

New genus and species of Pompilinae spider wasps from the Oriental Region (Hymenoptera, Pompilidae)

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Abstract

The new genus *Erythropompilus* Shimizu & Pitts, **gen. nov.** from the Oriental Region (Pompilidae, Pompilinae) is described, based on the new species *E. malaysiensis* Pitts & Shimizu, **sp. nov.** from Malaysia. Two other new species of this genus, *E. thailandensis* Pitts & Shimizu, **sp. nov.** from Thailand and *E. taiwanensis* Pitts & Shimizu, **sp. nov.** from Taiwan, are also described. A key to the species is provided, and the taxonomic position of the genus is discussed.

Keywords

Erythropompilus, Malaysia, Pompilidae, Pompilinae, Taiwan, taxonomy, Thailand

Introduction

In the course of studying the systematics of spider wasps (Hymenoptera: Pompilidae) globally and more specifically from the Oriental and Australasian regions, we recently examined specimens from Malaysia, Thailand, and Taiwan belonging to the subfamily Pompilinae. From these regions, we found species, specimens of which were collected in Malaise traps and yellow-pan traps, of an enigmatic and unknown genus. A comparison of this genus with other genera in the Old World was performed, and we concluded that the specimens belong to an undescribed genus. Through detailed examination of the specimens, we also concluded that those specimens from the three regions belong to three separate undescribed species.

In this paper, we create a new genus, *Erythropompilus* Shimizu & Pitts, gen. nov., based on the new species *E. malaysiensis* Pitts & Shimizu, sp. nov. from Malaysia (type species). We also describe two other new species of the genus, *E. thailandensis* Pitts & Shimizu, sp. nov. from Thailand and *E. taiwanensis* Pitts & Shimizu, sp. nov. from Taiwan, we provide a key to the species, and we discuss the taxonomic position of the genus at the subfamily level.

Materials and methods

Holotypes were photographed with a digital camera (Nikon Coolpix 4500 and MDC lens equipped with a stereo microscope Leitz TS and a transmitted light microscope Leitz Dialux). Photographs were stacked by using CombineZM (Hadley 2008), and the final synthesized photographs were post-processed for contrast and brightness using Adobe Photoshop software.

The terminology for general morphology, including the wing veins and cells, follows Day (1988). In addition, the following term is used: antennocular line, the anterior margin of the frons from the antennal base to the eye in dorsal view. The following abbreviations are used for morphological terms:

FW	fore wing;
Fl1, Fl2, Fl3 ...	the first, second, third, ... flagellomeres;
HW	hind wing;
LID	lower interocular distance;
MID	middle interocular distance;
OOD	ocello-ocular distance;
POD	postocellar distance;
S1, S2, S3 ...	the first, second, third, ... metasomal sterna;
SGP	subgenital plate;
SMC1, SMC2, SMC3	the first, second and third submarginal cells of the fore wing;
T1, T2, T3 ...	the first, second, third, ... metasomal terga;
TFD	transfacial distance (= head width);
UID	upper interocular distance.

The names of institutions in which specimens examined are deposited are abbreviated as follows:

- EMUS** Insect Collection, Utah State University, Utah, USA;
NIAES Insect Collection, Natural Institute for Agro-Environmental Sciences, Tsukuba, Japan;
QSBG Queen Sirikit Botanic Gardens, Chiang Mai, Thailand.

Taxonomy

Erythropompilus Shimizu & Pitts, gen. nov.

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Type species. *Erythropompilus malaysiensis* Pitts & Shimizu, sp. nov. (here designated).

Diagnosis. This genus differs from other genera of the subfamily Pompilinae by the following combination of features: **Both sexes:** setae on body sparse; clypeus small, as broad as or slightly narrower than LID (Figs 1A–6A); labrum well exposed beneath clypeus; ocelli forming obtuse-angled triangle (Figs 1B–6B); outer orbit sharply grooved (Fig. 1C); uppermost portion of occipital carina situated slightly below vertex crest (Fig. 1D); propodeum, in dorsal view, parallel-sided at anterior half, strongly narrowing at posterior half, dorsum reticulately rugose with a pair of subparallel longitudinal carinae medially, and declivity slightly pointed posterolaterally (Figs 1E, 3C, 5C); mid and hind tibial spurs ivory-white (Figs 1F, 2C, 3D, 4C, 5D, 6C); tarsomere 5 of all legs without ventral spines; all tarsal claws bifid (Figs 1G, 3E); orbicula small (Fig. 1G); FW with two dark fasciae (Figs 1H, 2D, 3F, 4D, 5E, 6D); crossvein *2m-cu* meeting vein *CuA*₁ more than half-way out on latter; **Male:** flagellomeres with placoid sensilla (median elliptic depressed area clothed with silvery minute setae anteroventrally) (Figs 2E, 4E, 6E); fore tarsal claws asymmetrical due to modification of inner claw (outer ray slender and strongly curved; inner ray long, much stouter than outer ray, rounded at apex); S6 with lateral hook large and rod-like, directed medially (Figs 2F, 4F, 6F); exposed portion of SGP thin, flattened or concave ventrally, triangular or long and parallel-sided with lateral margin edged (Figs 2F, 4F, 6G); genitalia with paramere very short, peg-like (Figs 2G, H, 4G, H, 6H, I); parapenial lobe very broad and sinuate, pointed at apex; and aedoeagus broad, parallel-sided for most part.

Of these features, the very sharply grooved outer orbit in both sexes, placoid sensilla on the flagellomeres, a pair of large, medially directed lateral hooks on S6, the very short, peg-like paramere, and the very broad and sinuate parapenial lobe in the male are unique to this genus. Our preliminary phylogenomics strongly support the close relationship of the genus with *Tachypompilus* Ashmead, 1902 and *Cenagenia* Saussure, 1892.

Description. Female. Greater part of body and legs with silvery-white pubescence densely. Vertex along inner orbit, labrum, and fore coxa posterobasally with sparse fine setae; S2–S6 with short erect setae, those on S6 dense.

Clypeus slightly convex with lateral margin strongly slanted, apicolateral corner broadly rounded (Figs 1A, 3A, 5A); apical margin without depressed rim. Mandible short and not stout with inner tooth large and rounded apically (Fig. 1I). Maxilla: exogalea 1 completely separated from exogalea 2 (Fig. 5F); last three palpomeres longer and thinner than third (Fig. 1J, 5G). Labium: prementum with preapical oval membranous area (Figs 1J, 5G, arrows); last palpomere longer than other palpomeres. Malar space very short and practically linear. Inner orbits emarginate above middle, convergent above and below (Figs 1A, 3A, 5A). Gena, in profile, thin, gradually narrowing above (Figs 1K, 3G, 5H).

Pronotum with dorsum steeply sloping anteriorly, merging into declivity, latter being short and almost vertical (Figs 1K, 3G, 5H). Mesoscutum rather flattened except anteriorly, with parapsidal lines very fine and slightly divergent anteriorly. Disc of metanotum declivous. Metapostnotum very short or invaginated medially (Figs 1E, 3C, 5C). Propodeum, in profile, gently convex (Figs 1K, 3G, 5H); dorsum merging into declivity; declivity shorter than dorsum, rather flattened, with short, appressed, silvery dense pubescence (Figs 1E, 3C, 5C).

