



Discovery of the velvet ant genus *Orientilla* Lelej from Laos (Hymenoptera, Mutillidae, Dasylabrinae), with description of a related new species from India

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Abstract

The genus *Orientilla* Lelej, 1979 is newly recorded from Laos based on *O. tamaderai* sp. nov. (Xieng Khouang) and *O. vietnamica* Lelej, 1979 (Vientiane). One additional new species, *O. nitens* sp. nov., is described from India (Tamil Nadu). These three species share many diagnostic features within *Orientilla*, but they are distinguished by the body coloration and shape of clypeus, hypostomal carina, humeral carina, and metasomal terga 1–2. An identification key to females of the genus is provided.

Keywords

Aculeata, biodiversity, Oriental Region, taxonomy

Introduction

Velvet ants (Mutillidae and Myrmecosidae) are large groups of aculeate wasps including more than 4600 species, which predominantly occur in tropical regions (Lelej 2005, 2007; Pagliano et al. 2020). Southeast Asia is known for the rich but hidden velvet ant diversity (Williams et al. 2019; Okayasu et al. 2021b). In this region, Laos is one of the most unsampled countries, with only 21 species so far recorded (see Appendix 1). This number is nearly one-third to half the number of species known from Thailand

and Vietnam, even though these adjacent countries share many terrestrial ecoregions (Olson et al. 2001; Wikramanayake et al. 2002; Dinerstein et al. 2017).

The genus *Orientilla* Lelej, 1979 presently includes 13 species from the eastern Palaearctic, Oriental, and Australasian Regions (Lelej 1979, 1996a, 2005; Das and Girish Kumar, 2016a; Zhou et al. 2018; Pagliano et al. 2020; Brothers 2022). This genus is widespread in mainland Southeast Asia but has never been found in Laos, presumably due to inadequate sampling. After extensive museum surveys, only two *Orientilla* specimens from Laos were discovered, which are treated in this paper. Additionally, one new species from India is described, because this species shows diagnostic features suggesting close relationship with the Laotian species.

Material and methods

The material examined in this study is deposited in the following institutes: Ehime University Museum, Matsuyama, Japan (**EUM**); Hokkaido University Insect Collection, Sapporo, Japan (**SEHU**); Thailand Natural History Museum, National Science Museum, Pathum Thani, Thailand (**THNHM**). Specimens were examined under a Leica M205C stereomicroscope (7.8–160× magnification). Habitus photographs were taken using a Canon EOS 6D Mark II digital camera equipped with a Canon MP-E 65mm f/2.8 1–5× Macro Photo lens. External morphological features were imaged with a Canon EOS 6D Mark II attached to a Leica M205C. Focus stacking was done using Zerene Stacker (Zerene Systems LLC, Richland, WA, USA). Images were post-processed using Adobe Photoshop and assembled into plates using Adobe Illustrator (Adobe Inc., San Jose, CA, USA). Terminology mostly follows the Hymenoptera Anatomy Consortium (2023). The following abbreviations are used in the description: **F**, flagellomere; **S**, metasomal sternum; **T**, metasomal tergum.

Taxonomy

Orientilla Lelej, 1979

Orientilla Lelej, 1979: 1066, ♀; Lelej 1996a: 103, ♂♀; Lelej 2002: 101; Lelej 2005: 111; Lelej and Brothers 2008: 42; Pagliano et al. 2020: 131. Type species: *Orientilla vietnamica* Lelej, 1979 (♀), by original designation.

Diagnosis. Male. Frons lacking medial longitudinal carina between antennal tubercles; eye oval, slightly projecting from head capsule; wings fully developed; tegula posteriorly reaching mesoscuto-scutellar articulation; mesoscutellum laterally longitudinally carinate; tibial spurs pale; metasomal segment 1 petiolate; T1 with distinct dorsal and anterior faces; lateral felt line present on S2 but absent on T2; S6 flat, lacking medial tubercles; genital paramere with short inner setae. **Female.** Frons lacking me-

dial process; F1 depressed; F1 length subequal to its width and F2 length; mesopleuron strongly expanded laterally; protarsus with short outer spines; metasomal segment 1 petiolate; T1 with distinct dorsal and anterior faces; lateral felt line present on S2 but absent on T2; pygidial plate convex, lacking lateral carina.

