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A Checklist of the Caddisflies (Insecta: Trichoptera) from the Middle and Lower Basins of Jinsha River, Southwestern China; Including One New Species and Nine New Records in China †

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Abstract: A checklist of trichopteran species in the middle and lower basins of the Jinsha River (southwestern China) is compiled for the first time. upon collected materials. It recorded ten families, 13 genera, and 23 species were recorded. Among them, the male of a new species *Cheumatopsyche latisecta* Ge & Sun, sp. nov., which can be diagnosed by its genitalia, is described and illustrated. In addition, nine other species are recorded for the first time from China, six species and three ones are recorded for the first time for Yunnan and Sichuan provinces, respectively. This trichopteran species list can provide guidance for caddisfly identification of the river and the region.

Keywords: taxonomy; *Cheumatopsyche*; new record; distribution; biodiversity

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1. Introduction

Biodiversity includes species diversity, phylogenetic diversity and functional diversity [1,2], and is closely related to human survival, living and production [3]. However, human interference and climate change are contributing to a continuous decline in global biodiversity [4], especially in species diversity. Concurrently, freshwater habitats are also recognized as the most threatened on earth [5]. Since 1970, the populations of freshwater species have declined by an average of 83%, a much steeper decline than for terrestrial or marine species [6]. Furthermore, the extinction rate of freshwater species is also unusually high [7]. Freshwater habitats, occupying only 1% of the earth's surface area, are inhabited by 10% of the known animal species, more than half of which are aquatic insects [8]. The life cycle of aquatic insects usually spans one or two ecosystems and plays an important role in the ecosystem. Aquatic insects belong to at least 12 insect orders, of which five orders are almost exclusively aquatic, with more than 27,000 known species, and Trichoptera is one of them [9].

Trichoptera Kirby, 1834, (caddisflies) is the seventh most species-rich order of Insecta, and it is also the largest order of exclusively aquatic insects, with more than 16,000 extant species worldwide [10–12]. There are more than 1100 known trichopteran species in China belonging to 110 genera and 28 families [13]. Many trichologists believe that there are still a large number of trichopteran new species unknown to humans, many of which can be found in biodiversity hotspots, such as Yunnan and Sichuan province [14]. Trichopteran adults usually are found in stones and branches of nearby larval habitats. Their eggs, larvae, and pupae live in many different types of water bodies [12,15]. They play an irreplaceable role in the material circulation and energy flow in water ecosystems, especially in stream ecosystems. Most larvae build fixed nests or can carry nests to live. They have a small range

of activities, unique breathing modes, and are sensitive to dissolved oxygen and water quality, and can adapt to different water environments. Therefore, they are widely used as bioindicators for water quality monitoring [16,17], moreover, they even have provided richer insight into the effects of climate change [18–20].

The Jinsha River (also known as Gold Sand River or Gold Dust River) is the upper reach of Yangtze River and it originates from the Qinghai-Tibet Plateau [21]. It is located in the Qinghai-Tibet Plateau, Yunnan-Guizhou Plateau and the western edge of Sichuan Basin. The river is located at 90°–105° E, 24°–36° N, with an altitude of 268–3522 m above sea level. The middle and lower basins of the Jinsha River through two provinces of Sichuan and Yunnan in western China, with a total length of 2391 km and a drainage area of about 473,200 km^2, accounting for 26% of the Yangtze River basin area [22]. Meanwhile, the middle and lower basins of Jinsha River is one of the most important sediment sources for the Yangtze River and the largest hydropower production region in China [23]. In addition, the three Parallel Rivers of Yunnan Protected Areas is located in the middle and lower basins of the Jinsha River [24]. This region is not covered by continental glaciers during the Quaternary glaciation, and the mountains in this region run north-south. Therefore, this region has become the main channel and refuge for biological species in Eurasia to move from south to north, and is the most enriched area of biological community in Eurasia [14]. This region covers less than 0.4% of the Chinese land area, but contains more than 20% of the higher plants and 25% of the animal species.