Fore tibia with several short spines internally. Fore tibial spur pale yellow. Fore tarsus lacking tarsal comb, without spines interiorly and exteriorly (Fig. 1G). Dorsal faces of mid and hind tibiae with several spines in exterior and interior rows (Figs 3H, 5I). Hind tibia with apical spines of unequal length and thickness, more or less splayed out and irregularly spaced, lacking integumental serrations dorsally. Orbicular pecten comprising about seven long divergent fine setae (Fig. 1G). Tarsal claws with inner ray much broader than outer ray, obliquely truncate (Fig. 3E). Longest seta of orbicular pecten much longer than orbicula itself (Fig. 1G).

FW inner fascia broad on both sides of second abscissae of veins *Rs* and *M* (basal vein) and crossvein *cu-a* (Figs 1H, 3F, 5E); outer fascia occupying basal half of marginal, SMCs 2 and 3, apical half of discal cell 2, and basal fourth to third of discal cell 3; outer wing margin infuscate; area between outer fascia and outer infuscate margin somewhat whitish. Pterostigma long, its base being much longer than crossvein *2r-rs*. SMC2 shorter than SMC3 on vein *M*, longer than SMC3 on vein *Rs*. Crossvein *2rs-m* nearly straight, oblique to vein *M*. Crossveins *3rs-m* and *2m-cu* curved outward. Vein *Cu-A₁* slightly deflected posteriorly at its base. Crossvein *cu-a* at or slightly distal to separation of vein *M+CuA*. A cluster of basal hamuli strongly proximal to separation of vein *C* from vein *Sc+R+Rs*. HW crossvein *cu-a* originating much basal to fork of vein *M+CuA*, forming angle with vein *A*, short and gently curved (Figs 1H, 3F, 5E). Jugal lobe small and elliptic, about third of subbasal cell in length.

S2 without transverse groove or depression. S6 not compressed laterally without median carina.

Male. Antenna much longer than head and mesosoma combined (Figs 2C, 4C, 6C), with placoids on each flagellomere (Figs 2E, 4E, 6E). Inner margin of fore tarsomere 5 not produced internally. S6 with inverted-V-shaped emargination posteriorly

(Figs 2F, 6F); with pair of large, medially directed lateral hooks. Genitalia with very short, peg-like parameres, and with very broad and sinuate parapenial lobes (Figs 2G, H, 4G, H, 6H, I). Otherwise similar to female.

Distribution. The Oriental Region (Thailand, Malaysia and Taiwan).

Etymology. The generic name is derived from the type species, of which the female mesosoma is orange-red for most part. The name is considered masculine.

Key to the species of *Erythropompilus*

Female

- 1 Thorax (mesosoma except propodeum) dark in coloration, almost black (Fig. 3G); clypeus narrower than LID (Fig. 3A); gena, in dorsal view, slightly thickened, roundly receding posteriorly (Fig. 3B; compare to Figs 1B, 5B); mid and hind femora without small spines set in pits apicodorsally (Taiwan) *E. taiwanensis* Pitts & Shimizu, sp. nov.
- Thorax mostly orange-red (Figs 1K, 5H); clypeus as broad as LID (Figs 1A, 5A); gena, in dorsal view, thin (Figs 1B, 5B; compare to Fig. 3B); mid and hind femora with small spines set in pits apicodorsally 2
- 2 Gena, in dorsal view, very thin, abruptly receding posteriorly (Fig. 1B; compare to Fig. 5B); lateral margin of pronotal dorsum, in dorsal view, slightly narrowing anteriorly (Fig. 1B) (Malaysia) *E. malaysiensis* Pitts & Shimizu, sp. nov.
- Gena, in dorsal view, not very thin, roundly receding posteriorly (Fig. 5B; compare to Fig. 1B); lateral margin of pronotal dorsum, in dorsal view, concave and scarcely narrowing anteriorly (Fig. 5B) (Thailand) *E. thailandensis* Pitts & Shimizu, sp. nov.

Male

- 1 Frons, in profile, spherically convex (Fig. 4I; compare to Figs 2I, 6J); clypeus narrower than LID (Fig. 4A); mid and hind femora without small spines set in pits apicodorsally (Taiwan) *E. taiwanensis* Pitts & Shimizu, sp. nov.
- Frons, in profile, gently convex (Figs 2I, 6J; compare to Fig. 4I); clypeus as broad as LID (Figs 2A, 6A); mid and hind femora with small spines apicodorsally 2
- 2 Thorax usually dark rufous (Fig. 2I); placoids small, shorter than half of each flagellomere (Fig. 2E); SGP arrowhead-shaped with rounded apex (Fig. 2F) (Malaysia) *E. malaysiensis* Pitts & Shimizu, sp. nov.
- Thorax mostly orange-red (Fig. 6J); placoids large, much longer than half of flagellomere (Fig. 6E); SGP long and parallel-sided for most part (Fig. 6G) (Thailand) *E. thailandensis* Pitts & Shimizu, sp. nov.

***Erythropompilus malaysiensis* Pitts & Shimizu, sp. nov.**

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Figures 1A–K, 2A–I

Material examined. *Holotype*, ♀: ‘Pasoh Forest Res. Negri S., Malaysia X.20.79 sec. for. P. & M. Becker’ (EMUS). *Paratypes*: same data except for date: 1♀, 6.v.1978 (for. gap) (EMUS); 1♀, 7.vi.1978 (sec. for.) (EMUS); 1♀, 15.ix.1978 (sec. for.) (EMUS); 1♂, 18.ix.1978 (prim. for.) (EMUS); 1♀1♂, 18.ix.1978 (sec. for.) (EMUS); 1♀, 20.x.1978 (forest) (EMUS); 1♀, 2.xi.1978 (sec. for.) (EMUS); 1♀, 14.xi.1978 (sec. for.) (EMUS); 1♂, 18.xii.1978 (sec. for.) (EMUS); 1♀, 3.i.1979 (sec. for.) (EMUS); 1♂, 15.i.1979 (sec. for.) (EMUS); 1♀, 16.i.1979 (forest) (EMUS); 1♀, 16.i.1979 (for. gap) (EMUS); 1♂, 15.ii.1979 (prim. for.) (EMUS); 1♀, 23.ii.1979 (sec. for.) (EMUS); 2♂, 28.ii.1979 (sec. for.) (EMUS); 1♀, 3.iii.1979 (sec. for.) (EMUS); 1♀, 7.iv.1979 (forest) (EMUS); 1♀, 12.iv.1979 (sec. for.) (EMUS); 1♀, 16.iv.1979 (for. gap) (EMUS); 1♀, 13.v.1979 (sec. for.) (EMUS); 1♂, 22.v.1979 (sec. for.) (EMUS); 1♂, 28.v.1979 (forest) (EMUS); 1♂, 30.v.1979 (forest) (EMUS); 1♂, 4.vi.1979 (sec. for.) (EMUS); 1♀, 9.vi.1979 (prim. for.) (EMUS); 1♀, 19.vi.1979 (prim. for.) (EMUS); 1♀, 28.vi.1979 (forest) (EMUS); 1♀, 20.viii.1979 (sec. for.) (EMUS); 1♂, 3.x.1979 (sec. for.) (EMUS); 1♂, 6.x.1979 (forest) (EMUS); 1♂, 7.x.1979 (forest) (EMUS); 1♂, 11.x.1979 (sec. for.) (EMUS); 1♀, 13.x.1979 (forest) (EMUS); 1♂, 15.x.1979 (forest) (EMUS); 1♀, 19.xi.1979 (for. gap) (EMUS); 1♂, 20.x.1979 (sec. for.) (EMUS); 1♀, 30.xi.1979 (forest) (EMUS); 1♂, 14.xii.1979 (prim. for.) (EMUS); 1♀, 24.xii.1979 (sec. for.) (EMUS); 1♂, 26.xii.1979 (sec. for.) (EMUS); 1♀, 2.i.1980 (forest) (EMUS); 1♂, 7.ii.1980 (prim. for.) (EMUS); 1♂, 18.ii.1980 (forest) (EMUS); 1♀, 29.ii.1980 (forest) (EMUS); 1♀, 25.iii.1980 (forest) (EMUS); 1♂, 15.iv.1980 (forest) (EMUS); 1♂, 30.iv.1980 (prim. for.) (EMUS); 1♂, 15.v.1980 (forest) (EMUS); 1♂, 29.v.1980 (forest) (EMUS); 1♀, Pasoh, N. Sembilan, West Malaysia, 18–25.i.1992, Fine Malaise trap, T. Matsumura (NIAES); 1♂, Air Hitam Forest Res., U. P. M., Selangor Peninsula, Malaysia, Coarse Malaise trap, 3–27.ii.1992 (NIAES).