Species included. This genus includes the following 15 species: *O. aureorubra* (Sichel & Radoszkowski, 1870), ♂♀ (India, Sri Lanka); *O. chinensis* (Zavattari, 1922), ♂♀ (China); *O. croma* (Zavattari, 1914), ♂ (Myanmar); *O. desponsa* (Smith, 1855), ♂♀ (China, Taiwan, Myanmar, Vietnam); *O. jabalpurensis* Das & Girish Kumar, 2016, ♀ (India); *O. kallata* (Nurse, 1902), ♂ (India, Sri Lanka); *O. krombeini* Lelej, 1996, ♂♀ (Vietnam); *O. manni* (Krombein, 1971), ♀ (Solomon Islands); *O. nitens* sp. nov., ♀ (India); *O. nobilis* (Smith, 1855), ♂ (India); *O. remota* (Cameron, 1897), ♀ (Sri Lanka); *O. schmideggeri* Lelej, 2005, ♀ (India); *O. sejugoides* (Magretti, 1892), ♂ (Myanmar); *O. tamaderai* sp. nov., ♀ (Laos); *O. vietnamica* Lelej, 1979, ♀ (Laos, Myanmar, Thailand, Vietnam).

Remarks. This genus was initially established to include East Asian species of the predominantly Afrotropical and western Palaearctic genus *Stenomutilla* André, 1896 (Lelej 1979). Later, this genus was recorded from South Asia and the Australasian Region (Lelej 2005; Das and Girish Kumar 2016ab; Terine et al. 2020; Brothers 2022). The females of *Orientilla* and *Stenomutilla* are recognized in Dasylabrinae by having the metasomal segment 1 petiolate and lateral felt line present only on S2. However, the *Orientilla* females have the F1 depressed, its length subequal to F1 width and F2 length (F1 cylindrical, its length 2.2–2.3× F1 width and 1.2× F2 length in *Stenomutilla*) (Lelej 1979, 1996a).

Orientilla tamaderai sp. nov.

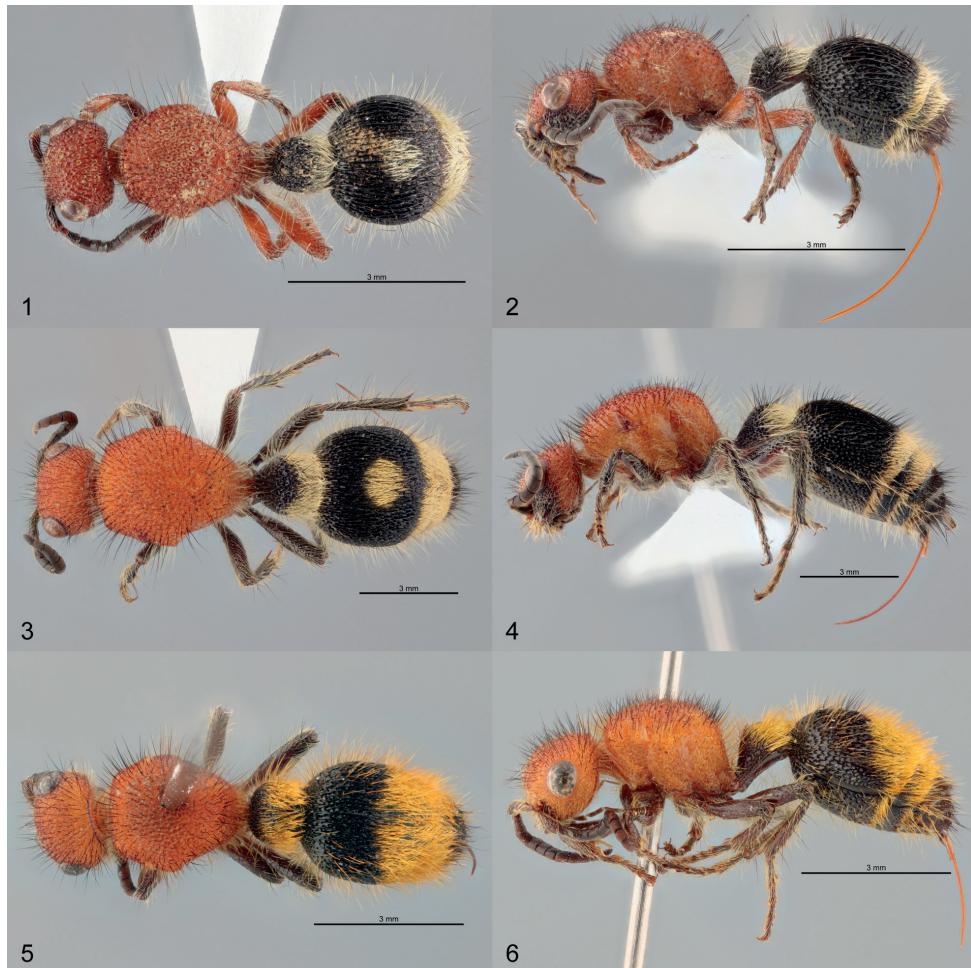
<https://zoobank.org/834489D9-ED8E-4D30-9ECB-FD89C6FF6C96>

