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RESEARCH ARTICLE

Review of *Atopopompilus* (Hymenoptera: Pompilidae) from China, with description of one new species and an updated key to the world species

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ABSTRACT. *Atopopompilus* Arnold, 1937 is a small genus of Pompilini. Most species are distributed in the Afrotropical Region, but there are a few in the Oriental region. In this contribution, the taxonomy of *Atopopompilus* from China is addressed, to ascertain species diversity and distribution in the country. One new species, *Atopopompilus robusticarinatus* Yang & Ma, **sp. nov.**, is described from Yunnan and Tibet. The new species is similar to *Atopopompilus daedalus daedalus* (Bingham, 1896), but can be distinguished by the facial carina, the posterior margin of the pronotum and the male SGP and genitalia. In addition, the geographic distribution of and a key to the world species of *Atopopompilus* are updated. This study increased the number of known species *Atopopompilus*, and expanded the known distribution of the genus to the Palearctic region.

KEY WORDS. Identification key, Pompilinae, Pompilini, taxonomy.

INTRODUCTION

Atopopompilus Arnold, 1937 was erected by Arnold (1937, type species *Pompilus venans* Kohl, 1894). The seven species of *Atopopompilus* from the Ethiopian, Malagasy and Oriental regions were reviewed and a key to the world species was provided by Day (1974). Subsequently, Tsuneki (1989) described and illustrated one new subspecies from Taiwan and Li et al. (2019) reported one newly recorded species from China (Tsuneki 1989, Li et al. 2019). *Atopopompilus* currently comprises seven species and one subspecies, of which six occur in the Afrotropical region, and one species and one subspecies occur in the Oriental region (Haupt 1929, 1950, Schulthess 1935, Arnold 1937, 1951, Day 1974, Tsuneki 1989, Li et al. 2019). To date, one species with one subspecies have been reported from China (Yunnan and Taiwan): *Atopopompilus daedalus* (Bingham, 1896) and *A. daedalus taiwanianus* Tsuneki, 1989 (Bingham 1896, Tsuneki 1989, Li et al. 2019). In this study, one new species of *Atopopompilus* from China is discovered and described, and a key to the world species is updated.

MATERIAL AND METHODS

The examined specimens are deposited at the Yunnan Agricultural University, Kunming, China (YNAU). An Olympus stereomicroscope (SZ Series, Japan) with an ocular micrometer was used to examine specimens. Photographs of the habitus were taken by Keyence (VHX-5000).

The abbreviations used in this contribution are as follows: A1, A2, A3, etc. – the first, second and third antennae, etc.; OCD – ocelloccipital distance; OD – ocellar diameter; OOD – ocellocular distance; POD – postocellar distance; aw – apical width; bw – basal width; MC – marginal cell; SMC – submarginal cell; DC – discal cell; UID – upper interocular distance (distance between eyes on vertex); LID – lower interocular distance (distance between eyes below antennae); MID – middle interocular distance (distance between eyes across front); T – Tarsomere; GT – gastral tergum; TFD – transfacial distance (width of head); and SGP – subgenital plate.

TAXONOMY

Atopopompilus Arnold, 1937

Atopopompilus Arnold, 1937: 22. Type-species: *Pompilus venans* Kohl, 1894 [=*Pompilus carinatus* Radoszkowski, 1881], by original designation.

Diagnosis. Both sexes: body black, some species with more or less reddish brown on head, thorax or legs; antennae sometimes reddish brown to orange; face, thorax, coxae and metasoma with more or less grey or white pubescence; metanotum and propodeum covered with dense, curved and silvery setae; labrum clearly exposed, apical margin not emarginated medially; malar space obvious, length smaller than half thickness of scape; postnotum short, slightly prominent from midline to sides. Males: antennae strongly crenulate; wings often hyaline, darker at apex; facial carina stout; gena narrow; posterior margin of pronotum more or less arcuate. Females: antennae normally elongate, but rarely with shorter, thicker antennae; wings smoky brown, darker at apex; lower frons between antennae with one tubercle, sometimes with one longitudinal faint carina; propodeum frequently well-defined with sloping posterior declivity, sometimes flattened also on lateral corners, declivity occasionally concave, sometimes with very fine aciculae centrally; apical metasoma sometimes laterally compressed (Day 1974).

Distribution. Afrotropical Region: Algoa Bay, Madagascar, Rhodesia, Mozambique, Malawi, Angola, Zaire, Tanzania, Uganda, Kenya, Cameroun, Ethiopia, Ivory Coast, Ghana, Sierra Leone, Nigeria, Senegal and Sudan; Oriental region: Indonesia, Malaysia, Philippine, Vietnam, Laos, Burma, India, Nepal and China.

Biology. Unknown. As these insects have no tarsal comb, they may utilize pre-existing nest-cavities (Day 1974). From our observation and collection experience, we found individuals of this genus in various environments such as tropical rainforests, woodlands with lush vegetation and human habitats.

