

## Contribution to the knowledge of Chinese species of the genus *Agathidium* Panzer, 1797 (Coleoptera: Leiodidae: Leiodinae) - part II

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**Abstract.** Chinese species *Agathidium (Agathidium) petiskai* sp. nov., from Yunnan, *A. (A.) punctipenne* sp. nov. from Sichuan and Yunnan and *Agathidium (Neoceble) gibbum* sp. nov. from Yunnan are described and compared to the similar species.

### INTRODUCTION

*Agathidium* Panzer, 1797 is the most numerous genus within the family Leiodidae. Taking into account the new species described in this paper, the genus comprises 825 species, including subspecies 843 taxa currently. The phylogenetic analyses done by Sun-Jae Park, Richard Leschen and Kee-Jeong Ahn in 2013 built very good base for further studies in the *Agathidium* focused on the generic concept. Nevertheless being aware of the great number of the described taxa belonging in present perception of the genus to *Agathidium* and believing that dozens until unknown *Agathidium* can be expected to discover in the Palaearctics and the south-east Asia, the present paper is restricted to the description of species new to science only. Therefore the deeper taxonomic-phylogenetic studies are postponed for the future.

This paper continues the previous article dealing with the Chinese and Indian *Agathidium* fauna (Švec 2016). The previous paper, beside one species belonging to the subgenus *Euryceble* Hlissnikovský, 1964, contains the description of new species attributed to the *A. laevigatum* species group sensu Angelini (1993). This part II deals beside the description of a new species of the subgenus *Neoceble* Des Gozis, 1886 with the species of the subgenus *Agathidium* species group *madurensis* sensu Angelini. As the genus *Agathidium* generally is a sort of taxonomic puzzle, the species group *madurensis* is even more complicated. The species group was defined by Angelini (1993) as follows: “Capo con ribordo antero-laterale, elitra senza striae suturali, capo senza linea clypeale”. As the supraocular carina (= “ribordo antero-laterale”) is always present in *Agathidium* and raised in the part between clypeus and eye in a great range of height, it is rather difficult to assess if a certain species should be attributed to the species group *dentatum* or to species group *madurensis*. As the species newly described in the present paper possess supraocular carina between clypeus and anterior margin of eye noticeably raised, they are assigned to the species group *madurensis*.

## MATERIAL AND METHODS

Abbreviations of body parts and measurements:

AII-AXI	Antennomeres II-XI.
TI-TIII	Tarsomeres I-III.
AIII/AII	The ratio of the length or width of the antennomeres III:II, analogously ratios of others antennomeres.
L	Length.
W	Width.
L/W or W/L	Ratio between measurements
MTLM	Length of metaventricle measured at midline from the top of anterior process and top of posterior process of metaventricle.
MTLC	Length of metaventricle measured at the shortest distance (between mid- and hind-coxae).
MTW	Width of metaventricle measured between outermost postero-lateral points.
MTW/MTLM or MTLC	Ratio between relevant measurements.

Terminology:

Supraocular carina = Antero-lateral raised marginal bead of head (e.g. Angelini 2004), i.e. carina at antero-lateral margin of head dorsum running from clypeus just above eyes (if present) caudally,  
subocular line = line or even carina bordering eyes on ventral side,  
basal part of median lobe = median foramen (Park, Leschen & Ahn 2013),  
median lobe = median lobe of aedeagus.

Abbreviations of the collections:

CNCO	The Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Canada;
IZAS	The Institute of Zoology, Chinese Academy of Science, Beijing, China;
MSBC	collection M. Schülke, Museum für Naturkunde Berlin, Germany;
NMPC	National Museum, Praha, Czech Republic;
ZSPC	Zdeněk Švec, Praha, private collection, Czech Republic.

The descriptions are based on the holotypes. The variability is mentioned in the paragraph "Variation" if necessary and includes features exhibited by paratypes. Also the important characters of the sexual dimorphism are included in the mentioned paragraph. Those characters that seem to be usual in the genus - e.g. presence of short recumbent setae in dorsal punctures, microsculpture of venter, setosity on antennae, legs and venter are not mentioned in the descriptions.

The examined material has been compared with the type and other *Agathidium* material deposited in ZSPC and in NMPC. The material mentioned in this paper is deposited in the collections of CNCO, MSBC, and in ZSPC. Indication of the place of the deposition CNCO added to the locality data at the type and other examined species should be considered as temporary; this means that the holotypes and a part of the paratypes temporary deposited in CNCO will be eventually deposited in IZAS.

