

## Notes on *Guizhaphaenops* (Coleoptera, Trechinae), with Descriptions of Two New Species

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**Abstract** The trechine genus *Guizhaphaenops* is reviewed on the basis of topotypical specimens of the type species, *G. zorzini* VIGNA TAGLIANTI, and two new congeners from limestone caves in northwestern Guizhou, South China, the latter of which are named *G. striatus* and *G. giganteus*. Exceptional variability of the component species is pointed out, and the original description is corrected to some extent.

The genus *Guizhaphaenops* was erected by VIGNA TAGLIANTI (1997, p. 34) for a semi-aphaenopsoid trechine beetle discovered in a limestone cave lying at the northwestern part of Guizhou, South China. Unfortunately, a female specimen in rather a worn condition was available for the original author at the time of description, and though his account was very careful and thorough, it still posed a problem concerning the systematic relationship of the type species to other aphaenopsoid and semi-aphaenopsoid trechine beetles from Chinese caves. He (p. 40) considered that “*Guizhaphaenops zorzini* would rather be a more specialized taxon of the same line of (and perhaps conge[ne]ric with) *Sinotrogodytes bedosae*,” but the latter species (DEUVE, 1996, p. 44, figs. 2, 5, 8) did not seem to me to be so close to the former even though sharing many character states with it. As was aptly commented by the original author himself (p. 41), it was apparent that a direct comparative study between the males of these taxa would be needed for clarifying the problem.

It was, however, not easy to obtain additional material of *G. zorzini*. In the first place, it was necessary to find out the exact location of the type cave, Anjia Yan. The cave was briefly described by ZORZIN and MELOTTI (1995, p. 24), but its exact location was not given in that account. Since the cave was little known to Chinese speleologists, I had to rely solely on the brief notes given by VIGNA TAGLIANTI (1997, p. 39): “The type locality, Anjia Yan Cave, whose name is from a nearby little village in the Shuicheng County (Guizhou, China), lies in the locality Show Ga, about 50 km north-westwards from Shuicheng, 2160 m above sea level.” However, there was no village called “Show Ga” to the northwest of Shuicheng, and to make the matter worse, the spelling “show” did not exist in Chinese. After making inquiries for many months, my friend, WANG Fuxing, finally realized that “Show Ga” must be “Shega” to the south-west of Shuicheng.

Thus, we made a trip to the Shuicheng area early in the autumn of 1998 and succeeded in obtaining a series of toptotypical specimens, including males, of *G. zorzini*. We were also able to find out the habitats of two other species of semi-aphaenopsoid trechines belonging to the same genus beyond doubt. To our utmost surprise, two of the three species thus obtained showed so incredibly wide range of individual variation, above all in the size and body form, that the two extremes looked like different species. However, the gap between them is perfectly bridged by gradations and besides, the male genitalia are identical with each other, which clearly shows that only one species of *Guizhaphaenops* occurs at one locality.

In the present paper, supplementary accounts will be given to the genus *Guizhaphaenops* and its type species, *G. zorzini*, and two new species of the same genus will be described under the names *G. striatus* and *G. giganteus*. The abbreviations used herein are the same as those explained in previous papers of mine.

Before going into further details, I wish to express my hearty thanks to Drs. Yoshiaki NISHIKAWA, WANG Fuxing and Toshio KISHIMOTO for their collaboration in field works, and to Mr. FAN Ting and the authorities of Liupanshui Shi for their kind arrangement and support of our investigations of the cave fauna. My deep appreciation is also due to Professor Augusto VIGNA TAGLIANTI, who helped my investigation by obtaining a copy of the map of Anjia Yan Cave surveyed by the Italian expedition "China Caves '94."

#### Genus *Guizhaphaenops* VIGNA TAGLIANTI, 1997

*Guizhaphaenops* VIGNA TAGLIANTI, 1997, Int. J. Speleol., **25** [for 1996], p. 34; type species: *Guizhaphaenops zorzini* VIGNA TAGLIANTI, 1997.

This genus was so carefully described by the original author that any full re-description does not seem necessary. However, because of incredibly high variability shown by its members, both interspecific and infraspecific, some amendments of the original account are needed for fulfilling taxonomic requirement. It is also needed to introduce male characters into science, which are indispensable for phylogenetic analysis. They are enumerated below, and the features of particular importance are indicated by bold-faced numerals.

1) Medium- to large-sized trechines of semi-aphaenopsoid facies with long appendages, often attaining to a gigantic size.

2) Body mostly glabrous on dorsum, though always covered with minute pubescence in the lateral areas of elytra, particularly at the humeral parts.

3) Head elongate, usually somewhat shorter than prothorax though exceptionally a little longer than the latter.

4) Posterior pair of supraorbital setae either present (*G. giganteus*) or absent (*G. zorzini* and *G. striatus*).

5) Submentum provided with a transverse row of 8–10 (usually 9) setae.

6) Maxillary palpus usually with half a dozen short hairs at the apical part of

penultimate segment (always more than three).

7) Antennae variable in length, usually longer in ♂ than in ♀, rarely reaching the apices of elytra in the former and rarely reaching only the middle of elytra in the latter.

8) Pronotum individually variable in configuration, though usually longer than wide and with regularly arcuate sides.

9) Posterior pair of marginal setae on pronotum almost always absent, though a short postangular seta rarely exists on one side in a few exceptional individuals.

10) Pronotal front angles either obtusely rounded or produced forwards as small angles, hind angles either completely rounded or marked as obtuse angles due to shallow emargination on each side of basal margin.

11) Elytra large and ovate, considerably variable in shape, sometimes very broad in basal parts with square shoulders and nearly transverse bases, particularly in large males.

12) Elytral striation variable, either almost entire (*G. striatus* and *G. giganteus*) or nearly obsolete at the sides and before apices (*G. zorzini*).

13) In ♂, only segment I of each protarsus weakly dilated, minutely denticulate at the apico-internal corner, and furnished beneath with adhesive appendages.

14) Male genital organ small and more or less lightly sclerotized, usually a little larger in proportion to the size of hind body in small individuals than in large ones. Aedeagus slender and more or less arcuate, particularly in basal half, with short apical lobe and large sagittal aileron; inner sac armed with an elongate copulatory piece just inside apical orifice, which is anisotopic, spatulate and partially covered with minute scales and spinules; no differentiated teeth-patches. Styles variable; left style larger than the right and devoid of ventral apophysis; apical setae variable in number from four to six, sometimes bearing a short extra seta on dorsal margin.

*Range.* The members of *Guizhaphaenops* in a strict sense have so far been known from only three limestone caves in Liupanshui Shi at the northwestern part of Guizhou, South China. However, DEUVE (2000, pp. 156–157) gave five new names to the species discovered from limestone caves in northeastern Yunnan, which were discriminated from *G. zorzini* in a new subgenus, *Semiaphaenops* (DEUVE, 2000, p. 153). Besides, a series of new *Guizhaphaenops*-like trechines recently discovered by myself in northeastern Guizhou may be classified at least into another new subgenus. It is therefore probable that *Guizhaphaenops* in a broad sense may be widely distributed in the subterranean domain of the Yungui Highlands which abound in limestone caves.