Key to the world species of *Atopopompilus*

Female

1. Propodeum with well-developed lateral tubercles; head black, except for mouthparts, most of pronotum, occasionally mesonotum and scutellum orange-brown to dark red-brown. Madagascar ..... *A. nefas* (Dalla Torre, 1897)
1'. Propodeum without well-developed lateral tubercles (Fig. 2H); if head and thorax red-brown, then antennae also red-brown 2
2. Propodeum between dorsal and posterior surfaces with one gentle declivity, rounded in profile. Tanzania, Uganda, Zaire ..... *A. nasutus* (Haupt, 1929)
2'. Propodeum between dorsal and posterior surfaces with one distinct declivity, moderately or abruptly sloping in profile 3
3. Wings pale reddish brown; prothorax red-brown or yellow-brown. Algoa Bay, Cameroun, Kenya, Malawi, Natal, Nigeria, Rhodesia, Senegal, Sierra Leone, Sudan, Tanzania ..... *A. jacens* (Bingham, 1912)
3'. Wings fuscous; prothorax black (Fig. 2J, K, E) 4
4. Head short, broad, face flat (Fig. 2B) 5
4' Head less short, face more convex 6
5. MID < 0.5 X TFD; OOD: OCD = 4.5: 5.5; spiracular tubercles fairly marked; China (Taiwan) ..... *A. daedalus taiwanianus* Tsuneki, 1989
5'. MID about 0.5 X TFD (Fig. 2B); OOD: OCD = 9: 6 (Fig. 2C); spiracule without tubercles (Fig. 2H). Burma, China (Beijing, Guangdong, Guangxi, Yunnan), India, Indonesia, Laos, Malaysia, Nepal, Philippine, Vietnam ..... *A. daedalus daedalus* (Bingham, 1896)
6. Unicolor black or black with very dark brown appendages, often with a little red-brown on antennae ventrally; inner orbits converging strongly above, converging or sub-parallel below 7
6'. Black with antennae orange, sometimes darker basally, face almost reddish brown; inner orbits converging above, less strongly so below. Angola, Ghana, Ivory Coast, Kenya, Malawi, Mozambique, Tanzania, Zaire ..... *A. kilimandjaroensis* (Cameron, 1910)
7. A4 at least 4 X as long as thick; thorax stout, legs and antennae short, thick. Angola, Cameroun, Dahomey, Gabon, Ghana, Nigeria, Rwanda, Sierra Leone, Togo, Uganda ..... *A. carinatus* (Radoszkowski, 1881)
7'. A4 not more than 3 X as long as greatest width; thorax stouter, legs and antennae shorter, thicker. Ethiopian, Uganda, Zaire ..... *A. crassicornis* Day, 1974

Male

1. Facial carina not extending beyond frontoclypeal suture (Fig. 1B, 3B) 2
1'. Facial carina extending beyond frontoclypeal suture 4
2. Facial carina stout and high (Fig. 1D); paramere of squama slender, slightly exceeding 1/4 of digitus, with sparse, long setae at inner sides (Fig. 4A, B). China

(Yunnan, Tibet)..... .....*A. robusticarinatus* Yang & Ma, sp. nov.

2'. Facial carina slightly stout and slightly high (Fig. 3C); paramere of squama slightly stout, far exceeding 2/3 of digitus, with very dense, long setae at inner sides (Fig. 4C, D)..... 3

3. Clypeus (except black spot basally) largely yellow (Fig. 3B); wings light brown, hyaline with infuscate margins (Fig. 3E); fore tarsomere 5 symmetric. Burma, China (Beijing, Guangdong, Guangxi, Yunnan), India, Indonesia, Laos, Malaysia, Nepal, Philippine, Vietnam .....*A. daedalus daedalus* (Bingham, 1896)

3'. Apical margin of clypeus narrowly yellow; wings deeply infuscate, but comparatively more broadly pale at basal area; fore tarsomere 5 asymmetric. China (Taiwan).....*A. daedalus taiwanianus* Tsuneki, 1989

4. Antennal crenulations angulate ventrally 5

4'. Antennal crenulations curved ventrally..... 7

5. Antennae short, stout, with less curvature dorsally on each segment; inner orbit convergent above and below. Algoa Bay, Cameroun, Kenya, Malawi, Natal, Nigeria, Rhodesia, Senegal, Sierra Leone, Sudan, Tanzania.....*A. jacens* (Bingham, 1912)

5'. Antennae elongate, with distinct segmental curvature dorsally; inner orbit converging above, sub-parallel below 6

6. Paramere of squama with dense, short setae at apical 3/4 on sides; at least some reddish ventrally on basal antennal segments; gastral tergum VII partly whitish yellow. Angola, Cameroun, Dahomey, Gabon, Ghana, Nigeria, Rwanda, Sierra Leone, Togo, Uganda..... .....*A. carinatus* (Radoszkowski, 1881)

6'. Paramere of squama with dense, long setae at apical 1/3 on sides; ventral surface of proximal antennal segments red-brown; gastral tergum VII whitish yellow. Tanzania, Uganda, Zaire .....*A. nasutus* (Haupt, 1929)

7. Wings hyaline with infuscate margins. Angola, Ghana, Ivory Coast, Kenya, Malawi, Mozambique, Tanzania, Zaire.....*A. kilimandjaroensis* (Cameron, 1910)

7'. Wings fusco-hyaline or fuscous with darker margins 8

8. Wings fuscous with darker margins; propodeum excised posteriorly; facial carina not forked; UID clearly exceeds LID. Madagascar..... .....*A. nefas* (Dalla Torre, 1897)

8'. Wings fusco-hyaline with darker margins; propodeum not excised posteriorly; facial carina forked; UID not clearly exceeds LID. Ethiopian, Uganda, Zaire.....*A. crassicornis* Day, 1974

Atopopompilus robusticarinatus Yang & Ma, sp. nov.

