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Distributions patterns of Cixiidae (Hemiptera, Fulgoroidea) in China highlight their high endemic diversity

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Abstract

Background

Does the distribution of the Hemiptera planthoppers Cixiidae, follow the patterns of biogeographical distribution already well established for their host plants or other taxa because they are all obligatory phytophagous taxa? Are their realms and boundaries recognized? What are their zoogeographical regions and usual connections? To investigate these issues, we provide here a referenced and comprehensive checklist of the 253 cixiid species currently reported from China, with their precise distribution at the regional level. Seventy seven of these species are new records for China. In the 8 Chinese main zoogeographical regions usually recognized and 2 adjacent areas, we analyzed further their diversity at the tribal, generic and specific levels using a non-metric multidimensional scaling and an unweighted pairwise group analysis using an arithmetic mean cluster analyses. The observed distribution patterns have shown that an intercalary Sino-Japanese realm is present between the Palaearctic and Oriental realms. At the regional level, the South China region cluster is more closely with the Southwest, Central and North China regions. Taiwan is clearly separated from the South China region and mainland China, but is more closely related to the Qinghai-Tibet region and Indochina countries. The Central and South China regions are close to each other, but the Qinghai-Tibet region is singularly different.

New information

An updated checklist of the 253 Cixiidae species currently known to occur in China that composes 10% of the Chinese planthopper fauna, is presented, based on original literature, collections in institutions, and museum records. More than 400 records

distributed among the 28 provinces and regions in China are provided including 77 new records for China. More than 80% of the species (205 species, 81.03%) have been only reported from China, and most of them are Chinese endemic species, which reflects the great diversity of the Chinese regional and local biotypes and highlights the uniqueness of this fauna. These species are found in 8 zoogeographical regions in China: The Taiwan region is the most diversified with 161 species and the highest rate of endemic species (70.81%), followed by South China (76 species, 17.11%), Central China (62 species, 35.48%), Southwest China (42 species, 40.48%), North China (29 species, 34.48%), Qinghai-Tibet region (10 species, 20%), Northeast China (8 species, 12.5%), and 5 species found in the Inner Mongolia-Xinjiang region that are not endemic. Thirty eight main distribution patterns were identified, and 9 of them were bi-regionally and tri-regionally distributed. The South China-Taiwan pattern has the highest proportion of these major distribution patterns followed by the Central-South China-Taiwan pattern. Semonini and Pentrastirini tribes are widespread among the 8 Chinese zoological regions, representing, respectively, 20.55% and 17% of all species of Chinese cixiids. Cixiini are the most common species of planthopper composing of 45.85% of the total planthopper species found in China, and they occur in 7 Chinese regions but are absent from northeastern China. The next most common Tribes are: Andini with only 5.14% of these species distributed in the Sino-Japanese - Oriental Region; Eucarpini (6.32%) and Borysthenini (1.98%), which are mainly concentrated in the south of the Qingling Mountain-Huai River. The remaining four tribes, Bennini (0.40%), Bixini (0.79%), Oecleini (1.58%) and Stenophlepsini (0.04%) are relatively rare and restricted to Taiwan. A non-metric multidimensional scaling and an unweighted pairwise group method analysis using arithmetic mean clustering based on the Jaccard similarity coefficient matrix support a Palaearctic/Sino-Japanese boundary and a South China region closer to the Southwest, Central and North China regions. The Taiwan region appears clearly separated from the South China region and to mainland China, but more closely related to the Qinghai-Tibet region and Indochina countries. The Central and South China regions appear close to each other, but the Qinghai-Tibet region is singularly isolated.

Keywords

Checklist, zoogeography region, distribution, species richness, endemism, Cixiidae, China

Introduction

China covers an area of 9,634,057 km², which is quite similar to the entire area of Europe, and spans nearly 50 degrees of latitude from north to south, and more than 60 degrees of longitude from east to west in a world-renowned monsoon region (National Bureau of Statistics of the People's Republic of China, <http://data.stats.gov.cn>). Most regions have cold, dry winters and warm, rainy summers, but in combination with the varying topography and terrain conditions, the climate is actually very complex and locally diverse with a wide variety of temperature zones and precipitation gradients (Ren and Wen 2011). Most regions are located in the temperate zone (semi-tropical, warm, mid-range, and cold-

temperatures). A small portion of the country is in the tropics and plateau climate zone (the Qinghai-Tibet plateau temperate zone), and northern regions are close to the boreal zone. Annual precipitation decreases from the rain-forest of the southeast coast to the Gobi Desert in the northwestern interior. An arid humidity zone covers about 31% of the land area (mainly in northwest China). A semi-arid zone covers 22%, a semi-humid zone covers 15%, and the humid zone (32%) is located primarily in the southeast of China (Ge et al. 2013, Jiang 2017). The geological complexity of China is also significant, particularly with the uplift of the Qinhai-Tibet Plateau, which occurred in the middle of the Eocene era (45-38 Ma) (Zhou et al. 2018). When this complexity is combined with the monsoonal climate evolution, it has created strongly diversified biotopes, isolated by biogeographical barriers that manage dispersal pathways for species, providing new ecological niches, which has driven the recent evolution of plants and animal diversity (Favre et al. 2015, Liu et al. 2017).

From a biogeographical point of view, China is usually divided in two parts, the north is in the Palearctic realm and the south is in the Oriental realm (Sclater 1858, Wallace 1876, Morrone 2015, He et al. 2017). From a zoological perspective, Holt et al. (2013) recently recognized that the Sino-Japanese realm, ranging from west of Tibet to the east of the Japanese archipelago stands between these two other realms. Accordingly, three main biogeographical lines cross China (Fig.1): the Palaearctic/Sino-Japanese boundary at about 40–41N, the Palearctic/Oriental line that follows the Qingling Mountain-Huai River, around 32–34N, and the Sino-Japanese/Oriental boundary at 24–25N in Southeastern China.

The family Cixiidae Spinola, 1839 (Hemiptera Fulgoromorpha), is a numerous and diverse taxon with a world-wide distribution (Holzinger et al. 2002, Bourgoin 2021). It comprises 18.6% of the currently known planthopper species (Bourgoin 2021), and is the largest family of the group. Classical taxonomy has divided the Cixiidae into 3 subfamilies: Borytheninae Emeljanov, 1989, Bothriocerinae Muir, 1923 and Cixiinae Spinola, 1839 (Holzinger et al. 2002). However, recent phylogenetical analyses have shown that these divisions are very artificial and three main lineages should be recognized: an oecleinian lineage (including Bothriocerini), a cixiian lineage and a pentastirinian lineage (including Borythenini) (Luo et al. 2021). Therefore, without including the fossil taxa, Cixiidae are currently divided into 18 tribes, 250 genera, and 2600 species (Bourgoin 2021).

Cixiidae nymphs usually live underground and feed on plant rootlets, whereas the adults feed on the above ground phloem tissues of woody or herbaceous plants and ferns (Wilson 1994, Wheeler 2003), predominally on Asterales (9.2%), Rosales (7.8%) Fabiales (6.7%), Myrtales (6.5%) Lamiales (5.1%) and Ericales (5.1%) in Eudicots and on Poales (8.3%) in Monocots (Bourgoin 2021). Several Cixiidae species are considered to be important agricultural pests that damage important crop plants and are vectors of plant pathogen including viruses, phytoplasmas and other prokaryotic-like organisms (Wilson 2005).

Although the Cixiidae are one of the larger planthopper families, little is known about their ecology. In China, knowledge of this fauna is still very fragmented and an overall comprehensive study is lacking. In the past, only a few researchers from Europe or Japan

have studied this group, mostly incidentally during their scientific travels. The first significant contribution was by Melichar (1902), who described 2 genera with 5 species from western China. Matsumura (1914) published 'Die Cixiinen Japans', describing 14 genus and 30 species, mostly from Taiwan. Kato 1932 focused on Northeastern China taxa, and published one new species. The first checklist of Cixiidae from the China mainland was provided by Hu (1935), who listed 11 species in 5 genera, which was updated by Metcalf (1936) in his 'Catalogue of the Homoptera'. Since then, many new species have been added. Jacobi (1944) reported 5 new species from the Fujian province. Fennah (1956) added 6 genera and 17 species from South China. Hori (1982) described 3 new *Betacixius* species from Taiwan. Chou et al. (1985) described 7 species in 4 genera in his "Economic Insect Fauna of China (Fulgoromorpha)". Tsaor provided a series of important contributions to the fauna from Taiwan, describing 155 species in 20 genera (Tsaor 1990, Tsaor 1989, Tsaor and Lee 1987, Tsaor et al. 1988, Tsaor et al. 1991a, Tsaor et al. 1991b, Tsaor 1989, Tsaor 1990, Tsaor 2009, Tsaor and Hsu 2003). Since then, several papers describing new recent taxonomic discoveries have been published (Wang 1991, Wang 1992, Liang 2001, Liang 2005a, Liang 2005b, Huang 1995, Hua 2000, Guo and Feng 2010, Guo and Wang 2007, Guo et al. 2009, Song and Liang 2013, Zhang and Chen 2011, Zhang and Chen 2013a, Zhang and Chen 2013b, Zhang and Chen 2011a, Zhang and Chen 2011b, Ren et al. 2014, Xing and Chen 2014, Bai et al. 2015, Li et al. 2017, Luo et al. 2019a, Luo et al. 2019b, Zhi et al. 2019, Zhi et al. 2020b, Zhi et al. 2020a, Zhi et al. 2018b, Zhi et al. 2018a, Zhi et al. 2017, Zhi et al. 2021).

All of these studies primarily focused on taxonomical issues, with limited ecological and geographical analyses. However, Cixiidae are obligatory phytophagous taxa and therefore directly linked to the distribution of their host plants. Both are patterned by the historical biogeography of the areas where they are distributed. How Cixiidae do follow the patterns of biogeographical distribution (major biological realms, biogeographical regions) already well established in China? Which boundaries can be identified for Cixiidae and at which taxonomical levels? The aim of this paper is to identify these correlations and to investigate how these zoogeographical regions are connected in China.

This current paper provides an updated species list of Chinese Cixiidae, their distribution in the main Chinese zoogeographical regions, and, also, which zoogeographical patterns they are distributed in. It also briefly proposes that an obligatory phytophagous insect group like the Cixiidae can help elucidate zoogeographical boundaries between the Palaearctic, Sino-Japanese and Oriental realms. Accordingly, the objectives of this paper are: (1) to provide a comprehensive species list of the Cixiidae from China, and their precise distribution within provinces. Although 191 Chinese species of Cixiidae have been currently recorded in FLOW (Fulgoromorpha Lists on The Web, Bourgoin 2021), an exhaustive review of the literature allows us to include in this review 253 species; (2) to compare Cixiidae species richness at the level of the Chinese zoogeographical regions and to document their distribution patterns and their endemism in each region, both at the tribal and generic level; (3) to investigate what biogeographical patterns the Cixiidae reflect: are they recognized effectively in a particular Sino-Japanese realm or a simple area of transition between the Palaearctic and Oriental realms?

Materials and methods

Taxonomic classification in this publication follows the classical systematic classification based on Holzinger et al. (2002), Emeljanov (2002) and as synthesized in Bourgoin (2021) recently updated in Luo et al. (2021). Fossil species are indicated by the symbol (†).

Eight Chinese zoogeographic regions, based on geographic, climatic, and vegetation characteristics (Gao et al. 2017, He et al. 2017), were used for the bio-geographical analyses: Northeast China, North China, Nei Mongol-Xinjiang, Qinghai-Tibet, South China, Central China, Southwest China and the Taiwan region (Fig. 1). Two other regions were added for countries adjacent to China: 1) a south China 'VM region' including Vietnam, Laos, Thailand, Cambodia, Myanmar, Bhutan, Bangladesh, as well as a small portion of India, and 2) a north East China 'Far East region' including a portion of Russian. The map (Fig. 1) was created using the National Earth System Science Data Sharing Infrastructure (<http://www.geodata.cn>).

The distribution matrix includes 253 Chinese Cixiidae species. Among them, 3 species: *Cixius narke* Kramer, 1981, *Oliarus splendidula* Fieber, 1876, and *Tachycixius* (*Tachycixius*) *pilosus* (Olivier, 1791), were excluded from the analyses because we could not confirm their occurrence in China (no specimens observed during our survey) or because of uncertainties about where they were collected. Forty-eight additional Cixiidae species (Suppl. material 1) from adjacent areas based on literature and FLOW (Bourgoin 2021) were added for the cluster analysis. The species richness, distribution patterns and endemism, were calculated from our dataset and were used to generate a Venn diagram (Fig. 2) by TBtools Software (Chen et al. 2018).

The diversity of Cixiid species was analyzed in each of the 10 zoogeographical regions (Fig. 1) and data were assembled into $1^{\circ} \times 1^{\circ}$ grid-cells ($\sim 100 \text{ km} \times 100 \text{ km}$). Similarity between each pair of grid-cells was calculated using the Jaccard Coefficient of similarity (Jaccard 1901), not involving the use of correspondence analysis to transform the data (Smith and Bermingham 2005). Similarity of the genus and species levels were compared among the 10 zoogeographical regions using non-metric multidimensional scaling (NMDS) and an unweighted pairwise group method using arithmetic mean (UPGMA) clustering based on the Jaccard similarity coefficient matrix. The similarity coefficient matrix was imported into NTSYS Version 2.1 software (Rohlf 2000) for the cluster analysis.

Data resources

This checklist contains information updated up to April, 2021 compiled from scientific papers, book chapters, conference abstracts, theses, and the FLOW website (Bourgoin 2021). It also includes our own unpublished taxonomic data and original information from the following institutions: Shanghai Entomological Museum C.A.S (SEM), Museum of China Agricultural University (CAU), Entomological Museum of Northwest A&F University

(NWAUFU), Museum of Chinese Academy of Forestry (CAF) and Muséum National d'Histoire Naturelle (MNHN).

An annotated checklist of Cixiidae from China (Hemiptera, Fulgoroidea)

Andes formosanus (Matsumura, 1914)

Nomenclature:

Brixia formosanus Matsumura, 1914: 432.

Materials

- a. country: China; stateProvince: Fujian; locality: Wuyi Mountain, Huangkeng; eventDate: 08-05-08; sex: 3males, 5 females; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO221993
- b. country: China; stateProvince: Sichuan; locality: Emei Mountain; eventDate: 07-01-55; sex: 1 male; recordedBy: Keren Huang; occurrenceID: NWAUFU_HO221994

Distribution: China: Fujian, Sichuan, Taiwan (Tsaur et al. 1991b).

Notes: First record: China: Fujian (Wuyi Mountain).

Andes hemina Fennah, 1978

Nomenclature:

Andes hemina Fennah, 1978: 209.

Material

- a. country: China; stateProvince: Yunnan; county: Menglun; eventDate: 11-25-09; sex: 2 males, 1 female; recordedBy: Manqiang Wang; occurrenceID: NWAUFU_HO221995

Distribution: China: Yunnan; Malaysia: Kuala Lumpur, Kedah (Fennah 1978); Vietnam: Ninh Binh(Fennah 1978).

Notes: First record: China: Yunnan (Menglun).

Andes lachesis Fennah, 1956

Nomenclature:

Andes lachesis Fennah, 1956: 447.

Distribution: China: Zhejiang (Fennah 1956).

Andes luzonensis* Tsaour & Hsu, 1991*Nomenclature:**

Brixia ocellata Matsumura, 1914: 433.|*Andes luzonensis* (Matsumura), Tsaour & Hsu 1991b: 72.

Distribution: China: Zhejiang, Taiwan (Tsaour et al. 1991b).

Andes marmoratus* (Uhler, 1896)*Nomenclature:**

Metabrixia marmorata Uhler, 1896: 280.|*Brixia marmorata* (Uhler), Matsumura 1914: 431.|*Andes marmorata* (Uhler), Chou 1985: 24| Liang 2005a: 429| Zhang 2008: 30| Hayashi & Fujinuma 2016: 323.

Materials

- a. country: China; stateProvince: Jiangsu; county: Suzhou; eventDate: 06-01-57; sex: 20 males, 6 females; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_01
- b. country: China; stateProvince: Jiangsu; county: Suzhou; locality: Mudu; eventDate: 06-13-57; sex: 5 males, 2 females; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_02
- c. country: China; stateProvince: Zhejiang; county: Taishun; locality: Wuyan; verbatimElevation: 700 m; eventDate: 07-27-87; sex: 3 males; recordedBy: Gentao Jin & Zuyao Liu; occurrenceID: SEM_CAS_03

Distribution: China: Beijing (Liang 2005b), Henan, Jiangsu, Zhejiang, Guangxi, Guizhuo; Japan: Hokkaido, Honshu, Shikoku, Kyushu, Tsushima Island (Palearctic) (Hayashi and Fujinuma 2016); Russian: Far East.

Notes: First record: China: Jiangsu (Suzhou), Zhejiang (Taishun).

Andes noctua* Fennah, 1956*Nomenclature:**

Andes noctua Fennah, 1956: 446| Zhang 2008: 33.

Material

- a. country: China; stateProvince: Beijing; municipality: Mengtougou; locality: Yanchi, 109 Relax area; eventDate: 07-16-17; sex: 1 male; recordedBy: Siyu Gong; occurrenceID: CAU_01

Distribution: China: Beijing, Henan, Hubei (Fennah 1956), Guizhou.

Notes: First record: China: Beijing (Mengtougou), Henan (Huixian), Hubei (Lichuan).

Andes notatus* Tsauro & Hsu, 1991*Nomenclature:**

Andes notatus Tsauro & Hsu, 1991b: 70.

Materials

- a. country: China; stateProvince: Guangxi; municipality: Jinxiu; locality: Dayao Mountain; eventDate: 06-14-83; sex: 1 male, 2 females; recordedBy: Jikun Yang; occurrenceID: CAU_02
- b. country: China; stateProvince: Guangxi; municipality: Jinxiu; locality: Dayao Mountain; eventDate: 06-13-83; sex: 1 female; recordedBy: Fasheng Li; occurrenceID: CAF_01
- c. country: China; stateProvince: Guangxi; municipality: Longsheng; locality: Cuijiang; verbatimElevation: 800 m; eventDate: 06-24-82; sex: 3 males, 2 females; recordedBy: Jikun Yang; occurrenceID: CAU_03
- d. country: China; stateProvince: Tibet; municipality: Motuo; verbatimElevation: 1050m; eventDate: 05-09-80; sex: 1 female; recordedBy: Gentao Jin & Jianyi Wu; occurrenceID: SEM_CAS_04

Distribution: China: Guangxi, Tibet, Taiwan (Tsauro et al. 1991b).

Notes: First record: China: Guangxi (Jinxiu, Longsheng), Tibet (Motuo).

Andes othrepte* Fennah, 1956*Nomenclature:**

Andes othrepte Fennah, 1956: 445.

Distribution: China: Hong Kong (Fennah 1956).

Andes truncatus* Fennah, 1978*Nomenclature:**

Andes truncatus Fennah, 1978: 208.

Materials

- a. country: China; stateProvince: Zhejiang; locality: Fengyang Mountain, Datianping; eventDate: 07-27-07; sex: 1 male; recordedBy: Jiufeng Wei & Tiantao Zhang; occurrenceID: NWAUFU_HO221996
- b. country: China; stateProvince: Zhejiang; locality: Fengyang, Mountain, Luao; eventDate: 08-04-07; sex: 3 males, 1 female; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO221997

Distribution: China: Guizhou, Zhejiang; Vietnam: Ninh Binh (Fennah 1978).

Notes: First record: China: Zhejiang (Fengyang Mountain).

***Andes uncinatus* Fennach, 1956**

Nomenclature:

Andes uncinatus Fennach, 1956: 444| Zhang 2008: 38.

Distribution: China: Guangdong, Sichuan (Fennah 1956).

***Andixius longispinus* Zhi & Chen, 2018**

Nomenclature:

Andixius longispinus Zhi & Chen, 2018b: 57.

Distribution: China: Yunnan (Zhi et al. 2018b).

***Andixius trifurcus* Zhi & Chen, 2018**

Nomenclature:

Andixius trifurcus Zhi & Chen, 2018b: 60.

Distribution: China: Yunnan (Zhi et al. 2018b).

***Andixius venustus* Zhi & Chen, 2018**

Nomenclature:

Brixia venusta Tsaur & Hsu, 1991a: 65.|*Andixius venustus* (Tsaur & Hsu, 1991), Emeljanov & Hayashi 2007: 129.

Distribution: China: Taiwan (Zhi et al. 2018b).

***Kotonisia kanoi* Matsumura, 1938**

Nomenclature:

Benna kanoi Matsumura, 1938: 152.|*Benna formosana* (Nast), Tsaur, 1988b: 76.|*Kotonisia kanoi* (Matsumura, 1938), Tsaur 2009: 67.|*Kotonisia kanoi* Matsumura, 1938, Hoch 2013: 174.

Distribution: China: Taiwan (Tsaur et al. 1991b).

***Borysthenes acuminatus* Fennah, 1956**

Nomenclature:

Borysthenes acuminatus Fennah, 1956: 459| Liang 2005a: 810.

Distribution: China: Hubei (Fennah 1956).

Borysthenes deflexus* Fennah, 1956*Nomenclature:**

Borysthenes deflexus Fennah, 1956: 460| Liang 2005a: 810.

Distribution: China: Guangdong (Fennah 1956).

Borysthenes emarginatus* Fennah, 1956*Nomenclature:**

Borysthenes emarginatus Fennah, 1956: 461| Liang 2005a: 810.

Distribution: China: Guangdong(Fennah 1956)

Borysthenes lacteus* Tsaur & Lee, 1987*Nomenclature:**

Borysthenes lacteus Tsaur & Lee, 1987: 9.

Distribution: China: Taiwan.

Borysthenes maculatus* (Matsumura, 1914)*Nomenclature:**

Barma maculata Mtsumura, 1914: 430.|*Bolysthenes (sic) guttatus* Kato, 1933: 468.|
Borysthenes maculatus (Matsumura, 1914), Fennah 1956: 459| Chou 1985: 26| Tsaur
1987: 8| Liang 2005a: 810| Liang 2005b: 429| Hayashi & Fujinuma 2016: 326.

Material

- a. country: China; stateProvince: Hainan; locality: Diaoluo Mountain; eventDate: 05-17-65;
sex: 1 female; recordedBy: Sikong Liu; occurrenceID: NWAUFU_HO221998

Distribution: China: Fujian (Liang 2005a, Liang 2005b), Hainan, Hunan, Guangxi, Sichuan, Taiwan (Matsumura 1914); Japan: Nansei-shoto (Fennah 1956).

Notes: First record: China: Hainan (Diaoluo Mountain).

Brixia formmosana* Matsumura,1914*Nomenclature:**

Brixia formmosana Matsumura, 1914: 433.

Distribution: China: Taiwan (Matsumura 1914).

***Brixia neglecta* Van Stalle, 1983**

Nomenclature:

Brixia neglecta Van Stalle, 1983: 272.

Distribution: China: Taiwan (Tsaour et al. 1991b).

***Ankistrus basalis* Tsaour & Hsu, 1991**

Nomenclature:

Ankistrus basalis Tsaour & Hsu, 1991b: 19.

Distribution: China: Taiwan (Tsaour et al. 1991b).

***Ankistrus choui* Tsaour & Hsu, 1991**

Nomenclature:

Ankistrus choui Tsaour & Hsu, 1991b: 12.

Distribution: China: Taiwan (Tsaour et al. 1991b).

***Ankistrus guttatus* Tsaour & Hsu, 1991**

Nomenclature:

Ankistrus guttatus Tsaour & Hsu, 1991b: 17.

Distribution: China: Taiwan (Tsaour et al. 1991b).

***Ankistrus montanus* Tsaour & Hsu, 1991**

Nomenclature:

Ankistrus montanus Tsaour & Hsu, 1991b: 9.

Distribution: China: Taiwan (Tsaour et al. 1991b).

***Ankistrus pini* Tsaour & Hsu, 1991**

Nomenclature:

Ankistrus pini Tsaour & Hsu, 1991b: 9.

Distribution: China: Taiwan (Tsaour et al. 1991b).

***Ankistrus taoi* Tsaour & Hsu, 1991**

Nomenclature:

Ankistrus taoi Tsaour & Hsu, 1991b: 14.

Distribution: China: Taiwan (Tsaour et al. 1991b).

***Ankistrus varius* Tsaour & Hsu, 1991**

Nomenclature:

Ankistrus varius Tsaour & Hsu, 1991b: 14.

Distribution: China: Taiwan (Tsaour et al. 1991b).

***Cixius (Ceratocixius) subsimplex* Vilbaste, 1968**

Nomenclature:

Cixius subsimplex Vilbaste, 1968: 5| Anufriev& Emeljanov, 1988: 452.| *Cixius (Ceratocixius) subsimplex*, Emeljanov, 2015: 98.

Material

- a. country: China; stateProvince: Gansu; municipality: Wenxian; locality: Gaolou Mountain; eventDate: 07-29-04; sex: 14 males, 8 females; recordedBy: Yani Duan; occurrenceID: NWAUFU_HO221999

Distribution: China: Gansu.

Notes: First record: China: Gansu (Wenxian).

***Cixius aculeatus* Tsaour & Hsu, 1991**

Nomenclature:

Cixius aculeatus Tsaour & Hsu, 1991a: 199.

Distribution: China: Taiwan (Tsaour et al. 1991a).