Figs 1, 2, 7, 10

Diagnosis. Female. Head mostly red; clypeal medial elevation forming subtriangular area; clypeal subtriangular area dorso-medially delimited by carina (Fig. 7); hypostomal carina sharp; antenna dark; humeral carina sharp; mesopleuron evenly convex, not spinose (Fig. 1); legs largely red; T1 and T2 posterior margins with complete pale setal bands; T1 long and slender, with dorsal T1 length $0.97 \times$ T1 width and $0.46 \times$ T2 length (Fig. 10); T2 broad, $2.26 \times$ wider than T1, with lateral margins strongly convex (Fig. 10); T2 with medial pale setal spot, distance between medial spot and posterior band subequal to spot diameter; T3 with pale setal band; S1 carina short, reaching anterior 1/4 of S1; S2 felt line short. **Male.** Unknown.

Description. Female. Body length. 7.09 mm.

Color and setae. Frons, vertex, dorsal half of gena, and mesosoma dark red; antennal rim, meso- and metafemora, and meso- and metatibiae except apices yellowish red; clypeus, mandible apex, T1–3, and S2–S3 black; ventral half of gena including malar space, postgenal bridge, scape except apex, pedicel, mandible except apex, coxae,



Figures 1–6. *Orientilla* spp., ♀, habitus **1, 2** *O. tamaderai* sp. nov., holotype **3, 4** *O. vietnamica* Lelej, Laos **5, 6** *O. nitens* sp. nov., holotype **1, 3, 5** dorsal view **2, 4, 6** lateral view.

trochanters, profemur, protarsus, and meso- and metatibial apices dark brown; prementum, stipes, F1, F2–10 dorsally, meso- and metatarsi, S1, T4–6, and S4–6 brownish black; scape apex, F2–10 ventrally, maxillary and labial palpi, and protibia brown; tibial spurs yellow.

Frons, vertex, gena, scape, and mesosomal dorsum with sparse short recumbent pale golden and sparse erect to suberect brownish black setae; clypeus, postgenal bridge, mandible, pronotal neck, propleuron, lateral mesosomal face, dorsal propodeal face, T1 anterior and lateral faces, T1 posterior margin, S1, T2 lateral and posterior margins, T3, and S2–4 with sparse long erect pale golden setae; pedicel and F1 with sparse short recumbent pale golden setae; F2–10 with sparse very short appressed pale golden setae; prementum, stipes, and maxillary and labial palpi with sparse short erect pale golden setae; coxae, trochanters, and tibiae with sparse long recumbent and sparse long erect

pale golden setae; tarsi with sparse long appressed pale golden setae; T1 dorsal face, T2 disc, T4–6, and S5–6 with sparse short recumbent and sparse long erect brownish black setae; posterior 2/5 of T1 dorsal face covered with band of dense appressed pale golden setae; T2 with medial circular ($0.92\times$ longer than wide) spot of dense appressed pale golden setae and with posterior narrow band of dense appressed pale golden setae; distance between T2 spot and band $0.82\times$ spot length; T2 lacking lateral felt line; S2 with short lateral felt line of pale golden setae; distance between S2 felt line and posterior fringe $0.55\times$ felt line length; T3 with wide uniform band of dense appressed pale golden setae; S2–S3 with posterior fringe of dense appressed pale golden setae.

Structure. Head $1.35\times$ wider than long with lateral margins strongly convergent behind eye; gena narrow, $0.78\times$ eye breadth in lateral view; eye height:eye breadth = 58:50; distance between eyes $1.72\times$ eye height; eye height $1.23\times$ malar distance; frons and vertex without medial carina or groove; occipital carina complete, dorsally strongly protruding from posterior margin of vertex; antennal scrobe lacking dorsal carina; genal carina wavy, ventrally separated from hypostomal carina and lacking hypostomal tooth; postgenal bridge laterally delimited by sharp carina extending from occiput; hypostomal carina sharp; eye semicircular, convex, distinctly protruding from head capsule; clypeus dorso-medially strongly elevated nearly to level of antennal rim; clypeus with subventral transverse ridge extending along entire width of clypeus, with anterior margin crenulate; medial elevation limited on dorsal half of clypeus and forming medial subtriangular area; medial subtriangular area dorso-medially delimited by carina; mandible worn out, apically rounded and lacking preapical tooth; mandible dorsal face with sharp ridge basally, ventral margin straight; prementum flattened; scape bending medially; length and width of pedicel: F1:F2 = 10:15:18:18:20:20; F2–9 almost same in length and width; F10 slightly longer than F1 and F9, conical; F3–10 depressed.