Figs 1, 4A, B

https://zoobank.org/18606485-5C83-45B4-A247-7C9AEC29755B

Material examined. Holotype: CHINA, male, Yunnan, Jinghong, Tropical Botanical Garden, rainforest, 21°91'N, 101°27'E, 606 m, Malaise trap, coll. Yong-sheng Pu (YNAU). Paratypes: CHINA. 55 males, Yunnan, same locality as holotype, 20.III-2.VII.2019 (43 males), 11.IV-15.VII.2021 (12 males), coll. Yong-sheng Pu (YNAU); 4 males, Yunnan, Jinghong, Menghai, Guanggang Village, 21°49'N, 100°29'E, 1526 m, Malaise trap, 13.I-15.II.2021, coll. Yong-sheng Pu (YNAU); 2 males, Tibet, Lingzhi, Motuo, Beilong Village, 26°50'N, 78°25'E, 29.VII.2014, coll. Ting-jing Li (YNAU).

Diagnosis. The new species clearly differs from *A. daedalus daedalus* (Bingham, 1896) and other congeners by the following characteristics: the new species: facial carina stout and high (Fig. 1B); each flagellum short, A4–12 obviously serrated, A1: A2: A3: A4: A5: A8: A12: A13 = 10: 3: 11: 10: 11: 9: 7: 8 (Fig. 1E); posterior margin of pronotum arcuate, obviously angulate in middle (Fig. 1F); SGP slender, with clear elevation medially, apical margin slightly emarginated medially (Fig. 1L); paramere of squama slender, slightly exceeding 1/4 of digitus, with long, dense setae at inner sides; digitus strongly enlarged apically, subscoop-shaped; width of aedeagus apically 0.5 × digitus width (Fig. 4A, B). In *A. daedalus daedalus* (Bingham, 1896): facial carina slightly stout and slightly high (Fig. 3B); flagellum long, A6–12 slightly arc-shaped bulged, A1: A2: A3: A4: A5: A8: A12: A13 = 10: 3: 16: 15: 14: 13: 11: 13 (Fig. 3G); posterior margin of pronotum slightly arcuate, not angulate in middle (Fig. 3F); SGP stout, not elevated medially, apical margin not emarginated medially (Fig. 3J); paramere of squama slightly stout, far exceeding 2/3 of digitus, with long, denser setae at inner sides; digitus at apical 3/4 slightly enlarged, thinner at base 1/4; width of aedeagus apically almost equal to digitus (Fig. 4C, D).

Description. Male (Measurements of the holotype are given in parentheses). Body length 8.6–11.5 (10.5) mm; forewing 7.3–11.0 (9.9) mm. Body black; mandible apically dark brown; subapical 1/3 of mandible and all tarsal claws reddish brown; antennae ventrally (except scape) reddish; labium, labial palpus and maxillary palpus yellow brown; apical margin of clypeus with one narrow, light brown band; clypeus (except black spot basally and band apically), facial carina, inner orbital mark, outer orbital stripe, ventral spot of antennal scape, one band (interrupted medially) at posterior margin of pronotum, spur and spot on dorsal surface

