

Support Text

Taxonomy

Jicyclocheilus subgen. nov. Luo & Zhou, 2026

Type species: *Sinocyclocheilus jii* Zhang & Dai, 1992

Diagnosis: (1) Body with a weakly elevated dorsal profile; (2) snout short obtusely rounded, non-duckbill-shaped; (3) head-dorsal junction slight elevated, without horn-like structures; (4) eyes normal; (5) dorsal-fin origin opposite to pelvic-fin origin, last unbranched dorsal-fin ray soft, without serrations along posterior margin; (6) pectoral fin short, not reaching to pelvic-fin origin; (7) body covered with small scales, lateral line with 43–64 scales, distinctly larger than scales above and below; (8) maxillary barbels slender and slight long, extending beyond the posterior margin of the preoperculum; (9) distributed mainly in Guijiang-Hejiang River basins.

Etymology: The subgenus name *Jicyclocheilus* subgen. nov. named after Mr. Chun-Shan Ji, he named *S. guilinensis*, for using his family name “Ji”, and *cyclocheilus*, a common generic root for golden-lined fish. We suggest its English common name “Ji’s Golden-lined Fish” and Chinese common name “Ji Shì Bā Yà Shǔ (季氏鲃亚属)”.

Remarks: We currently recognized seven species in the subgenus *Sinocyclocheilus* as follows: *S. (J.) brevifinus* Li, Li & Mayden, 2014; *S. (J.) guanyangensis* Chen, Peng & Zhang, 2016; *S. (J.) guilinensis* Ji, 1982; *S. (J.) huangtianensis* Zhu, Zhu & Lan, 2011; *S. (J.) jii* Zhang & Dai, 1992; *S. (J.) gracilis* Li, 2014; *S. (J.) pingshanensis* Li, Li, Lan & Wu, 2018. *Sinocyclocheilus gracilis* was placed in the subgenus *Jicyclocheilus* based on morphological characteristics (i.e., last unbranched dorsal-fin ray of dorsal-fin soft, without serrations along posterior margin) and its geographic distribution overlapping with the range of the subgenus *Jicyclocheilus*. However, future validation using genetic data is required.

Distribution: These species are mainly distributed in the Guijiang-Hejiang River basins, with a distribution that includes karst caves in eastern Guangxi and its adjacent border with Hunan Province.

Subgenus *Ceratobarbus* Wang & Liao, 1995

Type species: *Sinocyclocheilus bicornutus* Wang & Liao, 1997

Diagnosis: (1) Body with a strongly elevated dorsal profile; (2) snout elongate and flattened, duckbill-shaped; (3) head-dorsum junction sharply elevated, typically forming a forward-projecting horn-like structure in most species; (4) eyes reduced or absent; (5) dorsal-fin origin posterior to pelvic-fin origin in most species, last unbranched dorsal-fin ray strong, with serrations along posterior margin; (6) pectoral fin long, extending beyond pelvic-fin origin; (7) body covered with small scales or absent, lateral line with 35–58 scales, distinctly larger than scales above and below in most species; (8) Maxillary barbels medium-length, extending beyond or reaching the posterior margin of the preopercle in most species; (9) chromosome $2n=100$; (10) distributed mainly in Nanpanjiang River, Hongshui River, and Beipanjiang River basins.

Etymology: The subgenus name derived from the Greek noun *keras*, meaning horn, and and Latinization noun *barbus*, meaning barbel. We suggest its English common name “Horned Golden-lined Fishes” and Chinese common name “Jiǎo Bā Yà Shǔ (角鲃亚属)”.

Remarks: The subgenus *Ceratobarbus* is a genus established by Wang and Liao [1] using *S. bicornutus* (once recorded as *Ceratobarbus biangularis*) as the type species, and as a nomen nudum because of the absence of a morphological description [2, 3]. Considering that the type species of this subgenus, *S. bicornutus*, is nested in the *S. angularis* group, we propose to restore this generic name to reduce excessive redundancy in the genus name. *Sinocyclocheilus jiuxuensis* was initially placed into *Sinocyclocheilus*, and later, Zhang et al. [4] established the new genus *Pseudosinocyclocheilus* in consideration of the unique morphological differences. However, a subsequent genomic evidence showed that the species is distinct from *S. angularis* group of species clustered together. Therefore, we place *S. jiuxuensis* in the subgenus *Ceratobarbus*.

We currently recognized 19 species in the subgenus *Ceratobarbus* as follows: *S. (C.) altishoulderus* (Li & Lan, 1992); *S. (C.) angularis* Zheng & Wang, 1990; *S. (C.) bicornutus* Wang & Liao, 1997; *S. (C.) brevibarbus* Zhao, Lan & Zhang, 2009; *S. (C.) broadihornes* Li & Mao, 2007; *S. (C.) flexuosdorsalis* Zhu & Zhu, 2012; *S. (C.) furcodorsalis* Chen, Yang & Lan, 1997; *S. (C.) hyalinus* Chen & Yang, 1994; *S. (C.) jiuxuensis* Li & Lan, 2003; *S. (C.) longicornus* Luo, Xu, Wu, Zhou & Zhou, 2023; *S. (C.) mshanensis* Wu, Liao & Li, 2010; *S. (C.) rhinoceros* Li & Tao, 1994; *S. (C.) simengensis* Li, Wu, Li & Lan, 2018; *S. (C.) tianeensis* Li, Xiao & Luo, 2003; *S. (C.) tileihornes* Mao, Lu & Li, 2003; *S. (C.) xingyiensis* Luo, Tang, Deng, Duan & Zhang, 2023; *S. (C.) zhenfengensis* Liu, Deng, Ma, Xiao & Zhou, 2018; and *S. (C.) jinxiensis* Zheng, Xiu & Yang, 2013; *S. (C.) luopingensis* Li & Tao, 2002. *Sinocyclocheilus luopingensis* was placed in the subgenus *Jicyclocheilus* based on morphological characteristics (i.e., snout elongate and flattened, duckbill-shaped and head-dorsum junction sharply elevated) and its geographic distribution overlapping with the range of the subgenus *Ceratobarbus*. However, future validation using genetic data is required.

Distribution: These species are predominantly distributed in the Hongshui, Nanpanjiang, and Beipanjiang river basins, with their range extending to karst caves in northwestern Guangxi, southwestern Guizhou, and southeastern Yunnan.

Subgenus *Anchicyclocheilus* Li & Lan, 1992

Type species: *Sinocyclocheilus microphthalmus* Li, 1989

Diagnosis: (1) Body with a strongly elevated dorsal profile; (2) snout elongate and flattened, duckbill-shaped; (3) head-dorsum junction sharply elevated, typically forming a forward-projecting horn-like structure or absent; (4) eyes reduced or absent; (5) dorsal-fin origin posterior to pelvic-fin origin, last unbranched dorsal-fin ray strong, with serrations along posterior margin; (6) pectoral fin medium-length, nearly reaching pelvic-fin origin or beyond; (7) body covered with larger scales, lateral line with 34–49 scales, distinctly larger than scales above and below; (8) maxillary barbels medium-length,

not reaching the anterior margin of the preoperculum; (9) chromosome $2n=96$; (10) distributed mainly in Youjiang and Nanpangjiang River basins.

Etymology: The subgenus name derived from the Greek adjective *anchi*, meaning akin, Greek noun *kyklos*, meaning circle, and Greek noun *cheilos*, meaning lip. We suggest its English common name “Akin Golden-lined Fishes” and Chinese common name “Jìn Jīn Xiàn Bā Yà Shǔ (近金线鲃亚属)”.

Remarks: This subgenus was originally established by Li and Lan (1992) using *A. halfibindus* as the type species, and later *A. halfibindus* was used as a synonym of *S. microphthalmus* (Yue 2000; Zhao & Zhang, 2006, 2009; Lan et al. 2013; Zhang et al. 2016). We currently recognized five species in the subgenus *Gibbibarbus* as follows: *S. (A.) anshuiensis* Gan, Wu, Wei & Yang, 2013; *S. (A.) microphthalmus* Li, 1989; *S. (A.) longshanensis* Li & Wu, 2018; *S. (A.) maculatus* Li, 2000; and *S. (A.) luolouensis* Lan, 2013. *Sinocyclocheilus luolouensis* was placed in the subgenus *Anchicyclocheilus* based on morphological characteristics and its geographic distribution overlapping with the range of the subgenus *Anchicyclocheilus*. However, future validation using genetic data is required. Notably, given the substantial morphological disparities between *S. (A.) longshanensis* and *S. (A.) maculatus* compared to *S. (A.) anshuiensis* and *S. (A.) microphthalmus*, and considering that the specimens of these two species examined in this study were not obtained from their type localities, a re-evaluation of their phylogenetic placement is warranted.

Distribution: These species are mainly distributed in the Youjiang and Nanpangjiang River basins in the upper Pearl River. These distribution areas include karst caves in northwestern Guangxi and possibly in the southeast of Yunnan.

Subgenus *Pseudosinocyclocheilus* Zhang & Zhao, 2016

Type species: *Sinocyclocheilus jinxiensis* Zheng, Xiu & Yang, 2013

Diagnosis: (1) Body with a strongly elevated dorsal profile; (2) snout elongate and flattened, duckbill-shaped; (3) head-dorsum junction sharply elevated, typically forming a forward-projecting horn-like structure; (4) eyes absent or highly reduced; (5) dorsal-fin origin opposite to pelvic-fin origin in most species, last unbranched dorsal-fin ray strong, with serrations along posterior margin; (6) pectoral fin short, extending beyond or reaching pelvic-fin origin; (7) body typically scaleless, but with notably larger scales in *S. jinxiensis*, lateral line with 39–42 pores, equal in size to scales above and below lateral line; (8) maxillary barbels medium-length, not reaching the anterior margin of the preoperculum; (9) distributed mainly in Youjiang and Nanpangjiang River basins.

Etymology: The proposed subgenus *Pseudosinocyclocheilus* (masculine) is derived from the Greek prefix “Pseudo-” (false) combined with the former generic name *Sinocyclocheilus*. We propose the English common name “False Golden-lined Fishes” and Chinese common name “Nǐ Jīn Xiàn Bā Yà Shǔ (拟金线鲃亚属)”.

Remarks: We currently recognized five species in the subgenus *Pseudosinocyclocheilus* as follows: *S. (P.) anatrostris* Lin & Luo, 1986; *S. (P.) aquihornes* Li & Yang, 2007; *S. (P.) convexiforeheadus* Li, Yang & Li, 2017; *S. (P.) jinxiensis* Zheng, Xiu & Yang, 2013; *S. (P.) tianlinensis* Zhou, Zhang, He & Zhou, 2004.

Distribution: These species are primarily distributed in the Hongshui, Nanpanjiang, and Youjiang River basins, with their range encompassing karst caves in northwestern Guangxi and southeastern Yunnan.

Subgenus *Gibbibarbus* Dai, 1988

Type species: *Sinocyclocheilus cyphotergous* (Dai, 1988)

Diagnosis: (1) Body with a strongly elevated dorsal profile; (2) snout short and obtusely rounded, non-duckbill-shaped; (3) head-dorsum junction obvious elevated, not forming a forward-projecting horn-like structure; (4) eyes normal or highly reduced; (5) dorsal-fin origin posterior to pelvic-fin origin, last unbranched dorsal-fin ray strong, with serrations along posterior margin; (6) pectoral fin short, reaching or extending beyond pelvic-fin origin; (7) body covered with small scales, lateral line with 42–53 scales, distinctly larger than scales above and below in most species; (8) maxillary barbels medium-length, reaching the posterior margin of the eye; (8) chromosome $2n=100$; (9) distributed mainly in Liujiang, Hongshui, and Wujiang River basins.

Etymology: The subgenus name derived from the Latin adjective *gibba*, meaning humped and Latinization noun *barbus*, meaning barbel. We suggest its English common name “Humped Golden-lined Fishes” and Chinese common name “Tuó Bèi Bā Yà Shǔ (驼背鲃亚属)”.

Remarks: We currently recognized six species in the subgenus *Gibbibarbus* as follows: *S. (G.) cyphotergous* (Dai, 1988); *S. (G.) guiyang* Shao, Cheng, Lu, Zhou & Zeng, 2024; *S. (G.) multipunctatus* (Pellegrin, 1931); *S. (G.) punctatus* Lan & Yang, 2017; *S. (G.) sanxiaensis* Jiang, Li, Yang & Chang, 2019; and *S. (G.) zhenningensis* Wang, Luo & Zhang, 2025.

Distribution: These species are predominantly distributed in the Yangtze River basin, with a minority (e.g., *S. (G.) punctatus*) occurring in the Pearl River basin. Their range encompasses karst cave systems in northern Guangxi, central-southern Guizhou, and western Hubei.

***Hugeisinocyclocheilus* subgen. nov. Luo & Zhou, 2026**

Type species: *Sinocyclocheilus hugeibarbus* Li, Ran & Chen, 2003

Diagnosis: (1) Body with a strongly elevated dorsal profile; (2) snout short and obtusely rounded, non-duckbill-shaped; (3) head-dorsum junction obvious elevated, not forming a forward-projecting horn-like structure; (4) eyes normal or highly reduced; (5) dorsal-fin origin posterior to pelvic-fin origin, last unbranched dorsal-fin ray strong, with serrations along posterior margin; (6) pectoral fin short, reaching or extending beyond pelvic-fin origin in most species; (7) body covered with larger scales, lateral line with 42–82 scales, distinctly larger than scales above and below in most species; (8) maxillary barbels robust and long, extending beyond the posterior margin of the preoperculum; (9) distributed mainly in Liujiang and Hongshui River basins.

Etymology: The subgenus name *Hugeisinocyclocheilus* is derived from the English word “huge” (meaning the size of the barbels is exceptionally large), Latinized as “Hugei-”, combined with the former generic name *Sinocyclocheilus*. The name refers to the remarkably robust and elongated maxillary barbels, which extend at least to the posterior margin of the preoperculum, a diagnostic feature of the subgenus. We

suggest its English common name “Huge Barbel Golden-lined Fishes” and Chinese common name “Jù Xū Bā Yà Shǔ (巨须鲃亚属)”.

Remarks: We currently recognized 14 species in the subgenus *Gibbibarbus* as follows: *S. (H.) brevis* Lan & Chen, 1992; *S. (H.) donglanensis* Zhao, Watanabe & Zhang, 2006; *S. (H.) dongtangensis* Zhou, Liu & Wang, 2011; *S. (H.) gracilicaudatus* Zhao & Zhang, 2014; *S. (H.) huanjiangensis* Wu, Gan & Li, 2010; *S. (H.) hugeibarbus* Li, Ran & Chen, 2003; *S. (H.) lingyunensis* Li, Xiao & Lu, 2000; *S. (H.) longibarbatus* Wang & Chen, 1989; *S. (H.) macrolepis* Wang & Chen, 1989; *S. (H.) macrophthalmus* Zhang & Zhao, 2001; *S. (H.) ronganensis* Luo, Huang & Wen, 2016; *S. (H.) xunlensis* Lan, Zhan & Zhang, 2004; *S. (H.) yishanensis* Li & Lan, 1992; and *S. (H.) yaolanensis* Zhou, Li & Hou, 2009.

Distribution: These species are primarily distributed in the Liujiang River basin (upper Pearl River system), with their range encompassing karst caves in northern Guangxi and southern Guizhou.

Subgenus *Sinocyclocheilus* Shan & Yue, 1994

Type species: *Sinocyclocheilus tingi* Fang, 1936

Diagnosis: (1) Body with a not visibly elevated dorsal profile; (2) snout short and obtusely rounded, non-duckbill-shaped; (3) head-dorsum junction not visibly elevated, not forming a forward-projecting horn-like structure; (4) eyes normal or absent; (5) dorsal-fin origin posterior to pelvic-fin origin in most species, last unbranched dorsal-fin ray slight strong, with weakly serrations along posterior margin; (6) pectoral fin short, not reaching to pelvic-fin origin in most species; (7) body covered with small scales, lateral line with above 70 scales, distinctly larger than scales above and below in most species; (8) maxillary barbels slender and short, reaching the posterior margin of the preoperculum; (9) chromosome $2n=96$; (10) distributed mainly in Nanpangjiang River basins.

Etymology: The subgenus name derived from the Latin noun *sino* (*sina*), meaning from China, Greek noun *kyklos*, meaning circle, and Greek noun *cheilos*, meaning lip. We suggest its English common name “Golden-lined Fishes” and Chinese common name “Zhǐ Míng Yà Shǔ (指名亚属)”.

Remarks: We currently recognized 29 species in the subgenus *Sinocyclocheilus* as follows: *S. (S.) aluensis* Li & Xiao, 2005; *S. (S.) angustiporus* Zheng & Xie, 1985; *S. (S.) anophthalmus* Chen & Chu, 1988; *S. (S.) bannaensis* Li, Li & Chen, 2019; *S. (S.) grahami* (Regan, 1904); *S. (S.) guishanensis* Li, 2003; *S. (S.) huaningensis* Li, 1998; *S. (S.) huizeensis* Cheng, Pan, Chen, Li, Ma & Yang, 2015; *S. (S.) lateristriatus* Li, 1992; *S. (S.) longifinus* Li, 1998; *S. (S.) macrocephalus* Li, 1985; *S. (S.) macroscalus* Li, 1992; *S. (S.) maitianheensis* Li, 1992; *S. (S.) malacopterus* Chu & Cui, 1985; *S. (S.) oxycephalus* Li, 1985; *S. (S.) purpureus* Li, 1985; *S. (S.) panzhouensis* Luo, Chen & Zhou, 2025; *S. (S.) qiubeiensis* Li, 2002; *S. (S.) qujingensis* Li, Mao & Lu, 2002; *S. (S.) robustus* Chen & Zhao, 1988; *S. (S.) tingi* Fang, 1936; *S. (S.) wumengshanensis* Li, Mao, Lu & Yan, 2003; *S. (S.) xichouensis* Pan, Li, Yang & Chen, 2013; *S. (S.) xiejiahuai* Luo, Fan, Xiao & Zhou, 2024; *S. (S.) xingrenensis* Luo, Xiao, Zhou, Xiao & Zhou, 2025; *S. (S.) yangzongensis* Chu & Chen, 1977; *S. (S.) yimenensis* Li & Xiao, 2005; *S. (S.) wenshanensis* Li, Yang, Li & Chen, 2018; and *S. (S.) wui* Li & An, 2013. *Sinocyclocheilus wui* was placed in the subgenus *Sinocyclocheilus* based on morphological characteristics (i.e., lateral line with above 70 scales, specifically

79–81) and its geographic distribution overlapping with the range of the subgenus *Sinocyclocheilus*. However, future validation using genetic data is required.

Distribution: These species are predominantly distributed in the Nanpanjiang, Yuanjiang, Panlongjiang, Jinshajiang, and Beipanjiang river basins, with specific occurrences in karst caves of eastern Yunnan and southwestern Guizhou.

Key to seven subgenus of the genus *Sinocyclocheilus*

1. Last unbranched ray strong, with serration along posterior edge.....2
Last unbranched ray soft, without serration along posterior edge.....*Jicyclocheilus* **subgen. nov.**
2. Snout elongate and flattened, duckbill-shaped.....3
Snout short obtusely rounded, non-duckbill-shaped5
3. Horn-like structure absent on head-dorsum junction; maxillary barbels not reaching the anterior margin of the preoperculum*Anchicyclocheilus*
Horn-like structure present on head-dorsum junction; maxillary barbels extending beyond or reaching the posterior margin of the eye4
4. Maxillary barbels extending beyond or reaching the posterior margin of the preoperculum in most specie.....*Ceratobarbus*
Maxillary barbels not reaching the anterior margin of the preoperculum.....*Pseudosinocyclocheilus*
5. Body normal, with a fusiform profile; pectoral fin tip not reaching to pelvic-fin origin in most species, and lateral-line scales above 70.....*Sinocyclocheilus*
Body with a strongly elevated dorsal profile; pectoral fin tip reaching to pelvic-fin origin in most species, and lateral-line scales below 70.....6
6. Maxillary barbels medium-length, reaching the posterior margin of the eye; lateral-line scales 45–50; distributed mainly in Wujiang River basin.....*Gibbibarbus*
Maxillary barbels robust and long, extending beyond the posterior margin of the preoperculum; lateral-line scales 51–68; distributed mainly in Hongshui River basin.....
.....*Hugeisinocyclocheilus* **subgen. nov.**

Supported Tables and Figures

Table S1 A list of *Sinocyclocheilus* molecular markers, chromosomes, distributions, and references. The classification scheme used here follows Wen et al. [5] and Chen et al. [6].