The diversity of caddisflies in the Jinsha River is still deficiently known, especially from the middle and lower basins. In recent years, a limited number of studies have been published on the survey of macroinvertebrates in the middle and lower basins of the Jinsha River, and only some genera of caddisfly have been recorded based on larval material [25]. For example, *Hydropsyche penicillata* Martynov, 1931, *Hydropsyche cerva* Li & Tian, 1990, *Hydropsyche uvana* Mey, 1995, *Chimarra* sp., *Cheumatopsyche* sp., *Himalopsyche* sp., *Hydroptila* sp., *Stenopsyche* sp. and *Hydropsyche* sp. Unfortunately, researchers of these studies failed to collect trichopteran adults. As is true for much of the upper basin of the Jinsha river, the Trichoptera fauna of the middle and lower basins of the Jinsha River has been studied only partially. The situation limits the application of Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa in water quality monitoring. Moreover, with this continuous process of habitat loss, it is important to know the species list of this watershed, when defining species for conservation.

To fully understand the species diversity of trichopteran species in the Jinsha River, an investigation on that in the section of Shigu county to Yibin city of the Jinsha River was performed. Based on the collected trichopteran samples, the present study provides the first published checklist for caddisfly in the middle and lower basins of the Jinsha River, including the description of a new species and nine new geographical records from China. This checklist will serve as a guide for future studies of caddisfly in the Jinsha River basin.

2. Materials and Methods

2.1. Sample Collection

Adult specimens were collected into 95% alcohol using pan traps with 15-W ultraviolet light tubes in the ten sites of the middle and lower basins of the Jinsha River basin, China, during November 2019 and May 2020 (Figure 1A–D). The specimens were then sorted and stored at −20 °C temperature.

2.2. Morphological Study

The methods used for preparation of genitalia followed Peng et al. [26], using heated 10% KOH and lactic acid to remove all the non-chitinous tissues. The specimens were identified to species based on morphological descriptions of many trichologists. Male genital structures of new species were traced in pencil using a Nikon Eclipse 80i microscope and an Olympus SZX10 stereomicroscope equipped with a camera lucida. Pencil drawings were scanned with an Epson Perfection (V30 SE) scanner, then placed as templates in

Adobe Photoshop® (Version: 21.0.1) and inked digitally to produce illustrations. The illustrations were then arranged using Adobe Photoshop. Then, genitalia and the remainder of each specimen were stored in a microvial in 95% alcohol. The other specimens were examined using same above method, and specimens were identified using a large amount of accumulated literature. The type specimen of the new species and other examined specimens were deposited at the Insect Collection, Nanjing Agricultural University (NJAU), Nanjing, Jiangsu Province, China. The terminology for male genitalia follows that of Oláh et al. [27].