Diagnosis. Both sexes: clypeus as broad as LID (Figs 1A, 2A); and mid and hind femora with small spines set in pits apicodorsally. **Female:** thorax mostly orange-red (Fig. 1K); gena, in dorsal view, very thin, abruptly receding posteriorly (Fig. 1B); and lateral margin of pronotal dorsum, in dorsal view, slightly narrowing anteriorly (Fig. 1B). **Male:** frons, in profile, gently convex (Fig. 2I); placoids small, shorter than half of each flagellomere (Fig. 2E); thorax usually dark rufous (Fig. 2I); SGP arrowhead-shaped with rounded apex (Fig. 2F); and inner margin of parapenial lobe smooth (Fig. 2G, H).

Description. Holotype female. Length: Body 6.5 mm; forewing 5.7 mm. Head $1.3 \times$ as broad as long. MID $0.55 \times$ head width. UID:MID:LID = 7.4:10:8.0. POL:OOL = 1: 0.62. Clypeus $2.4 \times$ as broad as long. Gena, in profile, $0.2 \times$ eye width. Scape:Fl1:Fl2 = 7.6:10:8.9; Fl1 $3.7 \times$ as long as thick, $0.86 \times$ as long as UID. Longer spur of hind tibia $0.69 \times$ hind tarsomere 1. FW marginal cell removed from wing tip by $0.47 \times$ its own length. SMC2:SMC3 = 1:1.5 on vein *M*, 1:0.43 on vein *Rs*. SMC2 narrowed on vein *Rs* by $1.0 \times$ its length on vein *M*, receiving crossvein *Im-cu* at basal



Figure 1. *Erythropompilus malaysiensis* Pitts & Shimizu, sp. nov., holotype, female **A** head in anterior view **B** head and pronotum in dorsal view **C** head in lateral view **D** head, pronotum and mesonotum in posterodorsal view (arrow, occipital carina) **E** scutellum, metanotum, metapostnotum and propodeum in dorsal view **F** whole body in lateral view **G** left fore tarsus in dorsal view **H** left fore and hind wings **I** mandible in anterior view **J** labio-maxillary complex in posterior view (left maxilla removed; arrow, preapical membranous area of prementum) **K** head and mesosoma in lateral view. Scale bars: 0.3 mm (C, J); 0.5 mm (G, I); 1 mm (A, B, D–F, H, K).

0.57. SMC3 narrowed on vein *R*_s by $0.29 \times$ its length on vein *M*, receiving crossvein *2m-cu* at basal 0.45, removed from outer wing margin by $1.5 \times$ its own length.

The type series. Female. (Measurements of the holotype are given in parentheses.) Length: Body 5.6–7.7 (6.5) mm; forewing 5.4–7.1 (5.7) mm. Body and legs dark rufous to black, except for mesosoma mostly orange-red (Fig. 1F). Scape beneath yellowish brown (Fig. 1A). Following more or less reddish brown to dark rufous: clypeus, labrum, mandible, palpi, pedicel and flagellum beneath (Fig. 1A), legs, and metasoma. Wings translucent with yellowish tint (Fig. 1H).

Pubescence on body and legs mostly silvery, but that on following sericeous: upper frons, vertex, mesosoma dorsally (except for propodeum posteriorly), upper meso- and metapleura, metasomal terga anteriorly and posteriorly, metasomal sterna posteriorly, fore tibia and tarsus, and mid and hind tarsi.

Head 1.3–1.4 (1.3) \times as broad as long. Vertex not convex between eye tops (Fig. 1A). Frons in lateral view gently convex (Fig. 1K), with frontal line very fine on lower half, almost obsolete on upper half. Antennocular line slightly inclined from antennal base toward eye (Fig. 1B). MID 0.52–0.56 (0.55) \times head width. UID:MID:LID = 7.2–7.8 (7.4):10:7.9–8.6 (8.0). POL:OOL = 1:0.50–0.67 (0.62). Clypeus 2.4–2.7 (2.4) \times as broad as long; apical margin almost transversely straight (Fig. 1A). Labrum with apical margin almost transversely straight medially. Gena, in profile, 0.1–0.2 (0.2) \times eye width. Scape:F11:F12 = 7.1–8.2 (7.6):10:8.2–9.2 (8.9); F11 3.7–4.5 (3.7) \times as long as thick, 0.83–0.98 (0.86) \times as long as UID.

Pronotum with posterior margin subangulate medially (Fig. 1B). Mesoscutum slightly raised posterolaterally (Fig. 1D). Disc of scutellum barely convex above level of mesoscutum.

Mid tibia with five to eight spines externally and two or three spines internally. Hind tibia with six to eight spines externally and five to seven spines internally. Longer spur of hind tibia 0.63–0.71 (0.69) \times hind tarsomere 1.

FW and HW as shown in Fig. 1H. Marginal cell removed from wing tip by 0.42–0.49 (0.47) \times its own length. SMC2:SMC3 = 1:1.3–1.6 (1.5) on vein *M*, 1:0.36–0.62 (0.43) on vein *R*_s. SMC2 narrowed on vein *R*_s by 0.83–1.1 (1.0) \times its length on vein *M*, receiving crossvein *1m-cu* at basal 0.48–0.60 (0.57). SMC3 narrowed on vein *R*_s by 0.25–0.35 (0.29) \times its length on vein *M*, receiving crossvein *2m-cu* at basal 0.44–0.59 (0.45), removed from outer wing margin by 1.2–1.7 (1.5) \times its own length. Crossvein *cu-a* perpendicular to vein *A*.

Male. Body 4.6–6.2 mm; forewing 4.2–5.6 mm. Body and legs black (Fig. 2C); pro-, meso- and metanota, meso- and metapleura dorsally, and propodeum anteriorly more or less dark rufous (Fig. 2I) (in a specimen from Air Hitam Forest Res., U. P. M., Selangor Peninsula Malaysia, thorax mostly orange-red); palpi, metasomal terga except anteriorly, metasomal sterna, fore legs, and sometimes mid and hind coxae, trochanters, and femora reddish brown. Antenna beneath yellowish to light brown (Fig. 2A) (becoming darker apically). Wings with inner fascia narrower than in female (Fig. 2D).

