

## New Leiodinae (Coleoptera: Leiodidae) from India and Papua New Guinea

Zdeněk ŠVEC

Kamenická 4, CZ-170 00 Praha 7, Czech Republic; e-mail: zd.svec@volny.cz

**Abstract.** Six species of *Agathidium* Panzer, 1797 are described from northeast India: *Agathidium (Agathidium) fikaceki* sp. nov. (Meghalaya), *A. (Macroceble) cochleariforme* sp. nov. (Arunachal Pradesh), *A. (M.) armigerum* sp. nov. (Arunachal Pradesh), *A. (M.) unicorne* sp. nov. (Arunachal Pradesh), *A. (M.) guttiferum* sp. nov. (Arunachal Pradesh), and *A. (M.) acutangulum* sp. nov. (Arunachal Pradesh). *Zeadolopus punctiventris* sp. nov. is described from Papua New Guinea. All species are compared with the similar species and the diagnostic characters are illustrated.

**Key words.** Leiodidae, Leiodinae, *Agathidium*, *Zeadolopus*, taxonomy, new species, India, Papua New Guinea, Oriental Region, Australian Region

### Introduction

The genus *Agathidium* Panzer, 1797 is the most speciose genus of the subfamily Leiodinae, with more than 815 species known at present (ANGELINI 2010, COOTER & ŠVEC 2011, ŠVEC 2011). The bulk of the species, 726, are known from the Palearctic and Oriental Regions. Indian species of the genus *Agathidium* have been comprehensively elaborated by ANGELINI (2004), ANGELINI & DE MARZO (1983a,b, 1984, 1985, 1986), ANGELINI & STEPHENSON (1990), ANGELINI & ŠVEC (2002) and ŠVEC (2011). Six species new to science from India (Arunachal Pradesh and Meghalaya) are added in the present paper.

The genus *Zeadolopus* Broun, 1903 is distributed worldwide, with a total of 61 described species. Among them, 19 species are known from the Australian Region (DAFFNER 1982, 1983a,b, 1985a,b; ŠVEC 1997, 2002; COOTER & ŠVEC 1997). One species new to science is described here from Papua New Guinea, increasing the total number of species to 62.

### Material and methods

The present paper is based on a small but interesting amount of material, recently collected in northeast India and Papua New Guinea. Type material is preserved in the collections of the National Museum, Prague (NMPC) and in the collection of the author (ZSPC).

If it is not stated otherwise, the descriptions, including the measurements of individual body parts, are based on the holotypes only. On the other hand, the measurements of total body length were taken from all specimens examined. All measurements are given to one decimal place. The description of the variability is based on the paratypes of the respective new species.

Dissected male and female genitalia were mounted in Arabic gum on the same card with the beetle, or on a transparent plastic strip attached to the same pin as the respective specimen.

Each type specimen is indicated by a red label bearing the status of the specimen (holotype or paratype, respectively), name of the species, name of the author and the year of the designation. The type label is attached to the same pin as the specimen.

## Descriptions of new species

Tribe Agathidiini

### *Agathidium* Panzer, 1797

subgenus *Agathidium* Panzer, 1797

*Agathidium dentatum* species group

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

(Figs. 1, 2, 18, 19)

**Type locality.** India, Meghalaya, eastern Khasi Hills, 11 km SW of Cherrapunjee, Laitkynsew, 25°12'48"N 91°39'48"E, 735 m a.s.l.

**Type material.** HOLOTYPE: ♂ (NMPC): 'INDIA: Meghalaya state (7+9) / E Khasi Hills, 11 km SW Cherra- / punjee, Laitkynsew 25.iv.2008 / 25°12'48"N 91°39'48"E, 735 m / Fikáček, Podskalská, Šípek lgt. // secondary tropical rainforest / with young trees + bamboo just / below the village, thin layer of / leaf litter (sifting)'. PARATYPES: 3 ♂♂ (NMPC, ZSPC): same data as the holotype.

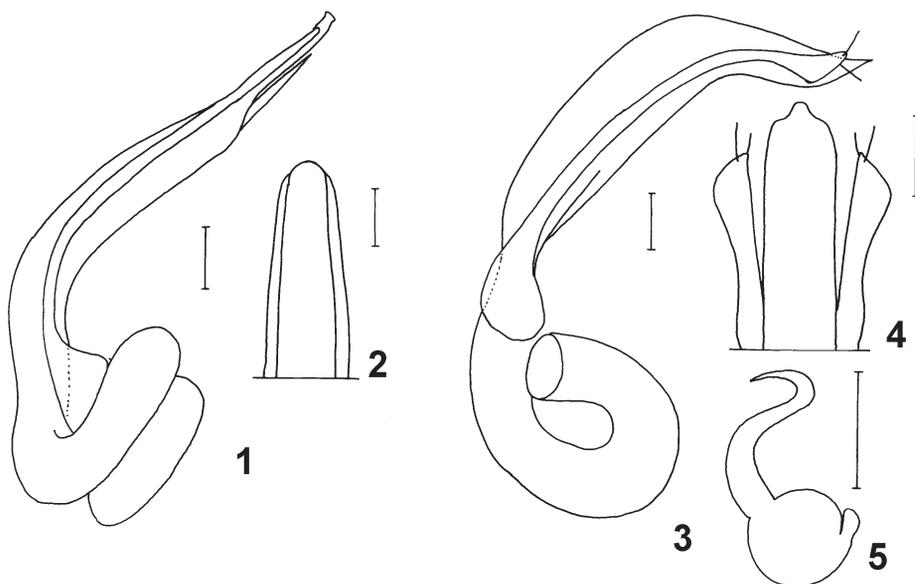
**Description.** Body length 2.0 mm. Length of body parts (holotype): head 0.3 mm, pronotum 0.8 mm, elytra 0.9 mm, antenna 0.7 mm. Maximum width of body parts (holotype): head 0.8 mm, pronotum 1.2 mm, elytra 1.2 mm.