## DESCRIPTIONS

### *Agathidium (Agathidium) petiskai* sp. nov.

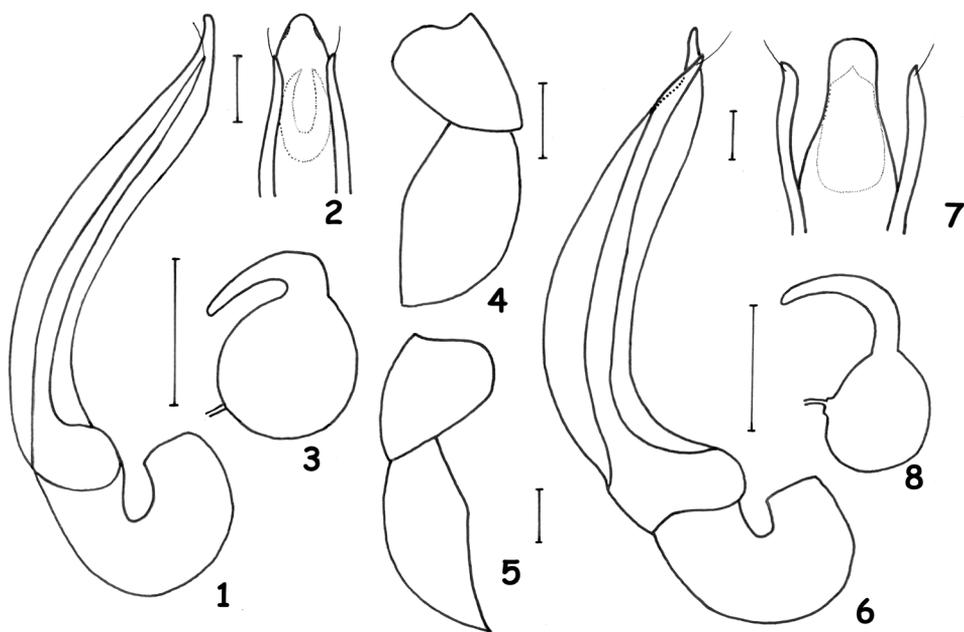
(Figs. 1-4, 12, 13)

**Type material.** Holotype (♂): “China: Yunnan [CH07-24], Nujiang/ Lisu Aut. Pref., Gaoligong Shan, valley, 18/ km W Gongshan, 3020 m, 27°47'54" N/ 98°30'13" E, mixed forest, litter, moss,/ wood sifted, 7.vi.2007, M. Schülke”, (MSBC). Paratypes (7 ♂♂, 1 ♀): the same data, (MSBC, ZSPC).

**Description.** Length of body 2.4 mm, head 0.5 mm, pronotum 0.8 mm, elytra 1.1 mm, antenna 0.7 mm, aedeagus 0.9 mm. Maximum width of head 0.8 mm, pronotum 1.3 mm, elytra 1.3 mm.

Short oval (Fig. 12). Dorsum and legs reddish with exception of lighter coloured last tarsomere, antennomeres I-VI yellow-red, AVII-AVIII infusate, AIX-AX dark brown, AXI red-brown. Ventral surface yellow-reddish with darker coxal margins and well developed proventral intercoxal process. Dorsum punctured, without microreticulation. Sutural striae absent; femoral lines developed, supraocular carina obtusively raised (species group *madurensis* sensu Angelini 1993).

Head. Shape as in Fig. 13. Maximum width of head at posterior margins of eyes. Eyes well developed. Supraocular carina low between eyes and antennal articulation raised



Figs. 1-8. Figs. 1, 6: aedeagus lateral; Figs. 2, 7: apex of aedeagus dorsal; Figs. 3, 8: spermatheca; Figs. 4, 5: pronotum with elytra lateral; 1-4- *Agathidium (Agathidium) petiskai* sp. nov.; 5-8- *A. (A.) punctipenne* sp. nov. Scale = 0.1 mm in Figs. 1-3, 6 - 8, 0.5 mm in Figs. 5, 6.

anteriorly. Subocular carina not developed. Clypeus slightly emarginate, clypeal line lacking. Antennomere III distinctly longer than AII (AIII/AII = 1.4). Ratio of length of AII-AXI (AII=1.0): 1.0-1.4-0.6-0.7-0.7-0.7-0.6-1.1-1.1-1.9. Ratio of width of AII-AXI (AII=1.0): 1.0-0.7-0.6-0.7-0.9-1.1-1.4-1.9-2.0-1.7. Ratio of W/L of AII-AXI: 0.8-0.4-0.8-0.8-1.0-1.3-2.0-1.3-1.4-0.7.

