Description of a second species of subgenus *Gutta* Wrase & Schmidt, 2006 from China (Coleoptera: Carabidae)

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**Abstract**

*Pterostichus* (*Gutta*) *kongshuhensis*, sp. n. (type locality: China, Yunnan Province, Baoshan Prefecture, Tengchong County, 2.8 km ENE village Kongshuhe), is described. The new species is morphologically closest to *P. (Gutta) gaoligongensis* Wrase & Schmidt, 2006.

**Key words**: Carabidae, *Pterostichus*, new species, taxonomy, China, Yunnan.

**Introduction**

In the course of work on the Carabidae collection of the National Museum of Natural History, Sofia, I found a single male specimen of the genus *Pterostichus* Bonelli, 1810 from China with the posterior angles of pronotum fully rounded. This specimen was collected by a recent Bulgarian caving expedition to the Chinese province Yunnan (see also, Guéorguiev 2014; Guéorguiev 2015). Subsequent investigation has shown that this specimen belongs to a new species of the little known subgenus *Gutta* Wrase & Schmidt, 2006.

**Material and Methods**

The measurements were made with an ocular micrometer mounted on a stereoscopic binocular microscope Olympus SZX10. The photos of the habitus and genitalia were taken by a Zeiss Stemi 2000 microscope equipped with an AxioCam ERC 5s camera and were stacked using CombineZM image stacking software.

Measurements: body length - distance from the apex of the longer mandible in closed position to the apex of the longer elytron (BL); body width as distance across maximal width of body (BW).

Proportions: head length - distance from apex of longer mandibular in closed position to the imaginary line connecting the posterior end of tempora (HL); head width - maximum linear distance across the head, including the eyes (HW); length of pronotum, measured along the midline, from the apical to the basal margin (PL); maximum width of pronotum (PW); width of the pronotal apex, between the anterior angles (PaW); width of the pronotal base - between the lateral points lying on a straight line with the medial point of basal border (PbW); length of elytra, from the basis of scutellum to the apex of the longer elytron (EL); maximum width of elytra (EW).
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Taxonomic part

Pterostichini Bonelli, 1810

Genus Pterostichus Bonelli, 1810

Subgenus Gutta Wrase & Schmidt, 2006

The main features that define this group are:
1/ elytra with microsculpture pattern isodiametric;
2/ head large, in relation to pronotum;
3/ pronotum round, with posterior angles nearly fully rounded;
4/ elytra pyriform, with completely rounded humeri and lacking humeral teeth;
5/ interval 3 of elytra with three setiferous punctures;
6/ apicolateral plica of elytron indistinct;
7/ hind wings strongly reduced;
8/ tarsomere 5 on all legs ventrally unseparate;
9/ median lobe of aedeagus with both ostium large, deflected to left and terminal lamella long;
10/ right paramere short, with distal part rounded.

The subgenus includes three species, P. (Gutta) phungaraziensis Wrase & Schmidt, 2006, P. (Gutta) adulterinus Wrase & Schmidt, 2006, and P. (Gutta) gaoligongensis Wrase & Schmidt, 2006 (Wrase & Schmidt 2006). The first two species occur in northern Myanmar, while the third taxon lives in the northwestern part of Chinese province of Yunnan. Most likely, the East Himalayan mountainous chain, including the massifs of Hkakabo Razi and Gaoligong Shan, located west of the Salween River has served as area of differentiation of the species.

Pterostichus (Gutta) kongshuhensis sp. n.

(Figs 1-8)

Type material. Holotype ♂, fully preserved, “CHINA, Yunnan Prov., Tengchong County, vil. Kongsuhu near cave Wu Shi Shan 1-2-3 N25.73111 E98.66459, ca. 2500-2600m, 11.11.2013, B. Petrov leg.” [print, white label] / “HOLOTYPE Pterostichus (Gutta) kongshuhensis sp. nov. Guéorguiev des. 2015” [print, red label]. The holotype is preserved in the carabid collection of the National Museum of Natural History, Sofia.