ID	Species	Authorship	Molecular data	Karyotype	River	River system
(A) <i>S. jii</i> group, five species						
1	<i>brevifinus</i>	Li, Li & Mayden, 2014	mtDNA		Pearl River	Guijiang-Hejiang River
2	<i>guanyangensis</i>	Chen, Peng & Zhang, 2016	mtDNA		Pearl River	Guijiang-Hejiang River
3	<i>guilinensis</i>	Ji, 1982	mtDNA		Pearl River	Guijiang-Hejiang River
4	<i>huangtianensis</i>	Zhu, Zhu & Lan, 2011	mtDNA		Pearl River	Guijiang-Hejiang River
5	<i>jii</i>	Zhang & Dai, 1992	mtDNA		Pearl River	Guijiang-Hejiang River
(B) <i>S. angularis</i> group, 22 species						
6	<i>altishoulderus</i>	(Li & Lan, 1992)	mtDNA		Pearl River	Hongshui River
7	<i>anatirostris</i>	Lin & Luo, 1986	mtDNA		Pearl River	Hongshui River
8	<i>angularis</i>	Zheng & Wang, 1990	mtDNA		Pearl River	Nanpanjiang River
9	<i>aquihornes</i>	Li & Yang, 2007	mtDNA		Pearl River	Nanpanjiang River
10	<i>bicornutus</i>	Wang & Liao, 1997	mtDNA	2n=100	Pearl River	Beipanjiang River
11	<i>brevibarbatus</i>	Zhao, Lan & Zhang, 2009	mtDNA		Pearl River	Hongshui River
12	<i>broadihornes</i>	Li & Mao, 2007	Absent		Pearl River	Nanpanjiang River
13	<i>convexiforeheadus</i>	Li, Yang & Li, 2017	mtDNA		Pearl River	Nanpanjiang River
14	<i>flexuosdorsalis</i>	Zhu & Zhu, 2012	mtDNA		Pearl River	Nanpanjiang River
15	<i>furcodorsalis</i>	Chen, Yang & Lan, 1997	mtDNA		Pearl River	Hongshui River
16	<i>hyalinus</i>	Chen & Yang, 1994	mtDNA		Pearl River	Nanpanjiang River
17	<i>jinxiensis</i>	Zheng, Xiu & Yang, 2013	Absent		Pearl River	Youjiang River
18	<i>jiuxuensis</i>	Li & Lan, 2003	mtDNA		Pearl River	Hongshui River
19	<i>longicornus</i>	Luo, Xu, Wu, Zhou & Zhou, 2023	mtDNA	2n=100	Pearl River	Nanpanjiang River
20	<i>mashanensis</i>	Wu, Liao & Li, 2010	mtDNA		Pearl River	Hongshui River
21	<i>rhinoceros</i>	Li & Tao, 1994	mtDNA		Pearl River	Nanpanjiang River
22	<i>simengensis</i>	Li, Wu, Li & Lan, 2018	mtDNA		Pearl River	Hongshui River
23	<i>tianeensis</i>	Li, Xiao & Luo, 2003	mtDNA		Pearl River	Hongshui River

24	<i>tianlinensis</i>	Zhou, Zhang, He & Zhou, 2004	mtDNA		Pearl River	Hongshui River
25	<i>tileihornes</i>	Mao, Lu & Li, 2003	Absent		Pearl River	Nanpanjiang River
26	<i>xingyiensis</i>	Luo, Tang, Deng, Duan & Zhang, 2023	mtDNA		Pearl River	Nanpanjiang River
27	<i>zhenfengensis</i>	Liu, Deng, Ma, Xiao & Zhou, 2018	mtDNA	2n=100	Yangtze River	Beipanjiang River
28	<i>wanlanensis</i>	Liu, Mao & Yang, 2025	mtDNA		Pearl River	Beipanjiang River
(C) <i>S. microphthalmus</i> group, four species						
29	<i>anshuiensis</i>	Gan, Wu, Wei & Yang, 2013	mtDNA		Pearl River	Youjiang River
30	<i>microphthalmus</i>	Li, 1989	mtDNA		Pearl River	Youjiang River
31	<i>longshanensis</i>	Li & Wu, 2018	mtDNA		Pearl River	Nanpanjiang River
32	<i>maculatus</i>	Li, 2000	mtDNA	2n=96	Pearl River	Nanpanjiang River
(D) <i>S. cyphotergous</i> group, 20 species						
33	<i>brevis</i>	Lan & Chen, 1992	mtDNA		Pearl River	Liujiang River
34	<i>cyphotergous</i>	(Dai, 1988)	mtDNA		Pearl River	Hongshui River
35	<i>donglanensis</i>	Zhao, Watanabe & Zhang, 2006	mtDNA		Pearl River	Hongshui River
36	<i>dongtangensis</i>	Zhou, Liu & Wang, 2011	Absent		Pearl River	Liujiang River
37	<i>gracilicaudatus</i>	Zhao & Zhang, 2014	mtDNA		Pearl River	Liujiang River
38	<i>guiyang</i>	Shao, Cheng, Lu, Zhou & Zeng, 2024	mtDNA		Yangtze River	Wujiang River
39	<i>huanjiangensis</i>	Wu, Gan & Li, 2010	mtDNA		Pearl River	Liujiang River
40	<i>hugeibarbus</i>	Li, Ran & Chen, 2003	mtDNA		Pearl River	Liujiang River
41	<i>lingyunensis</i>	Li, Xiao & Lu, 2000	mtDNA		Pearl River	Hongshui River
42	<i>longibarbatus</i>	Wang & Chen, 1989	mtDNA		Pearl River	Liujiang River
43	<i>macrolepis</i>	Wang & Chen, 1989	mtDNA		Pearl River	Liujiang River
44	<i>macrophthalmus</i>	Zhang & Zhao, 2001	mtDNA		Pearl River	Hongshui River
45	<i>multipunctatus</i>	(Pellegrin, 1931)	mtDNA	2n=100	Pearl River	Hongshui River
46	<i>punctatus</i>	Lan & Yang, 2017	mtDNA		Pearl River	Liujiang River
47	<i>ronganensis</i>	Luo, Huang & Wen, 2016	mtDNA		Pearl River	Liujiang River
48	<i>sanxiaensis</i>	Jiang, Li, Yang & Chang, 2019	mtDNA		Yangtze River	Yangtze River
49	<i>xunlensis</i>	Lan, Zhan & Zhang, 2004	mtDNA		Pearl River	Liujiang River
50	<i>yaolanensis</i>	Zhou, Li & Hou, 2009	Absent		Pearl River	Liujiang River
51	<i>yishanensis</i>	Li & Lan, 1992	mtDNA		Pearl River	Liujiang River

52	<i>zhenningensis</i>	Wang, Luo & Zhao, 2005	mtDNA		Yangtze River	Wujiang River
	(E) <i>S. tingi</i> group, 28 species					
53	<i>aluensis</i>	Li & Xiao, 2005	mtDNA		Pearl River	Nanpanjiang River
54	<i>angustiporus</i>	Zheng & Xie, 1985	mtDNA		Pearl River	Nanpanjiang River
55	<i>anophthalmus</i>	Chen & Chu, 1988	mtDNA		Pearl River	Nanpanjiang River
56	<i>bannaensis</i>	Li, Li & Chen, 2019	Absent		Lancang River	Luosuojiang River
57	<i>grahami</i>	(Regan, 1904)	mtDNA	2n=96	Yangtze River	Jinshajiang River
58	<i>guishanensis</i>	Li, 2003	mtDNA		Pearl River	Nanpanjiang River
59	<i>huaningensis</i>	Li, 1998	mtDNA		Pearl River	Nanpanjiang River
60	<i>huizeensis</i>	Cheng, Pan, Chen, Li, Ma & Yang, 2015	mtDNA		Yangtze River	Jinshajiang River
61	<i>lateristriatus</i>	Li, 1992	mtDNA		Pearl River	Nanpanjiang River
62	<i>longifinus</i>	Li, 1998	Absent		Pearl River	Nanpanjiang River
63	<i>macrocephalus</i>	Li, 1985	mtDNA		Pearl River	Nanpanjiang River
64	<i>macroscalus</i>	Li, 1992	mtDNA		Pearl River	Nanpanjiang River
65	<i>maitianheensis</i>	Li, 1992	mtDNA		Pearl River	Nanpanjiang River
66	<i>malacopterus</i>	Chu & Cui, 1985	mtDNA		Pearl River	Nanpanjiang River
67	<i>oxycephalus</i>	Li, 1985	mtDNA		Pearl River	Nanpanjiang River
68	<i>panzhouensis</i>	Luo, Chen & Zhou, 2025	mtDNA		Pearl River	Beipanjiang River
69	<i>purpureus</i>	Li, 1985	mtDNA		Pearl River	Nanpanjiang River
70	<i>qiubeiensis</i>	Li, 2002	mtDNA		Pearl River	Nanpanjiang River
71	<i>qujingensis</i>	Li, Mao & Lu, 2002	mtDNA		Pearl River	Nanpanjiang River
72	<i>robustus</i>	Chen & Zhao, 1988	Absent		Pearl River	Nanpanjiang River
73	<i>tingi</i>	Fang, 1936	mtDNA	2n=96	Pearl River	Nanpanjiang River
74	<i>wenshanensis</i>	Li, Yang, Li & Chen, 2018	mtDNA		Yangtze River	Panlongjiang Rive
75	<i>wumengshanensis</i>	Li, Mao, Lu & Yan, 2003	mtDNA		Red River	Nanpanjiang River
76	<i>xichouensis</i>	Pan, Li, Yang & Chen, 2013	mtDNA		Pearl River	Panlongjiang Rive
77	<i>xiejiahuai</i>	Luo, Fan, Xiao & Zhou, 2024	mtDNA		Pearl River	Beipanjiang River
78	<i>xingrenensis</i>	Luo, Xiao, Zhou, Xiao & Zhou, 2025	mtDNA		Pearl River	Nanpanjiang River
79	<i>yangzongensis</i>	Chu & Chen, 1977	mtDNA		Pearl River	Nanpanjiang River

80	<i>yimenensis</i>	Li & Xiao, 2005	mtDNA	Red River	Yuanjiang River
	(F) No assignment group, five species				
81	<i>luolouensis</i>	Lan, 2013	Absent	Pearl River	Youjiang River
82	<i>pingshanensis</i>	Li, Li, Lan & Wu, 2018	Absent	Pearl River	Liujiang River
83	<i>wui</i>	Li & An, 2013	Absent	Pearl River	Nanpanjiang River
84	<i>gracilis</i>	Li, 2014	Absent	Pearl River	Guijiang-Hejiang River
85	<i>luopingensis</i>	Li & Tao, 2002	Absent	Pearl River	Nanpanjiang River

Table S2 Localities, voucher information, and GenBank numbers for all samples used. The presence of a GenBank accession number in the "Mitogenomes" column indicates that the specimen possesses complete sequences of all 13 protein-coding genes, two rRNA genes, and 22 tRNAs. Accession numbers listed in the "Cyt *b*" or "ND4" columns indicate that only the mitochondrial sequence of the corresponding gene is available for the specimen. "NA" denotes data unavailability. A check mark ("√") indicates that the data were included in the corresponding phylogenetic analysis. Bold type indicates sequences generated in this study.

ID	Species	Revised species	Location (* type localities)	Voucher number	Mitogenomes	Cyt <i>b</i>	ND4	Data 1	Data 2
1	<i>S. altishoulderus_1</i>	<i>S. altishoulderus</i>	Mashan County, Guangxi	-	NC_013186			√	√
2	<i>S. altishoulderus_2</i>	<i>S. jiuxuensis</i>	Donglan County, Guangxi	ASIZB 78729		AB196442		√	
3	<i>S. altishoulderus_3</i>	<i>S. altishoulderus</i>	Mashan County, Guangxi	XH5801		AY854724	AY854781	√	
4	<i>S. aluensis</i>	<i>S. aluensis</i>	Luxi County, Yunnan*	-	MT122746			√	√
5	<i>S. anatirostris</i>	<i>S. anatirostris</i>	Youping Town, Leye County, Guangxi*	GZNU20210531002	NC_069226			√	√
6	<i>S. angularis_1</i>	<i>S. angularis</i>	Panzhou City, Guizhou*	GZNU20180420001	MZ636514			√	√
7	<i>S. angularis_2</i>	<i>S. angularis</i>	Panzhou City, Guizhou*	GZNU202001332	NC_057312			√	
8	<i>S. angularis_3</i>	<i>S. angularis</i>	Panzhou City, Guizhou*	GZNU202001332	MW362289			√	
9	<i>S. angustiporus_1</i>	<i>S. cf. angustiporus 1</i>	Luxi County, Yunnan	XH1203		AY854702	AY854759	√	√
10	<i>S. angustiporus_2</i>	<i>S. angustiporus</i>	Xingren County, Guizhou	GZNU20190504001	MZ636515			√	√
11	<i>S. angustiporus_3</i>	<i>S. cf. angustiporus 2</i>	-	-	MW548262			√	√
12	<i>S. angustiporus_4</i>	<i>S. angustiporus</i>	Xingyi City, Guizhou	GZNU20150807001	MW024378			√	
13	<i>S. anophthalmus</i>	<i>S. anophthalmus</i>	-	-	NC_023472			√	√
14	<i>S. anshuiensis</i>	<i>S. anshuiensis</i>	Lingyun County, Guangxi	-	KR069120			√	√
15	<i>S. aquihornes_2</i>	<i>S. aquihornes</i>	Qubei County, Yunnan	S62		OQ718393		√	
16	<i>S. bicornutus_1</i>	<i>S. bicornutus</i>	Xingren County, Guizhou	-	KX528071			√	√
17	<i>S. bicornutus_2</i>	<i>S. bicornutus</i>	Xingren County, Guizhou	XH8301		AY854730	AY854787	√	
18	<i>S. bicornutus_3</i>	<i>S. bicornutus</i>	Xingren County, Guizhou	XH8302		AY854731	AY854788	√	
19	<i>S. bicornutus_4</i>	<i>S. bicornutus</i>	Xingren County, Guizhou	XH8303		AY854732	AY854789	√	
20	<i>S. brevibarbatus_1</i>	<i>S. brevibarbatus</i>	-	GX0064-L20-13		MT373106	MW548423	√	√
21	<i>S. brevibarbatus_2</i>	<i>S. brevibarbatus</i>	Du'an, Guangxi	S63		OQ718394		√	
22	<i>S. brevifinus</i>	<i>S. brevifinus</i>	Hezhou, Guangxi	S64		OQ718395		√	√
23	<i>S. brevis_1</i>	<i>S. brevis</i>	-	GX0155		MT373105	MW548424	√	√
24	<i>S. brevis_2</i>	<i>S. brevis</i>	Luo Cheng, Guangxi	S65		OQ718396		√	
25	<i>S. cyphotergous_1</i>	<i>S. cyphotergous</i>	Luodian County, Guizhou*	GZNU20150819010	OQ319607			√	√
26	<i>S. cyphotergous_2</i>	<i>S. cyphotergous</i>	Luodian County, Guizhou*	XH2701		AY854711	AY854768	√	
27	<i>S. cyphotergous_3</i>	<i>S. cyphotergous</i>	Luodian County, Guizhou*	GZNU20150811002	MW024370			√	

28	<i>S. cyphotergous</i> _4	<i>S. cyphotergous</i>	Luodian County, Guizhou*	GZNU20150820002	MW024377			√	
29	<i>S. donglanensis</i> _1	<i>S. cf. donglanensis</i>	-	LIU050		MW548425		√	√
30	<i>S. flexuosdorsalis</i>	<i>S. flexuosdorsalis</i>	Longlin, Guangxi	S66	OQ718397			√	√
31	<i>S. furcodorsalis</i> _1	<i>S. cf. furcodorsalis</i>	Tian'e County, Guangxi	-	GU589570			√	√
32	<i>S. furcodorsalis</i> _2	<i>S. furcodorsalis</i>	-	2008050001		HQ677332		√	
33	<i>S. furcodorsalis</i> _3	<i>S. furcodorsalis</i>	Bala, Tiane County, Guangxi*	XH2202		AY854709	AY854766	√	√
34	<i>S. furcodorsalis</i> _4	<i>S. furcodorsalis</i>	-	2008050003		HQ709299		√	
35	<i>S. furcodorsalis</i> _5	<i>S. furcodorsalis</i>	-	2008050004		HQ709314		√	
36	<i>S. furcodorsalis</i> _6	<i>S. tianeensis</i>	-	2008050005		HQ709315		√	
37	<i>S. furcodorsalis</i> _7	<i>S. furcodorsalis</i>	-	2008050006		HQ709316		√	
38	<i>S. furcodorsalis</i> _8	<i>S. furcodorsalis</i>	-	2008050012		HQ709321		√	
39	<i>S. gracilicaudatus</i>	<i>S. cf. longibarbatus</i> 2	Huanjiang, Guangxi	S67		OQ718398		√	√
40	<i>S. grahami</i> _1	<i>S. grahami</i>	Kunming City, Yunnan	-	GQ148557			√	√
41	<i>S. grahami</i> _2	<i>S. cf. grahami</i> 1	-	-		AF051879		√	
42	<i>S. grahami</i> _3	<i>S. cf. grahami</i> 2	-	-			AF068329	√	√
43	<i>S. grahami</i> _4	<i>S. grahami</i>	Qinglongsi, Kunming, Yunnan	XH0701		AY854694		√	
44	<i>S. grahami</i> _5	<i>S. cf. grahami</i> 3	Huanglongdong, Kunming, Yunnan	XH0802		AY854695		√	√
45	<i>S. grahami</i> _6	<i>S. grahami</i>	Haikou, Kunming, Yunnan	XH4404		AY854696		√	
46	<i>S. guanyangensis</i> _1	<i>S. jii</i>	-	GX0173		MT373108	MW548426	√	√
47	<i>S. guanyangensis</i> _2	<i>S. jii</i>	Guanyang County, Guangxi	S68		OQ718399		√	
48	<i>S. guilinensis</i> _1	<i>S. guilinensis</i>	-	GX0073-L17-2		MT373104	MW548427	√	√
49	<i>S. guilinensis</i> _2	<i>S. guilinensis</i>	Guilin County, Guangxi	S69		OQ718400		√	
50	<i>S. guishanensis</i>	<i>S. guishanensis</i>	Guishan, Shilin County, Yunnan	XH5401		AY854722	AY854779	√	√
51	<i>S. huangtianensis</i> _1	<i>S. huangtianensis</i>	-	GX0175		MT373109	MW548428	√	√
52	<i>S. huangtianensis</i> _2	<i>S. brevifinus</i>	Hezhou County, Guangxi	S70		OQ718401		√	
53	<i>S. huaningensis</i>	<i>S. huaningensis</i>	Huaning County, Yunnan	XH3701		AY854718	AY854775	√	√
54	<i>S. huanjiangensis</i> _1	<i>S. huanjiangensis</i>	-	GX0124		MT373103	MW548429	√	√
55	<i>S. huanjiangensis</i> _2	<i>S. huanjiangensis</i>	Huanjiang County, Guangxi	S71		OQ718402		√	
56	<i>S. hugeibarbus</i> _1	<i>S. hugeibarbus</i>	Libo County, Guizhou*	GZNU20150120005	MW014319			√	√
57	<i>S. hugeibarbus</i> _2	<i>S. hugeibarbus</i>	Libo County, Guizhou*	S72		OQ718403		√	
58	<i>S. huizeensis</i> _1	<i>S. huizeensis</i>	Huize County, Yunnan*	hrfri2018046	MH982229			√	√
59	<i>S. huizeensis</i> _2	<i>S. huizeensis</i>	Xundian County, Yunnan		OK505604			√	√
60	<i>S. hyalinus</i>	<i>S. hyalinus</i>	Alugudong, Luxi County, Yunnan	XH4701		AY854721	AY854778	√	√

61	<i>S. jii_1</i>	<i>S. jii</i>	Gongcheng County, Guangxi	YNUSJ201308060038	MF100765			√	√
62	<i>S. jii_2</i>	<i>S. cf. jii</i>	Fuchuan County, Guangxi	XH8101		AY854727	AY854784	√	
63	<i>S. jii_3</i>	<i>S. jii</i>	Fuchuan County, Guangxi	XH8102		AY854728	AY854785	√	
64	<i>S. jiuxuensis_1</i>	<i>S. jiuxuensis</i>	Jiuxu Town, Hechi City, Guangxi	XH8501		AY854736	AY854793	√	√
65	<i>S. jiuxuensis_2</i>	<i>S. jiuxuensis</i>	Jiuxu, Hechi, Guangxi	XH8502		AY854737	AY854794	√	
66	<i>S. lateristriatus_1</i>	<i>S. lateristriatus</i>	Maojiachong, Zhanyi County, Yunnan	XH1102		AY854703	AY854760	√	√
67	<i>S. lateristriatus_2</i>	<i>S. lateristriatus</i>	Shannabian, Zhanyi County, Yunnan	XH1301		AY854704	AY854761	√	
68	<i>S. lateristriatus_3</i>	<i>S. lateristriatus</i>	Maojiachong, Zhanyi County, Yunnan	XH1302		AY854705	AY854762	√	
69	<i>S. lateristriatus_4</i>	<i>S. lateristriatus</i>	Luoshuidong, Zhanyi County, Yunnan	XH1401		AY854706	AY854763	√	
70	<i>S. lateristriatus_5</i>	<i>S. lateristriatus</i>	Maojiachong, Zhanyi County, Yunnan	XH1601		AY854707	AY854764	√	
71	<i>S. liboensis</i>	<i>S. longibarbatus</i>	Libo County, Guizhou	-	MW675304			√	
72	<i>S. lingyunensis_1</i>	<i>S. lingyunensis</i>	-	-	MW411665			√	√
73	<i>S. lingyunensis_2</i>	<i>S. lingyunensis</i>	Shadong, Lingyun County, Guangxi	XH0502		AY854691	AY854748	√	
74	<i>S. lingyunensis_3</i>	<i>S. lingyunensis</i>	Shadong, Lingyun County, Guangxi	XH2001		AY854692	AY854749	√	
75	<i>S. lingyunensis_4</i>	<i>S. lingyunensis</i>	Jiangcun, Lingyun County, Guangxi	XH3301		AY854693	AY854750	√	
76	<i>S. longibarbatus_1</i>	<i>S. cf. longibarbatus_1</i>	Libo County, Guizhou	GZNU20160728016	MW024375			√	
77	<i>S. longibarbatus_2</i>	<i>S. longibarbatus</i>	Libo County, Guizhou*	GZNU2019102022	NC_056194			√	√
78	<i>S. longibarbatus_3</i>	<i>S. cf. longibarbatus_1</i>	Libo County, Guozhou	XH2901		AY854714	AY854771	√	
79	<i>S. longibarbatus_4</i>	<i>S. longibarbatus</i>	Libo County, Guizhou*	-	MT361975			√	
80	<i>S. longibarbatus_5</i>	<i>S. longibarbatus</i>	Libo County, Guizhou*	GZNU2019102022	MW024371			√	
81	<i>S. longibarbatus_6</i>	<i>S. longibarbatus</i>	Libo County, Guozhou	GZNU20150812005	MW024372			√	
82	<i>S. longibarbatus_7</i>	<i>S. longibarbatus</i>	Libo County, Guozhou	GZNU20150812105	MW024373			√	
83	<i>S. longibarbatus_8</i>	<i>S. cf. longibarbatus_3</i>	Libo County, Guozhou	GZNU20170731004	MW024374			√	
84	<i>S. longihornes_1</i>	<i>S. longicornus</i>	Hongguo Town, Panzhou City, Guizhou*	GZNU20210503016		MZ634123	MZ634125	√	√

