

Koleopterologische Rundschau	87	129–162	Wien, September 2017
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# New data and eleven new species of *Algon* SHARP, 1874, with a special focus on the *A. kaiserianus* group (Coleoptera: Staphylinidae: Staphylininae)

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## Abstract

New and additional data on species of the genus *Algon* SHARP, 1874 are provided and eleven new species are described, one from the *A. oculatus* group: *A. mogokensis* sp.n. (Myanmar), and ten from the *A. kaiserianus* group: *A. ailaoshanus* sp.n. (China), *A. basilineatus* sp.n. (China), *A. doupengshan* sp.n. (China), *A. fanjingshanus* sp.n. (China), *A. grebennikov* sp.n. (China), *A. merkli* sp.n. (Vietnam), *A. phiaoacensis* sp.n. (Vietnam), *A. subtilis* sp.n. (China), *A. uncus* sp.n. (Laos), *A. zhenbaodingensis* sp.n. (China). Two species are redescribed: *A. fansipanicus* ASSING, 2015 and *A. uenoi* HAYASHI, 2011. *Algon viridis* BOHÁČ, 1992 is recorded from Laos for the first time. The aedeagi and body details of all new species, and all known species of the *A. kaiserianus* group, are illustrated. A key to species and a distribution map of the *A. kaiserianus* group are provided.

**Key words:** Coleoptera, Staphylinidae, Staphylininae, Algonina, *Algon*, new species, new record, systematics, taxonomy.

## Introduction

Up to present, 68 species of *Algon* SHARP, 1874 have been known. After an extensive revision (SCHILLHAMMER 2006), which lists 58 species, ten more species have been described in subsequent papers (SCHILLHAMMER 2008, 2011, HAYASHI 2011, ASSING 2015). The phylogenetic situation has been a matter of discussion for a long time without yielding a satisfactory solution, until molecular evidence lead to the erection of the new subtribe Algonina SCHILLHAMMER & BRUNKE, 2017 (in CHANI-POSSE et al. 2017), that also includes *Barypalpus* CAMERON, 1932. In addition, the study showed that *Rientis* SHARP, 1874 is not closely related to *Algon* despite striking superficial similarity.

In this paper, eleven new species are described, ten of which belong to the *A. kaiserianus* group, more than doubling the number of species. It is therefore treated more comprehensively. Furthermore, additional data on a variety of species, including a new country record, are presented.

## Acknowledgement and abbreviations

The material treated in this paper is deposited in the following institutional or private collections:

CAH	Coll. V. Assing, Hannover, Germany
CDM	Coll. A. Derunkov, Minsk, Belarus
CFM	Coll. B. Feldmann, Münster, Germany
CGO	Coll. V. Gollkowski, Oelsnitz, Germany
CNC	Canadian National Collection, Ottawa, Canada (A. J. Brunke)
CSB	Coll. M. Schülke, Berlin, Germany
IRSNB	Institut Royal des Sciences Naturelle, Bruxelles, Belgium (Y. Gerard)
IZ-CAS	Institute of Zoology, Chinese Academy of Sciences, Beijing, China (H. Zhou)
MHNG	Muséum d'Histoire Naturelle, Genève, Switzerland (G. Cuccodoro)
NHMB	Naturhistorisches Museum Basel, Switzerland (M. Geiser)
NMW	Naturhistorisches Museum Wien, Austria
OMNH	Osaka Museum of Natural History, Japan (S. Shiyake)
TMB	Magyar Természettudományi Múzeum, Budapest, Hungary (Gy. Makranczy, O. Merkl)
ZMUC	Zoological Museum, University of Copenhagen, Denmark (A. Solodovnikov)

The help of the respective curators and persons mentioned above is greatly appreciated. In addition, I thank Volker Gollkowsky for donating the holotype of *A. basilineatus* sp.n. to the NMW, and Adam J. Brunke for proof-reading the manuscript.

### Imaging methods

Photographs were taken with a Nikon D4 (in combination with a Novoflex bellows) tethered to a PC and controlled with Nikon Camera Control Pro. A reverse mounted Rodenstock 50/2.8 Apo-Rodagon N lens was used for the habitus image and Mitutoyo 5/0.14 and 10/0.25 Apo ELWD for the body details. Resulting images are focus stacks, aligned and stacked with Zerene Stacker and then postprocessed in Adobe Photoshop CS 4 and CS 5.

### *Algon grandicollis* group

#### *Algon pergrandis* SCHEERPELTZ, 1974

MATERIAL EXAMINED: 1 ♂: VIETNAM, Ninh Binh Prov., Cúc Phương National Park, 25.IV.2016, 20°21.489'N 105°34.878'E, 350 m a.s.l., leg. R. Novitsky & S. Zuyonak (CDM).

#### *Algon lisae* SCHILLHAMMER, 2011

MATERIAL EXAMINED: 1 ♂: LAOS: Hua Phan Prov., ~20°12'N 104°01'E, Phou Phan Mt., 1500-1900 m, 17.V.-3.VI.2007, leg. M. Brancucci (NHMB).

#### *Algon viridis* BOHÁČ, 1992

MATERIAL EXAMINED: 2 ♂♂: LAOS, Khammouane Prov., Ban Khoun Kham (Nahin), 18°13.027'N 104°30.880'E, 300 m, 4.-18.VI.2008, flight intercept trap in disturbed primary rain forest, leg. A. Solodovnikov & J. Pedersen (ZMUC, NMW).

New record for Laos! The species was so far known only from the type locality in Vietnam.

#### *Algon semiaureus* FAUVEL, 1895

MATERIAL EXAMINED: 1 ♂: "Himalaya oriental R.P. Bertand \ *Algon* sp.n. \ M. Cameron det. \ Coll. W. Chapman in Coll. P. Griveau MHNG – 2007 \ *Algon* sp. \ MHNG ENTO 00010931" (MHNG).

The locality label does not allow an exact assignment of the specimen to a certain country. It is most likely from Sikkim, Darjeeling or Bhutan.

### *Algon oculatus* group

The species of this small group are easily recognized by their large eyes, occupying almost the entire lateral length of the head. The species are very difficult or even impossible to identify without studying the aedeagus. Further difficulty is created because at least one species is known to be wing dimorphic, which has a strong influence on the external appearance, especially the shape of the elytra.

#### *Algon mogokensis* sp.n.

**Holotype** ♂: "MYANMAR: Mandalay Reg., Mogok Township, S Panlin vill., Mt. Taung Mae, west slope, ca. 1870 m \ ca. 22°58'06"N 96°27'29"E, 17.-24.5.2016, leg. Schillhammer, Brunke, Jenkins-Shaw, Jensen, FIT (MBS

212A)" (NMW). – **Paratypes** (4 exs.): 3 ♂♂, with same data as holotype, but "17.-21.5.2016, pitfall traps (212E)" (2 NMW, 1 ZMUC); 1 ♂, with same data as holotype, but "1780 m, ca. 22°58'03"N 96°27'22"E, 17.-21.5.2016, sifting (213B)" (NMW).

**DESCRIPTION** (Habitus: Fig. 1): 11.5–12.7 mm long (5.1–5.6 mm, abdomen excluded). – Black, rather opaque, mouthparts including labrum reddish, mandibles with medial tooth and tips blackened, antennae reddish with first antennomere to various extent darkened, legs black, tarsi reddish but often with darker basal tarsomeres; sternite IX and tergite X of abdomen reddish, styli of tergite IX dark reddish brown.

Head transversely elliptic, 1.31–1.36 times as wide as long, eyes very large, occupying almost entire side of head, ratio eye/temple quite variable, eyes 2.7–3.8 times as long as tempora; dorsal surface with dense isodiametrical microsculpture, in addition, with very fine micropunctuation; antennae long, slender, antennomeres distad decreasing in length, 5–7 markedly oblong, 8–10 weakly oblong; pronotum 1.03–1.07 times as wide as long, sides weakly to more distinctly convex, without dorsal row of punctures, microsculpture as on head; elytra short, along sides about as long as pronotum along midline, wings developed but non-functional; each elytron with three rows of punctures, along elevated sutural interval, on disc at about two thirds of the width and laterally, each consisting of 4–6 punctures, the sutural and lateral rows often becoming indistinct; deflexed portion of elytra finely, moderately densely punctate and pubescent; scutellum rather irregularly punctate, punctures variably deeply impressed, usually rather shallow, base of scutellum almost impunctate; abdominal tergites rather densely punctate, except at base and along midline of tergites where punctuation is gradually sparser and more irregular; punctural grooves drop-shaped.

Aedeagus (Fig. 2) very similar to that of *A. pseudoculatus* SCHILLHAMMER, 2006 (Fig. 3), but distinctly larger, with a slightly shorter apical piece of the median lobe (lateral view), shorter paramere and somewhat different arrangement of peg setae. In general, the shapes of the aedeagi are difficult to compare in this group because a large part of the apical portion of the median lobe is very weakly sclerotized.

**DIAGNOSIS:** The species is almost identical to *A. pseudoculatus*, but differs, in addition to the aedeagal characters, in a less densely and more irregularly punctate scutellum and slightly less densely punctate tergites.

**DISTRIBUTION:** The species is at present known only from the type locality, the forested slopes of Mt. Taung Mae, situated along the northward road from Mogok to Bernardmyo, Mandalay Region, Myanmar.

**ETYMOLOGY:** The specific epithet refers to Mogok township (Myanmar), well known for its richness in precious gems, but also renowned as type locality for a multitude of insect species, most of them collected by William Doherty in the late 19<sup>th</sup> century ("Ruby mines").

### *Algon kaiserianus* group

The species of this group, for which BERNHAUER (1933) erected a separate genus (*Brachycamonthus*), are characterized by the following combination of characters: large sized, broad in appearance, black to black brown, opaque, head quadrangular, wider than long, eyes small, almost always shorter than tempora, medial margin of eyes not bordered and without furrow along margin of eye (sometimes confluent punctural grooves may be misinterpreted as furrow), entire body with distinct isodiametrical microsculpture (Type I on head and pronotum, Type IIIa on elytra – see SCHILLHAMMER 2006 for explanation), elytra short, wings not developed, elytral punctuation very fine, variably developed, usually lacking on a large medial portion, surface with fine longitudinal or oblique creases, abdomen broad, punctuation more or less identical in all

species, coarse and dense, punctural grooves longitudinally drop-shaped, tergite VII without seam of palisade setae.