Differential diagnosis. The largest and widest species of subgenus Gutta, having: (1) BL: 13.5 mm; (2) BW: 4.8 mm; (3) micropunctation present only on head, very fine and scattered, lacking on the pronotum and the elytra; (4) head in comparison with pronotum narrower, ratio PW/HW: 1.35; (5) frontal furrows widened anteriorly, arched; (6) antennomere 1 not distinctly lighter than other antennomeres; (7) midline of pronotum equally impressed throughout, obsolete near the anterior border, distinct to posterior border; (8) elytra slender, ratio EL/EW: 1.58; (9) umbilicate series with 16-17 pores, the apical group consisting of 10-11 pores; (10) last abdominal sternite in male with horseshoe-shaped impression opening anteriorly (Fig. 3); (11) right paramere apically completely rounded; and (12) a median lobe of aedeagus more arcuate in lateral view, with apical lamella more elongate and narrower in dorsal view (Figs 4-5). The new species is morphologically closest to P. gaoligongensis, but is specifically distinct from it in points 1-7 and 9. Pterostichus kongshuhensis sp. n. is also distinct from the other two species of the subgenus, P. phungaraziensis and P. adulterinus, in the points 8 and 10-12 (cfr. Wrase & Schmidt 2006).

Description. Habitus. Large-sized species of Gutta, with moderately convex body, convex eyes, basal angles of pronotum entirely rounded posteriorly and ovate elytra (Fig. 1). Measurements. BL: 13.5 mm; BW: 4.8 mm. Ratios. HL/HW: 1.09; PW/HW: 1.35; PW/PL: 1.20; PW/PbW: 1.71; PbW/PaW: 0.85; EW/PW: 1.21; EL/PL: 2.38; EL/EW: 1.58. Tegument. Thoroughly glabrous dorsally and ventrally (excl. antennomeres 4-11), dorsally smooth, only head with very fine micropunctuation (visible at higher magnification), pronotum and elytra without micropunctation. Color. Dorsal surface black, antennae, palpi, legs (excl. tarsomeres) and ventral surface slightly lighter, tarsi reddish. Microsculpture. Very fine on head and pronotum, coarser
on elytra, isodiametric on head and elytra, transverse-mesh on pronotum; tegument shiny, more dorsally, less ventrally.

Figures 1-3. Pterostichus (Gutta) kongshuhensis sp. n., holotype; Fig. 1, habitus; Fig. 2, head and pronotum; Fig. 3, abdominal sternite VI. Scale line: 3 mm (Fig. 1); 2 mm (Fig. 2); 0.5 mm (Fig. 3).

