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New Cavernicolous Trechine Beetles From Eastern Guizhou Province, China (Coleoptera: Carabidae: Trechinae)

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ABSTRACT

Two new species of cavernicolous trechine beetles falling into a new proposed genus *Jiulongotrechus* n. gen. and a new proposed subgenus *Qiandongaphaenops* n. subgen. respectively, are described and illustrated from eastern Guizhou Province, southwestern China. *Jiulongotrechus pubescens* n. gen., n. sp. is recorded from the cave Jiulong Dong in Tongren City. This new genus is not related to any known trechines occurring in eastern Guizhou such as *Qianotrechus* Uéno, 2000, *Qianaphaenops* Uéno, 2000, and *Shenaphaenops* Uéno, 1999, but somewhat close to *Superbotrechus* Deuve and Tian, 2009 from western Hubei Province, or *Yunotrechus* Tian and Huang, 2014 from southern Yunnan Province. *Qianaphaenops* (*Qiandongaphaenops*) *variabilis* n. subgen., n sp. from cave Wanfuchangcheng Dong in Cengong County is set up within the known genus *Qianaphaenops* Uéno, 2000.

Key words: Ground beetle, troglobitic, new genus, new subgenus, new species.

INTRODUCTION

As one of the largest karst areas in the world, Guizhou is the most developed karst area in China (Sweeting, 1986). The carbonate rocks cover over 73% of the total terrestrial land in Guizhou, creating many caves (Zhou and Xiong, 2008) as the habitat of the richest cave fauna of the cavernicolous trechine beetles in this province. So far, about 30 species of troglobitic trechines have been recorded in Guizhou (Tian, 2008; Tian and Clarke, 2012). One third of them (11 species) are known from eastern Guizhou, viz. five species belonging to the genus *Qianotrechus* Uéno, 2000 (Uéno, 2000, 2003), four to *Qianaphaenops* Uéno, 2000 (Uéno, 2000; Tian and Clarke, 2012) and two to *Shenaphaenops* Uéno, 1999 (Uéno, 1999a, b). With studies on the cave fauna increasing, it is sure that more and more subterranean trechine beetles will be discovered in China in the future.

A biospeological survey was carried out in the eastern Guizhou karstic areas in June and July, 2014, leading to a few interesting findings on cavedwelling trechines. Among them there are two new species, one belongs to a new genus proposed as *Jiulongotrechus* n. gen., and the other to a new subgenus proposed as *Qiandongaphaenops* n. subgen., of the genus *Qianaphaenops* Uéno, 2000.

MATERIAL AND METHODS

The specimens were collected in caves by hand or by using an aspirator, and kept in vials with 50% ethanol before study. Dissections, observations and drawings were made with a binocular Leica MZ75 dissecting microscope. Dissected genital pieces, including the median lobe and parameres of aedeagus, were glued on small transparent plastic cards and then pinned under the specimen from which they were removed. Digital pictures were taken using a Canon EOS 5D Mark III camera, and subsequently processed by means of Adobe Photoshop CS5 software. Distributional map was prepared using Mapinfo 8.5 SCP software.

Length of body was measured from apex of right mandible (in opened position) to apices of elytra. Abbreviations of other measurements used in the text are as following.

HL: length of head, from apex of labrum to occipital suture;

HW: maximum width of head;

PL: length of pronotum, along the median line;

PW: maximum width of pronotum;

PWA: width of pronotum at front, between the apices of front angles;

PWB: width of pronotum at base, between the apices of hind angles;

EL: length of elytra, from the base of scutellum to apices of elytra;

EW: maximum width of combined elytra.

Abbreviations for the specimens' depository are as following.

IOZ: National Museum of Zoology, Institute of Zoology, Chinese Academy of Sciences, Beijing;

MNHN: Muséum National d'Histoire Naturelle, Paris;

SCAU: South China Agricultural University, Guangzhou;

ZUBM: Biological Museum of Zhongshan University, Guangzhou.

TAXONOMY

Jiulongotrechus n. gen.

Type species: *Jiulongotrechus pubescens* n. sp.