85	<i>S. longihornes_2</i>	<i>S. longicornus</i>	Hongguo Town, Panzhou City, Guizhou*	GZNU20210503017	MZ634124	MZ634126	√	
86	<i>S. lunanensis</i>	<i>S. oxycephalus</i>	Heilongtan, Shilin County, Yunnan	XH0302	AY854686		√	√
87	<i>S. macrocephalus_1</i>	<i>S. macrocephalus</i>	Heilongtan, Shilin County, Yunnan	XH0103	AY854683	AY854740	√	√
88	<i>S. macrocephalus_2</i>	<i>S. macrocephalus</i>	Heilongtan, Shilin County, Yunnan	XH0110	AY854684	AY854741	√	
89	<i>S. macrolepis</i>	<i>S. macrolepis</i>	Nandan County, Guangxi	XH8201	AY854729	AY854786	√	√
90	<i>S. macrophthalmus_1</i>	<i>S. macrophthalmus</i>	Xiaao, Duan County, Guangxi	XH8401	AY854733	AY854790	√	√
91	<i>S. macrophthalmus_2</i>	<i>S. macrophthalmus</i>	Heilongtan, Shilin County, Yunnan	XH8402	AY854734	AY854791	√	
92	<i>S. macrophthalmus_3</i>	<i>S. macrophthalmus</i>	Heilongtan, Shilin County, Yunnan	XH8403	AY854735	AY854792	√	
93	<i>S. macrophthalmus_4</i>	<i>S. cf. longibarbatus</i> 2	-	IHBCY0411246	HM536792	HM536711	√	
94	<i>S. macrophthalmus_5</i>	<i>S. macrophthalmus</i>	Du'an County, Guangxi	2008050065	HQ709311		√	
95	<i>S. macrophthalmus_6</i>	<i>S. macrophthalmus</i>	Du'an County, Guangxi	2008050066	HQ709312		√	
96	<i>S. macrophthalmus_7</i>	<i>S. macrophthalmus</i>	Du'an County, Guangxi	2008050067	HQ709313		√	
97	<i>S. maculatus_1</i>	<i>S. cf. maculatus</i>	Yiliang, Yunnan	IHB:2006632	EU366193		√	
98	<i>S. maculatus_10</i>	<i>S. maculatus</i>	Beishapo, Yanshan County, Yunnan	T11	MF325007		√	√
99	<i>S. maculatus_11</i>	<i>S. maculatus</i>	Beishapo, Yanshan County, Yunnan	T12	MF325008		√	
100	<i>S. maculatus_12</i>	<i>S. maculatus</i>	Beishapo, Yanshan County, Yunnan	T13	MF325009		√	
101	<i>S. maculatus_13</i>	<i>S. maculatus</i>	Beishapo, Yanshan County, Yunnan	T14	MF325010		√	
102	<i>S. maculatus_2</i>	<i>S. maculatus</i>	Beishapo, Yanshan County, Yunnan	M1	MF324999		√	
103	<i>S. maculatus_3</i>	<i>S. maculatus</i>	Beishapo, Yanshan County, Yunnan	M2	MF325000		√	
104	<i>S. maculatus_4</i>	<i>S. maculatus</i>	Beishapo, Yanshan County, Yunnan	M3	MF325001		√	
105	<i>S. maculatus_5</i>	<i>S. maculatus</i>	Beishapo, Yanshan County, Yunnan	M4	MF325002		√	

106	<i>S. maculatus_6</i>	<i>S. maculatus</i>	Beishapo, Yanshan County, Yunnan	M5		MF325003		√	
107	<i>S. maculatus_7</i>	<i>S. maculatus</i>	Beishapo, Yanshan County, Yunnan	MD1		MF325004		√	
108	<i>S. maculatus_8</i>	<i>S. maculatus</i>	Beishapo, Yanshan County, Yunnan	MD3		MF325005		√	
109	<i>S. maculatus_9</i>	<i>S. maculatus</i>	Beishapo, Yanshan County, Yunnan	MD2		MF325006		√	
110	<i>S. maitianheensis</i>	<i>S. maitianheensis</i>	Jiuxiang, Yiliang County, Yunnan	XH2301		AY854710	AY854767	√	√
111	<i>S. malacopterus_2</i>	<i>S. malacopterus</i>	Wulonghe, Shizong County, Yunnan	XH0901		AY854697	AY854754	√	
112	<i>S. malacopterus_3</i>	<i>S. malacopterus</i>	Jinji, Luoping County, Yunnan	XH0902		AY854698	AY854755	√	
113	<i>S. malacopterus_4</i>	<i>S. malacopterus</i>	Jinji, Luoping County, Yunnan	XH2501		AY854699	AY854756	√	
114	<i>S. malacopterus_5</i>	<i>S. malacopterus</i>	Changdi, Luoping County, Yunnan	XH5501		AY854700	AY854757	√	
115	<i>S. mashanensis_1</i>	<i>S. mashanensis</i>	-	GX0026-L18-12		MT373107	MW548430	√	√
117	<i>S. mashanensis_3</i>	<i>S. jiuxuensis</i>	Masan County, Guangxi	S73		OQ718404		√	
118	<i>S. microphthalmus_1</i>	<i>S. microphthalmus</i>	Lingyun County, Guangxi	NNNU201712001	MN145877			√	√
119	<i>S. microphthalmus_2</i>	<i>S. microphthalmus</i>	Shadong, Lingyun County, Guangxi	XH0402		AY854687	AY854744	√	
120	<i>S. microphthalmus_3</i>	<i>S. microphthalmus</i>	Shadong, Lingyun County, Guangxi	XH1801		AY854688	AY854745	√	
121	<i>S. microphthalmus_4</i>	<i>S. microphthalmus</i>	Luolou, Lingyun County, Guangxi	XH2101		AY854689	AY854746	√	
122	<i>S. microphthalmus_5</i>	<i>S. microphthalmus</i>	Luolou, Lingyun County, Guangxi	XH2102		AY854690	AY854747	√	
123	<i>S. microphthalmus_6</i>	<i>S. microphthalmus</i>	-	IHBCY0411238	NADH		HM536703	√	
124	<i>S. multipunctatus_1</i>	<i>S. multipunctatus</i>	Huishui County, Guizhou	-	MG026730			√	√
125	<i>S. multipunctatus_2</i>	<i>S. multipunctatus</i>	Huishui County, Guizhou	XH2801		AY854712	AY854769	√	
126	<i>S. multipunctatus_3</i>	<i>S. multipunctatus</i>	Huishui County, Guizhou	XH2802		AY854713	AY854770	√	
127	<i>S. oxycephalus_1</i>	<i>S. cf. oxycephalus</i>	Shilin County, Yunnan	YNUSO20160610002	MG686610			√	√
128	<i>S. oxycephalus_2</i>	<i>S. oxycephalus</i>	Heilongtan, Shilin County, Yunnan	XH0201		AY854685	AY854742	√	
129	<i>S. oxycephalus_3</i>	<i>S. oxycephalus</i>	Heilongtan Reservoir, Shilin County, Yunnan Province, China	YNUSO20160610002	MW548263			√	√

130	<i>S. punctatus_1</i>	<i>S. punctatus</i>	Libo County, Guizhou	-		MK610341	MK610346	√	
131	<i>S. punctatus_2</i>	<i>S. punctatus</i>	Libo County, Guizhou	-	MT361976			√	√
132	<i>S. punctatus_3</i>	<i>S. punctatus</i>	Libo County, Guizhou	S74		OQ718405		√	
133	<i>S. punctatus_4</i>	<i>S. punctatus</i>	-	ZJFR01		PP112594		√	
134	<i>S. punctatus_5</i>	<i>S. punctatus</i>	-	ZJFR02		PP112595		√	
135	<i>S. punctatus_6</i>	<i>S. punctatus</i>	-	ZJFR03		PP112596		√	
136	<i>S. purpureus_1</i>	<i>S. cf. purpureus</i>	-	IHB:2006638	MW548264			√	√
137	<i>S. punctatus_8</i>	<i>S. punctatus</i>	Libo County, Guizhou	-	MW014318			√	
138	<i>S. qiubeiensis_1</i>	<i>S. cf. purpureus</i>	Songming, Yunnan	IHB:2006624	NC_063104			√	√
139	<i>S. qiubeiensis_10</i>	<i>S. qiubeiensis</i>	Jiulongtan, Qiubei County, Yunnan	J22		MF324977		√	
140	<i>S. qiubeiensis_11</i>	<i>S. qiubeiensis</i>	Jiulongtan, Qiubei County, Yunnan	Q19		MF324978		√	
141	<i>S. qiubeiensis_12</i>	<i>S. qiubeiensis</i>	Jiulongtan, Qiubei County, Yunnan	JQ4		MF324979		√	
142	<i>S. qiubeiensis_13</i>	<i>S. qiubeiensis</i>	Jiulongtan, Qiubei County, Yunnan	JQ20		MF324980		√	
143	<i>S. qiubeiensis_14</i>	<i>S. qiubeiensis</i>	Jiulongtan, Qiubei County, Yunnan	JQ3		MF324981		√	
144	<i>S. qiubeiensis_15</i>	<i>S. qiubeiensis</i>	Jiulongtan, Qiubei County, Yunnan	Q16		MF324982		√	
145	<i>S. qiubeiensis_16</i>	<i>S. qiubeiensis</i>	Jiulongtan, Qiubei County, Yunnan	Q17		MF324983		√	
146	<i>S. qiubeiensis_17</i>	<i>S. qiubeiensis</i>	Dayile, Qiubei County, Yunnan	W6		MF324984		√	
147	<i>S. qiubeiensis_18</i>	<i>S. qiubeiensis</i>	Dayile, Qiubei County, Yunnan	W7		MF324985		√	
148	<i>S. qiubeiensis_19</i>	<i>S. qiubeiensis</i>	Dayile, Qiubei County, Yunnan	W8		MF324986		√	
149	<i>S. qiubeiensis_2</i>	<i>S. huizeensis</i>	Songming County, Yunnan	IHB:2006626		EU366195	EU366181	√	
150	<i>S. qiubeiensis_20</i>	<i>S. qiubeiensis</i>	Dayile, Qiubei County, Yunnan	W9		MF324987		√	
151	<i>S. qiubeiensis_21</i>	<i>S. qiubeiensis</i>	Dayile, Qiubei County, Yunnan	W10		MF324988		√	
152	<i>S. qiubeiensis_22</i>	<i>S. qiubeiensis</i>	Dayile, Qiubei County, Yunnan	WD6		MF324989		√	
153	<i>S. qiubeiensis_23</i>	<i>S. qiubeiensis</i>	Dayile, Qiubei County, Yunnan	WD7		MF324990		√	
154	<i>S. qiubeiensis_24</i>	<i>S. qiubeiensis</i>	Dayile, Qiubei County, Yunnan	WD8		MF324991		√	
155	<i>S. qiubeiensis_25</i>	<i>S. qiubeiensis</i>	Dayile, Qiubei County, Yunnan	WD9		MF324992		√	
156	<i>S. qiubeiensis_26</i>	<i>S. qiubeiensis</i>	Dayile, Qiubei County, Yunnan	WD10		MF324993		√	
157	<i>S. qiubeiensis_27</i>	<i>S. qiubeiensis</i>	Dayile, Qiubei County, Yunnan	WD11		MF324994		√	
158	<i>S. qiubeiensis_28</i>	<i>S. qiubeiensis</i>	Dayile, Qiubei County, Yunnan	WD12		MF324995		√	
159	<i>S. qiubeiensis_29</i>	<i>S. qiubeiensis</i>	Dayile, Qiubei County, Yunnan	WD13		MF324996		√	
160	<i>S. qiubeiensis_3</i>	<i>S. huizeensis</i>	Songming County, Yunnan	IHB:2006624		EU366188	EU366182	√	
161	<i>S. qiubeiensis_30</i>	<i>S. qiubeiensis</i>	Dayile, Qiubei County, Yunnan	WD14		MF324997		√	
162	<i>S. qiubeiensis_31</i>	<i>S. qiubeiensis</i>	Dayile, Qiubei County, Yunnan	WD15		MF324998		√	√
163	<i>S. qiubeiensis_4</i>	<i>S. qiubeiensis</i>	Baima, Qiubei County, Yunnan	B23		MF324971		√	

164	<i>S. qiubeiensis_5</i>	<i>S. qiubeiensis</i>	Baima, Qiubei County, Yunnan	B24		MF324972		√	
165	<i>S. qiubeiensis_6</i>	<i>S. qiubeiensis</i>	Baima, Qiubei County, Yunnan	B25		MF324973		√	
166	<i>S. qiubeiensis_7</i>	<i>S. qiubeiensis</i>	Jiulongtan, Qiubei County, Yunnan	J15		MF324974		√	
167	<i>S. qiubeiensis_8</i>	<i>S. qiubeiensis</i>	Jiulongtan, Qiubei County, Yunnan	J18		MF324975		√	
168	<i>S. qiubeiensis_9</i>	<i>S. qiubeiensis</i>	Jiulongtan, Qiubei County, Yunnan	J21		MF324976		√	
169	<i>S. qujingensis_1</i>	<i>S. cf. qujingensis</i>	Huize County, Yunnan	hrfri2018044	MH937706			√	√
170	<i>S. qujingensis_2</i>	<i>S. lateristriatus</i>	Wujiafen, Qujing County, Yunnan	XH3801		AY854719	AY854776	√	√
171	<i>S. rhinoceros_1</i>	<i>S. rhinoceros</i>	Luoping County, Yunnan	-	KR069119			√	√
172	<i>S. rhinoceros_2</i>	<i>S. rhinoceros</i>	Luoping County, Yunnan	XH3901		AY854720	AY854777	√	
173	<i>S. ronganensis</i>	<i>S. ronganensis</i>	Rong'an County, Guangxi	-	KX778473			√	√
174	<i>S. sanxiaensis_1</i>	<i>S. sanxiaensis</i>	Guojiaba Town, Zigui County, Hubei*	KNHM 2019000001	OP745534			√	√
175	<i>S. sanxiaensis_2</i>	<i>S. sanxiaensis</i>	Guojiaba Town, Zigui County, Hubei*	KIZ2019000001		MN106258		√	
176	<i>S. simengensis</i>	<i>S. simengensis</i>	Donglan, Guangxi	S75		OQ718406		√	√
177	<i>S. sp ban YJ-2019</i>	<i>S. cf. longibarbatus</i> 2	Libo County, Guizhou	-		MK610338		√	
178	<i>S. sp bia YJ-2019</i>	<i>S. cyphotergous</i>	Libo County, Guizhou	-		MK610339		√	
179	<i>S. sp boy YJ-2019</i>	<i>S. multipunctatus</i>	Huishui County, Guizhou	-		MK610340		√	
180	<i>S. sp CA139</i>	<i>S. donglanensis</i>	Taiping Town, Donglan County, Guangxi	-		AB196440		√	√
181	<i>S. sp CA141</i>	<i>S. donglanensis</i>	Taiping Town, Donglan County, Guangxi	-		AB196441		√	√
182	<i>S. sp n YK-2021</i>	<i>S. zhenfengensis</i>	Xiaotun Village, Zhenfeng County, Guizhou	-	MW574480			√	√
183	<i>S. sp w XW-2023</i>	<i>S. guiyangensis</i>	-	-		ON369436		√	√
184	<i>S. tianeensis_1</i>	<i>S. tianeensis</i>	Banshi, Tiane County, Guangxi*			AY854717		√	√
185	<i>S. tianeensis_10</i>	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050016		HQ709306		√	
186	<i>S. tianeensis_11</i>	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050017		HQ709307		√	
187	<i>S. tianeensis_12</i>	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050018		HQ709308		√	
188	<i>S. tianeensis_13</i>	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050019		HQ709309		√	
189	<i>S. tianeensis_14</i>	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050038		HQ709310		√	
190	<i>S. tianeensis_15</i>	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050008		HQ709317		√	
191	<i>S. tianeensis_16</i>	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050009		HQ709318		√	
192	<i>S. tianeensis_17</i>	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050010		HQ709319		√	

193	<i>S. tianeensis</i> _18	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050011		HQ709320		√	
194	<i>S. tianeensis</i> _2	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050020		HQ709297		√	
195	<i>S. tianeensis</i> _3	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050021		HQ709298		√	
196	<i>S. tianeensis</i> _4	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050022		HQ709300		√	
197	<i>S. tianeensis</i> _5	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050013		HQ709301		√	
198	<i>S. tianeensis</i> _6	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050030		HQ709302		√	
199	<i>S. tianeensis</i> _7	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050032		HQ709303		√	
200	<i>S. tianeensis</i> _8	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050036		HQ709304		√	
201	<i>S. tianeensis</i> _9	<i>S. tianeensis</i>	Tiane County, Guangxi	2008050015		HQ709305		√	
202	<i>S. tianlinensis</i> _2	<i>S. tianeensis</i>	-	GX0087-L17-16		MT373102		√	
203	<i>S. tianlinensis</i> _3	<i>S. tianeensis</i>	-	GX0121			MW548431	√	
204	<i>S. tianlinensis</i> _4	<i>S. tianeensis</i>	Tianlin, Guangxi	S76		OQ718407		√	
205	<i>S. tingi</i> _1	<i>S. tingi</i>	Fuxian Lake, Yunnan	YNUST201406180002	MG323567			√	√
206	<i>S. tingi</i> _2	<i>S. tingi</i>	Fuxianhu Lake, Yunnan	XH1001		AY854701	AY854758	√	
208	<i>S. tingi</i> _4	<i>S. tingi</i>	-	-			HQ235840	√	
209	<i>S. wenshanensis</i> _1	<i>S. wenshanensis</i>	Xigu Town, Wenshan, Yunnan*		OM001088			√	√
210	<i>S. wenshanensis</i> _2	<i>S. wenshanensis</i>	Wenshan, Yunnan	S77		OQ718408		√	
211	<i>S. wenshanensis</i> _3	<i>S. wenshanensis</i>	-	-	MW553076			√	
212	<i>S. wumengshanensis</i>	<i>S. wumengshanensis</i>	Xuanwei County, Yunnan	YNUSM20160817008	MG021442			√	√
213	<i>S. xichouensis</i> _2	<i>S. xichouensis</i>	Xichou County, Yunnan*	S78		OQ718409		√	√
214	<i>S. xingyiensis</i> _1	<i>S. xingyiensis</i>	Xingyi City, Guizhou*	GZNUSLS202008177		ON573218		√	√
215	<i>S. xingyiensis</i> _2	<i>S. xingyiensis</i>	Xingyi City, Guizhou*	GZNUSLS202008178		ON573219		√	
216	<i>S. xingyiensis</i> _3	<i>S. xingyiensis</i>	Xingyi City, Guizhou*	GZNUSLS202008179		ON573220		√	
217	<i>S. xingyiensis</i> _4	<i>S. xingyiensis</i>	Xingyi City, Guizhou*	GZNUSLS202008180		ON573221		√	
218	<i>S. xunlensis</i> _1	<i>S. xunlensis</i>	Huanjiang, Guangxi	IHB:04050268		EU366187	EU366184	√	√
219	<i>S. xunlensis</i> _2	<i>S. xunlensis</i>	Huanjiang, Guangxi	IHB:04050270		EU366190	EU366185	√	
220	<i>S. xunlensis</i> _3	<i>S. xunlensis</i>	Huanjiang, Guangxi	IHBCY04050268		HM536791	HM536710	√	
221	<i>S. yangzongensis</i> _1	<i>S. yangzongensis</i>	Yangzonghai Lake, Yunnan*	XH6101		AY854725	AY854782	√	√
222	<i>S. yangzongensis</i> _2	<i>S. yangzongensis</i>	Yangzonghai Lake, Yunnan*	XH6102		AY854726	AY854783	√	
223	<i>S. yangzongensis</i> _4	<i>S. yangzongensis</i>	-	-			HQ235873	√	
224	<i>S. yimenensis</i> _1	<i>S. yimenensis</i>	Yimen, Yunnan	IHB:2006646		EU366191	EU366180	√	√
225	<i>S. yimenensis</i> _2	<i>S. yimenensis</i>	Yimen, Yunnan	IHB:2006645		EU366192	EU366179	√	
226	<i>S. yishanensis</i> _1	<i>S. yishanensis</i>	Liujiang County, Guangxi	-	MK387704			√	√
227	<i>S. yishanensis</i> _2	<i>S. yishanensis</i>	Yizhou City, Guangxi	CA85		AB196443		√	

228	<i>S. yishanensis_3</i>	<i>S. yishanensis</i>	Yizhou City, Guangxi	CA87		AB196444		√	
229	<i>S. yishanensis_4</i>	<i>S. yishanensis</i>	Yizhou City, Guangxi	CA121		AB196445		√	
230	<i>S. yishanensis_5</i>	<i>S. yishanensis</i>	Liujiang County, Guangxi	GX0070-L18-18		MT373101		√	
231	<i>S. yishanensis_6</i>	<i>S. yishanensis</i>	-	LIU095			MW548432	√	
232	<i>S. zhenfengensis_1</i>	<i>S. zhenfengensis</i>	Zhenfeng County, Guizhou*	GZNU20150112021	MW014317			√	√
233	<i>S. zhenfengensis_2</i>	<i>S. zhenfengensis</i>	Zhenfeng County, Guizhou*	GZNU20150112021		MK610342	MK610347	√	
234	<i>S. tianlinensis</i>	<i>S. tianlinensis</i>	Tianlin, Guangxi	GZNU20201006S10	PQ222367			√	
235	<i>S. microphthalmus</i>	<i>S. zhenfengensis</i>	Zhenfeng County, Guizhou*	GZNU20201004S17	PQ222368			√	
236	<i>S. purpureus</i>	<i>S. purpureus</i>	Zhonghe Town, Kaiyuan City, Yunnan.*	GZNU20201004S20	PQ222369			√	√
237	<i>S. qiubeiensis</i>	<i>S. purpureus</i>	Jiucheng town, Qiubei County, Yunnan	GZNU20181004S21	PQ222370			√	√
238	<i>S. longshnaensis</i>	<i>S. longshnaensis</i>	Shupi Township, Qiubei County, Yunnan*	GZNU20201004S22	PQ222371			√	√
239	<i>S. aquihornes_1</i>	<i>S. aquihornes</i>	Shuanglongjian town, Qiubei County, Yunnan*	GZNU20201004S28	PX315717			√	√
240	<i>S. xichouensis_1</i>	<i>S. cf. xichouensis</i>	-	GZNU20201004S37	PQ222374			√	√
241	<i>S. malacopterus_1</i>	<i>S. malacopterus</i>	Wulong Township, Shizong County, Yunnan	GZNU20191018S43	PQ222372			√	√
242	<i>S. wenshanensis</i>	<i>S. wenshanensis</i>	Dehou Town, Wenshan City, Yunnan*	GZNU20200604S45	PQ222373			√	√
243	<i>S. xiejiahuai</i>	<i>S. xiejiahuai</i>	Hongguo Town, Panzhou City, Guizhou*	GZNU20180609S46	PX315718			√	√
244	<i>S. longibarbatus_9</i>	<i>S. longibarbatus</i>	Libo County, Guizhou*	GZNU20201010S47	PQ222375			√	
245	<i>S. macrolepis_2</i>	<i>S. macrolepis</i>	Libo County, Guizhou*	GZNU20180612S48	PQ222376			√	√
246	<i>S. convexiforeheadus</i>	<i>S. convexiforeheadus</i>	Wenliu Township, Qubei County, Yunnan*	GZNU20201006S10		PX289971	PX289972	√	√
247	<i>S. tianlinensis_1</i>	<i>S. tianlinensis</i>	Tianlin, Guangxi	GZNU20210531003	PQ214929			√	√
248	<i>Carassius auratus</i>	<i>Carassius auratus</i>	-	-	AB111951			√	√
249	<i>Cyprinus carpio</i>	<i>Cyprinus carpio</i>	-	-	JN105357			√	√
250	<i>Schizothorax yunnanensis</i>	<i>Schizothorax yunnanensis</i>	-	-	KR780749			√	√
251	<i>Onychostoma simum</i>	<i>Onychostoma simum</i>	-	-	KF021233			√	√
252	<i>Barbus barbus</i>	<i>Barbus barbus</i>	-	-	AB238965			√	√
253	<i>Puntius ticto</i>	<i>Puntius ticto</i>	-	-	AB238969			√	√
254	<i>Neolissochilus</i>	<i>Neolissochilus</i>	-	-	KU380329			√	√

	<i>hexagonolepis</i>	<i>hexagonolepis</i>					
255	<i>Garra orientalis</i>	<i>Garra orientalis</i>	-	-	JX290078	√	√
256	<i>Danio rerio</i>	<i>Danio rerio</i>	-	-	KM244705	√	√

Table S3 Species GPS information and the information of six extracted biological variables.