Surface of head smooth, lacking microsculpture but with very sparsely arranged very small and fine punctures separated by about 10 or more times their own diameters.

Pronotum. Shape in dorsal view as in Fig. 12, in lateral view as in Fig. 4. Punctuation sparser than that on head, punctures of similar strength as those on head.

Elytra. Shape as in Figs. 4, 12. Punctuation similarly sparse but more distinct, with punctures stronger than on head. Punctures separated by about 6-10 or more times their own diameter. Traces of transverse oblique and longitudinal lines in some places forming irregular large cells containing one or more punctures detectable on elytral surface as usual in many other *Agathidium*. Sutural stria absent.

Legs. All tarsomeres short, conically tapered apically in both sex. Tibiae slim. Hind femora with distinct triangular tooth at distal half of posterior margin. Tarsal formula: 5-5-4 in male; 5-4-4 in female.

Mesoventrite. Posterior part subconcave. Anterior part raised with longitudinal carina. Lateral lines not developed.

Metaventrte. Femoral lines shortened - evanescent far before lateral margins of metaventrte, forming widely opened letter V. Anterior part of metaventrte bordered by femoral lines a little elevated. Between both branches of femoral lines shortly before posterior margin of metaventrte with bunch of semi-erect lightly coloured setae. Metaventrte well developed - MTW/MTLM = 2.6; MTW/MTLC = 3.2.

Membranous wings fully developed.

Metascutum large, pentagonal.

Genitalia. Aedeagus as in Figs. 1, 2. Median lobe tapered toward closely rounded apex in dorsal view. Operculum U-shaped as in Fig. 2. Spermatheca as in Fig. 3.

**Variation.** Length of body 2.3-2.4 mm, AIII/AII=1.2-1.4 in the type series.

**Differential diagnosis.** *Agathidium (A.) petiskai* sp. nov. is very similar to *A. (A.) becvari* Angelini et Švec, 1994 from China (Yunnan) in size and shape of body head and eyes, the colour of its antenna, absence of sutural striae, by the feebly emarginate clypeus, the ratio of length of antennomeres III/II, by the toothed male femora, and fully developed wings. The new species differs by its stout and conical tarsi, closely rounded top of the median lobe that is broadly rounded in *A. becvari*; it differs also by the J-shaped basal part of the median lobe that is almost ring-shaped in *A. becvari*.

**Name derivation.** The new species is named to the honour of the well known Czech writers Eduard Petiška and his son Martin whose excellent books inspired me.

*Agathidium (Agathidium) punctipenne* sp. nov.

(Figs. 5-8, 14, 15)

**Type material.** Holotype (♂): “China, N-Yunnan, Nujiang Lisu Aut. Pr. Gongashan Co. Gaoligong Shan, valley at 3000-3050 m, 27°47.90' N, 98°30.19' E, 21.vi.2005, A. Smetana [C169]”, (ZSPC). Paratype (♂): the same data (ZSPC); paratypes (16 ♂♂, 16 ♀♀): “P.R. China, Yunnan E/ slope N Gaoligongshan./ N27°46.8' E098°33.1'// 12.-15.vi.2009, 2000/-3000m, sifting 1-7/ V.Grebennikov” (CNCO, ZSPC); (1♂): “P.R. CHINA, Yunnan W/ slope N Gaoligongshan./ N27°53.626' E098°24.168'// 08.vi.2009, 2500 m./ sifting 01, V.Grebennikov” (CNCO); (1♂): “P.R. CHINA: Sichuan./ E slope Gongga Shan/ N29°34'57'' E102°01'13''/ 04.vi.2011, 2798 m./sift 10. V. Grebennikov” (CNCO); (1♀): P.R. CHINA, Sichuan/ Emei Shan, N29°33.6' E103°20.6', 27.vi.-5.vii./ 2009, 1800-2400 m, sifti/ ngs 11-17, V. Grebennikov” (CNCO); (1♂, 3 ♀♀, 7 specimens): “China: N-Yunnan [C 2005-16] / Nujiang Lisu Aut. Pref., Gongshan Co. / Gaoligong Shan, side valley / 3000-3050 m 27°47.90' N 98°30.19' E // conif. forest with *Rhododendron*, broad / leaved bushes, litter, moss, dead wood / sifted along creek and snowfields / 21.vi.2005, M. Schülke [C2005-16]”, (MSBC, ZSPC).