Generic characteristics

Medium sized for Chinese cavernicolous trechines; body stout, surface pubescent; depigmented, eyeless and apterous; head thick, subquadrate, longer than wide; genae nearly parallel-sided though slightly convex medially, not subtuberculate posteriorly; frontal furrows deep and long, moderately divergent only near basal and apical portions, nearly parallel-sided medially; two pairs of supraorbital pores present, at about a little behind middle of genae and ending points of frontal furrows, respectively, distance between posterior pores slightly narrower than that between the anterior;

suborbital setae absent; neck short and well defined; mandibles developed, right mandible bidentate; mentum and submentum completely fused; ligula bisetose at apex; antennae long, extending at about 1/5 of elytra from apex; pronotum subcordate, wider than head, two pairs of latero-marginal setae present, propleura invisible from above; elytra elongated ovate, strongly convex, distinctly wider than pronotum, base of elytra unbordered, sides entirely bordered and distinctly ciliated; widest at about middle of elytra; shoulders wide and rounded; striae rather shallow, 1st–5th strae rather clear or at least traceable, others vague, intervals faintly convex; two setiferous dorsal pores present on 3rd stria, preapical dorsal pore present; humeral group of marginal umbilicate pores more or less regularly sited, but not really aggregated, 2nd pore closer to marginal gutter than others; both pores of the middle group widely spaced; scutellum small, scutellar striae absent; legs slender, 1st protarsomere distinctly dilated and inwardly denticulated at apex in ♂; abdominal ventrite VII quadrisetose in ♀, but bisetose in ♂; ♂ genitalia well sclerotized, median lobe very thin and slender, a large sagittal aileron present, both parameres subequal in length and each with four long apical setae.

Etymology

Jiulong + *trechus*, indicating the type species is occurring in the cave Jiulong Dong; gender masculine.

Geographical range

Known so far only from the cave Jiulong Dong, Tongren, eastern Guizhou Province, southwestern China (Fig. 1).

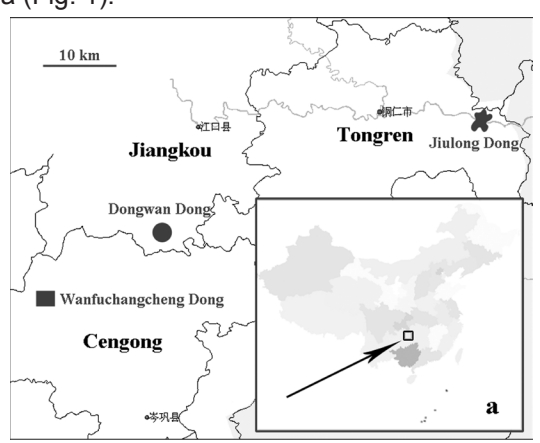


Fig. 1. Distributional map of *Jiulongotrechus pubescens* n. gen., n. sp. and *Qianaphaenops (Qiandongaphaenops)* n. subgen. (star: *Jiulongotrechus pubescens* n. gen., n. sp.; round: *Q. (Q.)pilosus* Uéno, 2000; square: *Q. (Q.) variabilis* n. sp.; a. arrowhead indicates the area of E. Guizhou in China)

Jiulongotrechus pubescens n. sp.

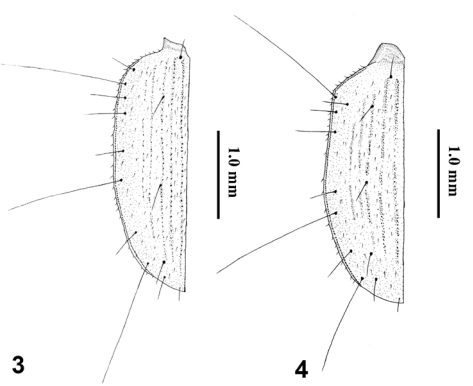
Figs. 2–3, 5–6, 12–13

Holotype, ♂, cave Jiulong Dong, Jiulong Village, Yangtou Town, Bijiang District,

Tongren City, eastern Guizhou Province, 27°42'29.59" N, 109°19'40.3" E, 450 m, 2014-VI-30, leg. Mingyi Tian, Weixin Liu, Haomin Yin, Sunbin Huang and Xinhui Wang, in South China Agricultural University, Guangzhou (SCAU); Paratypes: 4 ♀♀, ibid., all in SCAU except one ♀ in Muséum National d'Histoire Naturelle, Paris (MNHN).

Length: 4.8–5.5 mm; width: 1.8–1.9 mm. Habitus as in Fig. 2.