*Notes.* As was already pointed out, the range of variation shown by the members of this genus is quite extraordinary for trechine beetles. The size variation alone is almost incredibly wide, and it is accompanied with modification of facies, particularly of configuration of the elytra. The modification is above all pronounced in *G. zorzini*, whose largest individuals are more than a quarter as large again as the smallest ones and have the elytra much ampler and squarer at the basal parts than in the latter. In the trechine taxonomy, such a difference is almost always regarded as that of specific im-

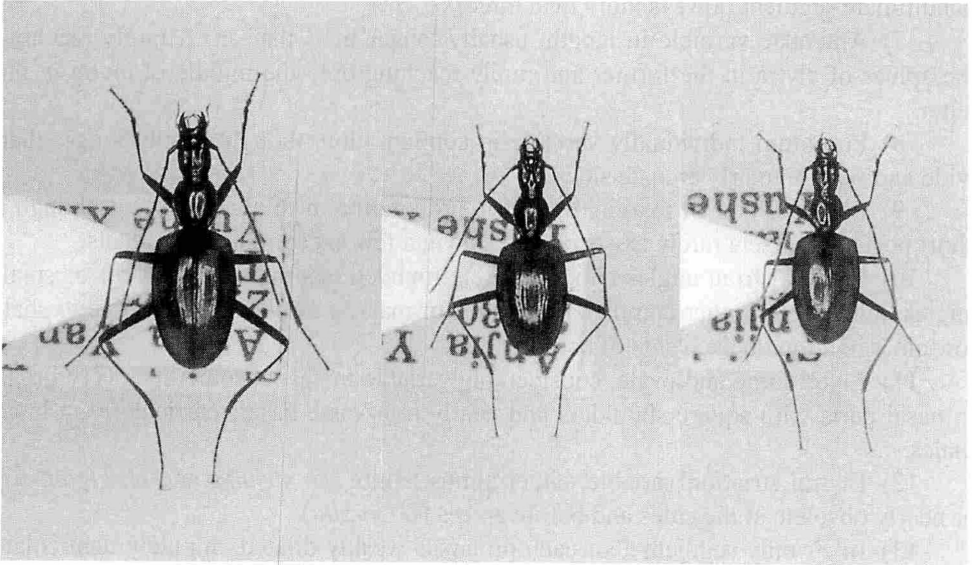


Fig. 1. Individual variation of *Guizhaphaenops* (s. str.) *zorzini* VIGNA TAGLIANTI, from Anjia Yan Cave. From left to right: largest, average-sized and smallest specimens examined, on the same scale. (Photo M. OWADA.)

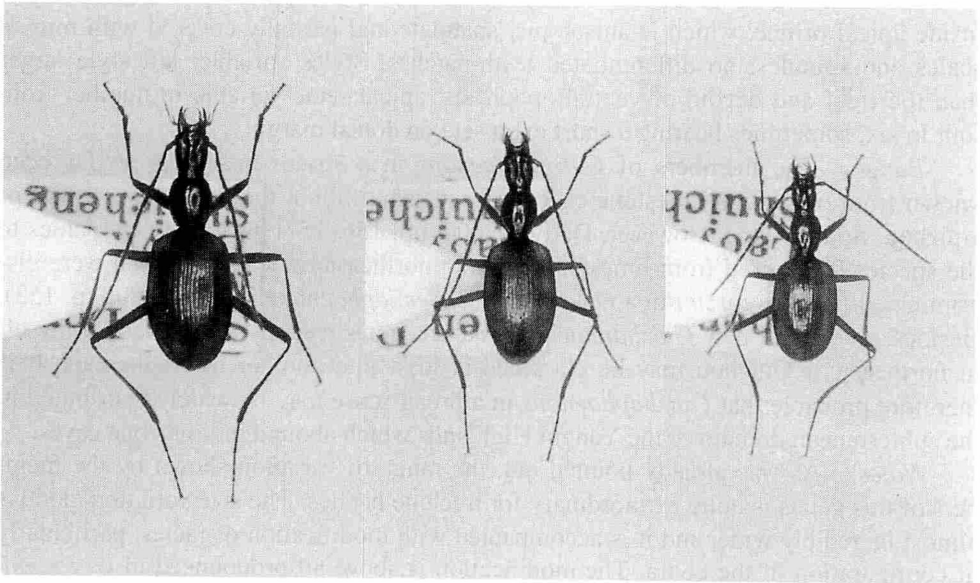


Fig. 2. Individual variation of *Guizhaphaenops* (s. str.) *giganteus* S. UENO, sp. nov., from Shen Dong Cave. From left to right: largest, average-sized and smallest specimens examined, on the same scale. (Photo M. OWADA.)

portance, if there were no gradations bridging the gap. Extraordinary variation of the same type is also found in the genus *Cathaiaphaenops* DEUVE (1996, pp. 42, 47; cf. UÉNO, 2000, pp. 265, 266).

Recently, a new subgenus of *Guizhaphaenops* was erected by DEUVE (2000, p. 153) under the name *Semiaphaenops* for the trechines discovered from three limestone caves in northeastern Yunnan. I have not seen any species of this subgenus as yet, but the detailed description given by the original author seems to show that the Yunnanese species are subgenerically segregated from the Guizhou ones. However, two of the three character states pointed out by the original author as being subgeneric are included in the range of variation of *Guizhaphaenops* in a strict sense, that is, “l’absence de la paire de soies basales du pronotum” and “la persistance de la deuxième paire de soies frontales.” Thus, only the third point, “la présence de la soie préapicale sur les élytres,” remains valid for the peculiarity of *Semiaphaenops*. On the other hand, I can not help feeling uneasy about the systematic status of *G. baiyinensis* DEUVE (p. 156) and *G. zhengxionensis* DEUVE (p. 157). Judging from the extraordinary variability of the Guizhou species of *Guizhaphaenops*, all their peculiarities pointed out by the French author seem to be included in the ranges of individual variation of *G. lipsorum* DEUVE and *G. daheiensis* DEUVE (p. 156), respectively. As DEUVE himself commented (p. 156), further investigations for obtaining longer series of specimens are needed for clearing up all these points.

#### Key to the Species of *Guizhaphaenops* (s. str.)

- 1 (4) Posterior pair of supraorbital setae absent.
- 2 (3) Elytral striae superficial, usually obsolete in the humeral, lateral and apical areas; aedeagus shorter and gently arcuate, distinctly enlarged towards apical orifice, with larger basal part; length 7.10–9.00 mm including mandibles; Anjia Yan Cave . . . . . *G. zorzini* VIGNA TAGLIANTI, 1997.
- 3 (2) Elytral striae entire, clearly impressed and distinctly crenulate; aedeagus longer and more strongly arcuate, only slightly enlarged towards apical orifice, with smaller basal part; length 6.75–7.95 mm including mandibles; Duolin Dong Cave . . . . . *G. striatus* S. UÉNO, sp. nov.
- 4 (1) Posterior pair of supraorbital setae present; elytral striae almost entire though becoming shallower at the side and near the apex; length 6.90–9.35 mm including mandibles; Shen Dong Cave . . . . . *G. giganteus* S. UÉNO, sp. nov.

