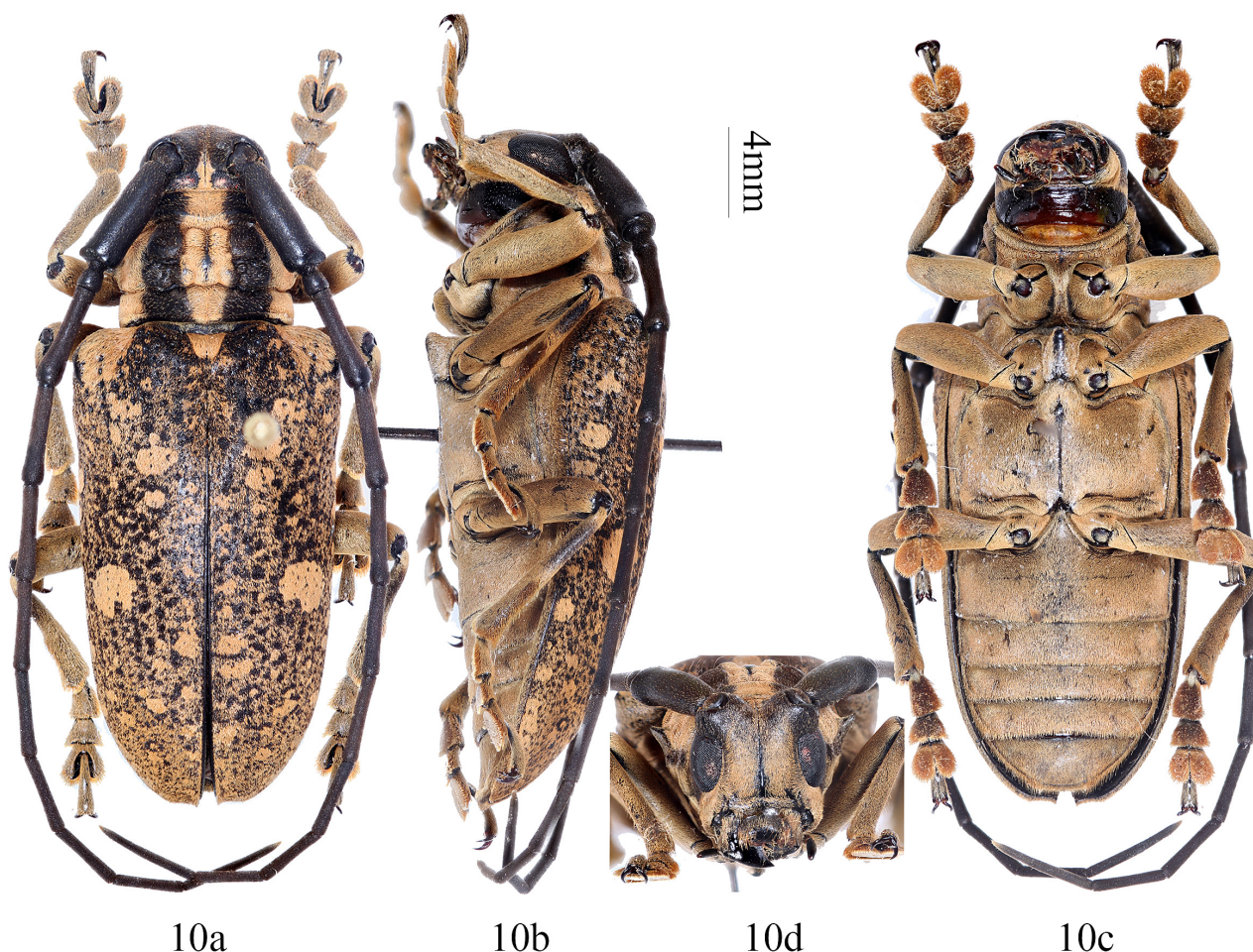
FIGURES 7–9. *Anoplophora ankangensis* (Chiang, 1981) comb. nov., male genitalia. 7. Tergite VIII and sternites VIII & IX. a. Ventral view, b. sternite VIII, c. Dorsal view. 8. Tegmen. 9. Median lobe with median struts, internal sac (partly broken and lost). a. Ventral view, b. Lateral view, c. Dorsal view, d. Ventral view and magnified. Scale 1 mm.

