Description of a new subgenus and five new species of the genus *Pterostichus* Bonelli, 1810 (Coleoptera, Carabidae, Pterostichini) from northern Myanmar and Yunnan

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Abstract

The following carabid beetle taxa of the tribe Pterostichini are newly described from the high mountains of Southeast Asia (Myanmar, Yunnan): *Pterostichus (Morphohaptoderus) muellermotzfeldi* sp. n. (loc. typ.: N. Myanmar, Mt. Phungarazi); *Gutta* subgen. n. of genus *Pterostichus* BONELLI, 1810 (type species: *Pterostichus phungaraziensis* sp. n.); *Pt.* (*Gutta*) *phungaraziensis* sp. n. (loc. typ.: N. Myanmar, Mt. Phungarazi); *Pt.* (*Gutta*) *adulterinus* sp. n. (loc. typ.: N. Myanmar, Mt. Phungarazi); *Pt.* (*Gutta*) *gaoligongensis* sp. n. (loc. typ.: China, N. Yunnan, Gaoligong Shan); *Pt.* (? subgenus) *reuteri* sp. n. (loc. typ.: N. Myanmar, Mt. Phungarazi). Illustrations of habitus and male genitalia of the species dealt with here are presented.

Zusammenfassung

Es werden die folgenden neuen Taxa der Laufkäfer-Tribus Pterostichini aus den Hochgebirgen Südostasien (Burma, Yunnan) beschrieben: *Pterostichus (Morphohaptoderus) muellermotzfeldi* sp. n. (loc. typ.: N. Burma, Mt. Phungarazi); *Gutta* subgen. n. der Gattung *Pterostichus* Bonelli, 1810 (Typusart: *Pterostichus phungaraziensis* sp. n.); *Pt.* (*Gutta*) *phungaraziensis* sp. n. (loc. typ.: N. Burma, Mt. Phungarazi); *Pt.* (*Gutta*) *adulterinus* sp. n. (loc. typ.: N. Burma, Mt. Phungarazi); *Pt.* (*Gutta*) *gaoligongensis* sp. n. (loc. typ.: China, N. Yunnan, Gaoligong Shan); *Pt.* (? subgenus) *reuteri* sp. n. (loc. typ.: N. Burma, Mt. Phungarazi). Habitus und Merkmale des männlichen Genitalapparats der neu beschriebenen Arten werden abgebildet.

Key words: Carabidae, Pterostichini, *Pterostichus, Morphohaptoderus*, *Gutta* subgen. n., new species, Myanmar, China

Introduction

Until now the carabid beetle fauna of Myanmar was insufficiently known. In the past very few field expeditions were conducted and those that did take place were very restricted geographically. The expeditions of Leonardo Fea (1885 und 1889) and of René Malaise (1934) in different areas of eastern and northeastern Myanmar are perhaps the best known. The Carabidae collected during these expeditions were studied for instance by BATES (1892), ANDREWES (1947), LANDIN (1954) und SCHMIDT (2000), and many species from the tropical and subtropical zones were described.
Despite these studies, we still have only a modest knowledge of the high montane fauna of northern Myanmar, for instance there are no species of the genus *Pterostichus* known to occur. However, due to the close biogeographical relationship between northern Myanmar and the mountains of Yunnan and due to the richness of *Pterostichus*-forms from alpine western China, representatives of this genus in the high montane areas of northern Myanmar were to be expected. These aspirations were fulfilled by the results of an expedition made by our friend and colleague Christoph Reuter (Hamburg) who travelled in Myanmar in August 2006, reaching areas of northwestern Myanmar up to areas close to the Indian border where he collected in heights up to 4000 m. The *Pterostichus*-material of his investigations is analyzed here, including a further new species recently collected in northern Yunnan.

Material and Methods

The following abbreviations are used for the places of deposition of the material examined:

NME	Naturkundemuseum Erfurt, Germany
OUMNH	The Hope Entomological Collections, Oxford University Museum of Natural History, Great Britain
cFACCH	Coll. S. Facchini, Piacenza, Italy
cMM	Coll. G. Müller-Motzfeld, Greifswald, Germany

cRT Coll. C. Reuter, Hamburg, Germany
cSCI Coll. R. Sciaky, Milano, Italy
cSCHM Coll. J. Schmidt, Admannshagen, Germany
cWR Coll. D.W. Wrase, Berlin, Germany

Total body length (BL) is measured from the tips of mandibles to the apex of the right elytron; the width of the head (HW) as the maximum linear distance across the head, including the compound eyes (or across the tempora); the length of the pronotum (PL) from the anterior to the posterior margin along the midline; the length of the elytra (EL) from the anterior margin of the elytra at the scutellum to the apex of the elytra; the width of the pronotum (PW) and elytra (EW) at their broadest point. These measurements, made at a magnification of 10X (BL) and 20 or 32x, respectively, and using an ocular micrometer in a Leica MZ 16 stereobinocular microscope, were combined in ratios or added as follows:

PW/PL: width/length of pronotum
PW/HW: width of pronotum/width of head
EL/EW: length/width of elytra

Microsculpture was examined at a magnification of 115x.

Line drawings were prepared by using an ocular grid (10x10 squares) attached to a Leica MZ 16 respectively an Olympus SZ40 stereobinocular microscope. Dissections were made with standard techniques, median lobes were preserved in Euparal on acetate labels, other parts glued to cards, and pinned beneath the specimens from which they had been removed.

Results

Pterostichus (Morphohaptoderus) muellermotzfeldi sp. n.

Type material:

Holotype: ♂, N Burma, ca. 75 km NW Putao, Mt. Phungarazi, 4000 m, 11.VIII. 2006, Reuter leg. (NME).

Paratypes: 36 ♂♂, 24 ♀♀, same as holotype (cFACCH, cMM, cRT, cSCI, cSCHM, cWR, NME, OUMNH); 1 ♂, the same, 3700 m, 10. VIII. 2006, Reuter leg. (cSCHM); 2 ♂♂, ca. 60 km NW Putao, 2200 m, 8+12.VIII. 2006, Reuter leg. (cSCHM).

