

An extraordinary new species of *Deuteragenia* Šustera, 1912 (Hymenoptera, Pompilidae) from Indonesia

Valery M. Loktionov¹

¹ Federal Scientific Center of the East Asia Terrestrial Biodiversity, Far Eastern Branch of the Russian Academy of Sciences, Vladivostok-22, 690022, Russia

Corresponding author: Valery M. Loktionov (pompilidaefer@mail.ru)

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Abstract

Deuteragenia leleji **sp. nov.** is described and illustrated, based on a female from Sumatra, Indonesia. This extraordinary species possesses a peculiar character, cleft tarsal claws, recorded for the first time in the genus *Deuteragenia* Šustera, 1912 and the tribe Deuterageniini Šustera, 1912. The genus *Deuteragenia* is newly reported from the island of Sumatra.

Keywords

Deuterageniini, new taxa, Oriental Region, Pepsinae, spider wasps, Sumatra, taxonomy

Introduction

Deuteragenia is a genus in the subfamily Pepsinae, comprising 56 species, distributed world-wide except in Australia (Lelej and Loktionov 2012). The genus was established by Šustera in 1912, as the only genus of the tribe Deuterageniini proposed by the same author in the same year. At that time, Šustera probably did not know the genus *Dipogon* Fox, 1897, described from Brazil, and therefore did not include it in his new tribe. Pate (1946) synonymized *Deuteragenia* with *Dipogon*. Subsequent authors considered *Deuteragenia* as a genus (Arnold 1948, 1955; Haupt 1959) or a subgenus of *Dipogon* (Townes 1957; Evans 1974; Day 1979; Wahis 1986; Shimizu and Ishikawa 2002a). Recently, Lelej and Loktionov (2012) restored *Deuteragenia* to generic level based on their phylogenetic analysis of the tribe Deuterageniini.

The data on distribution and biology of the genus *Deuteragenia* are fragmented. The only revision is of the congeners of *Deuteragenia* which occur in Japan north of the Ryukyu (Shimizu and Ishikawa 2002a, b, 2003) and there are some checklists of the species (Haupt 1959; Wolf 1972; Day 1979; Krombein 1979; Wiśniowski 2009; Loktionov and Lelej 2017, and others). For detailed information on systematic of the genus see Shimizu and Ishikawa (2002a).

Examination of the Pompilidae collection deposited at the Biologiezentrum des Oberösterreichischen Landesmuseums (Linz, Austria) has revealed a female specimen of *Deuteragenia* possessing a peculiar character which is extraordinary for the genus, as well as for the tribe Deuterageniini, namely, cleft tarsal claws. Herein, this new species is described and illustrated, and the genus *Deuteragenia* is newly reported from the island of Sumatra.

Materials and methods

The terminology for morphology is mostly based on the glossary provided by the Hymenoptera Anatomy Consortium (2013). The terminology of wing venation and cells follows Day (1988). The following abbreviations are used for morphological terms:

- F1, F2, F3, etc.** the first, second, and third flagellomere, etc.;
- UID** the upper interocular distance;
- MID** the middle interocular distance;
- LID** the lower interocular distance;
- OOD** the distance between posterior ocellus and compound eye which is measured from above;
- POD** the postocellar distance which is measured from above;
- S1, S2, S3, etc.** the first, second, and third metasomal sternum, etc.;
- T1, T2, T3, etc.** the first, second, and third metasomal tergum, etc.

Photographs were taken with the stereomicroscope Olympus SZX16 and digital camera Olympus DP74, and stacked using Helicon Focus software. The final illustrations were post-processed for contrast and brightness using Adobe® Photoshop® software. Material treated in this paper is deposited in the Biologiezentrum des Oberösterreichischen Landesmuseums, Linz, Austria [OLL].

Taxonomy

Family Pompilidae Latreille, 1804

Subfamily Pepsinae Lepeletier de Saint-Fargeau, 1845

Tribe Deuterageniini Šuster, 1912

Type genus. *Deuteragenia* Šuster, 1912.