***Cixius acutus* Tsaour & Hsu, 1991**

Nomenclature:

Cixius acutus Tsaour & Hsu, 1991a: 204.

Distribution: China: Taiwan (Tsaour et al. 1991a).

***Cixius aduncus* Tsaour & Hsu, 1991**

Nomenclature:

Cixius aduncus Tsaour & Hsu, 1991a: 239.

Distribution: China: Taiwan (Tsaour et al. 1991a).

Cixius alpinus* Tsaur & Hsu, 1991*Nomenclature:**

Cixius alpinus Tsaur & Hsu, 1991a: 242.

Distribution: China: Taiwan (Tsaur et al. 1991a).

Cixius anmashanus* Tsaur & Hsu, 1991*Nomenclature:**

Cixius anmashanus Tsaur & Hsu, 1991a: 266.

Distribution: China: Taiwan (Tsaur et al. 1991a).

Cixius aquilonius* Tsaur & Hsu, 1991*Nomenclature:**

Cixius aquilonius Tsaur & Hsu, 1991a: 260.

Distribution: China: Taiwan (Tsaur et al. 1991a).

Cixius arisanus* Tsaur & Hsu, 1991*Nomenclature:**

Cixius arisanus Matsumura, 1914: 386| Tsaur 1991a: 185.

Materials

- a. country: China; stateProvince: Zhejiang; locality: Fengyang Mountain, Luao; verbatimElevation: 1000m; eventDate: 08-02-08; sex: 1 male, 2 females; recordedBy: Manqiang Wang; occurrenceID: NWAFU_HO222000
- b. country: China; stateProvince: Zhejiang; locality: Fengyang Mountain, Datianping; eventDate: 07-21-07; sex: 1 female; recordedBy: Hongwei Guo & Jiufeng Wei; occurrenceID: NWAFU_HO222001

Distribution: China: Zhejiang, Hainan, Taiwan (Tsaur et al. 1991a).

Notes: First record: China: Zhejiang (Fengyang Mountain).

Cixius bicolor* Matsumura, 1914*Nomenclature:**

Cixius bicolor Matsumura, 1914: 395| Esaki, 1932: 1773| Tsaur, 1991a: 175.

Material

- a. country: China; stateProvince: Hainan; locality: Limuling; verbatimElevation: 650m; eventDate: 04-19-08; sex: 3 males, 5 females; recordedBy: Qiulei Men; occurrenceID: NWAUFU_HO222002

Distribution: China: Taiwan (Tsaur et al. 1991a) Hainan; Japan: (?).

Notes: First record: China: Hainan (Limuling).

Cixius bidentis Matsumura, 1914

Nomenclature:

Cixius bidentis Tsaur, 1991a: 279.

Distribution: China: Taiwan (Tsaur et al. 1991a).

Cixius brochus Tsaur & Hsu, 1991

Nomenclature:

Cixius brochus Tsaur & Hsu, 1991a: 222.

Distribution: China: Taiwan (Tsaur et al. 1991a).

Cixius broncus Tsaur & Hsu, 1991

Nomenclature:

Cixius broncus Tsaur & Hsu, 1991a: 233.

Distribution: China: Taiwan (Tsaur et al. 1991a).

Cixius capillatus Tsaur & Hsu, 1991

Nomenclature:

Cixius capillatus Tsaur & Hsu, 1991a: 208.

Distribution: China: Taiwan (Tsaur et al. 1991a).

Cixius cathetus Tsaur & Hsu, 1991

Nomenclature:

Cixius cathetus Tsaur & Hsu, 1991a: 275.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius chituanus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius chituanus Tsaur & Hsu, 1991a: 236.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius chouorum* Tsaur & Hsu, 1991**

Nomenclature:

Cixius chouorum Tsaur & Hsu, 1991a: 225.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius chydaeus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius chydaeus Tsaur & Hsu, 1991a: 252.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius circinatus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius circinatus Tsaur & Hsu, 1991a: 202.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius circulus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius circulus Tsaur & Hsu, 1991a: 219.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius communis* Tsaur & Hsu, 1991**

Nomenclature:

Cixius communis Tsaur & Hsu, 1991a: 200.

Materials

- a. country: China; stateProvince: Guangxi; county: Nanning; locality: Daming Mountain; verbatimElevation: 1200m; eventDate: 09-29-08; sex: 2 males, 5 females; recordedBy: Manqiang Wang; occurrenceID: NWAUFU_HO222003

- b. country: China; stateProvince: Zhejiang; locality: Fengyang Mountain, Luao;
verbatimElevation: 1000m; eventDate: 08-02-08; sex: 1 male, 1 female; recordedBy:
Manqiang Wang; occurrenceID: NWAFU_HO222004

Distribution: China: Guangxi, Zhejiang, Taiwan (Tsaur et al. 1991a)

Notes: First record: China: Guangxi (Nanning), Zhejiang (Fengyang Mountain).

***Cixius curvus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius curvus Tsaur & Hsu, 1991a: 183.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius cyclus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius cyclus Tsaur & Hsu, 1991a: 256.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius deflexus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius deflexus Tsaur & Hsu, 1991a: 300.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius denotatus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius denotatus Tsaur & Hsu, 1991a: 294.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius dentatus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius dentatus Tsaur & Hsu, 1991a: 254.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius denticulatus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius denticulatus Tsaur & Hsu, 1991a: 180.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius diductus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius diductus Tsaur & Hsu, 1991a: 241.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius dilatus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius dilatus Tsaur & Hsu, 1991a: 286.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius discretus* Li, Liu, Ren, Li & Yao, 2016**

Nomenclature:

Cixius discretus † Li, Liu, Ren, Li & Yao, 2016, 2.

Distribution: China: Qinghai (Li et al. 2017).

Notes: Fossil species.

***Cixius elegantulus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius elegantulus Tsaur & Hsu, 1991a: 244.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius elongatus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius elongatus Tsaur & Hsu, 1991a: 206.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius fangi* Tsaur & Hsu, 1991**

Nomenclature:

Cixius fangi Tsaur & Hsu, 1991a: 180.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius flavescens* Matsumura, 1914**

Nomenclature:

Cixius flavescens Matsumura, 1914: 405.

Material

- a. country: China; stateProvince: Shaanxi; county: Hanzhong; locality: Yangxian, Maoping, Shaojia; eventID: CAU_32; eventDate: 08-01-17; sex: 1 male; recordedBy: Xing Zhu

Distribution: China: Shaanxi, Taiwan (Tsaur et al. 1991a).

Notes: First record: China: Shaanxi (Hanzhong).

***Cixius furvus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius furvus Tsaur & Hsu, 1991a: 285.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius fustis* Tsaur & Hsu, 1991**

Nomenclature:

Cixius fustis Tsaur & Hsu, 1991a: 228.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius galeolus* Fennah, 1956**

Nomenclature:

Cixius galeolus Fennah, 1956: 449.

Distribution: China: Guangdong (Fennah 1956).

***Cixius gladius* Tsaur & Hsu, 1991**

Nomenclature:

Cixius gladius Tsaur & Hsu, 1991a: 225

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius habunus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius habunus Tsaur & Hsu, 1991a: 188.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius hopponis* Matsumura, 1914**

Nomenclature:

Cixius hopponis Matsumura, 1914: 399| Tsaur & Hsu, 1991a: 195.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius hsui* Tsaur & Hsu, 1991**

Nomenclature:

Cixius hsui Tsaur & Hsu, 1991a: 256.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius hueisunus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius hueisunus Tsaur & Hsu, 1991a: 279.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius inaffectus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius inaffectus Tsaur & Hsu, 1991a: 212.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius incisus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius incisus Tsaur & Hsu, 1991a: 219.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius inflatus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius inflatus Tsaur & Hsu, 1991a: 272.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius kommonis* Matsumura, 1914**

Nomenclature:

Cixius kommonis Matsumura, 1914: 401| Tsaar, 1991a: 301.

Distribution: China: Taiwan (Tsaar et al. 1991a).

***Cixius kukuanus* Tsaar & Hsu, 1991**

Nomenclature:

Cixius kukuanus Tsaar & Hsu, 1991a: 269.

Distribution: China: Taiwan (Tsaar et al. 1991a).

***Cixius kuyanyanus* Matsumura, 1914**

Nomenclature:

Cixius kuyanyanus Matsumura, 1914: 398.

Distribution: China: Taiwan (Tsaar et al. 1991a).

***Cixius laboriosus* Tsaar & Hsu, 1991**

Nomenclature:

Cixius laboriosus Tsaar & Hsu, 1991a: 272.

Distribution: China: Taiwan (Tsaar et al. 1991a).

***Cixius latus* Tsaar & Hsu, 1991**

Nomenclature:

Cixius latus Tsaar & Hsu, 1991a: 248.

Distribution: China: Taiwan (Tsaar et al. 1991a).

***Cixius leei* Tsaar & Hsu, 1991**

Nomenclature:

Cixius leei Tsaar & Hsu, 1991a: 282.

Material

- a. country: China; stateProvince: Zhejiang; locality: Feng Mountain, Xiaotianhu; eventDate: 07-30-07; sex: 1 male, 1 female; recordedBy: Jiufeng Wei & Tiantao Zhang; occurrenceID: NWAUFU_HO222005

Distribution: China: Zhejiang, Taiwan (Tsaur et al. 1991a).

Notes: First record: China: Zhejiang (Feng Mountain).

***Cixius linorum* Tsaur & Hsu, 1991**

Nomenclature:

Cixius linorum Tsaur & Hsu, 1991a: 216.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius luridus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius luridus Tsaur & Hsu, 1991a: 264.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius maculosus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius maculosus Tsaur & Hsu, 1991a: 188.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius meifengensis* Tsaur & Hsu, 1991**

Nomenclature:

Cixius meifengensis Tsaur & Hsu, 1991a: 208.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius montosus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius montosus Tsaur & Hsu, 1991a: 205.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius mukwanus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius mukwanus Tsaur & Hsu, 1991a: 176.

Materials

- a. country: China; stateProvince: Fujian; locality: Wuyi Mountain, Tongmu;
 verbatimElevation: 850m; eventDate: 08-16-08; sex: 2 males, 2 females; recordedBy:
 Manqiang Wang; occurrenceID: NWAUFU_HO222006
- b. country: China; stateProvince: Fujian; locality: Wuyi Mountain, Sangang;
 verbatimElevation: 850m; eventDate: 08-14-08; sex: 1 male, 2 females; recordedBy:
 Manqiang Wang; occurrenceID: NWAUFU_HO222007

Distribution: China: Fujian, Taiwan (Tsaur et al. 1991a).

Notes: First record: China: Fujian (Wuyi Mountain).

Cixius narke Kramer, 1981

Nomenclature:

Cixius narke Kramer, 1981: 38| Bartlett 2014: 90.

Distribution: China: (?); Morocco: (?); Tunisia: (?); USA: California.

Cixius nervosus (Linné, 1758)

Nomenclature:

Cicada nervosa Linné, 1758: 437.|*Cixius nervosus* (Linné, 1758), Beirne, 1951: 315|
 Kramer, 1981: 8| Bartlett, 2014: 90| Hayashi & Fujinuma, 2016: 324.

Material

- a. country: China; stateProvince: Ningxia; locality: Liupan Mountain, Xixia;
 verbatimElevation: 2150m; eventDate: 07-09-08; sex: 2 females; recordedBy: Qiulei Men;
 occurrenceID: NWAUFU_HO222008

Distribution: China: Ningxia, Taiwan (Tsaur et al. 1991a).

Notes: First record: China: Ningxia (Liupan).

Cixius nitobei Matsumura, 1914

Nomenclature:

Cixius nitobei Matsumura, 1914: 401| Jacobi, 1944: 14| Schumacher, 1915: 131.

Distribution: China: Fujian, Taiwan (Tsaur et al. 1991a).

Cixius obvius Tsaur & Hsu, 1991

Nomenclature:

Cixius obvius Tsaur & Hsu, 1991a: 288.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius operosus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius operosus Tsaur & Hsu, 1991a: 247.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius parallelus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius parallelus Tsaur & Hsu, 1991a: 251.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius paucus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius paucus Tsaur & Hsu, 1991a: 289.

Distribution: China: Taiwan .(Tsaur et al. 1991a).

***Cixius perexiguus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius perexiguus Tsaur & Hsu, 1991a: 236.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius perpendicularis* Tsaur & Hsu, 1991**

Nomenclature:

Cixius perpendicularis Tsaur & Hsu, 1991a: 291.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius petilus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius petilus Tsaur & Hsu, 1991a: 231.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius phonascus* Fennah, 1956**

Nomenclature:

Cixius phonascus Fennah, 1956: 449.

Distribution: China: Guangdong (Fennah 1956).

***Cixius pilosellus* Matsumura, 1914**

Nomenclature:

Cixius pilosellus Matsumura, 1914: 405.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius polydentis* Tsaur & Hsu, 1991**

Nomenclature:

Cixius polydentis Tsaur & Hsu, 1991a: 297.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius privus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius privus Tsaur & Hsu, 1991a: 244.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius procerus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius procerus Tsaur & Hsu, 1991a: 278.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius quinarius* Tsaur & Hsu, 1991**

Nomenclature:

Cixius quinarius Tsaur & Hsu, 1991a: 249.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius rarus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius rarus Tsaur & Hsu, 1991a: 190.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius reversus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius reversus Tsaur & Hsu, 1991a: 260.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius scrupeus* Fennah, 1956**

Nomenclature:

Cixius scrupeus Fennah, 1956: 450| Tsaur, 1991b: 297.

Materials

- a. country: China; stateProvince: Hunan; locality: Mang Mountain; eventDate: 07-30-07; sex: 6 males, 5 females; recordedBy: Lingfei Peng; occurrenceID: NWAUFU_HO222009
- b. country: China; stateProvince: Hunan; locality: Huping Mountain, Dadongping; verbatimElevation: 1040m; eventDate: 07-19-06; sex: 1 male, 1 female; recordedBy: Lin Lu; occurrenceID: NWAUFU_HO222010
- c. country: China; stateProvince: Anhui; locality: Guniujiang; eventDate: 08-11-07; sex: 2 males, 2 females; recordedBy: Lingfei Peng; occurrenceID: NWAUFU_HO222011
- d. country: China; stateProvince: Henan; municipality: Yuhuang; locality: Yuhuang Mountain; eventDate: 07-07-07; sex: 1 male, 1 female; recordedBy: Lingfei Peng; occurrenceID: NWAUFU_HO222012

Distribution: China: Anhui, Hunan, Henan, Taiwan (Fennah 1956).

Notes: First record: China: Hunan (Mang Mountain), Hunan (Huping Mountain), 1040m| Anhui (Guniujiang), Henan (Yuhuang).

***Cixius segregatus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius segregatus Tsaur & Hsu, 1991a: 263.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius separatus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius separatus Tsaur & Hsu, 1991a: 214.

Distribution: China: Taiwan (Tsaur et al. 1991a).

Cixius serratus* Tsaur & Hsu, 1991*Nomenclature:**

Cixius serratus Tsaur & Hsu, 1991a: 266.

Distribution: China: Taiwan (Tsaur et al. 1991a).

Cixius spinosus* Tsaur & Hsu, 1991*Nomenclature:**

Cixius spinosus Tsaur & Hsu, 1991a: 282.

Distribution: China: Taiwan (Tsaur et al. 1991a).

Cixius spirus* Tsaur & Hsu, 1991*Nomenclature:**

Cixius spirus Tsaur & Hsu, 1991a: 186.

Distribution: China: Taiwan (Tsaur et al. 1991a).

Cixius stallei* Tsaur & Hsu, 1991*Nomenclature:**

Cixius stallei Tsaur & Hsu, 1991a: 291.

Distribution: China: Taiwan (Tsaur et al. 1991a).

Cixius stigmaticus* (Germar, 1818)*Nomenclature:**

Flata stigmaticus Germar, 1818: 199. | *Cixius stigmaticus* (Germar, 1818), Stephens, 1829: 357. | *Cixius (Acanthocixius) stigmaticus* (Germar, 1818), Mozaffarian & Wilson, 2011: 9. | *Cixius stigmaticus* (Germar, 1818), Emeljanov, 2015: 115.

Materials

- a. country: China; stateProvince: Guangxi; locality: Huaping; eventDate: 07-31-17; sex: 5 males, 3 females; recordedBy: Jingjie Liu; occurrenceID: NWAUFU_HO222154
- b. country: China; stateProvince: Zhejiang; county: Hangzhou; locality: Botanical garden; eventDate: 05-07-81; sex: 4 males, 1 female; recordedBy: HengyuanYan; occurrenceID: SEM_CAS_57
- c. country: China; stateProvince: Guangxi; county: Jinxiu; locality: Zhonglianglin, Fangdancun; verbatimElevation: 700m; eventDate: 06-26-81; sex: 1 male; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_58

- d. country: China; stateProvince: Guangxi; county: Xingan; locality: Maoer Mountain;
eventDate: 08-18-9; recordedBy: Xianwei Liu & Haisheng Yin; occurrenceID:
SEM_CAS_59

Distribution: China: Guangxi, Guizhou, Zhejiang; France: (?); Germany: (?); UK: (?);
Iran: Kandovān; Italy: (?); Poland: (?); Sweden: (?).

Notes: First record: China: Guangxi (Huaping, Jinxiu, Xingan), Zhejiang (Hangzhou).

***Cixius suturalis* Matsumura, 1914**

Nomenclature:

Cixius suturalis Matsumura, 1914: 401| Tsaur 1991a: 301.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius taipingshanus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius taipingshanus Tsaur & Hsu, 1991a: 275.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius taiwanus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius taiwanus Tsaur & Hsu, 1991a: 294.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius tappanus* Matsumura, 1914**

Nomenclature:

Cixius tappanus Matsumura, 1914: 398| Tsaur 1991a: 195.

Material

- a. country: China; stateProvince: Zhejiang; locality: Longwang Mountain; eventDate:
09-08-00; sex: 2 males; recordedBy: Wu Dai & Cong Wei; occurrenceID:
NWAUFU_HO222013

Distribution: China: Zhejiang, Taiwan (Tsaur et al. 1991a).

Notes: First record: China: Zhejiang (Longwang Mountain).

***Cixius transversus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius transversus Tsaur & Hsu, 1991a: 229.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius tsuifenghuensis* Tsaur & Hsu, 1991**

Nomenclature:

Cixius tsuifenghuensis Tsaur & Hsu, 1991a: 259.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius tungpuus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius tungpuus Tsaur & Hsu, 1991a: 233.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius tzuenus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius tzuenus Tsaur & Hsu, 1991a: 222.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius vatius* Tsaur & Hsu, 1991**

Nomenclature:

Cixius vatius Tsaur & Hsu, 1991a: 216.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius velox* Matsumura, 1914**

Nomenclature:

Cixius velox Matsumura, 1914: 403.

Distribution: China: Taiwan (Tsaur et al. 1991a).

***Cixius vittatus* Tsaur & Hsu, 1991**

Nomenclature:

Cixius vittatus Tsaur & Hsu, 1991a: 211.

Materials

- a. country: China; stateProvince: Ningxia; locality: Liupan Mountain, Xixia; verbatimElevation: 2150m; eventDate: 07-09-08; sex: 1 male; recordedBy: Qiulei Men; occurrenceID: NWAUFU_HO222014
- b. country: China; stateProvince: Guangxi; locality: Huaping nature reserve; eventDate: 07-24-17; sex: 1 male; recordedBy: Jingjie Liu; occurrenceID: NWAUFU_HO222015

Distribution: China: Guangxi, Ningxia, Taiwan (Tsaur et al. 1991a).

Notes: First record: China: Ningxia (Liupan Mountain), Guangxi (Huaping nature reserve).

Cixius wui Tsaur & Hsu, 1991

Nomenclature:

Cixius wui Tsaur & Hsu, 1991a: 178.

Distribution: China: Taiwan (Tsaur et al. 1991a).

Cixius wusheus Tsaur & Hsu, 1991

Nomenclature:

Cixius wusheus Tsaur & Hsu, 1991a: 269.

Distribution: China: Taiwan (Tsaur et al. 1991a).

Cixius yangi Tsaur & Hsu, 1991

Nomenclature:

Cixius yangi Tsaur & Hsu, 1991a: 192.

Distribution: China: Taiwan (Tsaur et al. 1991a).

Gonophallus trinus Tsaur & Hsu, 1991

Nomenclature:

Gonophallus trinus Tsaur & Hsu, 1991b: 25.

Distribution: China: Taiwan (Tsaur et al. 1991b).

Macrocixius giganteus Matsumura, 1914

Nomenclature:

Macrocixius giganteus Matsumura, 1914: 394| Schumacher 1915: 131| Fennah 1956: 459|Tsaur 1991b: 3| Liang 2005: 429| Orosz 2013: 107| Zhang 2013b: 279| Hayashi & Fujinuma 2016: 325.

Materials

- a. country: China; stateProvince: Fujian; county: Chongan; locality: Tongmenguan; verbatimElevation: 800-1000m; eventDate: 07-21-60; sex: 1 male; recordedBy: Fuju Pu; occurrenceID: NWAUFU_HO222156
- b. country: China; stateProvince: Fujian; locality: Wuyi Mountain, Tongmenguan; verbatimElevation: 1200m; eventDate: 07-24-16; sex: 2 females; recordedBy: Jingjie Liu; occurrenceID: NWAUFU_HO222157
- c. country: China; stateProvince: Hainan; locality: Jianfeng; eventDate: 07-22-82; sex: 1 male; recordedBy: Zhiqin Chen; occurrenceID: NWAUFU_HO222158
- d. country: China; stateProvince: Hainan; locality: Jianfeng; eventDate: 09-25-82; sex: 2 males, 1 female; recordedBy: Youdong Lin; occurrenceID: NWAUFU_HO222159

Distribution: China: Fujian, Hainan, Jiangxi (Zhang and Chen 2013a), Taiwan (Tsauro et al. 1991b); Japan: Kyushu (Hayashi and Fujinuma 2016); Vietnam: (?).

Notes: First record: China: Fujian (Chongan), Hainan (Jianfeng), Jiangxi (Wuyishan).

Macrocoxius grossus Tsauro & Hsu, 1991

Nomenclature:

Macrocoxius grossus Tsauro & Hsu, 1991b: 5| Orosz 2013: 108| Zhang; 2013b: 281.

Material

- a. country: China; stateProvince: Guizhou; locality: Luodian; eventDate: 06-25-82; sex: 1 male; recordedBy: Unknown collector; occurrenceID: NWAUFU_HO222155

Distribution: China: Guizhou, Sichuan, Yunnan, Zhejiang (Zhang and Chen 2013a), Taiwan (Tsauro et al. 1991b) Vietnam: (?).

Notes: First record: China: Guizhou (Luodian).

Macrocoxius rarimaculatus Zhang & Chen, 2013

Nomenclature:

Macrocoxius rarimaculatus Zhang & Chen, 2013b: 283| Orosz & Redei 2016: 376.

Distribution: China: Guizhou, Jiangxi (Zhang and Chen 2013a), Taiwan; Nepal: Ganesh Himal.

Macrocoxius unispinus Zhang & Chen, 2013

Nomenclature:

Macrocoxius unispinus Zhang & Chen, 2013b: 285.

Distribution: China: Yunnan (Zhang and Chen 2013a).

***Semicixius denticulus* Tsaur & Hsu, 1991**

Nomenclature:

Semicixius denticulus Tsaur & Hsu, 1991b: 23.

Distribution: China: Taiwan (Tsaur et al. 1991b).

***Tachycixius (Tachycixius) pilosus* (Olivier, 1791)**

Nomenclature:

Tachycixius (Tachycixius) pilosus (Olivier, 1791): 575.

Distribution: China: (?).

***Tsauria brevispina* Zhi & Chen, 2019**

Nomenclature:

Tsauria brevispina Zhi & Chen, 2019: 57.

Distribution: China: Guizhou, Hubei (Zhi et al. 2019).

***Tsauria cehengensis* (Zhang & Chen, 2011)**

Nomenclature:

Discophorellus cehengensis Zhang & Chen, 2011a: 61.|*Tsauria chengensis* (Zhang & Chen, 2011), Xing, 2014: 149.

Distribution: China: Guizhou (Zhang and Chen 2011a).

***Tsauria longispina* Zhi & Chen, 2019**

Nomenclature:

Tsauria longispina Zhi & Chen, 2019: 63.

Distribution: China: Fujian, Guizhou, Hainan (Zhi et al. 2019).

***Tsauria major* (Tsaur & Hsu, 1991)**

Nomenclature:

Discophorellus major Tsaur & Hsu, 1991a: 21.|*Tsauria major* (Tsaur & Hsu, 1991), Kocak 2009: 6.

Distribution: China: Taiwan (Tsaur et al. 1991b).

Tsauria transspinus* (Zhang & Chen, 2011)*Nomenclature:**

Discophorellus transspinus Zhang & Chen, 2011a: 64. | *Tsauria transspinus* (Zhang & Chen, 2011), Xing, 2014: 150.

Distribution: China: Guizhou (Zhang and Chen 2011a).

Bajauana mestra* Fennah, 1980*Nomenclature:**

Bajauana mestra Fennah, 1980: 285.