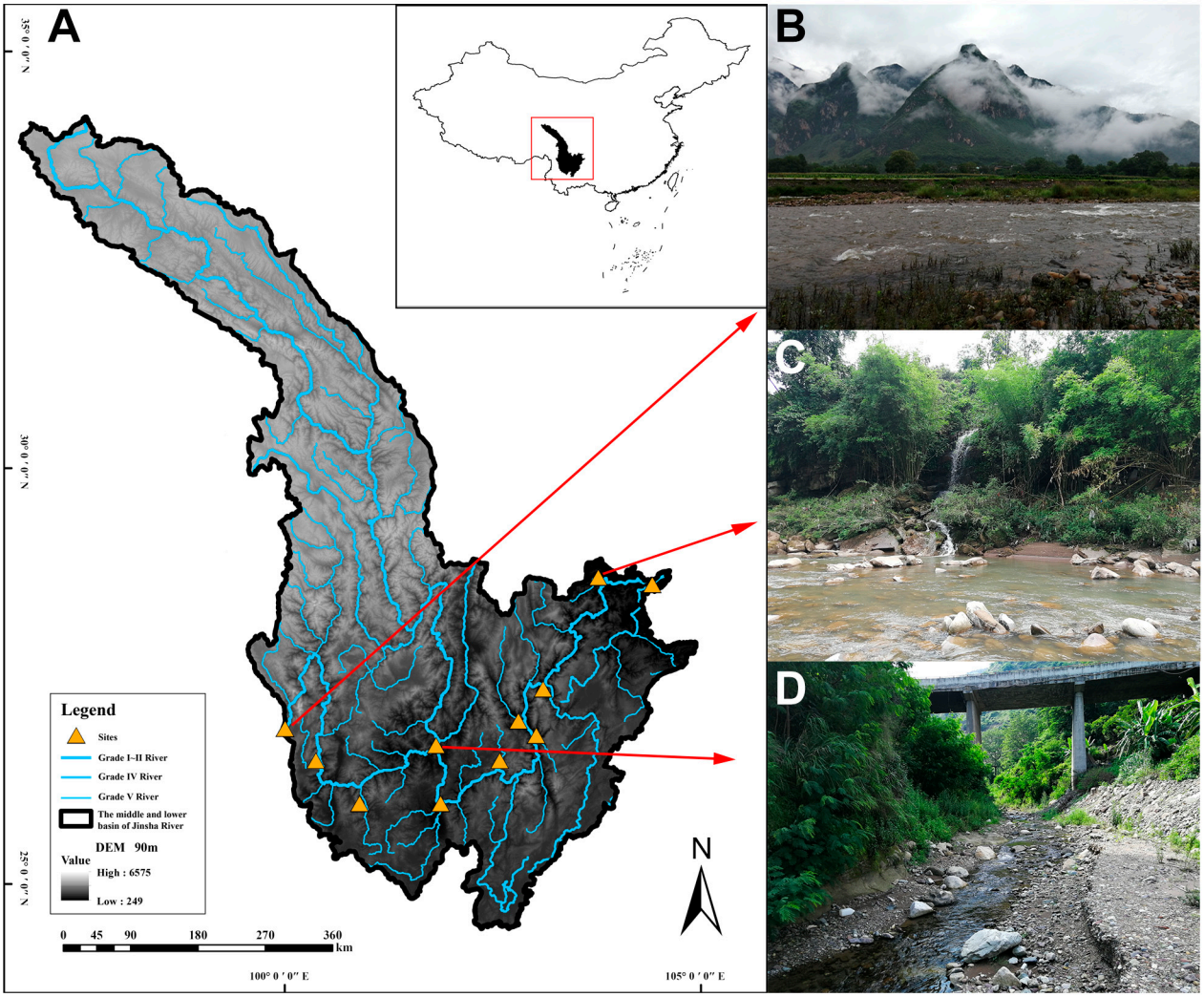

Figure 1. Map of the middle and lower reaches of the Jinsha River, showing collection sites. (**A**), hydrographic map of the middle and lower reaches of the Jinsha River with yellow triangles indicating the collection sites; (**B**), Chongsha River; (**C**), Xining River; (**D**), Yalong River.

3. Results

3.1. Morphological Study

This study is the first to give a list of trichopteran species in the middle and lower reaches of the Jinsha River basin, including one new species (*Cheumatopsyche latisecta* sp. nov.) and nine new records for the Chinese caddisfly fauna (*Cheumatopsyche charites* Malicky & Chantaramongkol, 1997, *Hydropsyche briareus* Malicky & Chantaramongkol, 2000, *Hydropsyche briseus* Malicky & Chantaramongkol, 2000, *Maesaipsyche stengeli* Malicky, 1997, *Ecnomus cationg* Oláh & Malicky, 2010, *Ceraclea hektor* Malicky & Bunlue, 2004, *Setodes iuppiter* Malicky & Chantaramongkol, 2006, *Psychomyia kalais* Malicky, 2004, *Psychomyia botosaneanui* Schmid, 1997). *Cheumatopsyche latisecta* sp. nov. was described, illustrated, and

diagnosed based on distinctive characters of male genitalia. The list of caddisflies for the middle and lower reaches of the Jinsha River basin is composed of 23 species, belonging to the following ten families: Ecnomidae Ulmer, 1903; Glossosomatidae Wallengren, 1891; Hydropsychidae Curtis, 1835; Hydroptilidae Stephens, 1836; Lepidostomatidae Ulmer, 1903; Leptoceridae Leach, 1815; Philopotamidae Stephens, 1829; Psychomyiidae Walker, 1852; Rhyacophilidae Stephens, 1836; Stenopsychidae Martynov, 1924.

3.2. Taxonomy

Cheumatopsyche latisecta Ge & Sun, sp. nov. (Figure 2A–D)