Mesosoma broadest at mesothorax; lateral margins of mesosoma weakly crenulate, lacking carina; head width:humeral width:mesonotal width:T2 width = 83:63:87:100; mesosomal length $1.20\times$ mesothoracic width; anterior margin of pronotal dorsum nearly straight; pronotal and propodeal spiracles without distinct tubercle; humeral carina sharp, reaching pronotal dorsum, rounded at dorsal end; scutellar scale obliterated; scutellar area without scales; metanotal-propodeal suture obliterated; mesopleuron evenly convex; propodeum lacking distinct dorsal and posterior faces; dorsal propodeal face vertical, without medial carina; mesopleural lamella absent; mesopleural ventral face with sharp precoxal transverse carina.

Protarsus lacking outer spines; protarsomere 1 apically truncate, not protruding outward; tibiae lacking outer spines; metacoxa armed with weak inner carina along its entire length.

Metasomal segment 1 petiolate; T1 with distinct dorsal and anterior faces; T1 dorsal length:T1 width:T2 dorsal length:T2 width = 38:39:82:88; T2 weakly convex, dorsally flattened; T2 lateral margin strongly convex; S1 medial carina present only on anterior 1/4 of sternum, anteriorly tuberculate; S2 with distinct anterior face, without medial carina; S6 posterior margin bidentate; pygidial plate obscurely defined, convex, lacking lateral carina.

Frons, vertex, mesosomal dorsum, T1 dorsal face, T2 lateral margin, and S1 with large dense punctures, with intervals distinct and smooth; gena with large confluent punctures, punctures larger and coarser ventrally; postgenal bridge densely transversely striate; antennal rim, clypeus lateral portion, pedicel, flagellum, and prementum with minute dense punctures; clypeal subtriangular area with large dense shallow punctures; scape, legs, T4–6, and S4–6 with small sparse punctures; stipes with small dense punctures; pronotal collar anteriorly with minute sparse punctures; pronotal collar posteriorly smooth; mesosomal lateral face and dorsal propodeal face with large confluent punctures; T1 anterior face, T3, and S2–3 with large sparse punctures; T2 disc longitudinally coarsely puncto-striate.

Male. Unknown.

Type material. Holotype: LAOS • ♀; Xieng Khouang Prov., Ban Vang, Ban Tha; 19°44'15.2"N, 103°35'16.6"E; 1239 m alt.; 30 Apr. 2018; Yutaka Tamadera leg. [SEHU].

Distribution. Laos: Xieng Khouang.

Etymology. The specific name is dedicated to the type collector, Yutaka Tamadera, an expert in the systematics of jewel beetles (Coleoptera: Buprestidae).

Remarks. The area of the type locality (Figs 13–15) is composed of two low mountains densely covered with forests and a trail between them, and surrounded by a village and a swidden (Y. Tamadera, pers. comm. 2023). The collector is not sure about the habitat (forest or swidden) where the holotype female was collected.

Orientilla tamaderai sp. nov. can be easily confused with *O. vietnamica* Lelej, 1979 by sharing the following combination of character states: head and mesosoma red, clypeus with a medial subtriangular area, mesopleuron evenly convex, T1 and T2 posterior margins with complete pale setal bands, and T2 with a medial pale setal spot. However, this new species is distinguished from the latter by the clypeal subtriangular area delimited by carinae only dorso-medially (subtriangular area delimited by carinae along its entire width in *O. vietnamica*; Figs 7, 8), T1 as long as wide (T1 wider than long in *O. vietnamica*; Figs 10, 11), and T2 lateral margins strongly convex (T2 lateral margins weakly convex in *O. vietnamica*; Figs 10, 11). Also, the female of *O. tamaderai* sp. nov. is smaller than that of *O. vietnamica* (8.0–14.9 mm; Lelej 1996a; Williams et al. 2019; supplemented by the specimens examined in this study).

***Orientilla vietnamica* Lelej, 1979**

Figs 3, 4, 8, 11

Orientilla vietnamica Lelej, 1979: 1066, ♀, holotype ♀ (Nha Trang, S. Annam, Vietnam) [Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia]; Lelej 1996a: 105, ♀; Lelej 2005: 113; Okayasu et al. 2018: 309, ♀; Williams et al. 2019: 11, ♀; Pagliano et al. 2020: 132; Thaochan et al. 2022: 164, ♂♀.

Diagnosis. Female. Head red; clypeal medial elevation forming subtriangular area; clypeal subtriangular area delimited by carina extending nearly to clypeal lateral margin

(Fig. 8); hypostomal carina sharp; antenna dark; humeral carina sharp; mesopleuron evenly convex, not spinose (Fig. 3); legs black; T1 and T2 posterior margins with complete pale setal bands; T1 short and broad, with dorsal T1 length $0.64\text{--}0.76 \times$ T1 width and $0.33\text{--}0.40 \times$ T2 length (Fig. 11); T2 slender, $1.80\text{--}2.03 \times$ wider than T1, with lateral margins weakly convex (Fig. 11); T2 with medial pale setal spot, distance between medial spot and posterior band subequal to spot diameter; T3 with pale setal band; S1 carina short, reaching anterior 1/4 of S1; S2 felt line short. **Male.** Unknown.