Diagnosis. The female possesses maxillary cardo with two tufts of curved bristles. The male with flagellomeres serrate beneath, the propodeum somewhat swollen and punctate, third submarginal cell of fore wing usually equal or slightly larger than second submarginal cell.

Genera included. Currently the tribe includes the following six genera: *Deuteragenia* Šustera, 1912; *Dipogon* Fox, 1897; *Myrmecodipogon* Ishikawa, 1965; *Nipponodipogon* Ishikawa, 1965; *Stigmatodipogon* Ishikawa, 1965; and *Winnemanella* Krombein, 1962.

Distribution. World-wide, except Australia (Lelej and Loktionov 2012).

Remarks. Lelej and Loktionov (2012) analyzed 13 species from six generic groups Deuterageniini, with the genus *Priocnemis* Schiødte, 1837 as an outgroup. At that time the tribe comprised only the genus *Dipogon* with six subgenera. The analysis revealed the following relationships: *Priocnemis* + [*Stigmatodipogon* + {(*Deuteragenia* + *Mesagenia*) + [(*Winnemanella* + *Nipponodipogon*) + (*Myrmecodipogon* + *Dipogon*)}]]. As a result of this study, a new generic classification of the tribe was proposed, where *Deuteragenia*, *Myrmecodipogon*, *Nipponodipogon*, *Stigmatodipogon*, and *Winnemanella* were elevated to generic status. The females of Deuterageniini differ clearly from those of the tribes Ageniellini and Priocnemini, while male characters of Deuterageniini overlap with those of other tribes of the subfamily Pepsinae. For detailed information on the tribe see Lelej and Loktionov (2012).

Genus *Deuteragenia* Šustera, 1912

Type species. *Deuteragenia variegata* (Linnaeus, 1758) [*Sphex*], by automatic designation.

Diagnosis. The female and the male possess the following characters: fore wings with a basal or apical fascia; ratio of maximum width to maximum length of second radio-medial cell 2.0 times or less; the pterostigma normal-sized, its width similar to width of second submarginal cell (usually narrow); length of hind wing anal lobe more than 0.33 times width of submedial cell; the antenna elongated, F1 length more than 3.5 times (in female) and more than 3.0 times (in male) its width; mandible stout, with three teeth, including apical one.

Species included. 56 species.

Distribution. World-wide, except Australia (Lelej and Loktionov 2012). The genus has not been previously known from the Indonesian island of Sumatra.

Remarks. For detailed information on the genus see Shimizu and Ishikawa (2002a), and Lelej and Loktionov (2012).

Deuteragenia leleji Loktionov, sp. nov.

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Figures 1, 2

Material examined. *Holotype*: female, “W Sumatra Padang Panjang XII.2003 St. Jakl leg.” [Indonesia, West Sumatra Prov., City of Padang Panjang] [OLL].