**Description.** Length of body 3.3 mm, head 0.5 mm, pronotum 1.2 mm, elytra 1.6 mm, antenna 1.0 mm, aedeagus 1.1 mm. Maximum width of head 1.2 mm, pronotum 1.8 mm, elytra 1.7 mm.

Oblong oval (Fig. 14). Dorsum dark brown-black, antennae and legs reddish, AI darker. Ventral surface red-brown with lighter mesoventrite. Dorsum punctured, without microreticulation. Sutural striae absent; femoral lines developed, supraocular carina obtusively raised (species group *madurensis* sensu Angelini 1993).

Head. Shape as in Fig. 15. Maximum width of head shortly before posterior margins of eyes. Eyes well developed, drop-like shaped. Supraocular carina low between eyes and antennal articulation raised anteriorly. Subocular carina not developed. Clypeus slightly emarginate, clypeal line very feebly expressed, almost not detectable. Antennomere III distinctly longer than AII (AIII/AII = 1.7). Ratio of length of AII-AXI (AII=1.0): 1.0-1.7-0.9-0.9-0.8-0.8-0.6-1.3-1.1-2.1. Ratio of width of AII-AXI (AII=1.0): 1.0-0.8-0.8-0.8-0.9-1.0-1.0-1.6-1.7-1.6. Ratio of W/L of AII-AXI: 0.9-0.4-0.8-0.8-1.0-1.1-1.4-1.1-1.4-0.7.

Surface of head smooth, lacking microsculpture but with very sparsely arranged small and fine punctures separated by about 4-5 times their own diameters.

Pronotum. Shape in dorsal view as in Fig. 14, in lateral view as in Fig. 5. Punctuation finer and sparser than that on head, punctures separated by about 6 or more times their own diameter.

Elytra. Shape as in Figs. 5, 14. Punctuation distinct, strongly developed, much stronger and denser than on head. Punctures separated by about 1-2 times their own diameter. Very fine transverse, oblique and longitudinal lines forming irregular large cells containing one or more punctures detectable on elytral surface as usual in many other *Agathidium*. Sutural stria absent.

Legs. Anterior and mid-tarsomeres I feebly widened and protracted in male. Tibiae slim. Hind femora with distinct tooth distally. Tarsal formula: 5-5-4 in male; 5-4-4 in female.

Mesoventrite. Posterior part subconcave. Anterior part raised with longitudinal carina. Lateral lines developed.

Metaventrte. Femoral lines almost reaching lateral margins of metaventrte, forming semicircular curve, anterior part of metaventrte bordered by femoral lines a little elevated. Metaventrte well developed - MTW/MTLM = 2.7; MTW/MTLC = 3.3.

Membranous wings absent.

Metascutum small, pentagonal.

Genitalia. Aedeagus as in Figs. 6-7. Median lobe broadly rounded apically in dorsal view. Operculum roof-shaped distally as in Fig. 7. Spermatheca as in Fig. 8.

**Variation.** Length of body 2.6-3.3 mm, AIII/AII=1.6-1.9 in the type series. Tarsi slender in female.

**Differential diagnosis.** *Agathidium* (*A.*) *punctipenne* sp. nov. is similar to *A.* (*A.*) *krali* Angelini et Švec, 2002 from China (Sichuan) in size and colour of its body, absence of sutural striae, lack of membranous wings, by the feebly emarginate clypeus, by the toothed male femora and shape of the distal part of the median lobe of the aedeagus that is very broadly rounded. The new species differs by the head widest before hind margin of eyes while head of *A. krali* is widest at posterior margin of the eyes, it differs also by the J-shaped basal part of the median lobe that is ring-shaped in *A. krali* and also by the unicolorous antennae while AIX and AX are dark in *A. krali*.

**Name derivation.** The name of the new species refers to the distinctly punctured elytra (from Latin punctus = puncture and penna = wings).

***Agathidium* (*Neoceble*) *gibbum* sp. nov.**

(Figs. 9-11, 16-17)

**Type material.** Holotype (♂): "CHINA: N-Yunnan, Diquing Tibet/ Aut.Pr. Zhongdian Co. Xue Shan/ nr. lake, 23 km S Zhongdian/ 27°37.1' N, 99°38.5' E 3850 m/ 6.vi.2005 A. Smetana (C153b)", (ZSPC).