Body oval (Fig. 18), dark chestnut coloured with lighter pronotal margins. Venter yellow-reddish. Legs and antennomeres I-VI yellow-red, antennomeres VII-XI dark. Dorsum without microreticulation; dorsal surface punctate, punctures regularly arranged, each with very short and fine seta.

Head. Maximum width of head at basal third of eyes. Eyes bulging, 3.7 times as long as wide in dorsal view. Clypeus flatly emarginate, clypeal line absent. Anterolateral margin of head moderately narrow, raised. Dorsal surface with very sparsely scattered fine punctures separated by more than 8× of their diameter. Relative length of antennomeres III : II = 1.5.

Pronotum. Widest at basal third. Lateral sides almost straightly tapered from posterior to anterior corners in dorsal view; rounded in lateral view (Fig. 19). Pronotal puncturation fine, similar to that of head; punctures separated by about 5–6× of their diameter.

Elytra. Broadest approximately at basal fourth. Punctures similar to those on head and pronotum; puncturation a little sparser. Sutural stria absent.



Figs. 1–5. Genitalia of *Agathidium* species. 1–2 – aedeagus of *Agathidium (Agathidium) fikaceki* sp. nov. (1 – lateral view, 2 – apex in dorsal view). 3–5 – *A. (Macroceble) cochleariforme* sp. nov. (3 – aedeagus, lateral view; 4 – apex of aedeagus, dorsal view; 5 – spermatheca). Scale bars = 0.1 mm.

**Legs.** Protarsomere I slightly enlarged in male. Femora and tibiae slender, simple (i.e. without any tooth or emargination on posterior margin). Tarsal formula: 5-5-4 in male. Female unknown.

**Mesoventrite.** Longitudinal mesoventral carina low; lateral lines not developed.

**Metathoracic wings** absent.

**Metaventrite.** Femoral lines incomplete. Male with shallow subcircular depression near posterior margin between coxae bearing a group of long erect setae.

**Genitalia.** Tegmen with horizontally orientated spiral part and broadly rounded apex as in Figs 1–2. Operculum very long, narrowly U-shaped. Female not known.

**Variability.** The length ratio of antennal segments III:II varies between 1.3–1.5 in the type series; the ratio of length : width of eyes in dorsal view varies between 3.4–3.9.

**Differential diagnosis.** *Agathidium (Agathidium) fikaceki* sp. nov. resembles *A. (A.) pseudomontanellum* Angelini & DeMarzo, 1986 in body size, coloration of the antennae, the presence of fine and sparse dorsal puncturation, absence of the microsculpture on the dorsum, absence of sutural striae, and by the broadly rounded apex of the tegmen in dorsal view. The new species differs from *A. pseudomontanellum* by the lighter coloration of the dorsum, by the absence of metathoracic wings, by the longer antennomere III (the length ratio antennomeres III : II=1.3–1.5 in *A. fikaceki* sp. nov. while 1.0 in *A. pseudomontanellum*), and by the narrow parameres in

both dorsal and lateral views (in contrast to dorsoventrally flattened parameres with broad basal part in lateral view in *A. pseudomontanellum*). As it is sometimes difficult to recognize if the examined species belongs to the *Agathidium madurense* species group or to a different species group, the new species was also compared with *A. madurense* Portevin, 1937 and *A. shilongense* Angelini & DeMarzo, 1986 (both attributed to the *Agathidium madurense* species group by ANGELINI (2004)). The new species is similar to both above species in the coloration of the dorsum and antennae, the presence of dorsal puncturation, absence of microsculpture on the dorsum, absence of sutural striae and clypeal line, the length ratio of the antennomeres III : II and by the same tarsal formula in males. The new species differs from *A. shilongense* and *A. madurense* by the absence of metathoracic wings, by smaller size (compared to 2.8–3.0 mm in *A. shilongense* and 3.2–3.3 mm in *A. madurense*), by the spiral, horizontally oriented basal part of the tegmen (compared to the irregularly twisted basal part in *A. shilongense*) and by the broadly rounded apex of the tegmen in dorsal view (compared to abruptly rounded apex in *A. shilongense*). The new species also differs by the narrow parameres in lateral view, in contrast to parameres with a broad basal part in lateral view in *A. madurense*.