Recognation: A small, piceous, wingless species with eyes small and almost flat and with short-ovaliform, convex elytra, short antennae and short legs.

Description: Figs 1, 6-9.

Body length 5.6-6.0 mm (holotype 6.0 mm), maximum width of elytra in males 2.0-2.2 mm (holotype 2.2 mm), in females 2.1-2.2 mm.

Colour: Dorsal and ventral surface lighter or darker red-piceous, femora and tibiae somewhat lighter, antennae (with exception of antennomere 1-3), tarsi and sometimes also mouthparts distinctly infuscated. Darker specimens with sutural interval and apex of elytra somewhat lightened.

Microsculpture: Head with mesh pattern isodiametric, weakly engraved, and pronotum with weakly developed transverse meshes, dorsal surface very shiny. Elytra with somewhat more strongly developed strongly transverse meshes, surface slightly iridescent. Mesh pattern in females not more strongly developed than in males.

Puncturation: Upper surface with very fine micropuncturation (only visible at high magnification). Prosternum, meso- and meta-sternum, episterna, and first abdominal segments laterally, coarsely and sparsely punctured, the latter additionally with grooves and ridges.

Head: Approximately quadrate in outline with a strong neck, without collar constriction; frontal furrows short, moderately deepened and with some punctures, mandibles normal.

Eyes: Relatively small, almost flat; tempora short and weakly developed, about one fifth to one third of eye diameter, seen dorsally.

Antennae: Relatively short with last antennomere extending beyond the basal border of pronotum, antennomeres 1-3 smooth with exception of the apical obligatory setation, antennomeres 5-11 additionally with a somewhat denser covering of shorter sensory setae.

Pronotum: Transverse (ratio PW/PL in males 1.34-1.42, holotype 1.42, in females 1.33-1.46), distinctly wider than head across eyes (ratio PW/HW in males 1.55-1.69, holotype 1.69, in females 1.61-1.65), width of base distinctly larger than anterior margin, widest at about end of anterior third; disc moderately convex. Anterior margin weakly excavated with anterior angles acutely protruding, only somewhat rounded at tip, from there laterally weakly curved till maximum width, basad slightly curved and

almost rectilinearly or weakly sinuately narrowed toward the rectangular posterior angles. Insertion of anterolateral seta distinctly before maximum width. Lateral gutter narrow, not explanate toward base. Base almost rectilinear, two basal impressions, the internal one elongate, the external one shorter and roundly deepened and sometimes indistinct, the base (except middle part) including area of the basal impressions somewhat irregularly punctured. Median longitudinal impression distinct in middle part, deeply engraved, becoming indistinct toward anterior and posterior margin. Anterior and posterior transverse impressions weak, sometimes only indicated.

Elytra: Short-oval with humeral angle almost completely reduced, humeral tooth small and acute, somewhat elevated and best observed obliquely from behind (ratio EL/EW in males 1.34-1.40, holotype 1.34, in females 1.34-1.45). Basal margin forming an obtuse or almost right angle with lateral margin. Maximum width about at middle, toward apex somewhat pointedly narrowed, disc convex. Striae deep, distinctly punctured, intervals very slightly convex, sometimes the external ones almost flat. Third interval with three to six setigerous pore punctures of somewhat irregular position (first ones mostly at middle of interval, last ones mostly adjacent to stria 2, very often unequal in number on both elytra), the first pore puncture at about end of first fourth, the last one at about beginning of apical fourth or fifth. Scutellar pore puncture fine, scutellar stria mostly short, seldom somewhat longer. Series umbilicata forming two groups of pore punctures, a humeral group and an apical group connected by one pore puncture in about following combination: 5-6 + 1 + 6-8 (exceptionally the groups are not distinctly separated). Preapical internal plica evident, hence epipleura distinctly “crossed”.

Hind wings: Reduced to small scales.

Metepisterna: Short, somewhat wider than long.

Last abdominal sternite in male: Without any particular character.

Legs: Short, tibiae and tarsi slender, meso- and metatibia in male not curved and not crenulate at internal margin. Tarsomeres 1-3 laterally weakly furrowed, tarsomere 5 with some setae underneath.

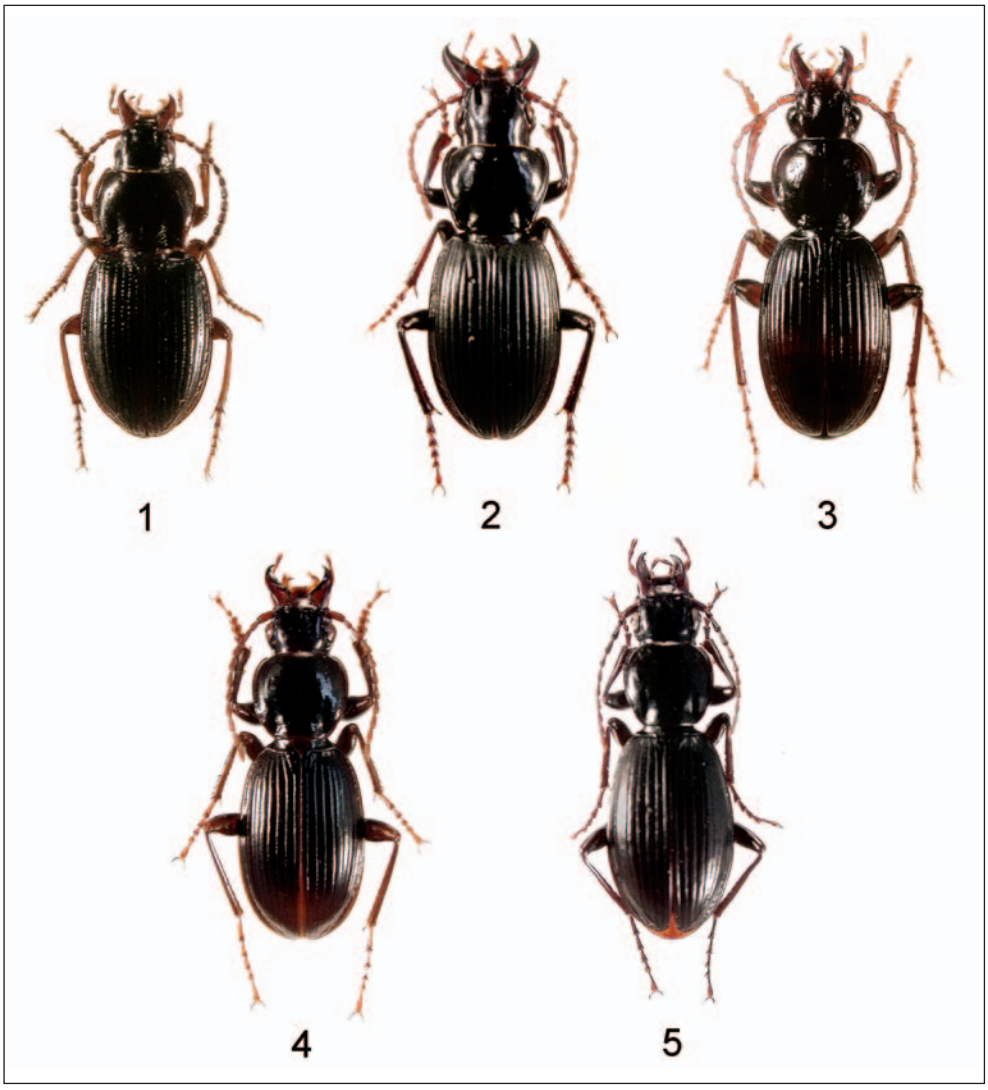
Male genitalia: Median lobe long with apical lamella distinctly deflexed, in dorsal view apical lamella almost triangular, somewhat blunted at apex, at left side with a small denticle at base, at best seen somewhat obliquely from behind. Internal sac with two stronger chitinized lamellae.