Head 1.3 \times as broad as long. Vertex, in frontal view, raised in ocellar area above level of eye tops (Fig. 2A). MID 0.57–0.63 \times head width. UID:MID:LID = 7.9–8.4:10:7.7–8.1. POL:OOL = 1:0.56–0.69. Clypeus 2.4–2.7 \times as broad as long, narrower than

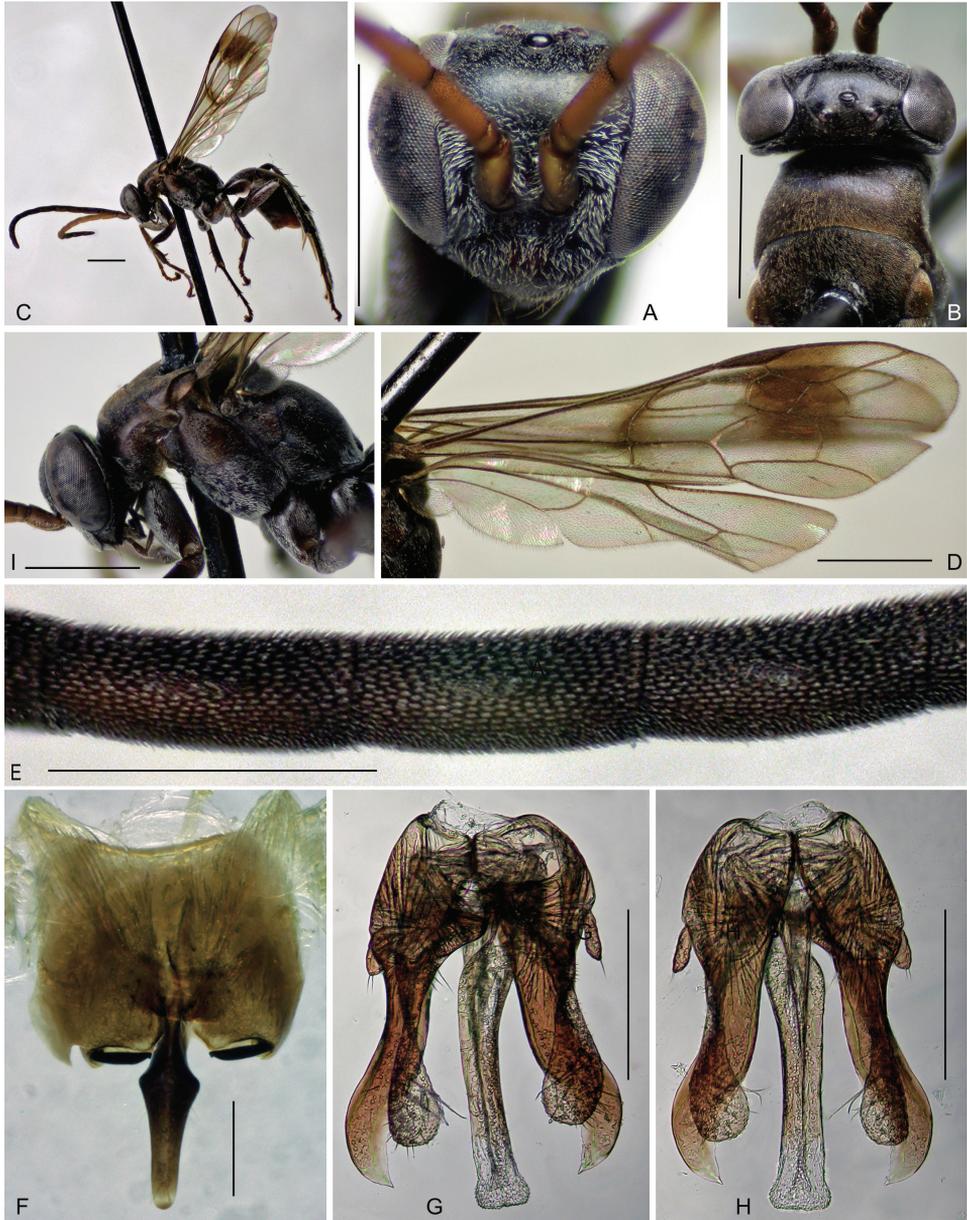


Figure 2. *Erythropompilus malaysiensis* Pitts & Shimizu, sp. nov., paratype, male (from Pasoh Forest Res., Negri S., Malaysia) **A** head in anterior view **B** head and pronotum in dorsal view **C** whole body in lateral view **D** left fore and hind wings **E** left flagellomeres 3–5 in medial view **F** metasomal sternum 6 and subgenital plate in ventral view **G** genitalia in dorsal view **H** genitalia in ventral view **I** head and mesosoma in lateral view. Scale bars: 0.25 mm (**F–H**); 0.5 mm (**E**); 1 mm (**A–D, I**).

LID (Fig. 2A). Gena, in dorsal view, slightly thicker than in female (Fig. 2B), $0.2\text{--}0.3 \times$ eye width in profile. Scape:Fl1:Fl2 = 8.0–8.5:10:9.8–10; Fl1 $3.0\text{--}3.5 \times$ as long as thick, $0.60\text{--}0.70 \times$ as long as UID.

Pronotum, in dorsal view, distinctly narrowing anteriorly (Fig. 2B).

Mid tibia with five or six spines externally and two or three short spines internally. Hind tibia with five to eight spines externally and four or five spines internally. Longer spur of hind tibia $0.65\text{--}0.83 \times$ hind tarsomere 1.

Fore and hind wings as shown in Fig. 2D. Marginal cell removed from wing tip by $0.36\text{--}0.44 \times$ its own length. SMC2:SMC3 = 1:1.2–1.5 on vein *M*, 1:0.41–0.74 on vein *Rs*. SMC2 narrowed on vein *Rs* by $0.90\text{--}1.1 \times$ its length on vein *M*, receiving crossvein *1m-cu* at basal $0.36\text{--}0.57$. SMC3 narrowed on vein *Rs* by $0.29\text{--}0.45 \times$ its length on vein *M*, receiving crossvein *2m-cu* at basal $0.45\text{--}0.55$, removed from outer wing margin by $1.3\text{--}1.8 \times$ its own length.

SGP somewhat concave ventrally. Genitalia (Fig. 2G, H): volsella constricted medially, broadened apically with rounded apex and several long setae; parapenial lobe extending far beyond apex of volsella; aedeagus slightly broadened apically, extending beyond apex of parapenial lobe.

Etymology. The species name is derived from its locality, i.e., Malaysia.

***Erythropompilus taiwanensis* Pitts & Shimizu, sp. nov.**

<http://zoobank.org/3534F399-53C5-4DD2-8404-4ABC7327E124>

Figures 3A–H, 4A–I

Material examined. *Holotype*, ♀: ‘Wushe. Taiwan 1150m. V-15-83 Henry Townes’ (EMUS). *Paratypes*: 1♂, ‘TAIWAN: Kaohsiung, Luluei Forest Sta., 750m; May 1 1989; J. Heppner & W. Wang’ (EMUS).

Diagnosis. Both sexes: clypeus narrower than LID (Figs 3A, 4A); mid and hind femora without small spines set in pits apicodorsally. **Female:** thorax almost black (Fig. 3G); gena, in dorsal view, slightly thickened, roundly receding posteriorly (Fig. 3B); and lateral margin of pronotal dorsum, in dorsal view, concave, not narrowing anteriorly (Fig. 3B). **Male:** thorax dark rufous (Fig. 4I); frons, in profile, spherically convex (Fig. 4I); placoids small, shorter than half of each flagellomere (Fig. 4E); SGP triangular with rounded apex (Fig. 4F); and inner margin of parapenial lobe finely and irregularly serrate (Fig. 4G, H).