The hitherto studied material infers that the species are most likely endemic to a particular mountain range or even a single mountain. Therefore, it does not come as a surprise that a substantial number of new species has surfaced in the past few years. It may be expected that this is only the tip of the iceberg, considering the large number of isolated mountain ecosystems within the distribution area of the group, which is at present confined to southern/central China, Vietnam and Laos.

**BIONOMICS:** Species of the *A. kaiserianus* group inhabit the floor and litter layer of montane forests, usually between 1000 and almost 3000 m a.s.l., rarely lower (see *A. uenoi* HAYASHI). Most of the known specimens have been collected by using baited pitfall traps, on rarer occasions they were manually collected.

**SPECIES RECOGNITION:** Due to the external similarity of the species, reliable identification is in many cases possible only by studying the aedeagus, preferably the lateral view. However, there are external characters which allow at least to narrow a specimen down to a certain level. These mainly concern the shape and punctuation of the elytra, the eye/temple ratio, the body size and, to a lesser extent, the shape of the pronotum. The latter, however, has proven to be subject to some variability. The same is true for the punctuation of the head and pronotum, and the absence of peg setae on the paramere in species where a single one can be present. Obvious characters, like the humeral hook in *A. uncus* sp.n., are the exception. Since the species are mostly endemic to a certain mountain or mountain range, the locality is a good indication as to which species to look into for comparison. So far, there is only one mountain known which is obviously home to more than one species (Leigong Shan, Guizhou Province, China), the second species being undescribed due to lack of a male specimen.

The species are therefore not diagnosed individually, except for a very few cases when exceptional characters are present.

**NOTE:** The descriptions of the new species below are to a large extent restricted to the most essential features for recognition. Two already described species, *A. uenoi* HAYASHI, 2011 and *A. fansipanicus* ASSING, 2015, are redescribed either to harmonize the descriptions with the standard used for the remainder of species or (in case of the latter species) because additional material made it possible to improve the original information (the holotype is a teneral specimen). In case of species named after the type locality, the etymology is not further explained.

### *Algon uenoi* HAYASHI, 2011

**TYPE MATERIAL:** **Holotype** ♂: "Chin Tsen San vill. (700m), 70 km NW of Chendu, Sichuan, CHINA: 19.VI.2009, A. GORODINSKI leg." (OMNH).

**REDESCRIPTION** (based on holotype): 15 mm long (7.1 mm, abdomen excluded). – Black, palpi and labrum reddish brown, antennae dark reddish brown, segments 1 and 3 blackish, 8–10 paler reddish brown, legs black, tarsi reddish, first segments of mid and hind tarsi dark brown to blackish.

Head (Fig. 107) 1.3 times as wide as long, eyes large, tempora 1.1 times as long as eyes, postocular region rather densely and coarsely punctate, micropunctuation distinct only in front of base, hardly visible on most of dorsal surface of head, antennae with segments 4–8 oblong, 9 inconspicuously oblong, 10 about as long as wide; pronotum (Fig. 108) 1.17 times as wide as long, sides slightly angulate, subparallel in basal half, dorsal surface with indication of irregular dorsal row of punctures, posterior punctures behind midlength; elytra (Fig. 109) subparallel, fine

punctuation and pubescence confined to very base and a very small band on dorsal surface along sides; scutellum finely, moderately densely punctate.

Aedeagus (Figs. 10, 29, 47): median lobe in lateral view (Fig. 10) slender, bent toward paramere, with comparatively long apical piece; paramere (Fig. 47) long, slender, with slightly notched apex, peg setae lacking.

NOTE: The redescription and measurements are based on the holotype only (the paratypes were not studied). For additional measurements and a precise description, see the original description by HAYASHI (2011)

DISTRIBUTION (Fig. 118): The species is at present known only from the Qingchengshan area NW of Chengdu, Sichuan, China.

### *Algon fansipanicus* ASSING, 2015

**Holotype** ♂: “N-Vietnam – 7 km NW Sa Pa, 22°20'58"N, 103°46'47"E, 2000 m, primary forest, 29.VII.2013, V. Assing [2+2]" (CAH). NOTE: The locality is in fact WNW of Sa Pa, the “7 km” indicates the distance in direct line.

REDESCRIPTION: 13.5–15.3 mm long (6.5–7.1 mm, abdomen excluded). – Black, palpi reddish brown, mandibles dark reddish testaceous but distal portion and edges black, antennae with segment 1 black, narrowly reddish distally, segments 2 and 3 reddish brown, usually blackened medially, segments 4–7 usually darker reddish brown to dark brown, distal 2 or 3 segments somewhat paler, legs black, tip of protibia narrowly reddish, tarsi dark reddish, first segments of mid and hind tarsi somewhat darker than remaining tarsomeres.

Head (Fig. 71) 1.16–1.21 times as wide as long, eyes moderately small, tempora 1.29–1.37 times as long as eyes, postocular region moderately densely punctate, but punctures of macrosetae rather coarse, micropunctuation distinct except for vertex where it is less obvious within the microsculpture; antennae slender, segments 4–9 markedly oblong, 10 as long as wide or inconspicuously oblong; pronotum (Fig. 72) 1.09–1.11 times as wide as long, sides subparallel in basal half and slightly angulate in holotype, almost regularly convex in remaining specimens, with almost regular admedian dorsal rows of three punctures each; elytra (Fig. 73) subparallel, shoulders bluntly obliquely truncate, sides with very short emargination next to shoulders; fine punctuation and pubescence confined to very base of elytra and even there rather sparse; scutellum finely and moderately to more densely punctate.

Aedeagus (Figs. 16, 35, 51): median lobe in lateral view (Fig. 16) very slender, bent toward paramere, apical piece very short, with small subapical tooth; paramere (Fig. 51) long and slender, apex rounded to subacute, peg setae lacking or with one peg seta (holotype).

#### ADDITIONAL MATERIAL EXAMINED:

V I E T N A M: 1 ♂, 1 ♀: Lai Châu Prov., WNW Sa Pa, nr. Tram Ton Pass, Fan Si Pan trail, 22°20'56"N 103°46'30"E, ca. 1920 m, 24–30.VI.2017, secondary forest, pitfall trap, leg. H. Schillhammer et al. [8b] (NMW, CNC); 1 ♂: Lai Châu Prov., WNW Sa Pa, 200 m SW Tram Ton Pass, 22°21'4"N 103°46'24"E, ca. 1900 m, 24.VI.2017, leg. H. Schillhammer et al. [9] (NMW).

DISTRIBUTION: The species is at present known only from Fan Si Pan in northern Vietnam.

### *Algon ailaoshanus* sp.n.

**Holotype** ♂: “CHINA, C-Yunnan, SE of Jingdong, Ailao Shan – 24°09'N, 101°22'E, 2600–2900 m, 14.–19.VI.2014, pitf. tr., leg. Reuter” (NMW). – **Paratype** ♂, with same data as holotype (NMW).

DESCRIPTION: 13.3–14.0 mm long (6.6–6.7 mm, abdomen excluded). – Black, labrum, maxillary and labial palpi reddish, sometimes with second palpomeres darker; mandibles dark reddish, apically and medially darkened to various extent; antennae dark reddish brown,

segments 1 and 3 to some extent blackish or entire antennae black; tarsi reddish, first one or three tarsomeres distinctly darker.

Head (Fig. 59) 1.23 times as wide as long, eyes moderately small, tempora 1.25–1.28 times as long as eyes, punctural grooves along medial margin of eye confluent, giving the impression of an ocular furrow, postocular region moderately densely punctate, micropunctuation on entire dorsal surface of head hardly visible; antennomeres 4–7 moderately oblong, 8–10 about as long as wide; pronotum (Fig. 60) 1.04–1.09 times as wide as long, sides nearly regularly convex, holotype without medio-dorsal punctures, paratype with two punctures left and one puncture right of the midline in anterior half; elytra (Fig. 61) subparallel-sided, pubescence confined to very base and deflexed lateral parts, remaining surface glossy but with fine longitudinal and oblique striae; scutellum finely and uniformly punctate; abdomen hardly widened, subparallel, paratergites narrow.

Aedeagus (Figs. 20, 39, 56): median lobe in lateral view (Fig. 20) slender, only slightly bent toward paramere, apical portion almost straight, without subapical tooth; paramere (Fig. 56) long and slender, apex rounded to subacute, peg setae lacking.

DISTRIBUTION (Fig. 118): The species is at present known only from the type locality in southern Yunnan, China.

### *Algos basilineatus* sp.n.

**Holotype** ♂: “SW China, Yunnan, 23.6.2014, Lijiang, Elephant hill, lgt. R.K. Sehnal, T. Sýkora” (NMW). – **Paratype** ♀, with same data as holotype (CGO).

DESCRIPTION: 13.2–13.7 mm long (7.0–7.3 mm, abdomen excluded). – Black, labrum, maxillary and labial palpi reddish; mandibles dark reddish brown, distal half black; antennae reddish brown; legs dark brown, medial faces of middle and hind tibiae infusate, tarsi reddish.

Head (Fig. 62) 1.18–1.19 times as wide as long, eyes very small, tempora 1.7–1.8 times as long as eyes, postocular region moderately densely punctate, micropunctuation very obvious, antennae rather short, segments 4–6 weakly oblong, 7–10 about as long as wide; pronotum (Fig. 63) 1.06–1.07 times as wide as long, sides almost regularly convex; elytra (Fig. 64) subparallel, elytral subbasal ridge extended toward shoulders, well visible in dorsal view (when not covered by the base of the pronotum) as a sharp ridge (Fig. 116), pubescence confined to very base and deflexed lateral parts, remaining surface glossy, but with sparse, irregularly scattered larger punctures; scutellum finely and uniformly punctate; abdomen hardly widened, subparallel, paraterga narrow.

Aedeagus (Figs. 19, 38, 55): median lobe in lateral view (Fig. 19) slender, straight, without subapical tooth; paramere (Fig. 55) long and slender, apex rounded to subacute, peg setae lacking.

DIAGNOSIS: The species stands out because of the laterad extended elytral subbasal ridge and the short antennal segments. With *A. ailaoshanus* it shares the slender abdomen.

DISTRIBUTION (Fig. 118): The species is at present known only from the type locality in northern Yunnan, China.

ETYMOLOGY: The name of the species refers to the sharp and long elytral subbasal ridge.

*Algon doupengshanus* sp.n.

**Holotype** ♂: "CHINA: C-GUIZHOU, Doupengshan for. park, 26°23'N 107°21'E, 1200 m, 2.-22.6.2012, leg. Jatua" (NMW). – **Paratypes**: 3 ♀♀, with same data as holotype (NMW).