Material

- a. country: China; stateProvince: Hunan; municipality: Nanyue; locality: Zhufuling; eventDate: 06-21-63; sex: 2 males, 1 female; recordedBy: Jikun Yang; occurrenceID: NWAUFU_HO222016

Distribution: China: Hunan; Indonesia: Irian Jaya (Fennah 1980).

Notes: First record: China: Hunan (Nanyue).

Bajauana smaragus* Fennah, 1980*Nomenclature:**

Bajauana smaragus Fennah, 1980: 277.

Material

- a. country: China; stateProvince: Hainan; locality: Qixianling; verbatimElevation: 128m; eventDate: 05-04-08; sex: 3 males, 2 females; recordedBy: Qiulei Men; occurrenceID: NWAUFU_HO222017

Distribution: China: Hainan; Indonesia: Irian Jaya (Fennah 1980).

Notes: First record: China: Hainan (Qixianling).

Dilacreon (Dilacreon) semiramis* Fennah, 1980*Nomenclature:**

Dilacreon (Dilacreon) semiramis Fennah, 1980: 242.

Materials

- a. country: China; stateProvince: Hainan; locality: Jianfeng; eventDate: 07-17-09; sex: 1 male, 2 females; recordedBy: Shuye Wang; occurrenceID: NWAUFU_HO222152

- b. country: China; stateProvince: Hainan; locality: Wuzhi Mountain; verbatimElevation: 750m; eventDate: 08-03-09; sex: 1 male; recordedBy: Manqiang Wang; occurrenceID: NWAUFU_HO222153

Distribution: China: Hainan; Indonesia: Irian Jaya; Papua New Guinea: Hollandia (Fennah 1980).

Notes: First record: China: Hainan (Jianfeng, Wuzhi Mountain).

***Eucarpia specialis* Tsaur & Hsu, 2003**

Nomenclature:

Eucarpia specialis Tsaur & Hsu, 2003: 438.

Materials

- a. country: China; stateProvince: Hainan; locality: Wuzhi Mountain; verbatimElevation: 720m; eventDate: 08-03-09; sex: 1 male, 3 females; recordedBy: Manqiang Wang; occurrenceID: NWAUFU_HO222018
- b. country: China; stateProvince: Hainan; locality: Wuzhi Mountain; verbatimElevation: 720m; eventDate: 08-02-09; sex: 1 male; recordedBy: Shuye Wang; occurrenceID: NWAUFU_HO222019
- c. country: China; stateProvince: Hainan; locality: Wuzhi Mountain, Maoxing; verbatimElevation: 250m; eventDate: 03-31-08; sex: 1 male; recordedBy: Qiulei Men; occurrenceID: NWAUFU_HO222020

Distribution: China: Hainan, Taiwan (Tsaur and Hsu 2003).

Notes: First record: China: Hainan (Wuzhi Mountain).

***Eucarpia stellata* Tsaur & Hsu, 2003**

Nomenclature:

Eucarpia stellata Tsaur & Hsu, 2003: 436.

Materials

- a. country: China; stateProvince: Hainan; locality: Liping; verbatimElevation: 720m; eventDate: 08-22-04; sex: 3 males, 5 females; recordedBy: Yani Duan; occurrenceID: NWAUFU_HO222021
- b. country: China; stateProvince: Fujian; locality: Meihua, Shuangche; verbatimElevation: 500m; eventDate: 08-24-08; sex: 1 male; recordedBy: Lei Zhang; occurrenceID: NWAUFU_HO222022

Distribution: China: Fujian, Hainan, Taiwan (Tsaur and Hsu 2003).

Notes: First record: China: Hainan (Liping), Fujian (Meihua).

***Eucarpia truncate* Tsaur & Hsu, 2003**

Nomenclature:

Eucarpia truncate Tsaur & Hsu, 2003: 438.

Distribution: China: Taiwan (Tsaur and Hsu 2003).

***Ptoleria indica* (Distant, 1916)**

Nomenclature:

Caneirona indica Distant, 1916: 39.|*Ptoleria indica* (Distant, 1916), Fennah 1956: 448.

Distribution: China: Hubei (Distant 1916); India: (?).

***Kirbyana aspina* Zhi & Chen, 2021**

Nomenclature:

Kirbyana aspina Zhi & Chen, 2021: 7.

Distribution: China: Hunan (Zhi et al. 2021).

***Kirbyana furcata* Zhi & Chen, 2021**

Nomenclature:

Kirbyana furcata Zhi & Chen, 2021: 8.

Distribution: China: Yunnan, Guangxi (Zhi et al. 2021).

***Kirbyana lini* Tsaur & Hsu, 2003**

Nomenclature:

Kirbyana lini Tsaur & Hsu, 2003: 434.

Distribution: China: Taiwan (Tsaur and Hsu 2003).

***Kirbyana pagana* (Melichar, 1903)**

Nomenclature:

Kirbya pagana Melichar, 1903: 248.|*Kirbyana pagana* (Melichar, 1903), Distant 1907: 262; Tsaur 2003: 432.

Material

- a. country: China; stateProvince: Hainan; locality: Wuzhi Mountain; verbatimElevation: 720m; eventDate: 08-02-09; sex: 1 male, 1 female; recordedBy: Shuye Wang; occurrenceID: NWAUFU_HO222023

Distribution: China: Hainan, Taiwan (Tsaur and Hsu 2003); India: (?); Malaysia: (?); Sri Lanka: Peradeniya.

Notes: First record: China: Hainan (Wuzhi Mountain).

Neocarpia acutata* Zhi & Chen, 2017*Nomenclature:**

Neocarpia acutata Zhi & Chen, 2017: 23.

Distribution: China: Yunann (Zhi et al. 2017).

Neocarpia bidentate* Zhang, 2013*Nomenclature:**

Neocarpia bidentate Zhang, 2013a: 43.

Distribution: China: Guizhou (Zhang and Chen 2013b).

Neocarpia hamata* Zhang, 2013*Nomenclature:**

Neocarpia hamata Zhang, 2013a: 45| Zhi, 2017: 27.

Distribution: China: Guizhou, Hubei (Zhang and Chen 2013b).

Neocarpia maa* Tsaur & Hsu, 2003*Nomenclature:**

Neocarpia maa Tsaur & Hsu, 2003: 441.

Material

- a. country: China; stateProvince: Zhejiang; locality: Fengyang Mountain, Luao; eventDate: 07-31-07; sex: 2 males, 5 females; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222024

Distribution: China: Zhejiang, Taiwan (Tsaur and Hsu 2003).

Notes: First record: China: Zhejiang (Fengyang Mountain).

Neocarpia reversa* Zhi & Chen, 2017*Nomenclature:**

Neocarpia reversa Zhi & Chen, 2017: 30.

Distribution: China: Yunnan (Zhi et al. 2017).

Haplaxius ovatus* Ball, 1933*Nomenclature:**

Myndus ovatus Ball, 1933: 473.|*Haplaxius ovatus* (Ball, 1933), Caldwell, 1946: 203.|
Myndus ovatus (Ball, 1933), Kramer, 1979: 344.|*Haplaxius ovatus* (Ball, 1933),
Emeljanov, 1989: 62| Bartlett 2014: 99| Wheeler 2014: 360.

Distribution: China: Guizhou; USA: Delaware, Georgia, Illinois, Iowa, Kansas,
Maryland, Massachusetts, Minnesota, Missouri, Nebraska, New Jersey, Oklahoma,
South Dakota, Virginia, Wisconsin (Bartlett et al. 2014).

Mundopa kotoshonis* Matsumura, 1914*Nomenclature:**

Mundopa kotoshonis Matsumura, 1914: 430| Tsaour, 1991b: 76.

Distribution: China: Taiwan (Tsaour et al. 1991b).

Myndus kotoshonis* Matsumura, 1940*Nomenclature:**

Myndus kotoshonis Matsumura, 1940: 45| Tsaour, 1991b: 74.

Distribution: China: Taiwan (Tsaour et al. 1991b).

Oteana oryzae* (Matsumura, 1911)*Nomenclature:**

Oliarus oryzae Matsumura, 1911: 134|Van Stalle, 1988a: 33.|*Oteana oryzae*
(Matsumura, 1911), Emeljanov, 2007: 291.

Distribution: China: Taiwan (Van Stalle 1991).

Arosinus hopponis* (Matsumura, 1914)*Nomenclature:**

Oliarus boninensis Matsumura, 1914: 423| Fennah 1956: 83; Van Stalle 1991: 46.|
Arosinus boninensis (Matsumura, 1914), Emeljanov 2007: 291| Hayashi & Fujinuma
 2016: 323.

Distribution: China: Taiwan (Van Stalle 1991).

***Arosinus velox* (Matsumura, 1914)**

Nomenclature:

Oliarus velox Matsumura, 1914: 425.|*Arosinus velox* (Matsumura, 1914), Emeljanov,
 2007: 291.

Distribution: China: Taiwan (Van Stalle 1991).

***Atretus horishanus* (Matsumura, 1914)**

Nomenclature:

Oliarus horishanus Matsumura, 1914: 418| Schumacher 1915: 131|Van Stalle 1991:
 84| Liang 2005: 429.|*Atretus horishanus* (Matsumura,1914), Emeljanov 2007: 291.

Distribution: China: Taiwan (Van Stalle 1991).

***Atretus hsui* (Tsaui, 1990)**

Nomenclature:

Oliarus hsui Tsaui, 1990b: 135.|*Atretus hsui* (Tsaui 1990), Emeljanov, 2007: 291.

Distribution: China: Taiwan (Tsaui 1990).

***Atretus nigronervatus* (Fennah, 1956)**

Nomenclature:

Oliarus nigronervatus Fennah, 1956: 451; Liang, 2005a: 429.|*Atretus nigronervatus*
 (Fennah), Emeljanov, 2007: 291.

Material

Holotype:

- a. country: China; stateProvince: Guangxi; locality: Baiyangsi; eventDate: 06-02-40; sex: 1
 male; recordedBy: Unknown collector; occurrenceID: NWAUFU_HO222160

Distribution: China: Fujian (Liang 2005b), Guangxi, Hubei (Fennah 1956).

Notes: First record: China: Guangxi (Baiyangsi).

Atretus shiao* (Tsauro 1990)*Nomenclature:**

Oliarus shiao Tsauro, 1990b: 137. | *Atretus shiao* (Tsauro 1990), Emeljanov, 2007: 291.

Distribution: China: Taiwan (Tsauro 1990).

Atretus yangi* (Tsauro 1989)*Nomenclature:**

Oliarus yangi Tsauro, 1989b: 171; Van Stalle, 1991: 84. | *Atretus yangi* (Tsauro 1989), Emeljanov, 2007: 291.

Distribution: China: Taiwan (Tsauro 1989).

Indolipa fopingensis* Luo, Liu & Feng 2019*Nomenclature:**

Indolipa fopingensis Luo, Liu & Feng, 2019b: 184.

Material

- a. country: China; stateProvince: Shaaxi; municipality: Foping; locality: Yueba;
verbatimElevation: 600-650m; eventDate: 07-07-14; sex: 3 males; recordedBy: Ruikai
Bai; occurrenceID: NWAUFU_HO222025

Distribution: China: Shaanxi (Luo et al. 2019b).

Indolipa fugongensis* Zhi & Chen, 2020*Nomenclature:**

Indolipa fugongensis Zhi & Chen, 2020b: 22.

Distribution: China: Yunnan (Zhi et al. 2020b).

Indolipa gansuensis* Feng, 2010*Nomenclature:**

Indolipa gansuensis Feng, 2010: 35.

Material

- a. country: China; stateProvince: Gansu; municipality: Kangxian; locality: Jincaifeng;
eventDate: 07-30-80; sex: 1 male; recordedBy: Chunhua Yang; occurrenceID:
NWAUFU_HO222026

Distribution: China: Gansu (Guo and Feng 2010).

Indolipa huapingensis Luo, Liu & Feng, 2019

Nomenclature:

Indolipa huapingensis Luo, Liu & Feng, 2019b: 189.

Materials

Holotype:

- a. country: China; stateProvince: Guangxi; locality: Huaping nature reserve; verbatimElevation: 550-600m; eventDate: 07-07-14; sex: 1 male; recordedBy: Ruikai Bai; occurrenceID: NWAUFU_HO222027

Paratype:

- a. country: China; stateProvince: Guangxi; locality: Lingyun; verbatimElevation: 600-700m; eventDate: 08-15-14; sex: 1 male; recordedBy: Ruikai Bai; occurrenceID: NWAUFU_HO222028

Distribution: China: Guangxi (Luo et al. 2019b).

Indolipa kurseongensis (Distant, 1911)

Nomenclature:

Oliarus kurseongensis Distant, 1911: 737| Fennah 1956: 451| Van Stalle 1991: 51.|
Indolipa kurseongensis (Distant), Emeljanov, 2001: 72| Guo 2010: 38|Luo, Liu & Feng, 2019a: 192.

Materials

- a. country: China; stateProvince: Tibet; locality: Check corner cave embarrassment; verbatimElevation: 1570m; eventDate: 06-24-78; sex: 2 males, 1 female; recordedBy: Fasheng Li; occurrenceID: CAF_02
- b. country: China; stateProvince: Tibet; locality: Check corner cave embarrassment; verbatimElevation: 1570m; eventDate: 06-25-78; sex: 1 female; recordedBy: Fasheng Li; occurrenceID: CAF_03
- c. country: China; stateProvince: Tibet; locality: Chayusha embarrassment; verbatimElevation: 1700m; eventDate: 06-29-78; sex: 2 males; recordedBy: Fasheng Li; occurrenceID: CAF_04
- d. country: China; stateProvince: Tibet; municipality: motuo; locality: back collapse; verbatimElevation: 850m; eventDate: 06-19-83; sex: 2 males 1 female; recordedBy: Yinheng Han; occurrenceID: CAF_05
- e. country: China; stateProvince: Yunnan; county: Lvchun; locality: Huanglian Mountain, Dapingzhang; eventDate: 06-24-17; sex: 1 male; recordedBy: Yingqi Lin; occurrenceID: CAU_04
- f. country: China; stateProvince: Hunan; locality: , Suining, Huangsang; verbatimElevation: 500m; eventDate: 06-07-16; sex: 1 male; recordedBy: Yang Luo; occurrenceID: NWAUFU_HO222029

Distribution: China: Guangxi, Hubei, Hunan, Tibet, Yunnan; India: Darjeeling (Van Stalle 1991).

Indolipa longlingensis* Zhi & Chen, 2020*Nomenclature:**

Indolipa longlingensis Zhi & Chen, 2020b: 25.

Distribution: China: Yunnan (Zhi et al. 2020b).

Indolipa tappanus* (Matsumura, 1914)*Nomenclature:**

Oliarus tappanus Matsumura, 1914: 424| Tsaur 1988: 46| Van Stalle 1991: 51.|*Indolipa tappanus* (Matsumura), Emeljanov, 2001b: 72| Guo 2010: 41.

Material

- a. country: China; stateProvince: Hunan; locality: Diaoluo Mountain; eventDate: 2007/6/1/6;
sex: 2 females; recordedBy: Yinglun Wang & Qin Zhai; occurrenceID:
NWAUFU_HO222030

Distribution: China: Hainan, Taiwan (Tsaur et al. 1988).

Notes: First record: China: Hainan (Diaoluo Mountain).

Melanoliarus canyonensis* (Mead & Kramer, 1981)*Nomenclature:**

Oliarus canyonensis Mead & Kramer, 1982: 381|*Melanoliarus canyonensis* (Mead & Kramer, 1981), Bartlett et al. (2014): 92.

Distribution: China: Taiwan; Japan: (?); USA: California, New Mexico (Bartlett et al. 2014).

Melanoliarus vicarius* (Walker, 1851)*Nomenclature:**

Cixius vicaria Walker, 1851: 343.|*Oliarus vicarius* (Walker, 1851), Distant, 1907: 282.|*Oliarus lucidus* Metcalf, 1936: 79.|*Oliarus vicarius* (Walker, 1851), Mead & Kramer 1981: 390.|*Melanoliarus vicarius* (Walker, 1851), Emeljanov, 2001a: 122; Bartlett, 2014: 96.

Distribution: China: Hunan; USA: Florida, Colorado; Georgia; Illinois; Maryland; Massachusetts; Mississippi; New Jersey; North Carolina; South Carolina; Texas (Bartlett et al. 2014).

***Oecleopsis articara* Van Stalle, 1991**

Nomenclature:

Oecleopsis articara Van Stalle, 1991: 22; Guo, 2009: 48.

Materials

- a. country: China; stateProvince: Hunan; locality: Jianfengling; verbatimElevation: 900m; eventDate: 07-01-05; sex: 1 male; recordedBy: Manqiang Wang; occurrenceID: NWAUFU_HO222031
- b. country: China; stateProvince: Hunan; locality: Limuling; verbatimElevation: 700m; eventDate: 07-22-09; sex: 1 male; recordedBy: Qiulei Men; occurrenceID: NWAUFU_HO222032
- c. country: China; stateProvince: Sichuan; locality: Emei Mountain; eventDate: 04-21-09; sex: 1 female; recordedBy: Wumin Zhang; occurrenceID: NWAUFU_HO222033
- d. country: China; stateProvince: Hainan; locality: Yinggeling; eventDate: 1976/10/?; sex: 1 female; recordedBy: Yinglun Wang & Qincai Zhai; occurrenceID: NWAUFU_HO222034
- e. country: China; stateProvince: Henan; locality: Gongyi; eventDate: 05-24-07; sex: 1 female; recordedBy: Chunhua Yang; occurrenceID: NWAUFU_HO222035
- f. country: China; stateProvince: Guizhou; county: Duyun; municipality: Libo; locality: Maolan; verbatimElevation: 600m; eventDate: 09-25-81; sex: 1 female; recordedBy: Yang Luo; occurrenceID: NWAUFU_HO222036

Distribution: China: Hainan, Henan, Sichuan, Guizhou; Malaysia: Borneo, Pahang (Van Stalle 1991).

Notes: First record: China: Guizhou (Duyun).

***Oecleopsis bifidus* (Tsaur, Hsu & Van Stalle, 1988)**

Nomenclature:

Oliarus bifidus Tsaur, Hsu & Van Stalle, 1988a: 52. | *Oecleopsis bifidus* (Tsaur, Hsu & Van Stalle, 1988), Van Stalle, 1991: 25 | Guo 2009: 48.

Materials

- a. country: China; stateProvince: Fujian; municipality: Shaowu; locality: Dazhulan; eventDate: 08-04-16; sex: 1 female; recordedBy: I Chou; occurrenceID: NWAUFU_HO222037
- b. country: China; stateProvince: Fujian; municipality: Shaowu; locality: Huaangkeng; eventDate: 1963/7/10/16; sex: 1 female; recordedBy: I Chou; occurrenceID: NWAUFU_HO222038

Distribution: China: Fujian, Taiwan (Tsaur et al. 1988).

Notes: First record: China: Fujian (Shaowu).

Oecleopsis chiangi* (Tsaaur, Hsu & Van Stalle, 1988)*Nomenclature:**

Oliarus chiangi Tsaaur, Hsu & Van Stalle, 1988a: 50. | *Oecleopsis chiangi* (Tsaaur, Hsu & Van Stalle, 1988), Van Stalle, 1991: 26 | Guo 2009: 49.

Materials

- a. country: China; stateProvince: Fujjian; municipality: Shaowu; locality: Dazhulan; eventDate: 07-08-63; sex: 1 male; recordedBy: I Chou; occurrenceID: NWAUFU_HO222039
- b. country: China; stateProvince: Fujjian; municipality: Shaowu; locality: Huaangkeng; eventDate: 1963/7/10/16; sex: 1 male; recordedBy: I Chou; occurrenceID: NWAUFU_HO222040

Distribution: China: Fujian, Taiwan (Tsaaur et al. 1988).

Notes: First record: China: Fujian (Shaowu).

Oecleopsis elevatus* (Tsaaur, Hsu & Van Stalle, 1988)*Nomenclature:**

Oliarus elevatus Tsaaur, Hsu & Van Stalle, 1988a: 53. | *Oecleopsis elevatus* (Tsaaur, Hsu & Van Stalle, 1988), Van Stalle, 1991: 26 | Guo 2009: 49 | Hayashi & Fujinuma 2016: 325.

Material

- a. country: China; stateProvince: Guangxi; county: Lingchuan; locality: Lingtian; eventDate: 07-08-63; sex: 1 male, 2 females; recordedBy: Zhengliang Wu & Xiaolin Lu; occurrenceID: NWAUFU_HO222041

Distribution: China: Guangxi, Taiwan (Tsaaur et al. 1988); Japan: Honshu.

Notes: First record: China: Guangxi (Lingchuan).

Oecleopsis laminatus* Zhi & Chen, 2018*Nomenclature:**

Oecleopsis laminatus Zhi & Chen, 2018b: 5.

Distribution: China: Yunnan (Zhi et al. 2018a).

Oecleopsis mori* (Matsumura, 1914)*Nomenclature:**

Oecleopsis mori (Matsumura, 1914): 426 | Van Stalle, 1991: 23 | Guo, 2009: 50 | Zhi, 2018: 9.

Distribution: China: Guangxi (Guo et al. 2009), Yunnan (Zhi et al. 2018a), Taiwan (Van Stalle 1991).

***Oecleopsis petasatus* (Noualhier, 1896)**

Nomenclature:

Oliarus petasatus Noualhier, 1896: 255| Fennah, 1956: 455.| *Oecleopsis petasatus* (Noualhier, 1896), Van Stalle, 1991: 22| Guo 2009:50.

Materials

- a. country: China; stateProvince: Yunnan; locality: Yaoqu; verbatimElevation: 800m; eventDate: 06-05-84; sex: 6 males, 20 females; recordedBy: Lei Zhang; occurrenceID: NWAUFU_HO222042
- b. country: China; stateProvince: Yunnan; locality: Yaoqu; verbatimElevation: 800m; eventDate: 05-31-09; sex: 2 males, 8 females; recordedBy: Lei Zhang; occurrenceID: NWAUFU_HO222043
- c. country: China; stateProvince: Yunnan; municipality: Menglun; locality: Mengla; eventDate: 05-09-09; sex: 1 male; recordedBy: Tianhe Hao; occurrenceID: NWAUFU_HO222044
- d. country: China; stateProvince: Sichuan; county: Yaan; locality: Zhougong Mountain; eventDate: 06-09-86; sex: 1 female; recordedBy: I Chou & Fengying Zheng; occurrenceID: NWAUFU_HO222045
- e. country: China; stateProvince: Hainan; locality: Yinggeling; eventDate: 07-13-39; sex: 1 female; recordedBy: Yinglun Wang & Qincai Zhai;; occurrenceID: NWAUFU_HO222046
- f. country: China; stateProvince: Yunnan; locality: Longling, Shanzipo; eventDate: 05-23-07; sex: 1 female; recordedBy: Tianhe Hao; occurrenceID: NWAUFU_HO222047

Distribution: China: Hainan, Sichuan, Yunnan; Cambodia: (?) (Van Stalle 1991).

Notes: First record: China: Yunnan (Yaoqu, Mengla, Longling, Kunming), Sichuan (Yaan), Hainan (Yinggeling).

***Oecleopsis productus* Zhi & Chen, 2018**

Nomenclature:

Oecleopsis productus Zhi & Chen, 2018b: 9.

Distribution: China: Yunnan (Zhi et al. 2018a)

***Oecleopsis sinicus* (Jacobi, 1944)**

Nomenclature:

Mnemosyne sinica Jacobi, 1944: 12|Chou 1985: 23.|*Oliarus sinicus* (Jacobi, 1944), Van Stalle 1988: 46.|*Oecleopsis sinicus* (Jacobi), Van Stalle, 1991: 23| Liang 2005b: 429| Guo 2009: 45| Hayashi & Fujinuma, 2016: 325.

Materials

- a. country: China; stateProvince: Hunan; county: Chenzhou; eventDate: 06-05-79; sex: 2 males; recordedBy: Yalin Zhang & Yonghui Chai; occurrenceID: NWAUFU_HO222048
- b. country: China; stateProvince: Fujian; county: Fuzhou; locality: Xihu; eventDate: 08-16-85; sex: 2 males; recordedBy: Zhencai Zhang; occurrenceID: NWAUFU_HO222049
- c. country: China; stateProvince: Guangxi; county: Lingchuan; locality: Lingtian; eventDate: 05-12-64; sex: 2 males; recordedBy: Zhengliang Wu & Xiaolin Lu; occurrenceID: NWAUFU_HO222050
- d. country: China; stateProvince: Hunan; municipality: Huping; locality: Quanping Mountain; eventDate: 06-05-84; sex: 2 males; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222051
- e. country: China; stateProvince: Beijing; municipality: Mentougou; locality: , Mentougou, Qingshui, Yanjiatai; eventDate: 07-20-06; sex: 8 males, 2 females; recordedBy: Siyu Gong; occurrenceID: CAU_05
- f. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Longmenjian; eventDate: 07-10-17; sex: 1 male, 1 female; recordedBy: Siyu Gong; occurrenceID: CAU_06
- g. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Shangqingshui; eventDate: 07-08-17; sex: 1 male; recordedBy: Siyu Gong; occurrenceID: CAU_07
- h. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Zhaitang, Malan; eventDate: 07-09-17; sex: 1 male, 1 female; recordedBy: Siyu Gong; occurrenceID: CAU_08
- i. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Zhaitang, Cuanbo; eventDate: 07-15-17; sex: 1 male; recordedBy: Siyu Gong; occurrenceID: CAU_09
- j. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Yanchi, Tianshenghu; eventDate: 07-08-17; sex: 1 female; recordedBy: Siyu Gong; occurrenceID: CAU_10
- k. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Yanchi, Facheng; eventDate: 07-15-17; sex: 1 male, 1 female; recordedBy: Siyu Gong; occurrenceID: CAU_11
- l. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Miaofeng Mountain; eventDate: 07-13-17; sex: 1 male, 1 female; recordedBy: Siyu Gong; occurrenceID: CAU_12

Distribution: China: Beijing, Anhui, Fujian, Guangdong, Guangxi, Henan, Hubei, Hunan, Sichuan, Guizhou, Zhejiang, Taiwan (Tsaur et al. 1988); Cambodia: (?) (Van Stalle 1991); Japan: Kyushu (Hayashi and Fujinuma 2016).