***Anoplophora multimaculata* (Xie & Wang, 2015) comb. nov.**

Mimonemophas multimaculatus Xie & Wang, 2015 In: Xie *et al.*, 2015: 599, figs. 5–6, 10–14. TL: China, Hubei. TD: YU.

Distribution. China: Hubei.

Remarks. *Mimonemophas multimaculatus* Xie & Wang is transferred to *Anoplophora* (new combination) since *Mimonemophas* was synonymized with *Anoplophora* by Bi & N. Ohbayashi (2015). The presence of dense bristle-like setae on the non-pubescent area of elytra in *Mimonemophas* is not a generic feature that distinguishes it from *Anoplophora* sensu Lingafelter & Hoebeke (2002) (Bi & N. Ohbayashi, 2015). The ending of the specific epithet should be “a” instead of “us” in the genus *Anoplophora*, because it is feminine in gender.



FIGURES 10. *Paranamera malaccensis* Breuning, 1935, male, from Malaysia, Sabah. a. Dorsal view, b. Lateral view, c. Ventral view, d. Head, frontal view. Scale 4 mm.

Acknowledgements

We are grateful to Xavier Gouverneur (Rennes, France), Gérard Tavakilian and Olivier Montreuil (MNHN) for providing access to the collection and the allowing us to use the image of *Annamanum lunulatum* (Pic, 1934); to Harold Labrique in charge of the zoological collections in Musée des Confluences – Lyon (MHNL) for providing type images of *Agnioides striatopunctatus* Breuning, 1956; to Shepherd Myers (BPBM), Nobuo Ohbayashi (Miura City, Japan), Junsuke Yamasako (Institute for Agro-Environmental Sciences, Ibaraki, Japan) for providing an image of the type of *Paragniopsis ochraceomaculata* Breuning, 1965; and to Camille Locatelli and Alain Drumont (IRSNB) for providing images of the type of *Monochamus fruhstorferi* Breuning, 1964. We wish to express our sincere thanks to Carolus Holzschuh (Villach, Austria) for sharing information of *Monochamus fruhstorferi* Breuning, 1964 and encouraging us to officially publish the synonymy situation; to Daniel Heffern (Texas, USA) for providing specimens of the genus *Paranamera* Breuning, 1935 for this study and to Oliver Keller (University of Florida, USA) for translating the original description of the genus *Paranamera* Breuning, 1935 from German to English. The first author thanks Lin Lü, Na Qiao and Yalin Zhang (NWAUFU) for providing access to the collection and assistance during the visit and thank Wen-Xuan Bi (CBWX) for sharing the distribution information of *Anoplophora ankangensis* (Chiang, 1981). We thank Gérard Tavakilian (IRD, MNHN) and the Zootaxa Cerambycidae co-editor (Eugenio Nearn) for critical comments. This research was supported by NSFC programs 31472029 and J1210002, the China Scholarship Council (CSC, File No. 201704910195), and partly by a grant (No. Y229YX5105) from the Key Laboratory of the Zoological Systematics and Evolution of the Chinese Academy of Sciences.