#### *Guizhaphaenops* (s. str.) *zorzini* VIGNA TAGLIANTI, 1997

(Figs. 1, 3–5)

*Guizhaphaenops zorzini* VIGNA TAGLIANTI, 1997, Int. J. Speleol., **25** [for 1996], p. 37, figs. 1–5; type locality: Anjia Yan Cave [at] Shega [originally “Show Ga”].

Length: 6.40–8.10 mm (from apical margin of clypeus to apices of elytra; mean

7.07 mm); 7.10–9.00 mm (including mandibles; mean 7.83 mm).

Unusually variable species of medium to large size. The holotype is an exceptionally small female measuring only 6.12 mm from the apical margin of clypeus to the apices of elytra and is smaller than any of the specimens examined in the present study, though identical in all the other respects with small females in the new series.

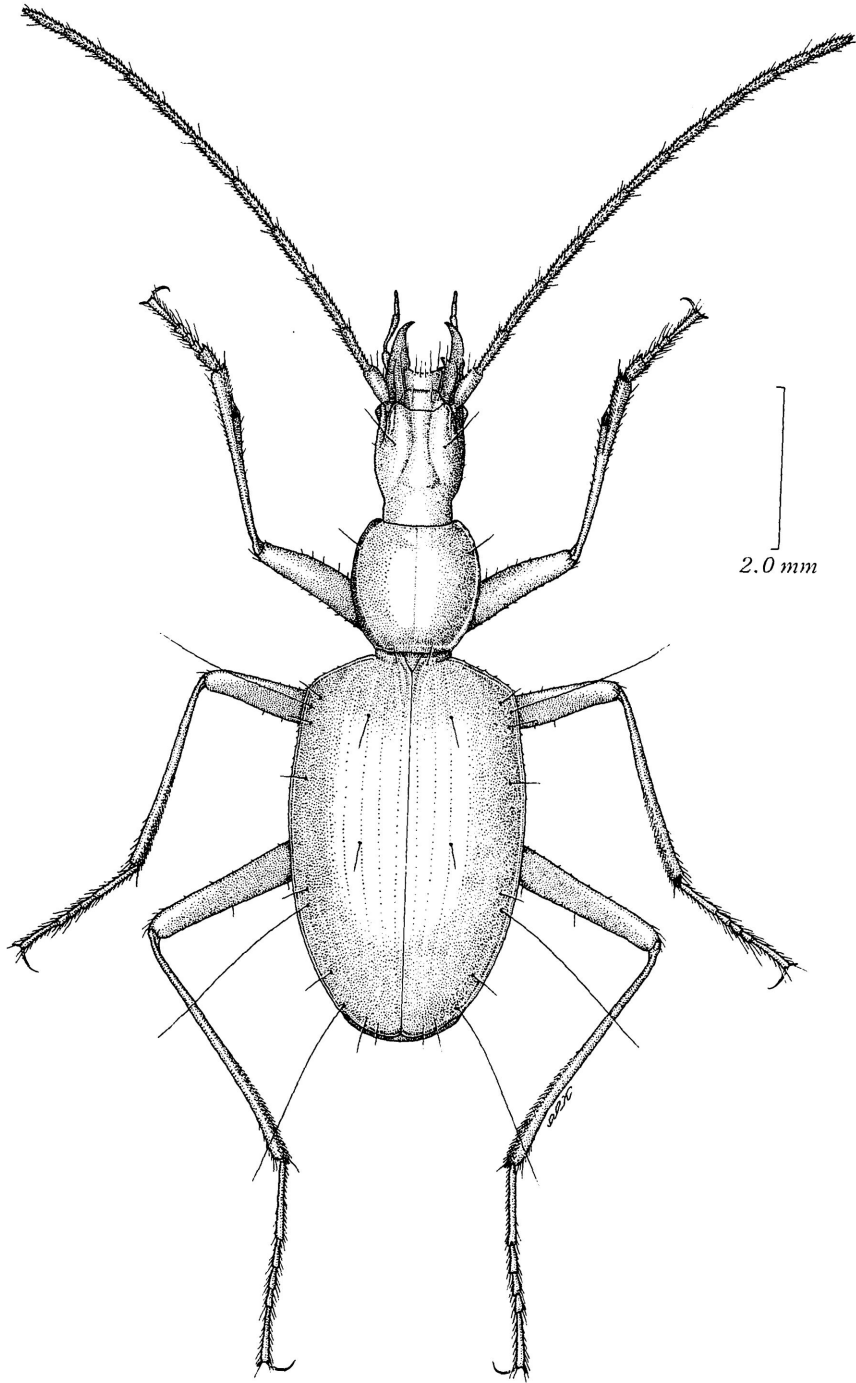
Body relatively wide, with rather short prothorax and rather long head. Colour reddish brown to dark reddish brown, translucent and shiny, sometimes with a little lighter elytra; palpi, venter of hind body, and tarsi somewhat lighter than the other parts in several individuals.

Head relatively long on an average, evidently longer than wide and about as long as prothorax though variable in proportion, HL/HW 1.28–1.44 (M 1.36), HL/PL 0.96–1.10 (M 1.02); genae either subparallel in anterior two-thirds or slightly convergent posteriad, feebly convex in posterior parts and narrowed towards distinct neck constriction, with short sparse pubescence; frontal furrows deep, feebly arcuate and posteriorly obsolete; posterior pair of supraorbital setae absent; microsculpture distinct, mostly consisting of minute polygonal meshes. Antennae long, usually reaching apical fifth of elytra and rarely reaching elytral apices in ♂, reaching apical four-ninths to one-sixth (usually apical fourth) of elytra in ♀.

Pronotum relatively short, obviously wider than head and about as wide as long, widest at a level between five-ninths and three-fifths from base, and more or less strongly rounded at the sides; PW/HW 1.26–1.37 (M 1.32), PW/PL 0.94–1.03 (M 0.99), PW/PA 1.57–1.69 (M 1.64), PW/PB ca. 1.64–1.76 (M ca. 1.70); sides narrowly bordered, the borders gradually widened posteriad in basal third, strongly arcuate from apex to base without ante-basal sinuation in most specimens examined though a little less strongly so behind middle; in a female specimen with relatively narrow prothorax (PW/PL 0.94 against 0.96–1.03 in the others), the side margins are rather gently arcuate even in front and only feebly so in basal third; only the anterior pair of marginal setae present just before apical fifth in most individuals, but in two (1 ♂, 1 ♀) of the ten specimens examined, a small postangular seta less than one-fifth the length of the anterior one exists only on the left side at about one-thirteenth from base; apex either straight or slightly emarginate, usually somewhat wider than base though rarely as wide as the latter, PB/PA ca. 0.90–1.01 (M ca. 0.96); front angles more or less obtuse, usually a little produced forwards but sometimes rounded off; base either straight or slightly emarginate, roundly oblique on each side in most specimens examined, obliquely emarginate on each side in a few specimens; hind angles usually rounded off but sometimes forming very obtuse but distinct angles due to the lateral emarginations of basal margin; dorsum convex and completely glabrous, with fine but distinct median line; apical transverse impression either vague or fairly apparent and continuous to marginal gutters; basal transverse impression superficial and mal-defined; basal foveae

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Fig. 3. *Guizhaphaenops* (s. str.) *zorzini* VIGNA TAGLIANTI, largest ♂ examined, from Anjia Yan Cave at Shega in northwestern Guizhou.



small and shallow, anteriorly extending; microsculpture formed by irregularly transverse lines largely forming wide meshes. Propleura not visible from above.