Description. Holotype female. Length: Body 6.0 mm; forewing 5.9 mm. Body and legs black (Fig. 3D). Following dark rufous: palpi, clypeus, labrum, mandible, flagellum beneath, legs, and metasoma. Scape and pedicel beneath light brown (Fig. 3A). Wings translucent with brownish tint (Fig. 3F). Pubescence on pronotum posteriorly and mesonotum sericeous.

Head $1.4 \times$ as broad as long. Vertex, in frontal view, almost transversely straight but slightly raised in ocellar area (Fig. 3A). Frons in lateral view strongly convex, but upper frons and vertex flattened (Fig. 3G), with frontal line very fine from antennal base to anterior ocellus. Antennocular line distinctly inclined from antennal base toward eye (Fig. 3B). MID $0.61 \times$ head width. UID:MID:LID = 8.1:10:7.5. POL:OOL = 1:0.86. Clypeus $2.3 \times$ as broad as long; apical margin barely and arcuately emargin-

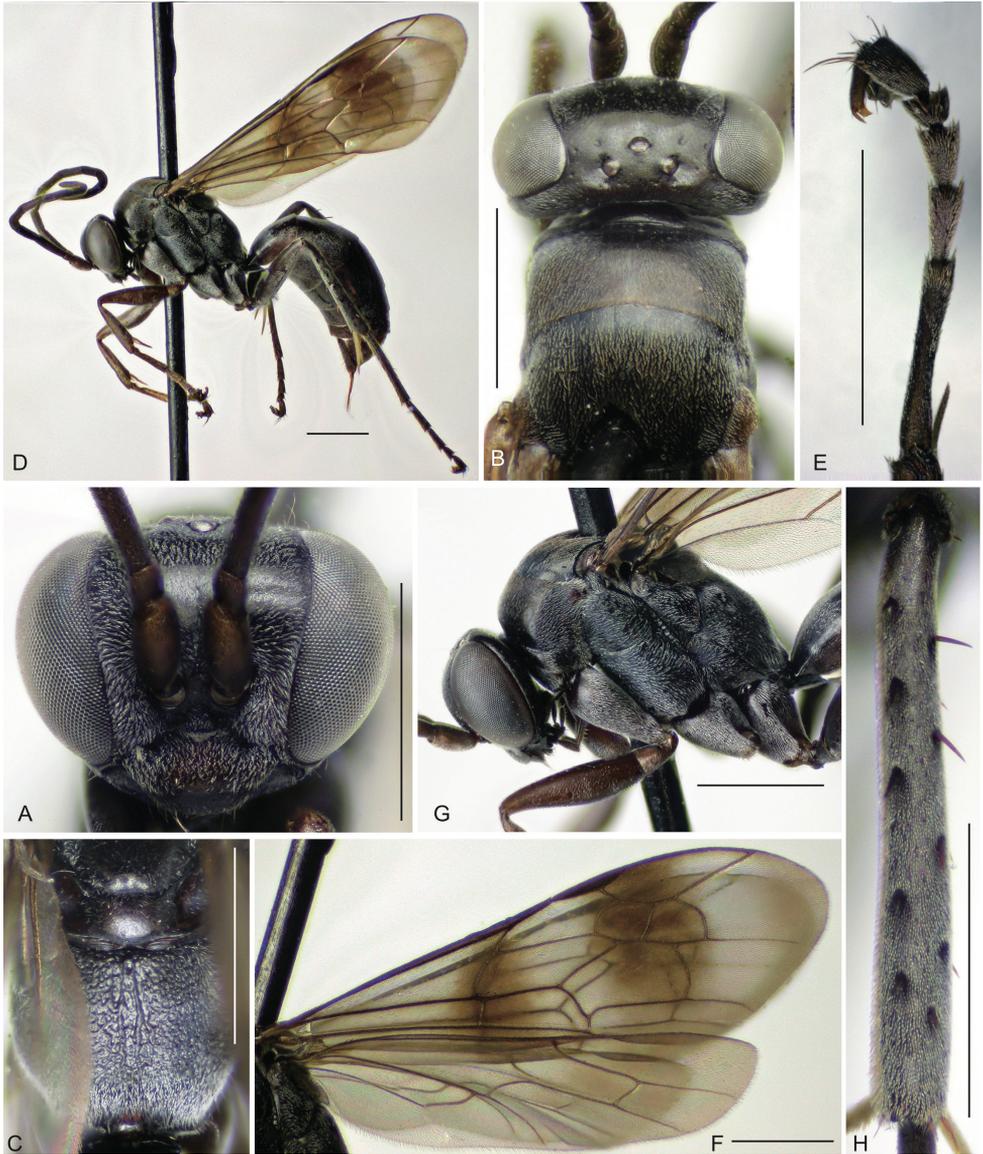


Figure 3. *Erythropompilus taiwanensis* Pitts & Shimizu, sp. nov., holotype, female **A** head in anterior view **B** head, pronotum, and scutum in dorsal view **C** scutellum, metanotum, metapostnotum and propodeum in dorsal view **D** whole body in lateral view **E** left fore tarsus in dorsal view **F** left fore and hind wings **G** head and mesosoma in lateral view **H** right hind tibia in dorsal view. Scale bars: 1 mm.

ate. Gena, in profile, thin, $0.2 \times$ eye width (Fig. 3G). Scape:Fl1:Fl2 = 7.2:10:8.7; Fl1 $4.2 \times$ as long as thick, $0.78 \times$ as long as UID.

Pronotum gently and arcuately emarginate posteriorly (Fig. 3B). Mesoscutum scarcely raised posterolaterally. Disc of scutellum not convex above level of mesoscutum.



Figure 4. *Erythropompilus taiwanensis* Pitts & Shimizu, sp. nov., paratype, male (from Kaohsiung, Luluei Forest Sta., 750 m, Taiwan) **A** head in anterior view **B** head and pronotum in dorsal view **C** whole body in lateral view **D** left fore and hind wings **E** left flagellomeres 2–4 in medial view **F** metasomal sternum 6 and subgenital plate in ventral view **G** genitalia in dorsal view **H** genitalia in ventral view. Scale bar: 0.25 mm (**F–H**); 0.5 mm (**A, B, E**); 1 mm (**C, D**).

Metapostnotum $0.1 \times$ as long as metanotum and depressed medially, with a few fine transverse striae (Fig. 3C).

Mid tibia with four spines externally and one spine internally; hind tibia with five or six spines externally and five spines internally (Fig. 3H). Longer spur of hind tibia $0.63 \times$ hind tarsomere 1.

FW and HW as shown in Fig. 3F. Marginal cell removed from wing tip by $0.46 \times$ its own length. SMC2:SMC3 = 1:1.3 on vein *M*, 1:0.48 on vein *Rs*. SMC2 narrowed on vein *Rs* by $0.82 \times$ its length on vein *M*, receiving crossvein *1m-cu* at basal 0.5. SMC3 narrowed on vein *Rs* by $0.3 \times$ its length on vein *M*, receiving crossvein *2m-cu* at basal 0.54, removed from outer wing margin by $1.8 \times$ its own length. Crossvein *cu-a* originating slightly distal to point of separation of vein *M+CuA*, leaning toward wing base. HW jugal lobe less than third of subbasal cell in length.