**Description.** Length of body 2.1 mm, head 0.4 mm, pronotum 0.5 mm, elytra 1.2 mm, antenna 0.7 mm, aedeagus 0.8 mm. Maximum width of head 0.8 mm, pronotum 1.2 mm, elytra 1.3 mm.

Short oval (Fig. 16). Dorsum, legs and antennomeres I-VIII and AXI light red-brown, AIX, AX brown. Ventral surface brown with lighter chin. Dorsum punctured, without microreticulation, sutural striae well developed; femoral lines absent (species group *nigripenne* sensu Angelini 1993).

Head. Shape as in Fig. 17. Maximum width of head shortly behind posterior margins of eyes. Eyes well developed. Supraocular carina low between eyes and antennal articulation raised anteriorly. Subocular carina not developed. Head with bump above the antennal insertion on each side. Clypeus very slightly flatly emarginate, clypeal line feebly expressed. Antennomere III very slightly longer than AII (AIII/AII = 1.1). Ratio of length of AII-AXI (AII=1.0): 1.0-1.1-0.7-0.7-0.7-0.7-1.0-1.0-1.7. Ratio of width of AII-AXI (AII=1.0): 1.0-0.9-0.9-1.1-1.1-1.7-1.6-2.0-2.3-2.3. Ratio of W/L of AII-AXI: 0.8-0.6-1.0-1.3-1.3-2.0-1.8-1.6-1.8-1.1. Surface of head smooth, lacking microsculpture but with distinct puncturation. Punctures irregularly distributed, separated by about 3-6 times their own diameters. Some very small punctures rarely interposed between basic puncturation.

Pronotum. Surface smooth without microsculpture. Shape in dorsal view as in Fig. 16, in lateral view as in Fig. 11. Punctuation similar to that on head, punctures approximately of similar density but finer than those that on head. Some very small punctures sparsely interposed between basic punctuation.

Elytra. Shape as in Figs. 11, 16. Punctuation distinct, strongly developed, much stronger and denser than on head. Punctures separated by about 2-3 times their own diameter. Extremely fine transverse, oblique and longitudinal lines forming traces of irregular large cells containing more punctures detectable on elytral surface as usual in many other *Agathidium*. Sutural stria distinct confined apical half of elytral length.

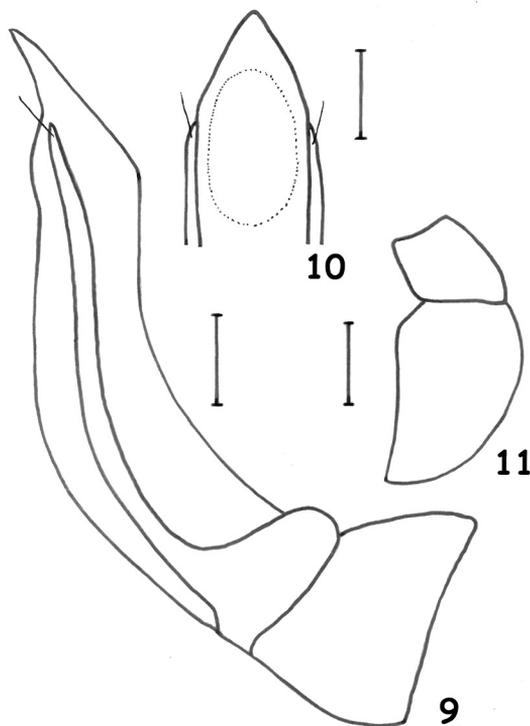
Legs. Anterior and mid-tarsomere I feebly widened. Tibiae slim. Hind femora with distinct tooth distally. Tarsal formula: 5-5-4.

Mesoventrite. Deeply depressed. Anterior part a little raised roof-shaped. Lateral lines not developed.

Metaventrte. With small fovea centrally equipped by brush of light erect setae. Femoral lines not developed.

Membranous wings vestigial.

Metascutum large, pentagonal.