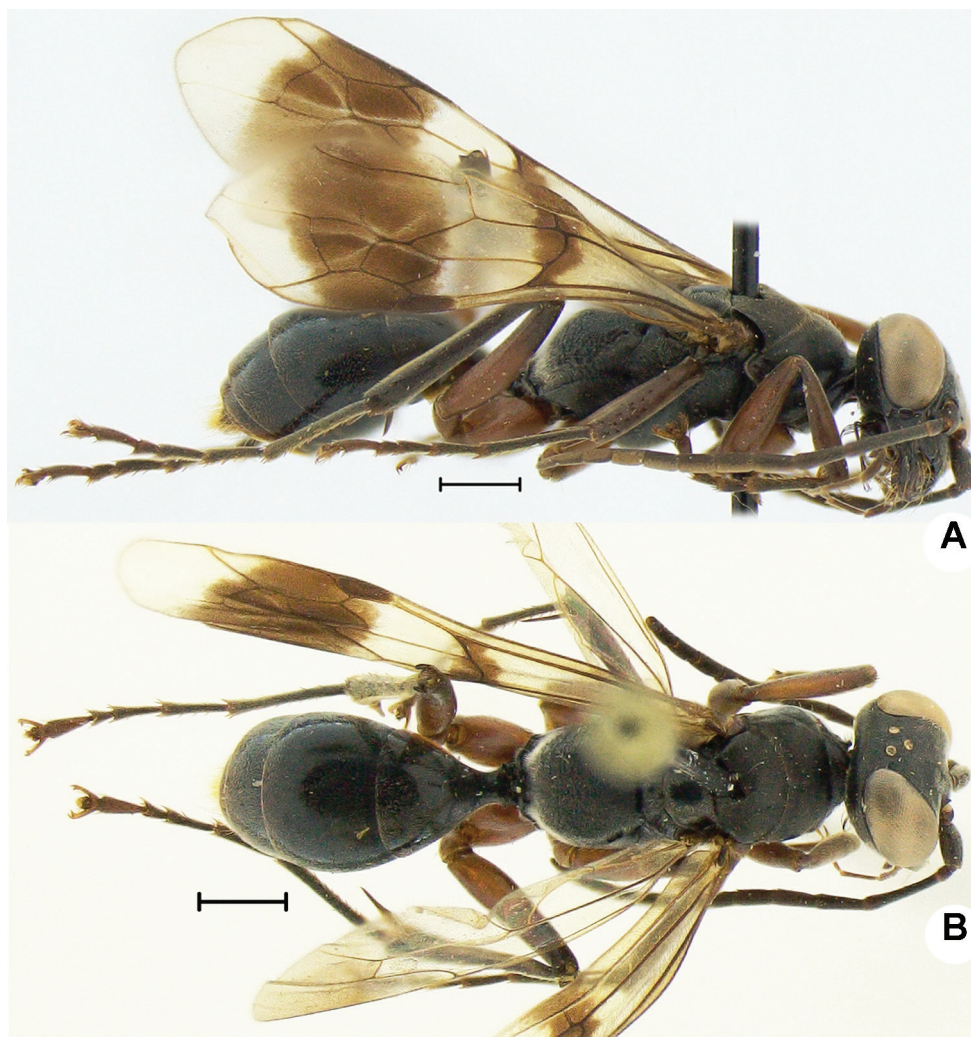


Figure 1. Habitus of *Deuteragenia leleji* sp. nov., holotype, female: **A** lateral view **B** dorsal view. Scale bars: 1.0 mm.

Diagnosis. The female of this new species is unique among congeners of *Deuteragenia* in having bifid tarsal claws (Fig. 2E). Other characters of importance are: propodeum medial and posterior portion with coarse transverse rugae; clypeus anterior rim smooth and polished, not depressed, and not differentiated from dorsal portion (Fig. 2A); head and mesosoma mostly without setae; T1 petiolate basally (Fig. 2D); F2–F10 pale ventrally; legs partially brown (Fig. 1). The male is unknown.

Description. Female, holotype (Figs 1, 2). Length: body 8.4 mm, fore wing 7.4 mm. Head width 1.21 times its height; MID 0.51 times head width in frontal view (Fig. 2A). Ocelli large, well raised; ocellar triangle slightly acute-angled; $POD : OOD = 0.87$ (Fig. 2C). Head in frontal view with vertex barely produced above dorsal eye margin (Fig. 2A). Posterior margin of vertex in dorsal view hardly concave (Fig. 2C). Head with frons