**DESCRIPTION**: 16.1–16.8 mm long (8.1–8.7 mm, abdomen excluded). – Black, labrum, maxillary and labial palpi reddish; mandibles black, shortly dark reddish dorsally; antennae with proximal 6–7 segments black, remaining segments increasingly paler, reddish; legs black, tarsi reddish brown.

Head (Fig. 65) 1.18–1.20 times as wide as long, eyes rather small, tempora about 1.4 times as long as eyes; postocular region rather densely punctate, micropunctuation very obvious, antennae with all segments oblong; pronotum (Fig. 66) 1.08–1.10 times as wide as long, sides almost regularly convex, as strongly narrowed posteriad as anteriad; elytra (Fig. 67) subparallel to slightly trapezoidal, pubescence confined to very base and deflexed lateral parts; scutellum extremely finely, uniformly punctate.

Aedeagus (Figs. 6, 25, 43): median lobe in lateral view (Fig. 6) broad, almost straight, with large subapical tooth; paramere (Fig. 43) broad, flame-shaped, much shorter than median lobe, strongly narrowed toward pointed apex, with a pair of peg setae at about midlength.

**DISTRIBUTION** (Fig. 118): The species is at present known only from the type locality in central Guizhou Province, China.

*Algon fanjingshanus* sp.n.

**Holotype** ♂: "CHINA, Guizhou, Fanjing Shan, 27°54'N 108°42'E, 1800–2000 m, 5.-11.VI.2014, leg. C. Reuter" (NMW). – **Paratypes**: 2 ♂♂, 1 ♀, with same data as holotype (2 NMW, 1 CFM).

**DESCRIPTION**: 14–15 mm long (7.0–7.2 mm, abdomen excluded). – Black, palpi and tarsi darker or sometimes paler reddish brown, antennae usually black, rarely proximal and distal 2–3 segments dark reddish.

Head (Fig. 68) 1.20–1.24 times as wide as long, eyes moderately small, tempora 1.20–1.33 times as long as eyes; postocular region rather coarsely and densely punctate, micropunctuation distinctly visible only in posterior third, on vertex hardly visible; antennae with all segments oblong; pronotum (Fig. 69) rather broad, 1.14–1.19 times as wide as long, sides subparallel in posterior half, distinctly narrowed anteriad, giving the lateral margin a slightly angulate appearance, dorsal surface with variable admedian row of 2–4 irregularly spaced punctures; elytra (Fig. 70) widened posteriad, trapezoidal, pubescence occupying about lateral half of dorsal surface, slightly less at about midlength; scutellum extremely finely, uniformly, sparingly punctate.

Aedeagus (Figs. 9, 28, 46): median lobe in lateral view (Fig. 9) slender, bent toward paramere, apical piece short, with distinct subapical tooth; paramere (Fig. 46) moderately broad, with weakly convex sides, apex pointed, peg setae arranged in two small clusters at about midlength.

**DISTRIBUTION** (Fig. 118): The species is at present known only from the type locality in northeastern Guizhou Province, China.

*Algon grebennikovi* sp.n.

**Holotype** ♂: "P.R. CHINA, Sichuan, Emei Shan, N29°33.605' E103°20.633', 27.vi.2009, 1947m, sifting 11, V. Grebennikov" (IZ-CAS). – **Paratypes** (19 exs.): 1 ♀, with same data as holotype (CNC); 2 ♂♂, 1 ♀: ibidem, but "29.vi.2009" (1 NMW, 2 CNC); 1 ♂: ibidem, but "N29°33.909' E103°21.405', 4.vii.2009, 1850m, sifting 16" (NMW); 1 ♂, 2 ♀♀: ibidem, but "5.vii.2009, sifting 17" (1 IZ-CAS, 2 CNC); 1 ♂: ibidem, but "N29°33'36.3" E103°20'38.0", 15.vi.2010, 1947m, sifting 33" (NMW); 1 ♂: ibidem, but "N29°32'37.3" E103°19'57.5", 18.vi.2010,

2440m, sifting 37" (CNC); 1 ♂: ibidem, but "N29°33'36.3" E103°20'38.0", 22.vi.2010, 1947m, sifting 39" (CNC); 2 ♂♂, 1 ♀: ibidem, but "N29°33'39" E103°20'42", 23.v.2011, 1850m, sift04" (CNC); 1 ♂: ibidem, but "N29°33'04" E103°21'19", 25.v.2011, 1729m, sift05" (CNC); 1 ♂, 2 ♀♀: ibidem, but "N29°33'56" E103°21'24", 26.v.2011, 1829m, sift06" (2 CNC, 1 NMW); 1 ♂: ibidem, but "N29°33'00" E103°21'38", 28.v.2011, 1639m, sift08" (CNC).

**DESCRIPTION:** 13.6–15.0 mm long (6.6–7.0 mm, abdomen excluded). – Black to brownish black, labrum dark brown, palpi and tarsi reddish brown, antennae reddish with first segment usually darkened, tibiae often with dark reddish lateral faces.

Head (Fig. 74) 1.17–1.20 times as wide as long, eyes moderately small, tempora 1.33–1.36 times as long as eyes; postocular region moderately coarsely and moderately densely punctate, density of punctuation variable; micropunctuation visible only on postocular region and in front of posterior margin; antennae with segments 4–7(8) oblong, segments 9 and 10 (sometimes also segment 8) about as long as wide; pronotum (Fig. 75) 1.11–1.13 times as wide as long, sides subparallel in posterior half, distinctly narrowed anteriorly, giving the lateral margin a slightly angulate appearance, dorsal surface with a dorsal row of usually 1 or 2 punctures each, posterior puncture usually in posterior half, rarely without punctures; elytra (Fig. 76) widened posteriorly, moderately trapezoidal, pubescence occupying lateral third in posterior half, reaching scutellum basally, glossy portion semi-circular; scutellum rather strongly, uniformly punctate.

**Aedeagus** (Figs. 14, 33, 50): median lobe in lateral view (Fig. 14) very slender, bent toward paramere, apical piece very short, with small subapical tooth; paramere (Fig. 50) slender, sides slightly concave, apex rounded to subtruncate and very slightly notched, peg setae lacking.

**DISTRIBUTION** (Fig. 118): The species is at present known only from Emei Shan, Sichuan, China.

**ETYMOLOGY:** The species is named in honour of its collector, Vasily Grebennikov, avid field entomologist and expert in various fields of the Coleoptera.

### *Algon merkli* sp.n.

**Holotype** ♂: "VIETNAM, Yen Bai Prov., Mu Cang Chai Distr., Che Tao commune, Mu Cang Chai Species and Habitats cons. area, 21.7695°N 104.0435°E \ around Cong Troi (Gate to Heaven) Pass, 2000 m, upper montane evergreen forest, hand-collected in forest at night, 24-29 IX.2016 (#12), Ottó Merkl & Phu Pham Van" (TMB). –

**Paratypes:** 3 ♂♂, 4 ♀♀, with same data as holotype (5 TMB, 2 NMW).

**DESCRIPTION:** 13.5–15.5 mm long (7.4–8.1 mm, abdomen excluded). – Black, opaque except for pronotum which is slightly more shiny due to finer and less developed microsculpture, labial palpi dark reddish brown, often to some extent darkened, especially segment 2 of maxillary palpi; antennae with proximal three segments black, segment 2 to various extent dark reddish, remaining segments variably colored, dark reddish brown or blackish up to segment 7; tarsi black, tarsomere 5 reddish, rarely also segments 3 and 4 dark reddish.

Head (Fig. 89) 1.21–1.31 times as wide as long, eyes small, tempora 1.4–1.6 times as long as eyes; postocular region variably, moderately densely to more densely, coarsely punctate, micropunctuation distinct, except for vertex where it becomes much less distinct; antennae with segments 4–8 oblong, segment 9 inconspicuously oblong, segment 10 as long as wide; pronotum (Fig. 90) about 1.1 times as wide as long, sides convex, distinctly narrowed toward base, without any punctures dorsally; elytra (Fig. 91) subparallel, dorsal surface mostly glossy, including most of basal elytral depression; scutellum with variable punctuation, punctures fine, but punctural grooves either inconspicuous or rather large but shallow.

**Aedeagus** (Figs. 21, 40, 57): median lobe in lateral view (Fig. 21) very slender, bent toward paramere basally, slightly bent away from paramere apically, apical piece long, without sub-



apical tooth on parameral face; paramere (Fig. 57) very long, slender, almost parallel-sided, apex deeply notched, peg setae lacking or with a single peg seta at about midlength.

**DISTRIBUTION** (Fig. 118): The species is at present known only from the type locality in northwestern Vietnam.

**ETYMOLOGY**: The species is named in honour of its collector, Ottó Merkl, beetle curator at the TMB, and outstanding expert on Lagriinae (Tenebrionidae).

***Algon phiaoacensis* sp.n.**

**Holotype** ♂: “Coll. I. R.Sc.N.B., VIETNAM – Pia Oac, Pifall Summit, 22°36'N 105°53'E, 04-06-VII-2010, Leg. J. Constant & P. Limbourg / I.G.31.668” (IRSNB).

**DESCRIPTION**: 15 mm long (6.9 mm, abdomen excluded). – Black, labial palpi dark reddish, antennae reddish brown, segments 1 and 3 partly blackish, legs black, tarsi dark reddish, first two tarsomeres of mid and hind legs darker than remaining segments.

Head (Fig. 95) 1.26 times as wide as long, eyes large, about as long as tempora, postocular region moderately densely but coarsely punctate, broad portion at base of head densely punctate, punctures becoming smaller toward disc gradually blending into distinctly visible micro-punctuation; antennae with all segments oblong but 8–10 weakly oblong; pronotum (Fig. 96) 1.1 times as wide as long, sides subparallel in posterior half, distinctly narrowed anteriorly, giving the lateral margin a slightly angulate appearance, with a pair of admedian punctures in anterior fourth; elytra (Fig. 97) widened posteriorly, slightly trapezoidal, finely and densely punctate and pubescent in area delimited by imaginary line from scutellum toward postero-lateral angles, triangular medial portion glossy, in addition with a few large punctures within punctate area; scutellum densely and rather coarsely punctate.

Aedeagus (Figs. 13, 32, 49): median lobe in lateral view (Fig. 13) very slender, bent toward paramere, apical piece very short, with small subapical tooth; paramere (Fig. 49) long and slender, apex subacute, peg setae lacking.

**DISTRIBUTION** (Fig. 118): The species is at present known only from the type locality, Phia Oác, in Cao Bằng Province, northern Vietnam.