**Etymology.** The new species is named after one of its collectors, Martin Fikáček (Prague).

**Bionomics.** The type specimens were collected by sifting of a thin layer of leaf litter in the bamboo bushes growing at the margin of the secondary tropical forest on the southern slope of the Meghalaya Plateau (M. Fikáček, pers. comm.).

subgenus *Macroceble* Angelini, 1993

*Agathidium (Macroceble) cochleariforme* sp. nov.

(Figs. 3–5, 20, 21)

**Type locality.** India, Arunachal Pradesh, 1.5 km NE of Bomdila near Bomdilla pass, 27°16'34"N 92°25'49"E, 2600 m a.s.l.

**Type material.** HOLOTYPE: ♂ (NMPC): 'INDIA: Arunachal Pradesh (14) / 1.5 km NE of Bomdila, nr. Bom- / dila pass, 2.–5.v.2008, 2600 m / 27°16'34"N 92°25'49"E / Fikáček, Podskalská, Šípek lgt. // dense evergreen bushes on / slopes (*Rhodod.*, *Pieris* etc.) / sifting: wet leaf litter'. PARATYPES: 3 ♀♀ (NMPC, ZSPC): same data as the holotype.

**Description.** Body length 1.9–2.0 mm (holotype: 2.0 mm). Length of body parts (holotype): head 0.4 mm, pronotum 0.8 mm, elytra 0.8 mm, antenna 0.8 mm. Maximum width of body parts (holotype): head 1.0 mm, pronotum 1.2 mm, elytra 1.2 mm.

Body shortly oval (Fig. 20), head and pronotum light chestnut coloured, elytra chestnut coloured. Venter yellow-reddish. Legs and antennae yellow-red. Dorsum without microreticulation; punctuate, punctures regularly arranged, each with very short and fine seta.

Head. Maximum width of head at middle of eyes. Eyes flat, 5 times as long as wide in dorsal view. Clypeus very feebly and flatly emarginate, clypeal line absent. Dorsal surface with very sparse scattered fine punctures separated by more than 10× of their diameters. Left mandible without any horn. Small bump present above antennal articulation. Relative length of antennal segments III : II = 1.5.

Pronotum. Widest at basal third. Lateral sides roundly tapered to anterior corners in dorsal view; broadly rounded in lateral view (Fig. 21). Puncturation as that of head.

Elytra. Broadest approximately at basal fourth. Punctures larger than on head and pronotum, separated by more than 10× their diameter. Sutural stria absent.

Legs. Protarsomere I a little enlarged in male. Tarsi slender in female. Femora and tibiae slender. Hind femora with small thin, pointed tooth close to midlength of posterior margin, Female femora simple. Tarsal formula: 5-5-4 in male, 4-4-4 in female.

Mesoventrite. Low, slightly developed longitudinal mesoventral carina present; lateral lines not developed.

Metathoracic wings absent.

Metaventrite. Femoral lines absent. Male with horn-shaped ventro-caudally oriented process at posterior margin between coxae.

Genitalia. Aedeagus as in Figs. 3–4. Operculum broadly U-shaped. Spermatheca as in Fig. 5.

**Variability.** The length ratio of the antennal segments III : II varies between 1.4–1.6 in the type specimens; the ratio of the length:width of the eyes in dorsal view varies between 5–6. The dorsum of one of the paratypes is slightly chestnut in colour.

**Differential diagnosis.** *Agathidium (Macroceble) cochleariforme* sp. nov. resembles *A. (Macr.) brancuccii* Angelini & DeMarzo, 1981 and *A. (Macr.) guttiferum* sp. nov. in the size of body, coloration of the antennae, the presence of dorsal puncturation, absence of microsculpture on the dorsum, absence of sutural striae and by the presence of the semivertical process on the metaventrite. The new species differs from *A. guttiferum* sp. nov. by the shorter antennomere III (the length ratio antennomeres III : II=1.4–1.6 in *A. cochleariforme*, while 1.7–1.8 in *A. guttiferum* sp. nov.), unicolored elytra, well developed eyes in dorsal view and also by the hemispherical shape of the basal part of the spermatheca (which is slender in *A. guttiferum* sp. nov.). It differs from *A. brancuccii* by the much sparser dorsal puncturation and by the shape of the median lobe that ends in a small process in *A. cochleariforme*, while it is simply pointed in *A. brancuccii*. The new species also differs from both *A. brancuccii* and *A. guttiferum* by the spoon-shaped distal part of the parameres (in contrast to the simply shaped parameres in both of the latter species).

**Etymology.** The species name refers to the spoon-shaped distal part of the parameres (*cochlear* in Latin means a spoon).

**Bionomics.** Type specimens were collected by the sifting of thick layers of wet leaf litter below dense evergreen bushes of *Rhododendron* and *Pieris* (M. Fikáček, pers. comm.).