Specific epithet: We welcome the opportunity of dedicating very cordially this new species to our colleague and friend Gerd Müller-Motzfeld (Greifswald).

Habitat: The specimens were collected in mixed cloud forests and forest remnants across the high montane zone up to the border of the subalpine zone at altitudes of 2000 m to 4000 m.

Geographical distribution: Currently only known from areas around the Mount Phungarazi on the western slopes of the Phungarazi mountain range in northern Myanmar close to the Indian border.

Comparisons: The subgenus *Morphohaptoderus* Tschitscherine, 1898 was initially revised by Sciaky (1994) who recognized 14 species, further papers dealing with that subgenus (Sciaky & Wrase, 1997; Sciaky, 1997; Facchini & Sciaky, 2003) increased the number of species considerably. Up to now there are 30 described species but many further species new to science are known but not yet described (Sciaky & Wrase, in preparation). Meanwhile it is obvious that *Morphohaptoderus* is fairly heterogeneous and can be split in several species-groups. We have placed this new species into the subgenus *Morphohaptoderus* Tschitscherine, 1898 with hesitation. In the small, flat eyes it resembles a small species group with *Pt. parvicollis* Sciaky & Wrase, 1997, and some other, still undescribed species (Sciaky & Wrase, in preparation), also the construction of the median lobe and its internal sac with sclerotized lamellae is similar to species of this group which have a simple apex (as far represented in males), though in *Pt. muellermotzfeldi* sp. n. the apex has a small hook-like elevation at the left side. It could be seen as an intermediate condition from a median lobe with simple apex to a median lobe strongly hooked apically (surely an apomorphic character). *Pt. muellermotzfeldi* sp. n. differs from the species of the *parvicollis* group by shorter, more convex elytra and a higher number of elytral pore punctures. The latter character is shared with some species from Shaanxi and Hubei (*P. shennongjianus* Facchini &



Figs 1-5:
Photographs of habitus. **1** – *Pterostichus (Morphohaptoderus) muellermotzfeldi* sp. n.; **2** – *Pt.* (? subgenus) *reuteri* sp. n.; **3** – *Pt.* (*Gutta*) *phungaraziensis* sp. n.; **4** – *Pt.* (*Gutta*) *adulterinus* sp. n.; **5** – *Pt.* (*Gutta*) *gaoligongensis* sp. n.