Fig. 2 Habitus of *Jiulongotrechus pubescens* n. gen., n. sp., holotype, ♂



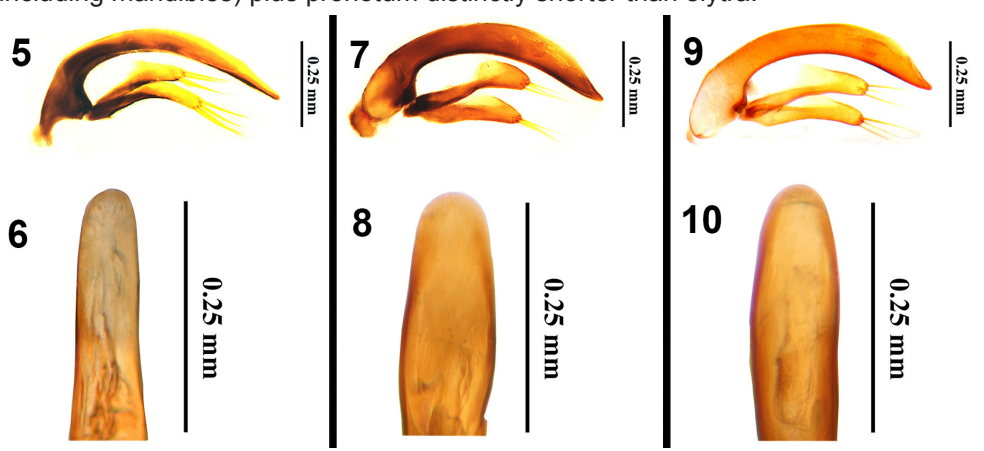
Figs. 3–4 Left elytra to show elytral chaetotaxal patterns (3. *Jiulongotrechus pubescens* n. gen., n. sp.; 4. *Qianaphaenops (Qiandongaphaenops) variabilis* n. sp.)

Description

Body moderately sized, rather stout, pubescent except for neck, base of head ventrally, propleura and epipleura which are glabrous, setae on genae and pronotum much longer than on other parts; microsculpture engraved meshes missing on head and pronotum, irregularly and moderately transverse on elytra; dark reddish brown, palps, 6th–11th antennomeres and 5th tarsomere pale.

Head longer than wide, HL/HW=1.3–1.6, widest at middle (from labrum to neck); genae nearly parallel-sided though faintly expanded laterally; frontal furrows almost

paralleled each other in middle portion; distance between anterior and posterior supraorbital pores much shorter than that between posterior supraorbital pores, but as long as from posterior pore to genal margin; clypeus transverse, quadrisetose; labrum transverse, frontal margin slightly protruding in middle portion, 6-setose; mandibles slender and elongated, gently incurved at apical half which are distinctly hooked at apices; labial suture completely disappeared; mentum widely and deeply concave at base, mentum 6-setose, strongly concave at base, mental tooth simple, blunt at apex; submentum 10-setose; palps slender and subcylindrical, apical palpomeres glabrous; 3rd maxillary palpomere longer than 4th, both glabrous; 2nd labial palpomere much longer than 3rd, bisetose on inner margin, and with two or three additional setae at subapical and apical parts; ligula short, bisetose at apex; antennae pubescent from 2nd antennomere, 1st sparsely covered with long setae, almost as long as 2nd, about 3/5 as long as 3rd, 3rd - 7th and 11th subequal in length, slightly longer than 8-10th; head (including mandibles) plus pronotum distinctly shorter than elytra.



Figs. 5–10. Median lobe (lateral view) and apical lobe (dorsal view) of aedeagus (5–6. *Jiulongotrechus pubescens* n. gen., n. sp.; 7–8. *Qianaphaenops (Qiandongaphaenops) variabilis* n. sp. stout body form; 9–10, ibid, slender body form)

Pronotum wider than head, PW/HW=1.2–1.5, but slightly shorter, PL/HL=0.9; nearly as long as wide, PL/PW, widest at about apical quarter; lateral sides strongly constricted in front, gently and gradually narrowed towards base, suddenly and distinctly sinuate before hind angles; propleura not tumid, invisible from above; disc moderately convex; fore and hind latero-marginal setae at a little behind widest point and before posterior angles respectively; base almost straight though slightly oblique near hind angles, front straight; both base and front unbordered; lateral sides evenly beaded throughout, distinctly and widely reflexed near hind angles; base narrower than front, PWA/PWB=1.1–1.7; fore angles not well angulated, hind angles nearly rectangular and denticulate; hind angular carinae indistinct; median line clear, reaching at both transverse impressions which are well marked. Scutellum small and short.