### *Agathidium (Macroceble) armigerum* sp. nov.

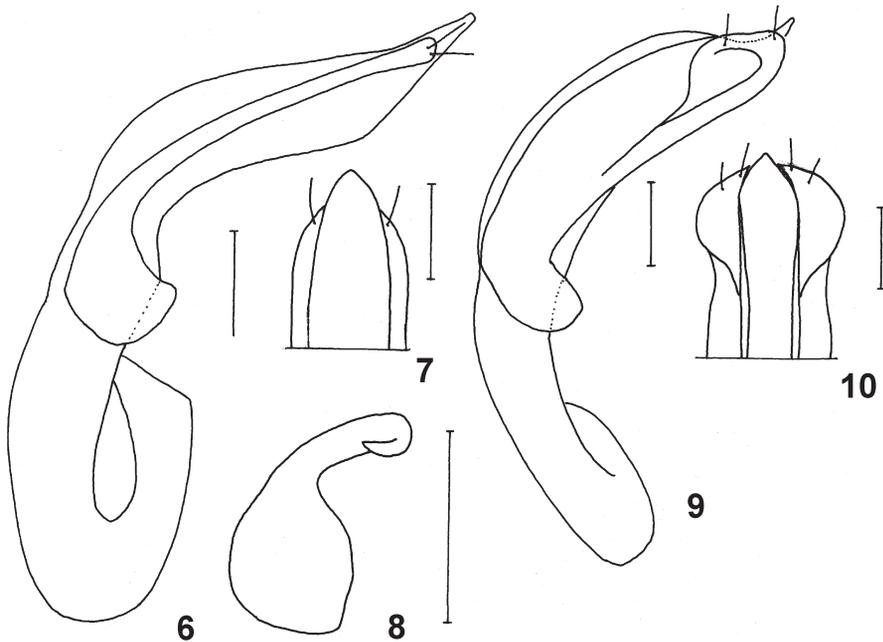
(Figs. 6–8, 22, 23)

**Type locality.** India, Arunachal Pradesh, 11 km SSE of Tenga, Eagles Nest wildlife sanctuary, 27°06'23"N 92°26'02"E, 2510 m a.s.l.

**Type material.** HOLOTYPE: ♂ (NMPC): 'INDIA: Arunachal Pradesh (15) / 11 km SSE of Tenga, Eagles / Nest WL sanctuary, 4.v.2008 / 27°06'23"N 92°26'02"E, 2510 m / Fikáček, Podskalská, Šípek lgt. // primary evergreen mountain / cloud forest with very sparse / understory vegetation, / sifting: wet leaf litter'. PARATYPES: 5 ♂♂ 2 ♀♀ (NMPC, ZSPC): the same data as the holotype.

**Description.** Body length 1.9–2.1 mm (holotype: 1.9 mm). Length of body parts (holotype): head 0.3 mm, pronotum 0.7 mm, elytra 0.9 mm, antenna 0.7 mm. Maximum width of body parts (holotype): head 0.9 mm, pronotum 1.2 mm, elytra 1.2 mm.

Body shortly oval (Fig. 22), red-brown with lighter anterior part of head, margins of pronotum and margins of elytra; antennae and legs reddish. Venter light yellow. Dorsum without



Figs. 6–10. Genitalia of *Agathidium* species., 6–8 – *Agathidium (Macroceble) armigerum* sp. nov. (6 – aedeagus in lateral view; 7 – apex of aedeagus, dorsal view; 8 – spermatheca). 9–10 – aedeagus of *A. (Macroceble) unicorne* sp. nov. (9 – lateral view; 10 – apex of aedeagus, dorsal view). Scale bars = 0.1 mm.

microreticulation; feebly punctate, each puncture with very short and fine seta.

Head. Maximum width of head just before posterior margin of eyes. Eyes flat, narrow,  $11\times$  as long as wide in dorsal view. Clypeus feebly emarginate, clypeal line lacking. Dorsal surface with very sparse, scattered fine punctures separated at least by ca.  $10\times$  their diameter. Mandibles without striking characters. Relative length of antennal segments III : II = 1.6.

Pronotum. Widest just before base. Lateral sides roundly tapered anteriorly in dorsal view; rounded in lateral view (Fig. 23). Punctuation sparser and finer than that of head, with few slightly longer setae close to lateral margin of pronotum.

Elytra. Broadest just before midlength. Punctures as on pronotum. Surface with few slightly longer setae close to lateral margins. Sutural stria absent.

Legs. Protarsomeres I–III and mesotarsomere I a little enlarged in male. Tarsi slender in female. Femora simple. Tarsal formula 5-5-4 in male, 4-4-4 in female.

Mesoventrite. Longitudinal mesoventral carina present; lateral lines not developed. Metathoracic wings absent.

Metaventrte. Femoral lines absent. Male and female with high hook-shaped ventro-caudally orientated process at posterior margin between coxae.

Genitalia. Aedeagus as in Figs. 6–7; operculum T-shaped with slight emargination on anterior margin; spermatheca as in Fig. 8.

**Variability.** The length ratio of antennal segments III : II varies between 1.5–1.8 in the type specimens; the ratio of length:width of the eyes in dorsal view is between 8–11. The coloration of the dorsum varies from uniformly light chestnut to a bicoloured dorsum with a reddish head and pronotum and dark brown elytra.