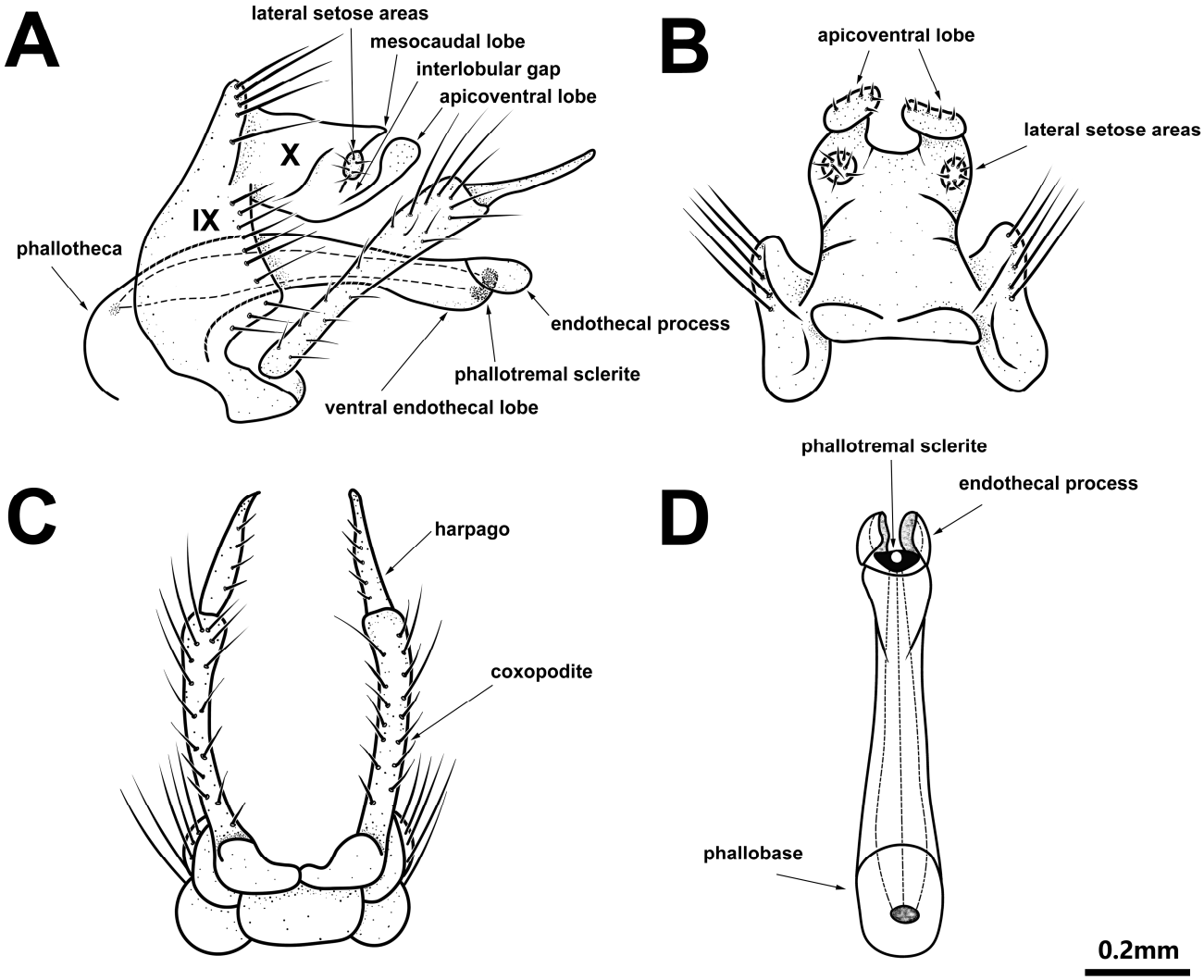

Figure 2. Male genitalia of *Cheumatopsyche latisecta* sp. nov. (**A**), genitalia, left lateral view; (**B**), genitalia, dorsal view; (**C**), genitalia, ventral view; (**D**), phallus ventral view. Abbreviations: IX = segment IX; X = segment X. Scale bar: 0.2 mm.

Description: Length of forewing: 6.5 mm. Specimens in alcohol with compound head dark brown to light brown, thorax dark brown to yellow, legs yellowish-brown, abdomen dorsum dark brown and venter yellow-white.

Male genitalia: In lateral view, abdominal sternum IX with strongly convex anterior margin, posterior margin slightly arc-shaped, with a row of posterior spines, dorsal one third narrow and strong constriction presented at insertion of inferior appendages (Figure 2A). Intersegmental step between segments IX and X absent. Upper and lower margins of segment X parallel-sided in later view, elevated lateral setose areas small and rounded. Mesocaudal lobe acute-angled, apicoventral lobes with narrow base and wider

distal part, dorsal interlobular gap wide. In dorsal view, lateral margins of segment X sinuated and widest at position of lateral setose areas, mesocaudal process slightly concave, apicoventral lobes oval (Figure 2B). In lateral view, coxopodites exceed apex of segment X, nearly straight rods; in ventral view slightly arc-shaped, with both basal and distal end broad and middle portion narrower. Harpagones in lateral view finger-shaped and slender, each with base broad, and tapering distad; in ventral view, with inner margins slightly waved and outer margin nearly straight (Figure 2C). In lateral view, phallotheca with base curved at 90 degree, distal one third slightly constrict, ventral endothecal lobe rounded, phallotremal sclerite reniform, and endothecal process somewhat triangular; in ventral view, phallobase wide, endotheca base and distal end broad, phallotremal sclerites semilunar, endothecal process curved-plate-like (Figure 2D).