Elytra much wider than pronotum, much longer than wide, EL/EW=1.6–1.7; widest at about middle, entire lateral margins ciliated throughout, more distinctly so on

prehumeral parts; shoulders wide and broad, lateral marginal bead suddenly ended against 4th stria; striae vague and shallow, punctures indistinct, intervals slightly convex; two setiferous dorsal pores present on 3rd stria at about basal 1/5 and a little behind middle respectively; preapical dorsal pore at about the apical anastomosis of 2nd and 3rd striae; marginal umbilicate pores (Fig. 3) not aggregated, 2nd pore distinctly closer to marginal gutter than others, 4th, 5th and 7th pores widely distance from marginal gutter; distance of 2nd and 3rd as long as that of 3rd and 4th, slightly shorter than that of 1st and 2nd; 5th and 6th pores of the middle group at a little before middle areas, widely separated each other, distance of 4th and 5th longer than that of 5th and 6th; scutellar striae absent, basal dorsal pores present, at the level of scutellum apex.

Legs thin and slender, 1st protarsomere slightly shorter than 2nd–4th combined, 1st meso- and metatarsomeres shorter than 2nd–4th combined respectively; 2nd–4th protarsomeres moniliform, each as long as wide, meso- and metatarsomeres cylindrical, each much longer than wide, except for 4th mesotarsomere which is as long as wide; 1st protarsomere distinctly dilated in ♂; mesotibia about half as long as elytra, metatibia longer than half of elytra; ventrites IV–VI bisetose in both sexes.

Male genitalia (Figs. 5–6): Median lobe of aedeagus very thin and elongated, strongly arcuate at about basal quarter, gently and gradually sinuate towards apex, straightly narrowed at apex; base wide, sagittal aileron large; inner sac armed with a thin and indistinct longitudinal copulatory piece; in dorsal view, apical lamella thin and quite long, nearly parallel-sided at subapical portion, rounded at apex; parameres quite elongated, left one slightly shorter than the right, both similar each other in form, each provided with 4 long setae at apex.

Etymology

The name of this new species indicates its pubescent body.

Distribution

Eastern Guizhou (Tongren). Known only from the type locality (Fig. 1).

Jiulong Dong is a large limestone cave, located at half way up Guanyin Shan (Fig. 11), in the National Scenery of Jiulong Dong. As the main part of the National Scenery, Jiulong Dong holds a lot of beautiful columns, shields, stalagmites, curtains and other calcite deposits. The main passage is huge, 2284 m long, 70 m wide and 30-210 m high. The beetles were collected under stones in a small branch along the underground river, where is not opened to tourists (Figs. 12–13). Other cave-dwelling animals found in the cave were crabs, bats, woodlices and millipedes.

***Qiandongaphaenops* n. subgen.**

Type species: *Qianaphaenops* (*Qiandongaphaenops*) *variabilis* n. sp.

Subgeneric diagnosis

Qiandongaphaenops n. subgen. shares the main generic characters with the nominate subgenus *Qianaphaenops (s. str.)*, viz. labial suture present, right

mandible tridentate, hind latero-marginal setae on pronotum and preapical setae on elytra present, 1st and 2nd partarsomeres of ♂ modified. It is discriminated from *Qianaphaenops (s. str.)* by its semi-anophthalmoid appearance, subpedunculate on base of pronotum, densely pubescent on whole body especially on elytra, and the peculiarities of elytral chaetotaxy, in which the basal pore distinctly moved backwards, and so far from scutellum, the 1st pore of the humeral group of the marginal umbilicate series moved onto 7th stria and located at the level a little behind 2nd pore.

Etymology

Qiandong + *aphaenops*, "Qiandong" means eastern Guizhou in Chinese, indicating the subgenus is distributed in eastern Guizhou Province; gender masculine.

Geographical range

Eastern Guizhou, known so far from two caves, one in Jiangkou County of Tongren City, the other in Cengong County of Qiandongnan Miao and Dong Autonomous Prefecture (Fig. 1).