Notes: First record: China: Beijing (Mentougou), Hunan (Chenzhou, Huping), Fujian (Fuzhou), Guangxi (Lingchuan), Guangdong (Lohchan).

Oecleopsis spinosus Guo & Wang, 2009

Nomenclature:

Oecleopsis spinosus Guo & Wang, 2009: 54.

Materials

- a. country: China; stateProvince: Shaanxi; municipality: Foping; eventDate: 08-01-91; sex: 1 male; recordedBy: Yinglun Wang & Hong Jiang; occurrenceID: NWAUFU_HO222051
- b. country: China; stateProvince: Shaanxi; municipality: Foping; eventDate: 08-01-91; sex: 1 male; recordedBy: Yinglun Wang & Jianghong Cai; occurrenceID: NWAUFU_HO222052
- c. country: China; stateProvince: Shaanxi; municipality: Foping; eventDate: 08-02-90; sex: 1 female; recordedBy: Yinglun Wang & MeinanWang; occurrenceID: NWAUFU_HO222053

Distribution: China: Shaanxi (Guo et al. 2009).

Oecleopsis tiantaiensis Guo & Wang, 2009

Nomenclature:

Oecleopsis tiantaiensis Guo & Wang, 2009: 54.

Materials

Holotype:

- a. country: China; stateProvince: Shaanxi; county: Hanzhong; eventDate: 1980/8/?; sex: 1 male; recordedBy: Jianhua Wei; occurrenceID: NWAUFU_HO222054

Paratype:

- a. country: China; stateProvince: Shaanxi; county: Hanzhong; eventDate: 1980/8/?; sex: 1 male, 21 females; recordedBy: Jianhua Wei; occurrenceID: NWAUFU_HO222055

Other materials:

- a. country: China; stateProvince: Shaanxi; municipality: Foping; eventDate: 08-02-90; sex: 1 male, 3 females; recordedBy: Yinglun Wang & Hongcai Jiang; occurrenceID: NWAUFU_HO222056
- b. country: China; stateProvince: Shaanxi; county: Hanzhong; locality: Maoping, Jiuchi; eventDate: 08-08-07; sex: 1 male, 1 female; recordedBy: Xiang Zhu; occurrenceID: CAU_13
- c. country: China; stateProvince: Gansu; locality: Xiaolong Mountain; eventDate: 07-17-83; sex: 1 male; recordedBy: DunsuWu; occurrenceID: SEM_CAS_05

Distribution: China: Shaanxi, Gansu (Guo et al. 2009).

Notes: First record: China: Shaanxi (Hanzhong), Gansu (Xiaolong Mountain).

Oecleopsis wuyiensis Guo & Wang, 2009

Nomenclature:

Oecleopsis wuyiensis Guo & Wang, 2009: 56.

Materials

- a. country: China; stateProvince: Fujian; locality: Wuyi Mountain, Guadun; eventDate: 08-22-88; sex: 1 male; recordedBy: Zhongqi Yang; occurrenceID: NWAUFU_HO222057

- b. country: China; stateProvince: Shaanxi; county: Hanzhong; eventDate: 1980/8/?; sex: 3 males, 6 females; recordedBy: Jianhua Wei; occurrenceID: NWAUFU_HO222058
- c. country: China; stateProvince: Henan; locality: Funiu Mountain; eventDate: 07-10-96; sex: 2 males, 1 female; recordedBy: Wenzhu Zhang; occurrenceID: NWAUFU_HO222059
- d. country: China; stateProvince: Shaanxi; municipality: Foping; eventDate: 1990/8/2/4; sex: 2 males; recordedBy: Yinglun Wang & Xiaojun Gao; occurrenceID: NWAUFU_HO222060
- e. country: China; stateProvince: Shaanxi; municipality: Foping; eventDate: 07-02-90; sex: 1 male; recordedBy: Yinglun Wang & Hong Jiang; occurrenceID: NWAUFU_HO222061
- f. country: China; stateProvince: Hunan; locality: Huping Mountain, Quanping; eventDate: 07-20-06; sex: 2 males; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222062
- g. country: China; stateProvince: Yunnan; county: Lvchun; locality: Huanglian Mountain, Dapingzhang; eventDate: 06-24-17; sex: 1 male; recordedBy: Yingqi Liu; occurrenceID: NWAUFU_HO222063

Distribution: China: Fujian, Shaanxi, Henan, Hunan (Guo et al. 2009).

Notes: First record: China: Yunnan (Lvchun).

***Oecleopsis yoshikawai* (Ishihara, 1961)**

Nomenclature:

Oliarus yoshikawai Ishihara, 1961: 228. | *Oecleopsis yoshikawai* (Ishihara), Van Stalle, 1991: 22 | Guo 2009: 58 | Zhi 2018b: 12.

Material

- a. country: China; stateProvince: Yunnan; locality: Sumie; verbatimElevation: 1600m; eventDate: 2005/7/?; sex: 1 male; recordedBy: Lin Lv; occurrenceID: NWAUFU_HO222064

Distribution: China: Guizhou, Yunnan (Zhi et al. 2018a); Thailand: Doi Inthanon (Van Stalle 1991).

Notes: First record: China: Yunnan (Sumie).

***Oecleus cucullatus* (Noualhier, 1896)**

Nomenclature:

Oliarus cucullatus Noualhier, 1896: 255 | Jacobi 1917: 11 | Fennah 1956: 453. | *Oecleus cucullatus* (Noualhier, 1896), Emeljanov 1971: 621.

Distribution: China: Guangdong, Hubei (Fennah 1956); Cambodia: (?).

***Oliarus bizonata* Kato, 1932**

Nomenclature:

Oliarus bizonata Kato, 1932

Distribution: China: Northwestern of China (Kato 1932).

Oliarus cingalensis (Distant, 1911)

Nomenclature:

Mnemosyne cingalensis Distant, 1911: 738. | *Oliarus cingalensis* (Distant, 1911), Van Stalle, 1988: 46 | 1991: 82.

Material

- a. country: China; stateProvince: Yunnan; locality: Yuanmou, Laochengxiang; verbatimElevation: 1200m; eventDate: 08-09-05; sex: 1 female; recordedBy: Meixia Yang; occurrenceID: NWAUFU_HO222065

Distribution: China: Yunnan; Sri Lanka: Trincomalee (Van Stalle 1991); USA: Puerto Rico.

Notes: First record: China: Yunnan (Yuanmou).

Oliarus indicus Distant, 1911

Nomenclature:

Oliarus indicus Distant, 1911: 735 | Van Stalle, 1991: 80.

Material

- a. country: China; stateProvince: Beijing; locality: Xishan; eventDate: 06-22-57; sex: 2 females; recordedBy: Songhe Ying & Shaohua Li; occurrenceID: NWAUFU_HO222066

Distribution: China: Beijing; India: (?) (Van Stalle 1991).

Notes: First record: China: Beijing (Xishan).

Oliarus mlanjensis Van Salle, 1987

Nomenclature:

Oliarus mlanjensis Van Salle, 1987: 66.

Materials

- a. country: China; stateProvince: Guangxi; municipality: Longsheng; locality: Hongtan; eventDate: 06-25-82; sex: 1 female; recordedBy: Jikun Yang; occurrenceID: CAU_14
- b. country: China; stateProvince: Guangxi; locality: Baegyangsa Temple; eventDate: 06-02-40; sex: 1 female; recordedBy: Unknown Collector; occurrenceID: SEM_CAS_06
- c. country: China; stateProvince: Hubei; locality: Shennongjia; verbatimElevation: 930m; eventDate: 07-03-83; sex: 1 female; recordedBy: Gentao Jin & Zuyao Lu; occurrenceID: SEM_CAS_07

Distribution: China: Guangxi, Hubei; Malawi: (?); Tanzania: (?); Zimbabwe: ex Rhodesia (Van Stalle 1987).

Notes: First record: China: Guangxi (Longsheng, Baegyangsa Temple), Hubei (Shennongjia).

***Oliarus speciosus* Matsumura, 1914**

Nomenclature:

Oliarus speciosus Matsumura, 1914: 424.

Distribution: China: Taiwan (Matsumura 1914).

***Oliarus splendidula* Fieber, 1876**

Nomenclature:

Oliarus splendidula Fieber, 1876

Distribution: Austria: (?); Bulgaria: (?); China: (?); Greece: (?); Hungary: (?); Italy: (?); Romania: (?); Serbia: (?); Slovakia: (?); Yugoslavia: (?).

***Oliarus zaoensis* Wang, 1991**

Nomenclature:

Oliarus zaoensis Wang, 1991: 85.

Distribution: China: Hebei (Wang 1991).

***Oliparisca pundaloyensis* (Van Stalle, 1991)**

Nomenclature:

Oliarus pundaloyensis Van Stalle, 1991: 72. | *Oliparisca pundaloyensis* (Van Stalle, 1991), Emeljanov, 2001a: 72.

Distribution: China: Tibet; Sri Lanka: (?) (Van Stalle 1991).

***Pentastiridius apicalis* (Uhler, 1896)**

Nomenclature:

Myndus apicalis Uhler, 1896: 281. | *Oliarus apicalis* (Uhler, 1896), Matsumura, 1900: ? | Chou et al., 1985: 21. | *Pentastiridius apicalis* (Uhler), Emeljanov, 1979: 223 | Anufriev & Emeljanov, 1988: 463 | Van Stalle, 1991: 15 | Liang, 2005b: 429 | Anufriev, 2009: 68 | Hayashi & Fujinuma, 2016: 326.

Materials

- a. country: China; stateProvince: Jiangsu; locality: Jinshan; eventDate: 08-01-63; sex: 1 male, 1 female; recordedBy: Insect group, Chinese Academy of Sciences; occurrenceID: SEM_CAS_08

- b. country: China; stateProvince: Shanghai; locality: Songjiang, Sheshan; eventDate: 05-23-80; sex: 18 males, 5 females; recordedBy: Insect group, Chinese Academy of Sciences; occurrenceID: SEM_CAS_09
- c. country: China; stateProvince: Jiangsu; locality: Jinshan; eventDate: 08-01-63; sex: 4 males, 2 females; recordedBy: Nian Zhang; occurrenceID: SEM_CAS_10

Distribution: China: Beijing, Shanghai, Fujian, Jiangxi, Jiangsu, Shaanxi, Sichuan, Zhejiang; Japan: Hokkaido, Honshu, Kyushu, Shikoku; Russia: Khabarovsk, Primorye. (Van Stalle 1991)

Notes: First record: China: Hebei (Shijiazhuang), Jiangsu (Jinshan), Shanghai (Songjiang).

***Pentastiridius bohemani* (Stål, 1859)**

Nomenclature:

Cixius bohemani Stål, 1859: 272. | *Oliarus bohemani* (Stål, 1859), Stål, 1862: 306. | *Pentastiridius bohemani* (Stål, 1895), Van Stalle, 1991: 12.

Material

- a. country: China; stateProvince: Hainan; municipality: Xisha; locality: Xing Yong; eventDate: 03-20-65; sex: 2 males; recordedBy: Unknown Collector; occurrenceID: NWAUFU_HO222067

Distribution: China: Hainan, Hongkong (Van Stalle 1991).

Notes: First record: China: Hainan (Xisha).

***Pentastiridius leporinus* (Linné, 1761)**

Nomenclature:

Cicada leporinus Linné, 1761: 242. | *Cixius leporinus* (Linné, 1761), Curtis, 1829: 194. | *Flata leporina* (Linné, 1761), Germar, 1830: 50. | *Oliarus leporinus* (Linné, 1761), Scott, 1870: 720. | *Pentastiridius leporinus* (Linné, 1761), Van stalle, 1985: 441 | Kalkandelen 1990: 3.

Distribution: China: Nei-Mongol, Heilongjiang; Iran: bādeh, Albāji, Bampur, Bazmān, Birjand, Chābahār, Dālaki, Evin, Gambuyeh, Gāvbandi, Gharechaman, Hafttappeh, Hamidieh, Hāresābād, Hashtpar, Irānshahr, Kandovān (Māzandarān), Marand, Miāneh-ZanjānRd, Minushahr, Mollāsāni, Shādegān, Shieh, Susangerd, Suza, Tabriz, Varāmin, Zābol. Afghanistan: (?); Albania: (?); Algeria: (?); Armenia: (?); Austria: (?); Azerbaijan: (?); Belgium: (?); Cyprus: (?); Czech Republic: (?); Denmark: (?); Estonia: (?); Finland: (?); France: (?); Georgia: (?); Germany: (?); UK: (?); Greece: (?); Hungary: (?); Ireland: (?); Israel: (?); Italy: (?); Jordan: (?); Kazakhstan: (?); Kyrgyzstan: (?); Libya: (?); Lithuania: (?); Moldova: (?); Mongolia: (?); Netherlands: (?); Poland: (?); Portugal: (?); Romania: (?); Russia (Primorye): (?); Slovakia: (?); Spain: (?); Sweden: (?);

Switzerland: (?); Tadjikistan: (?); Tunisia: (?); Turkey: (?); Turkmenistan: (?); Ukraine: (?); Yugoslavia: (?) (Kalkandelen 1990).

***Pentastiridius pachycephs* (Matsumura, 1914)**

Nomenclature:

Oliarus pachycephs Matsumura, 1914: 420| Schumacher, 1915: 131.| *Pentastiridius pachycephs* (Matsumura, 1914), Van Stalle, 1991: 13| Hayashi & Fujinuma, 2016: 326.

Material

- a. country: China; stateProvince: Hainan; county: Lingshui; eventDate: 05-05-83; sex: 2 males; recordedBy: Unknown Collector; occurrenceID: NWAFU_HO222068

Distribution: China: Hainan, Taiwan (Van Stalle 1991); Nansei-shoto: Ryukyu Islands (Hayashi and Fujinuma 2016).

Notes: First record: China: Hainan (Lingshui).

***Pentastiridius tsoui* (Muir, 1925)**

Nomenclature:

Oliarus tsoui Muir, 1925: 365.| *Nesopompe tsoui* (Muir, 1925), Fennah, 1956: 455.| *Pentastiridius tsoui* (Muir, 1925), Van Stalle, 1991: 16.

Distribution: China: Jiangsu, Hubei; Japan: (?) (Van Stalle 1991).

***Reptalus arcobogdulus* (Dlabola, 1985)**

Nomenclature:

Oliarus arcobogdulus Dlabola, 1965: 87.| *Reptalus arcobogdulus* (Dlabola, 1965), Emeljanov, 1971: 622| Emeljanov 1982: 111| Emeljanov, 2015: 209.

Materials

- a. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Yantai; eventDate: 07-10-17; sex: 1 female; recordedBy: Siyu Gong; occurrenceID: CAU_15
- b. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Tiansi; eventDate: 07-11-17; sex: 2 females; recordedBy: Siyu Gong; occurrenceID: CAU_16
- c. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Longmenjian; eventDate: 07-09-17; sex: 1 female; recordedBy: Siyu Gong; occurrenceID: CAU_17
- d. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Liangjiapu; eventDate: 07-11-17; sex: 1 female; recordedBy: Siyu Gong; occurrenceID: CAU_18
- e. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Zhaitang, Yangjiayu; eventDate: 07-12-17; sex: 2 males, 4 females; recordedBy: Siyu Gong; occurrenceID: CAU_19

- f. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Zhaitang, Shuanglongxia; eventDate: 07-18-17; sex: 2 males, 2 females; recordedBy: Siyu Gong; occurrenceID: CAU_20

Distribution: China: Beijing; Mongolia: (Uburchangaj aimak) (Emeljanov 2015).

Notes: First record: China: Beijing (Mentougou).

***Reptalus basiproprocessus* Guo & Wang, 2007**

Nomenclature:

Reptalus basiproprocessus Guo & Wang, 2007: 276| Bai 2015: 37.

Materials

Holotype:

- a. country: China; stateProvince: Hubei; locality: Houhe nature reserve; eventDate: 07-13-06; sex: 1 male; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222069

Paratype:

- a. country: China; stateProvince: Hubei; locality: Houhe nature reserve; eventDate: 07-13-06; sex: 3 males; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222070

Other materials:

- a. country: China; stateProvince: Hubei; locality: Houhe nature reserve, Quanning; eventDate: 07-23-06; sex: 5 males, 5 females; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222071
- b. country: China; stateProvince: Hunan; locality: Zhangjiajie nature reserve; eventDate: 07-06-06; sex: 1 male; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222072
- c. country: China; stateProvince: Fujian; locality: Wuyi Mountain nature reserve, Nankeng; eventDate: 07-15-08; sex: 1 male, 6 females; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222073
- d. country: China; stateProvince: Zhejiang; locality: Qingliang feng nature reserve; eventDate: 07-13-06; sex: 1 male; recordedBy: Daozheng Qin; occurrenceID: NWAUFU_HO222074
- e. country: China; stateProvince: Hubei; locality: Daming, Wandu; eventDate: 07-13-06; sex: 2 males; recordedBy: Fuxing Zhu; occurrenceID: SEM_CAS_06
- f. country: China; stateProvince: Sichuan; locality: Xiyang; eventDate: 07-20-06; sex: 2 males, 1 female; recordedBy: Xiehe Liu; occurrenceID: SEM_CAS_07
- g. country: China; stateProvince: Zhejiang; locality: Tianmu Mountain; eventDate: 07-23-06; sex: 1 male; recordedBy: Jie Wu; occurrenceID: SEM_CAS_08
- h. country: China; stateProvince: Jiangsu; locality: Xinghua, Liunan; eventDate: 08-06-09; sex: 1 female; recordedBy: Zhixiang Chen; occurrenceID: SEM_CAS_09
- i. country: China; stateProvince: Qinghai; locality: Xining; eventDate: 06-15-57; sex: 1 male; recordedBy: Zhixiang Chen; occurrenceID: SEM_CAS_10
- j. country: China; stateProvince: Jiangsu; locality: Zhenze; eventDate: 06-15-57; sex: 1 males, 1 female; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_11

Distribution: China: Fujian, Hubei, Hunan, Zhejiang, Sichuan, Guizhou, Hebei, Qinghai, Jiangsu (Guo and Wang 2007).

Notes: First record: China: Jiangsu (Xinghua), Jiangsu (Zhenze).

***Reptalus iguchii* (Matsumura, 1914)**

Nomenclature:

Reptalus iguchii (Matsumura, 1914): 419| Rahman, 2012: 39.

Materials

- a. country: China; stateProvince: Guizhou; county: Duyun; locality: Libo, Maolan; eventDate: 08-02-16; sex: 8 females; recordedBy: Yang Luo; occurrenceID: NWAUFU_HO222075
- b. country: China; stateProvince: Guizhou; county: Tongren; locality: Jiangkou, Minxian; eventDate: 07-24-16; sex: 12 males, 14 females; recordedBy: Yang Luo; occurrenceID: NWAUFU_HO222076
- c. country: China; stateProvince: Guizhou; county: Kaili; locality: Lei Mountain, Yongle; verbatimElevation: 600m; eventDate: 07-30-16; sex: 45 males, 2 females; recordedBy: Yang Luo; occurrenceID: NWAUFU_HO222077
- d. country: China; stateProvince: Guizhou; county: Kaili; locality: Lei Mountain, Yongle; eventDate: 07-31-16; sex: 27 males, 76 females; recordedBy: Yang Luo; occurrenceID: NWAUFU_HO222078
- e. country: China; stateProvince: Hunan; county: Suining; locality: Huangsang; verbatimElevation: 500m; eventDate: 07-07-16; sex: 45 males, 45 females; recordedBy: Yang Luo; occurrenceID: NWAUFU_HO222079

Distribution: China: Guizhou, Hunan; South Korea: Gyeongsangbuk-do (Rahmam et al. 2011).

Notes: First record: China: Guizhou (Duyun), Guizhou (Tongren), Guizhou (Kaili), Hunan (Suining).

***Reptalus quadricinctus* (Matsumura, 1914)**

Nomenclature:

Oliarus quadricinctus Matsumura, 1914: 419|Chou, 1985: 20.|*Reptalus quadricinctus* (Matsumura), Emeljanov, 1971: 622| Anufriev & Emeljanov 1988: 464.|*Reptalus quadricinctus* (Matsumura, 1914), Van Stalle, 1991: 17| Liang 2005b, 429| Guo & Wang, 2007: 276| Rahman, 2012: 35| Bai, 2015: 35| Emeljanov, 2015: 215| Hayashi & Fujinuma, 2016: 326.

Materials

- a. country: China; stateProvince: Shaanxi; locality: Foping nature reserve; eventDate: 08-01-90; sex: 37 males, 31 females; recordedBy: Yinglun Wang & Meicai Wang; occurrenceID: NWAUFU_HO222080
- b. country: China; stateProvince: Shaanxi; locality: Taibai Mountain, Artemisia temple; eventDate: 05-11-82; sex: 1 female; recordedBy: Jinian Feng; occurrenceID: NWAUFU_HO222081
- c. country: China; stateProvince: Shaanxi; locality: Ningqiang; eventDate: 07-18-84; sex: 4 males, 2 females; recordedBy: Zhouhuai Tang; occurrenceID: NWAUFU_HO222082

- d. country: China; stateProvince: Shaanxi; locality: Shiquan; eventDate: 06-13-81; sex: 1 male, 1 female; recordedBy: Longcheng Xiang; occurrenceID: NWAUFU_HO222083
- e. country: China; stateProvince: Hunan; locality: Hupengshan nature reserve, Quoping village; eventDate: 07-20-06; sex: 68 males, 38 females; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222084
- f. country: China; stateProvince: Hunan; locality: Zhangjiajie nature reserve; eventDate: 07-23-06; sex: 1 female; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222085
- g. country: China; stateProvince: Hubei; locality: Houhe nature reserve, Houhe village; eventDate: 07-13-06; sex: 1 male, 5 females; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222086
- h. country: China; stateProvince: Hubei; locality: Shennongjia; eventDate: 07-25-01; sex: 1 female; recordedBy: Yanli Che; occurrenceID: NWAUFU_HO222087
- i. country: China; stateProvince: Hubei; locality: Shennongjia; eventDate: 06-27-77; sex: 1 male, 1 female; recordedBy: Shengli Liu; occurrenceID: NWAUFU_HO222088
- j. country: China; stateProvince: Jilin; municipality: Linjiang; locality: Naozhi; eventDate: 07-24-83; sex: 3 males, 2 females; recordedBy: Baozhen Hua & Zhengliang Wu; occurrenceID: NWAUFU_HO222089
- k. country: China; stateProvince: Fujian; municipality: Shaowu; locality: Dazhulan; eventDate: 07-16-63; sex: 1 male; recordedBy: I Chou; occurrenceID: NWAUFU_HO222090
- l. country: China; stateProvince: Anhui; locality: Anhui labor university; eventDate: 06-19-78; sex: 2 males, 2 females; recordedBy: Sizheng Wang; occurrenceID: NWAUFU_HO222091
- m. country: China; stateProvince: Zhejiang; locality: Fengyang Mountain, Datianping; eventDate: 07-04-08; sex: 7 males, 12 females; recordedBy: Lei Zhang; occurrenceID: NWAUFU_HO222092
- n. country: China; stateProvince: Zhejiang; locality: Fengyang Mountain, Luao; eventDate: 07-30-00; sex: 8 males, 10 females; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222093
- o. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Yanchi, Facheng; eventDate: 07-13-17; sex: 1 female; recordedBy: Siyu Gong; occurrenceID: CAU_21
- p. country: China; stateProvince: Hunan; county: Suining; locality: Huangsang; eventDate: 07-14-17; sex: 50 males, 51 females; recordedBy: Yang Luo; occurrenceID: NWAUFU_HO222094
- q. country: China; stateProvince: Zhejiang; county: Hangzhou; eventDate: 07-13-78; sex: 3 males; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_12
- r. country: China; stateProvince: Zhejiang; county: Hangzhou; locality: Botanical garden; eventDate: 05-31-79; sex: 1 male; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_13
- s. country: China; stateProvince: Jiangsu; locality: Zhenze; eventDate: 06-15-57; sex: 29 males, 24 females; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_14
- t. country: China; stateProvince: Jiangsu; county: Suzhou; locality: Mudu; eventDate: 06-15-57; sex: 15 males, 27 females; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_15
- u. country: China; stateProvince: Shanghai; locality: Qingpu; eventDate: 07-13-60; sex: 2 females; recordedBy: Chen Shi; occurrenceID: SEM_CAS_16
- v. country: China; stateProvince: Shanghai; eventDate: 08-13-53; sex: 4 males, 6 females; recordedBy: Chen Shi; occurrenceID: SEM_CAS_17
- w. country: China; stateProvince: Shanghai; eventDate: 06-30-53; sex: 3 males; recordedBy: Chen Shi; occurrenceID: SEM_CAS_18

- x. country: China; stateProvince: Shanghai; locality: Bao Mountain; eventDate: 07-11-60; sex: 1 male, 1 female; recordedBy: Chen Shi; occurrenceID: SEM_CAS_19
- y. country: China; stateProvince: Hunan; locality: Chenxi; eventDate: 08-25-57; sex: 1 female; recordedBy: Chen Shi; occurrenceID: SEM_CAS_20
- z. country: China; stateProvince: Fujian; locality: Huangkeng; eventDate: 07-06-60; sex: 1 female; recordedBy: Gentao Jin & Yangming Lin; occurrenceID: SEM_CAS_21
- aa. country: China; stateProvince: Fujian; municipality: Jianning; locality: Jinrao Mountain; eventDate: 06-09-59; sex: 1 male; recordedBy: Gentao Jin & Yangming Lin; occurrenceID: SEM_CAS_22
- ab. country: China; stateProvince: Fujian; locality: Daan; eventDate: 06-28-59; sex: 1 female; recordedBy: Gentao Jin & Yangming Lin; occurrenceID: SEM_CAS_23
- ac. country: China; stateProvince: Shanghai; locality: Sheshan; eventDate: 07-29-60; sex: 1 male; recordedBy: Shi Hai; occurrenceID: SEM_CAS_24
- ad. country: China; stateProvince: Shanghai; locality: Jinshan; eventDate: 08-12-60; sex: 1 male; recordedBy: Chen Shi; occurrenceID: SEM_CAS_25
- ae. country: China; stateProvince: Sichuan; locality: Qianjiang; eventDate: 07-14-89; sex: 5 males, 2 females; recordedBy: Xiehe Liu; occurrenceID: SEM_CAS_26
- af. country: China; stateProvince: Shanghai; locality: Jin Mountain, Shennian; eventDate: 06-01-60; sex: 1 female; recordedBy: Shanmo Jin; occurrenceID: SEM_CAS_27

Distribution: China: Beijing, Anhui, Fujian, Hunan, Hubei, Jinlin, Shaanxi, Zhejiang, Jiangsu, Shanghai, Sichuan, Guizhou; Japan: Honshu, Kyushu, Shikoku (Hayashi and Fujinuma 2016); Russia: (Primor); South Korea: Daegu (Emeljanov 2015).