Material examined. LAOS • 1♀; Vientiane; May 1995 [EUM]. THAILAND • 1♀; Khon Kaen; 15 Oct. 1972; M. Sato leg. [EUM] • 1♀; Chiang Mai, Omkoi District; $17^{\circ}50'49.9''\text{N}$, $98^{\circ}22'33.0''\text{E}$; 950–1010 m alt.; 10 Sep. 2016; R. Mizuno; Dry dipterocarp forest [THNHM] • 1♀; same collection data as for preceding; 27 Jun. 2017 [THNHM] • 1♀; same collection data as for preceding; 28 Jun. 2017 [THNHM] • 1♀; same collection data as for preceding; 18 Jul. 2019 [THNHM] • 1♀; same collection data as for preceding; 19 Jul. 2019 [THNHM] • 1♀; same collection data as for preceding; 20 Jul. 2019 [THNHM] • 1♀; same collection data as for preceding; 21 Jul. 2019 [THNHM].

Distribution. LAOS: Vientiane (new record). Myanmar: additional data unavailable (Lelej 2005; Williams et al. 2019). Thailand: Chiang Mai, Khon Kaen, Phetchaburi, Ubon Ratchathani (Williams et al. 2019). Vietnam: Khanh Hoa (Lelej 1979; Williams et al. 2019).

Remarks. At Omkoi District, this species was collected on a trail through a dry dipterocarp forest during the rainy season (Mizuno et al. 2019; R. Mizuno, pers. comm. 2017).

Orientilla nitens sp. nov.

<https://zoobank.org/78D44215-5330-473B-9AB9-59A6B9860707>

Figs 5, 6, 9, 12

Diagnosis. Female. Head red; clypeal medial elevation forming subtriangular area; clypeal subtriangular area dorso-medially delimited by carina (Fig. 9); hypostomal carina lamellately projecting; antenna dark; humeral carina obliterated; mesopleuron evenly convex, not spinose (Fig. 5); legs black; T1 posterior margin with complete pale setal band and T2 posterior half covered with dense appressed golden setae; T1 short and broad, with dorsal T1 length $0.68 \times$ T1 width and $0.32 \times$ T2 length (Fig. 12); T2 slender, $1.96 \times$ wider than T1, with lateral margins weakly convex (Fig. 12); T2 lacking medial spot; T3 with golden setal band; S1 carina short, reaching anterior 1/4 of S1; S2 felt line short. **Male.** Unknown.

Description. Female. Body length. 8.51 mm.

Color and setae. Head except clypeus, mesosoma, and meso- and metacoxae basal 1/3 yellowish red; clypeus, mandible except apex, scape, pedicel, maxillary and labial palpi, and legs except meso- and metacoxal bases dark brown; mandible apex, flagellum dorsal face, prementum, and stipes black; flagellum ventral face and tibial spurs brown; metasoma brownish black.



Figures 7–12. *Orientilla* spp., ♀ **7, 10** *O. tamaderai* sp. nov., holotype **8, 11** *O. vietnamica* Lelej, Laos **9, 12** *O. nitens* sp. nov., holotype **7–9** face **10–12** metasoma, dorsal view. White arrows indicate the subtriangular area on the clypeus.

Frons, vertex, mesosomal dorsum, and tibiae with sparse short recumbent golden and sparse long erect black setae; gena, coxae, and femora with sparse long recumbent and sparse erect golden setae; postgenal bridge, clypeus, mandible, pronotal collar, lateral mesosomal face, dorsal propodeal face, T1, T2 except medial portion, T3, T4–5 lateral portions, and S1–S6 with sparse long erect golden setae; eye dorsal and posterior margins edged with long erect black setae; scape with sparse long recumbent golden setae; pedicel and F1 with sparse short recumbent golden setae; F2–10 with sparse very

short appressed golden setae; prementum, stipes, and maxillary and labial palpi with sparse short erect golden setae; tarsi with sparse long appressed golden setae; T2 and T4–5 medial portions with sparse short recumbent black and sparse long erect golden setae; T6 with sparse short recumbent and sparse long erect golden setae; T1 dorsal face entirely covered with band of dense appressed golden setae; T2 posterior half covered with semicircular spot of dense appressed golden setae; T2 lacking lateral felt line; S2 with short lateral felt line of pale golden setae; distance between S2 felt line and posterior fringe $0.46 \times$ felt line length; T3 with wide uniform band of dense appressed golden setae; S2–S3 with posterior fringe of dense appressed golden setae.