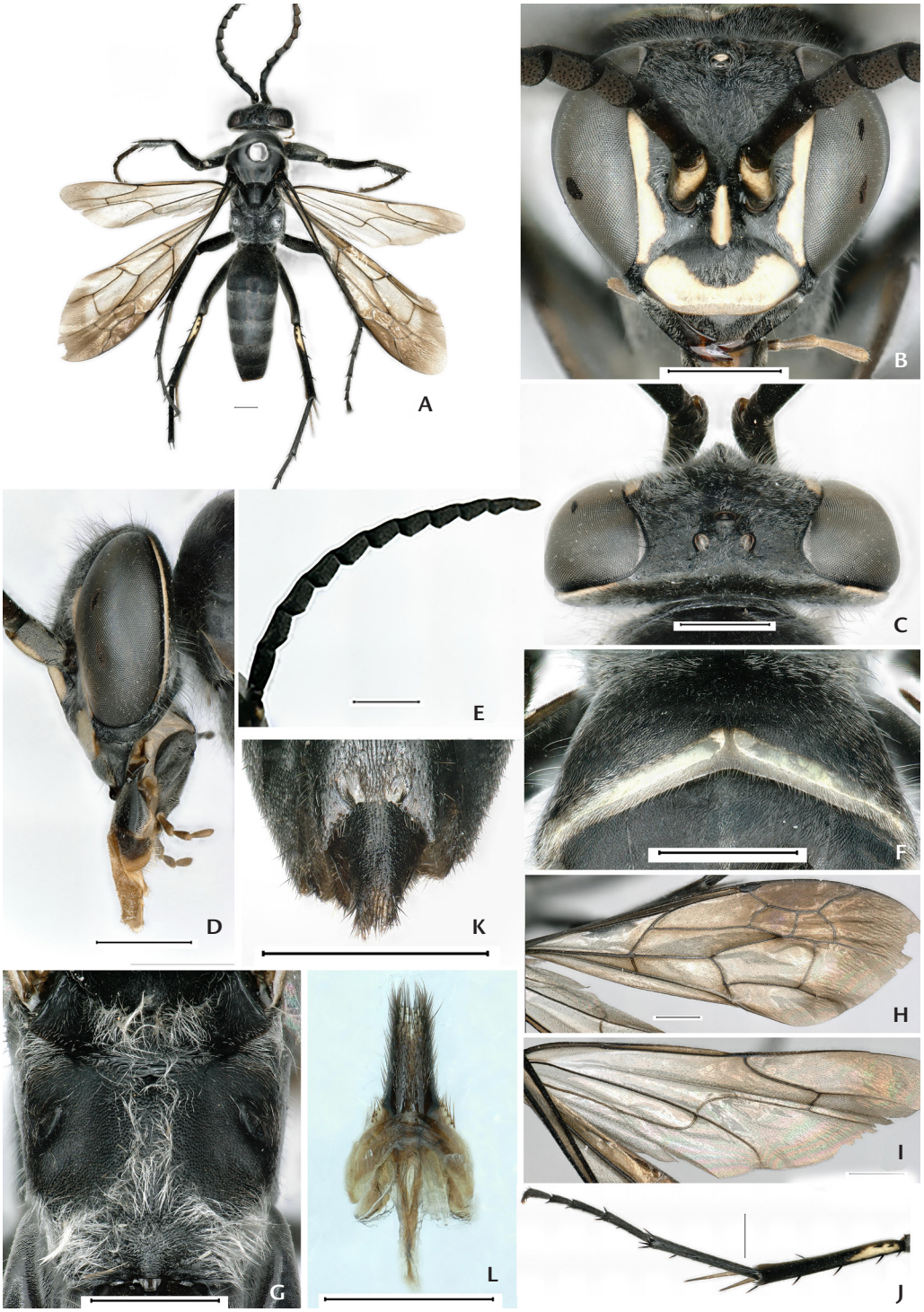

Figure 1. *Atopopompilus robusticarinatus* Yang & Ma, sp. nov., male: (A) habitus, dorsal view; (B) head, frontal view; (C) head, dorsal view; (D) head, lateral view; (E) flagellum, lateral view; (F) pronotum, dorsal view; (G) postnotum, metapostnotum, and propodeum, dorsal view; (H) fore wing; (I) hind wing; (J) hind tibia-tarsus, dorsal view; (K) S6, ventral view; (L) SGP, ventral view. Scale bars = 1 mm.