**Differential diagnosis.** *Agathidium (Macroceble) armigerum* sp. nov. is similar to *A. (Macr.) caelebs* Angelini & DeMarzo, 1981 in the size of body and the coloration of the dorsum, the shape of the pronotum having the lateral margin broadly rounded, and also in the shape of the spermatheca. It differs from the latter in having a longer antennomere III with the length ratio of antennomeres III : II = 1.5–1.8 (compared to 1.4 in *A. caelebs*), tarsal formula 4-4-4 in female (5-4-4 in female of *A. caelebs*), and by the shape of the tegmen that is not constricted laterally before the apex as it is in *A. caelebs*.

**Etymology.** The species name refers to the hook-like process on the metaventricle.

**Bionomics.** Type specimens were found by the sifting of thick layers of wet leaf litter in the primary evergreen mountain cloud forest with very sparse understory vegetation (M. Fikáček, pers. comm.).

### *Agathidium (Macroceble) unicorn* sp. nov.

(Figs. 9, 10, 24, 25)

**Type locality.** India, Arunachal Pradesh, 11 km SSE of Tenga, Eagles Nest wildlife sanctuary, 27°06'23"N 92°26'02"E, 2510 m a.s.l.

**Type material.** HOLOTYPE: ♂ (NMPC): 'INDIA: Arunachal Pradesh (15) / 11 km SSE of Tenga, Eagles / Nest WL sanctuary, 4.v.2008 / 27°06'23"N 92°26'02"E, 2510 m / Fikáček, Podskalská, Šípek lgt. // primary evergreen mountain / cloud forest with very sparse / understory vegetation, sifting: / wet leaf litter'. PARATYPES: 1 ♂ (ZSPC): same data as the holotype.

**Description.** Body length 1.7–1.9 mm (holotype 1.9 mm). Length of body parts (holotype): head 0.4 mm, pronotum 0.8 mm, elytra 0.7 mm, antenna 0.7 mm. Maximum width of body parts (holotype): head 0.7 mm, pronotum 1.2 mm, elytra 1.1 mm.

Body shortly oval (Fig. 24), chestnut in color, antennae and legs reddish-brown. Venter light yellow. Dorsum without microreticulation; feebly punctate, each puncture with very short and fine seta.

Head. Maximum width of head approximately in the midlength of eyes. Eyes flat, narrow, 10× as long as wide in dorsal view. Clypeus not emarginate with slightly convex anterior margin; clypeal line missing. Small bump present above antennal articulation. Dorsal surface with very sparsely scattered fine punctures separated at least by ca. 10× their diameter. Mandibles without striking characters. Relative length of antennal segments III : II = 1.2.

Pronotum. Widest just before base. Lateral sides slightly roundly tapered anteriorly in dorsal view; shortly rounded in lateral view (Fig. 25). Puncturation sparser and finer than that of head.

Elytra. Broadest just before midlength. Punctures as on pronotum. Sutural stria absent.

Legs. Protarsomeres I–III and mesotarsomere I enlarged in male. Femora simple. Tarsal formula 5-5-4 in male. Female unknown.

Mesoventrite. Longitudinal mesoventral carina present; lateral lines not developed. Metathoracic wings absent.

Metaventrite. Femoral lines absent. Male with high horn-shaped ventro-caudally oriented process at posterior margin between coxae.

Genitalia. Aedeagus as in Figs 9–10; operculum oblong rectangular with very feeble emargination on anterior margin. Female not known.

**Variability.** The length ratio of antennal segments III : II varies between 1.2–1.3 in the type specimens; the ratio of the length : width of the eyes in dorsal view being between 8–10.

**Differential diagnosis.** *Agathidium (Macroceble) unicorne* sp. nov. is similar to *A. (Macr.) scutellare* Angelini & DeMarzo, 1989 in the small body size, the non-emarginate clypeus, simply-shaped posterior femora in male, and by the length ratio of antennomeres III : II. It differs from the latter species by the shape of the aedeagus, especially by the thickened parameres (in contrast to slender parameres in *A. scutellare*).

**Etymology.** The name of the new species refers to the hook-like process on the metaventrite.

**Bionomics.** Type specimens were found by the sifting of thick layers of wet leaf litter in the primary evergreen mountain cloud forest with very sparse understory vegetation (M. Fikáček, pers. comm.).

### *Agathidium (Macroceble) guttiferum* sp. nov.

(Figs. 11–13, 26, 27)

**Type locality.** India, Arunachal Pradesh, 11 km SSE of Tenga, Eagles Nest wildlife sanctuary, 27°06'23"N 92°26'02"E, 2510 m a.s.l.

**Type material.** HOLOTYPE: ♂ (NMPC): 'INDIA: Arunachal Pradesh (15) / 11 km SSE of Tenga, Eagles / Nest WL Sanctuary, 4.v.2008 / 27°06'23"N 92°26'02"E, 2510 m / Fikáček, Podskalská, Šipek lgt. // Primary evergreen mountain / cloud forest with very sparse / understory vegetation / sifting: wet leaf litter'. PARATYPES: 1 ♂ 9 ♀♀ (NMPC, ZSPC): same data as the holotype.

**Description.** Body length 1.8–2.0 mm (holotype: 2.0 mm). Length of body parts (holotype): head 0.3 mm, pronotum 0.8 mm, elytra 0.9 mm, antenna 0.6 mm. Maximum width of body parts (holotype): head 0.9 mm, pronotum 1.2 mm, elytra 1.1 mm.