***Algon subtilis* sp.n.**

**Holotype** ♂: “China, NW Guangxi prov., Cenwangaoshan, 1750–2060 m, Nat. Res., 24°29'–30'N 106°24'E, Jatua leg., 28.V.2013” (NMW). – **Paratypes**: 4 ♂♂, 6 ♀♀, with same data as holotype (NMW).

**DESCRIPTION**: 12.5–13.0 mm long (6.0–6.5 mm, abdomen excluded). – Black, labial palpi reddish brown, labrum dark reddish brown, antennae dark brown, distal 2–3 segments paler reddish brown, frequently entire antennae dark reddish brown, legs with femora dark brown, tibiae reddish brown with extensively infusate medial faces, tarsi reddish, basal 1–2 segments often dark brown to almost blackish.

Head (Fig. 101) 1.23–1.24 times as wide as long, eyes moderately small, tempora 1.34–1.43 times as long as eyes; postocular region moderately densely but rather coarsely punctate, micro-punctuation distinct on entire dorsal surface; antennae short, segments 4–6 weakly oblong, segments 7–10 as long as wide; pronotum (Fig. 102) 1.11–1.13 times as wide as long, sides convex to slightly angulate, widest at about basal third, weakly narrowed toward base, more strongly anteriorly, without any indication of a dorsal row of punctures, except for an occasional larger puncture at anterior margin; elytra (Fig. 103) subparallel, fine punctuation and pubescence confined to very base, with variable number of larger punctures scattered in lateral two thirds of

each elytron; scutellum finely and densely punctate, punctural grooves, although shallow, sometimes more distinct.

Aedeagus (Figs. 18, 37, 54): median lobe in lateral view (Fig. 18) slender, bent toward paramere, apical portion extremely slender, apical piece hardly discernible; paramere (Fig. 54) filiform, parallel-sided, peg setae lacking.

DIAGNOSIS: The species is characterized by the presence of irregular rows of larger punctures on the elytra. The only other species with such punctures, although much less numerous, is *A. basilineatus*, which differs in the extended elytral subbasal ridge.

DISTRIBUTION (Fig. 118): The species is at present known only from the type locality in northwestern Guangxi Province, China.

ETYMOLOGY: The name of the species refers to the very slender paramere.

### *Algon uncus* sp.n.

**Holotype** ♂: “NE-LAOS: Prov. Hua Phan, Ban Saluei, Phou Pan, 11.4.-15.5.2012, 20°12'N 104°01'E, 1300-1900 m, leg. Holzschuh” (NMW).

DESCRIPTION: 14.7 mm long (7.0 mm, abdomen excluded). – Black, palpi and labrum dark reddish brown, antennae dark brown, distal three segments reddish brown, segments 1–2 and 7–8 partly reddish brown, tarsi reddish but first tarsomere of mid and hind legs darkened.

Head (Fig. 110) 1.28 times as wide as long, eyes moderately small, tempora 1.34 times as long as eyes; postocular region moderately densely, moderately coarsely punctate, only punctures bearing macrosetae rather coarse, micropunctuation distinct only in front of posterior margin, on vertex hardly visible; antennae slender, segments 4–8 distinctly oblong, 9 inconspicuously oblong, 10 as long as wide; pronotum (Fig. 111) 1.14 times as wide as long, sides almost regularly convex, slightly less narrowed posteriad than anteriad, very weakly and shallowly concave at level of anterior large lateral seta, dorsal surface without any indication of a dorsal row of punctures; elytra (Fig. 112) slightly widened posteriad, trapezoid, with distinct hook-like extension at shoulders (Fig. 117), fine punctuation and pubescence confined to basal third and deflexed part of elytra, remaining dorsal face of elytra glossy; scutellum moderately densely punctate, punctural groove comparatively large but very shallow.

Aedeagus (Figs. 22, 41, 58): median lobe in lateral view (Fig. 22) slender, bent toward paramere, apical piece very short, with distinct subapical tooth; paramere (Fig. 58) very slender, almost filiform, apex rounded, peg setae lacking.

DIAGNOSIS: The species is immediately recognizable by the hook-like humeral extensions of the elytra.

DISTRIBUTION (Fig. 118): The species is at present known only from the type locality in northern Laos.

ETYMOLOGY: The Latin noun “uncus” means “hook” and refers to the humeral extension of the elytra.

### *Algon zhenbaodingensis* sp.n.

**Holotype** ♂: “CHINA – N Guangxi, 23.6.2009, Zhenbaoding Shan, 2100 m, N 26.08,193', E 110.49,360', lgt. R. Sehnal & M. Hackel” (CSB). – **Paratypes**: 2 ♂♂, with same data as holotype (NMW, CNC).

DESCRIPTION: 12.5–13.0 mm long (6.0–6.8 mm, abdomen excluded). – Black, palpi and labrum reddish brown, antennae reddish brown or with first and middle segments darkened to variable extent, tarsi reddish but first tarsomere of mid and hind legs darkened.

Head (Fig. 113) 1.23–1.24 times as wide as long, eyes large, tempora 1.07–1.11 times as long as eyes, postocular region moderately densely to densely, coarsely punctate, micropunctuation distinct in front of base, less distinct to almost obsolete on vertex; antennae slender, segments 4–9 oblong, segment 10 about as long as wide; pronotum (Fig. 114) 1.12–1.14 times as wide as long, sides ever so slightly angulate to almost regularly convex, less distinctly narrowed posteriorly than anteriorly, dorsal surface with irregular dorsal row of punctures, however, one paratype without any indication of a punctural row; elytra (Fig. 115) slightly widened posteriorly, with fine punctuation and pubescence broad at base, delimiting line leading from scutellum to posterolateral angle of each elytron, diagonally separating elytron in pubescent and glossy part; scutellum rather densely but finely punctate.

Aedeagus (Figs. 11, 30, 48): median lobe in lateral view (Fig. 11) moderately slender, straight in basal two thirds, apically bent toward paramere, apical piece comparatively large, with distinct subapical tooth; paramere (Fig. 48) broad, with slightly convex sides, apex distinctly notched, with two clusters of usually three peg setae each at about midlength.

DISTRIBUTION (Fig. 118): The species is at present known only from the type locality in the very northeastern part of Guangxi Province, China.

#### List of currently known species of the *Algon kaiserianus* group

*Algon ailaoshanus* sp.n.

*Algon basilineatus* sp.n.

*Algon doupengshanus* sp.n.

*Algon fanjingshanus* sp.n.

*Algon fansipanicus* ASSING, 2015

*Algon grebennikovi* sp.n.

*Algon holzschuhi* SCHILLHAMMER, 2008

*Algon hubeiensis* SCHILLHAMMER, 2006

*Algon kaiserianus* (BERNHAEUER, 1933)

*Algon leigongshanus* SCHILLHAMMER, 2008

*Algon merkli* sp.n.

*Algon murzini* SCHILLHAMMER, 2008

*Algon phiaocensis* sp.n.

*Algon reuteri* SCHILLHAMMER, 2011

*Algon subtilis* sp.n.

*Algon tronqueti* SCHILLHAMMER, 2006

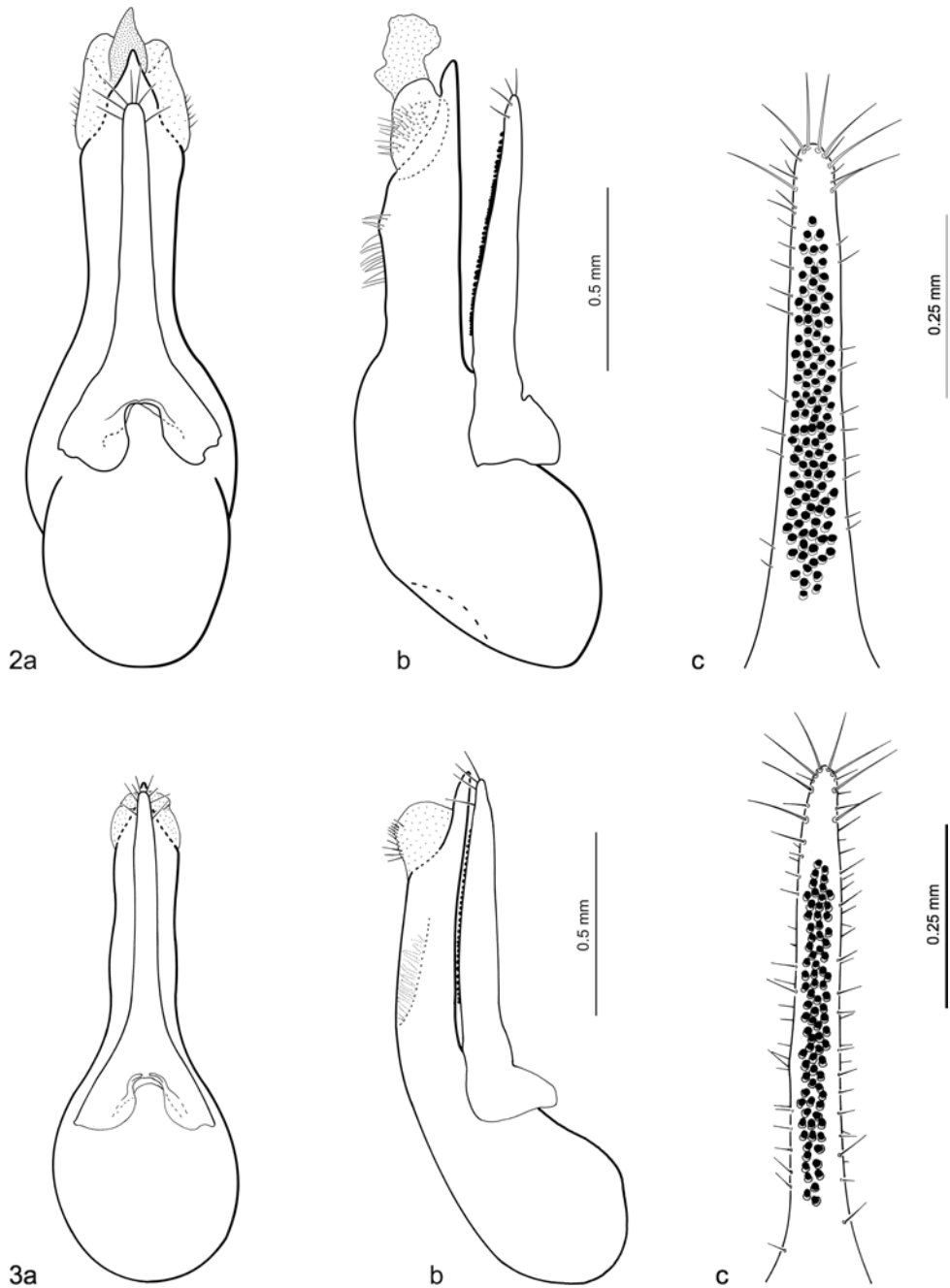
*Algon uenoi* HAYASHI, 2011

*Algon uncus* sp.n.