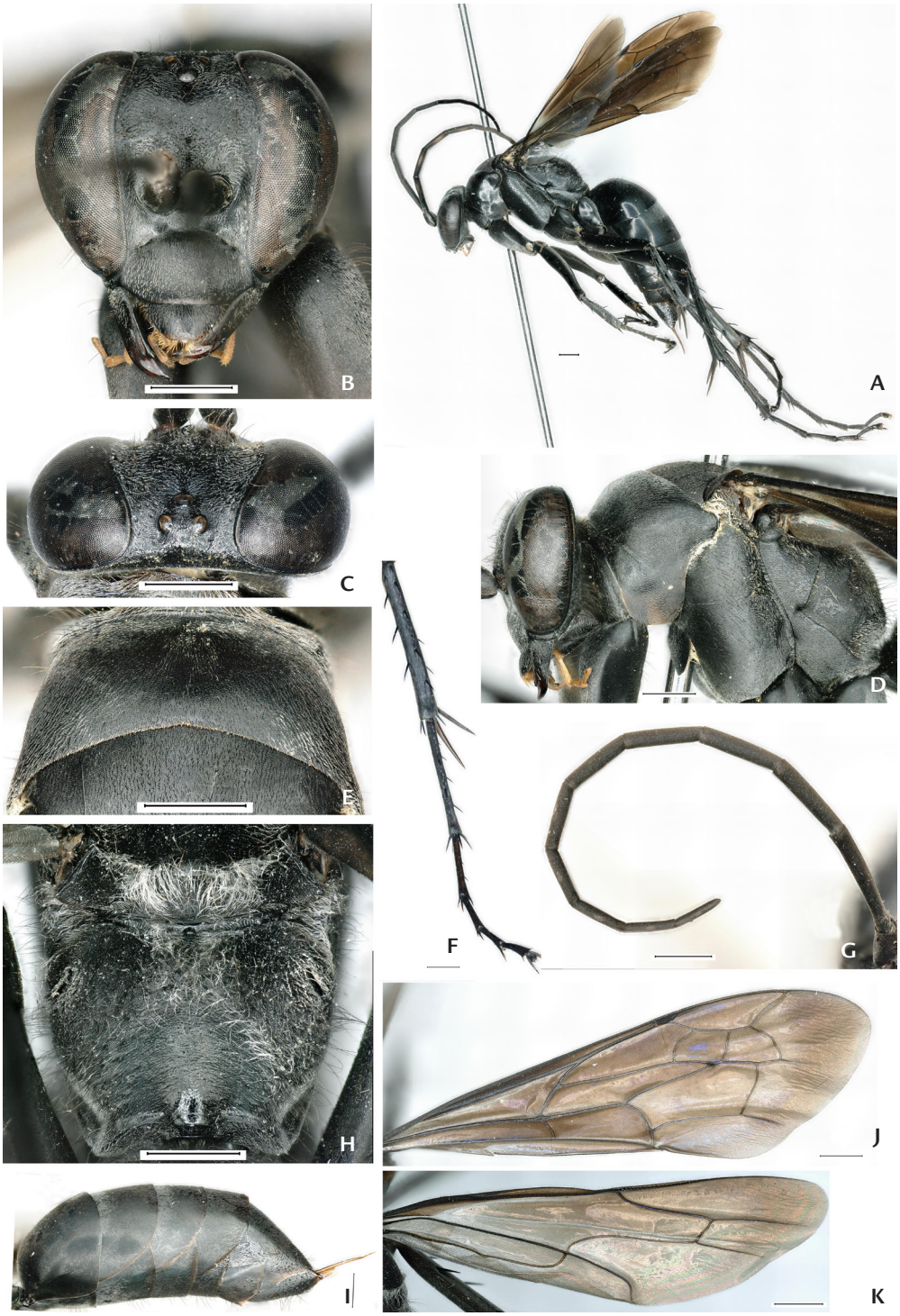

Figure 2. *Atopopompilus daedalus daedalus* (Bingham, 1896), female: (A) female habitus, lateral view; (B) head, frontal view; (C) head, dorsal view; (D) head and mesosoma, lateral view; (E) pronotum, dorsal view; (F) hind tibia-tarsus, dorsal view; (G) flagellum, lateral view; (H) postnotum, metapostnotum, and propodeum, dorsal view; (I) metasoma, lateral view; (J) fore wing; (K) hind wing. Scale bars = 1 mm.

of hind tibia at basal 1/4 yellow (Fig. 1A–D, F); wings light brown, hyaline with infuscate margins; in forewing, MC, SMC2, SMC3, DC1 at basal, and junction of subbasal cell and subdiscal cell with brown spots generally (Fig. 1H); tergum VII sometimes with one white spot; metasoma with blue-purple reflections in certain light.

Body extensively covered with silvery pubescence (Fig. 1A); upper frons and vertex covered with dense, long, brown setae, setae length equal to thickness of scape approximately, setae on lower frons, gena and propleuron relatively sparse, as long as thickness of scape; metanotum medially, postnotum medially, along center to declivity and posterior corner of propodeum with dense, long and curved, silvery setae; tergum I, and sterna I-VI covered with sparse, grey-white and brown short setae.

Head: In frontal view (Fig. 1B), mandible bidentate apically, outer tooth large and inner one small; clypeus slightly convex basally, width of clypeus: length = 26:12, clypeus with several small punctures, anterior margin widely prominent, nearly truncate; facial carina stout and high, but not extending beyond frontoclypeal suture; frontal line fine, extending to anterior ocella; frons with scattered punctures medially; inner orbits of eyes gently converged above, sub-parallel below; eyes width slightly less than half width of frons; in dorsal view (Fig. 1C), ocelli in acute triangle and slightly convex; vertex slightly raised medially; OOD:OD:POD:OCD = 7:2:4:8; in lateral view (Fig. 1D), gena strongly narrowed, width of gena: eyes in middle = 4:15; antennae stout and long (Fig. 1E), A4–12 obviously serrated, near basal 1/3 distinctly angulate ventrally, apical 2/3 grey, densely covered with short, black spines ventrally, A4–12 with larger and shallow depression dorsally, A1:A2:A3:A4:A5:A8:A12:A13 = 10:3:11:10:11:9:7:8, A3:aw = 11:4; A13:bw = 8:2.

Mesosoma: In dorsal view, width of pronotum: length = 50:15, posterior margin angular, pronotum conspicuously shorter than mesoscutum (Fig. 1F); notaulus and parapsidal line of mesoscutum clearly visible (Fig. 1F); scutellum obviously raised; metanotum moderately raised medially, with dense, small punctures and one oblique furrow sublaterally (Fig. 1G); postnotum with one longitudinal median groove and one transverse stripe medially, laterally with sparse, oblique stripes and dense, small punctures (Fig. 1G); length of metanotum:postnotum = 7:2; dorsal surface of propodeum covered with dense, small punctures, punctures at apex slightly larger than basal ones, curved slope forming one shallow depression medially and posteriorly, posterior margin in middle with one longitudinal elevation, and elevation area densely covered with fine, transverse wrinkles (Fig. 1G); in lateral view, mesopleuron scattered with small punctures, metapleuron without punctures, lateral surface of propodeum with inconspicuous, shallow and small punctures.

Wing: in forewing (Fig. 1H), length of pterostigma: 2r-rs = 3:8; length of marginal cell: marginal cell removed from wing tip = 45:25; SMC2:SMC3 = 20:20 on vein M, 12:8 on vein Rs; SMC2 receiving crossvein 1m-cu at apical 1/3, SMC3 receiving crossvein 2m-cu nearly at apical 1/2; vein M and vein cu-a of hindwing nearly coincides at intersection of vein M + CuA (Fig. 1I).

Legs: femur-tibia length (dorsal surface) of fore, mid and hind legs = 45–30, 50–46, 60–62; fore leg with T1:T2–4 = 24:22, fore tibia with three unequal length spines at ventro-outer side, one short spine at 1/3 of inner base, T1 with three short, equidistant spines on ventro-outer side, T2–4 with 2–4 small spines at apical tarsus; fore claws asymmetrical, inner claw modified, outer ray slender and pointed, strongly curved nearly 90 degrees at base 1/3, inner ray short and stout, finger-shaped, outer claw bifid, inner tooth pointed; mid and hind claws bifid, apical inner tooth truncate; length of longer spur of hind legs: T1 = 45:31 (Fig. 1J).

Metasoma: widest at posterior margin of GT1, thence gradually narrowed apically; sides of sterna 6 prominent in angular shape laterally, truncate medially, forming U shape, area close to angulate prominence with two small U-shaped depressions inwards (Fig. 1K).