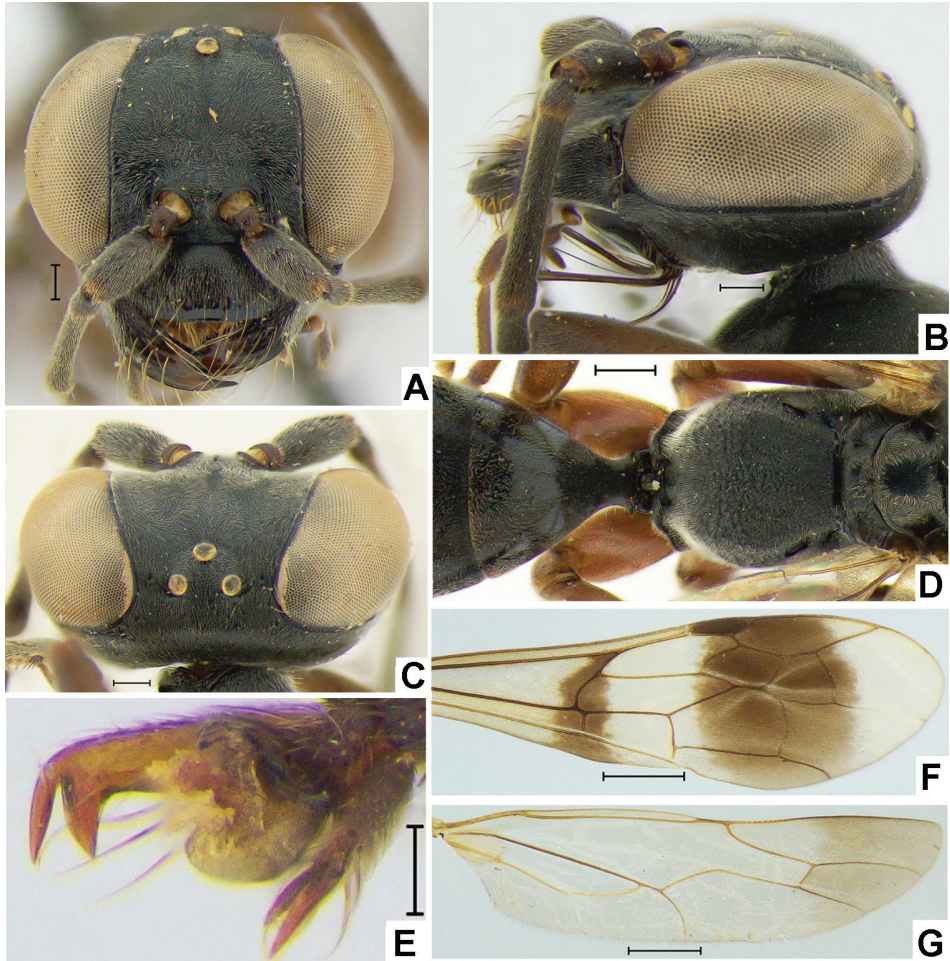


Figure 2. *Deuteragenia leleji* sp. nov., holotype, female: **A** head in frontal view **B** head in lateral view **C** head in dorsal view **D** mesoscutellum, metanotum, metapostnotum, propodeum and T1 in dorsal view **E** metaclaws **F** fore wing **G** hind wing. Scale bars: 1.0 mm (**F, G**); 0.5 mm (**D**); 0.2 mm (**A–C**); 0.1 mm (**E**).

almost flat in lateral view. Gena in profile well developed (Fig. 2B). Malar space very short. Clypeus moderately convex, its width 2.6 times its height, and 1.0 times LID; anterior margin straight, not depressed and not differentiated from dorsal portion; anterolateral corner rounded (Fig. 2A). Labrum not exposed. Bristles of maxillary cardo hard and long, reaching mandible ventral face. Antenna elongated; flagellomeres cylindrical; ratio of scape, pedicel and flagellomeres length (on dorsal side) 25 : 8 : 39 : 25 : 20 : 17 : 17 : 17 : 15 : 15 : 14 : 16; scape length 0.8 times UID; F1 length 5.0 times its maximum width (in dorsal view), and 1.27 times UID; apical flagellomere pointed apically.

Pronotum length 0.42 times its maximum width in dorsal view; anterior face not differentiated from dorsum; posterior margin moderately rounded (Fig. 1B). Dorsum of mesoscutum hardly convex. Dorsum of mesoscutellum and metanotum slightly convex like dorsum of propodeum in lateral view. Metapostnotum noticeably depressed, barely

arcuately emarginated postero-medially, its length 0.15 times metanotum length medially. Propodeum somewhat elongated, its length 1.05 times its maximum width in dorsal view; dorsum and posterior face not differentiated from each other and evenly convex (Fig. 2D).

All femora without spines. Protibia ventral face apically with few short spines. Meso- and metatibia dorsal and outer-lateral face with scattered short spines. Tarsomeres 1–3 of all legs with very short spines ventrally; tarsomeres 4 and 5 of all legs without spines ventrally. Tarsal claws of all legs symmetrical and bifid; inner tooth as long as apical one, very broad at base, and narrowing apically, with pointed apex; outer margins of inner and apical teeth parallel (Fig. 2E).