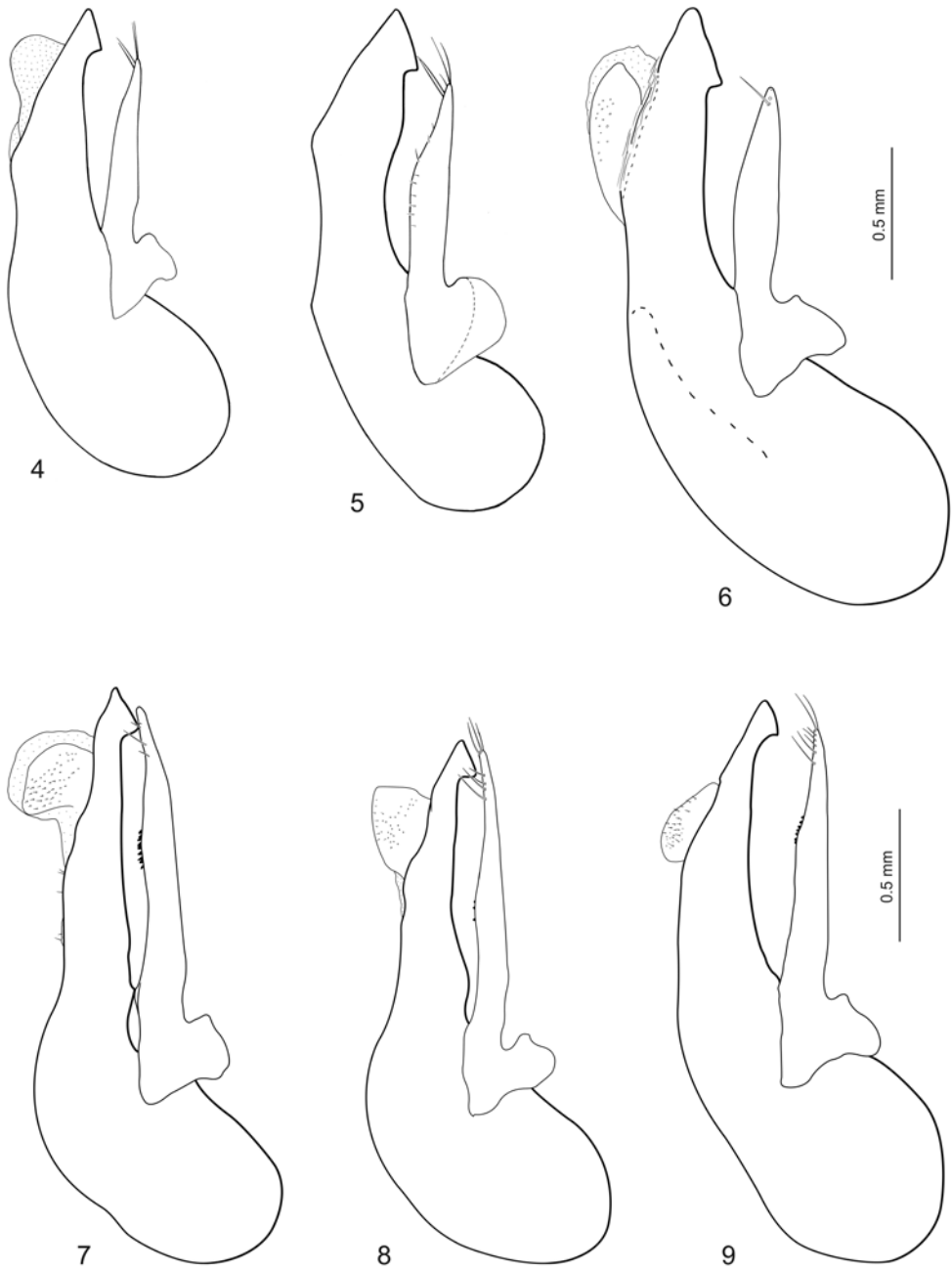
*Algon zhenbaodingensis* sp.n.



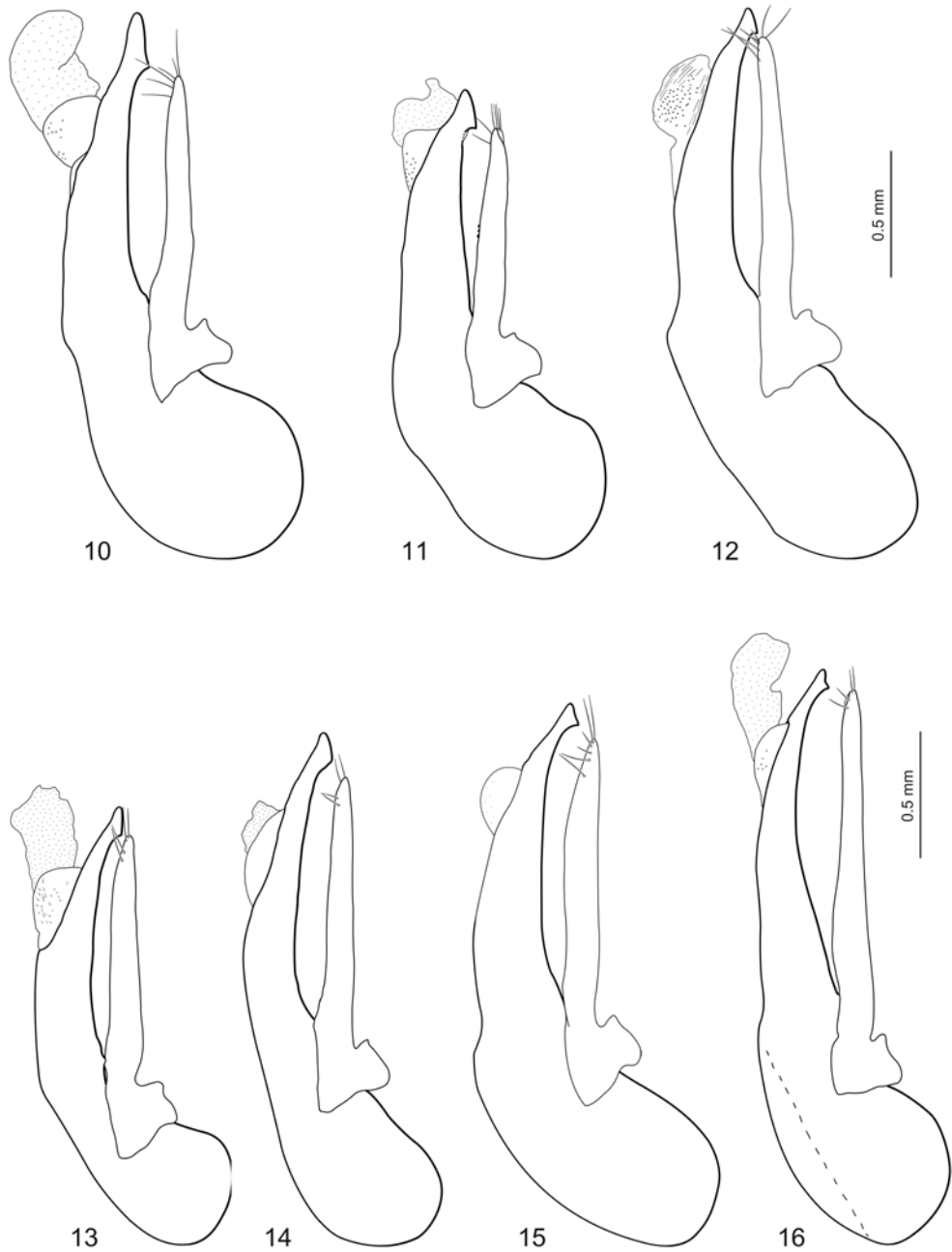
Fig. 1: *Algon mogokensis*, habitus.



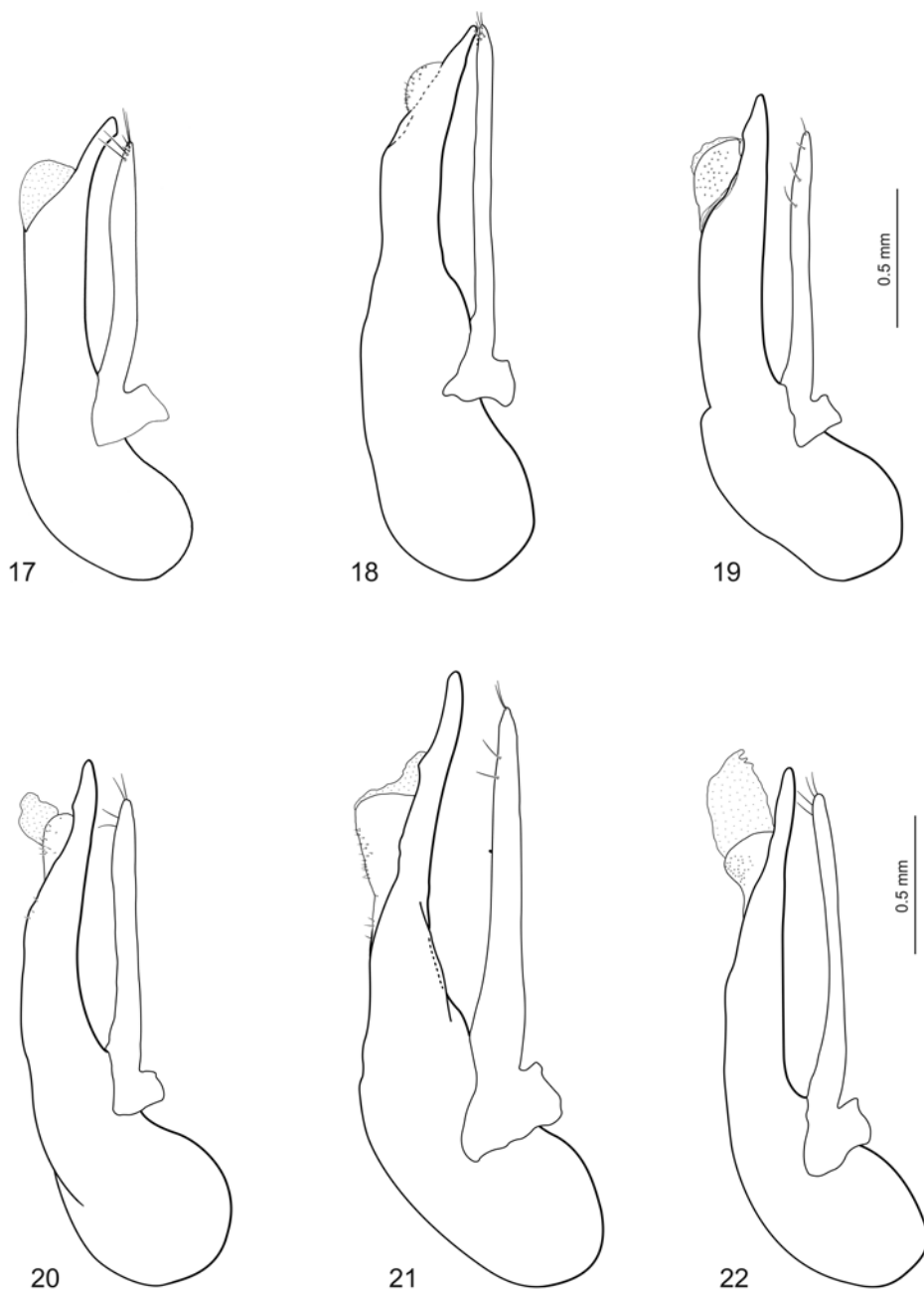
Figs. 2–3: Aedeagus in ventral (a), lateral (b) view and paramere (c) of 2) *Algon mogokensis*, 3) *A. pseudoculatus*.