Key to species of subgenus *Qiandongaphaenops*

1. Elytral chaetotaxy of the marginal umbilicate pores more or less equidistantly arranged in the humeral group, 8th pore close to marginal gutter, basal pore not backwardly moved, parameres of aedeagus shorter and stouter ……..... .....…….. *Q. (Qiandongaphaenops) pilosus* Uéno, 2000

- Elytral chaetotaxy of the marginal umbilicate pores not equidistantly arranged, 8th pore distant from marginal gutter, basal pore backwardly moved and distant from scutellum, parameres longer and more elongated ……..... .....…….....……*Q. (Qiandongaphaenops) variabilis* n. sp.

***Qianaphaenops* (*Qiandongaphaenops*) *variabilis* n. sp.**

Figs. 4, 7-10, 14-17.

Holotype: ♂, cave Wanfuchangcheng Dong, in Jiangjun Shan, Pingzhuang Xiang, Cengong County, Guizhou Province, 27°24'50.91"N, 108°35'43.0"E, 830 m, 2014-VI-29, leg. Mingyi Tian, Weixin Liu, Haomin Yin, Sunbin Huang and Xinhui Wang, deposited in South China Agricultural University, Guangzhou (SCAU); Paratypes:30 ♂♂ and 33 ♀♀, ibid., all in SCAU except 1 ♂ and 1 ♀ in IOZ, MNHN and ZUBM, respectively.

Length: 6.1–6.3 mm (4.8–5.1 mm for slender individuals), width: 1.5–1.9 mm (1.1 mm for slender individuals). Habitus as in Figs. 16–17.

Description

A small to medium sized trechine; the type series composed of individuals which are easily divided into two types of body forms: stouter and a little larger (23♂♂ and 27♀♀), and slenderer and smaller (7♂♂ and 6♀♀); surface covered with bristle hairs on head, pronotum and elytra, hairs on pronotum much longer, whole underside surface

pubescent except for head; shape semi-anophthalmoid but with semi-aphaenopsoid frontal furrows; body yellowish to reddish brown, palps and antennae pale, moderately shiny; microsculpture engraved meshes irregularly and moderately transverse on head, strongly transverse on pronotum and elytra.

Head subquadrate, longer than wide, HL/HW=1.2–1.4 for stout individuals (1.2–1.3 for slender individuals), widest at level just between anterior and posterior supraorbital pores, genae slightly convex, not parallel-sided, vertex and genae sparsely pubescent; neck wide and well marked; frontal furrows evidently arcuate, deeply impressed; two supraorbital pores present, at median portion of genae and near ending of frontal furrows respectively; frons and vertex moderately convex, clypeus quadrisetose; labrum more transverse than clypeus, straight at frontal margin, 6-setose; mandibles well developed, hardly hooked at apex, right mandible tridentate; labial suture indistinct, mentum and submentum incompletely fused, mentum with a pair of lateral setae and a pair of setae near base of mental tooth, mental tooth short and simple (but indistinctly bifid in three individuals), ligula bisetose at apex, submentum with a transverse row of 8 setae (but 9-setose in several individuals); palps slender, 3rd maxillary palp as long as 4th, both glabrous; 2nd labial palp distinctly longer than 3rd, bisetose on inner margin, with two or three additional hairs on outer subapex; a pair of suborbital pores present, at median portion of genae, far from base of head. Antennae moderately long, extending at about apical quarter of elytra, 1st antennomere as long as 2nd, distinctly shorter than 3rd which is slightly shorter than 4th; 5th and 6th longest, each nearly twice as long as 1st, then gradually shortened towards 11th which is slightly longer than 1st but shorter than 3rd.

Pronotum barrel-like, longer and wider than head, PL/HL=0.9–1.1 (0.8–1.3 for slender individuals), PW/HW=1.1–1.3 (1.2–1.3 for slender individuals); base slightly narrower than front, PWA/PWB=1.2–1.3 (1.1–1.3 for slender individuals), widest at about middle (or a little before middle in slender individuals), gently and evenly narrowed towards fore and hind angles, and suddenly and briefly sinuate just before the latter; lateral sides evenly bordered throughout, two latero-marginal pores present, at about basal fifth and on hind angles respectively, front and hind angles obtuse; front nearly straight, base briefly subpedunculate, basal margin straight, but sides obliquely rounded behind hind angles; hind transverse impression deep and well marked; disc moderately convex, covered with fairly long hairs. Propleura not tumid, invisible from above. Scutellum small.