Elytra ovate though variable in shape, much wider than prothorax, widest at a level between basal two-fifths and the middle, broader and squarer at the basal parts in large individuals than in small ones; EW/PW 1.85–1.99 (M 1.92), EL/PL 2.82–3.06 (M 2.94), EL/EW 1.51–1.60 (M 1.55); shoulders more or less distinct, often very obtuse and rounded but nearly square in large individuals, with prehumeral borders straight and moderately oblique in smaller individuals but much less oblique in larger ones; sides feebly arcuate from behind shoulders to near apices in many specimens examined, but in large individuals, the sides are nearly straight and only slightly convergent anteriorly before basal third, moderately bordered throughout, serrulate and ciliated particularly at the humeral parts; preapical emargination slight, often not appreciable; apices rather narrowly and almost conjointly rounded; dorsum moderately convex, steeply declivous at the sides and with obliquely flattened basal area; lateral areas sparsely covered with very minute and erect pubescence, which is particularly conspicuous in the humeral areas of large individuals; microsculpture distinct, consisting of irregular transverse lines; striae superficial, finely punctate, usually more complete in smaller individuals than in larger ones, sometimes almost entire in the former though usually obsolete in the humeral, lateral and apical areas, stria 8 not deepened in apical part; scutellar striole rudimentary; apical striole also rudimentary, sometimes perceptible as a trace but sometimes completely evanescent; stria 3 with two setiferous dorsal pores at  $1/8$ – $1/6$  (usually  $1/7$ ) and  $3/8$ – $1/2$  from base, respectively, the anterior one lying at a level between the second and third pores of the marginal umbilicate series; preapical pore always absent; marginal umbilicate pores as described in the original description.

Ventral surface and legs as described in the original description; anal sternite bisetose in ♂. Legs long; metatibia about two-thirds as long as elytra, outwardly arcuate in apical part; mesotarsus about two-thirds as long as metatibia, metatarsus about three-fourths as long as metatibia; tarsomere 1 obviously longer than tarsomeres 2–4 combined in both meso- and metatarsi.

Male genital organ very small and very lightly sclerotized. Aedeagus proportionally larger in small individuals than in large ones, about one-fifth as long as elytra in the former, only two-elevenths as long as elytra in the latter, elongate, gently arcuate before apical third, gradually enlarged towards apical orifice from behind basal third, and strongly curved ventrad at the basal part, which is not large but proximally enlarged and bears a large protrudent sagittal aileron; basal orifice small, with the sides not emarginate; apical lobe short, scalene subtriangular inclined to the left and with blunt extremity in dorsal view, slightly reflexed and blunt at the extremity in lateral view; ventral margin widely but shallowly emarginate though feebly convex before apical lobe in profile. Copulatory piece nearly one-third as long as aedeagus, rounded at the apex in dorsal view but seemingly tapered to pointed apex in lateral view, and largely covered with minute scales and short spinules from before middle. Styles short



and broad, with broad apical parts, each bearing four to six apical setae.

*Specimens examined.* 6 ♂♂, 4 ♀♀, 17–IX–1998, S. UÉNO & Y. NISHIKAWA leg. Deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

*Type locality.* Limestone cave called Anjia Yan, 2,030 m in altitude, at Tianfa Cun of Shega in Yushe Xiang of Shuicheng Xian, Liupanshui Shi, northwestern Guizhou, South China.

*Notes.* In general appearance, this species is different from the other two known species of *Guizhaphaenops* in a strict sense, and looks similar to certain *Cathaiaphaenops* from southwestern Hubei. Trend of individual variation is also the same between them. This may suggest a relationship of *Guizhaphaenops* to *Cathaiaphaenops*, though the two genera are decisively different in many morphological details, above all in the conformation of buccal appendages, the pubescence of the elytra, and the arrangement of marginal umbilicate pores.

Anjia Yan Cave, the type locality of this remarkable species, lies on the left side of a branch valley above Shega, and is open under a large cliff of limestone. In many places of South China, the word “yan” (primarily meaning a rock) is synonymously used with “dong” (a cave), since many large rocks contain caves. Therefore, the name Anjia Yan means the cave of the An family. It is a fossilized cave of debouchure, and the large entrance room has been formed by collapse of the ceiling. A huge pile of rocks can be passed through a maze of narrow spaces to the lower end of a shallow groove about 80 m removed from the entrance. This is the stream course in former times and probably also in rainy seasons, intermittently continuing for about 150 m to near the innermost of the cave. The first section of the groove, less than 30 m in length, is gravelly and wet, containing a small amount of rotten boards and bamboo sticks abandoned by local people. *Guizhaphaenops zorzini* occurred only in this part of the cave; all the specimens collected were found running about among gravel or hiding themselves under stones or decayed boards.

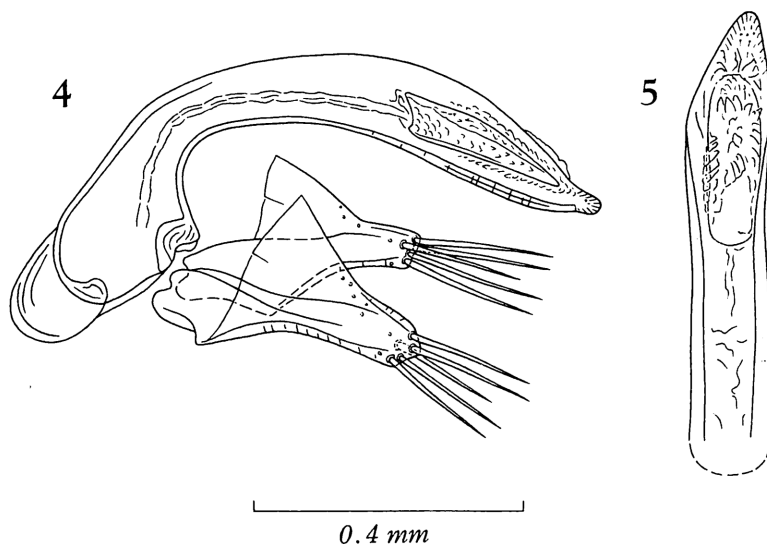
***Guizhaphaenops* (s. str.) *striatus* S. UÉNO, sp. nov.**

(Figs. 6–7, 10)

Length: 6.10–7.20 mm (from apical margin of clypeus to apices of elytra; mean 6.72 mm); 6.75–7.95 mm (including mandibles; mean 7.40 mm).