Body shortly oval (Fig. 26), red-brown with posterior half of head, majority of pronotal surface except margins and large triangular ill-defined patch on base of elytra dark brown. Venter yellow-reddish. Dorsum without microreticulation, punctuate, each puncture with very short and fine seta.

Head. Maximum width of head at eyes shortly before their posterior margin. Eyes very flat, narrow, 7× as long as wide in dorsal view. Clypeus feebly emarginate, clypeal line absent. Dorsal surface with very sparsely scattered fine punctures separated by more than 10× their diameter. Mandibles without striking characters. Relative length of antennomeres III : II = 1.7.

Pronotum. Widest shortly before base. Lateral sides in basal half of pronotum roundly tapered, then conically narrowed to anterior corners in dorsal view; closely rounded in lateral view (Fig. 27). Puncturation as that of head.

Elytra. Broadest approximately at midlength. Punctures as on head and pronotum. Sutural stria absent.

Legs. Anterior tarsomere I a little enlarged in male. Tarsi slender in female. Femora simple. Tarsal formula 5-5-4 in male, 4-4-4 in female.

Mesoventrite. Low longitudinal mesoventral carina present; lateral lines not developed. Metathoracic wings absent.

Metaventrite. Femoral lines absent. Both sexes with horn-shaped ventro-caudally oriented process at posterior margin between coxae.

Genitalia. Aedeagus as in Figs. 11–12. Operculum small, triangular. Spermatheca as in Fig. 13.

**Variability.** The length ratio of antennomeres III : II varies between 1.7–1.8 in the type specimens; the ratio of length : width of the eyes in the dorsal view being between 6–8. The majority of the paratypes are reddish with a dark vertex and elytral patch.

**Differential diagnosis.** *Agathidium (Macroceble) guttiferum* sp. nov. resembles *A. (Macr.) brancuccii* Angelini & DeMarzo, 1981 and *A. (Macr.) cochleariforme* sp. nov. in the body size, coloration of the antennae, the presence of dorsal puncturation, absence of microsculpture on the dorsum, absence of sutural striae and by the presence of a semivertical process on the metaventrite. It also resembles *A. brancuccii* in the shape of the aedeagus. The new species differs from *A. brancuccii* and *A. cochleariforme* sp. nov. in the longer antennomere III (the length ratio antennomeres III : II = 1.7–1.8 in *A. guttiferum*, while it is 1.4 in *A. brancuccii*, and 1.5 in *A. cochleariforme*), the presence of the triangular darker patch on the elytra, and finally by the slender basal part of the spermatheca (in contrast to the subhaemispherical basal portion of spermatheca in both *A. brancuccii* and *A. cochleariforme* sp. nov.). The new species also differs from *A. brancuccii* in the distinctly sparser dorsal puncturation, the tarsal formula in females 4-4-4 (in contrast to 5-4-4 in *A. brancuccii*), and by the shape of the median lobe that ends in a small pointed process (in contrast to the simply pointed apex of the median lobe in *A. brancuccii*). The new species also differs from *A. cochleariforme* sp. nov. in the very flat and narrow eyes (in contrast to larger dorsal portion of eyes in *A. cochleariforme* sp. nov., see the description of that species), and by the simple distal part of the parameres (in contrast to the spoon-shaped parameral apices in *A. cochleariforme* sp. nov.).

**Etymology.** The species name refers to the drop-shaped patch on the elytra.

**Bionomics.** Type specimens were found by the sifting of thick layers of wet leaf litter in the primary evergreen mountain cloud forest with very sparse understory vegetation (M. Fikáček, pers. comm.).

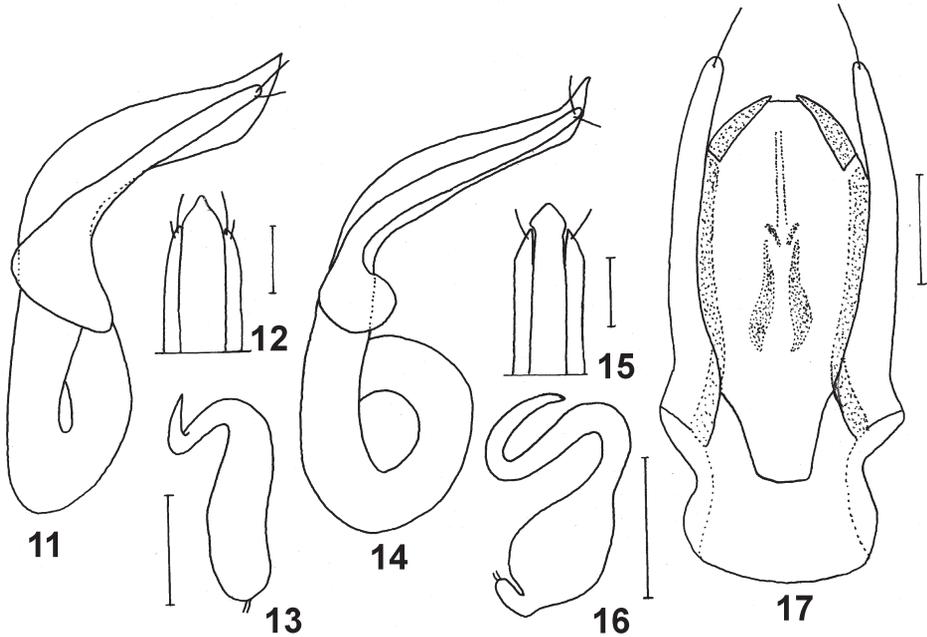
### *Agathidium (Macroceble) acutangulum* sp. nov.