Structure. Head $1.39 \times$ wider than long with lateral margins strongly convergent behind eye; gena narrow, $0.73 \times$ eye breadth in lateral view; eye height:eye breadth = 62:50; distance between eyes $1.75 \times$ eye height; eye height $1.49 \times$ malar distance; frons and vertex without medial carina or groove; occipital carina complete, dorsally strongly protruding from posterior margin of vertex; antennal scrobe lacking dorsal carina; genal carina weakly developed, wavy, ventrally separated from hypostomal carina and lacking hypostomal tooth; postgenal bridge laterally delimited by sharp carina extending from occiput; eye semicircular, convex, distinctly protruding from head capsule; clypeus dorso-medially strongly elevated nearly to level of antennal rim; clypeus with subventral transverse ridge extending along entire width of clypeus, with anterior margin shallowly concave; medial elevation limited on dorsal half of clypeus and forming medial subtriangular area; medial subtriangular area dorso-medially delimited by carina; mandible apically bidentate; mandible dorsal face with sharp ridge basally, ventral margin straight; prementum flattened; scape bending medially; length and width of pedicel:F1:F2 = 10:14:20:18:20:20; F2–9 almost same in length and width; F10 slightly longer than F1 and F9, conical; F3–10 depressed.

Mesosoma broadest at mesothorax; lateral margins of mesosoma weakly crenulate, lacking carina; head width:humeral width:mesonotal width:T2 width = 91:75:98:100; mesosomal length $1.14 \times$ mesothoracic width; anterior margin of pronotal dorsum nearly straight; pronotal and propodeal spiracles without distinct tubercle; humeral carina obliterated; scutellar scale obliterated; scutellar area without scales; metanotal-propodeal suture obliterated; mesopleuron evenly convex; propodeum lacking distinct dorsal and posterior faces; dorsal propodeal face vertical, without medial carina; mesopleural lamella absent; mesopleural ventral face with sharp precoxal transverse carina.

Protarsus lacking outer spines; protarsomere 1 apically truncate, not protruding outward; tibiae lacking outer spines; metacoxa armed with weak inner carina along its entire length.

Metasomal segment 1 petiolate; T1 with distinct dorsal and anterior faces; T1 dorsal length:T1 width:T2 dorsal length:T2 width = 32:47:100:92; T2 weakly convex, dorsally flattened; T2 lateral margin weakly convex; S1 medial carina present only on anterior 1/4 of sternum, anteriorly rounded; S2 with distinct anterior face, without medial carina; S6 posterior margin truncate; pygidial plate obscurely defined, convex, lacking lateral carina.



Figures 13–15. The type locality of *Orientilla tamaderai* sp. nov. **13** type locality seen from the south **14** type locality and a swidden seen from the north **15** the access to the forest trail. Photo by Y. Tamadera.

Frons, vertex, mesosomal dorsum, T2 lateral margin, and S1 with large dense punctures, with intervals distinct and smooth; gena, mesosomal lateral face, and dorsal propodeal face with large confluent punctures; postgenal bridge, antennal rim, clypeus lateral portion, scape, legs except coxae, T3–T6, and S3–S6 with small sparse punctures; clypeal subtriangular area with small sparse punctures, with intervals wrinkled; pedicel, flagellum, and prementum with minute dense punctures; stipes with minute sparse punctures; pronotal collar transversely wrinkled on anterior half and smooth on posterior half, with minute sparse punctures; coxae with small dense punctures; T1 anterior face and S2 with large sparse punctures; T1 dorsal face and T2 posteriorly with large shallow dense punctures interspersed with small punctures; T2 anteriorly to setal patch longitudinally coarsely puncto-striate.

Male. Unknown.

Type material. Holotype: INDIA • ♀; Tamil Nadu, Anaimalai, Top Slip; 550–800 m alt.; 2–5 Dec. 1978; JAP-IND CO TR [SEHU].

Distribution. India: Tamil Nadu.

Etymology. The specific name *nitens* is a Latin feminine adjective in the nominative case meaning bright. It refers to the metasoma of this new species ornamented with golden setal bands.

Remarks. By having the red head, dark legs, and slender T2, this new species is similar to *O. jabalpurensis* Das & Girish Kumar, 2016 and *O. vietnamica*. This new species differs from these two species by having the clypeal subtriangular area delimited by carinae only dorso-medially (subtriangular area delimited by carinae along its entire width in *O. vietnamica*; Figs 8, 9), hypostomal carina lamellately

projecting (sharp but not projecting in *O. vietnamica*), humeral carina obliterated (well developed in *O. jabalpurensis* and *O. vietnamica*), T1 with a complete pale setal band (T1 band medially interrupted in *O. jabalpurensis*; Fig. 12), T2 lacking medial spot (T2 with a medial pale setal spot in *O. jabalpurensis* and *O. vietnamica*; Figs 11, 12), T2 posterior half covered with dense appressed golden setae (T2 with a complete or medially interrupted setal band on posterior margin in *O. jabalpurensis* and *O. vietnamica*; Figs 11, 12), and T3 with a golden setal band (T3 with sparse erect black setae in *O. jabalpurensis*; Fig. 12).