Similar in many respects to small individuals of *G. zorzini*, but distinguished at first sight from the latter by the deeper entire striae on elytra.

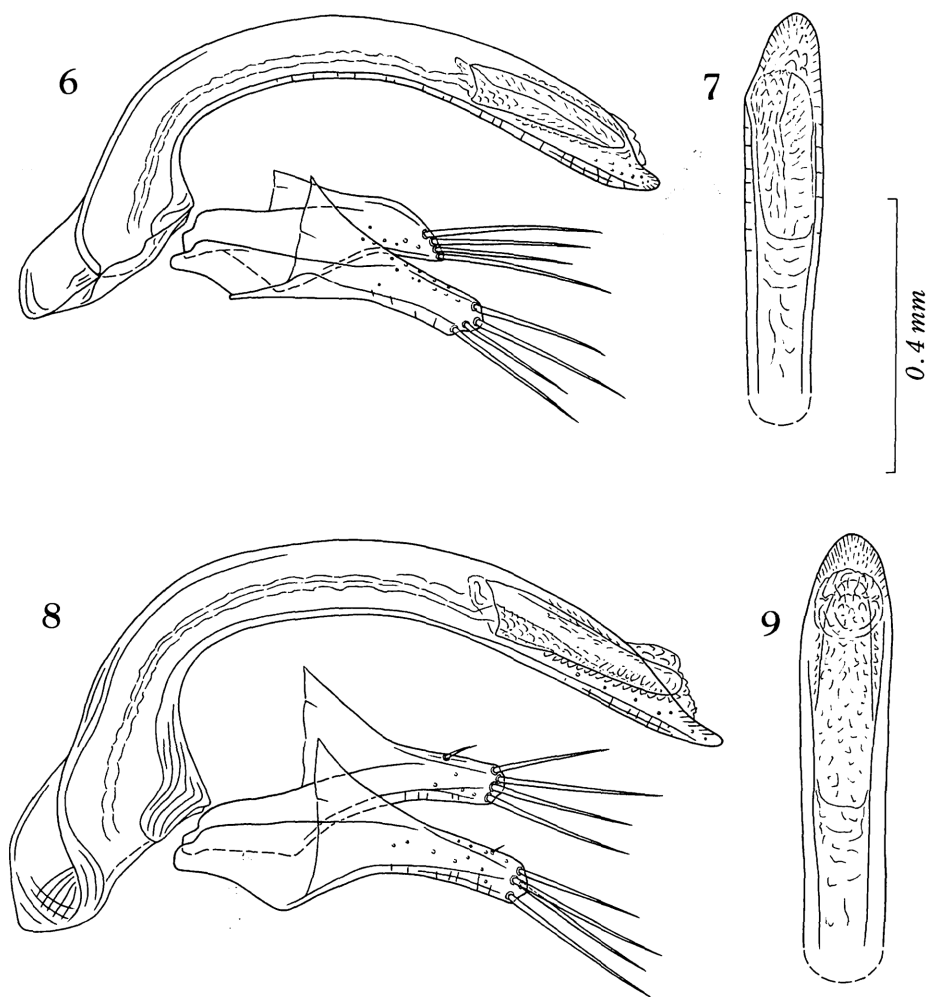
Body relatively elongate due to narrower hind body, with rather small head; colour as in *G. zorzini*. Head a little smaller on an average than in *G. zorzini*, HL/HW 1.22–1.34 (M 1.28), HL/PL 0.90–0.93 (M 0.92); posterior pair of supraorbital setae absent. Antennae reaching apical fourth to fifth of elytra in ♂, apical third of elytra in ♀; scape short though thickest of all the antennomeres, about as long as segment 10 and about four-fifths as long as pedicel, which is about three-fourths as long as seg-



Figs. 4–5. Male genitalia of *Guizhaphaenops* (s. str.) *zorzini* VIGNA TAGLIANTI, from Anjia Yan Cave at Shega; left lateral view (4), and apical part of aedeagus, dorso-apical view (5).

ment 3, 4 or 5; segments 6–10 gradually decreasing in length, segment 8 about as long as pedicel; segment 5 about 5.5 times as long as wide, segment 7 about 5 times as long as wide; terminal segment short, slightly shorter than pedicel and only slightly longer than scape. Pronotum as in *G. zorzini*, though slightly narrower at the apex on an average and a little less rounded at the sides than in the latter; PW/HW 1.29–1.43 (M 1.38), PW/PL 0.96–1.01 (M 0.98), PW/PA 1.62–1.75 (M 1.71), PW/PB ca. 1.65–1.79 (M ca. 1.71), PB/PA ca. 0.97–1.04 (M ca. 1.00); front angles variable as in *G. zorzini*; hind angles usually marked though very obtuse; postangular pair of marginal setae usually absent, but one of the female paratypes bears a postangular seta on the left side.

Elytra elongated ovate, much wider than prothorax, widest at about middle, and a little more gradually narrowed towards bases than towards apices; EW/PW 1.77–1.85 (M 1.81), EL/PL 2.83–2.90 (M 2.86), EL/EW 1.58–1.65 (M 1.61); shoulders distinct though rounded, with prehumeral borders oblique and nearly straight; sides narrowly bordered throughout, feebly arcuate from shoulders to slight preapical emargination, serrulate and ciliated particularly at the humeral parts; apices narrowly and almost conjointly rounded; dorsum as in *G. zorzini* with the exception of striae, which are entire, much deeper and more distinctly crenulate than in the latter species, even stria 7 clearly impressed throughout, and stria 8 moderately deepened behind the middle set of marginal umbilicate pores; scutellar striole short but distinct; apical striole vaguely impressed though sometimes rudimentary, directed to stria 5 if perceptible; stria 3 with two setiferous dorsal pores at 1/7–1/6 and 2/5–1/2 from base, respectively; preapical



Figs. 6-9. Male genitalia of *Guizhaphaenops* (s. str.) spp.; left lateral view (6, 8), and apical part of aedeagus, dorso-apical view (7, 9). — 6-7. *G. striatus* S. UENO, sp. nov., from Duolin Dong Cave at Maolin Cun. — 8-9. *G. giganteus* S. UENO, sp. nov., from Shen Dong Cave at Muqiao Cun.

pore always absent. Ventral surface and legs as in *G. zorzini*, though the first segments of meso- and metatarsi are a little shorter, only a little longer than tarsomeres 2-4 combined in mesotarsus; metatibia about two-thirds as long as elytra, lightly arcuate outwards in apical part; metatarsus about three-fourths as long as metatibia.