Diagnosis: The male genitalia of the new species closely resemble those of *Cheumatopsyche longisclasper* Li, 1998, but segment X of the new species in lateral view with the upper margin straight, other than with a shallow concave at the subapex as in *C. longisclasper*; middle lobe of the new species in lateral view triangular, other than nipple-shaped as in *C. longisclasper*; lateral setose area near apex in the new species, other than at the middle as in the latter species.

Holotype: Male, China, Sichuan Province, Pingshan County, Xining River, 28°41′10″ N, 103°46′02″ E, alt. 368 m, 19 November 2019, light trap, leg. X. Y. Ge & X. Chen (NJAU).

Paratypes: Two males, China, Yunnan Province, Qiaojia County, Yili River, 26°47′14″ N, 103°1′23″ E, alt. 738 m, 23 November 2019, light trap, leg. X. Y. Ge & X. Chen (NJAU).

Other specimens: Ten males, Guangxi Zhuang Autonomous Region, Nandan County, Qingshui River at swinging bridge, Provincial Road 317 at marker 24.0 km, 24°54′4″ N, 107°26′18″ E, alt. 310 m, 14 Jul 2004, light trap, leg. C. H. Sun (NJAU).

Etymology. The Latin adjective *latisectus*, *-a*, *um* refers to the wide dorsal interlobular gap of the sternum X in lateral view.

Distribution: China (Guangxi, Sichuan, Yunnan).

Remarks: The *Cheumatopsyche latisecta* sp. nov. were collected near Xining River and Yili River (Figure 3). The stream is 3–5 m wide and 0.2–0.4 m deep, with water transparency about 0.3 m. Filamentous green algae were rare, indicating the stream may be oligotrophic. The substrate of the stream consists of pebbles, cobbles, and boulders. The stream was turbid during high discharge.

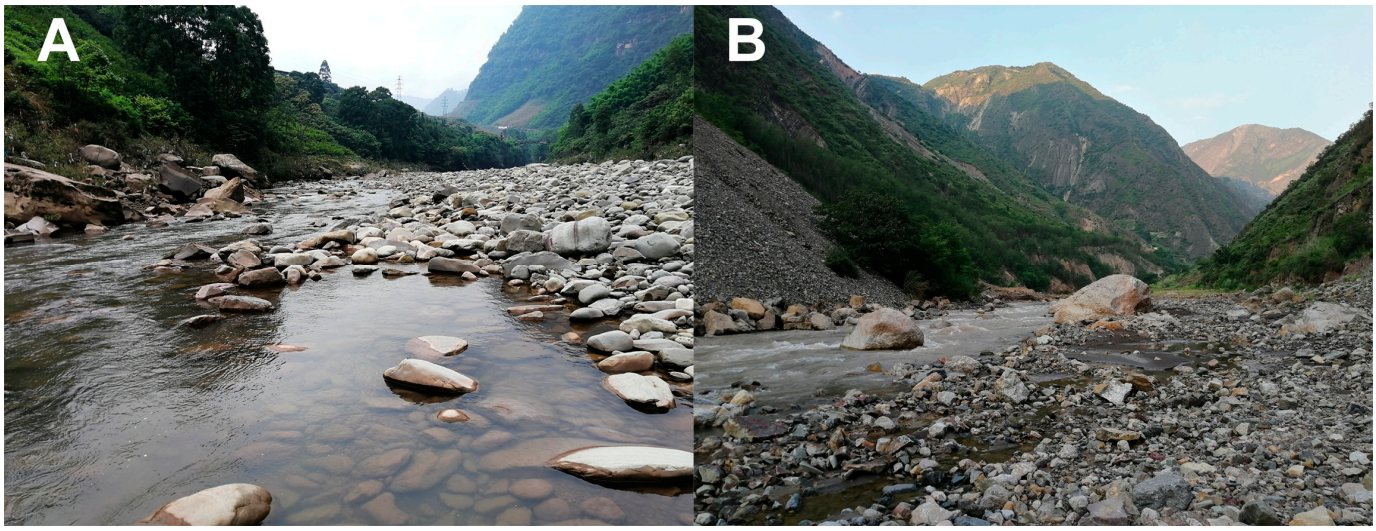

Figure 3. Type locality of *Cheumatopsyche latisecta* sp. nov. (**A**), Xining River; (**B**), Yili River.