ID	Longitude	Latitude	Species	Species group	Bio_1	Bio_7	Bio_11	Bio_12	Bio_15	Bio_17
1	105.1905600	25.5186690	<i>bicornutus</i>	<i>angularis</i> group	15.33450031	23.63600159	7.554666519	1297	79.33289337	65
2	105.2248621	25.4919386	<i>bicornutus2</i>	<i>angularis</i> group	15.78349972	23.64799881	7.988666534	1312	79.07783508	67
3	105.2681637	25.4942628	<i>bicornutus3</i>	<i>angularis</i> group	15.69816685	23.52799988	7.895999908	1310	79.06541443	67
4	105.1117587	25.4445728	<i>bicornutus4</i>	<i>angularis</i> group	15.46983337	23.38000107	7.746666908	1293	79.67034912	65
5	105.0897217	25.5241637	<i>bicornutus5</i>	<i>angularis</i> group	14.82316685	23.43599892	7.180666924	1286	79.47744751	64
6	105.6428300	25.5089800	<i>zhenfengensis1</i>	<i>angularis</i> group	16.36716652	24.22399902	8.236666679	1286	79.0667572	64
7	105.5566840	25.4933080	<i>zhenfengensis2</i>	<i>angularis</i> group	15.79199982	23.84000015	7.803999901	1305	79.10868835	65
8	105.5982685	25.5111508	<i>zhenfengensis3</i>	<i>angularis</i> group	16.04466629	24.06399918	7.943333149	1296	79.09571075	65
9	104.4068460	25.6547585	<i>xiejiahuai</i>	<i>tingi</i> group	13.17249966	22.76000023	6.450666904	1123	84.27873993	46
10	104.4370651	25.6580841	<i>xiejiahuai1</i>	<i>tingi</i> group	13.57133293	22.90399933	6.728000164	1141	83.98696899	49
11	111.4753667	24.5977961	<i>brevifinus</i>	<i>jii</i> group	17.71233368	26.13199997	8.653333664	1614	61.3515358	149
12	111.2290556	24.2996389	<i>guanyangensis</i>	<i>jii</i> group	19.43216705	26.13199997	10.5	1555	64.00057983	137
13	110.3207200	25.0338100	<i>guilinensis</i>	<i>jii</i> group	19.41316605	27.31999969	9.994667053	1822	66.90061188	171
14	111.5243394	24.4692781	<i>huangtianensis</i>	<i>jii</i> group	20.24250031	27.10400009	10.97533321	1564	61.42665863	147
15	111.4197110	24.8304500	<i>jii1</i>	<i>jii</i> group	19.09466743	27.59199905	9.622666359	1578	59.63653564	158
16	111.6996320	25.1101380	<i>jii2</i>	<i>jii</i> group	17.79050064	27.08799934	8.260666847	1569	57.64970398	164
17	111.5669998	24.4034997	<i>gracilis</i>	<i>jii</i> group	20.47633362	27.1760006	11.21733379	1570	61.7895546	145
18	107.3898600	24.3458110	<i>altishoulderus</i>	<i>angularis</i> group	19.27316666	23.94400024	11.00599957	1435	74.702034	100
19	107.37	24.37	<i>altishoulderus</i>	<i>angularis</i> group	18.51416588	23.71199989	10.35066605	1429	75.18013763	97
20	106.5601200	24.7867600	<i>anatirostris</i>	<i>angularis</i> group	16.86016655	23.79199982	8.905333519	1271	80.18937683	60
21	106.5	24.75	<i>anatirostris</i>	<i>angularis</i> group	16.47566605	23.65999985	8.552000046	1273	80.92929077	59
22	106.5	24.66667	<i>anatirostris</i>	<i>angularis</i> group	16.81233406	23.60400009	8.954000473	1268	81.47019958	58
23	106.58333	25.0	<i>anatirostris</i>	<i>angularis</i> group	18.63949966	24.27600098	10.49066639	1238	77.47647858	60
24	106.43333	24.66667	<i>anatirostris</i>	<i>angularis</i> group	16.2614994	23.35200119	8.463999748	1270	82.75991058	54
25	108.0769670	24.0629850	<i>brevibarbatus</i>	<i>angularis</i> group	20.7595005	24.19599915	12.34799957	1618	69.09759521	133
26	107.1990400	24.8821110	<i>furcodorsalis</i>	<i>angularis</i> group	18.4216671	24.79199982	9.937999725	1319	73.62635803	80
27	107.7646600	24.5306900	<i>jiuxuensis</i>	<i>angularis</i> group	19.37899971	24.86800003	10.81066704	1467	71.95742798	109
28	108.3051200	23.7127700	<i>mashanensis</i>	<i>angularis</i> group	19.88800049	23.55599976	11.62733364	1731	67.57142639	139

29	108.3201000	23.6328400	<i>mashanensis</i>	<i>angularis</i> group	20.23516655	23.57600021	12.04800034	1744	67.38516998	141
30	107.2705830	24.4937970	<i>simengensis</i>	<i>angularis</i> group	18.75333405	24.18799973	10.47666645	1393	75.13495636	90
31	107.1708024	24.9138484	<i>tianeensis</i>	<i>angularis</i> group	18.4216671	24.79199982	9.937999725	1319	73.62635803	80
32	106.33333	24.83333	<i>tianeensis</i>	<i>angularis</i> group	16.94599915	23.10400009	9.143333435	1230	83.00748444	50
33	106.3	24.58	<i>tianeensis</i>	<i>angularis</i> group	15.42350006	22.63599968	7.855333328	1277	83.95540619	52
34	106.3607180	24.4770310	<i>tianlinensis</i>	<i>angularis</i> group	15.70216656	22.54000092	8.07199955	1282	84.23308563	54
35	103.96667	24.8	<i>tianlinensis1</i>	<i>angularis</i> group	14.45133305	22.81599998	7.890666485	1035	81.20439911	52
36	103.98	25.02	<i>tianlinensis2</i>	<i>angularis</i> group	14.35816669	22.62799835	7.960666656	1037	82.46153259	48
37	106.6530400	25.6365300	<i>cyphotergous</i>	<i>cyphotergous</i> group	16.28249931	25.05599976	7.734666348	1218	72.68664551	67
38	106.8625180	25.5571330	<i>cyphotergous1</i>	<i>cyphotergous</i> group	16.97366714	25.20800018	8.410666466	1221	71.90235138	69
39	106.7568970	25.6356455	<i>cyphotergous2</i>	<i>cyphotergous</i> group	16.24799919	25.44799995	7.63466692	1217	72.02735138	69
40	107.3894220	24.3573210	<i>donglanensis</i>	<i>cyphotergous</i> group	19.27316666	23.94400024	11.00599957	1435	74.702034	100
41	107.2706500	24.4938300	<i>donglanensis</i>	<i>cyphotergous</i> group	18.75333405	24.18799973	10.47666645	1393	75.13495636	90
42	106.6027800	24.4038720	<i>lingyunensis</i>	<i>cyphotergous</i> group	18.1886673	23.07999992	10.32866669	1285	82.18490601	61
43	107.9332590	24.3084900	<i>macrophthalmus</i>	<i>cyphotergous</i> group	19.55183411	24.58399963	11.05066681	1536	70.88449097	120
44	106.7983639	25.7416477	<i>multipunctatus</i>	<i>cyphotergous</i> group	16.22883415	25.88400078	7.505333424	1208	71.65593719	68
45	106.8597785	26.0137904	<i>multipunctatus1</i>	<i>cyphotergous</i> group	14.66250038	25.93599892	5.897333145	1194	70.71425629	68
46	106.8761963	26.1124841	<i>multipunctatus2</i>	<i>cyphotergous</i> group	14.24650002	25.89999962	5.495999813	1195	70.30245209	68
47	106.5473306	26.2610961	<i>multipunctatus3</i>	<i>cyphotergous</i> group	14.68033314	25.65600014	5.972000122	1157	71.62054443	62
48	106.8291101	26.5498920	<i>multipunctatus4</i>	<i>cyphotergous</i> group	15.26716614	26.88399887	6.176666737	1107	70.22900391	60
49	106.0944557	25.9540317	<i>multipunctatus5</i>	<i>cyphotergous</i> group	15.32566643	24.8560009	6.816666603	1213	74.84335327	62
50	102.7056885	24.8291177	<i>grahami</i>	<i>tingi</i> group	14.98799992	20.64799881	8.944666862	891	82.52855682	41
51	102.5656128	24.8004483	<i>grahami1</i>	<i>tingi</i> group	14.6503334	23.2159996	8.631333351	919	83.34884644	41
52	102.6342773	24.9947711	<i>grahami2</i>	<i>tingi</i> group	15.00749969	21.89999962	8.911333084	912	82.66925049	44
53	103.2275391	26.3352685	<i>huizeensis</i>	<i>tingi</i> group	11.63883305	22.9640007	5.144000053	907	89.55603027	26
54	108.6961800	24.7773600	<i>brevis</i>	<i>cyphotergous</i> group	19.42466736	25.98000145	10.43866634	1536	66.56087494	133
55	108.0260800	25.2554400	<i>dongtangensis</i>	<i>cyphotergous</i> group	17.17300034	26.23999977	8.125999451	1348	67.70829773	101
56	108.0585635	25.1450345	<i>gracilicaudatus</i>	<i>cyphotergous</i> group	18.61849976	26.35199928	9.597999573	1368	68.04767609	104
57	108.5040333	25.2471190	<i>huanjiangensis</i>	<i>cyphotergous</i> group	18.56999969	26.9640007	9.42266655	1395	66.28265381	120
58	107.6771900	25.4170100	<i>hugeibarbus</i>	<i>cyphotergous</i> group	16.04516602	26.61600113	7.07066679	1306	68.22050476	90

59	107.7266979	25.3133821	<i>hugeibarus1</i>	<i>cyphotergous</i> group	16.57966614	26.08799934	7.665999889	1322	68.6019516	92
60	107.6833333	25.3333333	<i>hugeibarus2</i>	<i>cyphotergous</i> group	16.3433342	26.51200104	7.403999805	1316	68.53115082	91
61	107.9958600	25.2354680	<i>longibarbatus</i>	<i>cyphotergous</i> group	16.62849998	25.83600044	7.651333332	1368	67.88585663	102
62	107.7154541	25.1278793	<i>longibarbatus1</i>	<i>cyphotergous</i> group	17.28416634	25.88000107	8.437333107	1346	69.57868958	92
63	108.0066500	24.9664500	<i>longibarbatus2</i>	<i>cyphotergous</i> group	18.20816612	25.61599922	9.359333038	1409	69.14156342	104
64	108.2696770	24.8310290	<i>longibarbatus3</i>	<i>cyphotergous</i> group	19.36283302	25.73600006	10.49733353	1469	68.39057159	121
65	107.8869990	25.4107990	<i>longibarbatus4</i>	<i>cyphotergous</i> group	17.36766624	26.58400154	8.306666374	1311	67.69174194	94
66	107.9331207	25.3012775	<i>longibarbatus5</i>	<i>cyphotergous</i> group	16.28333282	25.94000053	7.313333035	1353	67.87641907	98
67	108.0370617	25.2241214	<i>longibarbatus6</i>	<i>cyphotergous</i> group	17.24300003	26.03600121	8.220000267	1358	68.06324768	101
68	108.0206680	25.1976410	<i>longibarbatus7</i>	<i>cyphotergous</i> group	17.34233284	25.82400131	8.359333038	1370	68.0689621	103
69	108.0270624	25.2555253	<i>longibarbatus8</i>	<i>cyphotergous</i> group	17.17300034	26.23999977	8.125999451	1348	67.70829773	101
70	108.0618882	25.2854078	<i>longibarbatus9</i>	<i>cyphotergous</i> group	17.59583282	26.50399971	8.531999588	1347	67.58612061	101
71	107.6791477	25.2990272	<i>longibarbatus10</i>	<i>cyphotergous</i> group	16.44599915	26.24399948	7.541999817	1322	68.98370361	90
72	107.6639128	25.2775693	<i>longibarbatus11</i>	<i>cyphotergous</i> group	16.25566673	25.9279995	7.433333397	1331	69.27947235	90
73	107.4545288	25.3275801	<i>longibarbatus12</i>	<i>cyphotergous</i> group	16.34300041	25.98799896	7.571333408	1305	70.30627441	83
74	107.6787829	25.2474907	<i>macrolepis</i>	<i>cyphotergous</i> group	16.64233398	25.79599953	7.807333469	1333	69.1712265	92
75	108.0548360	25.2654160	<i>punctatus</i>	<i>cyphotergous</i> group	17.59583282	26.50399971	8.531999588	1347	67.58612061	101
76	107.3305361	25.3982694	<i>punctatus</i>	<i>cyphotergous</i> group	16.12700081	25.60400009	7.406000137	1281	70.58371735	79
77	108.0262899	25.2548849	<i>punctatus</i>	<i>cyphotergous</i> group	17.17300034	26.23999977	8.125999451	1348	67.70829773	101
78	109.4726650	24.9092990	<i>ronganensis</i>	<i>cyphotergous</i> group	18.96850014	26.42000008	9.807332993	1721	68.77063751	150
79	108.2619300	25.3936690	<i>xunlensis</i>	<i>cyphotergous</i> group	17.88866615	26.89599991	8.748666763	1331	66.47036743	104
80	108.9083700	24.3724600	<i>yishanensis</i>	<i>cyphotergous</i> group	19.5561676	25.63599968	10.71000004	1614	66.17382813	136
81	107.9396730	25.3082980	<i>yaolanensis</i>	<i>cyphotergous</i> group	16.28333282	25.94000053	7.313333035	1353	67.87641907	98
82	109.5691904	24.6613295	<i>pingshanensis</i>	NA	19.94766617	26.4960022	10.87599945	1707	68.75881195	148
83	104.7288895	25.4621846	<i>angularis</i>	<i>angularis</i> group	14.09500027	23.24799919	6.758666515	1226	81.46446991	61
84	104.1722627	25.9169081	<i>angularis</i>	<i>angularis</i> group	13.17150021	23.05200005	6.452666759	1049	85.55180359	40
85	104.2900347	24.3318312	<i>aquihornes</i>	<i>angularis</i> group	16.40850067	21.8560009	9.777999878	1083	81.35414124	51
86	103.3018903	24.7970733	<i>broadihornes</i>	<i>angularis</i> group	15.86716652	23.34000015	9.494667053	907	82.56230164	43
87	104.4237000	24.2827800	<i>convexiforeheadus</i>	<i>angularis</i> group	15.98849964	21.71999931	9.350667	1117	80.91595459	53
88	104.4239506	24.3258442	<i>convexiforeheadus1</i>	<i>angularis</i> group	15.88966656	21.6079998	9.218000412	1115	80.71168518	53

89	104.0209140	24.2439210	<i>convexiforeheadus2</i>	<i>angularis</i> group	16.50816727	21.79599953	10.04066658	1058	81.51831818	52
90	104.1400990	24.2475240	<i>convexiforeheadus3</i>	<i>angularis</i> group	16.31283379	21.85599899	9.809999466	1079	81.85062408	51
91	104.2757139	24.6308972	<i>convexiforeheadus4</i>	<i>angularis</i> group	17.46516609	22.38800049	10.58466721	1088	79.29577637	62
92	104.3689300	24.0501500	<i>convexiforeheadus5</i>	<i>angularis</i> group	16.47649956	21.62400055	9.887332916	1125	82.23590088	48
93	104.0228139	24.2410250	<i>convexiforeheadus6</i>	<i>angularis</i> group	16.50816727	21.79599953	10.04066658	1058	81.51831818	52
94	105.0981900	24.9186910	<i>flexuosdorsalis</i>	<i>angularis</i> group	18.49300003	22.73600006	10.9460001	1287	82.63838959	65
95	107.0529200	24.9491380	<i>furcodorsalis</i>	<i>angularis</i> group	16.29349899	24.11599922	8.013999939	1318	74.58552551	75
96	107	25	<i>furcodorsalis1</i>	<i>angularis</i> group	18.29916763	24.43600082	9.953332901	1273	73.6085968	73
97	107.16667	24.91667	<i>furcodorsalis2</i>	<i>angularis</i> group	18.5909996	24.81999969	10.09000015	1310	73.28244019	80
98	107.03	24.97	<i>furcodorsalis3</i>	<i>angularis</i> group	17.19683266	24.23999977	8.899333	1284	74.31358337	73
99	103.7523250	24.5578850	<i>hyalinus</i>	<i>angularis</i> group	15.20316696	22.99600029	8.727999687	993	81.40148163	50
100	104.4068460	25.6547585	<i>longicornus</i>	<i>angularis</i> group	13.17249966	22.76000023	6.450666904	1123	84.27873993	46
101	104.2909680	24.7777270	<i>rhinoceros</i>	<i>angularis</i> group	15.71883297	22.89599991	8.807333946	1087	80.22787476	58
102	104.33333	24.9	<i>rhinoceros</i>	<i>angularis</i> group	16.16383362	23.34000015	9.049333572	1108	79.80437469	62
103	103.9853597	25.0136778	<i>tileihornes</i>	<i>angularis</i> group	14.35816669	22.62799835	7.960666656	1037	82.46153259	48
104	105.0326275	25.0513262	<i>xingyiensis</i>	<i>angularis</i> group	16.37083435	22.67200089	8.879333496	1261	80.59008026	63
105	104.1053478	23.8236126	<i>longshanensis</i>	<i>microphthalmus</i> group	15.38883305	21.24799919	9.088000298	1194	84.29249573	48
106	104.0719414	23.8202906	<i>longshanensis1</i>	<i>microphthalmus</i> group	15.55883312	21.2480011	9.265333176	1180	84.40818024	47
107	104.3542695	23.5975697	<i>maculatus</i>	<i>microphthalmus</i> group	16.20483398	21.2840004	9.759333611	1297	86.03730011	48
108	104.6065105	24.0451546	<i>maculatus1</i>	<i>microphthalmus</i> group	16.63299942	21.75600052	9.929333687	1134	81.87103271	47
109	104.1048360	24.4673700	<i>maculatus2</i>	<i>microphthalmus</i> group	17.89249992	22.06400108	11.2086668	1040	80.37846375	57
110	104.6043889	24.0481444	<i>maculatus3</i>	<i>microphthalmus</i> group	16.63299942	21.75600052	9.929333687	1134	81.87103271	47
111	104.1629460	23.4203580	<i>maculatus4</i>	<i>microphthalmus</i> group	17.18283272	21.06399918	10.89066696	1334	87.27220154	46
112	104.6234714	24.8530024	<i>maculatus5</i>	<i>microphthalmus</i> group	15.55533314	22.5720005	8.436666489	1141	80.05511475	59
113	104.3949830	23.5766111	<i>maculatus6</i>	<i>microphthalmus</i> group	16.00966644	20.94799995	9.640666962	1323	86.53279877	50
114	103.7523250	24.5578850	<i>aluensis</i>	<i>tingi</i> group	15.20316696	22.99600029	8.727999687	993	81.40148163	50
115	104.8857814	25.0802307	<i>angustiporus</i>	<i>tingi</i> group	17.03700066	23.26000023	9.519332886	1257	80.60914612	67
116	103.1410040	24.9196000	<i>anophthalmus</i>	<i>tingi</i> group	16.90850067	23.07600021	10.61600018	878	82.57874298	42
117	103.45	25.4	<i>anophthalmus</i>	<i>tingi</i> group	14.5085001	23.15999985	8.253333092	931	83.31228638	41
118	103.38	25.05	<i>anophthalmus</i>	<i>tingi</i> group	14.98366642	22.49599838	8.783333778	934	82.27186584	45