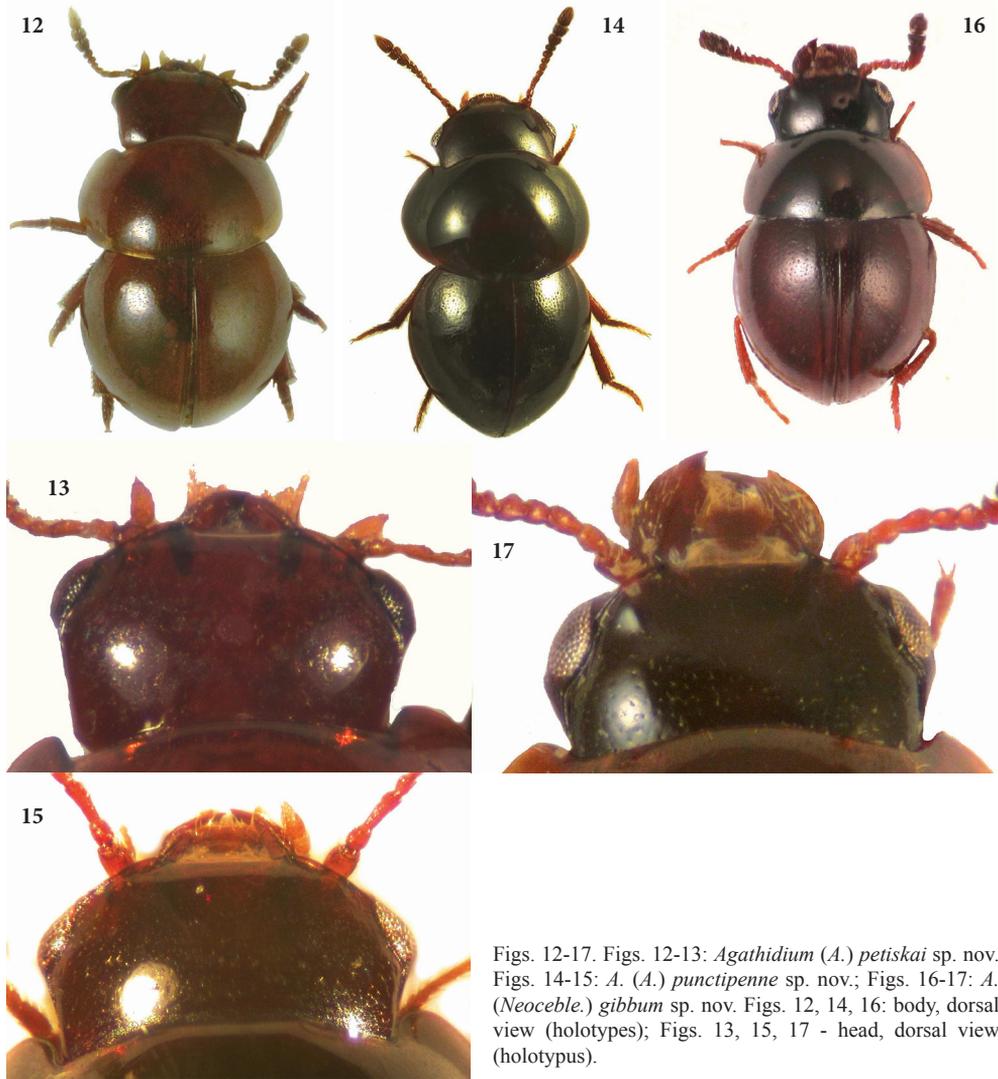
Figs. 9-11. *Agathidium (Neoceble) gibbum* sp. nov.: 9- aedeagus lateral; 10- apex of aedeagus dorsal; 11- pronotum with elytra lateral.

Genitalia. Aedeagus as in Figs. 9-10. Median lobe evenly rounded to the almost pointed tip distally in dorsal view. Operculum oval as in Fig. 10.

Female. Unknown.

**Differential diagnosis.** *Agathidium (N.) gibbum* sp. nov. is similar to *A. (N.) aleseki* Švec, 2011 from China (Sichuan) and *A. (N.) dundai* Angelini et Švec, 1994 from China (Shaanxi, Sichuan, Yunnan) in shape of the body, colour of its antennae, shape of head, absence of microsculpture, presence of sutural striae and by the feebly emarginate clypeus. The new species differs by the evenly narrowed median lobe of aedeagus distally while the distal part of the median lobe is leaf *Tilia*-shaped in *A. aleseki* and *A. dundai*.

**Name derivation.** The name of the new species refers to the humps developed above the antennal articulation (from Latin *gibbus* = hump).



Figs. 12-17. Figs. 12-13: *Agathidium (A.) petiskai* sp. nov. Figs. 14-15: *A. (A.) punctipenne* sp. nov.; Figs. 16-17: *A. (Neoceble.) gibbum* sp. nov. Figs. 12, 14, 16: body, dorsal view (holotypes); Figs. 13, 15, 17 - head, dorsal view (holotypus).

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