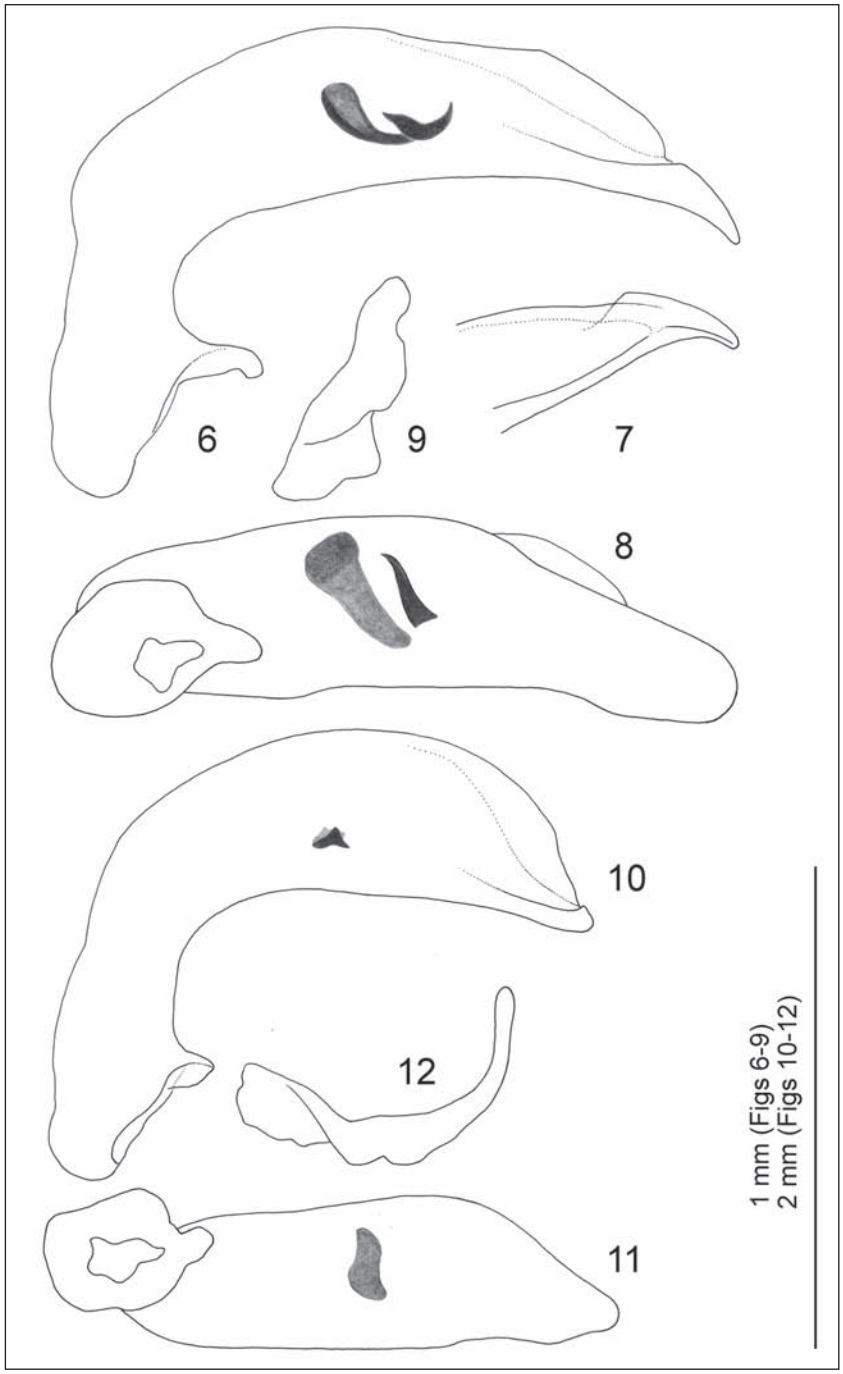
Photo 1:
Photographs of habitat for the *Pterostichus* species from Mt. Phungarazi, 4000 m, in Northern Myanmar (*Pt. adulterinus* sp. n., *Pt. muellermotzfeldi* sp. n., *Pt. phungaraziensis* sp. n., *Pt. reuteri* sp. n.).

Sciaky, 2003, and some other not yet described species) which differ, however, in much larger size (up to 12 mm) and with a very different shaped pronotum, and with a completely different construction of the median lobe (apex strongly hooked) and in other important characters. Comparison with species of the subgenus *Neohaptoderus* Tschitscherine, 1898, which is closest to *Morphohaptoderus* (see SCIAKY, 1994: 1), make insertion of *Pt. muellermotzfeldi* sp. n. into subgenus *Neohaptoderus* not very probable due to external differences.

***Pterostichus (? subgenus) reuteri* sp. n.**

Type material:
Holotype: ♂, N Burma, ca. 75 km NW Putao, Mt. Phungarazi, 4000 m, 11.VIII. 2006, Reuter leg. (cSCHM).
Paratypes: 3 ♂♂, 4 ♀♀, same as holotype (cSCHM, cRT, cWR).

Recognation: A black, moderately large, wingless species with head large, eyes small, tempora long and oblique, mandibles long, pronotal posterior angles widely rounded, and with elytra long-ovaliform.
Description: Figs 2, 10-12.
Body length 13 – 15.2 mm (holotype: 14.8 mm), maximum width of elytra 4.1 – 5.1 mm (holotype: 4.8 mm).
Colour: Dorsal and ventral surface, femora and tibiae black, tarsi, antennae and mouthparts somewhat lighter, dark reddish brown.
Microsculpture: Head with isodiametric and pronotum with weakly transverse mesh pattern weakly engraved, surface very shiny. Elytra with relatively strongly developed isodiametric meshes, surface somewhat matt. Mesh pattern in female not more strongly developed than in male.
Puncturation: Head and pronotum with very fine micropuncturation (only visible at high magnification), undersurface smooth, only mes- and met-episterna with some coarse and sparse punctures.
Head: Large, only somewhat narrower than pronotum (ratio PW/HW 1.26 – 1.32; holotype: 1.32), without collar constriction; frontal furrows short, shallow and smooth.
Eyes: Relatively small, somewhat convex; tempora long and oblique, markedly swollen (maximum width of head across tempora), as long or even a little longer as eye diameter seen dorsally.
Antennae: Relatively short and fine, last antennomere extending beyond the basal border of pronotum, setose from antennomere 4.
Pronotum: Large, almost quadrate (ratio PW/PL 1.21 – 1.29; holotype: 1.26), only somewhat wider than head across tempora, width of base distinctly narrower than anterior margin, widest at about end of anterior fourth; disc flat. Anterior margin weakly excavated with anterior angles somewhat protruding and somewhat rounded at tip, from there weakly curved laterally till maximum width, basad slightly curved and almost rectilinearly or weakly sinuate narrowed toward the obtuse-angled posterior angles, widely rounded at tip. Insertion of anterolateral seta somewhat before maximum width, posterolateral seta a little before posterior angle. Lateral gutter narrow, not explanate toward base. Base weakly convex, two elongate basal impressions, the internal one twice as long as external one which is somewhat indistinct. Whole base unpunctured. Median longitudinal impression distinct and deeply engraved in middle, becoming indistinct toward anterior and posterior margin. Anterior transverse impression weak, posterior transverse impression only indicated.
Elytra: Long-oval with humeral angle almost completely reduced, humeral tooth very small and acute, somewhat elevated and best observed obliquely from behind (ratio EL/EW 1.39 – 1.61; holotype: 1.56). Basal margin forming an obtuse angle with lateral margin. Maximum width somewhat behind middle. Striae deep, unpunctured, intervals convex. Third interval with three setigerous pore punctures, the first pore puncture at about end of first fourth, the second at about middle, the last one at about beginning of apical fourth (in one paratype the right first puncture is missing). Scutellar pore puncture absent, scutellar stria short and only weakly indicated. Series umbilicata not forming distinct groups, consisting of 16-17 pore punctures, punctures at humeral area connected with apical punctures by some punctures at some wider distance. Preapical internal plica not evident, hence epipleura not “crossed”. Elytra gaped at about posterior fourth, each elytron in both sexes