119	103.5612945	24.6407581	<i>guishanensis</i>	<i>tingi</i> group	13.95300007	22.49600029	7.706666946	995	81.54962158	50
120	103.1026900	24.2220195	<i>huaningensis</i>	<i>tingi</i> group	19.05216599	22.28000069	13.00533295	920	86.90113068	39
121	103.6666667	25.0833333	<i>lateristriatus</i>	<i>tingi</i> group	14.92399979	23.42399979	8.43200016	965	82.46746826	45
122	103.1026900	24.2220195	<i>longifinus</i>	<i>tingi</i> group	19.05216599	22.28000069	13.00533295	920	86.90113068	39
123	103.2772445	24.7622563	<i>macrocephalus</i>	<i>tingi</i> group	16.1534996	23.23200035	9.819999695	903	82.86978149	42
124	103.6666667	25.0833333	<i>macroscalus</i>	<i>tingi</i> group	14.92399979	23.42399979	8.43200016	965	82.46746826	45
125	103.6666667	25.0833333	<i>maitianheensis</i>	<i>tingi</i> group	14.92399979	23.42399979	8.43200016	965	82.46746826	45
126	104.0679951	25.6729168	<i>malacopterus</i>	<i>tingi</i> group	13.05200005	22.5719986	6.536666393	1046	84.96069336	41
127	104.2757139	24.6308972	<i>malacopterus1</i>	<i>tingi</i> group	17.46516609	22.38800049	10.58466721	1088	79.29577637	62
128	104.3339101	24.6303215	<i>malacopterus2</i>	<i>tingi</i> group	17.69533348	22.15999985	10.74800014	1093	79.44618225	62
129	104.3179278	24.6307083	<i>malacopterus3</i>	<i>tingi</i> group	17.35849953	22.2159996	10.47399998	1088	79.3993988	62
130	103.2666667	24.7666667	<i>oxycephalus</i>	<i>tingi</i> group	16.1534996	23.23200035	9.819999695	903	82.86978149	42
131	103.7863550	23.7464410	<i>purpureus</i>	<i>tingi</i> group	16.83566666	21.59599876	10.62733364	1131	84.8596344	47
132	103.6113450	23.7591200	<i>purpureus</i>	<i>tingi</i> group	16.76733398	21.83600044	10.62533379	1085	85.60421753	45
133	104.1355851	24.0473507	<i>qiubeiensis</i>	<i>tingi</i> group	16.49233437	21.69199944	9.964666367	1108	82.28572845	51
134	104.1498756	24.0024842	<i>qiubeiensis1</i>	<i>tingi</i> group	15.84583282	21.48799896	9.406666756	1128	82.77849579	50
135	104.1066000	24.2395670	<i>qiubeiensis2</i>	<i>tingi</i> group	16.53649902	21.82799911	10.01133347	1070	81.63833618	52
136	104.1700000	24.4600000	<i>qiubeiensis3</i>	<i>tingi</i> group	18.10866737	22.07600021	11.34200001	1054	80.12553406	57
137	104.1066000	24.2395670	<i>qiubeiensis4</i>	<i>tingi</i> group	16.53649902	21.82799911	10.01133347	1070	81.63833618	52
138	103.9519421	25.4302515	<i>qujingensis</i>	<i>tingi</i> group	13.14650059	21.84000015	6.854000092	1032	83.85865021	44
139	104.7445200	25.4015120	<i>robustus</i>	<i>tingi</i> group	14.93516636	23.49600029	7.535999775	1231	81.3449707	62
140	104.6761410	24.9711430	<i>robustus1</i>	<i>tingi</i> group	16.26016617	22.79999924	9.024000168	1174	81.29064941	57
141	102.8846882	24.4968543	<i>tingi</i>	<i>tingi</i> group	15.56416702	20.13199997	9.749333382	890	82.54154205	42
142	104.0833333	23.3833333	<i>wumengshanensis</i>	<i>tingi</i> group	16.12216568	20.53199959	9.834667206	1381	87.12265778	49
143	103.8506720	26.2378310	<i>wumengshanensis1</i>	<i>tingi</i> group	13.84566689	23.22399902	7.0746665	942	87.06712341	32
144	103.6019880	25.9902260	<i>wumengshanensis2</i>	<i>tingi</i> group	14.99983311	22.87999916	8.504666328	895	85.71042633	35
145	103.0016399	24.8970380	<i>yangzongensis</i>	<i>tingi</i> group	14.76516628	22.06799889	8.751999855	919	82.48728943	43
146	102.4000000	24.4166667	<i>wui</i>	NA	14.26416683	22.15600014	8.382666588	953	82.27177429	48
147	104.3124390	25.0059727	<i>luopingensis</i>	<i>tingi</i> group	15.49600029	22.79599953	8.613333702	1108	80.2633667	60
148	104.5612450	23.2583730	<i>xichouensis_2</i>	<i>tingi</i> group	17.41033363	20.3920002	10.88333321	1459	89.82817078	54

149	104.5606613	23.2430023	<i>xichouensis1</i>	<i>tingi</i> group	16.64599991	20.24400139	10.17599964	1492	90.85516357	53
150	104.0833333	23.3833333	<i>wenshanensis</i>	<i>tingi</i> group	16.12216568	20.53199959	9.834667206	1381	87.12265778	49
151	103.8470770	23.5334410	<i>wenshanensis1</i>	<i>tingi</i> group	16.02983284	20.4679985	9.939332962	1271	85.53520203	49
152	106.4317499	23.1651541	<i>jinxiensis</i>	<i>angularis</i> group	20.16583252	20.65200043	12.92133331	1512	87.69611359	80
153	106.6027800	24.4038720	<i>anshuiensis</i>	<i>microphthalmus</i> group	18.1886673	23.07999992	10.32866669	1285	82.18490601	61
154	106.7524113	24.3671066	<i>microphthalmus</i>	<i>microphthalmus</i> group	18.08483315	23.18400192	10.16333294	1327	80.38922119	70
155	106.81667	24.33333	<i>microphthalmus</i>	<i>microphthalmus</i> group	18.66366577	23.23199844	10.72666645	1339	80.03266144	73
156	107.03333	24.53333	<i>microphthalmus</i>	<i>microphthalmus</i> group	18.61450005	24.11199951	10.40866661	1346	76.92514801	79
157	106.53333	24.33333	<i>microphthalmus</i>	<i>microphthalmus</i> group	18.1590004	22.87599945	10.43733311	1300	83.07516479	61
158	106.664016	24.505015	<i>microphthalmus</i>	<i>microphthalmus</i> group	18.45599937	23.80800056	10.5	1270	80.92832947	60
159	106.8140400	24.3905200	<i>luolouensis</i>	NA	18.51499939	23.65999985	10.50466633	1327	79.70511627	71
160	102.0833333	24.3666667	<i>yimenensis</i>	<i>tingi</i> group	15.73483372	22.92399979	9.888667107	937	83.96063995	43
161	102.0550919	24.3668008	<i>yimenensis1</i>	<i>tingi</i> group	15.73483372	22.92399979	9.888667107	937	83.96063995	43
162	103.4666667	26.6666667	<i>qujingensis_1</i>	<i>tingi</i> group	13.71833324	24.5	6.779333591	883	88.74880219	29
163	104.0353930	24.2721020	<i>qiubeiensis_31</i>	<i>tingi</i> group	16.62866592	21.59999847	10.15200043	1046	81.10572052	53
164	103.6002083	23.7506694	<i>purpureus</i>	<i>tingi</i> group	16.76733398	21.83600044	10.62533379	1085	85.60421753	45
165	104.1279389	24.0494833	<i>qiubeiensis</i>	<i>tingi</i> group	16.49233437	21.69199944	9.964666367	1108	82.28572845	51
166	103.6113450	23.7591200	<i>punctatus_7</i>	<i>tingi</i> group	16.76733398	21.83600044	10.62533379	1085	85.60421753	45
167	104.1279389	24.0494833	<i>qiubeiensis_1</i>	<i>tingi</i> group	16.49233437	21.69199944	9.964666367	1108	82.28572845	51
168	103.7661500	24.5319810	<i>angustiporus_1</i>	<i>tingi</i> group	15.51366711	22.7519989	9.016666412	989	81.58970642	51
169	104.4466732	24.9409297	<i>angustiporus_3</i>	<i>tingi</i> group	15.74233341	23.27199936	8.533332825	1117	80.61203766	58
170	103.2938780	24.7948230	<i>lunanensis</i>	<i>tingi</i> group	15.86716652	23.34000015	9.494667053	907	82.56230164	43
171	103.3200000	24.7700000	<i>oxycephalus_3</i>	<i>tingi</i> group	15.91983318	23.15200043	9.587333679	906	82.74247742	42

Table S4 Genetic distances(%) between species, based on mitochondrial Cyt *b* sequences.

See Table S4 in Excel format.

Table S5 The clade divergence events associated with *Sinocyclocheilus* summarized based on the time tree.

ID	Species group	Lower (Ma)	Upper (Ma)
1	<i>S. jii</i> group	0	0.37
2	<i>S. jii</i> group	0	0.37
3	<i>S. jii</i> group	0.32	4.08
4	<i>S. jii</i> group	0.32	4.08
5	<i>S. jii</i> group	1.4	8.65
6	<i>S. jii</i> group	1.4	8.65
7	<i>S. jii</i> group	5.47	24.17
8	<i>S. jii</i> group	5.47	24.17
9	<i>S. jii</i> group	30.46	38.57
10	<i>S. angularis</i> group	21.93	31.84
11	<i>S. angularis</i> group	21.93	31.84
12	<i>S. angularis</i> group	18.43	29.14
13	<i>S. angularis</i> group	18.43	29.14
14	<i>S. angularis</i> group	13.56	24.36
15	<i>S. angularis</i> group	13.56	24.36
16	<i>S. angularis</i> group	3.2	17.22
17	<i>S. angularis</i> group	3.2	17.22
18	<i>S. angularis</i> group	0.34	3.85
19	<i>S. angularis</i> group	0.34	3.85
20	<i>S. angularis</i> group	8.35	22.29
21	<i>S. angularis</i> group	8.35	22.29
22	<i>S. angularis</i> group	5.38	17.91
23	<i>S. angularis</i> group	5.38	17.91
24	<i>S. angularis</i> group	2.89	14.41
25	<i>S. angularis</i> group	2.89	14.41
26	<i>S. angularis</i> group	4.47	10.72
27	<i>S. angularis</i> group	4.47	10.72
28	<i>S. angularis</i> group	0.19	2.17
29	<i>S. angularis</i> group	0.19	2.17
30	<i>S. angularis</i> group	3.96	9.79
31	<i>S. angularis</i> group	3.96	9.79
32	<i>S. angularis</i> group	3.16	8.8
33	<i>S. angularis</i> group	3.16	8.8
34	<i>S. angularis</i> group	1.74	6.77
35	<i>S. angularis</i> group	1.74	6.77
36	<i>S. angularis</i> group	0.62	4.33
37	<i>S. angularis</i> group	0.62	4.33
38	<i>S. angularis</i> group	1.92	6.34
39	<i>S. angularis</i> group	1.92	6.34
40	<i>S. angularis</i> group	1.37	4.66
41	<i>S. angularis</i> group	1.37	4.66
42	<i>S. angularis</i> group	1.13	4.09
43	<i>S. angularis</i> group	1.13	4.09
44	<i>S. angularis</i> group	0.76	3.18
45	<i>S. angularis</i> group	0.76	3.18
46	<i>S. angularis</i> group	0.36	2.09
47	<i>S. angularis</i> group	0.36	2.09
48	<i>S. angularis</i> group	0.03	0.79

49	<i>S. angularis</i> group	0.03	0.79
50	<i>S. angularis</i> group	0.03	0.79
51	<i>S. microphthalmus</i> group	8.2	22.94
52	<i>S. microphthalmus</i> group	8.2	22.94
53	<i>S. microphthalmus</i> group	5.23	20.09
54	<i>S. microphthalmus</i> group	5.23	20.09
55	<i>S. microphthalmus</i> group	0.53	6.28
56	<i>S. microphthalmus</i> group	0.53	6.28
57	<i>S. microphthalmus</i> group	21.22	31.31
58	<i>S. cyphotergous</i> group	21.22	31.31
59	<i>S. cyphotergous</i> group	18.92	29.03
60	<i>S. cyphotergous</i> group	16.8	27.17
61	<i>S. cyphotergous</i> group	16.8	27.17
62	<i>S. cyphotergous</i> group	14.25	24.78
63	<i>S. cyphotergous</i> group	14.25	24.78
64	<i>S. cyphotergous</i> group	9.78	20.72
65	<i>S. cyphotergous</i> group	9.78	20.72
66	<i>S. cyphotergous</i> group	2.5	10.84
67	<i>S. cyphotergous</i> group	2.5	10.84
68	<i>S. cyphotergous</i> group	0.98	7.25
69	<i>S. cyphotergous</i> group	0.98	7.25
70	<i>S. cyphotergous</i> group	0.82	3.98
71	<i>S. cyphotergous</i> group	0.37	2.77
72	<i>S. cyphotergous</i> group	0.37	2.77
73	<i>S. cyphotergous</i> group	6.46	16.06
74	<i>S. cyphotergous</i> group	6.46	16.06
75	<i>S. cyphotergous</i> group	0.49	5.47
76	<i>S. cyphotergous</i> group	0.49	5.47
77	<i>S. cyphotergous</i> group	4.53	11.31
78	<i>S. cyphotergous</i> group	4.53	11.31
79	<i>S. cyphotergous</i> group	0.19	2.52
80	<i>S. cyphotergous</i> group	0.19	2.52
81	<i>S. cyphotergous</i> group	1.45	5.75
82	<i>S. cyphotergous</i> group	1.45	5.75
83	<i>S. cyphotergous</i> group	0.82	4.22
84	<i>S. cyphotergous</i> group	0.82	4.22
85	<i>S. cyphotergous</i> group	0.11	2.12
86	<i>S. cyphotergous</i> group	0.11	2.12
87	<i>S. cyphotergous</i> group	2.67	8.54
88	<i>S. cyphotergous</i> group	2.67	8.54
89	<i>S. cyphotergous</i> group	1.04	4.7
90	<i>S. cyphotergous</i> group	1.04	4.7
91	<i>S. cyphotergous</i> group	0	1.54
92	<i>S. cyphotergous</i> group	0	1.54
93	<i>S. tingi</i> group	18.92	29.03
94	<i>S. tingi</i> group	13.17	23.22
95	<i>S. tingi</i> group	13.17	23.22
96	<i>S. tingi</i> group	8.55	17.71
97	<i>S. tingi</i> group	8.55	17.71

98	<i>S. tingi</i> group	0.19	3.06
99	<i>S. tingi</i> group	0.19	3.06
100	<i>S. tingi</i> group	5.61	12.33
101	<i>S. tingi</i> group	5.61	12.33
102	<i>S. tingi</i> group	3.84	9.28
103	<i>S. tingi</i> group	3.84	9.28
104	<i>S. tingi</i> group	1.26	6.16
105	<i>S. tingi</i> group	1.26	6.16
106	<i>S. tingi</i> group	2.89	7.99
107	<i>S. tingi</i> group	2.89	7.99
108	<i>S. tingi</i> group	0.37	3.02
109	<i>S. tingi</i> group	0.37	3.02
110	<i>S. tingi</i> group	1.51	5.73
111	<i>S. tingi</i> group	1.51	5.73
112	<i>S. tingi</i> group	0.46	3.15
113	<i>S. tingi</i> group	0.46	3.15
114	<i>S. tingi</i> group	0.13	1.51
115	<i>S. tingi</i> group	0.13	1.51
116	<i>S. tingi</i> group	11.7	20.93
117	<i>S. tingi</i> group	11.7	20.93
118	<i>S. tingi</i> group	4.47	13.36
119	<i>S. tingi</i> group	4.47	13.36
120	<i>S. tingi</i> group	1.89	8.03
121	<i>S. tingi</i> group	1.89	8.03
122	<i>S. tingi</i> group	0.78	5.29
123	<i>S. tingi</i> group	0.78	5.29
124	<i>S. tingi</i> group	7.53	15.32
125	<i>S. tingi</i> group	7.53	15.32
126	<i>S. tingi</i> group	9.55	18.5
127	<i>S. tingi</i> group	9.55	18.5
128	<i>S. tingi</i> group	7.53	15.32
129	<i>S. tingi</i> group	7.53	15.32
130	<i>S. tingi</i> group	3.09	10.66
131	<i>S. tingi</i> group	3.09	10.66
132	<i>S. tingi</i> group	0.95	4.88
133	<i>S. tingi</i> group	0.95	4.88
134	<i>S. tingi</i> group	0.1	1.06
135	<i>S. tingi</i> group	0.1	1.06
136	<i>S. tingi</i> group	0.5	2.2
137	<i>S. tingi</i> group	0.5	2.2
138	<i>S. tingi</i> group	0.37	1.89
139	<i>S. tingi</i> group	0.37	1.89
140	<i>S. tingi</i> group	0.04	0.57
141	<i>S. tingi</i> group	0.04	0.57
142	<i>S. tingi</i> group	7.53	15.32
143	<i>S. tingi</i> group	7.53	15.32
144	<i>S. tingi</i> group	4.88	11.22
145	<i>S. tingi</i> group	4.88	11.22
146	<i>S. tingi</i> group	4.16	9.79

147	<i>S. tingi</i> group	4.16	9.79
148	<i>S. tingi</i> group	0.33	3.77
149	<i>S. tingi</i> group	0.33	3.77
150	<i>S. tingi</i> group	0.25	2.06
151	<i>S. tingi</i> group	0.25	2.06
152	<i>S. tingi</i> group	0.04	1.05
153	<i>S. tingi</i> group	0.04	1.05
154	<i>S. tingi</i> group	2.92	7.52
155	<i>S. tingi</i> group	2.92	7.52
156	<i>S. tingi</i> group	2.05	6.13
157	<i>S. tingi</i> group	2.05	6.13
158	<i>S. tingi</i> group	1.25	4.65
159	<i>S. tingi</i> group	1.25	4.65
160	<i>S. tingi</i> group	0.5	3.12
161	<i>S. tingi</i> group	0.5	3.12

Table S6 Dispersal and *in situ* diversification events associated with *Sinocyclocheilus* summarized based on time tree.

Events	Lower (Ma)	Upper (Ma)	Basins
Dispersal	1.04	4.7	Hongshui River→Liujiang River
Dispersal	0.98	7.25	Liujiang River→Beipanjiang River
Dispersal	2.5	10.84	Liujiang River→Hongshui River
Dispersal	4.53	11.31	Liujiang River→Hongshui River
Dispersal	0.82	3.98	Liujiang River→Yangtze River
Dispersal	1.74	6.77	Nanpanjiang River→Beipanjiang River
Dispersal	1.89	8.03	Nanpanjiang River→Beipanjiang River
Dispersal	4.47	10.72	Nanpanjiang River→Beipanjiang River
Dispersal	3.96	9.79	Nanpanjiang River→Hongshui River
Dispersal	18.43	29.14	Nanpanjiang River→Hongshui River
Dispersal	0.5	2.2	Nanpanjiang River→Jinshajiang River
Dispersal	3.09	10.66	Nanpanjiang River→Jinshajiang River
Dispersal	4.47	13.36	Nanpanjiang River→Jinshajiang River
Dispersal	18.92	29.03	Nanpanjiang River→Liujiang River
Dispersal	8.55	17.71	Nanpanjiang River→Panlongjiang River
Dispersal	8.2	22.94	Nanpanjiang River→Youjiang River
Dispersal	1.26	6.16	Jinshajiang River→Nanpanjiang River
Dispersal	0.37	3.02	Jinshajiang River→Panlongjiang River
Dispersal	1.51	5.73	Jinshajiang River→Yuanjia Yangtze River
Dispersal	5.61	12.33	Panlongjiang River→Jinshajiang River
<i>In situ</i> diversification	0.19	2.17	Beipanjiang River
<i>In situ</i> diversification	0.19	2.17	Beipanjiang River
<i>In situ</i> diversification	0	0.37	Guijiang-Hejiang River
<i>In situ</i> diversification	0	0.37	Guijiang-Hejiang River
<i>In situ</i> diversification	0.32	4.08	Guijiang-Hejiang River
<i>In situ</i> diversification	0.32	4.08	Guijiang-Hejiang River
<i>In situ</i> diversification	1.4	8.65	Guijiang-Hejiang River
<i>In situ</i> diversification	1.4	8.65	Guijiang-Hejiang River
<i>In situ</i> diversification	5.47	24.17	Guijiang-Hejiang River
<i>In situ</i> diversification	5.47	24.17	Guijiang-Hejiang River
<i>In situ</i> diversification	30.46	38.57	Guijiang-Hejiang River
<i>In situ</i> diversification	3.2	17.22	Hongshui River
<i>In situ</i> diversification	3.2	17.22	Hongshui River
<i>In situ</i> diversification	0.34	3.85	Hongshui River
<i>In situ</i> diversification	0.34	3.85	Hongshui River
<i>In situ</i> diversification	1.92	6.34	Hongshui River
<i>In situ</i> diversification	1.92	6.34	Hongshui River
<i>In situ</i> diversification	1.37	4.66	Hongshui River
<i>In situ</i> diversification	1.37	4.66	Hongshui River
<i>In situ</i> diversification	1.13	4.09	Hongshui River
<i>In situ</i> diversification	1.13	4.09	Hongshui River
<i>In situ</i> diversification	0.76	3.18	Hongshui River
<i>In situ</i> diversification	0.76	3.18	Hongshui River
<i>In situ</i> diversification	0.36	2.09	Hongshui River
<i>In situ</i> diversification	0.36	2.09	Hongshui River
<i>In situ</i> diversification	0.03	0.79	Hongshui River