Figs. 4–9: Aedeagus in lateral view of 4) *Algon kaiserianus*, 5) *A. tronqueti*, 6) *A. doupengshanus*, 7) *A. reuteri*, 8) *A. leigongshanus*, 9) *A. fanjingshanus*.

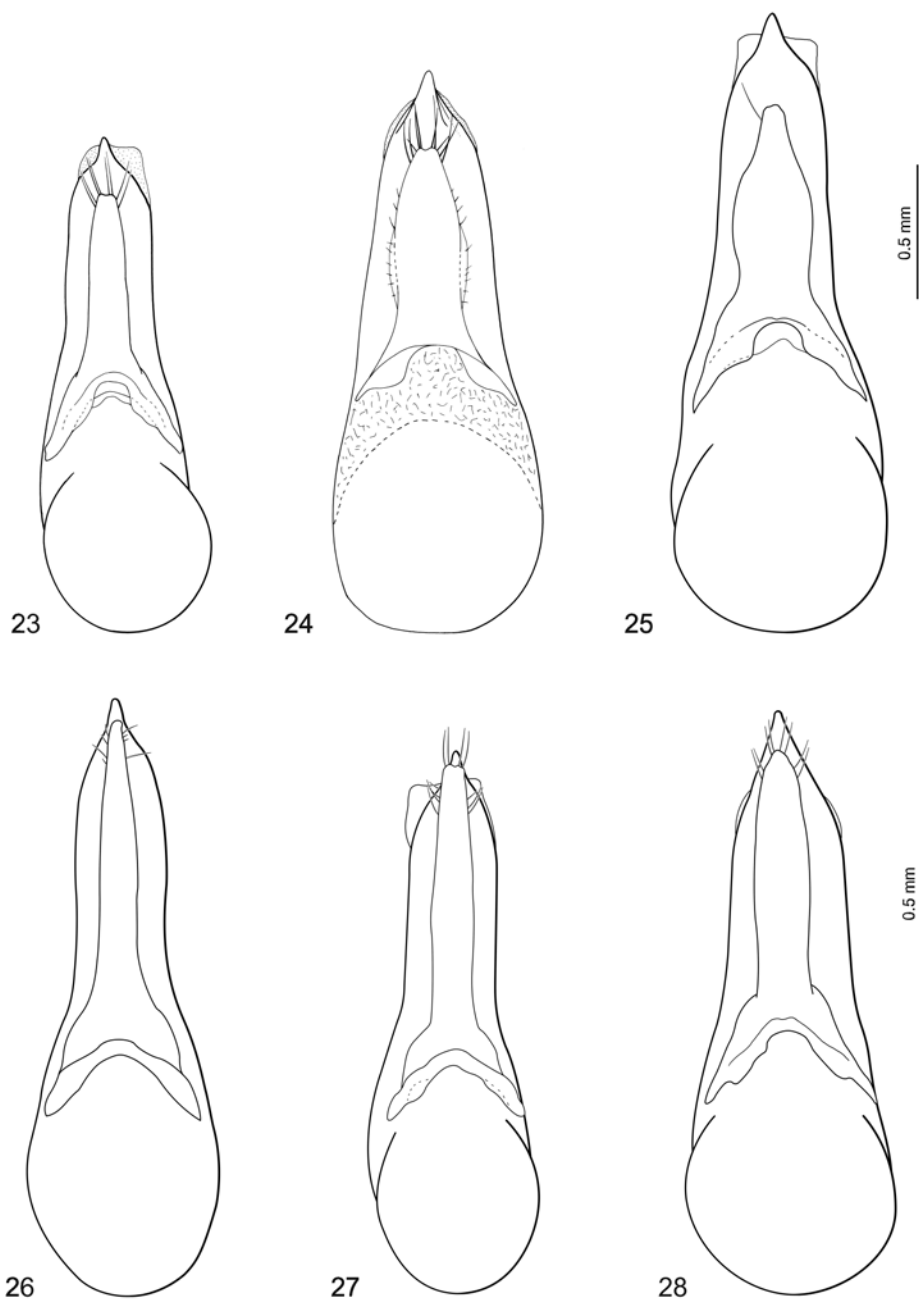


Figs. 10–16: Aedeagus in lateral view of 10) *Algon uenoi*, 11) *A. zhenbaodingensis*, 12) *A. murzini*, 13) *A. phiaocensis*, 14) *A. grebennikovi*, 15) *A. holzschuhi*, 16) *A. fansipanicus*.

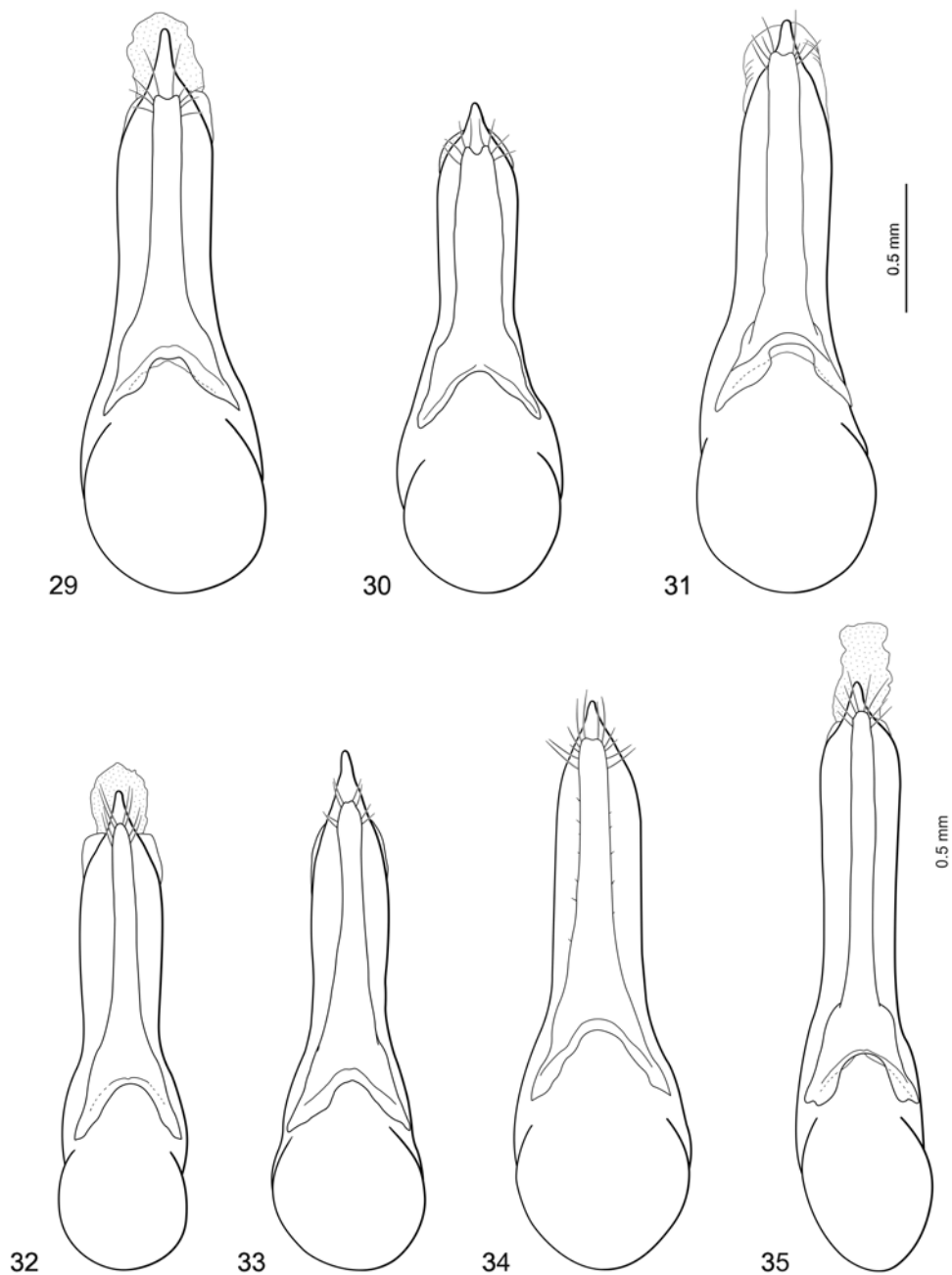


Figs. 17–22: Aedeagus in lateral view of 17) *Algon hubeiensis*, 18) *A. subtilis*, 19) *A. basilineatus*, 20) *A. ailaoshanus*, 21) *A. merkli*, 22) *A. uncus*.