Male. Based on the only paratype. Body 3.8 mm; forewing 3.6 mm. Body and legs reddish brown (Fig. 4C); scape and pedicel yellowish brown beneath.

Head $1.3 \times$ as broad as long. Vertex distinctly convex between eye tops (Fig. 4A). Antennocular line strongly inclined from antennal base toward eye (Fig. 4B). MID $0.67 \times$ head width. UID:MID:LID = 8.6:10:7.3. POL:OOL = 1:0.87. Clypeus much narrower than LID (Fig. 4A), $2.3 \times$ as broad as long; surface more convex than in female; apical margin transversely straight. Gena, in profile, $0.3 \times$ eye width. Scape:Fl1:Fl2 = 8.4:10:10; Fl1 $2.4 \times$ as long as thick, $0.54 \times$ as long as UID.

Metapostnotum very short, $0.06 \times$ as long as metanotum at midline.

FW and HW as shown in Fig. 4D. Marginal cell removed from wing tip by $0.38 \times$ its own length. SMC2:SMC3 = 1:2 on vein *M*, 1:0.67 on vein *Rs*. SMC2 not narrowed above, receiving crossvein *1m-cu* at basal 0.43. SMC3 narrowed on vein *Rs* by $0.34 \times$ its length on vein *M*, receiving crossvein *2m-cu* at basal 0.51, removed from outer wing margin by $1.5 \times$ its own length. Crossvein *cu-a* perpendicular to vein *A*.

Mid tibia with very small spines dorsally, three spines externally and two spines internally. Hind tibia with spines longer than those on mid tibia, five or six spines externally and three or four spines internally. Longer spur of hind tibia $0.65 \times$ hind tarsomere 1.

SGP somewhat concave beneath. Genitalia (Fig. 4G, H): volsella slender but broadened apically with rounded apex and several long setae; parapenial lobe extending far beyond apex of volsella; aedoeagus parallel-sided for most part.

Etymology. The species name is derived from its locality, i.e., Taiwan.

***Erythropompilus thailandensis* Pitts & Shimizu, sp. nov.**

<http://zoobank.org/E04D0285-EF0D-48E8-8D00-A5996E2D6210>

Figures 5A–I, 6A–J

Material examined. *Holotype*, ♀: 'THAILAND Nakhon Nayok Khao Yai NP near Training Center 2 $14^{\circ}24.515'N$, $101^{\circ}22.432'E$ 750m Pan traps 5–6.ii.2007 Wirat Sukho leg. T2235' (QSBG). *Paratypes*: Thailand: 1♀, same data as that of holotype (QSBG); 1♀, same locality, nature trail in secondary forest, $14^{\circ}24.522'N$,



Figure 5. *Erythropompilus thailandensis* Pitts & Shimizu, sp. nov., holotype, female **A** head in anterior view **B** head and pronotum in dorsal view **C** scutellum, metanotum, metapostnotum, and propodeum in dorsal view **D** whole body in lateral view **E** left fore and hind wings **F** left maxilla in lateral view **G** labio-maxillary complex in posterior view (arrow, preapical membranous area of prementum) **H** head and mesosoma in lateral view **I** mid and hind tibiae in dorsal view. Scale bars: 0.3 mm (**F, G**); 1 mm (**A–E, H, I**).

101°22.434'E, 750 m, Malaise trap, 5.vii–12.viii.2006, Pong Sandao leg., T399 (QSBG); 1♂, same locality, behind headmasters house, 14°24.781'N, 101°22.689'E, 770 m, Malaise trap, 5–12.vii.2006, Pong Sandao leg., T144 (QSBG); 2♂, same

locality and collector, Malaise trap, 19–26.vii.2006, 150 (QSBG); 1♀, same locality, Lum Ta Kong View Point, 14°25.82'N, 101°23.754'E, 744 m, Malaise trap, 5–12.iv.2007, Pong Sandao leg., T2123 (QSBG); 1♂, same locality, 12–19.iv.2007, Wirat Sukho leg., T2126 (QSBG); 1♀, same locality, 12–19.iv.2007, Wirat Sukho leg., T2126 (QSBG); 1♂, same locality, moist evergreen forest near the reservoir, 14°27.119'N, 101°21.482'E, 699 m, Malaise trap, 19–26.xi.2006, Wirat Sookkho leg., T997 (QSBG); 1♀, Nakhon Ratchasima, Khao Yai NP, Cobra zone near fire protection office, 14°28.524'N, 101°22.928'E, 757 m, Malaise trap, 19–26.vi.2007, Pong Sandao leg., T2227 (QSBG); 1♀, Tang Prov., Nayong, Khaochong, 75 m, 7°33.068'N, 99°47.369'E, 2005 (QSBG); 1♀2♂, Trang Prov., near Nam Tok, Tan Prov. Khoa Chong Mt., 140 m, 7°32'15"N, 99°47'35"E, vii.2005, D. Lohman (QSBG); 3♀1♂, same locality, date and collector, 7°32'15"N, 99°47'36"E (QSBG); 1♀2♂, same locality, date and collector, 7°32'16"N, 99°47'36"E (QSBG); 1♂, Trang Prov., Nayong Khaochong Lab, Malaise trap, 75 m, 7°33.38'N, 47°47.369'E, 20–22.vi.2005 (QSBG); 1♀, Khonkaen, Phu Pha Man NP, teak plantation, 16°43.241'N, 101°59.580'E 265 m, Malaise trap, 6–13.vi.2006, Vinai Boonma leg., T3 (EMUS); 6♀6♂, same locality, 16°44.837'N, 102°00.160'E 265 m, Malaise trap, 13–20.vi.2006, Rabeab Phatai leg., T1 (EMUS); 1♀5♂, same locality, 16°44.902'N, 102°0.182'E 245 m, Malaise trap, 14–21.vi.2006, Rabeab Phatai leg., T6 (EMUS); 1♀, Phetchabun, Thung Salaeng Luang NP, Gang Wang Nam Yen, 16°37.531'N, 100°53.745'E 721 m, Malaise trap, 31.v–7.vi.2007, Pongpitak Pranee & Sathit leg., T2088 (EMUS); 1♀, Phetchabun, Khao Kho NP office, 16°39.479'N, 101°08.105'E 260 m, Malaise trap, 5–12.vii.2006, Somchai Chatchumnan & Sa-ink Singtong leg., T163 (EMUS); 1♂, Phetchabun, Khao Kho NP, savana at nursery, 16°52.568'N, 101°08.104'E 520 m, Pan traps, 11–12.x.2006, Somchai Chatchumnan & Sa-ink Singtong leg., T802 (EMUS); 1♂, Phetchabun, Khao Kho NP, mix deciduous near office, 16°39.479'N, 101°8.105'E 260 m, Malaise trap, 5–12.ii.2007, Somchai Chatchumnan & Saink Singtong leg., T1600 (EMUS); 1♀4♂, Phetchabun, Nam Nao NP, helicopter landing ground, 16°43.156'N, 101°35.118'E 890 m, Malaise trap, 24–30.vii.2006, Noopean Hongyothi leg., T278 (EMUS); 1♂, Phetchabun, Nam Nao NP, forest check point, 16°43.695'N, 101°33.797'E 921 m, Malaise trap, 13–20.xi.2006, Noopean Hongyothi leg., T1020 (EMUS); 1♂, Phitsanulok, Thung Salaeng Luang NP, mixed deciduous forest, 16°50.563'N, 100°51.757'E 481 m, Malaise trap, 2–9.x.2006, Pongpitak Pranee leg., T936 (EMUS); 2♂, same locality and collector, 16°50.319'N, 101°51.792'E 479 m, Malaise trap, 11–18.viii.2006, T568 (QSBG); 2♂, same locality and collector, Malaise trap, 1–8.ix.2006, T577 (QSBG); 4♂, same locality and collector, dry evergreen forest, 16°50.277'N, 100°52.917'E 486 m, Malaise trap, 25.ix–2.x.2006, T932 (QSBG); 3♂, same locality and collector, moist evergreen forest, 16°50.641'N, 101°52.894'E 557 m, Malaise trap, 11–18.viii.2006, T566 (QSBG); 3♂, same locality and collector, Malaise trap, 25.viii–1.ix.2006, T572 (QSBG); 1♀1♂, same locality and collector, evergreen forest, 16°50.217'N, 101°52.541'E 580 m, Malaise trap, 25.viii–1.ix.2006, T573 (EMUS); 1♀1♂, same locality and collector, Malaise trap, 11–12.viii.2006, T559 (EMUS); 2♂, Loei Phu