Notes: First record: China: Anhui (labor university), Shaanxi (Foping nature reserve, Taibai Mountain, Ningqiang, Shiquan, Suining, Chenxi), Hunan (Hupengshan nature reserve, Zhangjiajie nature reserve), Hubei (Houhe nature reserve, Shennongjia), Jilin (Linjiang), Fujian (Shaowu, Huangkeng, Jianning, Daan), Anhui (Anhui labor university), Zhejiang (Fengyangshan), Beijing (Mentougou), Zhejiang (Hangzhou), Jiangsu (Zhenze, Suzhou), Shanghai (Qingpu, Bao Mountain, Sheshan, Jinshan), Sichuan (Qianjiang).

***Reptalus quinquecostatus* (Dufour, 1833)**

Nomenclature:

Cixius quinquecostatus Dufour, 1833: 224. | *Reptalus quinquecostatus* (Dufour, 1833), Emeljanov, 1971: 622 | Lodos & Kalkandelen, 1980: 23 | Jovic, 2009: 1055 | Bertin, 2010: 552 | Cvrkovic, 2010: 222 | Jovic, 2010: 238 | Drobnjaković, 2010: 313 | Cvrkovic, 2011: S130 | Mozaffarian & Wilson, 2011: 14 | Emeljanov, 2015: 209 | Mozaffarian 2018: 480.

Distribution: Armenia: (?); Austria: (?); Bulgaria: (?); China: (Chongqing); Czech Republic: (?); France: (?); Germany: (?); Greece: (?); Hungary: Andornaktalya; Iran: North; Italy: Emilia Romagna, Piemonte; Kazakhstan: (?); Portugal; Romania: Csi'kszereda, Fundulea; Russia: Azov; Serbia: Vršac, Topla, Rajac, South Banat District; Slovakia: (?); Spain: (?); Tadzhikistan: (?); Turkey: (?); Ukraine: (?); Yugoslavia: (?) (Emeljanov 2015).

Reptalus shunxiwuensis* Bai Guo & Feng, 2015*Nomenclature:**

Reptalus shunxiwuensis Bai Guo & Feng, 2015: 38.

Materials**Holotype:**

- a. country: China; stateProvince: Zhejiang; locality: Qingliangfeng Nature Reserve, Shunxiwu; eventDate: 08-08-08; sex: 1 male; recordedBy: Daozheng Qin; occurrenceID: NWAUFU_HO222095

Paratype:

- a. country: China; stateProvince: Zhejiang; locality: Qingliangfeng Nature Reserve, Shunxiwu; eventDate: 08-12-07; sex: 1male; recordedBy: Xiangqun Yuan & Hongwei Guo; occurrenceID: NWAUFU_HO222096

Other materials:

- a. country: China; stateProvince: Sichuan; locality: Xiu Mountain; eventDate: 07-04-89; sex: 2 males, 1 female; recordedBy: Xiehe Liu; occurrenceID: SEM_CAS_28
- b. country: China; stateProvince: Sichuan; locality: Xiu Mountain; eventDate: 07-07-89; sex: 1 male, 1 female; recordedBy: Xiehe Liu; occurrenceID: SEM_CAS_29
- c. country: China; stateProvince: Zhejiang; locality: Mogan Mountain; eventDate: 08-20-64; sex: 1 female; recordedBy: Hengyuan Yan; occurrenceID: SEM_CAS_30
- d. country: China; stateProvince: Anhui; locality: Huang Mountain; eventDate: 07-02-88; sex: 1 female; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_31

Distribution: China: Anhui, Sichuan, Zhejiang (Bai et al. 2015).

Siniarus formosanus* (Matsumura, 1914)*Nomenclature:**

Oliarus formosanus Matsumura, 1914: 427| Van Stalle 1991: 31|Schumacher 1915: 131.|*Siniarus formosanus* (Matsumura, 1914), Emeljanov, 2007: 291.

Distribution: China: Taiwan (Matsumura 1914).

Siniarus insetosus* (Jacobi, 1944)*Nomenclature:**

Oliarus insetosus Jacobi, 1944: 13| Fennah 1956: 454.|*Siniarus insetosus* (Jacobi, 1944)|Emeljanov 2007: 291.

Distribution: China: Fujian, Guangdong, Hongkong, Hubei, Sichuan, Yunnan, Tibet, Guangxi, Guizhou, Hunan, Taiwan (Fennah 1956).

Siniarus scalenus* (Tsaour, Hsu & Van Stalle, 1988)*Nomenclature:**

Oliarus scalenus Tsaour, Hsu & Van Stalle, 1988a: 41| Van Stalle 1988a: 29| *Siniarus scalenus* (Tsaour, Hsu & Van Stalle, 1988), Emeljanov, 2007: 291.

Distribution: China: Taiwan (Tsaour et al. 1988).

Betacixius bispinus* Zhang & Chen, 2011*Nomenclature:**

Betacixius bispinus Zhang & Chen, 2011b: 53.

Materials

- a. country: China; stateProvince: Xinjiang; locality: Changji Temple, Erhai; eventDate: 1982/5/28/30; sex: 1 male; recordedBy: Min Wang; occurrenceID: NWAUFU_HO222097
- b. country: China; stateProvince: Guangxi; municipality: Lintian; locality: Shuangjiao; eventDate: 08-01-08; sex: 1 male, 1 female; recordedBy: Xinli Wang; occurrenceID: NWAUFU_HO222098

Distribution: China: Guangxi, Guizhou, Xinjiang (Zhang and Chen 2011b).

Notes: First record: China: Xinjiang (Changji Temple), Guangxi (Lintian).

Betacixius brunneus* Matsumura, 1914*Nomenclature:**

Betacixius brunneus Matsumura, 1914: 417| Hori, 1982: 181| Tsaour, 1991b: 37| Zhang & Chen, 2011b: 50| Hayashi & Fujinuma, 2016: 323.

Material

- a. country: China; stateProvince: Fujian; locality: Taoyuan valley scenic spot of wuyi Mountain; verbatimElevation: 600m; eventDate: 08-10-07; sex: 2 males, 4 females; recordedBy: Manqiang Wang; occurrenceID: NWAUFU_HO222099

Distribution: China: Fujian, Zhejiang, Taiwan (Tsaour et al. 1991b); Japan: (?); Nansei-shoto: Ryukyu Islands (Hayashi and Fujinuma 2016).

Notes: First record: China: Fujian (Taoyuan valley scenic spot of wuyi Mountain).

Betacixius clypealis* Matsumura, 1914*Nomenclature:**

Betacixius clypealis Matsumura, 1914: 415| Hori 1982: 181| Tsaour 1991b: 39.

Materials

- a. country: China; stateProvince: Zhejiang; locality: Jiulong Mountain; eventDate: 08-04-07; sex: 2 males, 1 female; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222100
- b. country: China; stateProvince: Zhejiang; locality: Wuyanling; eventDate: 08-01-08; sex: 1 female; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222101

Distribution: China: Zhejiang, Taiwan (Tsaaur et al. 1991b).

Notes: First record: China: Zhejiang (Jiulong Mountain, Wuyanling).

Betacixius clypealis subsp. *vitifrons* (Matsumura, 1914)

Nomenclature:

Betacixius clypealis vitifrons Matsumura, 1914: 416.

Distribution: China: Taiwan (Tsaaur et al. 1991b).

Betacixius delicatus Tsaaur & Hsu, 1991

Nomenclature:

Betacixius delicatus Tsaaur & Hsu, 1991b: 29.

Material

- a. country: China; stateProvince: Zhejiang; locality: Fengyang Mountain; verbatimElevation: 1000m; eventDate: 08-04-07; sex: 1 male, 1 female; recordedBy: Manqiang Wang; occurrenceID: NWAUFU_HO222102

Distribution: China: Shaanxi, Zhejiang, Yunnan, Taiwan (Tsaaur et al. 1991b).

Notes: First record: China: Zhejiang (Fengyang Mountain).

Betacixius euterpe Fennah, 1956

Nomenclature:

Betacixius euterpe Fennah, 1956: 458; Zhang & Chen 2011b: 50.

Distribution: China: Guangdong (Fennah 1956).

Betacixius flagellihamus Zhang & Chen, 2011

Nomenclature:

Betacixius flagellihamus Zhang & Chen, 2011b: 54.

Distribution: China: Guizhou (Zhang and Chen 2011b).

Betacixius flavovittatus* Hori, 1982*Nomenclature:**

Betacixius flavovittatus Hori, 1982: 179| Tsaur 1991b: 41| Zhang & Chen 2011b: 50.

Material

- a. country: China; stateProvince: Zhejiang; locality: Fengyang, Luao Mountain; eventDate: 08-24-08; sex: 2 males, 5 females; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222103

Distribution: China: Taiwan, Zhejiang (Tsaur et al. 1991b).

Notes: First record: China: Zhejiang (Fengyang).

Betacixius fuscus* Tsaur & Hsu, 1991*Nomenclature:**

Betacixius fuscus Tsaur & Hsu, 1991b: 44| Zhang & Chen 2011b: 50.

Material

- a. country: China; stateProvince: Fujian; locality: Longyan City Contour Park; verbatimElevation: 400m; eventDate: 05-05-09; sex: 4 males, 6 females; recordedBy: Manqiang Wang; occurrenceID: NWAUFU_HO222104

Distribution: China: Fujian, Taiwan (Tsaur et al. 1991b).

Notes: First record: China: Taiwan (Hualien Hsien, Nantou Hsien, Taichung Hsien), Fujian (Longyan City Contour Park).

Betacixius herbaceous* Tsaur & Hsu, 1991*Nomenclature:**

Betacixius herbaceous Tsaur & Hsu, 1991b: 28.

Materials

- a. country: China; stateProvince: Yunnan; locality: Yangyang Valley; verbatimElevation: 800m; eventDate: 06-05-09; sex: 2 males, 3 females; recordedBy: Lei Zhang; occurrenceID: NWAUFU_HO222105
- b. country: China; stateProvince: Yunnan; locality: Matang Reservoir; verbatimElevation: 2000m; eventDate: 08-06-09; sex: 2 females; recordedBy: Lei Zhang; occurrenceID: NWAUFU_HO222106

Distribution: China: Yunnan, Taiwan (Tsaur et al. 1991b).

Notes: First record: China: Yunnan (Yangyang Valley, Matang Reservoir).

Betacixius latissilus* Zhi, Zhang, Yang & Chen, 2020*Nomenclature:**

Betacixius latissilus Zhi, Zhang, Yang & Chen, 2020a: 8.

Distribution: China: Yunnan (Zhi et al. 2020a).

Betacixius maculosus* Tsaur & Hsu, 1991*Nomenclature:**

Betacixius maculosus Tsaur & Hsu, 1991b: 31.

Materials

- a. country: China; stateProvince: Fujian; locality: Wuyi Mountain, Huangkeng; eventDate: 08-06-09; sex: 3 males, 1 female; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222107
- b. country: China; stateProvince: Fujian; locality: Wuyi Mountain, Tongmu Village; eventDate: 06-23-57; sex: 2 males; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222108
- c. country: China; stateProvince: Sichuan; locality: Emei Mountain, Baoguo temple; eventDate: 05-05-09; sex: 1 male; recordedBy: Unknown Collector; occurrenceID: NWAUFU_HO222109

Distribution: China: Fujian, Sichuan, Taiwan (Tsaur et al. 1991b).

Notes: First record: China: Fujian (Wuyi Mountain), Sichuan (Emei Mountain).

Betacixius maguanensis* Zhi, Zhang, Yang & Chen, 2020*Nomenclature:**

Betacixius maguanensis Zhi, Zhang, Yang & Chen, 2020: 11.

Distribution: China: Yunnan (Zhi et al. 2020a).

Betacixius michioi* Hori, 1982*Nomenclature:**

Betacixius michioi Hori, 1982: 176| Tsaur 1991a: 35| Zhang & Chen 2011b: 50.

Materials

- a. country: China; stateProvince: Yunnan; locality: Yangyang Valley; verbatimElevation: 800m; eventDate: 06-05-09; sex: 2 males, 3 females; recordedBy: Lei Zhang; occurrenceID: NWAUFU_HO222110
- b. country: China; stateProvince: Yunnan; locality: Matang Reservoir; verbatimElevation: 2000m; eventDate: 05-28-07; sex: 2 males; recordedBy: Lei Zhang; occurrenceID: NWAUFU_HO222111

Distribution: China: Yunnan, Taiwan (Tsaur et al. 1991b).

Notes: First record: China: Yunnan (Yangyang Valley, Matang Reservoir).

***Betacixius nelides* subsp. *atrrior* Fennah, 1956**

Nomenclature:

Betacixius nelides atrrior Fennah, 1956: 458.

Distribution: China: Zhejiang (Fennah 1956).

***Betacixius nelides* subsp. *nelides* Fennah, 1956**

Nomenclature:

Betacixius nelides nelides Fennah, 1956: 457.

Distribution: China: Zhejiang (Fennah 1956).

***Betacixius nelides* Fennah, 1956**

Nomenclature:

Betacixius nelides Fennah, 1956: 457.

Distribution: China: Zhejiang, Guangdong (Fennah 1956).

***Betacixius nigromarginalis* Fennah, 1956**

Nomenclature:

Betacixius nigromarginalis Fennah, 1956: 457.

Distribution: China: Hubei (Fennah 1956).

***Betacixius obliquus* Matsumura, 1914**

Nomenclature:

Betacixius obliquus pallens Matsumura, 1914: 414| Chou 1985: 23; Chou 1998: 382| Liang 2005b: 429| Zhang & Chen 2011b: 50.|*Betacixius obliquus* (Matsumura, 1914) Hayashi & Fujinuma, 2016: 323.

Materials

- a. country: China; stateProvince: Hainan; locality: Diaoluoshan; verbatimElevation: 944m; eventDate: 04-14-08; sex: 1 female; recordedBy: Yani Duan; occurrenceID: NWAUFU_HO222112
- b. country: China; stateProvince: Hainan; locality: Diaoluoshan; verbatimElevation: 900m; eventDate: 04-19-08; sex: 1 female; recordedBy: Qiule Men; occurrenceID: NWAUFU_HO222113

- c. country: China; stateProvince: Hainan; locality: Limu Island; verbatimElevation: 650m; eventDate: 2016/7/21/24; sex: 1 male; recordedBy: Qiule Men; occurrenceID: NWAUFU_HO222114
- d. country: China; stateProvince: Fujian; locality: Wuyi Mountain, Mucongsangang; verbatimElevation: 800-1200m; eventDate: 2016/7/21/24; sex: 3 males, 3 females; recordedBy: Jingjie Liu; occurrenceID: NWAUFU_HO222115
- e. country: China; stateProvince: Fujian; locality: Wuyi Mountain, Mucongsangang; verbatimElevation: 800-1200m; eventDate: 06-06-57; sex: 3 males, 3 females; recordedBy: Jingjie Liu; occurrenceID: NWAUFU_HO222116
- f. country: China; stateProvince: Sichuan; locality: Emei Mountain, Baoguo Temple; verbatimElevation: 600m; eventDate: 07-31-17; sex: 1 male; recordedBy: Leyi Zheng & Hanhua Cheng; occurrenceID: NWAUFU_HO222117
- g. country: China; stateProvince: Guangxi; locality: Huaping nature reserve; eventDate: 07-29-85; sex: 6 males, 7 females; recordedBy: Jingjie Liu; occurrenceID: NWAUFU_HO222118
- h. country: China; stateProvince: Hunan; county: Shenzhou; eventDate: 06-16-60; sex: 7 males, 7 females; recordedBy: Yalin Zhang; occurrenceID: NWAUFU_HO222119
- i. country: China; stateProvince: Fujian; municipality: Chongan; locality: Tongmu; verbatimElevation: 790-1155m; eventDate: 04-02-60; sex: 1 male; recordedBy: Gentao Jin & Yangming Lin; occurrenceID: SEM_CAS_32
- j. country: China; stateProvince: Fujian; municipality: Guangze; locality: Zhima; verbatimElevation: 200-300m; eventDate: 04-06-60; sex: 9 males, 4 females; recordedBy: Lin Jin; occurrenceID: SEM_CAS_33
- k. country: China; stateProvince: Fujian; municipality: Guangze; verbatimElevation: 200-300m; eventDate: 04-09-60; sex: 1 male, 3 females; recordedBy: Gentao Jin & Yangming Lin; occurrenceID: SEM_CAS_34
- l. country: China; stateProvince: Fujian; municipality: Guangze; locality: Huaqiao; eventDate: 04-17-60; sex: 1 male, 1 female; recordedBy: Lin Jin; occurrenceID: SEM_CAS_35
- m. country: China; stateProvince: Fujian; municipality: Guangze; locality: Huaqiao; eventDate: 04-21-60; sex: 1 male, 1 female; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_36
- n. country: China; stateProvince: Fujian; municipality: Yongan; locality: Xiyang; eventDate: 04-21-60; sex: 1 female; recordedBy: Yongcheng Lin; occurrenceID: SEM_CAS_37
- o. country: China; stateProvince: Fujian; municipality: Yongan; eventDate: 04-16-63; sex: 1 female; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_38
- p. country: China; stateProvince: Zhejiang; municipality: Qingyuan; locality: Baizu Mountain; verbatimElevation: 1050m; eventDate: 04-27-63; sex: 2 females; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_39
- q. country: China; stateProvince: Zhejiang; municipality: Qingyuan; verbatimElevation: 350m; eventDate: 04-27-63; sex: 1 female; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_40
- r. country: China; stateProvince: Zhejiang; municipality: Longquan; locality: Houguang; verbatimElevation: 600m; eventDate: 04-28-55; sex: 1 female; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_41
- s. country: China; stateProvince: Sichuan; locality: Emei Mountain; eventDate: 07-29-09; sex: 1 male; recordedBy: Keren Huang; occurrenceID: SEM_CAS_42

Distribution: China: Fujian, Guizhou, Guangxi, Guangdong, Hainan, Hunan, Sichuan, Yunnan, Zhejiang; Japan: Honshu, Kyushu, Shikoku (Hayashi and Fujinuma 2016).

Notes: First record: China: Hainan (Diaoluoshan, Limu Island), Fujian (Wuyi Mountain, Chongan, Guangze, Yongan), Sichuan (Emei Mountain), Guangxi (Huaping nature reserve), Hunan (Shenzhou); Guangdong (Dinghu Mountain), Zhejiang (Qingyuan, Longquan).

***Betacixius ocellatus* Matsumura, 1914**

Nomenclature:

Betacixius ocellatus Matsumura, 1914: 412| Esaki 1932: 1774| Hori 1982: 181| Tsaor 1991b: 33.

Distribution: China: Yunnan, Fujian, Taiwan (Tsaor et al. 1991b).

Notes: First record: China: Fujian (Shaowu Jiangshi Nature Reserve).

***Betacixius pallidior* Jacobi, 1944**

Nomenclature:

Betacixius pallidior Jacobi, 1944: 15| Fennah 1978: 213.

Distribution: China: Fujian; Vietnam: Hanio (Fennah 1978).

***Betacixius rinkihonis* Matsumura, 1914**

Nomenclature:

Betacixius rinkihonis Matsumura, 1914: 417.|*Betacixius rinkihonis* Hori, 1982: 180| Tsaor 1991b: 42.

Material

- a. country: China; stateProvince: Guangdong; county: Shaoguan; locality: Nanling; eventDate: 05-07-07; sex: 2 males, 1 female; recordedBy: Jiangli Tan; occurrenceID: NWAUFU_HO222120

Distribution: China: Guangdong, Taiwan (Tsaor et al. 1991b).

Notes: First record: China: Guangdong (Shaoguan Nanling).

***Betacixius robustus* Jacobi, 1944**

Nomenclature:

Betacixius robustus Jacobi, 1944: 15| Zhang & Chen 2011b: 50.

Distribution: China: Fujian (Jacobi 1944).

Betacixius shirozui* Hori, 1982*Nomenclature:**

Betacixius shirozui Hori, 1982: 178| Tsaar, 1991b: 48| Zhang& Chen 2011b: 50.

Material

- a. country: China; stateProvince: Yunnan; locality: Xishuangbanna Mengla; eventDate: 04-20-82; sex: 3 males, 1 female; recordedBy: Sumei Wang; occurrenceID: NWAUFU_HO222121

Distribution: China: Yunnan (Mengla) (Tsaar et al. 1991b).

Notes: First record: China: Yunnan (Mengla).

Betacixius sparsus* Tsaar & Hsu, 1991*Nomenclature:**

Betacixius sparsus Tsaar & Hsu, 1991b: 46| Zhang& Chen 2011b: 50.

Materials

- a. country: China; stateProvince: Fujian; county: Longyan; locality: Lotus Park; verbatimElevation: 400m; eventDate: 08-23-08; sex: 3 males, 7 females; recordedBy: Lei Zhang; occurrenceID: NWAUFU_HO222122
- b. country: China; stateProvince: Hainan; locality: Jianfengling; eventDate: 12-14-74; sex: 1 male; recordedBy: Fasheng Li; occurrenceID: NWAUFU_HO222123

Distribution: China: Fujian, Hainan, Taiwan (Tsaar et al. 1991b).

Notes: First record: China: Fujian (Longyan), Hainan (Jianfengling).

Betacixius transversus* Jacobi, 1944*Nomenclature:**

Betacixius transversus Jacobi, 1944: 14| Zhang & Chen, 2011b: 50.

Distribution: China: Fujian (Jacobi 1944).

Kuvera communis* Tsaar & Hsu, 1991*Nomenclature:**

Kuvera communis Tsaar & Hsu, 1991b: 59.

Material

- a. country: China; stateProvince: Fujian; locality: Fengyang Mountain, Datianping; verbatimElevation: 1200m; eventDate: 08-04-08; sex: 2 males, 1 female; recordedBy: Lei Zhang; occurrenceID: NWAUFU_HO222124

Distribution: China: Fujian, Taiwan (Tsaar et al. 1991b).

Notes: First record: China: Fujian (Fengyang Mountain).

Kuvera flaviceps (Matsumura, 1900)

Nomenclature:

Oliarus flaviceps (Matsumura, 1900): 208. | *Kuvera flaviceps* (Matsumura, 1900), Matsumura, 1914: 407 | Anufriev, 1987: 14 | Anufriev & Emeljanov, 1988: 449 | Hayashi & Fujinuma, 2016: 325.

Material

- a. country: China; stateProvince: Gansu; municipality: Wen County; locality: Gaolou Mountain; eventDate: 07-29-04; sex: 9 males, 11 females; recordedBy: Yani Duan; occurrenceID: NWAUFU_HO222125

Distribution: China: Gansu, Jilin; Japan: Hokkaido, Honshu, Kyushu, Shikoku; Korea: (?); Russia: Sakhalin (Anufriev and Emeljanov 1988).

Notes: First record: China: Gansu (Wen County).

Kuvera hama Tsaar & Hsu, 1991

Nomenclature:

Kuvera hama Tsaar & Hsu, 1991b: 61.

Materials

- a. country: China; stateProvince: Jilin; county: Linjiang; locality: Naozhi; eventDate: 07-22-83; sex: 3 males, 4 females; recordedBy: Zhengliang Wu & Baozhen Hua; occurrenceID: NWAUFU_HO222126
- b. country: China; stateProvince: Fujian; locality: Wuyi Mountain straight pit; eventDate: 08-04-09; sex: 2 males, 6 females; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222127
- c. country: China; stateProvince: Hunan; locality: Huping Mountain; eventDate: 07-20-06; sex: 1 male; recordedBy: Hongwei Guo; occurrenceID: NWAUFU_HO222128

Distribution: China: Jilin, Fujian, Hunan, Taiwan (Tsaar et al. 1991b).