Male genital organ small and very lightly sclerotized. Aedeagus long and slender, about three-tenths as long as elytra, moderately and regularly arcuate before apical two-fifths, and strongly curved ventrad at the basal part, which is small and bears a large protrudent sagittal aileron; apical lobe short, narrowly rounded at the extremity

in dorsal view, slightly reflexed and blunt at the extremity in lateral view; ventral margin widely emarginate to near apical lobe in profile. Copulatory piece as in *G. zorzini*. Styles more elongate, at the apical parts in particular, than in *G. zorzini*, each bearing four long setae at the apex.

*Type series.* Holotype: ♂, 18-IX-1998, S. UENO leg. Allotype: ♀, 18-IX-1998, T. KISHIMOTO leg. Paratypes: 1 ♂, 2 ♀♀, 18-IX-1998, Y. NISHIKAWA & T. KISHIMOTO leg. Deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

*Type locality.* Limestone cave called Duolin Dong, 1,200 m in altitude, at Duolinzhai of Maolin Cun in Luobie Xiang of Liuzhi, Liupanshui Shi, northwestern Guizhou, South China.

*Notes.* Of the three species of *Guizhaphaenops* dealt with in the present paper, only *G. striatus* has been known from medium-sized individuals alone. They are fairly uniform and do not exhibit such extraordinary individual variation as is observed in *G. zorzini* and *G. giganteus*. It is, however, probable that similar variation will be found also in the present species, if a sufficiently long series of specimens can be obtained by future investigations.

Duolin Dong Cave, the type locality of *G. striatus*, is developed in a hill about 98 km distant to the east-southeast from Anjia Yan Cave, that of *G. zorzini*. The entrance to this cave is rather small and not impressive, opening on the flank of the hill above a small paddy field at the back of a small village called Duolinzhai. The cave is developed on two different levels, and the main passage on the upper level is connected with the lower phreatic one by several vertical shafts. At the innermost of the main passage, a very steep slope crusted with flowstone leads down to an underground stream in the lower level passage. Three of the five known specimens of *G. striatus* were taken on the muddy banks of this stream, one from a crack of half-dried mud and the other two crawling on the wall just above the mud deposit. The remaining two specimens were found in the upper level passage, both crawling on a clayey floor just above a shaft leading to the underground stream. Anyway, terrestrial troglobiontic animals were by no means abundant in this cave, probably due to relatively dry, oligotrophic condition of the main passage on the upper level and much restricted habitats in the phreatic passages on the lower level.

***Guizhaphaenops* (s. str.) *giganteus* S. UENO, sp. nov.**

(Figs. 2, 8–9, 11)

Length: 6.40–8.50 mm (from apical margin of clypeus to apices of elytra; mean 7.43 mm); 6.90–9.35 mm (including mandibles; mean 8.17 mm).

Similar in many respects to *G. striatus*, but distinguished at first sight from that species and also from *G. zorzini* by the presence of the posterior pair of supraorbital setae. Besides, *G. giganteus* is much larger on an average than *G. striatus* and has narrower or more elongate prothorax. Individual variation is pronounced in body size,

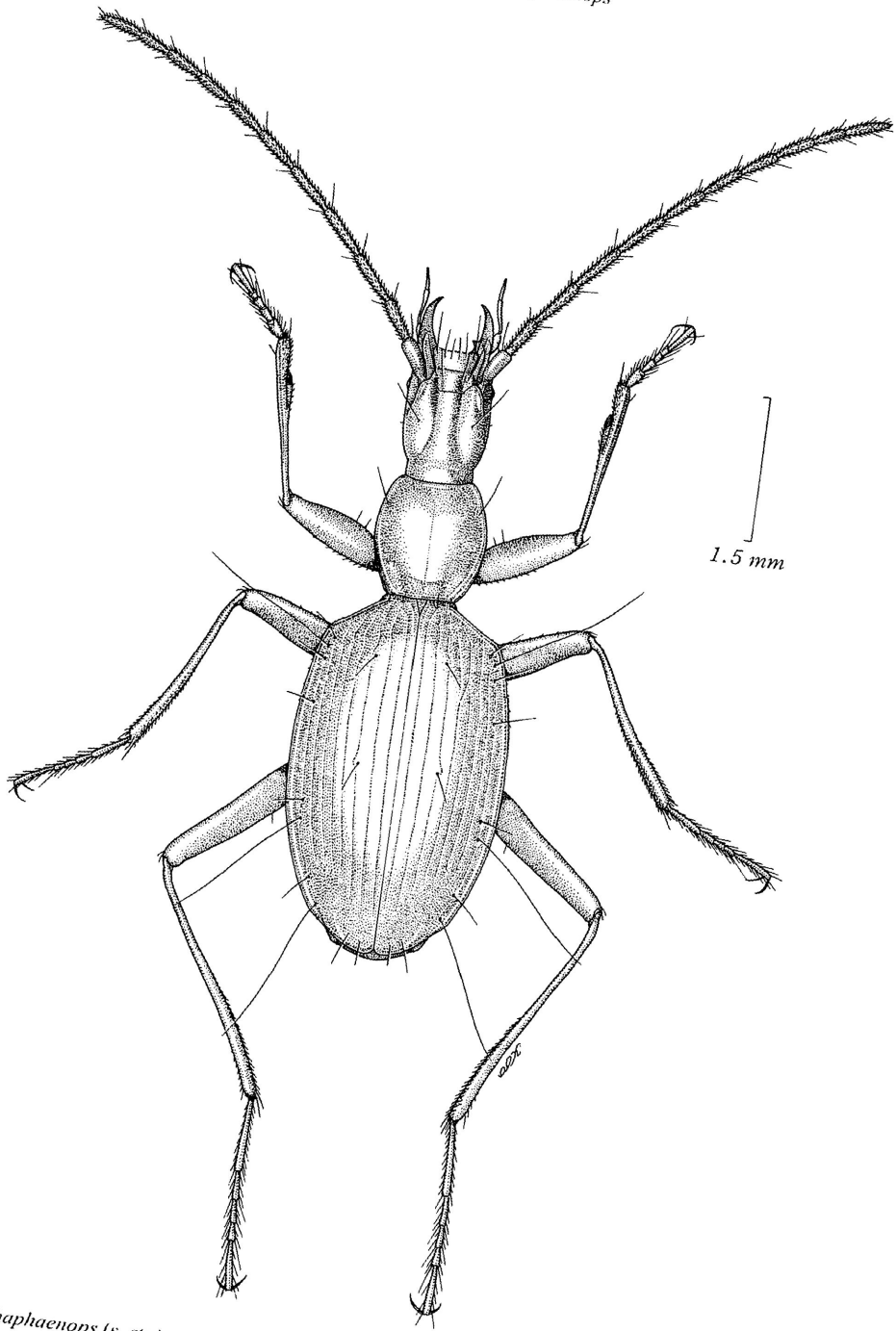


Fig. 10. *Guizhaphaenops* (s. str.) *striatus* S. UENO, sp. nov., ♂, from Duolin Dong Cave at Maolin Cun in northwestern Guizhou.