Fore wing (Fig. 2F) translucent, with subapical and subbasal brown fasciae. Pterostigma brown, its length 4.75 times its height (on inner distance), and 5.2 times R_{s2} . Second submarginal cell narrowed on vein R_s by 0.77 times its own length on vein M , receiving crossvein $1m-cu$ at basal 0.55. Third submarginal cell narrowed on vein R_s by 0.43 times its own length on vein M , receiving crossvein $2m-cu$ at basal 0.3. Crossvein $2rs-m$ slightly bent near M . Crossvein $3rs-m$ weakly arcuate. Crossvein $cu-a$ straight, originating beyond separation of vein $M+CuA$. Vein M touching wing margin. Hind wing (Fig. 2G) translucent, with slightly brownish apical portion.

Metasoma with T1 distinctly petiolate (Fig. 2D).

Head, meso- and metasoma matt and punctate. Clypeus anterior rim smooth and polished, with other part densely punctate (Fig. 2A). Mandible apical portion polished. Frons finely and densely punctate, median line distinct. Metapostnotum polished, with indistinct transverse striae. Propodeum (Fig. 2D) anterior portion with dense and coarse merging punctures, its medial and posterior portions with coarse transverse rugae which somewhat arcuate posteriorly. Antenna and legs matt.

Body black (Figs 1, 2). Antenna black, with F2–F10 pale ventrally. Mandible partially brown apically. Bristles of maxillary cardo brown. Legs black, with following brown: all coxae and trochanters, fore- and mesofemora, foretibia partially, metafemure except apical portion, all claws.

Body without setae except following: upper frons along inner orbits with one long setae; gena with short scattered setae; all coxae anterior face and pronotum with scattered short setae; propodeum postero-laterally with scattered gray short setae; T6 and S6 with long and dense pale setae. Body with sparse gray pubescence most intensive on propodeum postero-laterally.

Male is unknown.

Distribution. Indonesia: West Sumatra.

Etymology. The specific epithet is a pathronym honoring Prof. Arkady Lelej (FSC Biodiversity FEB RAS, Vladivostok, Russia), my scientific advisor and inspirer, on the occasion of his 75th birthday.

Discussion

The female of *Deuteragenia leleji* sp. nov. is closely related to that of *Deuteragenia polita* Haupt, 1929, described from a single specimen from the island of Krakatau, which is

located in the Sunda Strait between the Indonesian islands of Sumatra and Java. Both species have similar size, coloration of legs and fore wing, shape of the head and T1, and some other morphological characters. The new species can easily be separated from *D. polita* by the following characters: tarsal claws bifid (Fig. 2E), inner tooth as long as apical one, very broad at base, and narrowing apically, with pointed apex, outer margins of inner and apical teeth parallel in *D. leleji* sp. nov. (tarsal claws with stout inner tooth, not bifid in *D. polita*); propodeum (Fig. 2D) anterior portion with dense and coarse merging punctures, its medial and posterior portion with transverse coarse rugae in *D. leleji* sp. nov. (propodeum with scattered coarse punctures, without rugae in *D. polita*); F1 length 1.2 times scape and pedicel length combined in *D. leleji* sp. nov. (1.0 times in *D. polita*); ocellar triangle slightly acute-angled, POD : OOD = 0.87 in *D. leleji* sp. nov. (obtuse-angled, 1.0 in *D. polita*).

The character “cleft tarsal claws” is considered here as extraordinary for the genus *Deuteragenia* Šusterá, 1912 as well as for the tribe Deuterageniini Šusterá, 1912. Within Deuterageniini a claw normally has an inner tooth that can be more or less large, but never forming a “bifid” shape of the claw. This character is also considered here as a specific one and not sufficient to propose a new genus based on it. For example, within the nominate subgenus of the genus *Anoplius* Dufour, 1834, females of which normally possess claws with a small inner tooth, there is a species, *A. (A.) aberrans* Gussakovskij, 1932, having distinctly bifid claws.

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