Notes: First record: China: Fujian (Wuyishan straight pit), Hunan (Huping Mountain).

Kuvera huoditangensis* Luo, Liu & Feng, 2019*Nomenclature:**

Kuvera huoditangensis Luo, Liu & Feng, 2019a: 140.

Materials

- a. country: China; stateProvince: Shaanxi; municipality: Ningshan; locality: Huoditang; verbatimElevation: 1400m-1500m; eventDate: 06-21-85; sex: 1 male; recordedBy: Liu Lan; occurrenceID: NWAUFU_HO222129
- b. country: China; stateProvince: Shaanxi; municipality: Ningshan; locality: Huoditang; verbatimElevation: 1500m; eventDate: 06-15-85; sex: 1 male; recordedBy: Liu Lan; occurrenceID: NWAUFU_HO222130

Distribution: China: Shaanxi, Henan, Gansu (Luo et al. 2019a).

Kuvera kurilensis* Anufriev, 1987*Nomenclature:**

Kuvera kurilensis Anufriev, 1987: 15| Anufriev & Emeljanov 1988: 449.

Material

- a. country: China; stateProvince: Tibet; locality: Motlin Green; verbatimElevation: 1550-1900m; eventDate: 05-25-83; sex: 1 male; recordedBy: Zai Lin; occurrenceID: NWAUFU_HO222131

Distribution: China: Jilin, Fujian, Hunan, Tibet, Taiwan; Russian. Far East (Anufriev 1987).

Notes: First record: China: Tibet (Motlin Green).

Kuvera laticeps* (Metcalf, 1936)*Nomenclature:**

Cixius latifrons Melichar, 1902: 85.|*Cixius laticeps* Metcalf, 1936: 180.|*Kuvera laticeps* (Metcalf, 1936), Anufriev 1987: 6.

Distribution: China: Sichuan (Melichar 1902).

Kuvera longipennis* Matsumura, 1914*Nomenclature:**

Kuvera longipennis Matsumura, 1914: 411.

Distribution: China: Taiwan (Matsumura 1914).

***Kuvera longwangshanensis* Luo, Liu & Feng, 2019**

Nomenclature:

Kuvera longwangshanensis Luo, Liu & Feng, 2019a: 144.

Material

- a. country: China; stateProvince: Zhejiang; county: Anji; locality: Longwang Mountain; verbatimElevation: 1000m–1200m; eventDate: 2000/8/6-8; sex: 3 males; recordedBy: Wu Dai & Cong Wei; occurrenceID: NWAUFU_HO222132

Distribution: China: Zhejiang (Luo et al. 2019a).

Notes: First record: China: Zhejiang (Anji).

***Kuvera pallidula* Matsumura, 1914**

Nomenclature:

Kuvera flaviceps var. *pallidula* Matsumura, 1914: 409. | *Kuvera pallidula* Matsumura, 1914, Anufriev, 1987: 10 | Anufriev & Emeljanov, 1988: 449.

Materials

- a. country: China; stateProvince: Shaaxi; locality: Shiquan; eventDate: 04-27-84; sex: 1 male; recordedBy: Zhouhuai Tang; occurrenceID: NWAUFU_HO222133
- b. country: China; stateProvince: Jilin; municipality: Antu County; locality: Erdaobaihe Huangsongpu Forest Farm; verbatimElevation: 1000m; eventDate: 07-16-09; sex: 1 male, 4 females; recordedBy: Daozheng Qin; occurrenceID: NWAUFU_HO222134
- c. country: China; stateProvince: Guangxi; municipality: Longsheng; locality: Huaping; eventDate: 07-29-17; sex: 1 male; recordedBy: Jingjie Liu; occurrenceID: NWAUFU_HO222135
- d. country: China; stateProvince: Sichuan; county: Yaan; eventDate: 04-05-82; sex: 4 males; recordedBy: Yan Feng; occurrenceID: SEM_CAS_43

Distribution: China: Jilin, Guangxi, Shaanxi, Sichuan; Japan: Hokkaido, Honshu; Russian. Far East (Anufriev 1987, Anufriev and Emeljanov 1988).

Notes: First record: China: Jilin (Antu County), Guangxi (Longsheng), Sichuan (Yaan).

***Kuvera semihyalina* Distant, 1906**

Nomenclature:

Kuvera semihyalina Distant, 1906: 261; Anufriev, 1987: 6.

Materials

- a. country: China; stateProvince: Liaoning; locality: Baling County National Balding National Nature Reserve; verbatimElevation: 5400m; eventDate: 07-24-09; sex: 8 males, 7 females; recordedBy: Daozheng Qin; occurrenceID: NWAUFU_HO222136

- b. country: China; stateProvince: Liaoning; locality: laobalding zi national nature reserve, Huanren; verbatimElevation: 5400m; eventDate: 07-24-09; sex: 2 males, 2 females; recordedBy: Daozheng Qin; occurrenceID: NWAUFU_HO222137
- c. country: China; stateProvince: Shaanxi; locality: Qinling; eventDate: 08-18-65; sex: 1 male; recordedBy: Yao Zhou & Jinsheng Lu; occurrenceID: NWAUFU_HO222138
- d. country: China; stateProvince: Shaanxi; locality: Shiquan; eventDate: 04-27-84; sex: 1 male, 1 female; recordedBy: Zhouhuai Tang; occurrenceID: NWAUFU_HO222139

Distribution: China: Liaoning, Shaanxi; Myanmar: (?) (Anufriev 1987).

Notes: First record: China: Liaoning (Baling County National Balding National Nature Reserve), Shaanxi (Shiquan, Qinling).

Kuvera similis Tsaur & Hsu, 1991

Nomenclature:

Kuvera similis Tsaur & Hsu, 1991b: 55.

Materials

- a. country: China; stateProvince: Fujian; municipality: Meihua; locality: Shuangche; verbatimElevation: 500m; eventDate: 08-29-08; sex: 2 males, 3 females; recordedBy: Lei Zhang; occurrenceID: NWAUFU_HO222140
- b. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Xiaolongmen, Linchang; eventDate: 07-05-17; sex: 3 females; recordedBy: Siyu Gong; occurrenceID: CAU_22
- c. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Bamuyan; eventDate: 07-08-17; sex: 3 males, 4 females; recordedBy: Siyu Gong; occurrenceID: CAU_23
- d. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Huanglongtuo; eventDate: 07-21-17; sex: 2 males, 4 females; recordedBy: Siyu Gong; occurrenceID: CAU_24
- e. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Yanjiatai; eventDate: 07-16-17; sex: 17 males, 16 females; recordedBy: Siyu Gong; occurrenceID: CAU_25
- f. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Xiaolongmen, Linchang; eventDate: 07-05-17; sex: 3 females; recordedBy: Siyu Gong; occurrenceID: CAU_26
- g. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Erdi Mountain, Guchengcheng; eventDate: 07-06-17; sex: 2 males, 1 female; recordedBy: Siyu Gong; occurrenceID: CAU_27
- h. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Baihua Mountain; eventDate: 07-08-17; sex: 2 males, 3 females; recordedBy: Siyu Gong; occurrenceID: CAU_28
- i. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Longmenjian; eventDate: 07-10-17; sex: 3 males; recordedBy: Siyu Gong; occurrenceID: CAU_29
- j. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Zhangjiapu; eventDate: 07-11-17; sex: 1 male, 5 females; recordedBy: Siyu Gong; occurrenceID: CAU_30

- k. country: China; stateProvince: Beijing; municipality: Mentougou; locality: Qingshui, Longmenxia; eventDate: 07-15-17; sex: 3 males, 1 female; recordedBy: Siyu Gong; occurrenceID: CAU_31

Distribution: China: Beijing, Fujian, Taiwan (Tsaur et al. 1991b).

Notes: First record: China: Beijing(Mentougou), Fujian(Meihua).

***Kuvera taiwana* Tsaur & Hsu, 1991**

Nomenclature:

Kuvera taiwana Tsaur & Hsu, 1991b: 50.

Materials

- a. country: China; stateProvince: Zhejiang; locality: Fengyang Mountain, Xiaoyang Lake; eventDate: 07-30-07; sex: 2 males, 3 females; recordedBy: Jiufeng Wei & Tiantao Zhang; occurrenceID: NWAUFU_HO222141
- b. country: China; stateProvince: Hainan; locality: Yinggeling, Maoxing Village; verbatimElevation: 240m; eventDate: 04-01-08; sex: 2 males, 3 females; recordedBy: Qiulei Men; occurrenceID: NWAUFU_HO222142
- c. country: China; stateProvince: Tibet; municipality: Yadong; locality: Xiayadong; eventDate: 2010/7/7-12; sex: 16 males, 18 females; recordedBy: Wenxuan Bi; occurrenceID: NWAUFU_HO222143
- d. country: China; stateProvince: Shaanxi; municipality: Huayin; locality: Huayang; verbatimElevation: 1500m; eventDate: 08-24-78; sex: 3 males, 1 female; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_44
- e. country: China; stateProvince: Yunnan; municipality: Lvchun; eventDate: 04-30-82; sex: 2 males, 1 female; recordedBy: Gentao Jin; occurrenceID: SEM_CAS_45
- f. country: China; stateProvince: Ningxia; locality: Liupan Mountain, Longtan; verbatimElevation: 1900m; eventDate: 2008/7/7-8; sex: 1 male; recordedBy: Wenxuan Bi; occurrenceID: NWAUFU_HO222144
- g. country: China; stateProvince: Zhejiang; locality: Linan, Xitianmu, Huangshansongfumu; verbatimElevation: 1163m; eventDate: 2011/5/5-6/13; sex: 1 male; recordedBy: Hui Pan; occurrenceID: NWAUFU_HO222145

Distribution: China: Hainan, Shaanxi, Yunnan, Ningxia, Zhejiang, Tibet, Taiwan (Tsaur et al. 1991b).

Notes: First record: China: Zhejiang (Fengyang Mountain, Linan), Hainan (Yinggeling), Tibet (Yadong); Shaanxi (Huayin), Yunnan (Lvchun), Ningxia (Liupan Mountain).

***Kuvera tappanella* Matsumura, 1914**

Nomenclature:

Kuvera tappanella Matsumura, 1914: 410.

Materials

- a. country: China; stateProvince: Hubei; locality: Shennongjia; eventDate: 06-30-07; sex: 3 males, 3 females; recordedBy: Lingfei Peng; occurrenceID: NWAUFU_HO222146
- b. country: China; stateProvince: Jiangxi; locality: Jinggang Mountain, Ciping; verbatimElevation: 820m; eventDate: 05-07-81; sex: 2 males, 1 female; recordedBy: Gentao Jin & Zuyao Liu; occurrenceID: SEM_CAS_46
- c. country: China; stateProvince: Hunan; locality: Mang Mountain, Linfen; eventDate: 04-23-78; sex: 1 male; recordedBy: Jianyi Wu; occurrenceID: SEM_CAS_47
- d. country: China; stateProvince: Hubei; locality: Shennongjia, Muyu; verbatimElevation: 1200m; eventDate: 08-26-83; sex: 1 female; recordedBy: Gentao Jin & Zuyao Liu & Jianzhong Zheng; occurrenceID: SEM_CAS_48
- e. country: China; stateProvince: Jilin; locality: Changbai Mountain; eventDate: 08-01-81; sex: 1 female; recordedBy: Bisheng Liu; occurrenceID: SEM_CAS_49

Distribution: China: Hubei, Jiangxi, Hunan, Jilin, Taiwan (Tsaour et al. 1991b).

Notes: First record: China: Hubei (Shennongjia), Jiangxi (Jinggang Mountain), Hunan (Mang Mountain), Hubei (Shennongjia), Jilin (Changbai Mountain).

Kuvera toroensis Matsumura, 1914

Nomenclature:

Kuvera toroensis Matsumura, 1914: 410| Anufriev, 1987: 18.

Materials

- a. country: China; stateProvince: Yunnan; municipality: Mengla; locality: Longmen; verbatimElevation: 930m; eventDate: 05-17-09; sex: 1 male, 1 female; recordedBy: Wei Cui; occurrenceID: NWAUFU_HO222147
- b. country: China; stateProvince: Yunnan; locality: Matang Reservoir; verbatimElevation: 2000m; eventDate: 06-05-09; sex: 1 female; recordedBy: Lei Zhang; occurrenceID: NWAUFU_HO222148
- c. country: China; stateProvince: Jiangxi; locality: Lu Mountain; eventDate: 06-04-81; sex: 2 males; recordedBy: Dasan Shi; occurrenceID: SEM_CAS_50
- d. country: China; stateProvince: Zhejiang; county: Hangzhou; eventDate: 1979/?/?; sex: 1 female; recordedBy: Zihua Hong; occurrenceID: SEM_CAS_51
- e. country: China; stateProvince: Tibet; municipality: Langxian; eventDate: 07-05-77; sex: 1 female; recordedBy: Jianyi Wu; occurrenceID: SEM_CAS_52
- f. country: China; stateProvince: Tibet; municipality: Cuona; eventDate: 07-22-77; sex: 1 female; recordedBy: Jianyi Wu; occurrenceID: SEM_CAS_53
- g. country: China; stateProvince: Hunan; municipality: Qianyang; locality: Shuang Mountai; eventDate: 05-09-82; sex: 1 male; recordedBy: Zhixiang Chen; occurrenceID: SEM_CAS_54

Distribution: China: Yunnan, Jiangxi, Zhejiang, Hunan, Tibet, Taiwan (Tsaour et al. 1991b).

Notes: First record: China: Hunan (Qianyang), Jiangxi (Lu Mountain), Yunnan (Mengla Longmen, Matang Reservoir), Zhejiang (Hangzhou) Tibet (Langxian Cuona).

Kuvera transversa* Tsaur & Hsu, 1991*Nomenclature:**

Kuvera transversa Tsaur & Hsu, 1991b: 57.

Material

- a. country: China; stateProvince: Yunnan; county: Tengchong; locality: Laifeng Mountain; verbatimElevation: 1997m; eventDate: 08-13-05; sex: 6 males, 7 females; recordedBy: Meixia Yang; occurrenceID: NWAUFU_HO222149

Distribution: China: Yunnan, Taiwan (Tsaur et al. 1991b).

Notes: First record: China: Yunnan (Tengchong Laifeng Mountain).

Kuvera ussuriensis* (Vilbaste, 1968)*Nomenclature:**

Kuvera ussuriensis Anufriev, 1987: 17.

Distribution: China: Sichuan; Russia: Primorsky Territory, South of the Khabarovsk Territory; Japan: Hokkaido (Anufriev 1987).

Kuvera vilbastei* Anufriev, 1987*Nomenclature:**

Kuvera vilbastei Anufriev, 1987: 7 | Anufriev & Emeljanov, 1988: 448 | Anufriev 2009: 68.

Materials

- a. country: China; stateProvince: Tibet; municipality: Bomi; locality: Yigong; verbatimElevation: 2300m; eventDate: 07-29-78; sex: 1 male; recordedBy: Fasheng Li; occurrenceID: CAF_06
- b. country: China; stateProvince: Tibet; municipality: Bomi; locality: Yigong; verbatimElevation: 2300m; eventDate: 06-15-78; sex: 1 female; recordedBy: Fasheng Li; occurrenceID: CAF_07
- c. country: China; stateProvince: Tibet; locality: Yadong; verbatimElevation: 2800m; eventDate: 08-24-78; sex: 1 female; recordedBy: Fasheng Li; occurrenceID: CAF_08
- d. country: China; stateProvince: Shaanxi; locality: Hua Mountain, Nanfeng; verbatimElevation: 2100m; eventDate: 08-08-78; sex: 2 males 1 female; recordedBy: Yintao Jin; occurrenceID: SEM_CAS_55
- e. country: China; stateProvince: Zhejiang; locality: Tianmu Mountain; verbatimElevation: 350-1100m; eventDate: 05-05-63; sex: 2 males 1 female; recordedBy: Yintao Jin; occurrenceID: SEM_CAS_56
- f. country: China; stateProvince: Shaanxi; municipality: Huxian; locality: Huashuping; verbatimElevation: 1700m; eventDate: 2007/6/23-28; sex: 3 males, 2 females; recordedBy: Shun Zhou; occurrenceID: NWAUFU_HO222150

Distribution: China: Shaanxi, Zhejiang, Tibet; Russia: Primorye (Anufriev 1987, Anufriev and Emeljanov 1988).

Notes: First record: China: Tibet (Bomi Yigong, Yadong), Shaanxi (Hua Mountain, Huxian), Zhejiang (Tianmu Mountain).

***Kuvera yecheonensis* Rahman, Kwon & Suh, 2017**

Nomenclature:

Kuvera yecheonensis Rahman, Kwon & Suh, 2017: 10.

Material

- a. country: China; stateProvince: Guizhou; municipality: Qiandong; locality: Dongnanlei Mountain, Yongle; verbatimElevation: 600m; eventDate: 07-29-16; sex: 1 male, 3 females; recordedBy: Yang Luo; occurrenceID: NWAUFU_HO222151

Distribution: China: Guizhou; South Korea: Gyeongsangbuk-do (Rahman et al. 2017).

Notes: First record: China: Guizhou (Qiandong).

***Euryphepsia yamia* Tsaar, 1989**

Nomenclature:

Euryphepsia yamia Tsaar, 1989a: 82.

Distribution: China: Taiwan (Tsaar 1989).

Analysis

Checklist

Ten cixiid tribes are reported in China: Andini Emeljanov, 2002; Bennini Metcalf, 1938, Borythenini Stål, 1866, Brixini Emeljanov, 2002, Cixiini Spinola, 1839, Eucarpini Emeljanov, 2002, Oecleini Muir, 1922, Pentastirini Emeljanov, 1971, Semonini Emeljanov, 2002, and Stenophlepsini Metcalf, 1938. These tribes include 35 genera and subgenera, 253 species and 400 collection records from 28 Chinese provinces. In this study, 77 new species were recorded for the first time from China.

Regional richness and endemism

A species richness gradient occurs from North to South and from West to East for Cixiidae as shown in Fig. 2. Substantial variation in species richness and endemism among the different zoogeographic regions were observed. A huge number of known species occur in the South China region, but few are present in the Northeast China, Nei Mongol-Xinjiang and Qinghai-Tibet regions (Fig. 2). Table 1 describes the species richness of Cixiidae by region, ranging from 5 species and no endemic species in the Nei Mongol-Xinjiang region,

to 161 species and 70.81% of endemic species in Taiwan region. In-between, species richness and endemism ratios are distributed in two groups: the Northeast China and the Qinghai-Tibet regions, respectively, with 8 and 10 species and 12.1% and 20% of endemism. The North, Central and South-West China regions, had comparable numbers of species and endemism, respectively, with 29 to 62 species and 35-40% of endemism. No significant differences in endemism among regions was observed. More than five-fourths of the species (205 species; 81.03%) are reported to occur in only in China, which illustrates the high level of endemism of Chinese fauna for this family (Table 1).

Distribution patterns of cixiid species in China

Based on the eight zoogeographic regions of China (Fig. 1), 38 main distribution patterns are observed (Fig. 2, Table 2). The number of species distributed only mono-regionally with a mono-regional distribution type (accounting for regional endemism) is highly variable among the different regions: Taiwan (45.10%), Central China (8.70%), Southwest China (6.72%), South China (5.14%), North China (3.95%), Qinghai-Tibet (0.79%) and Northeast China (0.40%). No endemic species were observed in the Nei Mongol-Xinjiang region (Table 2). Nine bi-regional distribution patterns were observed, and among them the South China-Taiwan regional combination has the greatest number of species (13 species), which is 5.14% of the total number of Cixiidae species in China. Nine tri-regional distribution patterns were also observed, among which the largest number of species (11 species), is 4.35% of the total number of Chinese cixiids species in the Central-South China-Taiwan regions. The Southwest-South China-Taiwan combination has 6 species, which is 2.37% of the total number of cixiids in China. Five distribution patterns occur in 4 zoogeographic regions, among which the North-Southwest-Central-South China region and the Northeast-Central-South China-Taiwan region have two species, which is 0.79% of the total number of cixiids in China. All the remaining IV-, V-, VI- and VII-distribution patterns have only a single species, which represents 0.40% of the total number of cixiids in China (Table 2).

Cixiid patterns of distribution at the tribal level

Of the ten cixiid tribes distributed in China (Table 3), Pentastirini (20.55% of the cixiid species) and Semonini (17%) are the two most widely distributed tribes in all of China. Cixiini, which is the most species rich tribe with 45.85% of the species, is distributed in 7 regions of China, but has not been reported from the Northeast China region. Andini (5.14%) is not distributed in the Palaearctic realm in China; Eucarpiini (6.32%) and Borythenini (1.98%) are distributed only in the Southwest, Central, South China, and in the Taiwan regions. The remaining tribes, Bennini (0.40%), Brixini (0.79%), Oecleini (1.58%) and Stenophlepsini (0.40%) are only found in Taiwan (Table 3).

Cluster and Ordination Analysis

In both the generic and specific taxonomic levels, the dendograms clearly separate the northernmost regions (Russian Far East, Nei Mongol-Xinjiang and Northeast China regions) from all other regions and with the similar relationships for Chinese zoogeographical

regions: ((((((South-Central) + SouthWest) + North) + Taiwan) + Qinghai-Tibet). At the species-level the south adjacent China country region appears as sister to all of China. In contrast, at the generic level, this south adjacent China region sister to the central and south Chinese regions. In the northernmost regions, Russian Far East is closer to the Northeast China region at the species level and closer to the Nei Mongol-Xinjiang region at the generic level. In both analyses, the cophenetic correlation coefficient ($r>0.8$) is high, indicating close agreement between the cluster assignment and the original Jaccard similarity coefficient matrix.

The cluster analysis and the NMDS ordination generally showed similar interrelationships among regions (Fig. 3b, d). The stress values of 0.18 (generic level) and 0.30 (species level) demonstrate the accuracy of the projections in the matrix in the 2D ordination space. At the generic level (Fig. 3b), the Nei Mongol-Xinjiang and Russian Far East regions are closely related to each other, and the Northeast China, Nei Mongol-Xinjiang, and Russian Far East regions are clearly separated from the other 7 regions. The Southwest, Central, and South China regions are closely grouped together, and are also related to the North China and Taiwan regions, but the Qinghai-Tibet and VM regions are more separated. At the species level (Fig. 3d), a roughly similar pattern occurs and the Russian Far East is closer to the Northeast China region, but the VM region is clearly separated and more distant from all other regions.

Discussion

Host-plants are a key factor affecting the distribution of these obligatory, phytophagous planthoppers. The host-plants and the planthopper species complex are also affected by other complex topographic and climatic factors embedded in a long dynamic geological process. The high diversity of Chinese biotopes allows us to better understand and explain the resulting high diversity of Chinese Cixiidae with 253 species already described, that represent no less than 8.6% of the total species richness of the family.

Current Chinese Cixiidae diversity and distribution

More than 80% of the Cixiidae species are considered to be endemic to China. The highest endemism is found in Taiwan (45.1%), followed by the Central China (8.7%), Southwest China (6.72%) and South China (5.14%) regions. These figures are consistent with the species richness and endemism patterns observed in other Hemiptera groups, such as aphids (Huang et al. 2008, Gao et al. 2018), leafhoppers (Yuan et al. 2014), or more specifically for planthoppers (Zhao et al. 2020b, Zhao et al. 2020a). The South China-Taiwan distribution patterns pattern (5.14%), Central-South China-Taiwan (4.35%) and the South Western-South China-Taiwan (2.37%) are richer in distributions of species. This pattern probably results from the past interconnection of the island of Taiwan with the Asian continent during the Quaternary period, when the sea level fell, facilitating the species flow between these areas (Lei et al. 2003, Tang et al. 2006). Its subsequent geographical isolation after the Quaternary period explains its relatively independent pattern of speciation (Gao et al. 2018) and its high endemism of species.

At the tribal level Cixiini, Pentastirini, and Semonini are widely distributed in China, except in the Northeastern China region for the Cixiini, which is probably a collect artefact as Cixiini are known to occur in higher latitudes (Bourgoin 2021). With 5.14% of the species, Andini is distributed in the Sino-Japanese - Oriental Region (NC, QT, SWC, CC, SC, TW), and Eucarpini and Borysthenini (6.32% and 1.98% respectively) are mainly concentrated south to the Qingling Mountain-Huai River (SWC, CC, SC, TW). The remaining four tribes [Bennini (0.40%), Brixini (0.79%), Oecleini (1.58%) and Stenophlepsini (0.04%)] are all distributed in Taiwan.

Biogeographical history shaped Chinese Cixiidae diversity

Cixiidae have a wide range of host plants, including mostly angiosperm Eudicot shrubs: Asterales, Rosales, Fabales, Myrtales, Lamiales, etc., but also Monocots as Poales and Arecales and tall trees such as Gymnosperm Pinales, or Magnolids Laurales, etc (Bourgoin 2021). Known from fossil records since the Barremian period, 130MYA (Luo et al. 2020) and probably occurring at least since 200MYA (Urban and Cryan 2012, Song and Liang 2013, Johnson et al. 2018), it is likely that the radiation of angiosperms around 145 MY (Condamine et al. 2020), has greatly influenced the diversification of the major Cixiidae lineages (Labandeira 2014, Szwedo 2016, Luo et al. 2020).