(Figs. 14–16, 28, 29)

**Type locality.** India, Arunachal Pradesh, 11 km SSE of Tenga, Eagles Nest wildlife sanctuary, 27°06'23"N 92°26'02"E, 2510 m a.s.l.

**Type material.** HOLOTYPE: ♂ (NMPC): 'INDIA: Arunachal Pradesh (15) / 11 km SSE of Tenga, Eagles / Nest WL Sanctuary, 4.v.2008 / 27°06'23"N 92°26'02"E, 2510 m / Fikáček, Podskalská, Šípek lgt. // Primary evergreen mountain / cloud forest with very sparse / understory vegetation / sifting: wet leaf litter'. PARATYPES: 5 ♂♂, 12 ♀♀ (NMPC, ZSPC): same data as the holotype; 1 ♀ (NMPC): 'INDIA: Arunachal Pradesh (12) / 1.6 km SEE of Tawang (at petrol station) / 30.iv.2008, 27°35'55"N 91°52'47"E, 2880 m / Fikáček, Podskalská, Šípek lgt. // small remnants of high *Juniperus/Rhododendron* forest with / sparse understory vegetation / sifting: leaf litter + fallen / *Rhododendron* petals'.

**Description.** Body length 2.2–2.7 mm (holotype: 2.3 mm). Length of body parts (holotype): head 0.5 mm, pronotum 0.9 mm, elytra 0.9 mm, antenna 0.7 mm. Maximum width of body parts (holotype): head 1.2 mm, pronotum 1.5 mm, elytra 1.4 mm.



Figs. 11–17. Genitalia of *Agathidium* and *Zeadolopus*. 11–13 – *Agathidium* (*Macroceble*) *guttigerum* sp. nov. (11 – aedeagus, lateral view; 12 – apex of aedeagus, dorsal view; 13 – spermatheca). 14–16 – *A.* (*Macroceble*) *acutangulum* sp. nov. (14 – aedeagus, lateral view; 15 – apex of aedeagus, dorsal view; 16 – spermatheca). 17 – *Zeadolopus punctiventris* sp. nov., aedeagus, dorsal view. Scale = 0.1 mm.

Body shortly oval (Fig. 28), black-brown with lighter margins of pronotum and elytra, antennae and legs yellow-reddish. Venter light yellow-reddish. Dorsum without microreticulation, punctate, each puncture with very short and fine seta.

Head. Maximum width of head far before posterior margin of eyes. Eyes flat, 6× as long as wide in dorsal view. Clypeus moderately emarginate, clypeal line lacking. Dorsal surface with rare and very fine punctures separated by much more than 10× their diameter. Mandibles without striking characters. Relative length of antennomeres III : II = 1.4.

Pronotum. Widest at basal third. Lateral sides flatly rounded toward anterior angles in dorsal view; with distinct very closely rounded angle in lateral view (Fig. 29). Punctuation sparser and finer than that of head, here and there with several larger punctures.

Elytra. Broadest approximately at anterior quarter of elytral length. Punctures very small, fine and very rare. Sutural stria absent.

Legs. Anterior tarsomeres I and II a little enlarged in male. Tarsi slender in female. Femora of both sexes with flat emargination at posterior margin situated before and behind midlength, hence forming hardly detectable unobtrusive central angle. Tarsal formula 5-5-4 in male, 4-4-4 in female.

Mesoventrite. Longitudinal mesoventral carina low and feeble; lateral lines not developed. Metathoracic wings absent.



Figs 18–29. Habitus of the holotypes of *Agathidium* species. 18–19 – *A. (A.) fikaceki* sp. nov.; 20–21 – *A. (Macrocoble) cochleariforme* sp. nov.; 22–23 – *A. (Macr.) armigerum* sp. nov.; 24–25 – *A. (Macr.) unicorne* sp. nov.; 26–27 – *A. (Macr.) guttiferum* sp. nov.; 28–29 – *A. (Macr.) acutangulum* sp. nov. (18, 20, 22, 24, 26, 28 – dorsal view; 19, 21, 23, 25, 27, 29 – lateral view).



Figs. 30–32. Habitus of the holotype of *Zeadolopus punctiventris* sp. nov. (30 – dorsal view; 31 – lateral view; 32 – ventral view)

Metaventricle. Femoral lines absent. Both sexes with club-shaped ventro-caudally oriented process at posterior margin between coxae.

Genitalia. Aedeagus as in Figs. 14–15; operculum oval with short notch in middle of anterior margin; spermatheca as in Fig. 16.