SGP and genitalia: SGP narrowing apically, slightly concave in middle at apical margin, gradually broadened towards base, subbasal area widest, with clear elevation in middle, densely covered with short setae laterally and apically (Fig. 1L); paramere of squama slender, slightly exceeding 1/4 of digitus, with dense, long setae at inner side, obvious gaps between setae; digitus strongly enlarged apically, with irregular, sparse and short setae apically and medially; aedeagus half as wide as digitus apically (Fig. 4A, B).

Female. Unknown.

Distribution. Oriental region: China (Yunnan, Tibet).

Etymology. The name *robusticarinatus* originates from the Latin word "robust" (= stout) and "carinatus" (= ridge), referring to the facial carina of male stout and high.

Atopopompilus daedalus daedalus (Bingham, 1896)

Figs 2, 3, 4C, D

Pompilus daedalus Bingham, 1896: 429. Lectotype female, BURMA (BMNH).

Atopopompilus daedalus: Day, 1974: 66, comb. nov., female and male.

Anoplius styrus Cameron, 1903: 327. Holotype male. INDIA (BMNH); synonymized by Day, 1974: 66.

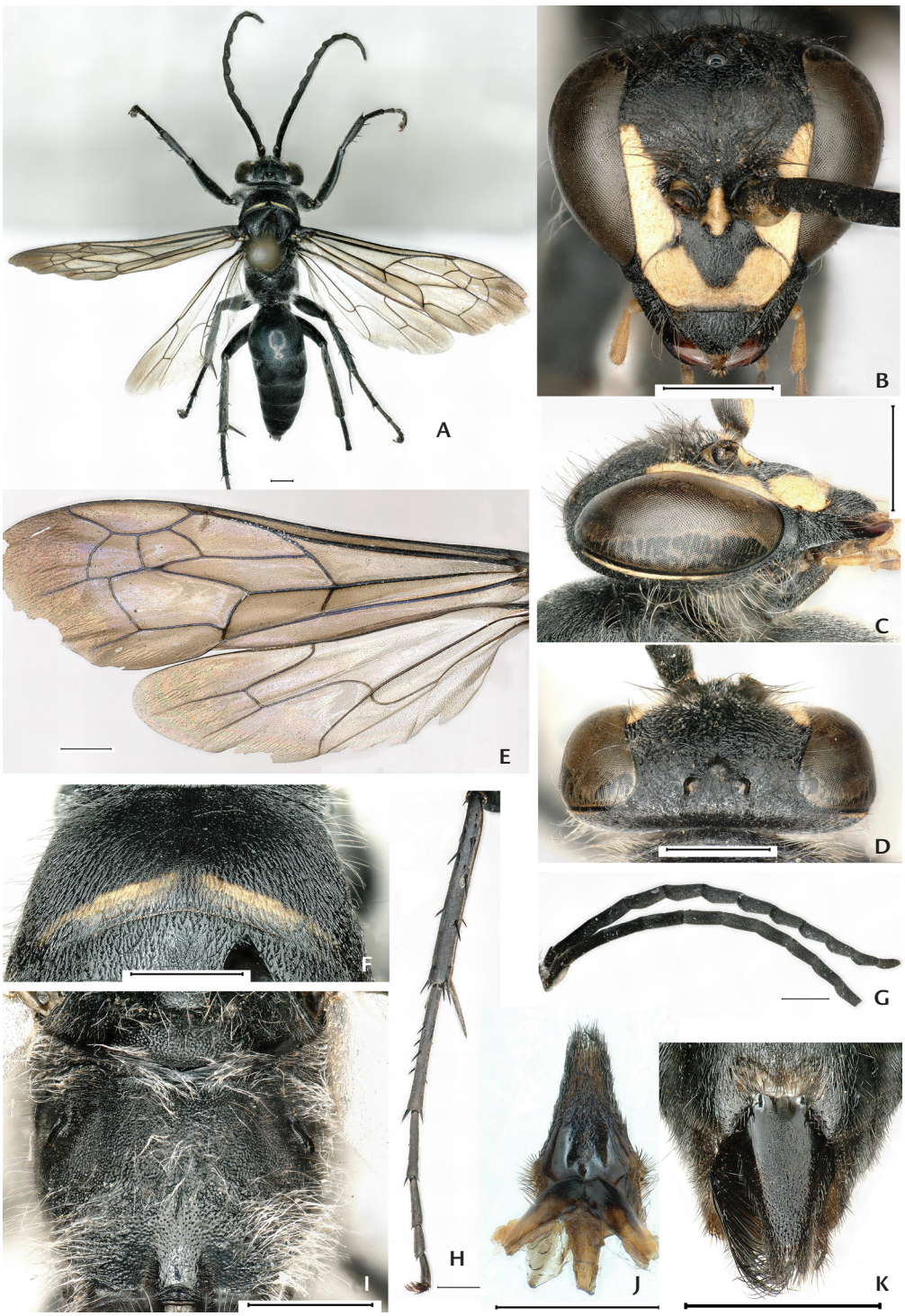

Figure 3. *Atopopompilus daedalus daedalus* (Bingham, 1896), male: (A) male habitus, dorsal view; (B) head, frontal view; (C) head, lateral view; (D) head, dorsal view; (E) fore and hind wings; (F) pronotum, dorsal view; (G) flagellum, lateral view; (H) hind tibia-tarsus, dorsal view; (I) postnotum, metapostnotum, and propodeum, dorsal view; (J) SGP, ventral view; (K) S6, ventral view. Scale bars = 1 mm.