Elytra elongated ovate, much longer than wide, EL/EW=1.6–1.8 (1.7–1.8 for slender individuals), and much wider than pronotum, EW/PW=1.9–2.0 (1.8–2.1 for slender individuals), much longer than head plus pronotum, EL/PL+HL=1.6–1.7 (1.5–1.6 for slender individuals) (excluding mandibles), or =1.2–1.3 (1.1–1.3 for slender individuals) (including mandibles); widest at a little behind middle, where sides slightly but distinctly expanded; shoulders well defined, angulately rounded, prehumeral borders obliquely and nearly straight; lateral sides narrowly bordered and distinctly ciliated, nearly straight behind shoulders, distinctly and gently arcuate behind middle, slightly emarginated before apex which is conjointly rounded; disc strongly convex, sides deeply declivous,

whole densely covered with short hairs; striae almost entire, moderately punctate; 1st stria ended at about apical fifth of elytra, 2–4th striae rather clear, 5–8th more or less obsolete but traceable; basal pores markedly moved backwards and very far from scutellum; two dorsal pores present on 3rd stria, at about fifth and 3/7 from base respectively; preapical pore located at the apical anastomosis of 3rd and 4th striae, about quarter of elytra from apex; marginal umbilicate pores not aggregated (Fig. 4), only 2nd pores close to marginal gutter; 1st pore of humeral group inwardly and backwardly moved onto 7th stria, at level a little behind 2nd pore, 3rd pore at a little behind level of anterior dorsal pore, 4th pore far from marginal gutter, locations of 1st, 2nd and 3rd pores nearly regular triangle, 3rd closer to 1st or 2nd than to 4th (but 4th pore closer to 3rd, making distance from which to 3rd slightly shorter than that from 3rd to 2nd in the slender individuals); 5th and 6th pores of middle group not far each other, 5th at level just behind widest point of elytra; 8th pore far from marginal gutter; scutellar striae absent;

Ventrites IV–VI each with a pair of paramedian setae, ventrite VII quadrisetose in ♀, and bisetose in ♂.

Legs rather short, pro- and mesotibiae nearly straight, protibia not externally grooved, metatibia thin and slightly curved, about 2/3 as long as elytra; protarsi 4/7 as long as protibia; in ♂, 1st and 2nd protarsomeres dilated and inwardly denticulate at apex, 1st longer than wide, 2nd slightly wider than long, 3rd and 4th moniliform; mesotarsi about 5/8 as long as mesotibia; metatarsi about 3/4 as long as metatibia; 1st tarsomere shorter than 2nd-4th combined in fore leg, but almost equal in middle and hind legs respectively.

Male genitalia (Figs. 7–10): Slender but elongated, or shorter and rather stouter, well sclerotized, strongly arcuate from basal quarter, almost parallel-sided in middle portion, apex slightly reflexed, distinctly or indistinctly, basal part small, so does basal orifice, slightly bisinuate ventrad, sagittal aileron large or small, rounded and protruding ventrad, inner sac armed with a thin and faint copulatory piece; in dorsal view, apical lamella broad, rounded at apex, not parallel-sided; parameres slender and long, both similar in size, broadly rounded at apex, each with three long setae at apex.