Family Ecnomidae Ulmer, 1903

Ecnomus cationg Oláh & Malicky, 2010 **first record for China**

Material examined: Two males, China, Sichuan Province, Pingshan County, Xinshi Town, Xianfeng Village, Xining River, 28°41′10″ N, 103°46′02″ E, alt. 368 m, 19 November 2019, light trap, leg. X. Y. Ge & X. Chen; one male, Yunnan Province, Dayao County, Wanbi Village, Yupao River, 25°57′36″ N, 100°54′04″ E, alt. 1128 m, 17 November 2019, light trap, leg. C. H. Sun & Y. C. Wang.

Distribution: China (Sichuan, Yunnan); Vietnam, Nepal [28].

Ecnomus tenellus (Rambur, 1842)

Material examined: one male, China, Yunnan Province, Shuifu City, Heng River, 28°35′60″ N, 104°24′58″ E, alt. 227 m, 18 November 2019, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Guangdong, Anhui, Jiangxi, Jiangsu, Hubei, Sichuan, Yunnan, Tibet, Taiwan) [13].

Family Glossosomatidae Wallengren, 1891

Glossosoma caudatum Martynov, 1931 **first record for Yunnan Province**

Material examined: One male, China China, Yunnan Province, Shigu County, Chongsha River, 26°51′13″ N, 99°55′45″ E, alt. 1800 m, 17 November 2019, C. H. Sun & Y. C. Wang

Distribution: China (Sichuan, Yunnan) [13].

Family Hydropsychidae Curtis, 1835

Cheumatopsyche charites Malicky & Chantaramongkol, 1997 **first record for China**

Material examined: 20 Males, China, Yunnan Province, Yuanmou County, Jianshe Village, Longchuan River 25°57′39″ N, 101°52′26″ E, alt: 880 m, 19. May 2020, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Yunnan); Thailand [29].

Hydropsyche briareus Malicky & Chantaramongkol, 2000 **first record for China**

Material examined: Two males, China, Sichuan Province, Ningnan County, Hulukou Town, Heishui River, 26°57′46″ N, 102°48′27″ E, alt. 610 m, 22 November 2019, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Sichuan); Thailand [30].

Hydropsyche briseus Malicky & Chantaramongkol, 2000 **first record for China**

Material examined: Two males, China, Sichuan Province, Pingshan County, Xinshi Town, Xianfeng Village, Xining River, 28°41′10″ N, 103°46′02″ E, alt. 368 m, 19 November 2019, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Sichuan); Nepal [30].

Hydropsyche cerva Li & Tian, 1990

Material examined: Two males, China, Yunnan Province, Heqing County, Zhongjiang Town, Zhongjiang Village, Yanggong River, 26°29′16″ N, 100°22′24″ E, alt. 1196 m, 19 November 2019, light trap, leg. C. H. Sun & Y. C. Wang; one male, Yunnan Province, Qiaojia County, Yili River, 26°47′14″ N, 103°1′23″ E, alt. 738 m, 23 November 2019, light trap, leg. X. Y. Ge & X. Chen; two males, Sichuan Province, Pingshan County, Xinshi Town, Xianfeng Village, Xining River, 28°41′10″ N, 103°46′02″ E, alt. 368 m, 19 November 2019, light trap, leg. X. Y. Ge & X. Chen; one male, Sichuan Province, Ningnan County, Hulukou Town, Heishui River, 26°57′46″ N, 102°48′27″ E, alt. 610 m, 22 November 2019, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Sichuan, Yunnan, Guangxi); Thailand; Vietnam [31].

Hydropsyche columnata Martynov, 1931

Material examined: Three males, China, Yunnan Province, Shuifu City, Heng River, 28°35′60″ N, 104°24′58″ E, alt. 227 m, 18 November 2019, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Guizhou, Henan, Shaanxi, Sichuan, Yunnan, Jiangxi, Beijing) [13].