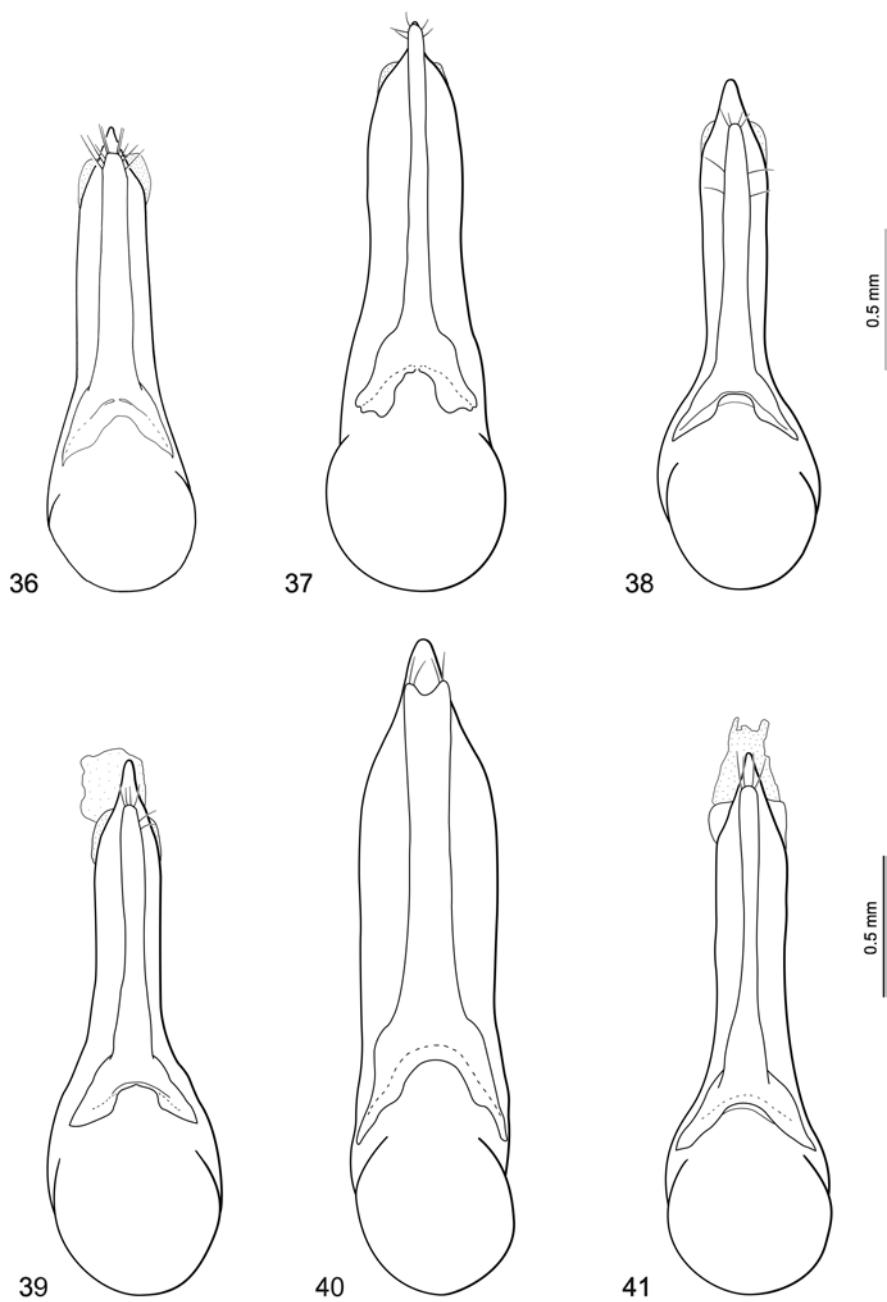




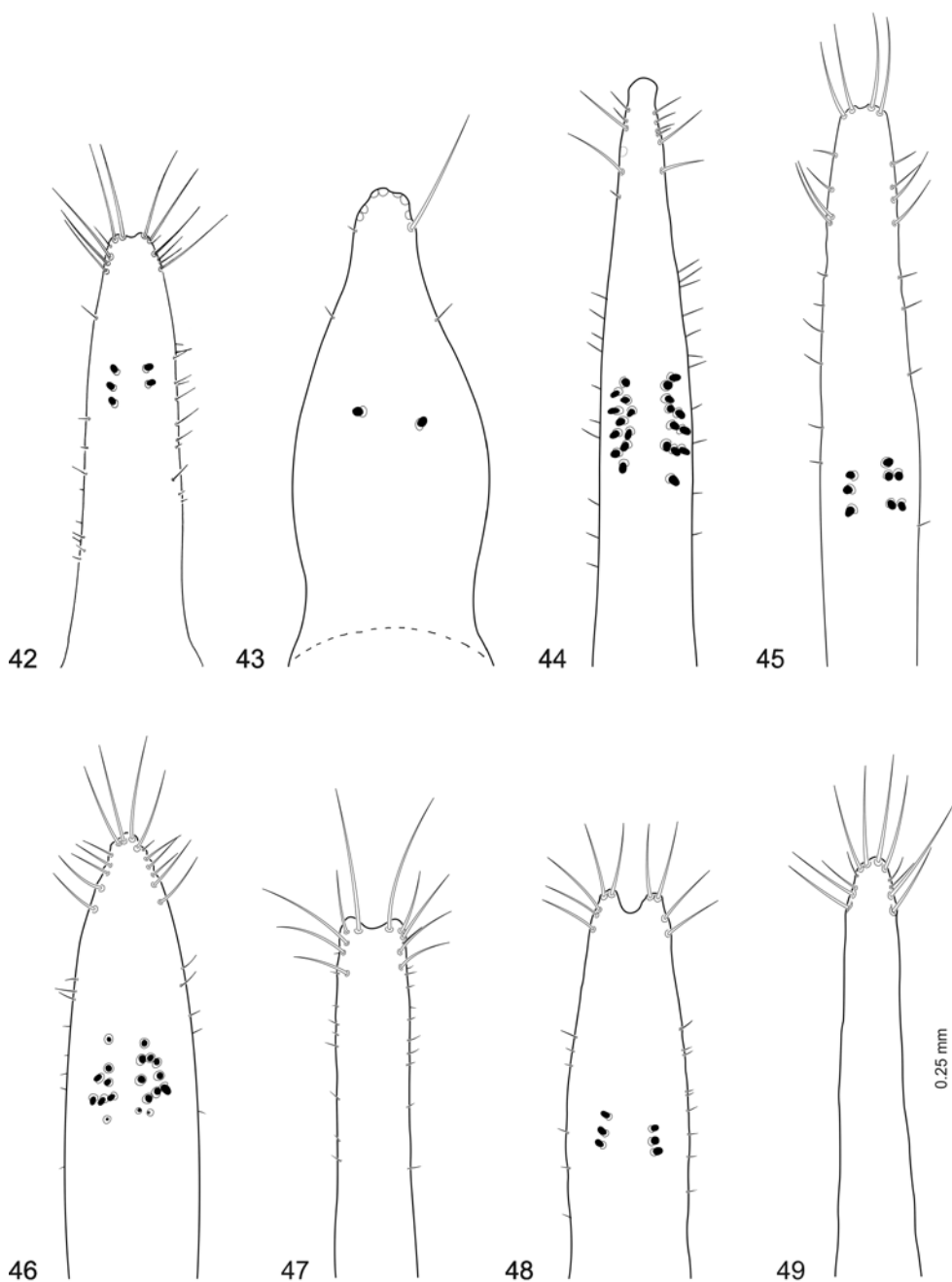
Figs. 23–28: Aedeagus in ventral view of 23) *Algon kaiserianus*, 24) *A. tronqueti*, 25) *A. doupengshanus*, 26) *A. reuteri*, 27) *A. leigongshanus*, 28) *A. fanjingshanus*.



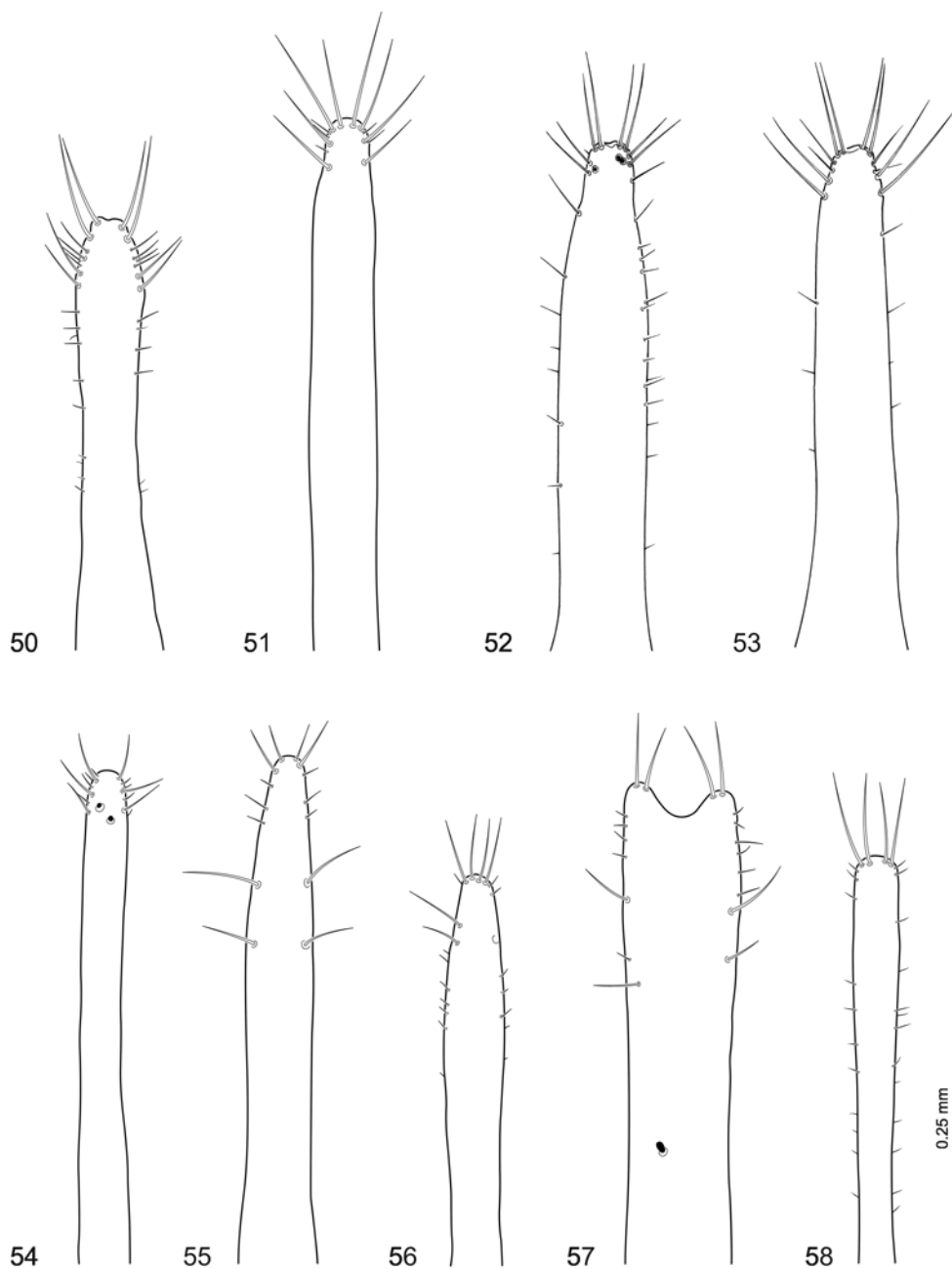
Figs. 29–35: Aedeagus in ventral view of 29) *Algon uenoi*, 30) *A. zhenbaodingensis*, 31) *A. murzini*, 32) *A. phiaocensis*, 33) *A. grebennikovi*, 34) *A. holzschuhi*, 35) *A. fansipanicus*.