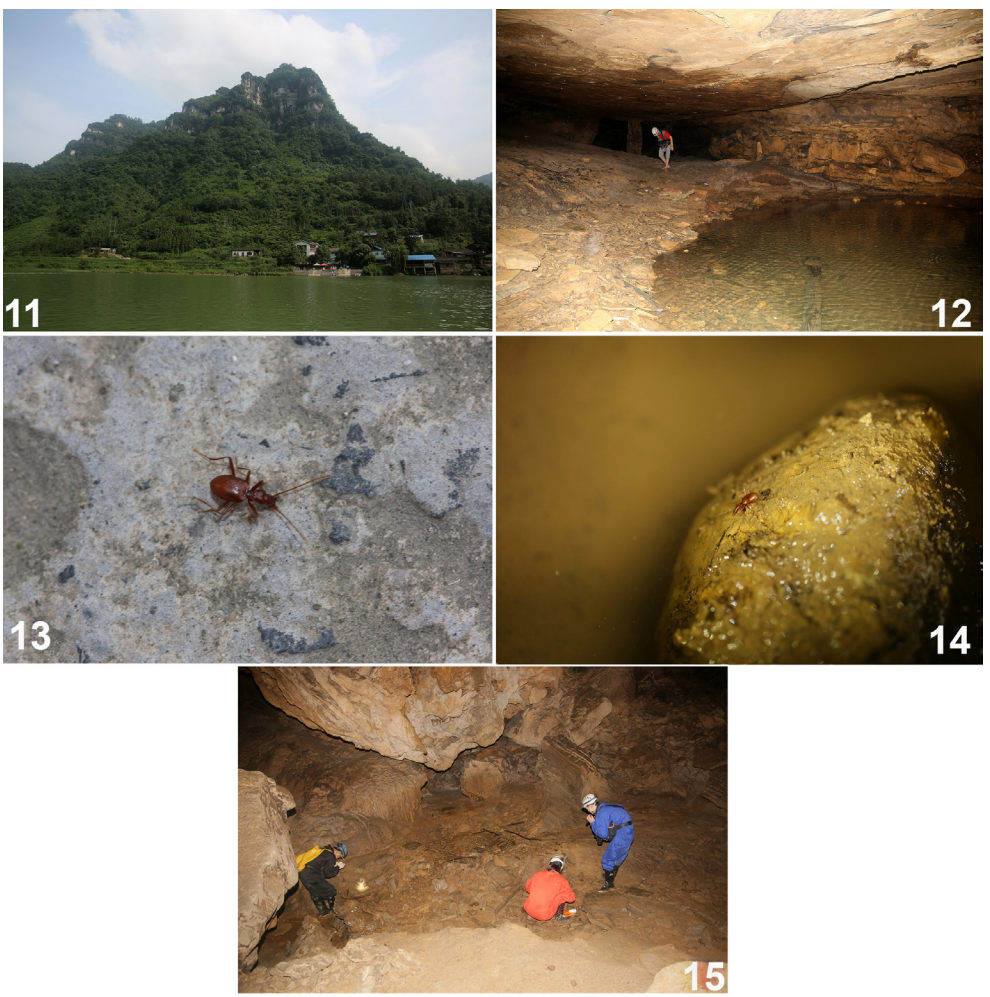
Remarks: *Qianaphaenops* (*Qiandongaphaenops*) *variabilis* n. sp. is similar to *Q. (Qiandongaphaenops) pilosus* Uéno, which was recorded from a limestone cave, about 20 km far from the cave Wanfuchangcheng Dong, but it is easily separated from the latter by: (1) its basal pore of elytra remarkably moved backwards and far from scutellum; (2) the humeral group of marginal umbilicate series not equidistantly ranged; (3) 8th pore of apical series distant from marginal gutter; and (4) aedeagus more elongated, less arcuate in middle part, and with thinner and longer parameres.

Variability: At the first sight, the type series of *Q.* (*Qiandongaphaenops*) *variabilis* n. sp. can be clearly divided into two groups in form: larger and stouter sized, and smaller and slenderer sized (Figs. 16–17). Furthermore, two types of aedeagus are matchable to the above groups: majority ♂ individuals of the former group have a longer and slenderer aedeagus which with a large sagittal aileron, while a smaller and stouter aedeagus which with a small sagittal aileron present in the latter group (Figs.

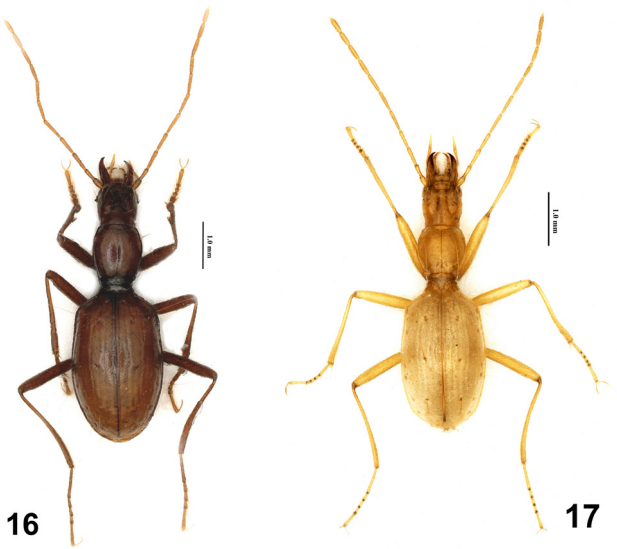
7–10). However, 2 ♂♂ individuals of the former group have rather small and stout aedeagus which is similar to that belonging to the latter group. Hence, we presently treat the above differences as variability: all the individuals in the type series are members of the same species.