Hydropsyche gautamittra Schmid, 1961 **first records for Sichuan and Yunnan Province**

Material examined: Two males, China, Sichuan Province, Panzhihua City, Yalong River, 26°40′09″ N, 101°49′15″ E, alt. 940 m, 22 November 2019, light trap, leg. C. H. Sun & Y. C. Wang; one male, Yunnan Province, Qiaojia County, Yili River, 26°47′14″ N, 103°1′23″ E, alt. 738 m, 23 November 2019, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Sichuan, Yunnan, Guangxi, Guizhou); Pakistan; Afghanistan; Nepal [13].

Hydropsyche penicillata Martynov, 1931

Material examined: Two males, China, Sichuan Province, Panzhihua City, Yalong River, 26°40′09″ N, 101°49′15″ E, alt. 940 m, 22 November 2019, light trap, leg. C. H. Sun & Y. C. Wang

Distribution: China (Fujian, Shaanxi, Sichuan, Yunnan) [13].

Hydropsyche shizongensis (Gui & Yang, 1999) **first record for Sichuan Province**

Material examined: Three males, China, Sichuan Province, Panzhihua City, Yalong River, 26°40′09″ N, 101°49′15″ E, alt. 940 m, 22 November 2019, light trap, leg. C. H. Sun & Y. C. Wang.

Distribution: China (Sichuan, Yunnan) [32].

Maesaipsyche stengeli Malicky, 1997 **first record for China**

Material examined: 34 males, China, Sichuan Province, Panzhihua City, Yalong River, 26°40′09″ N, 101°49′15″ E, alt. 940 m, 22 November 2019, light trap, leg. C. H. Sun & Y. C. Wang.

Distribution: China (Sichuan); Thailand [33].

Family Hydroptilidae Stephens, 1836

Hydroptila angulata Mosely, 1922 **first record for Yunnan Province**

Material examined: One male, China, Yunnan Province, Qiaojia County, Yili River, 26°47′14″ N, 103°1′23″ E, alt. 738 m, 23 November 2019, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Henan, Yunnan); Russia; Korea Peninsula; Iran [13].

Family Lepidostomatidae Ulmer, 1903

Lepidostoma bibrochatum Yang & Weaver, 2002 **first record for Sichuan Province**

Material examined: One male, China, Yunnan Province, Shigu County, Chongsha River, 26°51′13″ N, 99°55′45″ E, alt. 1800 m, 17 November 2019, C. H. Sun & Y. C. Wang; two males, Sichuan Province, Pingshan County, Xinshi Town, Xianfeng Village, Xining River, 28°41′10″ N, 103°46′02″ E, alt. 368 m, 19 November 2019, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Sichuan, Zhejiang) [34].

Family Leptoceridae Leach, 1815

Ceraclea hektor Malicky & Bunlue, 2004 **first record for China**

Material examined: One male, China, Yunnan Province, Shuifu City, Heng River, 28°35′60″ N, 104°24′58″ E, alt. 227 m, 18 November 2019, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Yunnan); Thailand [35].

Ceraclea indistincta Forsslund, 1935 **first record for Yunnan Province**

Material examined: Five males, China China, Yunnan Province, Shuifu City, Heng River, 28°35′60″ N, 104°24′58″ E, alt. 227 m, 18 November 2019, light trap, leg. X. Y. Ge & X. Chen; two males, Yunnan Province, Qiaojia County, Yili River, 26°47′14″ N, 103°1′23″ E, alt. 738 m, 23 November 2019, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Sichuan) [13].

Setodes iuppiter Malicky & Chantaramongkol, 2006 **first record for China**

Material examined: Two males, China, Sichuan Province, Panzhihua City, Yalong River, 26°40′09″ N, 101°49′15″ E, alt. 940 m, 22 November 2019, light trap, leg. C. H. Sun & Y. C. Wang.

Distribution: China (Sichuan); Thailand [36].

Family Philopotamidae Stephens, 1829

Chimarra paramonorum Hu, Wang & Sun, 2018 **first record for Yunnan Province**

Material examined: One male, China, Yunnan Province, Shuifu City, Heng River, 28°35′60″ N, 104°24′58″ E, alt. 227 m, 18 November 2019, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Yunnan, Zhejiang) [37]

Family Psychomyiidae Walker, 1852

Psychomyia kalais Malicky, 2004 **first record for China**

Material examined: One male, China, Yunnan Province, Qiaojia County, Jin tang Town, Yili River, 26°47′14″ N, 103°1′23″ E, alt. 738 m, 23 November 2019, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Yunnan); Indonesia [38].