<i>In situ</i> diversification	0.03	0.79	Hongshui River
<i>In situ</i> diversification	0.03	0.79	Hongshui River
<i>In situ</i> diversification	0.37	2.77	Hongshui River
<i>In situ</i> diversification	0.37	2.77	Hongshui River
<i>In situ</i> diversification	1.04	4.7	Hongshui River
<i>In situ</i> diversification	0	1.54	Hongshui River
<i>In situ</i> diversification	0	1.54	Hongshui River
<i>In situ</i> diversification	16.8	27.17	Liujiang River
<i>In situ</i> diversification	16.8	27.17	Liujiang River
<i>In situ</i> diversification	14.25	24.78	Liujiang River
<i>In situ</i> diversification	14.25	24.78	Liujiang River
<i>In situ</i> diversification	9.78	20.72	Liujiang River
<i>In situ</i> diversification	9.78	20.72	Liujiang River
<i>In situ</i> diversification	2.5	10.84	Liujiang River
<i>In situ</i> diversification	0.98	7.25	Liujiang River
<i>In situ</i> diversification	6.46	16.06	Liujiang River
<i>In situ</i> diversification	6.46	16.06	Liujiang River
<i>In situ</i> diversification	0.49	5.47	Liujiang River
<i>In situ</i> diversification	0.49	5.47	Liujiang River
<i>In situ</i> diversification	4.53	11.31	Liujiang River
<i>In situ</i> diversification	0.19	2.52	Liujiang River
<i>In situ</i> diversification	0.19	2.52	Liujiang River
<i>In situ</i> diversification	1.45	5.75	Liujiang River
<i>In situ</i> diversification	1.45	5.75	Liujiang River
<i>In situ</i> diversification	0.82	4.22	Liujiang River
<i>In situ</i> diversification	0.82	4.22	Liujiang River
<i>In situ</i> diversification	0.11	2.12	Liujiang River
<i>In situ</i> diversification	0.11	2.12	Liujiang River
<i>In situ</i> diversification	2.67	8.54	Liujiang River
<i>In situ</i> diversification	2.67	8.54	Liujiang River
<i>In situ</i> diversification	21.93	31.84	Nanpanjiang River
<i>In situ</i> diversification	21.93	31.84	Nanpanjiang River
<i>In situ</i> diversification	18.43	29.14	Nanpanjiang River
<i>In situ</i> diversification	13.56	24.36	Nanpanjiang River
<i>In situ</i> diversification	13.56	24.36	Nanpanjiang River
<i>In situ</i> diversification	8.35	22.29	Nanpanjiang River
<i>In situ</i> diversification	8.35	22.29	Nanpanjiang River
<i>In situ</i> diversification	5.38	17.91	Nanpanjiang River
<i>In situ</i> diversification	5.38	17.91	Nanpanjiang River
<i>In situ</i> diversification	2.89	14.41	Nanpanjiang River
<i>In situ</i> diversification	2.89	14.41	Nanpanjiang River
<i>In situ</i> diversification	4.47	10.72	Nanpanjiang River
<i>In situ</i> diversification	3.96	9.79	Nanpanjiang River
<i>In situ</i> diversification	3.16	8.8	Nanpanjiang River
<i>In situ</i> diversification	3.16	8.8	Nanpanjiang River
<i>In situ</i> diversification	1.74	6.77	Nanpanjiang River
<i>In situ</i> diversification	0.62	4.33	Nanpanjiang River
<i>In situ</i> diversification	0.62	4.33	Nanpanjiang River
<i>In situ</i> diversification	8.2	22.94	Nanpanjiang River

<i>In situ</i> diversification	5.23	20.09	Nanpanjiang River
<i>In situ</i> diversification	5.23	20.09	Nanpanjiang River
<i>In situ</i> diversification	21.22	31.31	Nanpanjiang River
<i>In situ</i> diversification	21.22	31.31	Nanpanjiang River
<i>In situ</i> diversification	18.92	29.03	Nanpanjiang River
<i>In situ</i> diversification	13.17	23.22	Nanpanjiang River
<i>In situ</i> diversification	13.17	23.22	Nanpanjiang River
<i>In situ</i> diversification	8.55	17.71	Nanpanjiang River
<i>In situ</i> diversification	0.19	3.06	Nanpanjiang River
<i>In situ</i> diversification	0.19	3.06	Nanpanjiang River
<i>In situ</i> diversification	11.7	20.93	Nanpanjiang River
<i>In situ</i> diversification	11.7	20.93	Nanpanjiang River
<i>In situ</i> diversification	4.47	13.36	Nanpanjiang River
<i>In situ</i> diversification	1.89	8.03	Nanpanjiang River
<i>In situ</i> diversification	0.78	5.29	Nanpanjiang River
<i>In situ</i> diversification	0.78	5.29	Nanpanjiang River
<i>In situ</i> diversification	7.53	15.32	Nanpanjiang River
<i>In situ</i> diversification	7.53	15.32	Nanpanjiang River
<i>In situ</i> diversification	9.55	18.5	Nanpanjiang River
<i>In situ</i> diversification	9.55	18.5	Nanpanjiang River
<i>In situ</i> diversification	7.53	15.32	Nanpanjiang River
<i>In situ</i> diversification	7.53	15.32	Nanpanjiang River
<i>In situ</i> diversification	3.09	10.66	Nanpanjiang River
<i>In situ</i> diversification	0.95	4.88	Nanpanjiang River
<i>In situ</i> diversification	0.95	4.88	Nanpanjiang River
<i>In situ</i> diversification	0.1	1.06	Nanpanjiang River
<i>In situ</i> diversification	0.1	1.06	Nanpanjiang River
<i>In situ</i> diversification	7.53	15.32	Nanpanjiang River
<i>In situ</i> diversification	7.53	15.32	Nanpanjiang River
<i>In situ</i> diversification	4.88	11.22	Nanpanjiang River
<i>In situ</i> diversification	4.88	11.22	Nanpanjiang River
<i>In situ</i> diversification	4.16	9.79	Nanpanjiang River
<i>In situ</i> diversification	4.16	9.79	Nanpanjiang River
<i>In situ</i> diversification	0.33	3.77	Nanpanjiang River
<i>In situ</i> diversification	0.33	3.77	Nanpanjiang River
<i>In situ</i> diversification	0.25	2.06	Nanpanjiang River
<i>In situ</i> diversification	0.25	2.06	Nanpanjiang River
<i>In situ</i> diversification	0.04	1.05	Nanpanjiang River
<i>In situ</i> diversification	0.04	1.05	Nanpanjiang River
<i>In situ</i> diversification	2.92	7.52	Nanpanjiang River
<i>In situ</i> diversification	2.92	7.52	Nanpanjiang River
<i>In situ</i> diversification	2.05	6.13	Nanpanjiang River
<i>In situ</i> diversification	2.05	6.13	Nanpanjiang River
<i>In situ</i> diversification	1.25	4.65	Nanpanjiang River
<i>In situ</i> diversification	1.25	4.65	Nanpanjiang River
<i>In situ</i> diversification	0.5	3.12	Nanpanjiang River
<i>In situ</i> diversification	0.5	3.12	Nanpanjiang River
<i>In situ</i> diversification	3.84	9.28	Jinshajiang River
<i>In situ</i> diversification	3.84	9.28	Jinshajiang River

<i>In situ</i> diversification	1.26	6.16	Jinshajiang River
<i>In situ</i> diversification	2.89	7.99	Jinshajiang River
<i>In situ</i> diversification	2.89	7.99	Jinshajiang River
<i>In situ</i> diversification	0.37	3.02	Jinshajiang River
<i>In situ</i> diversification	1.51	5.73	Jinshajiang River
<i>In situ</i> diversification	0.46	3.15	Jinshajiang River
<i>In situ</i> diversification	0.46	3.15	Jinshajiang River
<i>In situ</i> diversification	0.13	1.51	Jinshajiang River
<i>In situ</i> diversification	0.13	1.51	Jinshajiang River
<i>In situ</i> diversification	0.37	1.89	Panlongjiang River
<i>In situ</i> diversification	0.37	1.89	Panlongjiang River
<i>In situ</i> diversification	0.04	0.57	Panlongjiang River
<i>In situ</i> diversification	0.04	0.57	Panlongjiang River
<i>In situ</i> diversification	0.5	2.2	Panlongjiang River
<i>In situ</i> diversification	5.61	12.33	Panlongjiang River
<i>In situ</i> diversification	0.53	6.28	Yuanjiang River
<i>In situ</i> diversification	0.53	6.28	Yuanjiang River

Table S4 Classification history and new taxonomic assignment of species groups or subgenera of the genus *Sinocyclocheilus* included in this study.

ID	Species	Shan and Le [7]	Yue et al. [8]	Zhao and Zhang [2]	Mao et al.[9]	Wen et al [5]	Mao et al., [10]	Current classification + Reference	New taxonomic assignment
1	<i>brevifinus</i>	—	—	—	—	—	<i>S. jii</i> group	<i>S. jii</i> group	Subgenus <i>Jicyclocheilus</i>
2	<i>guanyangensis</i>	—	—	—	<i>S. jii</i> group	—	<i>S. jii</i> group	<i>S. jii</i> group	Subgenus <i>Jicyclocheilus</i>
3	<i>guilinensis</i>	—	—	<i>S. jii</i> group	<i>S. jii</i> group	—	<i>S. jii</i> group	<i>S. jii</i> group	Subgenus <i>Jicyclocheilus</i>
4	<i>huangtianensis</i>	—	—	—	<i>S. jii</i> group	—	<i>S. jii</i> group	<i>S. jii</i> group	Subgenus <i>Jicyclocheilus</i>
5	<i>jii</i>	Subgenus <i>Sinocyclocheilus</i>	Subgenus <i>Sinocyclocheilus</i>	<i>S. jii</i> group	<i>S. jii</i> group	<i>S. jii</i> group	<i>S. jii</i> group	<i>S. jii</i> group (This study)	Subgenus <i>Jicyclocheilus</i>
6	<i>gracilis</i>	—	—	—	—	—	—	<i>S. jii</i> group (This study)	Subgenus <i>Jicyclocheilus</i>
7	<i>pingshanensis</i>	—	—	—	—	—	—	<i>S. jii</i> group (This study)	Subgenus <i>Jicyclocheilus</i>
8	<i>altishoulderus</i>	—	Subgenus <i>Gibbibarbus</i>	<i>S. angularis</i> group	<i>S. angularis</i> group	<i>S. angularis</i> group	<i>S. angularis</i> group	<i>S. angularis</i> group	Subgenus <i>Ceratobarbus</i>
9	<i>angularis</i>	Subgenus <i>Gibbibarbus</i>	Subgenus <i>Gibbibarbus</i>	<i>S. angularis</i> group	—	<i>S. angularis</i> group	<i>S. angularis</i> group	<i>S. angularis</i> group	Subgenus <i>Ceratobarbus</i>
10	<i>bicornutus</i>	—	—	<i>S. angularis</i> group	<i>S. angularis</i> group	<i>S. angularis</i> group	<i>S. angularis</i> group	<i>S. angularis</i> group	Subgenus <i>Ceratobarbus</i>
11	<i>brevibarbatus</i>	—	—	<i>S. angularis</i> group	<i>S. angularis</i> group	—	<i>S. angularis</i> group	<i>S. angularis</i> group	Subgenus <i>Ceratobarbus</i>
12	<i>broadihornes</i>	—	—	<i>S. angularis</i> group	—	—	—	<i>S. angularis</i> group [11]	Subgenus <i>Ceratobarbus</i>
13	<i>flexuosdorsalis</i>	—	—	—	<i>S. angularis</i> group	—	—	<i>S. angularis</i> group [11]	Subgenus <i>Ceratobarbus</i>
14	<i>hyalinus</i>	—	Subgenus <i>Gibbibarbus</i>	<i>S. angularis</i> group	<i>S. angularis</i> group	—	—	<i>S. angularis</i> group	Subgenus <i>Ceratobarbus</i>
15	<i>jiuxuensis</i>	—	—	<i>S. angularis</i> group	<i>S. angularis</i> group	—	<i>S. angularis</i> group	<i>S. angularis</i> group	Subgenus <i>Ceratobarbus</i>
16	<i>longicornus</i>	—	—	—	—	—	<i>S. angularis</i> group	<i>S. angularis</i> group [11]	Subgenus <i>Ceratobarbus</i>
17	<i>mashanensis</i>	—	—	—	<i>S. angularis</i> group	—	<i>S. angularis</i> group	<i>S. angularis</i> group	Subgenus <i>Ceratobarbus</i>
18	<i>rhinoceros</i>	—	Subgenus <i>Gibbibarbus</i>	<i>S. angularis</i> group	<i>S. angularis</i> group	<i>S. angularis</i> group	<i>S. angularis</i> group	<i>S. angularis</i> group	Subgenus <i>Ceratobarbus</i>
19	<i>simengensis</i>	—	—	—	—	—	—	<i>S. angularis</i> group [11]	Subgenus <i>Ceratobarbus</i>
20	<i>tianeensis</i>	—	—	—	<i>S. angularis</i> group	—	<i>S. angularis</i> group	<i>S. angularis</i> group	Subgenus <i>Ceratobarbus</i>
21	<i>tileihornes</i>	—	—	<i>S. angularis</i> group	—	—	—	<i>S. angularis</i> group	Subgenus <i>Ceratobarbus</i>
22	<i>wanlanensis</i>	—	—	—	—	—	—	<i>S. angularis</i> group [12]	Subgenus <i>Ceratobarbus</i>
23	<i>xingyiensis</i>	—	—	—	—	—	—	<i>S. angularis</i> group [13]	Subgenus <i>Ceratobarbus</i>
24	<i>zhenfengensis</i>	—	—	—	<i>S. angularis</i> group	<i>S. angularis</i> group	<i>S. angularis</i> group	<i>S. angularis</i> group	Subgenus <i>Ceratobarbus</i>
25	<i>luopingensis</i>	—	—	<i>S. cyphotergous</i> group	—	—	—	<i>S. angularis</i> group (This study)	Subgenus <i>Ceratobarbus</i>
26	<i>anshuiensis</i>	—	—	—	<i>S. angularis</i> group	<i>S. microphthalmus</i> group	Clade D	<i>S. microphthalmus</i> group	Subgenus <i>Anchicyclocheilus</i>
27	<i>microphthalmus</i>	Subgenus <i>Gibbibarbus</i>	Subgenus <i>Gibbibarbus</i>	<i>S. angularis</i> group	<i>S. angularis</i> group	<i>S. microphthalmus</i> group	Clade D	<i>S. microphthalmus</i> group	Subgenus <i>Anchicyclocheilus</i>
28	<i>longshanensis</i>	—	—	—	—	—	—	<i>S. microphthalmus</i> group [14]	Subgenus <i>Anchicyclocheilus</i>
29	<i>maculatus</i>	—	—	—	<i>S. tingi</i> group	—	—	<i>S. microphthalmus</i> group (This study)	Subgenus <i>Anchicyclocheilus</i>
30	<i>luolouensis</i>	—	—	—	—	—	—	<i>S. microphthalmus</i> group (This study)	Subgenus <i>Anchicyclocheilus</i>
31	<i>furcodorsalis</i>	—	—	<i>S. angularis</i> group	—	<i>S. angularis</i> group	<i>S. angularis</i> group	<i>S. angularis</i> group	Subgenus <i>Anchicyclocheilus</i>
32	<i>anatirostris</i>	Subgenus <i>Gibbibarbus</i>	Subgenus <i>Gibbibarbus</i>	<i>S. angularis</i> group	<i>S. angularis</i> group	—	Clade B	<i>S. angularis</i> group	Subgenus <i>Pseudosinocyclocheilus</i>
33	<i>aquihornes</i>	—	—	—	—	—	Clade B	<i>S. angularis</i> group	Subgenus <i>Pseudosinocyclocheilus</i>
34	<i>convexiforeheadus</i>	—	—	—	—	—	—	<i>S. angularis</i> group [11]	Subgenus <i>Pseudosinocyclocheilus</i>
35	<i>jinximensis</i>	—	—	—	—	—	—	<i>S. angularis</i> group [15]	Subgenus <i>Pseudosinocyclocheilus</i>
36	<i>tianlinensis</i>	—	—	<i>S. angularis</i> group	<i>S. angularis</i> group	—	Clade B	<i>S. angularis</i> group	Subgenus <i>Pseudosinocyclocheilus</i>
37	<i>cyphotergous</i>	Subgenus <i>Gibbibarbus</i>	Subgenus <i>Gibbibarbus</i>	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	Subgenus <i>Gibbibarbus</i>
38	<i>guiyang</i>	—	—	—	—	—	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group [16]	Subgenus <i>Gibbibarbus</i>
39	<i>multipunctatus</i>	Subgenus <i>Sinocyclocheilus</i>	Subgenus <i>Sinocyclocheilus</i>	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	Subgenus <i>Gibbibarbus</i>
40	<i>punctatus</i>	—	—	—	—	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	Subgenus <i>Gibbibarbus</i>
41	<i>sanxiaensis</i>	—	—	—	—	—	—	<i>S. cyphotergous</i> group [17]	Subgenus <i>Gibbibarbus</i>
42	<i>zhenningensis</i>	—	—	—	—	—	—	<i>S. cyphotergous</i> group [18]	Subgenus <i>Gibbibarbus</i>

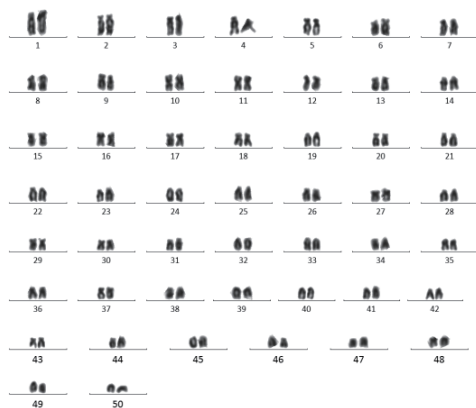
43	<i>brevis</i>	Subgenus <i>Sinocyclocheilus</i>	Subgenus <i>Sinocyclocheilus</i>	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	—	Clade E	<i>S. cyphotergous</i> group	Subgenus <i>Hugeibarbus</i>
44	<i>donglanensis</i>	—	—	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	—	Clade E	<i>S. cyphotergous</i> group	Subgenus <i>Hugeibarbus</i>
45	<i>dongtangensis</i>	—	—	—	—	—	—	<i>S. cyphotergous</i> group [11]	Subgenus <i>Hugeibarbus</i>
46	<i>gracilicaudatus</i>	—	—	—	—	—	Clade E	<i>S. cyphotergous</i> group [14]	Subgenus <i>Hugeibarbus</i>
47	<i>huanjiangensis</i>	—	—	—	<i>S. cyphotergous</i> group	—	Clade E	<i>S. cyphotergous</i> group	Subgenus <i>Hugeibarbus</i>
48	<i>hugeibarbus</i>	—	—	<i>S. cyphotergous</i> group	—	<i>S. cyphotergous</i> group	Clade E	<i>S. cyphotergous</i> group	Subgenus <i>Hugeibarbus</i>
49	<i>lingyunensis</i>	—	—	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	Clade E	<i>S. cyphotergous</i> group	Subgenus <i>Hugeibarbus</i>
50	<i>longibarbatus</i>	Subgenus <i>Sinocyclocheilus</i>	Subgenus <i>Sinocyclocheilus</i>	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	Clade E	<i>S. cyphotergous</i> group	Subgenus <i>Hugeibarbus</i>
51	<i>macrolepis</i>	Subgenus <i>Sinocyclocheilus</i>	Subgenus <i>Sinocyclocheilus</i>	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	—	—	<i>S. cyphotergous</i> group	Subgenus <i>Hugeibarbus</i>
52	<i>macrophthalmus</i>	—	—	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	—	Clade E	<i>S. cyphotergous</i> group	Subgenus <i>Hugeibarbus</i>
53	<i>ronganensis</i>	—	—	—	<i>S. cyphotergous</i> group	—	Clade E	<i>S. cyphotergous</i> group	Subgenus <i>Hugeibarbus</i>
54	<i>xunlensis</i>	—	—	<i>S. angularis</i> group	<i>S. cyphotergous</i> group	—	Clade E	<i>S. cyphotergous</i> group	Subgenus <i>Hugeibarbus</i>
55	<i>yaolanensis</i>	—	—	—	—	—	—	<i>S. cyphotergous</i> group [11]	Subgenus <i>Hugeibarbus</i>
56	<i>yishanensis</i>	—	Subgenus <i>Sinocyclocheilus</i>	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	<i>S. cyphotergous</i> group	Clade E	<i>S. cyphotergous</i> group	Subgenus <i>Hugeibarbus</i>
57	<i>aluensis</i>	—	—	—	—	—	—	<i>S. tingi</i> group [11]	Subgenus <i>Sinocyclocheilus</i>
58	<i>angustiporus</i>	Subgenus <i>Sinocyclocheilus</i>	Subgenus <i>Sinocyclocheilus</i>	<i>S. tingi</i> group	<i>S. tingi</i> group	<i>S. tingi</i> group	<i>S. tingi</i> group	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
59	<i>anophthalmus</i>	Subgenus <i>Sinocyclocheilus</i>	Subgenus <i>Sinocyclocheilus</i>	—	<i>S. tingi</i> group	<i>S. tingi</i> group	<i>S. tingi</i> group	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
60	<i>bannaensis</i>	—	—	—	—	—	—	<i>S. tingi</i> group [11]	Subgenus <i>Sinocyclocheilus</i>
61	<i>grahami</i>	Subgenus <i>Sinocyclocheilus</i>	Subgenus <i>Sinocyclocheilus</i>	<i>S. tingi</i> group	<i>S. tingi</i> group	<i>S. tingi</i> group	<i>S. tingi</i> group	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
62	<i>guishanensis</i>	—	—	<i>S. tingi</i> group	<i>S. tingi</i> group	—	—	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
63	<i>huaningensis</i>	—	—	<i>S. tingi</i> group	<i>S. tingi</i> group	—	—	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
64	<i>huizeensis</i>	—	—	—	<i>S. tingi</i> group	<i>S. tingi</i> group	—	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
65	<i>lateristriatus</i>	—	Subgenus <i>Sinocyclocheilus</i>	<i>S. tingi</i> group	<i>S. tingi</i> group	—	—	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
66	<i>longifinus</i>	—	—	<i>S. tingi</i> group	—	—	—	<i>S. tingi</i> group [11]	Subgenus <i>Sinocyclocheilus</i>
67	<i>macrocephalus</i>	Subgenus <i>Sinocyclocheilus</i>	Subgenus <i>Sinocyclocheilus</i>	<i>S. tingi</i> group	<i>S. tingi</i> group	—	<i>S. tingi</i> group	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
68	<i>macroscalus</i>	—	Subgenus <i>Sinocyclocheilus</i>	—	—	—	—	<i>S. tingi</i> group [11]	Subgenus <i>Sinocyclocheilus</i>
69	<i>maitianheensis</i>	—	Subgenus <i>Sinocyclocheilus</i>	—	<i>S. tingi</i> group	—	<i>S. tingi</i> group	<i>S. tingi</i> group [11]	Subgenus <i>Sinocyclocheilus</i>
70	<i>malacopterus</i>	—	Subgenus <i>Sinocyclocheilus</i>	<i>S. tingi</i> group	<i>S. tingi</i> group	—	<i>S. tingi</i> group	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
71	<i>oxycephalus</i>	Subgenus <i>Sinocyclocheilus</i>	Subgenus <i>Sinocyclocheilus</i>	<i>S. tingi</i> group	<i>S. tingi</i> group	<i>S. tingi</i> group	<i>S. tingi</i> group	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
72	<i>purpureus</i>	Subgenus <i>Sinocyclocheilus</i>	Subgenus <i>Sinocyclocheilus</i>	<i>S. tingi</i> group	<i>S. tingi</i> group	—	<i>S. tingi</i> group	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
73	<i>panzhouensis</i>	—	—	—	—	—	—	<i>S. tingi</i> group [6]	Subgenus <i>Sinocyclocheilus</i>
74	<i>qiubeiensis</i>	—	—	<i>S. tingi</i> group	<i>S. tingi</i> group	—	<i>S. tingi</i> group	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
75	<i>qujingensis</i>	—	—	<i>S. tingi</i> group	<i>S. tingi</i> group	<i>S. tingi</i> group	—	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
76	<i>robustus</i>	Subgenus <i>Sinocyclocheilus</i>	Subgenus <i>Sinocyclocheilus</i>	<i>S. tingi</i> group	—	—	—	<i>S. tingi</i> group [11]	Subgenus <i>Sinocyclocheilus</i>
77	<i>tingi</i>	Subgenus <i>Sinocyclocheilus</i>	Subgenus <i>Sinocyclocheilus</i>	<i>S. tingi</i> group	<i>S. tingi</i> group	<i>S. tingi</i> group	—	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
78	<i>wenshanensis</i>	—	—	—	<i>S. tingi</i> group	—	<i>S. tingi</i> group	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
79	<i>wumengshanensis</i>	—	—	<i>S. tingi</i> group	—	<i>S. tingi</i> group	—	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
80	<i>xichouensis</i>	—	—	—	—	—	<i>S. tingi</i> group	<i>S. tingi</i> group [11]	Subgenus <i>Sinocyclocheilus</i>
81	<i>xiejiahuai</i>	—	—	—	—	—	—	<i>S. tingi</i> group [14]	Subgenus <i>Sinocyclocheilus</i>
82	<i>xingrenensis</i>	—	—	—	—	—	—	<i>S. tingi</i> group [19]	Subgenus <i>Sinocyclocheilus</i>
83	<i>yangzongensis</i>	Subgenus <i>Sinocyclocheilus</i>	Subgenus <i>Sinocyclocheilus</i>	<i>S. tingi</i> group	<i>S. tingi</i> group	—	—	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
84	<i>yimenensis</i>	—	—	<i>S. tingi</i> group	<i>S. tingi</i> group	—	—	<i>S. tingi</i> group	Subgenus <i>Sinocyclocheilus</i>
85	<i>wui</i>	—	—	—	—	—	—	<i>S. tingi</i> group (This study)	Subgenus <i>Sinocyclocheilus</i>