Figs 6-12:
Aedeagal characters. **6, 8, 10, 11** – medianlobus of aedeagus (6+10 viewed from lateral, 8+11 viewed from ventral); **7** – tip of median lobe (viewed from dorsal, slightly tilt to the right side); **9, 12** – right paramere. **6-9** – *Pterostichus (Morphohaptoderus) muellermotzfeldi* sp. n.; **10-12** – *Pt.* (? subgenus) *reuteri* sp. n. Scale bar 1 mm (Figs 6-9); 2 mm (Figs 10-12).

apically more or less obtuse-angled, rounded at tip.
Hind wings: Reduced to small scales.
Metepisterna: Short, about as wide as long.
Last abdominal sternite in male: Without any particular character.
Legs: Of normal length and strength, meso- and metatibia in male not curved but metatibia distinctly crenulate on internal margin and additionally with fine oblique grooves internally at basal half. Tarsomeres laterally not furrowed, tarsomere 5 without setae underneath.
Male genitalia: Median lobe short and stout with apical lamella short. Ostium large and situated on the left (as normal in the genus *Pterostichus*). Right paramere long, curved and narrowed apically. Internal sac with a small leaf-like sclerite at the middle part of median lobe.
Specific epithet: Cordially dedicated to our friend and colleague Christoph Reuter (Hamburg) who collected all the interesting new species from northern Myanmar described in this paper.
Habitat: This species were collected in mixed cloud forests of the high montane zone close to the subalpine zone at an altitude of approximately 4000 m.
Geographical distribution: Currently only known from of the Mount Phungarazi on the western slopes of the Phungarazi mountain range in northern Myanmar.
Comparisons: The position of this remarkable species cannot be defined with certainty. With the large head, small eyes and the well-developed, wide and swollen tempora it resembles *Pt.* (*Natalianoe*) *microps* Heyden, 1887, from the Russian Far East and some other species from Japan (subgen. *Nialoe* Tanaka, 1958) but this species differs in having a pronotum with acute posterior angles, elytra flat with well-developed humeri, and therefore the mentioned similarity is most probably a result of a convergent development. Species of the subgenus *Circinatus* Sciaky, 1994, have the pronotum with widely rounded posterior angles but the posterolateral setae are never in the hind angles but in front of it, the head and the eyes are of normal form, the elytra though also with rounded humerus, have very fine strong-transverse meshes, causing a very distinct iridescence, also the right paramere is constantly short and straight, dilated and rounded at tip.
Species of the subgenus *Tschitscherinea* Berg, 1898, show a reduction of the eyes, too, connected, at least partly, with long oblique tempora but have a long, weakly depigmented, depressed body with sharp-angled pronotal posterior angles, and long, parallel-sided elytra with a large laterally protruding humeral tooth (very probable synapomorphies caused by a special way of life, see also SCIAKY, 1997: 166). The median lobe in *Pt. reuteri* sp. n. and in species of *Tschitscherinea* is similar (relatively small with apical lamella short, and with a sclerotized sclerite in the middle part), and also the right paramere (with exception of *Pt. filum* Tschitscherine, 1879) show a similar form (long and bent at right angle, relatively strong in *Tschitscherinea*, long but more curved and apically strongly narrowed in *Pt. reuteri* sp. n.) but the remarkable differences in external characters made the conclusion very probable that reduction of eyes with development of wide tempora and similarities in the male genital is caused by convergence and therefore the inclusion of *Pt. reuteri* sp. n. into the subgenus *Tschitscherinea* seems not justified.
Most likely the erection of a separate subgenus for *Pt. reuteri* sp. n. is necessary, more material and probably discovery of more species in future will help to elucidate this problem and the relationship to other subgenera of *Pterostichus* from eastern Asia.

***Gutta* subgen. n.**
Type species: *Pterostichus phungaraziensis* sp. n.

Recognation: A subgenus of *Pterostichus* with strongly brachypterous species of medium size with large head, small, weakly convex eyes, and rounded shape of pronotum; pronotal margin with 1 or 2 anterolateral setae. Elytra long-oval, somewhat drop-like with completely rounded humerus and without humeral tooth. Elytral microsculpture isodiametric. Median lobe long with apex long, ostium large and situated on the left (as normal in the genus *Pterostichus*). Right paramere short, somewhat bent and apically rounded or weakly pointed.
Subgeneric epithet: Derived from the Latin noun "gutta" (drop), alluding to the characteristic elytral form. Gender feminine.
Description: Figs 3-6, 13-18.
Head: Large, with tempora somewhat less wide as

pronotum; collar constriction hardly visible; frontal furrows short, shallow and smooth.

Eyes: Relatively small, somewhat convex; tempora oblique, about half as long as eye diameter, seen dorsally.

Antennae: Relatively long and of normal build, setose from antennomere 4.

Pronotum: Large, almost quadrate, only slightly wider than head across eyes, width of base slightly narrower than anterior margin, widest just behind end of anterior third, disc almost flat. Anterior margin weakly excavated with anterior angles weakly protruding and somewhat rounded at tip, from there weakly curved laterally till maximum width, basad almost evenly curved toward widely rounded posterior angles. Insertion of anterolateral seta or setae slightly before maximum width, posterolateral seta before posterior angle in distance of about length of antennomere 1. Lateral gutter narrow, somewhat explanate before posterior angle. Base rectilinear, one elongate shallow basal impression, reaching the end of basal third. Whole base unpunctured. Median longitudinal impression distinct in middle part, deeply engraved, becoming evanescent toward anterior and posterior margin. Anterior and posterior transverse impression weak, sometimes hardly distinct.

Elytra: Long-oval with humeral angle completely reduced, no humeral tooth. Basal margin forming an obtuse angle with lateral one. Maximum width just behind middle. Striae complete, deep and unpunctured, intervals convex. Third interval with three setigerous pore punctures. Scutellar pore puncture present, scutellar stria of normal length, in interval 2. Preapical internal plica not evident, hence epipleura not "crossed". Elytra gaped at posterior third, each elytron apically more or less rounded or indistinctly truncate.

Last abdominal sternite in male: Without any particular character.