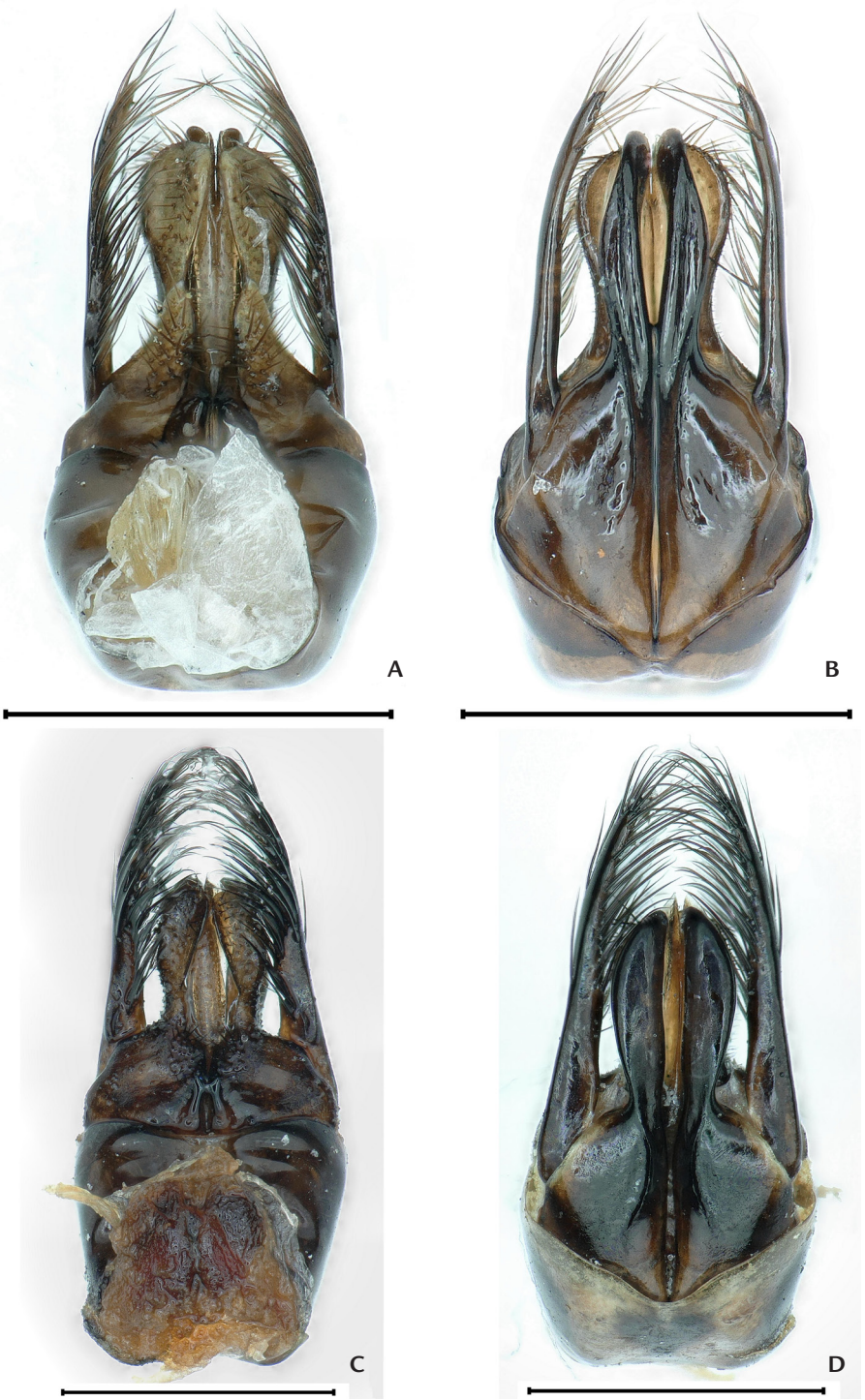

Figure 4. (A, B) *Atopopompilus robusticarinatus* Yang & Ma, sp. nov., male: (A) genitalia, ventral view; (B) genitalia, dorsal view; (C, D) *Atopopompilus daedalus daedalus* (Bingham, 1896), male: (C) genitalia, ventral view; (D) genitalia, dorsal view.

Ceropales pruinosa Cameron, 1905: 415. Lectotype male (not female, as originally stated), INDIA (UM, Oxford); synonymized by Day, 1974: 66.

Anoplinellus javanus Haupt, 1935 (in Schulthess ans Haupt 1935): 318. Lectotype female, JAVA (NM, Basle); synonymized by Day, 1974: 66.