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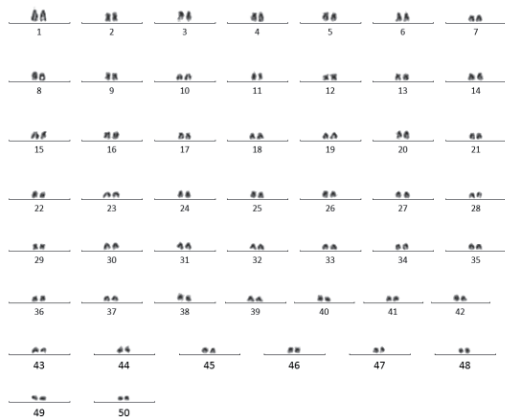
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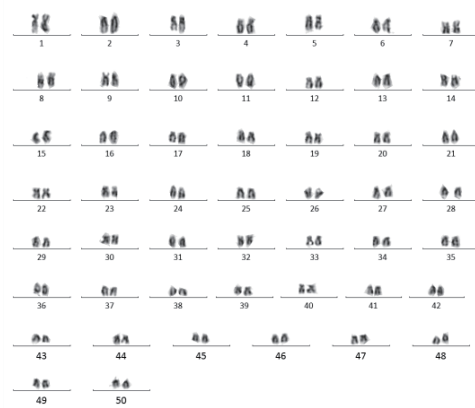
Figure S1



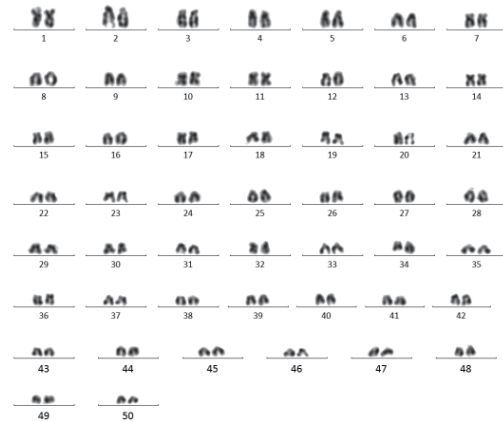
Sinocyclocheilus multipunctatus



Sinocyclocheilus bicornutus



Sinocyclocheilus longicornus



Sinocyclocheilus zhenfengensis

Figure S2

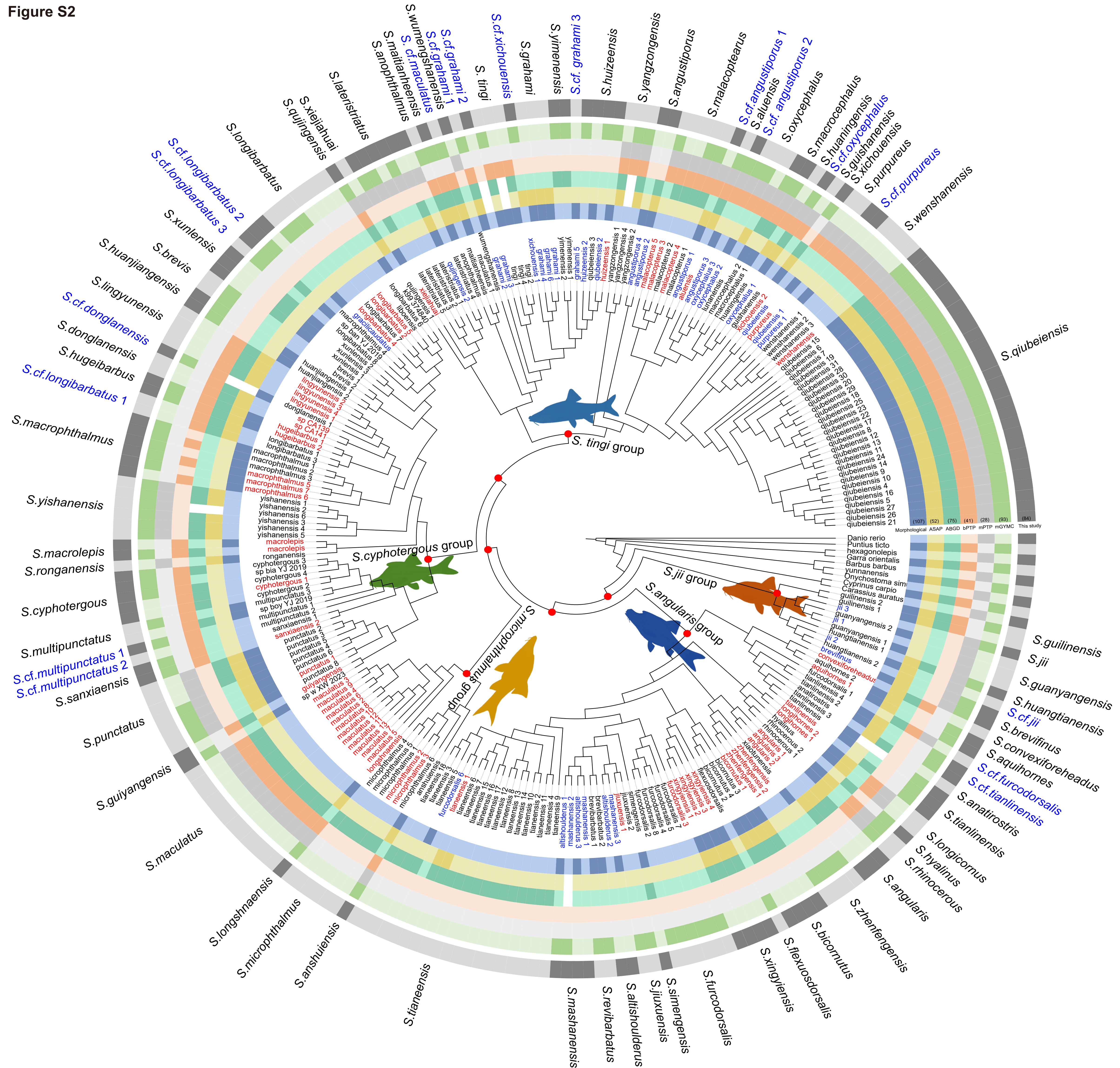
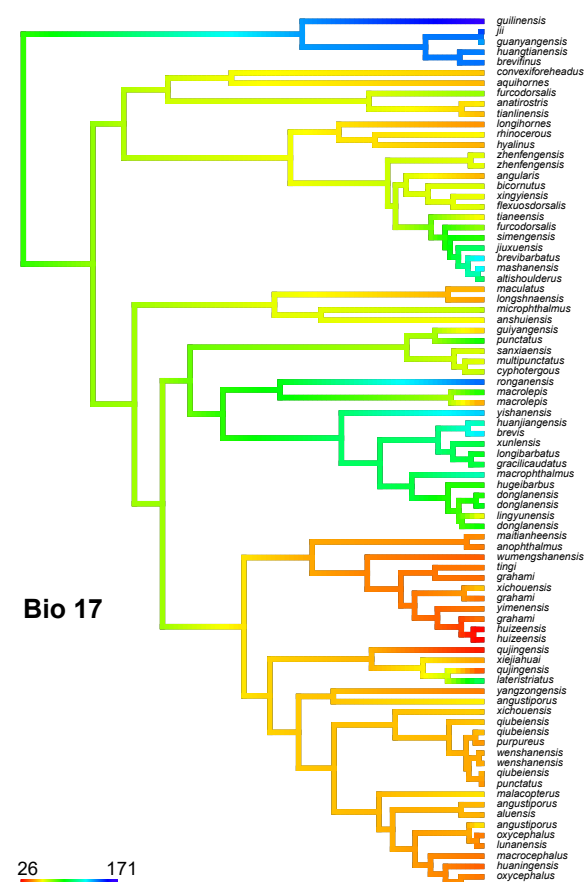
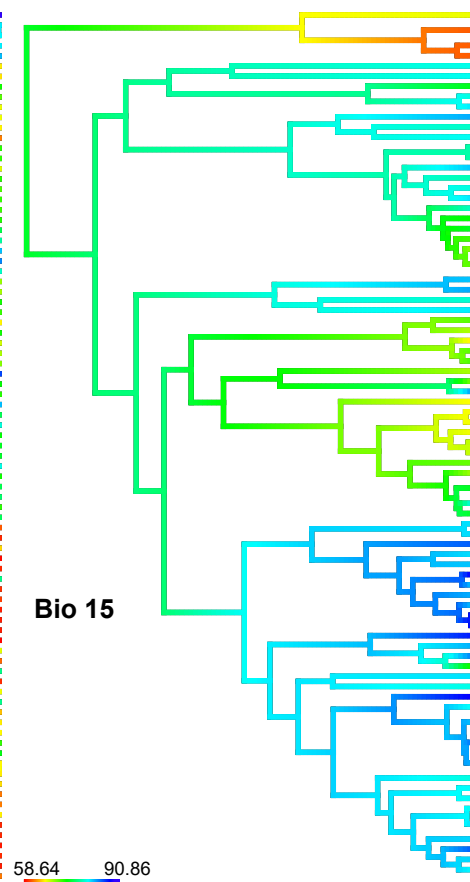
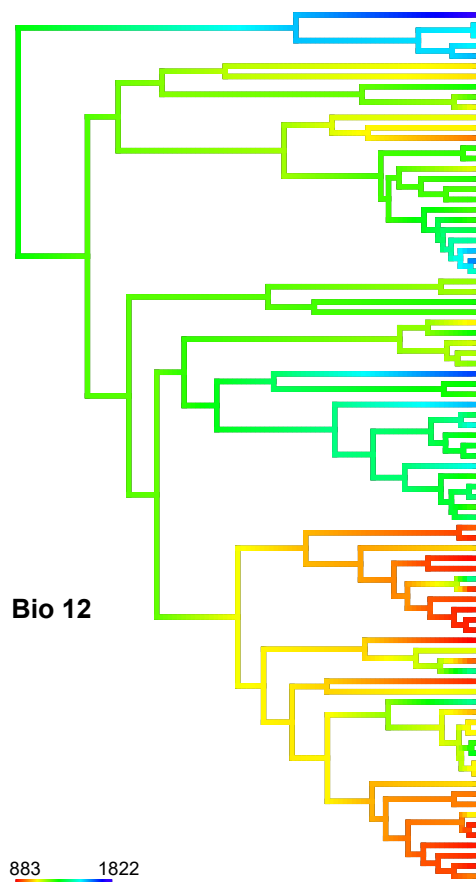
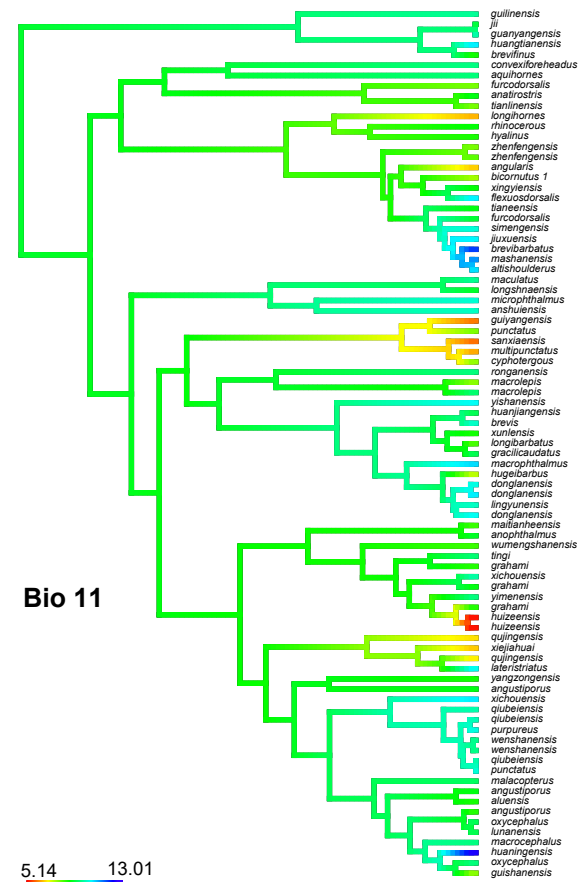
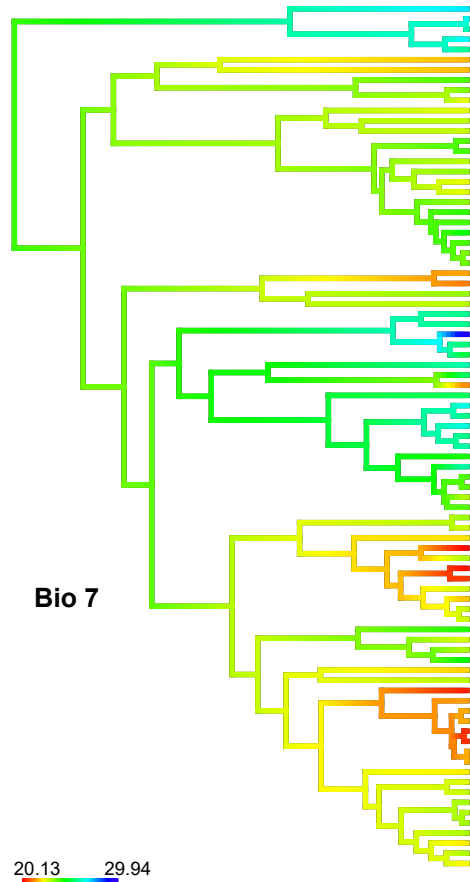
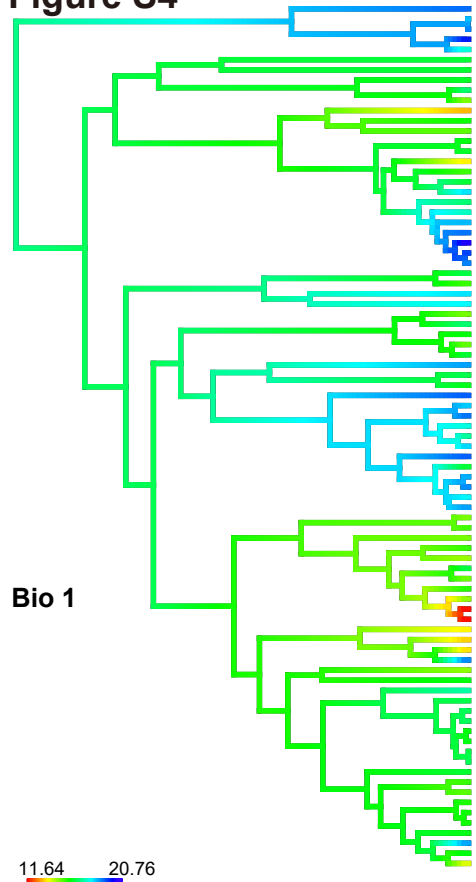