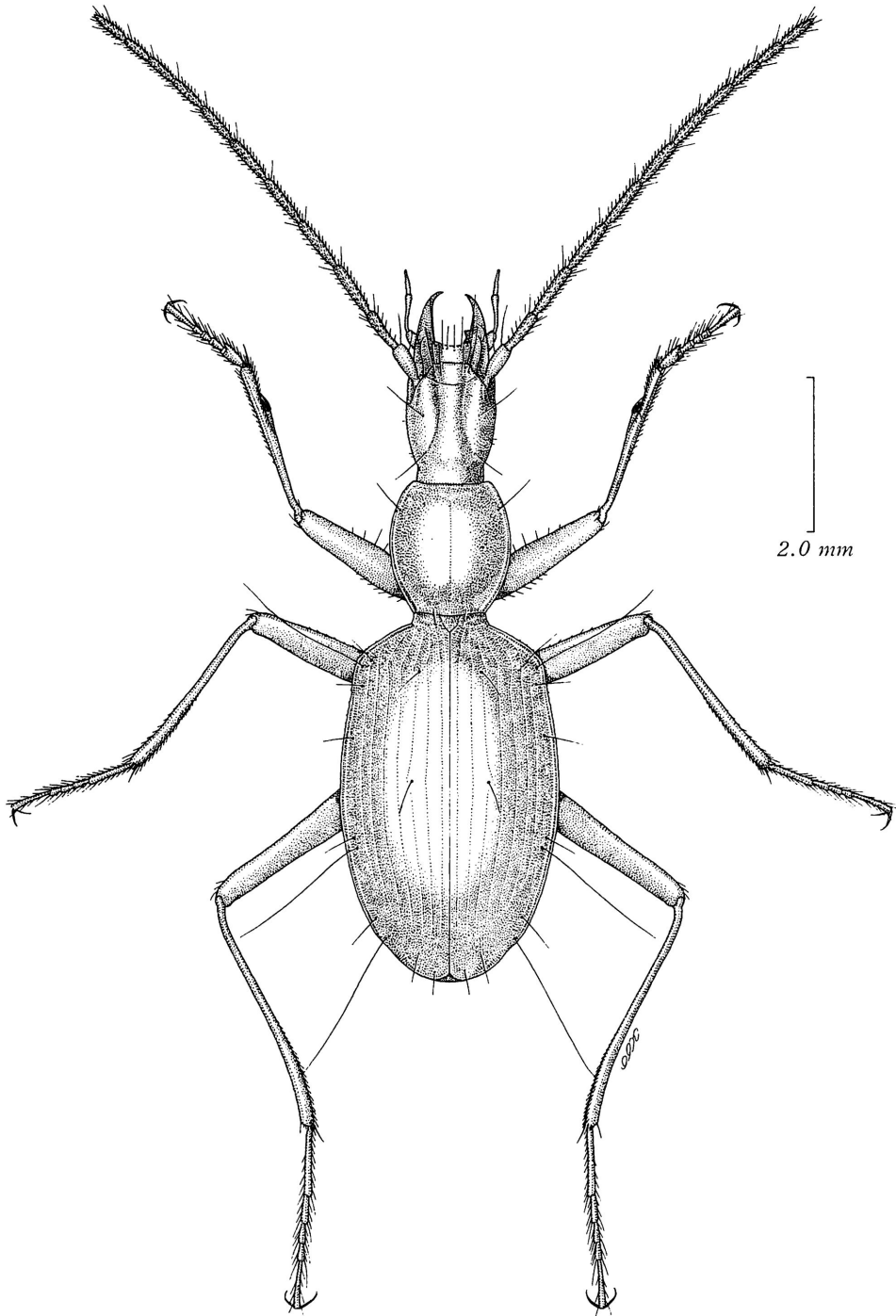
prothoracic configuration and antennal length, but is not so remarkable in the modification of elytral configuration as in *G. zorzini*.

Medium- to large-sized species of elongate facies with long appendages, often attaining to a gigantic size. Colour reddish brown to dark reddish brown, usually darker in large individuals than in small ones, shiny or dull shiny; palpi and venter of hind body sometimes lighter than dorsum, particularly in small individuals.

Head elongate, evidently longer than wide though usually a little shorter than prothorax, HL/HW 1.20–1.45 (M 1.33), HL/PL 0.84–1.00 (M 0.91), either subparallel-sided in anterior three-fifths and then narrowed posteriad towards neck constriction or widest at the level of anterior supraorbital pores and gradually narrowed posteriad from there; genae either feebly convex or rather flat, scattered with very short pubescence; neck constriction shallow but distinct, continuing onto both dorsum and venter; dorsum convex particularly at the posterior part, with two pair of supraorbital setae on lines convergent posteriorly; frontal furrows deeply impressed, feebly arcuate, and obsolete at posterior supraorbital pores; microsculpture fine though distinct, mostly consisting of minute polygonal meshes; mandibles slender, feebly arcuate except for sharply incurved apical portions, right mandible strongly bidentate. Antennae long though variable in length, even in single individuals (i.e., different in length between right and left), reaching apical two-fifths to one-seventh of elytra in ♂, reaching the middle to apical third (usually apical two-fifths) of elytra in ♀; scape a little shorter than pedicel and about as long as segment 9; pedicel about three-fourths as long as segment 3, 4 or 5, each of which is more than 5.5 times as long as wide; segments 6–10 gradually decreasing in length, segment 10 the shortest of all the antennomeres, segment 7 about 4.5 times as long as wide; terminal segment short, about as long as pedicel or segment 7 and only a little longer but obviously narrower than scape.

Pronotum barrel-shaped, evidently wider than head, more or less longer than wide, widest at a level between four-ninths and three-fourths (usually at about five-ninths) from base, and almost equally narrowed in front and behind; PW/HW 1.25–1.38 (M 1.31), PW/PL 0.84–0.97 (M 0.90), PW/PA 1.51–1.83 (M 1.71), PW/PB ca. 1.60–1.97 (M ca. 1.74); sides narrowly bordered in front, the borders gradually widened posteriad in basal third and usually reflexed at hind angles, moderately arcuate in front and a little more feebly so behind in the majority of the specimens examined, but more strongly arcuate in the specimens with relatively broad prothorax; only the anterior pair of marginal setae present just before apical fifth, the posterior pair always absent; in a female paratype, an extra marginal seta present on the left side just in front of the ordinary anterior seta; apex either straight or slightly emarginate, usually about as wide as base though variable to some extent in proportion, PB/PA ca. 0.86–1.12 (M 0.98); front angles variable though always obtuse, usually somewhat produced forwards but sometimes rounded off; base either straight or slightly emar-

Fig. 11. *Guizhaphaenops* (s. str.) *giganteus* S. UENO, sp. nov., ♂, from Shen Dong Cave at Muqiao Cun in northwestern Guizhou.



ginate, usually with a small shallow emargination on each side, which is either transverse or oblique; hind angles obtuse but usually clearly marked due to the lateral emarginations of basal margin, sometimes completely rounded off; dorsum convex and completely glabrous, with fine but distinct median line; apical transverse impression variable, sometimes vague but sometimes clearly impressed; basal transverse impression mal-defined, usually uneven; basal foveae small and shallow, extending anteriorly parallel to side borders; basal area longitudinally strigose along basal margin; microsculpture distinct, consisting of irregularly transverse lines which form wide meshes here and there. Propleura not visible from above.