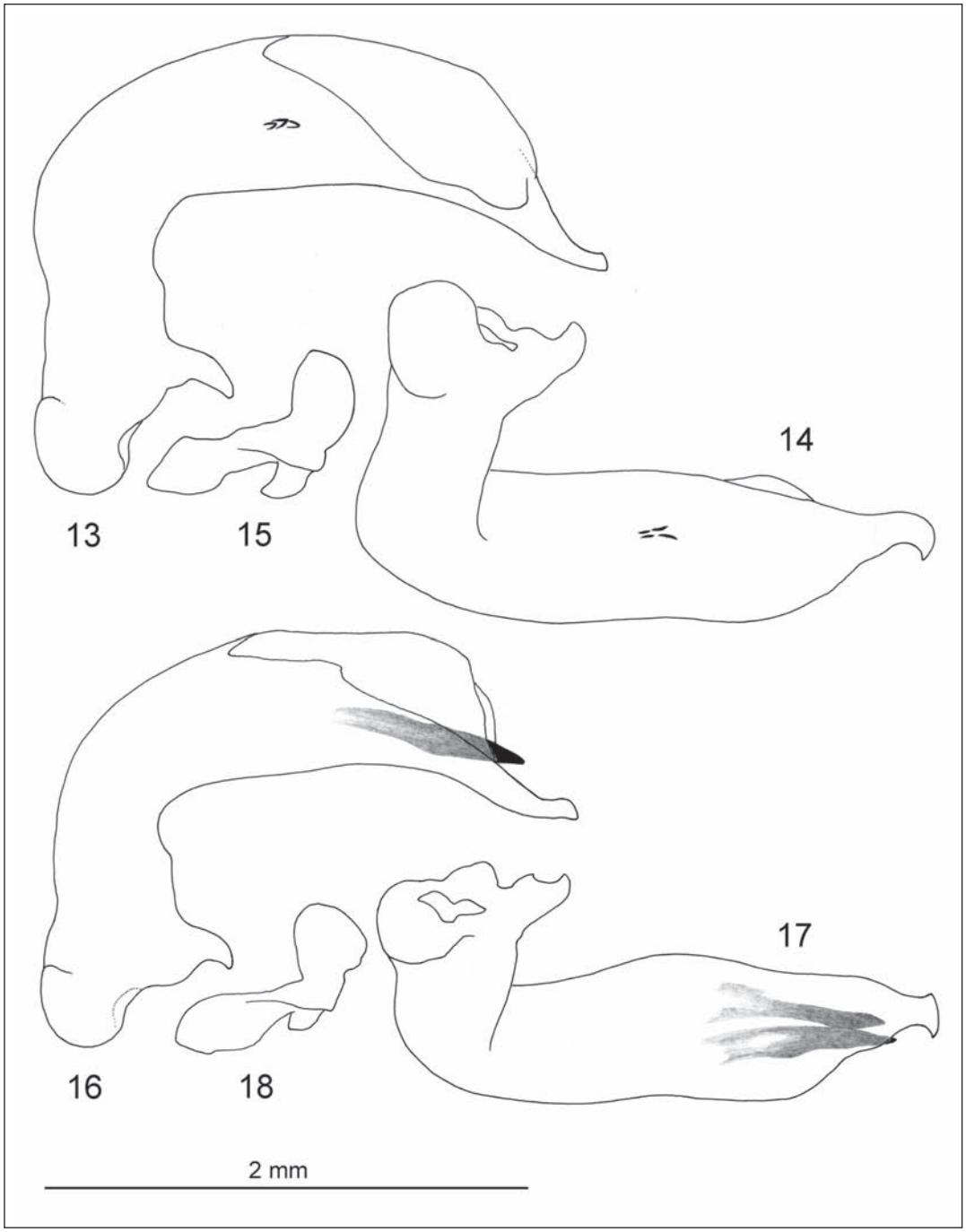
Metepisterna: Short, about as wide as long.

Hind wings: Reduced to small scales.

Legs: Of normal length and build, meso- and metatibia in male not curved but metatibia weakly crenulate on internal margin. Metatarsomeres 1-4 laterally weakly furrowed, tarsomere 5 without setae underneath.

Male genitalia: Median lobe long with apex long, ostium large and situated on the left (as normal in the genus *Pterostichus*). Right paramere short, somewhat bent and apically rounded or bluntly pointed. Internal sac armed with big, long spines or with some smaller plate-like spines (in one species male genital is unknown).

Comparisons: The group, formed (up to now) by three species dealt with here is very homogenous and the species are very similar to each other, forming surely a monophylum. By important characters it is well delimited from other subgenera known from Asia; the species come from a restricted region in northern Myanmar and northern Yunnan and do not have intermediate forms to species of subgenera already known. In the shape of pronotum with its widely rounded hind angles they resemble species of *Circinatus* Sciaky, 1996 (Sichuan, Yunnan and Shaanxi) but in these species the lateral margin forms with the basal margin a distinct angle though the hind angles are widely rounded. Other important differences are in *Circinatus* the smaller head with normal-sized eyes and less distinct tempora, the elytra with more developed humeral angles (and partly with well-developed humeral tooth) and with very fine strongly transverse meshes (causing a very distinct iridescence). The median lobe in its general form is similar but the apex is simple (narrowly or widely rounded at tip, with one exception: *Pt. subtilissimus* Sciaky, 1996 where the apex is strongly bent to the left in dorsal view), the internal sac is without special armaments of teeth or thorns. One another subgenus with species from Shaanxi, Sichuan and Yunnan with rounded pronotal hind angles (*Sinosteropus* Sciaky, 1994) has characters too different from species of *Gutta* subgen. n. (small size, short antennae and legs, supposed to be a tendency to an endogeous way of life, see SCIAKY, 1996: 221, different construction of median lobe). Also members of the subgenus *Eosteropus* Tschitscherine, 1902, having widely rounded pronotal hind angles differ in external characters and in genital too strongly to take into consideration a closer relationship to species of *Gutta* subgen. n.