References

- Bi, W.-X. & Ohbayashi, N. (2015) A New Synonym of the Genus *Anoplophora* Hope, 1839, and Description of a New Species from Yunnan, China (Coleoptera: Cerambycidae: Lamiinae). *Japanese Journal of Systematic Entomology*, 21 (2), 291–296
- Breuning, S. (1935) Novae species Cerambycidae. III. *Folia Zoologica et Hydrobiologica*, 8, 51–71.
- Breuning, S. (1944) Études sur les lamiines: Douzième tribu: Agniini Thomson. *Novitates Entomologicae*, 3 (Supplement), 281–512. [note: Index, pp. 513–523 issued in 1945]
- Breuning, S. (1956) Lamiines nouveaux de la collection Lepesme (2e note). *Longicornia*, 3, 665–702.
- Breuning, S. (1964) Nouvelles formes de Lamiines. (Seizième partie). *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique, Bruxelles*, 40 (10), 1–8.
- Breuning, S. (1964) Contribution à la connaissance des Lamiens du Laos (Coll. Céramb.) (Onzième partie). *Bulletin de la Société Royale des Sciences Naturelles du Laos*, 12 (1964), 43–62.
- Chiang, S.-N. (1981) New longicorn beetles from China. *Acta Entomologica Sinica*, 24 (1), 78–84, 1 pl. [in Chinese with English summary]
- Chiang, S.-N., Pu, F.-J. & Hua, L.-Z. (1985) *Economic insect fauna of China. Vol. XXXV. Coleoptera: Cerambycidae (Third)*. Science Press, Beijing, 189 pp, 13 pls. [in Chinese]
- Hüdepohl, K.E. (1994) Über südostasiatische Cerambyciden XII (Coleoptera, Cerambycidae). *Entomofauna Zeitschrift für Entomologie, Ansfelden*, 15 (15), 185–195, 6 figs.
- Lin, M.-Y. (2012) *Glenea problematica* Lin & Yang 2009 is newly recorded from Myanmar (Coleoptera: Cerambycidae: Lamiinae: Saperdini). *Annales de la Société Entomologique de France, New Series*, 48 (1–2), 232–234, 10 figs.
- Lin, M.-Y. (2017) *Insect Fauna of the Qinling Mountains. Vol. VI. Coleoptera II. Cerambycid-beetles*. World publishing corporation, Xi'an, 510 pp., 37 pls. [in Chinese with English summary]
- Lin, M.-Y. & Ge, S.-Q. (2017) Notes on the genera *Annamanum* Pic and *Uraecha* Thomson (Coleoptera: Cerambycidae: Lamiinae: Lamiini). *Humanity space International almanac*, 6 (5), 889–915.
- Lingafelter, S.W. & Hoebeke, E.R. (2002) *Revision of Anoplophora (Coleoptera, Cerambycidae)*. Entomological Society of Washington, Washington, 236 pp., 46 pls.
- Löbl, I. & Smetana, A. (2010) *Catalogue of Palaearctic Coleoptera. Vol. 6. Chrysomeloidea*. Apollo books, Stenstrup, 924 pp.
- Pic, M. (1934) Nouveautés asiatiques. *Matériaux pour servir à l'étude des longicornes*, 11 (3), 33–40.
- Pu, F.J. (1991) New genus and species of Cerambycinae, with new records of longicorn beetles from China (Coleoptera: Cerambycidae). *Sinozoologia*, 8, 247–252. [in Chinese with English summary]
- Roguet, J.-P. (2017) Note synonymique concernant le genre *Agnioides* Breuning et son espèce-type (Coleoptera, Cerambycidae, Lamiinae). *Les Cahiers Magellanes, New Series*, 28, 104–105, 1 fig.
- Rondon, J.A. & Breuning, S. (1970) Lamiines du Laos. In: Gressitt, J.L., Rondon, J.A. & Breuning, S.V. (Eds.), *Cerambycid beetles of Laos (Longicornes du Laos)*. *Pacific Insects Monograph 24*. Bishop Museum, Hawaii, pp. 315–571.
- Tavakilian, G. (Author) & Chevillotte, H. (Software) (2018) Titan: base de données internationales sur les Cerambycidae ou Longicornes. Version 3.0. Available from: <http://titan.gbif.fr/> (accessed 23 November 2017)
- Xie, G.-L., Huang, J.-H., Wang, W.-K. & Xiang, L.-B. (2015) First record of the genus *Mimonophas* Breuning (Coleoptera: Cerambycidae: Lamiinae: Monochamini) from China with description of a new species. *Zootaxa*, 4057 (4), 595–600. <https://doi.org/10.11646/zootaxa.4057.4.11>
- Wang, W.-K. & Chiang, S.-N. (2000) Taxonomic study on the Chinese *Uraecha* (Coleoptera: Cerambycidae: Lamiinae). *Entomotaxonomia*, 22, 45–47. [in Chinese with English summary]