Material examined. CHINA. 1 female, Beijing: Heishan Village, 40°21'N, 116°18'E, 3.IX.2009; 1 female, Guangxi: Laibing, Jinxiu, Dayao Mountain, 24°11'N, 109°59'E, 20.VII.2015, coll. Hai-xia Lu (YNAU); 3 females, 3 males, Yunnan: Dali Ancient Town, Congyuan Village, 25°8'N, 102°44'E, 2.V.2006, coll. He-sheng Wang (YNAU); 3 females, Yunnan: Dali, Yongping, 41°33'N, 113°34'E, 20.VIII.2003, coll. YNAU; 4 females, 1 male, Yunnan: Dehong, Luxi, Fapa Town, 24°26'N, 98°35'E, 10.VIII.2005, coll. He-sheng Wang (YNAU); 1 female, Yunnan: Honghe, Hekou, Qiaotou Village, 22°52'N 104°7'E, 30.X.2006, coll. YNAU; 10 females, Yunnan: Jinghong, Menghai, Bulang Mountain, 21°45'N, 100°26'E, 1677 m, Malaise trap, 17.V-14.IX.2018, coll. Yong-sheng Pu (YNAU); 6 females, Yunnan: Jinghong, Menghai, Guanggang Village, 21°49'N, 100°29'E, 1526 m, Malaise trap, 22.IV-22.VI.2018, coll. Yong-sheng Pu (YNAU); 1 female, Yunnan: Jinghong, Tropical Botanical Garden, rainforest, 21°91'N, 101°27'E, 606 m, Malaise trap, 15. V-18.VI.2018, coll. Yong-sheng Pu (YNAU); 2 females, Yunnan: Kunming, Heilong Pool, 25°8'N, 102°45'E, 28.V.2002, coll. Xing-yan Wang (YNAU); 24 females, 1 male, Yunnan: Kunming, Yunnan Agricultural University, 30.VIII-15.IX.2020, coll. YNAU; 1 female, Yunnan: Puer, Longtan Village, 23°5'N, 101°35'E, IX.2007, coll. YNAU; 3 females, Yunnan: Wenshan, Maguan, Gulinjing Village, virgin forest, 22°48'N 103°57'E, 1495 m, Malaise trap, VI-IX.2017, coll. YNAU; 4 females, Yunnan: Wenshan, Maguan, Miechang Village, junction of river, virgin forest and secondary forest, 22°54'N, 104°02'E, 1345 m, Malaise trap, V.2017, coll. YNAU; 1 female, Yunnan: Wenshan, Maguan, Muchang Town, secondary forest, 22°56'N, 104°11'E, Malaise trap, VII.2017, coll. YNAU; 8 females, Yunnan: Wenshan, Maguan, Pojiao, Mafang Village, junction of farmland and virgin forest, 23°06'N, 104°20'E, 1551 m, Malaise trap, 3.VI-15.IX.2017, coll. YNAU; 1 female, Yunnan: Zhaotong, Huanghua, Qinggang, 27°59'N, 103°33'E, 21.VIII.2007, coll. YNAU; 1 male, Yunnan: Dali, Shimen Village, 25°41'N, 100°9'E, 3.V.2006, coll. Ming Luo (YNAU); 1 male, Guangdong: Nanling, 24°41'N, 112°59'E, 5.VI-7.VI.2021, coll. Zai-fu Xu. LAOS. 1 female, Pakse: 15°7'N, 105°48'E, 17.VI.2016, coll. Liang Wang (YNAU).

Description. Female. Body length 12.0–18.5 mm; wings strongly fuscous throughout with infuscate margins and blue-purple reflections in certain light (Fig. 2J, K); propodeum (except sloping posterior declivity) fairly closely covered with blackish and silvery hairs (Fig. 2H); metanotum medially and postnotum medially with dense, long, curved and silvery setae (Fig. 2H); propodeum (except sloping posterior declivity) with dense aciculate protuberant (Fig. 2H); MID about 0.5 X TFD (Fig. 2B); OOD: OCD = 9:6 (Fig. 2C). SMC2: SMC3 = 27:30 on vein M, 17:12 on vein Rs (Fig. 2J).

Male. Body length 10–14.5 mm; clypeus (except black spot basally), facial carina, inner orbital mark, outer orbital stripe, ventral spot of antennal scape, and one band (interrupted medially) at posterior margin of pronotum yellow (Fig. 3B, C, F); wings light brown, hyaline with infuscate margins (Fig. 3E); facial carina slightly stout and slightly high (Fig. 3B); flagellum long, A6–12 slightly arc-shaped bulged (Fig. 3G); posterior margin of pronotum slightly arcuate, not angulate in middle (Fig. 3F).

Distribution. Oriental region: Indonesia, Malaysia, Philippine, Vietnam, Laos, Burma, India, Nepal, China (Guangdong, Guangxi, Yunnan); Palearctic region: China (Beijing).

Atopopompilus daedalus taiwanianus Tsuneki, 1989

Atopopompilus daedalus taiwanianus Tsuneki, 1989: 143, female and male.

Distribution. Oriental region: China (Taiwan).

DISCUSSION

Currently *Atopopompilus* comprises eight species and one subspecies. Most species are distributed in the Afrotropical. This study has expanded the known distribution of the genus in the Oriental and Palearctic regions and revealed a new species from the Oriental region in Southwest China. The distribution of one known species was expanded to the Palearctic region. So far, only *A. daedalus dadalus* (Bingham, 1896) is widely distributed in both Palaearctic and Oriental regions worldwide; however, *A. daedalus taiwanianus* Tsuneki, 1989 only occurs in Taiwan. They can be distinguished by the spiracular tubercles of the female, the color of the wing of the male and the color of fore tarsomere 5. Since Day's (1974) revision of the world species, there have been only two reports on the classification of this genus. Our study analyzed the characteristics of species, summarized their geographical and recompiled a key to the world species. According to our data, there are more females and less males in anthropomorphic habitats. The males are mostly found in the forest where few people live.

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