Elytra elongated oval, much wider than prothorax, obviously longer than wide, widest at about middle, and more gradually narrowed towards bases than towards apices; EW/PW 1.82–2.08 (M 1.95), EL/PL 2.67–2.97 (M 2.84), EL/EW 1.54–1.77 (M 1.62); shoulders distinct though rounded, with prehumeral borders straight and fairly oblique; sides narrowly bordered in basal and apical thirds, moderately so at middle, nearly straight for a short distance behind shoulders, then feebly arcuate to slight preapical emargination, finely serrulate and ciliated at the humeral parts; apices almost conjointly rounded, often forming a very obtuse re-entrant angle at suture; dorsum rather strongly convex, steeply declivous at the sides and apices, obliquely flattened in basal area, and sparsely covered with very minute pubescence at the lateral parts; microsculpture distinct, consisting of irregular transverse lines; striae almost entire though shallower at the side and near the apex than on the disc, lightly crenulate, inner four striae deepened in basal area, stria 8 usually somewhat deepened in apical part; scutellar striole vestigial though usually perceptible; apical striole either rudimentary or evanescent; intervals flat even near suture; stria 3 with two setiferous dorsal pores at  $1/8$ – $1/6$  and  $2/5$ – $1/2$  from base, respectively; preapical pore always absent; marginal umbilicate pores as in the other species of the subgenus.

Ventral surface pubescent at the median parts of all segments, the pubescence being conspicuous particularly on prosternum and abdominal sternites; anal sternite bisetose in ♂, quadrisetose in ♀. Legs long and slender; metatibia about five-sevenths as long as elytra and gently arcuate outwards in apical part, metatarsus about three-fourths as long as metatibia; tarsomere 1 a little longer than tarsomeres 2–4 combined in mesotarsus, much longer than tarsomeres 2–4 combined in metatarsus.

Male genital organ very small and lightly sclerotized. Aedeagus about two-ninths as long as elytra in large individuals, a little larger than that in proportion to the size of hind body in small individuals, very slender, more strongly arcuate than in *G. striatus*, particularly in proximal half, with long basal part strongly curved ventrad and short apical lobe, towards which the apical part is gradually tapered in profile; sagittal aileron large, often fused with the proximal end of basal part at the ventral side; basal orifice usually small, with the sides not emarginate; apical lobe narrowly rounded at the extremity in dorsal view, relatively narrow and slightly reflexed in lateral view; ventral margin widely emarginate in profile. Copulatory piece as in the other species. Styles relatively narrow at the apical parts, each bearing four to six setae at the apex.



*Type series.* Holotype: ♂, allotype: ♀, 16-IX-1998, S. UÉNO leg. Paratypes: 46 ♂♂, 63 ♀♀ (incl. 1 teneral ♂ and 1 crushed ♀), 16-IX-1998, S. UÉNO, Y. NISHIKAWA & T. KISHIMOTO leg. All deposited at present in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

*Type locality.* Limestone cave called Shen Dong, 1,860 m in altitude, at Muqiao Cun of Laoyingshan Zhen in Shuicheng Xian, Liupanshui Shi, northwestern Guizhou, South China.

*Notes.* It seems worth noting that though its type locality, Shen Dong Cave, is geographically much nearer to that of *G. zorzini* (Anjia Yan Cave) than to that of *G. striatus* (Duolin Dong Cave), *G. giganteus* is apparently closer to the latter species in general facies, the striation of the elytra and the configuration of the male genitalia. It is about 35 km distant to the east-northeast from Anjia Yan Cave at Shega, and about 77 km distant to the northwest from Duolin Dong Cave at Maolin Cun. However, the present species is decisively different from the others in the presence of the posterior pair of the supraorbital setae, so that the close external similarity between *G. giganteus* and *G. striatus* may be deceptive. At any rate, the presence or absence of the posterior supraorbital setae should be regarded as a mere specific difference in classifying Chinese trechines. As was already shown in one of our previous papers dealing with *Sinaphaenops*, an asymmetrical reversion of this seta was observed in one of the nine specimens examined of *S. wangorum* which ordinarily lacks the posterior pair of the supraorbital setae (cf. UÉNO & RAN, 1998, p. 55).

*Guizhaphaenops giganteus* is an exceptionally abundant species among the Chinese cave trechines. We were able to collect 111 specimens in total of this trechine beetle, which enabled me to make a careful study of the unusual individual variation of *Guizhaphaenops*. For calculating standard ratios, I took the measurements of 109 out of the 111 specimens by excluding one teneral male and one crushed female. This was a painstaking and time-consuming task to do (I usually take measurements of less than 24 males and 24 females randomly picked up for calculating standard ratios of a given species), but the result obtained was very important for understanding the incredible variability of the members of *Guizhaphaenops* and *Cathaiaphaenops*.

A brief sketch of Shen Dong Cave, the type locality of *G. giganteus*, was already given in the *Notes* following the description of *Shenaphaenops humeralis* S. UÉNO (1999, p. 632). The present large trechine beetle was found in various places of the cave and in various habitats, but was most abundant at the bottom of the entrance shaft, where many individuals were found running about on the wet floor, even on cemented stairs, and also from beneath stones. They were always quick-moving, and readily ran up onto vertical walls and stalagmites. In deeper parts of the cave, however, the beetle seemed mainly attracted to rotten logs and bamboos, probably because of their humidness.

## 要 約

上野俊一： *Guizhaphaenops* 属のアシナガメクラチビゴミムシ類。—— *Guizhaphaenops* 属は、中国贵州省北西部の石灰洞で発見されたただ1点の、保存状態のあまりよくない雌に基づいて創設されたアシナガメクラチビゴミムシの1属で、実態の解明がかねてから望まれていた。今回、基準種である *G. zorzini* VIGNA TAGLIANTI の、複数の雄を含む同地基準標本と、近傍の洞窟で採集された同属の2新種とを詳しく検討した結果、この属の原記載にいくつかの重要な誤りがあることと、構成種にチビゴミムシ類としては信じられないほど極端な個体変異のあることがわかったので、新種の記載にあわせて属そのものの再検討も行った。新種名は *G. striatus* S. UÉNO および *G. giganteus* S. UÉNO で、後者のうちの大型個体は、チビゴミムシ類のなかでも最大級のものである。なお、現在の時点で確認されている狭義の *Guizhaphaenops* はこれらの3種だけだが、ごく最近（2000年3月）に隣接する云南省北東部の石灰洞から、この属の新亜属として記載された *Semiaphaenops* DEUVE については、実物の比較に基づく綿密な検討の必要がある。基準亜属との区別点として原記載に挙げられた三つの特徴のうちの二つまでが、上記の3種の種間変異あるいは個体変異の幅に含まれるので、高次分類の標徴にはなりえないからである。

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