Psychomyia botosaneanui Schmid, 1997 **first record for China**

Material examined: One male, China, Sichuan Province, Pingshan County, Xinshi Town, Xianfeng Village, Xining River, 28°41′10″ N, 103°46′02″ E, alt. 368 m, 19 November 2019, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Sichuan); India [39].

Family Rhyacophilidae Stephens, 1836

Himalopsyche navasi Banks, 1940 **first record for Yunnan Province**

Material examined: One male, China, Yunnan Province, Qiaojia County, Xiaoniulan Village, Xiaoniulan River, 27°20′46″ N, 103°6′19″ E, alt. 612 m, 21 November 2019, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Anhui, Fujian, Jiangxi, Sichuan, Shaanxi, Guangdong Yunnan) [13].

Family Stenopsychidae Martynov, 1924

Stenopsyche laminata Ulmer, 1926

Material examined: Five males, China, Yunnan Province, Dayao County, Wanbi Village, Yupao River, 25°57′36″ N, 100°54′04″ E, alt. 1128 m, 17 November 2019, leg. C. H. Sun & Y. C. Wang, three males, Sichuan Province, Ningnan County, Hulukou Town, Heishui River, 26°57′46″ N, 102°48′27″ E, alt. 610 m, 22 November 2019, light trap, leg. X. Y. Ge & X. Chen; four males, Sichuan Province, Huidong County, Gaji Town, Shenyu River, 26°29′06″ N, 102°35′04″ E, alt. 610 m, 22 November 2019, light trap, leg. X. Y. Ge & X. Chen; three males, Sichuan Province, Pingshan County, Xinshi Town, Xianfeng Village, Xining River, 28°41′10″ N, 103°46′02″ E, alt. 368 m, 19 November 2019, light trap, leg. X. Y. Ge & X. Chen.

Distribution: China (Sichuan, Yunnan, Guangdong, Hunan) [13].

4. Discussion

In this study, we implemented an extensive collection of trichopteran species in the middle and lower basins of the Jinsha River; as a result, we described a new species and reported nine new records. Since trichopteran species are sensitive to dissolved oxygen and water quality, we scarcely collected caddis near rivers (i.e., Yangtze River, the Huanghe River) before this study, we usually collect caddis adults and larvae in ponds, streams, small reservoirs and other habitats, therefore the understanding of the diversity of trichopteran species in rivers is incomplete. This caddis list of the study has improved our understanding of the diversity of Trichoptera in the Jinsha River and it provides a preliminary database for further biodiversity research, simultaneously; it also suggested that we should cover a wider area in future collections.

All new geographical record species in this study were previously reported occurring in Southeast Asia, however, our report of these new record species extends their distribution ranges from their type countries northeastward to southwestern China The significant extensions of these new record species highlight the great potential richness of southwestern China, and support the hypothesis that this area possesses the highest biodiversity in China. Moreover, the new distribution data would be helpful in the biogeographical analysis in the future. In addition, the discovery of these new records in the Three Parallel Rivers of Yunnan Protected Areas indirectly supports the viewpoint that the Hengduan Mountains provided convenience for some animal species to escape from the Quaternary glaciation and migrate to the current shelters.

However, this trichopteran species list may still be considered preliminary for the river and region, since no material was sampled in the major eclosion period of caddisflies (June to August). There are a lot of areas rich in streams in southwestern China with suitable aquatic ecosystems and a warm climate that are suitable for the occurrence of caddis species. We believed that there are still many unknown caddis species to be described in these areas, and the list will be helpful in the descriptions of caddis larvae and then use them in biomonitoring water quality in the middle and lower basins of the Jinsha River. In the

future, we still need to increase the proportion of sweep netting and Malaise trapping in the collection operations, in order to get more sufficient material for our understanding of the biodiversity in these basins.

5. Conclusions

Small caddisfly collection from the middle and lower basins of the Jinsha River shows it has 10 families, 13 genera and 23 species. Among them, one new species *Cheumatopsyche latisecta* sp. nov. and nine new Chinese records are identified. Further, the genitalia of the new species and main diagnoses are illustrated and described in details. Remarkably, this checklist is the first one of the southwestern China and the Jinsha River, and it provides a preliminary database for further biodiversity research and water biomonitoring.

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Informed Consent Statement: Not applicable.

Data Availability Statement: The data, holotype specimen, and other voucher specimens from this research was deposited in the Insect Classification and Aquatic Insect Laboratory, College of Plant Protection, Nanjing Agricultural University, Nanjing, China.

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