**Variability.** The length ratio of antennomeres III : II varies between 1.4–1.6 in the type specimens; the ratio of length : width of the eyes in dorsal view between 4–6. The coloration of the dorsum varies from uniformly dark brown (with lighter margins of the pronotum and elytra) to a bicoloured dorsum with a light chest-nut pronotum and/or head with dark brown elytra.

**Differential diagnosis.** The shape of the aedeagus in *Agathidium* (*Macroceble*) *acutangulum* sp. nov. is almost identical to that in *A. (Macr.) caelebs* Angelini & DeMarzo, 1981 and in *A. (Macr.) sherpa* Angelini & DeMarzo, 1981. The new species is also similar to both the above species in the body size, the length ratio of antennomeres III : II (1.4 in *A. caelebs* and 1.6 in *A. sherpa*), absence of microsculpture on the dorsum, the missing sutural stria and clypeal line. The new species differs from both above species by the shape of the pronotum, having the lateral margin almost angulate (in contrast to broadly rounded lateral margins in both species compared). The new species also differs in the shape of the spermatheca, which is almost spherical in its basal part and twisted in its proximal part (in contrast to the simply horseshoe-shaped spermatheca in *A. sherpa*). The spermatheca of *A. acutangulum* is slightly similar to that of *A. caelebs*, but both species differ by the tarsal formula in females (4-4-4 in the new species, 5-4-4 in *A. caelebs*).

**Etymology.** The name refers to the shape of the lateral margin of the pronotum of the new species.

**Bionomics.** The specimens were collected by the sifting of wet leaf litter in a primary evergreen mountain cloud forest, with very sparse understory vegetation, and by the sifting of leaf litter and fallen *Rhododendron* petals in the small remnants of high *Juniperus/Rhododendron* forest with sparse understory vegetation (M. Fikáček, pers. comm.).

## Tribe Leiodini

***Zeadolopus punctiventris* sp.nov.**

(Figs. 17, 30–32)

**Type locality.** Papua New Guinea, Sandaun province, north of Mianmin, 1100 m a.s.l.

**Type material.** HOLOTYPE: ♂ (NMPC): 'PAPUA N.G., Sandaun prov. / N Mianmin, 1100 m / 20.v.1998, sifted / leg. A. Riedel'. PARATYPES: 1 ♂ 1 ♀ (NMPC, ZSPC): same data as the holotype.

**Description.** Body length 1.6–1.9 mm (holotype 1.9 mm). Length of body parts (holotype): head 0.3 mm, pronotum 0.5 mm, elytra 1.1 mm, antenna 0.4 mm. Maximum width of body parts (holotype): head 0.6 mm, pronotum 1.1 mm, elytra 1.1 mm.

Body very shortly oval (Fig. 30), dorsum chestnut. Elytra slightly opalescent. Venter light chestnut. Antennae yellow-reddish, legs pale chestnut. Dorsum with microsculpture, punctuate, punctures partly setiferous.

Head. Dorsal surface with punctures separated by 2–3× their diameter. Interstices distinctly microreticulate. Lateral sides of clypeus and medial margins of eyes with few longer setae. Ratio of width of antennomeres X : XI = 1.3.

Pronotum. Widest at base. Base slightly flatly concave before posterior angles. Lateral sides roundly tapered anteriorly in dorsal and lateral views, posterior angles acutely pointed in dorsal view, obtuse and very broadly rounded in lateral view. Punctuation a little sparser and finer than that of head. Microreticulation finer than that on head.

Elytra. Broadest at basal third of elytral length. Punctures coarser than on head. With hardly detectable inobtrusive double rows of punctures disappearing far from base. Punctures of intervals of similar size as those in rows. Serial punctures separated by about 1–2× their diameter; interval punctuation a little sparser. Sutural stria shallow, detectable approximately at apical fourth. Microreticulation very feebly developed. Lateral channel without larger punctures or foveae (Fig. 31).

Legs. Hind margin of posterior femora with strong long curved tooth at apex in male; broadly rounded in female; mid-femora simple.

Metaventricle. With strong, irregularly arranged large punctures separated by about 0.5–1× their diameter, irregularly dispersed laterally, becoming smaller and sparser medially (Fig. 32).

Abdomen: First visible abdominal ventrite with row of large punctures close to anterior margin (Fig. 32).

Genitalia. Aedeagus as in Fig. 17. Female genitalia not examined.

**Variability.** The microreticulation is feebly developed on the whole dorsum in the female paratype.

**Differential diagnosis.** *Zeadolopus punctiventris* sp. nov. belongs to an informal group of the species lacking large foveae on the lateral sides of the elytra, containing in the Australian region only one species – *Z. balkei* Švec, 2002. The new species is similar to *Z. balkei* by the presence of the hardly detectable unobtrusive double elytral rows (compared to well marked rows in *Z. balkei*). The new species also differs from *Z. balkei* in the much larger body and by the presence of microreticulation on the dorsum. The aedeagal parameres of *Z. punctiventris* sp. nov. are longer than the median lobe, which is roundly tapered to the apex, in contrast to the parameres being distinctly shorter and the rectangular median lobe of *Z. balkei*.

**Etymology.** The species name refers to the striking puncturation of the venter.

**Biology.** Not known. The specimens were collected by sifting.

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