Head. Slightly longer than wide, disc smooth, frontal furrows faintly impressed, widened anteriorly, arched, divergent anteriorly and posteriorly, backwards hardly exceeding level of anterior supraorbital punctures; collar constriction distinct only laterally; eyes moderately large and projecting laterally, two times as long as tempora, length of each eye in dorsal view exceeds length of scape; paraorbital sulci distinct, exceeding level of posterior supraorbital puncture; labrum with concave anterior margin, convex sides and six setiferous punctures, two lateral setae longer than four inner setae; clypeus trapezoid, emarginate anteriorly and laterally, with two large, foveable setiferous punctures situated closer to lateral margins than to anterior margin, clypeal setae as long as lateral labral setae, clypeal suture distinct; antennomeres filiform, pubescent from second fifth of antennomere 4, with penultimate antennomere exceeding base of pronotum, scape longer than any other antennomere, pedicel shortest, antennomeres III-XI of similar length; glossal sclerite of ligula with two long setae on anterior margin; maxillary palpomeres glabrous, somewhat longer than labial palpomeres, palpomeres II massive and swollen, thicker twice than following two palpomeres; mentum deeply emarginated, with tooth bifid in front and pair of short labial setae, without paramedical pits, epilobes large, significantly exceeding mentum tooth in front; submentum with two basal setae and two lateral ones,
basal setae as long as three times and more than lateral setae. *Thorax*. Pronotum large, hardly transverse, one fifth wider than long, with widest point at anterior third (Fig. 2); disc gently convex, smooth; midline equally impressed throughout, disappearing just near to anterior border, but distinct to posterior border; anterior border weakly concave, unbordered, wider than basal border; sides convex, more anteriorly, less posteriorly, finely bordered from anterior angles up to basal impressions, each side with a lateral gutter equally narrow along most extent, but widened at basal 1/5; basal border between two basal impressions straight, unbordered; anterior angles rounded, hardly protruding in front, posterior angles entirely rounded off; anterolateral seta at apical third, posterolateral seta removed from posterior angle in distance less than length of antennomere 1; two basal impressions, moderately profound, impunctate, tricorn-shaped, with medial horn sublinear; basis between impressions impunctate, but with at least two longitudinal notches on each side of midline, as notches divergent posteriorly. Elytra subelongate, oviform, rather convex dorsally, widest in their third fourth, narrow basally, gradually widened apically, without both apicolateral plica and apical sinuation, apices of each elytron widely rounded; shoulder rounded, without tooth; basal border complete, forming an obtuse angle with lateral margin; elytral striae well impressed, complete, impunctate, parascutellar stria touching basal border, not anastomosing with stria 1, angular base of stria 1 present, hardly joining stria 2; parascutellar puncture present, removed back from basal margin with distance of three diameters of puncture, situated on angular junction of striae 1 and 2, stria 7 with two preapical punctures, umbilicate series within stria 8, indistinctly interrupted in middle, 7 humeral + 11 apical pores on left elytron and 6 humeral + 10 apical pores on right elytron; intervals rather convex, smooth; interval 3 with three setiferous punctures, first puncture adjoining stria 3 at anterior fourth of elytron, second and third punctures adjoining stria 2 in posterior half of elytron. Hind wings vestigial. Prosternum and proepipleura smooth, prosternal process unbordered, slightly grooved medially. Mesosternum and mesepisterna smooth. Metasternum and metepisterna smooth, metepisterna (without metepimeron) wider than long, with anterior margin longer than inner one. Fore and middle legs moderately long and slender, hind legs longer and more slender; procoxa asetose; protrochanter with one seta; profemur posterior margin with one seta, profemur ventral margin setiferous, first three protarsomeres dilated, ventrally densely squamose; mesocoxa bisetose, with one lateral seta and one medial seta; mesotrochanter with one seta; mesofemur ventral margin with two long setae; mesotibia moderately widened apically, with ctenidium well differentiated; first two mesotarsomeres grooved externally; metacoxa bisetose, with one anterolateral and one posterolateral seta; metatrochanter elongate, reniform, as long as a half of metafemur, with one seta; metafemur with two long posteroventral setae; metatibia long and slender; metatarsomeres 1-2 grooved externally; tarsomere 5 on all legs glabrous ventrally. *Abdomen*. Sternites smooth, 1-2 unsetose, 3-5 with a pair of apical ambulatory setae each of them, 6 with two submarginal punctures and a horseshoe-shaped impression surrounding convex surface (Fig. 3). *Male genitalia*. Median lobe of aedeagus long, in lateral view strongly arcuate, with basal bulb large and well developed, basal orifice concave, medial third wider than both basal bulb and apical part, ostium large and deflected to left, apical part long, narrowed distally, with lamella finely bent ventrally (Fig. 4); median lobe dorsally elongate, with apical lamella narrowed and slightly bent to left, hooked at the tip, as hook bent to left (Fig. 5). Internal sac of aedeagus without spine-like or thorn-like sclerites. Left paramere conchoid, with a distinctly transverse apophysis and a robust internal process (Figs 6-7). Right paramere short, somewhat bent at apical third, completely round apically (Fig. 6-7).

**Etymology.** The name, treated as adjective, is derived from the village in Western Yunnan in the vicinities of which this species was discovered.

**Locality and habitat.** The type locality is situated in the Gaoligong Mts., at ca. 2530-2600 m altitude, GPS coordinates: N25.73111 E98.66459, it lies approximately 2.8 km east-northeast from village Kongshuhe and is very close to the type locality of the bembidiine Amerizus gaoligongensis Guéorguiev, 2015 (see Guéorguiev, 2015: 69, Fig. 4). The holotype of the new species was collected under a stone lying in a shady area on the way to cave Wu Shi Shan 1-2-3 (Boyan Petrov personal communication, Fig. 8). The surrounding area was composed of semi-degraded sub-tropical wood vegetation characteristic of the humid evergreen broad-leaved forests with well-developed undergrowth (see also Guéorguiev, 2015: 71, Fig. 6). Administratively, the type locality falls into Tengchong County, Baoshan Prefecture, western part of Yunnan Province, China.
Affinities. *Pterostichus kongshuhensis* sp. n. is morphologically similar to *P. gaoligongensis*. Although male specimens of the latter species are still unknown, there are some marked external differences (see “Differential diagnosis”), which confirms they are two specifically distinct forms. The distance between the type locality of the former and the type locality of the latter (with GPS coordinates: 27°47.90′N, 98°30.19′E) is nearly 230 km in a straight line.

The new species could be easily distinguished from *P. phungaraziensis* and *P. adulterinus* by the narrower elytra, structure of last visible sternite in the male and the structure of the male genitalia (median lobe of aedeagus laterally more arcuate, dorsally apical lamella more elongate and narrower).

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Figure 8. The road running through the type locality of *Pterostichus kongshuhensis* sp. n. (photo by B. Petrov).

References