Figs. 36–41: Aedeagus in ventral view of 36) *Algon hubeiensis*, 37) *A. subtilis*, 38) *A. basilineatus*, 39) *A. ailaoshanus*, 40) *A. merkli*, 41) *A. uncus*.



Figs. 42–49: Paramere of 42) *Algon kaiserianus*, 43) *A. doupengshanus*, 44) *A. reuteri*, 45) *A. leigongshanus*, 46) *A. fanjingshanus*, 47) *A. uenoi*, 48) *A. zhenbaodingensis*, 49) *A. phiaoacensis*.



Figs. 50–58: Paramere of 50) *Algon grebennikovi*, 51) *A. fansipanicus*, 52, 53) *A. hubeiensis*, 54) *A. subtilis*, 55) *A. basilineatus*, 56) *A. ailaoshanus*, 57) *A. merkli*, 58) *A. uncus*.



59



62



60



63



61

2.0 mm



64

2.0 mm

Figs. 59–64: Head, pronotum and elytra of 59–61) *Algon ailaoshanus*, 62–64) *A. basilineatus*.



65



68



66



69



67



70

Figs. 65–70: Head, pronotum and elytra of 65–67) *Algon doupengshanus*, 68–70) *A. fanjingshanus*.



71



74



72



75



73

2.0 mm



76

2.0 mm

Figs. 71–76: Head, pronotum and elytra of 71–73) *Algon fansipanicus*, 74–76) *A. grebennikovi*.





77



80



78



81



79

2.0 mm



82

2.0 mm

Figs. 77–82: Head, pronotum and elytra of 77–79) *Algon holzschuhi*, 80–82) *A. hubeiensis*.



83



86



84



87



85

2.0 mm



88

2.0 mm

Figs. 83–88: Head, pronotum and elytra of 83–85) *Algon kaiserianus*, 86–88) *A. leigongshanus*.



89



92



90



93



91

2.0 mm



94

2.0 mm

Figs. 89–94: Head, pronotum and elytra of 89–91) *Algon merkli*, 92–94) *A. murzini*.



95



98



96



99



97



100

Figs. 95–100: Head, pronotum and elytra of 95–97) *Algon phiaoacensis*, 98–100) *A. reuteri*.





101



104



102



105



103

2.0 mm



106

2.0 mm

Figs. 101–106: Head, pronotum and elytra of 101–103) *Algon subtilis*, 104–106) *A. tronqueti*.



107



110



108



111



109

2.0 mm



112

2.0 mm

Figs. 107–112: Head, pronotum and elytra of 107–109) *Algon uenoi*, 110–112) *A. uncus*.



113



114



115

2.0 mm



116



117

1.0 mm

Figs. 113–117: 113–115) Head, pronotum and elytra of *Algon zhenbaodingensis*; 116–117) elytral base of 116) *A. basilineatus*, 117) *A. uncus*.



Fig. 118: Distribution of species of the *Algon kaiserianus* group.

#### Key to species of the *Algon kaiserianus* group

- 1 Elytra with shoulders extended into sharp hook (Fig. 117)..... *uncus*
- Elytra with shoulders angled or slightly rounded, at most with a blunt gibbosity..... 2
- 2 Subbasal elytral ridge extending laterad toward humeral angle (Fig. 116), forming sharp plate-like structure at base of elytra..... *basilineatus*
- Subbasal elytra ridge normal, extending anteriad, or, if extending laterad, vanishing a short distance from scutellum, base of elytra thus without carina..... 3
- 3 Eyes larger, inconspicuously longer than tempora ..... *phiaoacensis*
- Eyes smaller, distinctly shorter than tempora, rarely only slightly shorter ..... 4
- 4 Entire elytra covered with sparse, very fine, regularly spaced setiferous punctures; aedeagus: Figs. 17, 36, 52, 53; head: Fig. 80; pronotum: Fig. 81; elytra: Fig. 82..... *hubeiensis*
- Elytra with posterior half or at least a large roundish area along suture glabrous..... 5
- 5 Elytra (Fig. 103) with irregular longitudinal rows of larger punctures..... *subtilis*
- Elytra without rows of larger punctures ..... 6
- 6 Elytral ground punctation more extensive, occupying entire base and lateral third or almost lateral half of each elytron between base and posterior margin, sometimes extending toward suture at posterior margin, leaving only a circular central spot glabrous (doubtful cases key out twice)..... 7
- Elytral ground punctation distinctly less extensive, elytra either almost entirely glabrous or, if extending toward posterior margin, never occupying more than the dorsolateral fifth or less of the elytral width in front of posterior margin (doubtful cases key out twice) ..... 9



- 7 Eyes small, tempora more than 1.5 times as long as eyes; pronotum without any indication of dorsal rows of punctures; aedeagus: Figs. 12, 31; head: Fig. 92; pronotum: Fig. 93; elytra: Fig. 94..... *murzini*
- Eyes larger, tempora less than 1.4 times as long as eyes; pronotum with rather irregular, usually asymmetrical, but distinct indication of dorsal rows of punctures ..... 8
- 8 Aedeagus: Figs. 9, 28, 46; China, Guangxi ..... *fanjingshanus*
- Aedeagus: Figs. 8, 27, 45; head: Fig. 86; pronotum: Fig. 87; elytra: Fig. 88; China, Guangxi...  
..... *leigongshanus*
- Aedeagus: Figs. 14, 33, 50; China, Sichuan ..... *grebennikovi*
- Aedeagus: Figs. 15, 34; head: Fig. 77; pronotum: Fig. 78; elytra: Fig. 79; China, Yunnan.....  
..... *holzschuhi*
- 9 Eyes larger, tempora about 1.1 times as long as eyes (rarely 1.2)..... 10
- Eyes smaller, tempora at least 1.25 times as long as eyes ..... 11
- 10 Aedeagus: Figs. 7, 26, 44; head: Fig. 98; pronotum: Fig. 99; elytra: Fig. 100; China, Guangxi..  
..... *reuteri*
- Aedeagus: Figs. 10, 29, 47; China, Sichuan ..... *uenoi*
- Aedeagus: Figs. 11, 30, 48; China, Guangxi ..... *zhenbaodingensis*
- 11 Species from Vietnam ..... 12
- Species from China..... 13
- 12 Smaller, more slender species; fore body length 6.5–7.1 mm, head width 2.2–2.5 mm, pronotum width 2.9–3.1 mm..... *fansipanicus*
- More robust species; fore body length 7.4–8.1 mm, head width 2.8–3.1 mm, pronotum width 3.3–3.6 mm..... *merkli*
- 13 Abdomen slender, subparallel between segments III–VII, paraterga narrow..... *ailaoshanus*
- Abdomen broad, with convex outline, widest at about level of segment IV, paraterga broad..... 14
- 14 Larger, fore body 8.1–8.7 mm long; eyes smaller, tempora more than 1.4 times as long as eyes, sides of pronotum almost regularly convex, distinctly narrowed toward base. *doupengshanus*
- Smaller, fore body less than 8 mm long; eyes larger, tempora less than 1.4 times as long as eyes, sides of pronotum subparallel in basal half, hardly narrowed toward base..... 15
- 15 Pronotum with irregular, asymmetrical, but distinct indication of dorsal rows of punctures (in addition to pair of larger punctures at anterior margin), often present as seemingly erratic single punctures on each side of midline, usually in anterior half of pronotum..... *grebennikovi*
- Pronotum without any indication of dorsal rows of punctures ..... 16
- 16 Elytra strongly trapezoidal, sharply angled at shoulders; aedeagus: Figs. 5, 24; head: Fig. 104; pronotum: Fig. 105; elytra: Fig. 106..... *tronqueti*
- Elytra less strongly trapezoidal, shoulders rounded; aedeagus: Figs. 4, 23, 42; head: Fig. 83; pronotum: Fig. 84; elytra: Fig. 85..... *kaiserianus*

### Zusammenfassung

Neue und zusätzliche Daten der Gattung *Algon* SHARP, 1874 werden präsentiert und elf neue Arten werden beschrieben; eine Art aus der *A. oculatus* Gruppe: *A. mogokensis* sp.n. (Myanmar), und zehn Arten aus der *A. kaiserianus* Gruppe: *A. ailaoshanus* sp.n. (China), *A. basilineatus* sp.n. (China), *A. doupengshanus* sp.n. (China), *A. fanjingshanus* sp.n. (China), *A. grebennikovi* sp.n. (China), *A. merkli* sp.n. (Vietnam), *A. phiaoacensis* sp.n. (Vietnam), *A. subtilis* sp.n. (China), *A. uncus* sp.n. (Laos), *A. zhenbaodingensis* sp.n. (China). Zwei Arten werden rede-

skribiert: *A. fansipanicus* ASSING, 2015 und *A. uenoi* HAYASHI, 2011. *Algon viridis* BOHAČ, 1992 wird zum ersten Mal für Laos nachgewiesen. Die Aedeagi und Körperdetails aller neuen Arten, sowie aller bekannten Arten der *A. kaiserianus* Gruppe, werden abgebildet. Ein Bestimmungsschlüssel und eine Verbreitungskarte der *A. kaiserianus* Gruppe vervollständigen die Studie.

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Autor(en)/Author(s): Schillhammer Harald

Artikel/Article: [New data and eleven new species of Algon SHARP, 1874, with a special focus on the A. kaiserianus group \(Coleoptera: Staphylinidae: Staphylininae\) 129-162](#)