Ruea NP, Subhnonghin, 17°28.772'N, 101°21.308'E 860 m, Malaise trap, 5–12.vii.2006, Patikhom Tamtip leg., T310 (EMUS); 1♂, Loei Phu Ruea NP office, 17°28.805'N, 101°21.242'E 870 m, Malaise trap, 12–19.vii.2006, Patikhom Tamtip leg., T315 (EMUS); 1♀, same locality, 19–26.vii.2006, Nukoonchai Jaroenchai leg., T318 (EMUS); 6♂, Chiang Mai, Huai Nam Dang NP, Thung Buatong View Point, 19°17.47'N, 98°36.033'E 1464 m, Malaise trap, 31.vii–7.viii.2007, Thawatchai Boonthum & Anuchart Chaimuengchun leg., T2849 (EMUS).

Diagnosis. Both sexes: mid and hind femora with small spines set in pits apico-dorsally. **Female:** gena, in dorsal view, thin but roundly receding posteriorly (Fig. 5B); and lateral margin of pronotal dorsum, in dorsal view, concave and scarcely narrowing anteriorly (Fig. 5B). **Male:** frons, in profile, gently convex (Fig. 6J); placoids large, much longer than half of flagellomere (Fig. 6E); SGP very long and parallel-sided for most part (Fig. 6G); and inner margin of parapepial lobe smooth (Fig. 6H, I).

Description. Holotype female. Length: Body 7.1 mm; forewing 6.6 mm. Head $1.4 \times$ as broad as long. MID $0.57 \times$ head width. UID:MID:LID = 7.6:10:8.1. POL:OOL = 1:0.72. Clypeus $2.5 \times$ as broad as long. Gena, in profile, $0.3 \times$ eye width. Scape:Fl1:Fl2 = 7.5:10:8.6; Fl1 $4.4 \times$ as long as thick, $0.86 \times$ as long as UID. Longer spur of hind tibia $0.68 \times$ hind tarsomere I. FW marginal cell removed from wing tip by $0.53 \times$ its own length. SMC2:SMC3 = 1:1.6 on vein *M*, 1:0.70 on vein *Rs*. SMC2 narrowed on vein *Rs* by $0.90 \times$ its length on vein *M*, receiving crossvein *1m-cu* at basal 0.57. SMC3 narrowed on vein *Rs* by $0.40 \times$ its length on vein *M*, receiving crossvein *2m-cu* at basal 0.51, removed from outer wing margin by $1.5 \times$ its own length.

The type series. Female. (Measurements of the holotype are given in parentheses.) Length: Body 5.1–9.0 (7.1) mm; forewing 4.7–8.0 (6.6) mm. Body and legs black, except for mesosoma mostly orange-red (Fig. 5D) (in some specimens, pronotum anterolaterally, meso- and metapleura ventrally and propodeum black). Scape beneath, fore femur apically, fore tibia except for dorsally, and fore tarsomere 1 light brown. Fore femur except apically, fore tarsomeres 2–5, metasomal terga medially, and metasomal sterna posteriorly dark rufous. Wings translucent with brownish tint (Fig. 5E).

Pubescence on dorsal part of mesosoma except for blackish part of propodeum, T1–5 medially and metasomal sterna posteriorly sericeous.

Head 1.3 – 1.4 (1.4) \times as broad as long. Vertex slightly convex between eye tops (Fig. 5A). Frons with frontal line very fine, almost obsolete near anterior ocellus. Antennocular line slightly inclined from antennal base toward eye (Fig. 5B). MID 0.53 – 0.58 (0.57) \times head width. UID:MID:LID = 7.6–8.0 (7.6):10:7.6–8.4 (8.1). POL:OOL = 1:0.63–0.72 (0.72). Clypeus 2.3 – 2.6 (2.5) \times as broad as long; apical margin almost transversely straight (Fig. 5A). Labrum with apical margin transversely straight or barely emarginate medially. Gena, in profile, thin, 0.2 – 0.3 (0.3) \times eye width (Fig. 5H). Scape:Fl1:Fl2 = 6.7 (7.5):10:7.9–8.9 (8.6); Fl1 3.9 – 4.9 (4.4) \times as long as thick, 0.67 – 0.99 (0.86) \times as long as UID.

Pronotum with posterior margin gently arcuate or subangulate medially (Fig. 5B). Mesoscutum slightly raised posterolaterally. Disc of scutellum slightly convex above level of mesoscutum.



Figure 6. *Erythropompilus thailandensis* Pitts & Shimizu, sp. nov., paratype, male (from Phu Pha Man NP Teak plantation, Khonkaen, Thailand) **A** head in anterior view **B** head and pronotum in dorsal view **C** whole body in lateral view **D** left fore and hind wings **E** right flagellomeres 2–4 in medial view **F** meta-somal sternum 6 in ventral view **G** subgenital plate in ventral view **H** genitalia in dorsal view **I** genitalia in ventral view **J** head and mesosoma in lateral view. Scale bars: 0.25 m.

Mid tibia with about five spines externally, two or three spines internally (Fig. 5I). Hind tibiae with about six long spines externally and internally (Fig. 5I). Longer spur of hind tibia 0.64–0.74 (0.68) × hind tarsomere 1.

FW and HW as shown in Fig. 5E. Marginal cell removed from wing tip by $0.40\text{--}0.56$ (0.53) \times its own length. SMC2:SMC3 = 1: $1.3\text{--}1.9$ (1.6) on vein *M*, 1: $0.55\text{--}0.79$ (0.70) on vein *Rs*. SMC2 narrowed on vein *Rs* by $0.79\text{--}1.0$ (0.90) \times its length on vein *M*, receiving crossvein *1m-cu* at basal $0.52\text{--}0.66$ (0.57). SMC3 narrowed on vein *Rs* by $0.31\text{--}0.49$ (0.40) \times its length on vein *M*, receiving crossvein *2m-cu* at basal $0.45\text{--}0.54$ (0.51), removed from outer wing margin by $1.3\text{--}1.6$ (1.5) \times its own length. Crossvein *cu-a* perpendicular to vein *A*.

Male. Body $4.1\text{--}7.9$ mm; forewing $4.1\text{--}7.6$ mm. Body and legs black, but pronotum except anteriorly, meso- and metanota, metapostnotum, and meso- and metapleura except ventrally orange-red (Fig. 6C, J) (in some specimens, frons along inner orbit also orange-red). Palpi, and pedicel and a few basal flagellomeres beneath (Fig. 6A) light- to reddish brown. Scape beneath (Fig. 6A), fore coxa, trochanter and femur apically, fore tibia except dorsally, and fore tarsus more or less yellowish-, light- or reddish brown.