More recently, the uplift of the Qinghai-Tibetan Plateau starting in the middle of the Eocene period (45-38 Ma), also had profound effects on the topography and watersheds of East Asia, the aridity of inland Asia, and the Asian monsoon system. These abiotic factors produced a three-stage pattern of species distribution, from high in the west to low in the east (Zhang et al. 2000). The vertical differentiation in plant distribution (Jin et al. 2003), affected their diversity and increased the richness of local speciation events (Wen et al. 2014, Favre et al. 2015, Ye et al. 2017), and subsequently influenced the species distribution and speciation of the Cixiidae. During the late Oligocene to early Miocene periods (25-15Ma), the expansion of the Tibetan Plateau continued, and the East Asian monsoon and Indian monsoon prevailed in the Asian continent. This resulted in an increase of both temperature and sea levels (Ye et al. 2017), which allowed the northward propagation of fauna and flora. This area was pushed back southwards at the end of the Miocene period (10 Ma) by the uplift of the Hengduan mountains (Li et al. 2020), which caused the climate to cool (Xie et al. 2019, Yu et al. 2020). Since the middle of the Holocene period (6Ka), rainfall declined and monsoon strength weakened, resulting in a dramatic decrease in precipitation in northern China, which affected the vegetative environment (Zhao et al. 2009, Huang et al. 2012). Quantitative precipitation reconstructions based on pollen collected from northern China indicated that a strong sea-land pressure and temperature gradient caused by strong summer insolation in the northern hemisphere during the early Holocene period (0.14-0.07 Ma) caused enhanced monsoons (Chen et al. 2015, Zhao et al. 2009, Cook et al. 2011, Ge et al. 2017). Obviously the cixiid fauna diversity fluctuated at the same periods along with the diversity of their host-plants. However, without more robust phylogeny studies of Cixiidae, it remains difficult to better infer a more precise biogeographic historical scenario for the family and to link their distribution patterns to any of these important past events.

Biogeographical patterns of Chinese cixiids

Traditionally, the global biogeographical regionalization of China covers both the Oriental and Palearctic realms, which are bounded by the Qingling Mountain-Huai River, around 32–34N in the east of China (Sclater 1858, Wallace 1876, Zhen 1960, Zhang 1999, Cox 2001, Kreft and Jetz 2010, Morrone 2015, Song et al. 2016, He et al. 2017). In 2013, based on its zoological fauna, Holt added a Sino-Japanese realm standing between the Palearctic and Oriental realms, and from west of Tibet to east of the Japanese archipelago. He located the Palaeartic/Sino-Japanese boundary at about 40–41N, and the Sino-Japanese/Oriental boundary at 24–25N in southeast China (Fig. 1). Kreft and Jetz (2013) questioned the validity of this realm because they regarded it as just a biogeographical transition zone between the Palearctic and Oriental realms. According to their taxa etho-ecological characteristics, the Sino-Japanese realm boundaries are generally clustered with the Oriental realm (Kreft and Jetz 2010, Song et al. 2016, He et al. 2017, Gao et al. 2017, He et al. 2018).

This result is also observed here for the Chinese Cixiidae divided into two major zoogeographic areas: the Nei Mongol-Xinjiang and Northeast China regions from the rest of China. This boundary corresponds to the Palearctic/Sino-Japanese north boundary and appears to be more well defined than the Palearctic/Oriental boundary. The Andini tribe serves as a landmark for the Palearctic/Sino-Japanese north boundary, while the Eucarpini and Borysthenini tribes are primarily concentrated south to the Qingling Mountain-Huai River point to the traditional Palaeartic/Oriental boundary as proposed by Zhang (2011). Eucarpini and Borysthenini are landmarks for the south Sino-Japanese realm, clustering with the Oriental realm. Bennini, Brixini, Oecleini and Stenophlepsini, which are all distributed in Taiwan, may either indicate the northern limit of older and wider distributions of these tribes or might have resulted from occasional dispersals from neighbouring south regions.

At the genus level, the south parts of China cluster with the Indochina region in our analyses, but at the species level all of China forms a unique group. This may be related to the late Eocene uplift of the Himalayas and recent uplift of the Himalayan-Hengduan Mountains in the late Miocene, with a peak before the late Pliocene (Harrison et al. 1992, Sun et al. 2011). These geographical uplifts resulted in the formation of large topographic barriers isolating South China fauna and favorizing recent speciation events and endemism as already shown in several other taxa such as frogs (Che et al. 2010), insects (Ye et al. 2016; Chen et al. 2016), birds (Cai et al. 2018, Liu et al. 2016, Dong et al. 2020), mammals (Ge et al. 2017) and plants (Ebersbach et al. 2017, Favre et al. 2016, Liu et al. 2017, Ye et al. 2017, Feng et al. 2013). Moreover, Quaternary (2.6 Ma) tectonic movements and the influence of the Indian and Pacific monsoons greatly contributed also to the segregation, dispersal and speciation of Cixiidae in southern China and Southeast Asia (Shi et al. 1998, Liang 2003).

The South China region is usually included in the Oriental realm in other studies (Zhang 1999, Zhang 2011), but our analysis indicates that for Cixiidae the South China region is

closer to the Central, Southwest, and North China region (Sino-Japanese realm). This is consistent with the results of a quantitative analysis of terrestrial mammals in China and adjacent regions by Xiang et al. (2004), where clustering analysis showed the proximity of South China region to Central and Southwest China regions, and they suggested these regions as the South China Division.

Conclusions

This study is the first zoogeographic analysis based on grid cells of Cixiidae in China and adjacent areas. However, since collecting efforts are stronger into southern China and taxonomic studies clearly advanced in the Taiwan region because of studies by Tsaur over the past three decades (Tsaur 1989, Tsaur 1990, Tsaur and Lee 1987, Tsaur et al. 1988, Tsaur et al. 1991a, Tsaur et al. 1991b, Tsaur 1989, Tsaur 1990, Tsaur 2009, Tsaur and Hsu 2003), the results reported from those areas may be based on more data than those in other regions of China. Previous studies of Cixiidae in countries adjacent to China are very limited in their numbers and scope of the investigations. Despite studies by Distant (1911), Anufriev (1987), Anufriev and Emeljanov (1988), Emeljanov (2015), Fennah 1978, Hoch (2013) a large number of species are still undescribed, particularly in the Indochina peninsula.

With the current available data, the observed distribution patterns show that an intercalary Sino-Japanese realm is recognizable between the Palaearctic and Oriental realms. At the regional level, the South China region cluster is more closely with the Southwest, Central and North China regions. Taiwan is clearly separated from the South China region and mainland China, but is more closely related to the Qinghai-Tibet region and Indochina countries. The Central and South China regions are close to each other, but the Qinghai-Tibet region is singularly different. In the future, a more comprehensive analysis in combination with a more reliable phylogenetic analysis of the Cixiidae family in certain areas of China and countries surrounding China, will be essential to develop a more complete biogeographical history of the evolution, development, and distribution of Cixiidae in China.

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Author contributions

Conceptualization, Y.L., J.F. and T.B.; Specimen identification, Y.L. and J.Z.; Methodology and Experiments, Y.L., J.Z. and T.B.; Data analysis, Y.L., J.F. and T.B.; writing—original draft preparation, Y.L.; writing—review and editing, Y.L., J.F. and T.B.; funding acquisition, J.F. All authors have read and agreed to the published version of the manuscript.

References

- Anufriev GA (1987) Review of the cixiid genus *Kuvera* Distant (Homoptera, Auchenorrhyncha, Cixiidae). *Taksonomiia nasekomykh Sibiri i Dal'nego Vostoka SSR, Vladivostok Dalnauka*, 4-21 pp.
- Anufriev GA, Emeljanov AF (1988) Suborder Cicadinea - (Auchenorrhyncha). In: Emeljanov AF, et al. (Ed.) P. A. 1988 - Keys to the insects of the Far East of the USSR, 2. Nauka, Leningrad (Russia). 12-49 pp.
- Bai RK, Guo HW, Feng JN (2015) A new species in the genus *Reptalus* Emeljanov, 1971 (Hemiptera: Cixiidae: Pentastirini) from China. *Entomotaxonomia* 37 ((1)): 31-42. <https://doi.org/10.11680/entomotax.2015005>
- Bartlett CR, O'Brien LB, Wilson SW (2014) A review of the planthoppers (Hemiptera: Fulgoroidea) of the United States. 50. *Memoirs of the American Entomological Society*, 1-287 pp.
- Bourgoin T (2021) FLOW (Fulgoromorpha Lists On the Web): a world knowledge base dedicated to Fulgoromorpha. URL: <http://hemiptra-databases.org/flow>
- Cai T, Fjeldså J, Wu Y, Shao S, Chen Y, Quan Q, Li X, Song G, Qu Y, Qiao G, Lei F (2018) What makes the Sino-Himalayan mountains the major diversity hotspots for pheasants? *Journal of Biogeography* 45 (3): 640-651. <https://doi.org/10.1111/jbi.13156>
- Che J, Zhou W, Hu J, Yan F, Papenfuss T, Wake D, Zhang Y (2010) Spiny frogs (Paini) illuminate the history of the Himalayan region and Southeast Asia. *Proceedings of the National Academy of Sciences of the United States of America* 107 (31): 13765-70. <https://doi.org/10.1073/pnas.1008415107>
- Chen C, Xia R, Chen H, He Y (2018) TBtools, a Toolkit for Biologists integrating various HTS-data handling tools with a user-friendly interface. *TBtools, a Toolkit for Biologists integrating various HTS-data handling tools with a user-friendly interface* 289660. <https://doi.org/10.1101/289660>
- Chen R, Shen J, Li C, Zhang E, Sun W, Ji M (2015) Mid- to late-Holocene East Asian summer monsoon variability recorded in lacustrine sediments from Jingpo Lake, Northeastern China. *The Holocene* 25 (3): 454-468. <https://doi.org/10.1177/0959683614561888>
- Chen R, Jiang L, Chen J, Qiao G (2016) DNA barcoding reveals a mysterious high species diversity of conifer-feeding aphids in the mountains of southwest China. *Scientific Reports* 6 (1): 1-11. <https://doi.org/10.1038/srep20123>
- Chou I, Lu JS, Huang J, Wang SZ (1985) Economic Insect Fauna of China. Fasc. 36. Homoptera: Fulgoroidea. Science Press, Beijing, China 2: 1-152.

- Condamine F, Silvestro D, Koppelhus E, Antonelli A (2020) The rise of angiosperms pushed conifers to decline during global cooling. *Proceedings of the National Academy of Sciences of the United States of America* 117 (46): 28867-28875. <https://doi.org/10.1073/pnas.2005571117>
- Cook C, Jones R, Langdon P, Leng M, Zhang E (2011) New insights on Late Quaternary Asian palaeomonsoon variability and the timing of the Last Glacial Maximum in southwestern China. *Quaternary Science Reviews* 30 (7-8): 808-820. <https://doi.org/10.1016/j.quascirev.2011.01.003>
- Cox B (2001) The biogeographic regions reconsidered. *Journal of Biogeography* 28 (4): 511-523. <https://doi.org/10.1046/j.1365-2699.2001.00566.x>
- Distant WL (1911) New genera and species of Oriental Homoptera. *Annals and Magazine of Natural History* 9 (52): 459-471. <https://doi.org/10.1080/00222931208693156>
- Distant WL (1916) The Fauna of British India including Ceylon and Burma. *Rhynchota* 6: 1-239.
- Dong F, Hung C, Yang X (2020) Secondary contact after allopatric divergence explains avian speciation and high species diversity in the Himalayan-Hengduan Mountains. *Molecular Phylogenetics and Evolution* 143: 106671. <https://doi.org/10.1016/j.ympev.2019.106671>
- Ebersbach J, Schnitzler J, Favre A, Muellner-Riehl AN (2017) Evolutionary radiations in the species-rich mountain genus *Saxifraga* L. *BMC Evolutionary Biology* 17 (1): 119. <https://doi.org/10.1186/s12862-017-0967-2>
- Emeljanov AF (2002) Contribution to classification and phylogeny of the family Cixiidae (Hemiptera, Fulgoroidea). *Denisia* 4 (176): 103-112.
- Emeljanov AF (2015) Planthoppers of the family Cixiidae of Russia and adjacent territories. In: Emeljanov AF, et al. (Ed.) *Keys to the fauna of Russia*. 177. 149 pp.
- Favre A, Päckert M, Pauls S, Jähnig S, Uhl D, Michalak I, Muellner-Riehl A (2015) The role of the uplift of the Qinghai-Tibetan Plateau for the evolution of Tibetan biotas. *Biological Reviews* 90 (1): 236-253. <https://doi.org/10.1111/brv.12107>
- Favre A, Michalak I, Chen C, Wang J, Pringle J, Matuszak S, Sun H, Yuan Y, Struwe L, Muellner-Riehl A (2016) Out-of-Tibet: the spatio-temporal evolution of *Gentiana* (Gentianaceae). *Journal of Biogeography* 43 (10): 1967-1978. <https://doi.org/10.1111/jbi.12840>
- Feng X, Tang B, Kodrul T, Jin J (2013) Winged fruits and associated leaves of *Shorea* (Dipterocarpaceae) from the Late Eocene of South China and their phytogeographic and paleoclimatic implications. *American Journal of Botany* 100 (3): 574-581. <https://doi.org/10.3732/ajb.1200397>
- Fennah GR (1980) The genus *Bajauana* and two allied new genera in New Guinea (Fulgoroidea: Cixiidae). *Pacific Insects* 22 (1): 237-328.
- Fennah RG (1956) Fulgoroidea from southern China. *Proceedings of the California Academy of Science* (4th Series) 28 (4): 441-527.
- Fennah RG (1978) Fulgoroidea (Homoptera) from Viet-nam. *Annales Zoologici* 34 (9): 207-279.
- Gao C, Chen J, Li Y, Jiang L, Qiao G (2018) Congruent patterns between species richness and areas of endemism of the Greenideinae aphids (Hemiptera: Aphididae) revealed by global-scale data. *Zoological Journal of the Linnean Society* 183 (4): 791-807. <https://doi.org/10.1093/zoolinnean/zlx092>

- Gao E, He J, Wang Z, Xu Y, Tang X, Jiang H (2017) China's zoogeographical regionalization based on terrestrial vertebrates. *Biodiversity Science* 25 (12): 1321-1330. <https://doi.org/10.17520/biods.2017135>
- Ge D, Lu L, Cheng J, Xia L, Chang Y, Wen Z, Lv X, Du Y, Liu Q, Yang Q (2017) An endemic rat species complex is evidence of moderate environmental changes in the terrestrial biodiversity centre of China through the late Quaternary. *Scientific Reports* 7 (1): 46127. <https://doi.org/10.1038/srep46127>
- Ge QS, Bian JJ, Zheng JY, Liao YM, Hao ZX, Yin YH (2013) The climate regionalization in China for 1981-2010. *Chinese Science Bulletin* 58 (30): 3088-3099. <https://doi.org/10.1360/972012-1491>
- Guo H, Wang Y (2007) Taxonomic study of the genus *Reptalus* (Hemiptera: Cixiidae: Pentastirini) from China with description of a new species. *Entomotaxonomia* 29: 275-280.
- Guo H, Wang Y, Feng J (2009) Taxonomic study of the genus *Oecleopsis* Emeljanov, 1971 (Hemiptera: Fulgoromorpha: Cixiidae: Pentastirini), with descriptions of three new species from China. *Zootaxa* 2172 (1): 45-58. <https://doi.org/10.11646/zootaxa.2172.1.3>
- Guo H, Feng J (2010) A new species of the genus *Indolipa* Emeljanov, 2001 from China (Hemiptera: Fulgoromorpha: Cixiidae: Pentastirini), with a checklist of world species. *Zootaxa* 2668 (1): 33-43. <https://doi.org/10.11646/zootaxa.2668.1.3>
- Harrison TM, Copeland P, Kidd WS, Yin A (1992) Raising tibet. *Science* 255 (5052): 1663-1670. <https://doi.org/10.1126/science.255.5052.1663>
- Hayashi M, Fujinuma S (2016) *Catalogue of the insects of Japan*. Volume 4 Paraneoptera (Psocodea, Thysanoptera, Hemiptera). In: Hayashi M, et al. (Ed.) Fulgoromorpha. In: Entomological Society of Japan. Editorial Committee of Catalogue of the Insects of Japan, 1-355 pp.
- He J, Kreft H, Gao E, Wang Z, Jiang H (2017) Patterns and drivers of zoogeographical regions of terrestrial vertebrates in China. *Journal of Biogeography* 44 (5): 1172-1184. <https://doi.org/10.1111/jbi.12892>
- He J, Kreft H, Lin S, Xu Y, Jiang H (2018) Cenozoic evolution of beta diversity and a Pleistocene emergence for modern mammal faunas in China. *Global Ecology and Biogeography* 27 (11): 1326-1338. <https://doi.org/10.1111/geb.12800>
- Hoch H (2013) Diversity and evolution of the Southeast-Asian planthopper taxon Bannini (Hemiptera, Cixiidae). *Nova Supplementa Entomologica* 23 (September): 1-2.
- Holt B, Lessard J, Borregaard M, Fritz S, Araújo M, Dimitrov D, Fabre P, Graham C, Graves G, Jønsson K, Nogués-Bravo D, Wang Z, Whittaker R, Fjeldså J, Rahbek C (2013) An update of Wallace's Zoogeographic regions of the World. *Science* 339 (6115): 74-78. <https://doi.org/10.1126/science.1228282>
- Holzinger W, Emeljanov AF, Kammerlander I (2002) The family Cixiidae Spinola, 1839 (Hemiptera: Fulgoromorpha) - a Review. *Denisia* 04 (176): 113-138.
- Hori Y (1982) The genus *Betacixius* Matsumura, 1914 (Homoptera: Cixiidae) of Formosa. Special issue to the memory of retirement of Emeritus Professor Michio Chûjô. Association of the Memorial Issue of Emeritus Professor M. Chûjô C/O Biological Laboratory, Nagoya Women's University, Nagoya 175-182.
- Hua LZ (2000) List of Chinese Insects. 1. Zhejiang Science and Technology Publishing House, 52-53 pp.

- Huang J (1995) Homoptera: Cixiidae In: Zhu Ting (Ed.) An 1995 – Insects and macrofungi of Gutianshan. Zhejiang Science and Technology Publishing House, 673-688 pp.
- Huang J, Chen B, Liu C, Lai J, Zhang J, Ma K (2012) Identifying hotspots of endemic woody seed plant diversity in China. Diversity and Distributions 18 (7): 673-688. <https://doi.org/10.1111/j.1472-4642.2011.00845.x>
- Huang X, Lei F, Qiao G (2008) Areas of endemism and patterns of diversity for aphids of the Qinghai-Tibetan Plateau and the Himalayas. Journal of Biogeography 35: 230-240. <https://doi.org/10.1111/j.1365-2699.2007.01776.x>
- Hu JF (1935) Catalogus Insectorum Sinensium (Catalogue of Chinese Insects). In: Hu JF, et al. (Ed.) The Fan Memorial Institute of Biology. 1. The Fan Memorial Institute of Biology, 1-378 pp.
- Jaccard P (1901) Étude comparative de la distribution florale dans une portion des Alpes et du Jura. Bulletin de la Societe Vaudoise Sciences Naturelles 37: 547-579.
- Jacobi A (1944) Die Zikadenfauna der Provinz Fukien in Sudchina und ihre tiergeographischen Beziehungen. Mitteilungen der Munchner Entomologischen Gesellschaft 34: 5-66.
- Jiang J, JDLY (2017) Changes and projection of dry/wet areas over China. Journal of Atmospheric Sciences 41 (1): 43-56.
- Jin J, Liao W, Wang B, Peng S (2003) Global change in Cenozoic and evolution of flora in China. Guihaia 23: 217-225.
- Johnson K, Dietrich C, Friedrich F, Beutel R, Wipfler B, Peters R, Allen J, Petersen M, Donath A, Walden KO, Kozlov A, Podsiadlowski L, Mayer C, Meusemann K, Vasilikopoulos A, Waterhouse R, Cameron S, Weirauch C, Swanson D, Percy D, Hardy N, Terry I, Liu S, Zhou X, Misof B, Robertson H, Yoshizawa K (2018) Phylogenomics and the evolution of hemipteroid insects. Proceedings of the National Academy of Sciences 115 (50): 12775-12780. <https://doi.org/10.1073/pnas.1815820115>
- Kalkandelen A (1990) Türkiye Cixiidae (Homoptera) Türleri Üzerinde Taksonomik Çalışmalar V-Pentastirini: *Pentastiridus* ve *Setapius*. Bitki Koruma Bülteni 30: 3-27.
- Kato M (1932) Notes on some Homoptera from South Manchurai, collected by Mr. Yukimichi Kikuchi. Kontyu. Tokyo Entomological Society 5: 216-229.
- Kreft H, Jetz W (2010) A framework for delineating biogeographical regions based on species distributions. Journal of Biogeography 37 (11): 2029-2053. <https://doi.org/10.1111/j.1365-2699.2010.02375.x>
- Kreft H, Jetz W (2013) Comment on "An update of Wallace's zoogeographic regions of the world". Science (New York, N.Y.) 341 (6144): 343. <https://doi.org/10.1126/science.1237471>
- Labandeira C (2014) Why did terrestrial insect diversity not increase during the angiosperm radiation? Mid-Mesozoic, plant-associated insect lineages harbor clues. In: Labandeira C, et al. (Ed.) Evolutionary Biology: Genome Evolution, Speciation, Coevolution and Origin of Life. Springer International Publishing, Cham, 38 pp. https://doi.org/10.1007/978-3-319-07623-2_13
- Lei FM, Qu YH, Lu JL, Liu Y, Yin ZH (2003) Conservation on diversity and distribution patterns of endemic birds in China. Biodiversity and Conservation 12 (2): 239-254. <https://doi.org/10.1023/A:1021928801558>

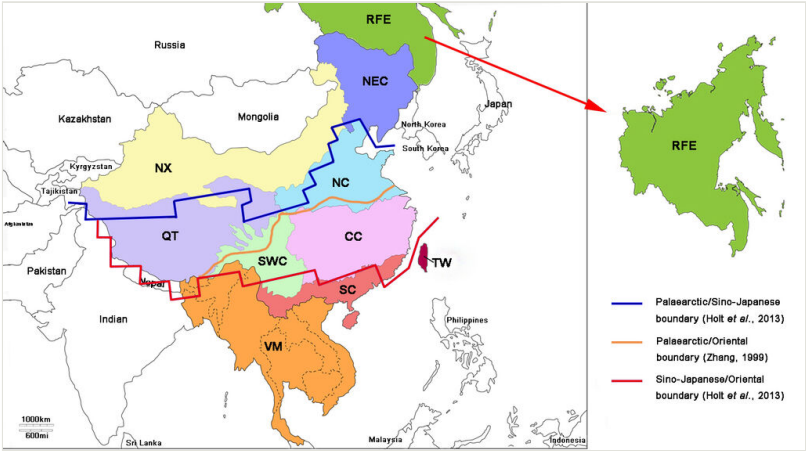
- Liang AP (2001) Taxonomic notes on oriental and eastern Palaearctic Fulgoroidea (Hemiptera). *Journal of the Kansas Entomological Society* 73 (4): 235-237. <https://doi.org/10.2307/25085975>
- Liang AP (2003) Zoogeography of the spittlebug superfamily Cercopoidea (Hemiptera) in Southern Tibet and the nearby areas. *Acta Zootaxonomica Sinica* 28: 589-598.
- Liang AP (2005a) A new structure on the subantennal process of *Borysthenes* species (Hemiptera: Fulgoromorpha: Cixiidae: Borystheninae). *Proceedings of the Biological Society of Washington* 118 (4): 809-814. [https://doi.org/10.2988/0006-324X\(2005\)118\[809:ANSOTS\]2.0.CO;2](https://doi.org/10.2988/0006-324X(2005)118[809:ANSOTS]2.0.CO;2)
- Liang AP (2005b) Occurrence of the latero-subapical labial sensillum in *Borysthenes maculata* and *Andes marmorata* (Hemiptera: Fulgoromorpha: Cixiidae). *Journal of Entomological Science* 40: 428-237. <https://doi.org/10.18474/0749-8004-40.4.428>
- Li S, Ji X, Harrison T, Deng C, Wang S, Wang L, Zhu R (2020) Uplift of the Hengduan Mountains on the southeastern margin of the Tibetan Plateau in the late Miocene and its paleoenvironmental impact on hominoid diversity. *Palaeogeography, Palaeoclimatology, Palaeoecology* 553 <https://doi.org/10.1016/j.palaeo.2020.109794>
- Liu J, Luo Y, Li D, Gao L (2017) Evolution and maintenance mechanisms of plant diversity in the Qinghai-Tibet Plateau and adjacent regions: retrospect and prospect. *Biodiversity Science* 25 (2): 41-45. <https://doi.org/10.17520/biods.2016293>
- Liu Y, Hu J, Li S, Duchon P, Wegmann D, Schweizer M (2016) Sino-Himalayan mountains act as cradles of diversity and immigration centres in the diversification of parrotbills (Paradoxornithidae). *Journal of Biogeography* 43 (8): 1488-1501. <https://doi.org/10.1111/jbi.12738>
- Li Y, Liu XH, Ren D, Li XC, Yao YZ (2017) First report of Cixiidae insect fossils from the Miocene of the northeastern Tibetan Plateau and their palaeoenvironmental implications. *Alcheringa* 41 (1): 54-60. <https://doi.org/10.1080/03115518.2016.1180027>
- Luo C, Jiang T, Szwedo J, Wang B, Xiao C (2020) A new planthopper family Katlasidae fam. nov. (Hemiptera: Fulgoromorpha: Fulgoroidea) from mid-Cretaceous Kachin amber. *Cretaceous Research* 115: 104532. <https://doi.org/10.1016/j.cretres.2020.104532>
- Luo Y, Liu J, Feng J (2019a) Two new species in the genus *Kuvera* Distant, 1906 (Hemiptera, Cixiidae, Cixiinae) from China. *ZooKeys* 832: 135-152. <https://doi.org/10.3897/zookeys.832.30301>
- Luo Y, Liu JJ, Feng JN (2019b) Two new species in the genus *Indolipa* Emeljanov, 2001 (Hemiptera: Fulgoromorpha: Cixiidae: Pentastirini) from China. *Zootaxa* 4560 (1): 184-194. <https://doi.org/10.11646/zootaxa.4560.1.11>
- Luo Y, Bourgoin T, Szwedo J, Feng J (2021) Acrotiarini trib. nov., in the Cixiidae (Insecta, Hemiptera, Fulgoromorpha) from mid-Cretaceous amber of northern Myanmar, with new insights in the classification of the family. *Cretaceous Research* 128: 104959. <https://doi.org/10.1016/j.cretres.2021.104959>
- Matsumura S (1914) Die Cixiinen Japans. *Annotationes Zoologicae Japonenses* 8: 393-434.
- Melichar L (1902) Homopteren aus West-China, Persien, und dem Sud-Ussuri-Gebiete. *Annuaire du Musée Zoologique de l'Académie Impériale des Sciences de Saint Pétersbourg* 7: 76-146.
- Metcalf ZP (1936) Cixidae- General Catalogue of the Homoptera. Fascicule IV, 266 pp.