Etymology

The name of this new species refers to its variability occurring not only in morphology, but also in ♂ genital structure.



Figs. 11–15. Caves of Jiulong Dong and Wanfuchangcheng Dong (11. Mt. Guanying Shan, where cave Jiulong Dong is located; 12. underground river in cave Jiulong Dong, showing the locality of *Jiulongotrechus pubescens* n. sp.; 13. an individual of *Jiulongotrechus pubescens* n. sp.; 14. an individual of *Q. (Q.) variabilis* n. sp.; 15. main passage of cave Wanfuchangcheng Dong, showing the locality of *Qianaphaenops (Qiandongaphaenops) variabilis* n. sp.)



Figs. 16–17 Habitus of *Qianaphaenops (Qiandongaphaenops) variabilis* n. sp. (16. stout body form, ♂, holotype; 17. slender body form, ♂)

Distribution

Eastern Guizhou (Cengong). Known only from the type locality (Fig. 1).

The cave Wanfuchangcheng Dong opens on half way up Mt. Jiangjun Shan in Pingzhuang, northwestern Cengong County. Its entrance is completely concealed by dense brushes and the gate is locked by local people. The length of the cave is unknown. The main passage is gently and obliquely downwards, with a few quite large halls and a small stream inside. Because of muddy and moist, the cave is good for cave animals (Fig. 15). Apart from the trechine beetles (Fig. 14), a number of millipedes were also found in this cave.

DISCUSSIONS

So far, three genera of cave-dwelling trechines have been reported from eastern and northeastern Guizhou Province: *Qianotrechus* Uéno, 2000, *Qianaphaenops* Uéno, 2000 and *Shenaphaenops* Uéno, 1999 (Uéno, 1999a,b, 2000). But all of them are not related to *Jiulongotrechus* n. gen. Instead, *Jiulongotrechus* may be allied to *Yunotrechus* Tian and Huang, 2014 (Tian and Huang, 2014) from southern Yunnan Province, and *Superbotrechus* Deuve and Tian, 2009 from western Hubei Province by sharing similar chaetotaxy on elytra, esp. both pores of the middle group of umbilicate marginal series are widely spaced, and labial suture completely disappeared. But *Jiulongotrechus* n. gen. is easily distinguished from the latter two genera by its pubescent body, narrow and nearly parallel-sided head, slenderer appendages, and bidentate right mandible. In addition, it differs from *Superbotrechus* also by stouter,

more convex and smaller sized body, only 1st protarsomere dilated in ♂ (1st and 2nd protarsomeres dilated in *Superbotrechus*), and median lobe of aedeagus much slenderer, with present of sagittal aileron (while stouter, without sagittal aileron in *Superbotrechus*). *Jiulongotrechus* differs from *Yunotrechus* also by 1st protarsomere dilated in ♂ (not modified in *Yunotrechus*), thin and much elongated mandibles (stout in *Yunotrechus*), nearly parallel-sided frontal furrows in middle portion (not parallel-sided in *Yunotrechus*), and much slenderer aedeagus (stouter in *Yunotrechus*).

Apart from *Qianaphaenops (Qiandongaphaenops) variabilis* n. sp., *Q. pilosus* Uéno, 2000 which was known from a limestone cave in southern Jiangkou County, not so far from the type locality of the new species, must be fallen into this subgenus according to the author's detailed description though several important characters shown in the habitus were not consistent to the description, e.g. the positions of basal pore, 1st pore in the humeral group of the marginal umbilicate series, and of the preapical dorsal pore.

When Uéno (2000) dealt with *Qianaphaenops pilosus*, he thought the peculiarities of this species must be an exceptional variability which often happened in some groups of Chinese cavernicolous trechines. But the new species discovered in Cengong County revealed that the peculiarities are stable morphological characters rather than variability. Considering *Qiandongaphaenops* shares the main generic characters of the genus *Qianaphaenops*, we presently prefer to treat it as a subgenus of the later.

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