Head $1.3\text{--}1.5 \times$ as broad as long. Vertex, in frontal view, distinctly convex above level of eye tops (Fig. 6A). Antennocular line distinctly inclined from antennal base toward eye (Fig. 6B). MID $0.57\text{--}0.60 \times$ head width. UID:MID:LID = $8.1\text{--}8.7:10:7.6\text{--}8.4$. POL:OOL = $1:0.60\text{--}0.72$. Clypeus $2.4\text{--}2.7 \times$ as broad as long. Gena, in dorsal view, slightly thicker than in female (Fig. 6B), in profile, $0.2\text{--}0.3 \times$ eye width. Scape:Fl1:Fl2 = $8.1\text{--}9.8:10:10\text{--}11$; Fl1 $2.8\text{--}3.6 \times$ as long as thick, $0.49\text{--}0.67 \times$ as long as UID.

Mid tibia with four to six spines externally and two to six spines internally. Hind tibia with four or eight spines externally and four to six spines internally. Longer spur of hind tibia $0.67\text{--}0.82 \times$ hind tarsomere 1.

FW and HW as shown in Fig. 6D. Marginal cell removed from wing tip by $0.40\text{--}0.50 \times$ its own length. SMC2:SMC3 = $1:1.2\text{--}1.7$ on vein *M*, $1:0.46\text{--}0.76$ on vein *Rs*. SMC2 narrowed on vein *Rs* by $0.52\text{--}0.98 \times$ its length on vein *M*, receiving crossvein *1m-cu* at basal $0.48\text{--}0.65$. SMC3 narrowed on vein *Rs* by $0.26\text{--}0.45 \times$ its length on vein *M*, receiving crossvein *2m-cu* at basal $0.50\text{--}0.66$, removed from outer wing margin by $1.4\text{--}1.8 \times$ its own length. Crossvein *cu-a* perpendicular to vein *A*.

SGP flattened ventrally with several long setae laterally near middle (Fig. 6G). Genitalia (Fig. 6H, I): volsella arcuately emarginate interiorly, broadened apically with rounded apex and short setae; parapenial lobe extending slightly beyond apex of volsella but not extending beyond apex of aedeagus; aedeagus very slightly narrowing subapically, slightly expanded at apex.

Etymology. The species name is derived from its locality, i.e., Thailand.

Discussion

In recent molecular phylogenetic analyses, the monophyly of the subfamily Pompilinae was well supported, more so than the other large subfamily Pepsinae (Waichert et al. 2015; Rodriguez et al. 2016). With traditional morphological studies, the family Pompilidae, as well as this subfamily, is well defined, although the morphological

diagnoses of not only Pompilinae, but also of Pepsinae, are not necessarily easily defined. The Pompilinae has been recognized by the following features:

The mid and hind femora have one or several small spines set in grooves or pits apicodorsally (Haupt 1927, 1929, 1930; Banks 1934; Evans 1950; Townes 1957; Brothers and Finnamore 1993) (The Pompilinae treated here corresponds to Haupt's (1930) "Psammocharidae-trachyscelidae", i.e., Psammocharinae (= Pompilinae), Pedinaspinae and Homonotinae combined).

In practice, however, this characteristic is found not solely in Pompilinae but also in Ceropalinae (*Ceropales* Latreille, 1796), Notocyphinae (*Notocyphus* Smith, 1855), and some Pepsinae (e.g., *Minotocyphus* Banks, 1934, *Calopompilus* Ashmead, 1900, *Austrosalius* Turner, 1917, *Dolichocurgus* Haupt, 1937, *Mimocurgus* Haupt, 1937, *Alococurgus* Haupt, 1937, *Pachycurgus* Haupt, 1937, *Eremocurgus* Haupt, 1937, *Pompilocalus* Roig-Alsina, 1989, *Hypoferreola* Ashmead, 1902, *Aimatocare* Roig-Alsina, 1989, *Anacyphonyx* Banks, 1946, and *Cordyloscelis* Arnold, 1935). In older classifications, *Minotocyphus* was placed in Notocyphinae (Banks 1934) or Notocyphini of Ceropalinae (Townes 1957). In our preliminary molecular phylogenetic analyses (unpub. data), *Minotocyphus* is found to be a member of the Pepsinae clade. Here, thus, we treat this genus as a member of Pepsinae.

FW vein CuA_1 is deflected posteriorly at the base (Arnold 1932; Banks 1934; Evans 1950; Townes 1957; Day 1988; Brothers and Finnamore 1993).

This feature is also found in Ceropalinae (*Irenangelus* Schulz, 1906, and *Ceropales*) and some Pepsinae (e.g., *Minotocyphus*, *Dolichocurgus*, *Pachycurgus*, *Plagicurgus* Roig-Alsina, 1982, *Anacyphonyx*, *Pepsis* Fabricius, 1804, *Hemipepsis* Dahlbom, 1843, *Cyphononyx* Dahlbom, 1845 and *Entypus* Dahlbom, 1844). Thus, the feature is not always characteristic of Pompilinae.

Spines at the apex of the hind tibia are of unequal length, more or less splayed out and irregularly spaced (Haupt 1927, 1929; Arnold 1932; Banks 1934; Evans 1950; Townes 1957; Day 1988; Brothers and Finnamore 1993).

This is a good feature for Pompilinae. The condition is, however, sometimes subtle. For example, in some parasitoid genera, such as *Allochares* Banks, 1917 and *Eoferreola* Arnold, 1935 (Pompilinae), the spines are short and a few, and their splayed-out condition is indistinct. Nevertheless, in these genera, the spines are of unequal thickness, as in the other genera of Pompilinae. Thus, the differing thickness of the apical spines on the hind tibia is also available for the definition of this subfamily.

A cluster of the HW basal hamuli are strongly proximal to the separation of vein C from vein $Sc+R+Rs$ (Day 1988, p. 9).

This characteristic is not applicable to a few Pompilinae, e.g., *Priochilus* Banks, 1944, *Braunilla* Wasbauer & Kimsey, 2019 (= *Balboana* Banks, 1944), and *Parabatozonus* Yasumatsu, 1936, in which the cluster of basal hamuli are at or distal to the separation of vein C from vein $Sc+R+Rs$, as in most Pepsinae. In contrast, in some Pepsinae, e.g., *Psoropempula* Evans, 1974, *Trichocurgus* Haupt, 1937 and some *Priocnemis* Schiødte, 1837 (e.g., *P. pusilla* (Schiødte, 1837)), the cluster of the basal hamuli are strongly proximal to the separation of vein C from vein $Sc+R+Rs$.

The prementum has a preapical circular, or heart- or spade-shaped membranous area (Shimizu 1994).

This feature is applicable to almost all members of Pompilinae, although the verification of the condition is difficult. To examine the degree of the sclerotization of the apical prementum, in many cases, the labio-maxillary complex has to be removed from a specimen after softening the specimen with water vapor.

Erythropompilus possesses all the above features, and, thus, this genus should be treated as a member of Pompilinae. We are currently conducting molecular phylogenetic analyses using ultra-conserved elements, and the preliminary phylogenomics highly support this subfamilial position of the genus and its close relationship with *Tachypompilus* and *Ctenagenia*.

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