- Morrone J (2015) Biogeographical regionalisation of the world: A reappraisal. *Australian Systematic Botany* 28 (3): 81-90. <https://doi.org/10.1071/SB14042>
- Rahmam MA, Kwon YJ, Suh SJ (2011) Sexual dimorphism documented in *Reptalus iguchii* (Matsumura) (Hemiptera: Fulgoromorpha: Cixiidae) with a description of males. *Entomological Research* 42 (1): 35-43. <https://doi.org/10.1111/j.1748-5967.2011.00358.x>
- Rahman MA, Kwon YJ, Suh SJ (2017) Three new species of the genus *Kuvera* Distant (Hemiptera: Fulgoromorpha: Cixiidae) from Korea. *Oriental Insects* 52 (1): 66-78. <https://doi.org/10.1080/00305316.2017.1344741>
- Ren X, Wen R (2011) All about Chinese Geography. The Chinese Overseas Publishing House, 367 pp.
- Ren ZY, Qiu ZT, Hu CL, Sun CH (2014) Four new record species of Cixiidae and Dictyopharidae from Jiangsu Province (Hemiptera: Fulgoroidea). *Journal of Jinling Institute of Technology* 30 (3): 76-7.
- Rohlf FJ (2000) NTSYS: Numerical Taxonomy and Multivariate analysis System (version 2.1). Numerical Taxonomy and Multivariate analysis System, 82 pp.
- Sclater PL (1858) On the general geographical distribution of the members of the class Aves. *Journal of the Proceedings of the Linnean Society of London. Zoology* 2 (7): 130-136. <https://doi.org/10.1111/j.1096-3642.1858.tb02549.x>
- Shi Y, Tang M, Ma Y (1998) The relationship of the second phase uplift of Qinghai-Xizang Plateau with the inoculation of Asian monsoon. *Science in China: Earth Sciences* 28: 263-271.
- Smith S, Bermingham E (2005) The biogeography of lower Mesoamerican freshwater fishes. *Journal of Biogeography* 32 (10): 1835-1854. <https://doi.org/10.1111/j.1365-2699.2005.01317.x>
- Song G, Zhang R, Qu Y, Wang Z, Dong L, Kristin A, Alström P, Ericson PP, Lambert D, Fjeldså J, Lei F (2016) A zoogeographical boundary between the Palaearctic and Sino-Japanese realms documented by consistent north/south phylogeographical divergences in three woodland birds in eastern China. *Journal of Biogeography* 43 (11): 2099-2112. <https://doi.org/10.1111/jbi.12758>
- Song N, Liang A (2013) A preliminary molecular phylogeny of planthoppers (Hemiptera: Fulgoroidea) based on nuclear and mitochondrial DNA sequences. *PLOS One* 8 (3): 1-11. <https://doi.org/10.1371/journal.pone.0058400>
- Sun B, Wu J, Liu Y(, Ding S, Li X, Xie S, Yan D, Lin Z (2011) Reconstructing Neogene vegetation and climates to infer tectonic uplift in western Yunnan, China. *Palaeogeography, Palaeoclimatology, Palaeoecology* 304 (3-4): 328-336. <https://doi.org/10.1016/j.palaeo.2010.09.023>
- Szwedo J (2016) The unity, diversity and conformity of bugs (Hemiptera) through time. *Earth and Environmental Science Transactions of the Royal Society of Edinburgh* 107 (2-3): 109-128. <https://doi.org/10.1017/S175569101700038X>
- Tang Z, Wang Z, Zheng C, Fang J (2006) Biodiversity in China's mountains. *Frontiers in Ecology and the Environment* 4 (7): 347-352. [https://doi.org/10.1890/1540-9295\(2006\)004\[0347:BICM\]2.0.CO;2](https://doi.org/10.1890/1540-9295(2006)004[0347:BICM]2.0.CO;2)
- Tsaor S, Lee P (1987) Cixiidae of Taiwan, Part II. Bothriocerini. *Bulletin of the Entomological Society of NCHU* 20: 7-14.
- Tsaor S, Hsu T, Van Stalle J (1988) Cixiidae of Taiwan, Part I. Pentastirini. *Journal of Taiwan Museum* 41 (1): 35-74.

- Tsaur S (1989) A new specie of *Oliarus* from Taiwan. *Academia Sinica* 28 (3): 171-174.
- Tsaur S (1990) Two new species of *Cixius* from California (USA) (Homoptera Fulgoroidea Cixiidae) with a revised key to the species of the genus. *Bulletin of the Institute of Zoology, Academia Sinica* 29 (1): 49-55.
- Tsaur S, Hsu T, Van Stalle J (1991a) Cixiidae of Taiwan, Part VI. *Cixius*. *Journal of Taiwan Museum* 44 (2): 169-306.
- Tsaur S, Hsu T, Van Stalle J (1991b) Cixiidae of Taiwan, Part V. Cixiini except *Cixius*. *Journal of Taiwan Museum* 44 (1): 1-78.
- Tsaur SC (1989) Cixiidae of Taiwan, Part IV. Stenophlepsini. *Bulletin of the Institute of Zoology, Academia Sinica* 28 (2): 81-85.
- Tsaur SC (1990) Two new species of *Oliarus* from Taiwan (Homoptera: Fulgoroidea: Cixiidae), with proposition and discussion on *O. horishanus* group. *Bulletin of the Institute of Zoology, Academia Sinica* 29 (3): 135-139.
- Tsaur SC, Hsu TC (2003) Cixiidae of Taiwan, Part VII. Pintaliini. *Zoological Studies* 42 (3): 431-443.
- Tsaur SC (2009) The rediscovery of the holotype of *Kotonisia kanoi* Matsumura, 1938 with notes on Matsumura's type specimens of Fulgoroidea (Insecta: Hemiptera: Fulgoromorpha). *Zootaxa* (2315)66-68. <https://doi.org/10.11646/zootaxa.2315.1.7>
- Urban JM, Cryan JR (2012) Two ancient bacterial endosymbionts have coevolved with the planthoppers (Insecta: Hemiptera: Fulgoroidea). *BMC Evolutionary Biology* 12 (1): 87. <https://doi.org/10.1186/1471-2148-12-87>
- Van Stalle (1991) Taxonomy of Indo-Malayan Pentastirini (Homoptera, Cixiidae). *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique* 61: 5-101.
- Van Stalle J (1987) Revision of Afrotropical Pentastirini (Homoptera, Cixiidae) 5: the genus *Oliarus* Stål, 1862. *Musée Royal de l'Afrique Centrale Tervuren, Belgique*. 252: 1-173.
- Wallace A (1876) The geographical distribution of animals: With a study of the relations of living and extinct faunas as elucidating the past changes of the Earth's surface. 1. Harper Brothers, 503 pp. <https://doi.org/10.2307/1101>
- Wang S (1991) A new pest in Chinese jujube tree- A new species of Cixiidae described in China. *Acta Agriculturae Boreali—Sinica* 6 (3): 85-87. <https://doi.org/10.1029/JB073i010p03295>
- Wang ZY (1992) An initial observation of overwintering habits of *Pentastiridius apicalis* Uhler (Hemiptera: Cixiidae) in China. *Guangxi Plant Protection* 1: 16-41.
- Wen J, Zhang J, Nie Z, Zhong Y, Sun H (2014) Evolutionary diversifications of plants on the Qinghai-Tibetan Plateau. *Frontiers in Genetics* 5: 1-16. <https://doi.org/10.3389/fgene.2014.00004>
- Wheeler A (2003) Bryophagy in the Auchenorrhyncha: Seasonal history and habits of a moss specialist *Javesella opaca* (Beamer) (Fulgoroidea: Delphacidae). *Proceedings of the Entomological Society of Washington* 105: 599-610.
- Wilson S (2005) Keys to the families of fulgoromorpha with emphasis on planthoppers of potential economic importance in the southeastern United States (Hemiptera: Auchenorrhyncha). *Florida Entomologist* 88 (4): 464-481. [https://doi.org/10.1653/0015-4040\(2005\)88\[464:KTTFOF\]2.0.CO;2](https://doi.org/10.1653/0015-4040(2005)88[464:KTTFOF]2.0.CO;2)
- Wilson SWMCDRWM (1994) Evolutionary patterns of host plant use by delphacid planthoppers and their relatives. In: Wilson SW, et al. (Ed.) n: Denno RF; Perfect TJ 1994 - Planthoppers: Their Ecology and Management, Chapman. 106 pp.

- Xiang Z, Liang X, Huo S, Ma S (2004) Quantitative analysis of land mammal zoogeographical regions in China and adjacent regions. *Zoological Studies* 43 (1): 142-160.
- Xie C, Xie D, Zhong Y, Guo X, Liu Q, Zhou S, He X (2019) The effect of Hengduan Mountains Region (HMR) uplift to environmental changes in the HMR and its eastern adjacent area: Tracing the evolutionary history of *Allium* section *Sikkimensia* (Amaryllidaceae). *Molecular Phylogenetics and Evolution* 130: 380-396. <https://doi.org/10.1016/j.ympev.2018.09.011>
- Xing JC, Chen XS (2014) Nomenclatural changes for the genus *Discophorellus* Tsaur & Hsu, 1991 and new replacement name for *Numata* Matsumura, 1935 (Hemiptera: Fulgoromorpha). *Zootaxa* 3856 (1): 149-150. <https://doi.org/10.11646/zootaxa.3856.1.8>
- Ye J, Bai W, Bao L, Wang T, Wang H, Ge J (2017) Sharp genetic discontinuity in the aridity-sensitive *Lindera obtusiloba* (Lauraceae): solid evidence supporting the Tertiary floral subdivision in East Asia. *Journal of Biogeography* 44 (9): 2082-2095. <https://doi.org/10.1111/jbi.13020>
- Ye JW, Zhang Y, Wang XJ (2017) Phylogeographic breaks and the mechanisms of their formation in the Sino-Japanese floristic region. *Chinese Journal of Plant Ecology* 41 (9): 1003-1019. <https://doi.org/10.17521/cjpe.2016.0388>
- Ye Z, Chen P, Bu W (2016) Terrestrial mountain islands and Pleistocene climate fluctuations as motors for speciation: A case study on the genus *Pseudovelia* (Hemiptera: Veliidae). *Scientific Reports* 6 (1): 3362. <https://doi.org/10.1038/srep33625>
- Yuan S, Huang M, Wang X, Ji L, Zhang Y (2014) Centers of endemism and diversity patterns for typhlocybina leafhoppers (Hemiptera: Cicadellidae: Typhlocybinae) in China. *Insect Science* 21 (4): 523-536. <https://doi.org/10.1111/1744-7917.12040>
- Yu H, Miao S, Xie G, Guo X, Chen Z, Favre A (2020) Contrasting floristic diversity of the Hengduan Mountains, the Himalayas and the Qinghai-Tibet Plateau sensu stricto in China. *Frontiers in Ecology and Evolution* 8: 136. <https://doi.org/10.3389/fevo.2020.00136>
- Zhang D, Fengquan L, Jianmin B (2000) Eco-environmental effects of the Qinghai-Tibet Plateau uplift during the Quaternary in China. *Environmental Geology* 39 (12): 1352-1358. <https://doi.org/10.1007/s002540000174>
- Zhang P, Chen X (2011) A checklist and key to species of the genus *Betacixius* Matsumura (Hemiptera: Fulgoromorpha: Cixiidae) with descriptions of two new species from Guizhou province, China. *Florida Entomologist* 94 (1): 48-56. <https://doi.org/10.1653/024.094.0107>
- Zhang P, Chen XS (2011a) Two new species of the genus *Discophorellus* Tsaur & Hsu (Hemiptera: Fulgoromorpha: Cixiidae: Cixiini) from Guizhou Province, China. *Zootaxa* 68 (3105): 60-68. <https://doi.org/10.11646/zootaxa.3105.1.3>
- Zhang P, Chen XS (2011b) A checklist and key to species of the genus *Betacixius* matsumura (Hemiptera: Fulgoromorpha: Cixiidae) with descriptions of two new species from Guizhou Province, China. *Florida Entomologist* 94 (1): 48-56. <https://doi.org/10.1653/024.094.0107>
- Zhang P, Chen X (2013a) Taxonomic study on the planthopper genus *Macrocixius* Matsumura (Hemiptera: Fulgoromorpha: Cixiidae) with descriptions of two new species from China. *Zootaxa* 3646 (3): 277-88. <https://doi.org/10.11646/zootaxa.3646.3.6>

- Zhang P, Chen X (2013b) Two new bamboo-feeding species of the genus *Neocarpia* Tsaur & Hsu (Hemiptera: Fulgoromorpha: Cixiidae: Eucarpiini) from Guizhou Province, China. *Zootaxa* 3641 (1): 41-8. <https://doi.org/10.11646/zootaxa.3641.1.4>
- Zhang R (1999) Zoogeography of China. Science Press, 393 pp.
- Zhang R (2011) China Animal Geography. Science Press
- Zhao Y, Yu Z, Chen F, Zhang J, Yang B (2009) Vegetation response to Holocene climate change in monsoon-influenced region of China. *Earth-Science Reviews* 97 (1-4): 242-256. <https://doi.org/10.1016/j.earscirev.2009.10.007>
- Zhao Z, Jin B, Zhou Z, Yang L, Long J, Chen X (2020a) Determinants of Delphacidae richness and endemism in China. *Ecological Entomology* 45 (6): 1396-1407. <https://doi.org/10.1111/een.12924>
- Zhao Z, Yang L, Long J, Chang Z, Zhou Z, Zhi Y, Yang L, Li H, Sui Y, Gong N, Wang X, Chen X (2020b) Testing seven hypotheses to determine what explains the current planthopper (Fulgoridae) geographical and species richness patterns in China. *Insects* 11 (12): 892. <https://doi.org/10.3390/insects11120892>
- Zhen Z (1960) The zoogeographic division of China and the distribution of chief economic animals. *Chinese Journal of Zoology* 154 (4): 176-177.
- Zhi Y, Yang L, Zhang P, Chen XS (2017) Taxonomic study of the genus *Neocarpia* Tsaur & Hsu, with descriptions of two new species from China (Hemiptera, Fulgoromorpha, Cixiidae). *ZooKeys* 2017 (695): 19-35. <https://doi.org/10.3897/zookeys.695.12809>
- Zhi Y, Yang L, Zhang P, Chen XS (2018a) Two new species of genus *Oecleopsis* Emeljanov from China, with descriptions of female genitalia of five species (Hemiptera, Fulgoromorpha, Cixiidae). *ZooKeys* 2018 (768): 1-17. <https://doi.org/10.3897/zookeys.768.24796>
- Zhi Y, Yang L, Zhang P, Chen XS (2018b) Two new species of the genus *Andixius* Emeljanov & Hayashi from China (Hemiptera, Fulgoromorpha, Cixiidae). *ZooKeys* 2018 (739): 55-64. <https://doi.org/10.3897/zookeys.739.13043>
- Zhi Y, Zhang P, Yang L, Chen XS (2019) Two new species of the genus *Tsauria* Koçak & Kemal (Hemiptera, fulgoromorpha, cixiidae) from china, with descriptions of female genitalia of three species. *ZooKeys* 2019 (855): 55-69. <https://doi.org/10.3897/zookeys.855.34024>
- Zhi Y, Zhang C, Yang L, Chen X (2020a) Two new species of the genus *Betacixius* Matsumura, 1914 from China (Hemiptera, Fulgoromorpha, Cixiidae). *ZooKeys* 956: 1-18. <https://doi.org/10.3897/zookeys.956.50195>
- Zhi Y, Zhang P, Yang L, Chen X (2020b) Two new species of the genus *Indolipa* Emeljanov (Hemiptera, Fulgoromorpha, Cixiidae) from Yunnan Province, China, with a key to species. *ZooKeys* 956: 19-30. <https://doi.org/10.3897/zookeys.956.51326>
- Zhi Y, Yang L, Chen XS (2021) Two new bamboo-feeding species of the genus *Kirbyana* Distant, 1906 from China (Hemiptera, fulgoromorpha, cixiidae). *ZooKeys* 1037: 1-1. <https://doi.org/10.3897/zookeys.1037.64653>
- Zhou Q, Sun H, Evans N, Li C, Liu Z, Zhang Q, Yan G, Huang J (2018) Contemporaneous east–west extension and north–south compression at 43 Ma in the Himalayan orogen. *Journal of Structural Geology* 117: 124-135. <https://doi.org/10.1016/j.jsg.2018.09.011>



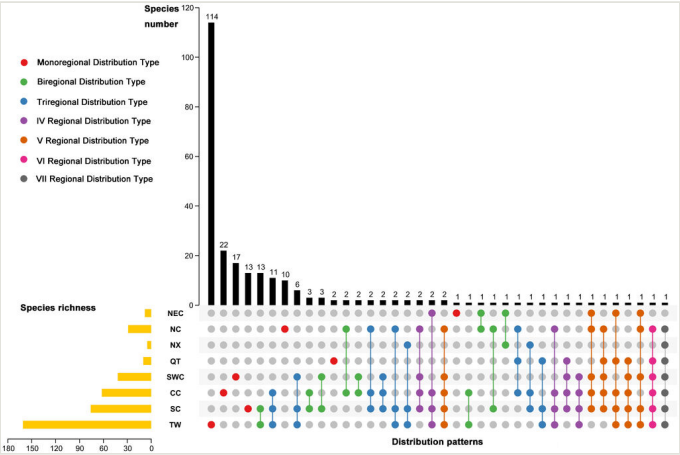


Figure 2.

Venn diagram of the number of cixiid species and distribution patterns in China zoogeographical regions.

a Abbreviations: NEC, Northeast China; NC, North China; NX, Nei Mongol-Xinjiang; QT, Qinghai-Tibet; SWC, Southwest China; CC, Central China; SC, South China; TW, Taiwan.

b The dots in this figure indicate the number of cixiid species distributed in different zoogeographical regions; there are no endemic species in the Nei Mongol-Xinjiang region.

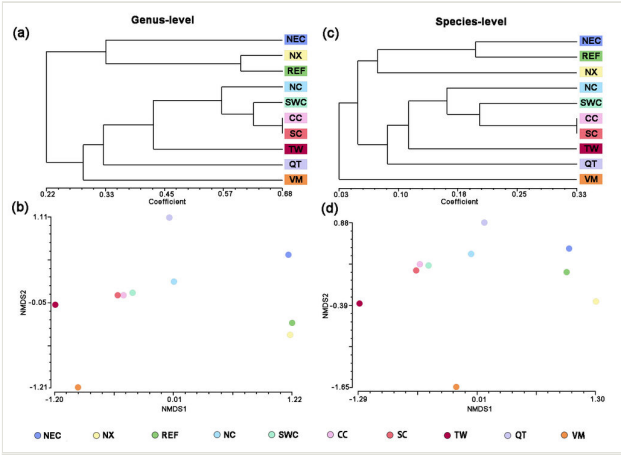


Figure 3. Dendrograms from UPGMA clustering and NMDS ordination of Jaccard similarity coefficients based on Chinese zoogeographical regions and adjacent areas for Chinese Cixiidae genera (a), (b) and species (c), (d). Abbreviations: NEC, Northeast China; NC, North China; NX, Nei Mongol-Xinjiang; QT, Qinghai-Tibet; SWC, Southwest China; CC, Central China; SC, South China; TW, Taiwan; RFE, Russian Far East; VM, Vietnam, Laos, Thailand, Cambodia, Myanmar, Bhutan, Bangladesh and part of Indian.

Table 1.

Species richness, endemism, and the proportion of endemic species in each of the 8 zoogeographical regions of China.

Zoogeographical regions	Species richness	Number of endemic species	Endemic species %
South China	76	13	17.11
Southwest China	42	17	40.48
Central China	62	22	35.48
North China	29	10	34.48
Northeast China	8	1	12.5
Nei Mongol-Xinjiang	5	0	0
Qinghai-Tibet	10	2	20
Taiwan	161	114	70.81
China	253	205	81.03

Table 2.

Distribution patterns of Cixiidae among China zoogeographical regions and proportion of species in these patterns of the total number of species. Abbreviations: NEC, Northeast China; NC, North China; NX, Nei Mongol-Xinjiang; QT, Qinghai-Tibet; SWC, Southwest China; CC, Central China; SC, South China; TW, Taiwan.

Distributed pattern	Number of species	Species number %
TW	114	45.10
CC	22	8.70
SWC	17	6.72
SC	13	5.14
NC	10	3.95
QT	2	0.79
NEC	1	0.40
SC-TW	13	5.14
CC-SC	3	1.19
SWC-SC	3	1.19
NC-CC	2	0.79
SWC-CC	2	0.79
CC-TW	1	0.40
NEC-NC	1	0.40
NC-SC	1	0.40
NEC-NX	1	0.40
CC-SC-TW	11	4.35
SWC-SC-TW	6	2.37
NC-SC-CC	2	0.79
SWC-SC-CC	2	0.79
NC-SC-TW	2	0.79
NX-SC-TW	2	0.79
NC-QT-CC	1	0.40
NX-CC-SC	1	0.40
QT-SC-TW	1	0.40
NC-SWC-CC-SC	2	0.79
NEC-CC-SC-TW	2	0.79
NC-CC-SC-TW	1	0.40
QT-SWC-CC-SC	1	0.40
SWC-CC-SC-TW	1	0.40
NC-SWC-CC-SC-TW	2	0.79

NEC-NC-SWC-CC-SC	1	0.40
NC-QT-SWC-CC-SC	1	0.40
NEC-QT-CC-SC-TW	1	0.40
QT-SWC-CC-SC-TW	1	0.40
NEC-NC-SWC-CC-TW	1	0.40
NC-QT-SWC-CC-SC-TW	1	0.40
NC-NX-QT-SWC-CC-SC-TW	1	0.40

Table 3.

Number and percentage of cixiid species distributed in China by tribes among the Chinese zoogeographical regions. Abbreviations: NEC, Northeast China; NC, North China; NX, Nei Mongol-Xinjiang; QT, Qinghai-Tibet; SWC, Southwest China; CC, Central China; SC, South China; TW, Taiwan.

Chinese tribes of Cixiidae	Number of species	Species %	Zoogeographical distribution
Andnini Emeljanov, 2002	13	5.14	NC, QT, SWC, CC, SC, TW
Bennini Metcalf, 1938	1	0.40	TW
Brixiini Emeljanov, 2002	2	0.79	TW
Cixiini Spinola, 1839	116	45.85	NC, NX, QT, SWC, CC, SC, TW
Eucarpiini Emeljanov, 2002	16	6.32	SWC, CC, SC, TW
Oecleini Muir, 1922	4	1.58	TW
Pentastirini Emeljanov, 1971	52	20.55	NEC, NC, NX, QT, SWC, CC, SC, TW
Semonini Emeljanov, 2002	43	17.00	NEC, NC, NX, QT, SWC, CC, SC, TW
Stenophlepsini Metcalf, 1938	1	0.40	TW
Borysthenini Stål, 1866	5	1.98	SWC, CC, SC, TW

Supplementary material

Suppl. material 1: 48 additional Cixiidae species from adjacent areas based on literature and FLOW (Bourgoin, 2021).

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Data type: Table

Brief description: Presence (1) or absence (0) of 48 Cixiidae species in VM (Bangladesh, Bhutan, Cambodia, Laos, Myanmar, Thailand, Vietnam) and RFE (Russian Far East).

* BD, Bangladesh; BT, Bhutan; KH, Cambodia; LA, Laos; MM, Myanmar; TH, Thailand; VN, Vietnam.

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