Figs 13-18:
Aedeagal characters. **13-14, 16-17** – median lobe (13+16 viewed from lateral, 14+17 viewed from ventral); **15, 18** – right paramere. **13-15** – *Pterostichus* (*Gutta*) *adulterinus* sp. n.; **16-18** – *Pt.* (*Gutta*) *phungaraziensis* sp. n. Scale bar 2 mm.

Key to species of *Gutta* subgen. n.

1 Species from northern Myanmar, with antennae and legs somewhat lighter than body, not distinctly darkened. Pronotum with one anterolateral seta. Head in comparison to pronotum narrower (PW/HW 1.31-1.36.) Elytra wider (EL/EW1.44-1.48) 2

- Species from northern Yunnan, with antennae and legs (with exception of tarsi) distinctly darkened. Pronotum with two anterolateral setae. Head in comparison to pronotum wider (PW/HW 1.21-1.30). Elytra narrower (EL/EW 1.53-1.66) ..... ***Pt. gaolingongensis* sp. n.**

2 Median lobe of male genitalia with apical lamella grooved and apically laterally with two almost triangular, sharp-angled processes (Fig. 17). Right paramere short, somewhat bent and apically rounded (Fig 18). Internal sac with two large spines directed apicad and ending outside the sac (Figs 16-17) ..... ***Pt. phungaraziensis* sp. n.**

- Median lobe of male genitalia with apical lamella flattened, apex somewhat narrowed and finger-like bent to the left, apically pointed (Fig. 14). Right paramere short, somewhat bent and apically bluntly pointed (Fig. 15). Internal sac in middle part with three small plate-like thorns (Figs 13-14) ..... ***Pt. adulterinus* sp. n.**

***Pterostichus (Gutta) phungaraziensis* sp. n.**

Type material:
Holotype: ♂, N Burma, ca. 75 km NW Putao, Mt. Phungarazi, 4000 m, 11.VIII. 2006, Reuter leg. (cSCHM).
Additional material: 3 ♀♀, same as holotype, not designated as paratypes (cSCHM, cWR).

Recognation: A black, medium-sized, wingless species with head large, eyes small, tempora long and oblique, mandibles long, pronotal hind angles widely rounded, and with elytra long-ovaliform. Internal sac of aedeagus with two enormous spines directed apicad and ending outside of the sac.
Description: Figs 3, 16-18.
Body length 11.5 mm, maximum width of elytra 4.8 mm.
Colour: Dorsal and ventral surface dark piceous, legs and appendages somewhat lighter.
Microsculpture: Head with isodiametric and pronotum with weakly transverse mesh pattern, weakly engraved, surface very shiny. Elytra with relatively moderately developed isodiametric meshes, surface somewhat matt. Mesh pattern in female not more strongly developed than in male.
Puncturation: Head and pronotum with very fine micropuncturation (only visible at high magnification), undersurface smooth.
Head: Large, with eyes somewhat narrower than pronotum (ratio PW/HW 1.36); collar constriction hardly visible; frontal furrows short, shallow and smooth.
Eyes: Relatively small, somewhat convex; tempora oblique, about half as long as eye diameter, seen dorsally.
Antennae: Relatively long and of normal build, last 2 antennomeres extending beyond the basal border of pronotum, setose from antennomere 4.
Pronotum: Large, almost quadrate (ratio PW/PL 1.23 mm), only somewhat wider than head across eyes, width of base somewhat narrower than anterior margin, widest somewhat behind anterior third, disc almost flat. Anterior margin weakly excavated with anterior angles weakly protruding and somewhat rounded at tip, from there weakly curved laterally till maximum width, basad almost evenly curved toward widely rounded posterior angles. Insertion of anterolateral seta somewhat before maximum width, posterolateral seta before posterior angle in distance of about length of antennomere 1. Lateral gutter narrow, somewhat explanate before posterior angles. Base rectilinear, one elongate shallow basal impression, reaching the end of basal third. Whole base unpunctured. Median longitudinal impression distinct in middle part, deeply engraved, becoming

indistinct toward anterior and posterior margin. Anterior and posterior transverse impressions weak. Elytra: Long-oval with humeral angle completely reduced, no humeral tooth (ratio EL/EW 1.48). Basal margin forming an obtuse angle with lateral one. Maximum width just behind middle. Striae deep, unpunctured, intervals convex. Third interval with three setigerous pore punctures, the first pore puncture at about end of anterior fourth, the middle at about middle, the last one at about beginning of apical fourth. Scutellar pore puncture present, scutellar stria of normal length, in interval 2. Series umbilicata forming two groups of pore punctures, humeral group and apical group connected by two pore punctures in about following combination: 6 + 1 + 1 + 6-7. Preapical internal plica not evident, hence epipleura not "crossed". Elytra gaped at posterior third, each elytron apically more or less rounded or indistinctly truncate.

Last abdominal sternite in male: Without any particular character.

Metepisterna: Short, about as wide as long.

Hind wings: Reduced to small scales.

Legs: Of normal length and build, meso- and metatibia in male not curved but metatibia weakly crenulate on internal margin. Metatarsomeres 1-4 laterally weakly furrowed, tarsomere 5 unsetose underneath.

Male genitalia: Median lobe long, apical lamella middle-long, grooved and apically laterally with 2 almost triangular, sharp-angled processes. Ostium large and situated on the left (as normal in the genus *Pterostichus*). Right paramere short, somewhat bent and apically rounded. Internal sac with two enormous spines directed apicad and ending outside of the sac (also visible outside the sac in dry condition).

Specific epithet: Referring to the type locality, Mt. Phungarazi.

Habitat: This species was collected in mixed cloud forests of the high montane zone close to the subalpine zone at an altitude of approximately 4000 m.

Geographical distribution: Currently only known from the Mount Phungarazi on the western slopes of the Phungarazi mountain range in northern Myanmar.

Comparisons: See key above.

This and the following species are sympatric and most likely they are also syntopic, however, they cannot be distinguished by external characters from each other with certainty though the males have a genital with considerable differences. Therefore, the females mentioned above (see additional material) are assigned only with a question mark to this species due to their pronotal ratio (PW/PL 1.18-1.22).