Figure S3



Figure S4



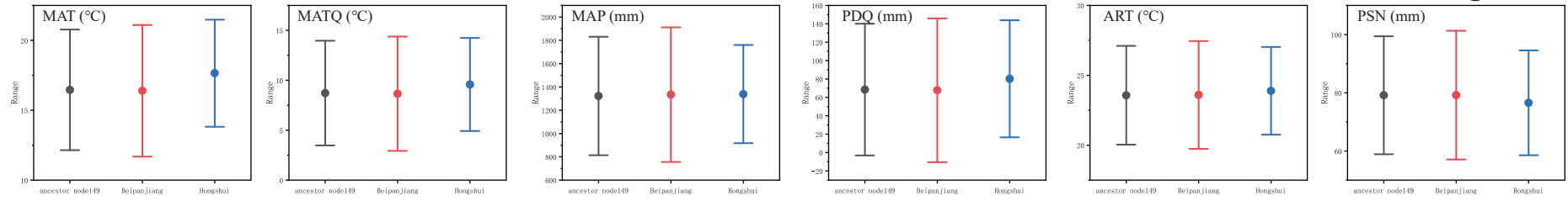
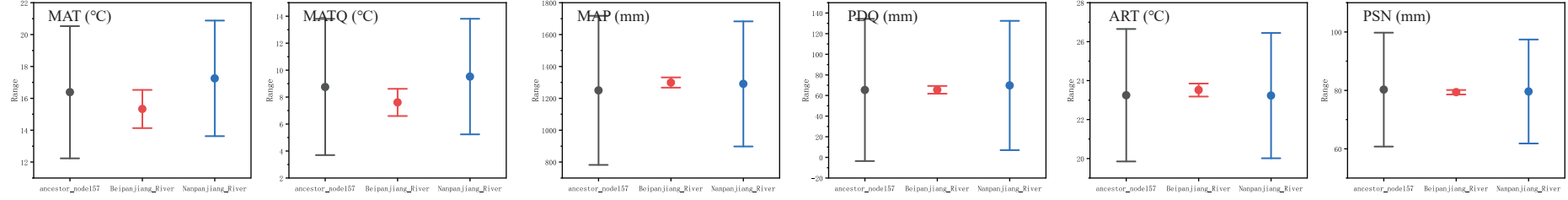
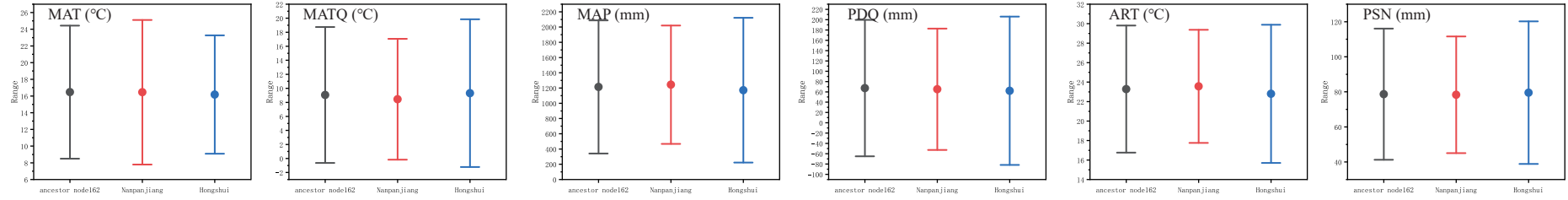
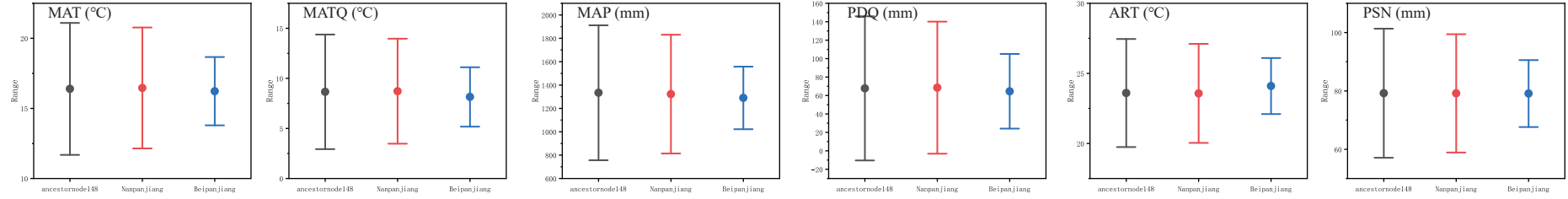
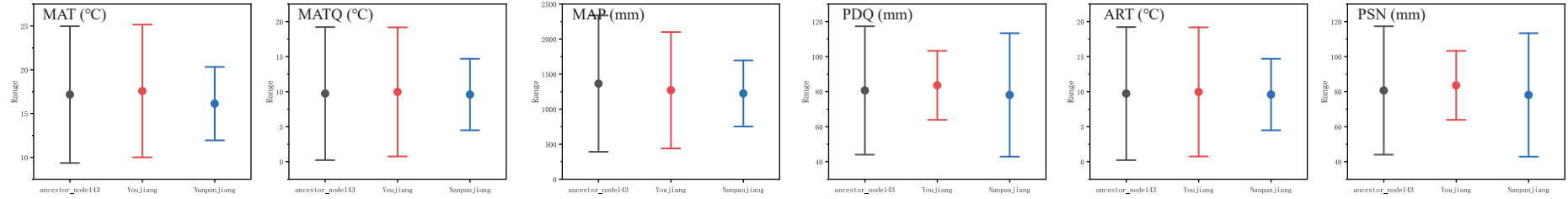
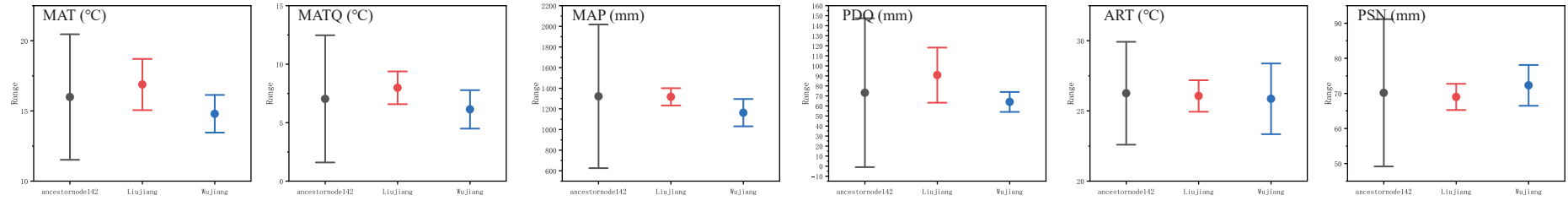
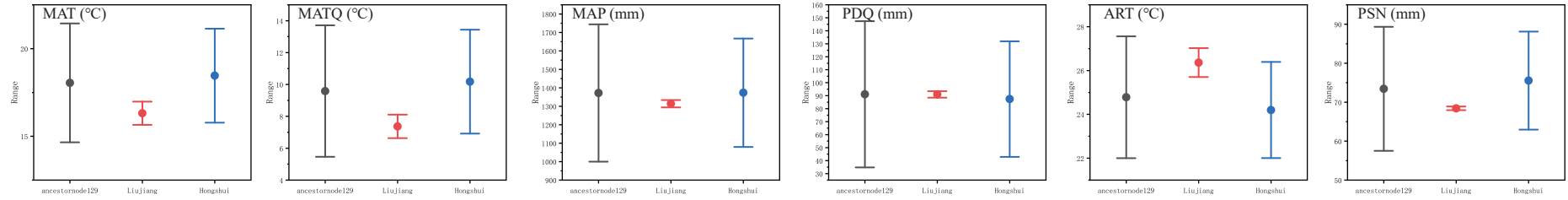
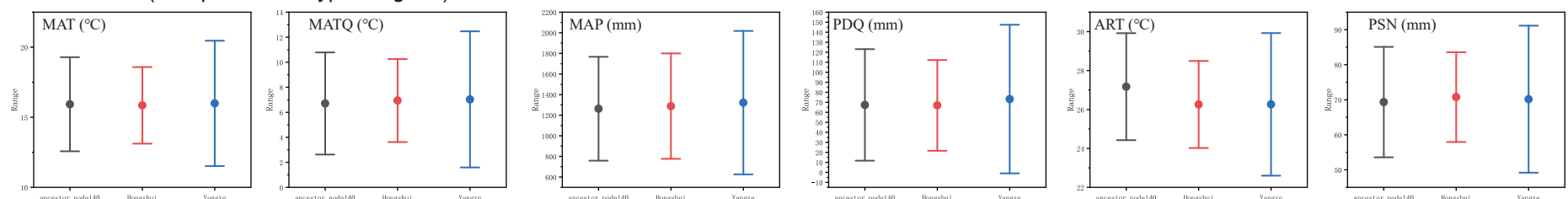
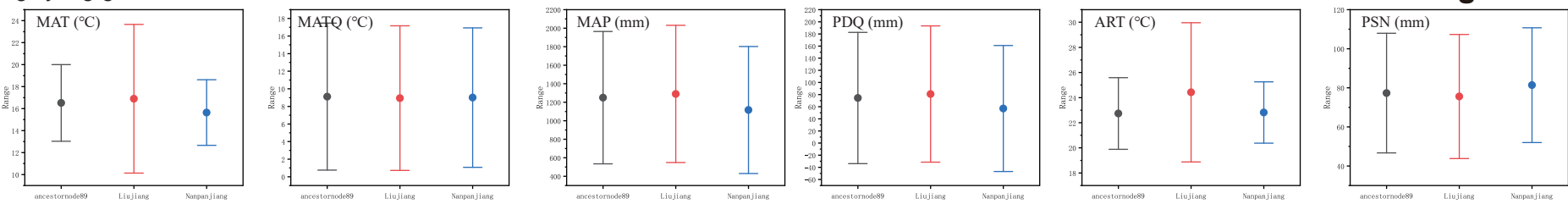
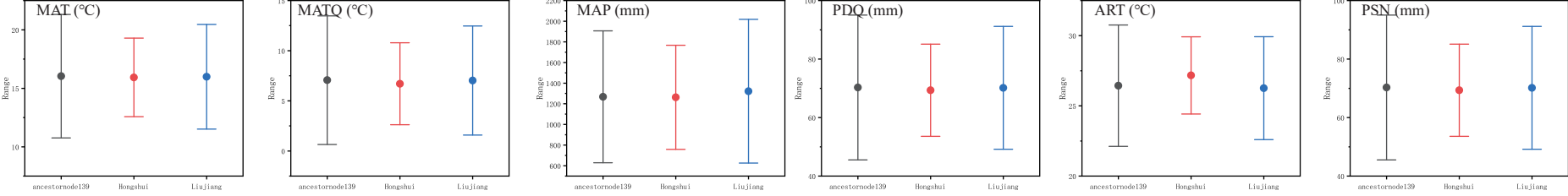
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Figure S5

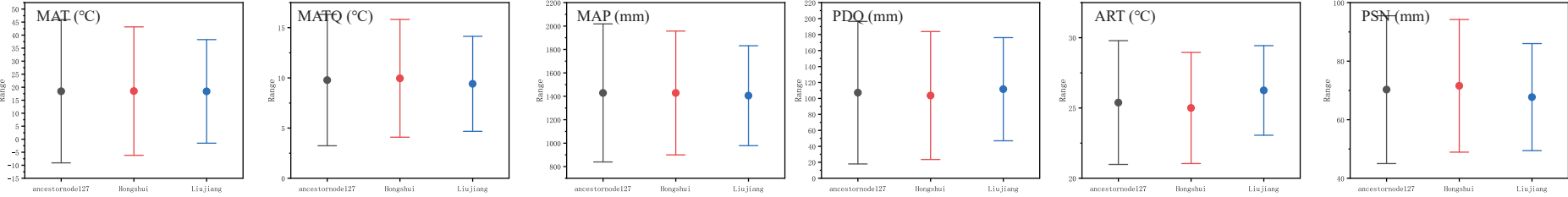
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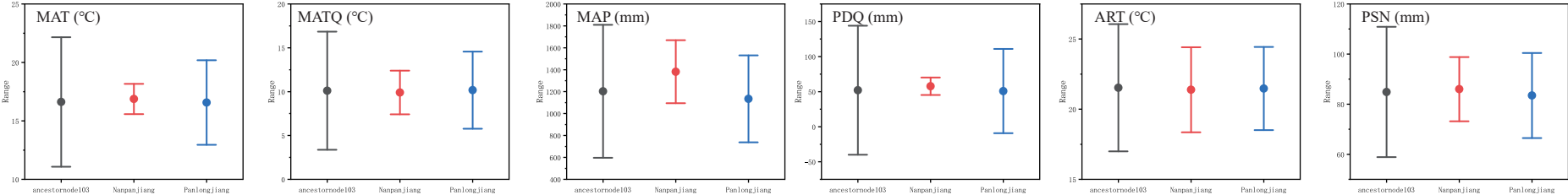
guiyang-cyphotergous



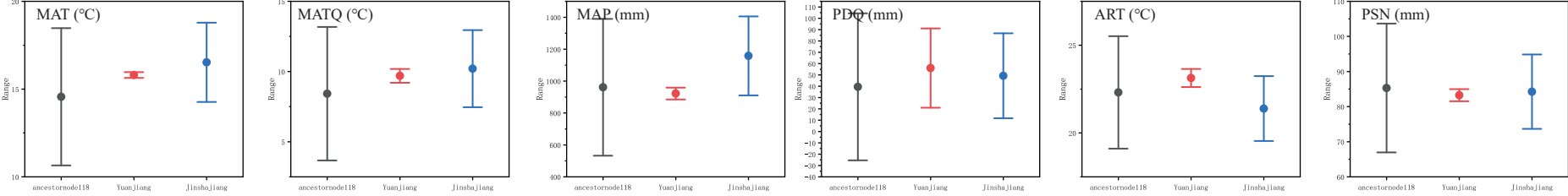
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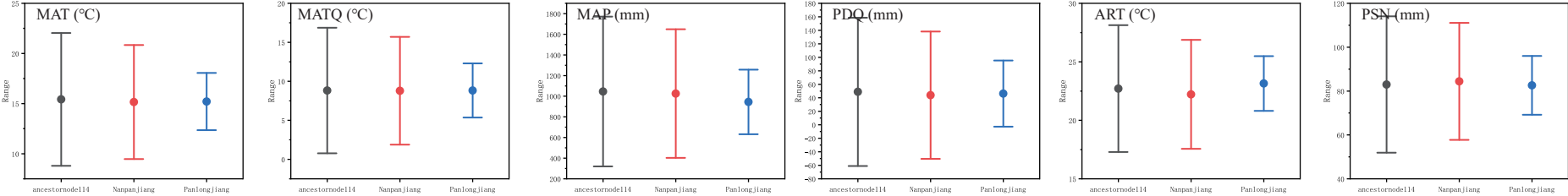
xichouensis-qiubeiensis



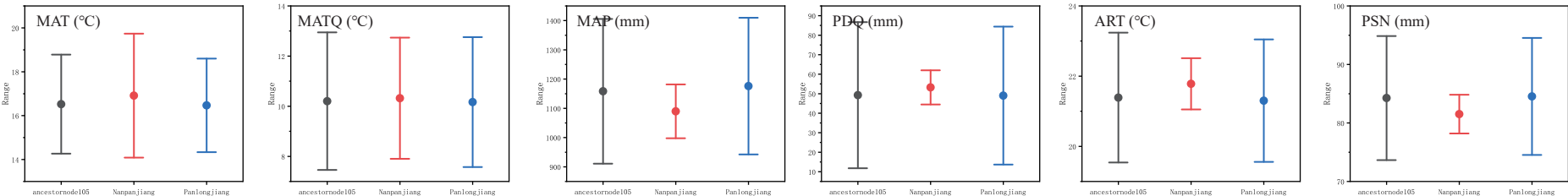
yimenensis-(cf. grahami 3-huizeensis-huizeensis)



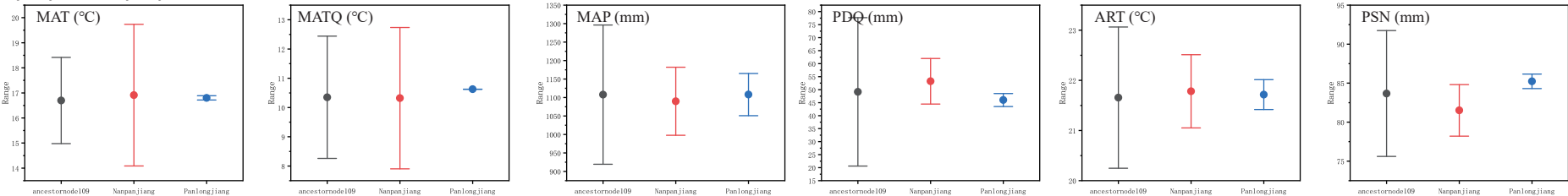
(maitianheensis-anophthalmus)-wumengshanensis



(purpureus-purpureus)-(wenshanensis-wenshanensis-cf. purpureus-cf. purpureus)



purpureus-purpureus



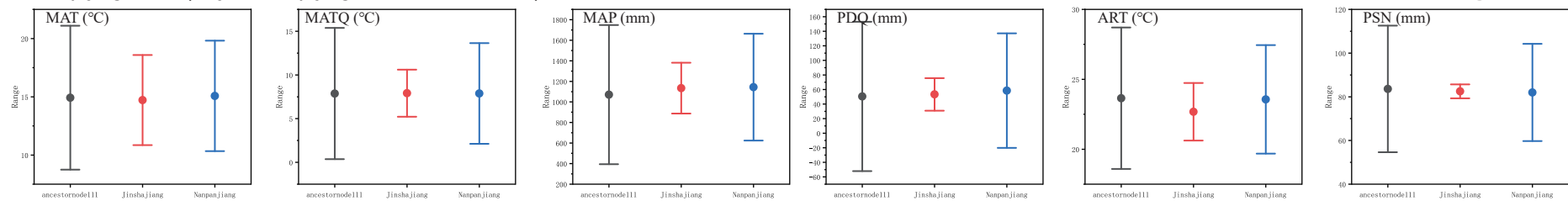
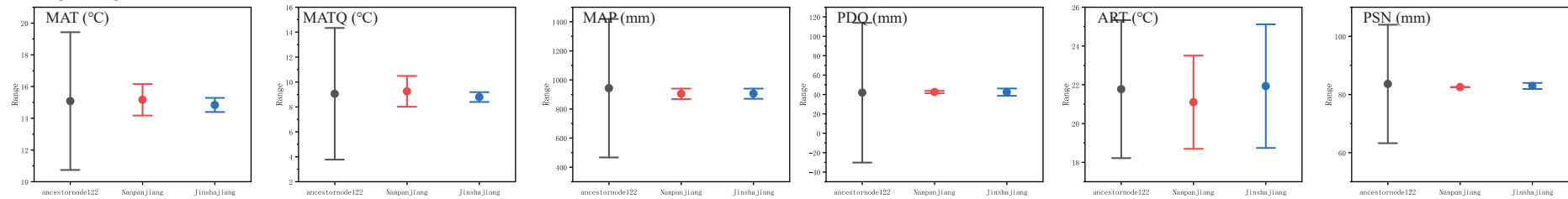
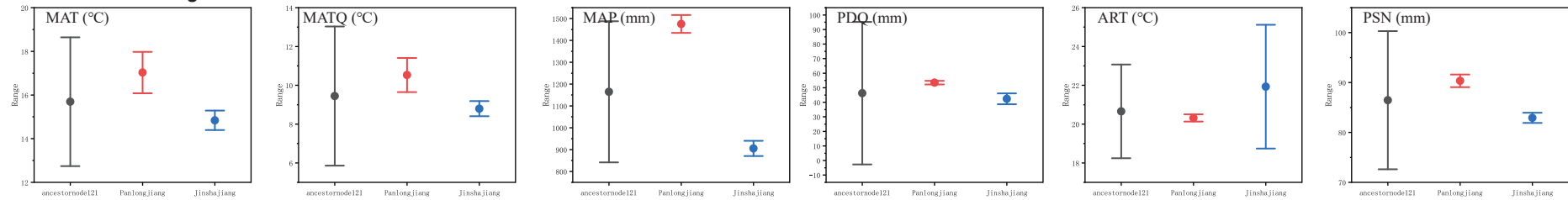
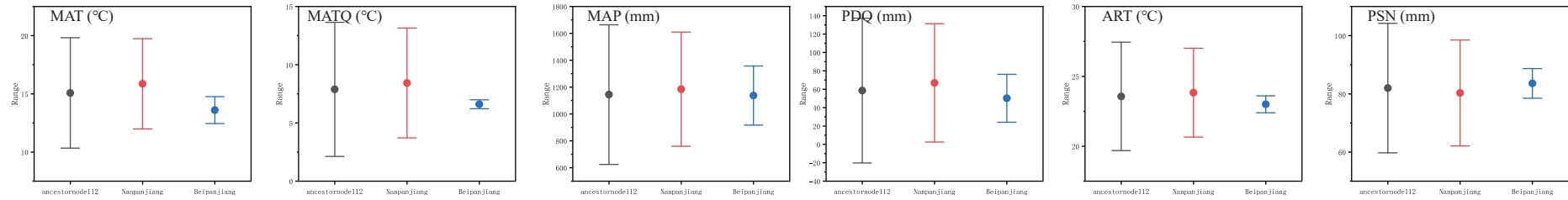
cf. qujingensis-(xiejiahuai-qujingensis-lateristriatus)*tingi-cf. grahami 2**cf. xichouensis-grahami**xiehuai-lateristriatus*

Figure S6

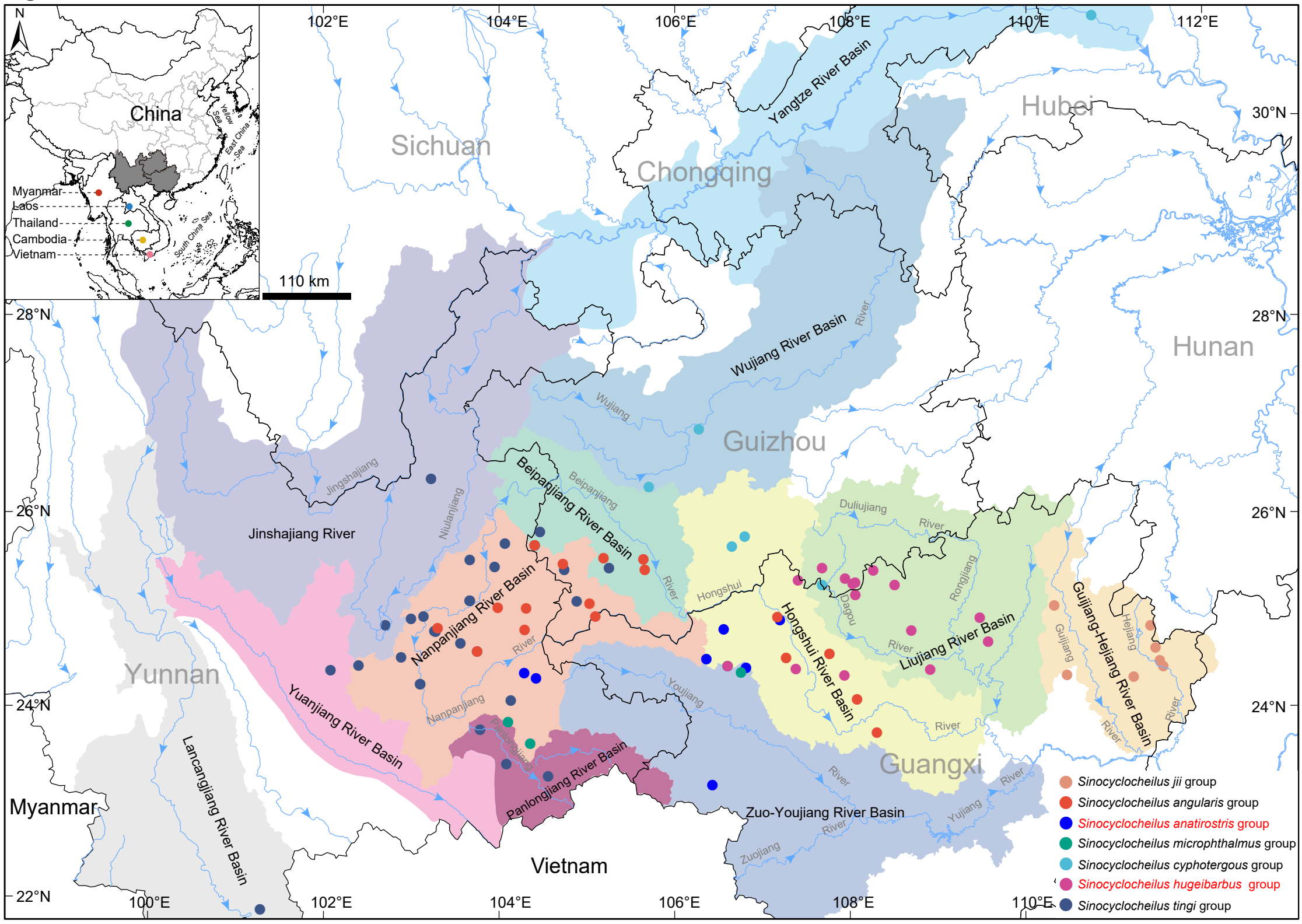


Figure S7

Sinocyclocheilus guilinensis

A1

Sinocyclocheilus longicornus

B1

Sinocyclocheilus microphthalmus

C1

Sinocyclocheilus jinxiensis

D1

Sinocyclocheilus cyphotergous

E

Sinocyclocheilus qiubeiensis

G1

Sinocyclocheilus jii

A2

Sinocyclocheilus zhengfengensis

B2

Sinocyclocheilus anshuiensis

C2

Sinocyclocheilus furcodorsalis

D2

Sinocyclocheilus longibarbatus

F

Sinocyclocheilus wenshanensis

G2