Key to females of *Orientilla*

- 1 Mesopleuron evenly convex 2
- Mesopleuron laterally strongly produced to form large spine 9
- 2 Body black; mesopleuron with vertical carina extending from in front of mesocoxa to midway of mesopleuron; body punctures sparse. Solomon Islands.....
..... *O. manni* (Krombein, 1971)
- Body black with mesosoma or both head and mesosoma red; mesopleuron lacking vertical carina; body punctures large dense, longitudinally punctostriate on T2 3
- 3 Clypeal medial elevation and subventral transverse ridge forming T-shaped area; T2 lacking pale setal spot. China *O. chinensis* (Zavattari, 1922)
- Clypeal medial elevation forming subtriangular area (Fig. 8); T2 with medial pale setal spot (Fig. 11), if absent, then posterior half of T2 covered with dense golden setae (Fig. 12) 4
- 4 Head mostly red 5
- Head black 8
- 5 Legs largely red (Fig. 2); T1 as long as wide (Fig. 10); T2 lateral margin strongly convex (Fig. 10). Laos *O. tamaderai* sp. nov.
- Legs brownish to black; T1 wider than long (Figs 11, 12); T2 lateral margin weakly convex (Figs 11, 12) 6
- 6 Humeral carina obliterated; T2 lacking medial spot (Fig. 12); T2 posterior half covered with dense golden setae (Fig. 12). India *O. nitens* sp. nov.
- Humeral carina sharp; T2 with medial pale setal spot (Fig. 11); T2 posterior margin with complete or medially interrupted pale setal band (Fig. 11)..... 7
- 7 T1 and T2 posterior pale setal bands medially interrupted (Das and Girish Kumar 2016a: fig. 4); T2 medial pale setal spot small, distance between medial spot and posterior band apparently exceeding spot diameter (Das and Girish Kumar 2016a: fig. 4). India
..... *O. jabalpurensis* Das & Girish Kumar, 2016
- T1 and T2 posterior pale setal bands complete (Fig. 11); T2 medial pale setal spot large, distance between medial spot and posterior band subequal to spot diameter (Fig. 11). Laos, Myanmar, Thailand, Vietnam
..... *O. vietnamica* Lelej, 1979

- 8 Head lateral margins weakly convergent posteriorly (Lelej 1996a: fig. 1); length of S2 lateral felt line 1.2–1.3× distance between felt line and S2 posterior band. China, Taiwan, Myanmar (?), Vietnam *O. desponsa* (Smith, 1855)
- Head lateral margins strongly convergent posteriorly (Lelej 1996a: Fig. 2); length of S2 lateral felt line 0.4–0.6× distance between felt line and S2 posterior band. Vietnam *O. krombeini* Lelej, 1996
- 9 Body black with mesosoma red; T3 except lateral portion with black setae. India *O. schmideggeri* Lelej, 2005
- Body entirely black or with head and mesosoma red; T3 with pale setal band 10
- 10 Head and mesosoma red (de Saussure 1867: fig. 1); scape black. India, Sri Lanka *O. aureorubra* (Sichel & Radoszkowski, 1870)
- Head and mesosoma black (Pagliano et al. 2020: fig. 190); scape reddish. Sri Lanka *O. remota* (Cameron, 1897)

Discussion

The genus *Orientilla* is closely related to *Stenomutilla*, only differing in the male mesoscutellum, tibial spurs, genital paramere, and female flagellum (Lelej 1996a). This hypothesis is supported by Waldren et al. (2023) in which the sister relationship of *Orientilla* and *Stenomutilla* was recovered by a phylogenomic framework examining seven out of ten dasylabrine genera. The *Stenomutilla* species parasitize on bees and wasps constructing their nests with mud or in pre-existing cavities (Bradley and Bequaert 1928; Ronchetti and Polidori 2020; Weaving 1994, 1995), except for few sub-Saharan and Malagasy species utilizing moth cocoons (Limacodidae, Lepidoptera) in the soil or on twigs (Bezzi 1924; Seyrig 1936; Paulian 1950; Bowden 1967; Krombein 1972). Like *Stenomutilla* (excluding some Malagasy species; Krombein 1972), the females of *Orientilla* lack the protarsal rake and defined pygidial plate, suggesting that they do not utilize ground-nesting hosts (Krombein 1972; Bayliss and Brothers 2001; Pitts and Manley 2004; Bartholomay et al. 2015; Brothers 2018; Taylor et al. 2019; Okayasu 2020).