***Pterostichus (Gutta) adulterinus* sp. n.**

Type material:

Holotype: ♂, N Burma, ca. 75 km NW Putao, Mt. Phungarazi, 4000 m, 11.VIII. 2006, Reuter leg. (cSCHM).

Paratype: ♂, same as holotype (cWR).

Recognation: A black, medium-sized, wingless species with head large, eyes small, tempora long and oblique, mandibles long, pronotal hind angles widely rounded, and with elytra long-oviform.

Description: Figs 4, 13-15.

Body length 11.3 (paratype) – 11.5 mm (holotype), maximum width of elytra 4.2 mm.

Values: Ratio PW/HW 1.31 (holotype) – 1.35 (paratype); ratio PW/PL 1.14; ratio EL/EW 1.47 (holotype) – 1.48 (paratype).

In all other characters (except male genitalia) completely agreeing with *Pt. phungaraziensis* sp. n.

Male genitalia: Median lobe long, apical lamella middle-long, flattened, apex somewhat narrowed and, apically pointed, finger-like bent to the left. Ostium large and situated on the left (as normal in the genus *Pterostichus*). Right paramere short, bent and apically bluntly pointed. Internal sac in middle part with three small plate-like thorns.

Specific epithet: Named due to the fact of the externally perfect similarity to *Pt. phungaraziensis* sp. n. (Latin "adulterinus": copied).

Habitat: The species was collected in mixed cloud forests of the high montane zone close to the subalpine zone at an altitude of approximately 4000 m.

Geographical distribution: Up to now only known from the Mount Phungarazi on the western slopes of the Phungarazi mountain range in northern Myanmar close to the Indian border.

Comparisons: For differentiating see key above.

***Pterostichus (Gutta) gaoligongensis* sp. n.**

Type material:
Holotype: ♀, China (N-Yunnan) Nujiang Lisu Aut. Pref., Gongshan Co., Gaoligong Shan, sidevalley at 3000-3050 m, 27°47.90'N, 98°30.19'E (coniferous forest with Rhododendron and other broad leaved bushes, litter, moss/dead wood sifted along creek and snowfields), 21.VI.2005, M. Schülke [16] (cWR).
Paratype: 1 ♀, same as holotype (cSCHM).

Recognation: A black, medium-sized, wingless species with head large, eyes small, tempora long and oblique, mandibles long, pronotal hind angles widely rounded, and with elytra long-ovaliform.
Description: Fig. 5.
Body length 12.8 mm (paratype) -13.0 mm (holotype), maximum width of elytra 3.5 mm (holotype) – 4.1 mm (paratype).
Colour: Dorsal and ventral surface black, femora and tibiae indistinctly, tarsi and mouthparts slightly lighter. Antennae with exception of antennomere 1 distinctly darkened.
Microsculpture: Head with isodiametric and pronotum with weakly transverse mesh pattern, weakly engraved, surface very shiny. Elytra with distinctly developed isodiametric meshes, surface somewhat matt.
Puncturation: Head and pronotum with very fine micropuncturation (only visible at high magnification), undersurface smooth.
Head: Large, with eyes somewhat less wide as pronotum (ratio PW/HW in holotype 1.25, in paratype 1.30); collar constriction hardly visible; frontal furrows short, shallow and smooth.
Eyes: Relatively small, somewhat convex; tempora oblique, about half as long as eye diameter, seen dorsally.
Antennae: Relatively long and of normal build, last 2 antennomeres extending beyond the basal border of pronotum, setose from antennomere 4.
Pronotum: Large, almost quadrate (ratio PW/PL 1.22 in holotype, 1.11 in paratype), only slightly wider than head across eyes, width of base slightly narrower than anterior margin, widest just behind end of anterior third, disc almost flat. Anterior margin weakly excavated with anterior angles weakly protruding and somewhat rounded at tip, from there weakly curved laterally till maximum width, basad almost evenly curved toward widely rounded posterior angles. Insertion of 2 anterolateral setae about maximum width, posterolateral seta before posterior angle in distance of about length of antennomere 1. Lateral gutter narrow, somewhat explanate before posterior angles. Base rectilinear, one elongate shallow, somewhat laterad curved basal impression, reaching the end of basal third. Whole base unpunctured. Median longitudinal impression distinct in middle part, deeply engraved, becoming indistinct toward anterior and posterior margin. Anterior and posterior transverse impressions weak.
Elytra: Long-oval with humeral angle completely reduced, no humeral tooth (ratio EL/EW 1.53 in holotype, 1.66 in paratype). Basal margin forming an obtuse angle with lateral one. Maximum width somewhat behind middle. Striae deep, unpunctured, intervals convex. Third interval with three setigerous pore punctures, the first pore puncture at about end of basal fourth, the second at about middle, the last one at about beginning of apical fourth. Scutellar pore puncture present, scutellar stria of normal length, in interval 2. Series umbilicata forming two groups of pore punctures in the combination: 6-7 + 8, humeral and apical group divided by a wide gap. Praeapical internal plica not evident, hence epipleura not "crossed". Elytra gaped at posterior fourth, each elytron apically more or less rounded.
Metepisterna: Short, about as wide as long.
Hind wings: Reduced to small scales.
Legs: Of normal length and built. Metatarsomeres 1-3 laterally weakly furrowed, tarsomere 5 without setae underneath.
Male genitalia: Unknown.
Specific epithet: Derived from the type locality, the Gaoligong Shan.
Habitat: The specimens were collected in a coniferous forest with *Rhododendron* and other broad leaved bushes, by sifting litter, moss and dead wood along a creek and snowfields at a height of 3000-3050 m.
Geographical distribution: Up to now only known from the type locality in the Gaoligong Shan, northern Yunnan.
Comparisons: The most slender species of that

subgenus, femora, tibiae and antennae distinctly darkened. For differentiating see key above.

Acknowledgements

We are very pleased to express our appreciation to our colleagues and friends Christoph Reuter (Hamburg, to whom we are also indebted for the biotope photograph) and Michael Schülke (Berlin) for providing us with the material this study deals with; Jon Cooter (Oxford) for reading a previous draft of the manuscript on which this paper is based; and Michael Hornburg (Berlin) who took photographs of the new species.

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