In addition to the character states listed above, *O. nitens* sp. nov. and *O. tamaderai* sp. nov. are similar in their small body size. Specifically, *O. tamaderai* sp. nov. is the second smallest *Orientilla* species ever described after *O. manni* which measures only 5.4 mm (Krombein 1971). The body length of other *Orientilla* females ranges from 7.5 to 29 mm (de Saussure 1867; Sichel and Radoszkowski 1869–1870; Smith 1879; Cameron 1897; Nurse 1904; Chen 1957; Lelej 1979, 1996a; Das and Girish Kumar 2016a; Williams et al. 2019). Morphologically, *O. nitens* sp. nov. and *O. tamaderai* sp. nov. resemble *O. vietnamica*. However, these new species are comparable to or even smaller than the smallest specimen of *O. vietnamica*. Of the nine *O. vietnamica* females examined herein, only one specimen was 9.05 mm long and others exceeded

12 mm. Given that the body size of adult mutillids correlates with that of the host (Mickel 1924; Ferguson 1962), the size difference of those *Orientilla* species likely reflects utilization of different sized hosts. Additional data are apparently needed to test this hypothesis. I hope the key and descriptions in this paper will facilitate discovery of more *Orientilla* species and their hosts from the Oriental Region.

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Appendix I

Synoptic list of Mutillidae of Laos

Dasylabrinae

1. *Orientilla tamaderai* sp. nov.: Xieng Khouang (this paper).
2. *Orientilla vietnamica* Lelej, 1979: Vientiane (this paper).

Mutillinae: Ctenotillini

3. *Williamstilla guangdongensis* (Lelej, 1992): Bolikhamsay, Champasak (Williams et al. 2019; Lelej 2023).

Mutillinae: Mutillini

4. *Kurzenkotilla harmandi* (André, 1898): Sayaboury, Vientiane (Okayasu et al. 2018; Lelej et al. 2023).

Mutillinae: Smicromyrmini

5. *Andreimyrme substriolata* (Chen, 1957): Houa Phanh, Xieng Khouang (Okayasu 2020; Okayasu et al. 2021b).
6. *Andreimyrme yotoi* Okayasu, 2021: Attapeu (Okayasu et al. 2021b).
7. *Mickelomyrme athalia* (Pagden, 1949): additional data unavailable (Lelej 2005).

8. *Mickelomyrme chinensis* (Smith, 1855): additional data unavailable (Brothers and Lelej 2017).
9. *Mickelomyrme exiloides* (Magretti, 1892): Vientiane (Lelej 1996b).
10. *Mickelomyrme kuznetsovi* Lelej, 1996: additional data unavailable (Brothers and Lelej 2017).
11. *Mickelomyrme pusillaeformis* (Hammer, 1962): Attapeu, Bolikhamsay, Luang Phabang (Okayasu 2018; Williams et al. 2019).
12. *Physetopoda thai* Lelej, 1995: Bolikhamsay (Williams et al. 2019).
13. *Smicromyrme triguttatus* Mickel, 1933: Lak Sao (Okayasu 2018).

Mutillinae: Trogaspidiini

14. *Eotrogaspidia auroguttata* (Smith, 1855): Houa Phan, Luang Phabang, Xieng Khouang (Okayasu et al. 2021a).
15. *Eotrogaspidia oryzae* (Pagden, 1934): Bolikhamsay (Okayasu et al. 2021a).
16. *Neotrogaspidia circumcincta* (André, 1896): Houa Phan, Xaisomboun, Xieng Khouang (Okayasu 2023).
17. *Promecidia birmanica* (Dalla Torre, 1897): additional data unavailable (Lelej 2005; Lelej et al. 2016).
18. *Trogaspidia lingnani* (Mickel, 1933): Attapeu, Khammouan (Williams et al. 2019).
19. *Trogaspidia pagdeni* Mickel, 1933: Attapeu, Bolikhamsay (Williams et al. 2019).
20. *Trogaspidia pittsi* Williams, 2019: Bolikhamsay (Williams et al. 2019).
21. *Trogaspidia wilsoni* Williams, 2019: Attapeu (Williams et al. 2019).
22. *Wallacidia oculata* (Fabricius, 1804): Bolikhamsay, Vientiane (O'Toole 1975; Williams et al. 2019).

Odontomutillinae

23. *Odontomutilla uranioides* Mickel, 1933: additional data unavailable (Okayasu et al. 2018).

Note: Pagliano et al. (2020) included *Sinotilla boheana* (Chen, 1957) in the Laotian fauna, but this species has not yet been formally recorded from this country.