

Three new species of *Amphibulus* Kriechbaumer (Hymenoptera, Ichneumonidae, Phygadeuontinae) from China with a key to species known from the Oriental and Eastern Palaearctic Regions

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Abstract

Three new species of *Amphibulus* Kriechbaumer, 1893, collected from the northern border of the Oriental part of China, are described and illustrated: *A. areolaris* Sheng, Li & Yang, **sp. nov.**, *A. rufithorax* Sheng, Li & Yang, **sp. nov.** collected from Guizhou province, and *A. guiiicus* Sheng, Li & Sun, **sp. nov.** collected from Guangxi Zhuang Autonomous Region. A key to the species of the genus known in the Oriental and Eastern Palaearctic Regions is provided.

Keywords

Asia, Endaseina, Guangxi, Guizhou, taxonomy

Introduction

The subfamily Phygadeuontinae (Hymenoptera, Ichneumonidae) was raised to subfamily status from within Cryptinae by Santos (2017), which was corroborated by Bennett et al. (2019) and followed by other authors (e.g., Broad et al. 2018).

Amphibulus Kriechbaumer is a relatively small genus belonging to the subfamily Phygadeuontinae (Hymenoptera, Ichneumonidae) currently comprising 27 species (Yu et al. 2016), of which four are from the Eastern Palaearctic (one of which also occurring in the Oriental Region), two from the Western Palaearctic, six from the Nearctic, two from the Oriental Region (Luhman 1991), one from the Afrotropical and 15 from the Neotropical Region (Yu et al. 2016).

Sawoniewicz (1990) revised the European species of the genus. More species and a revision and a key to the species of the world *Amphibulus* was reported by Luhman (1991). Three species, *A. albimaculatus* Sheng, 1999, *A. melanarius* Zong, Sun & Sheng, 2013, and *A. orientalis* Luhman 1991, are known from China.

In the last five years the authors, Sheng, Li and their research group, have been exploring the forests in Guizhou province and Guangxi Zhuang Autonomous Region, in the Oriental part of China, and collected large numbers of ichneumonids. In this article three new species of *Amphibulus*, collected in these areas, are described.

Materials and methods

Specimens were collected with intercept traps (Li et al. 2012) in the forests of Fanjingshan and Leigongshan National Natural Reserves, Guizhou, and Shiwandashan National Natural Reserve, Guangxi Zhuang Autonomous Region, the Oriental part of China in 2018 to 2022.

Images were taken using a Leica M205A stereomicroscope with LAS Montage MultiFocus software. Morphological terminology is based on Broad et al. (2018). All type specimens are deposited in the Insect Museum, Center for Biological Disaster Prevention and Control (CBDPC), National Forestry and Grassland Administration, Shenyang, P. R. China.

Results

Amphibulus Kriechbaumer, 1893

Amphibulus Kriechbaumer, 1893:122. Type species: *Amphibulus gracilis* Kriechbaumer.

Complete diagnosis. Provided in Townes (1970), Luhman (1991) and Zong et al. (2013).

Summary diagnosis. The genus is characterized by clypeus large, apical margin thick and slightly raised. Lower tooth of mandible shorter than upper tooth. Dorsal edge of face with small, rounded median tubercle. Occipital carina reaching hypostomal carina above base of mandible. Posterior edge of mesoscutum with transverse suture. Scutoscutellar groove without median longitudinal carina. Epicnemial carina approaching anterior edge of mesopleuron. Sternaulus reaching to posterior margin of mesopleuron, usually sculptured anterior portion. Latero-median carinae of first

tergite weak or absent. Tip of ovipositor (Figs 3E, 6C, 8H) elongate lanceolate, nodus indistinct (Luhman 1991, Zong et al. 2013).

Key to the species of *Amphibulus* Kriechbaumer known from the Oriental and Eastern Palaearctic Regions

- 1 Male 2
- Female 7
- 2 Clypeus about 2.5 × as wide as long, apical margin distinctly lifted. Postpetiole 2.0 × as wide as long. Tergites 2–6 orange. (Pakistan) ***A. salicis* Luhman, 1991**
- Clypeus about 3.0 × as wide as long, apical margin not or only slightly lifted. Postpetiole less than 2.0 × as wide as long. Tergites 2–6 black, or at most tergites 2–3 orange 3
- 3 Lower end of occipital carina reaching hypostomal carina at mandibular base 4
- Lower end of occipital carina reaching hypostomal carina distinctly above mandibular base 5
- 4 Fore wing with ramulus present. Clypeus white or pale yellow. Tergites 2–3 mostly orange. (Female unknown). (Korea) ***A. bicolor* Luhman, 1991**
- Fore wing without ramulus. Clypeus and tergites 2–3 black. (China) ***A. guiiicus* Sheng, Li & Sun, sp. nov.**
- 5 Propodeum without apophysis. Flagellomeres 10 and 11 with distinct tyloids. Apices of tergites 2–6 yellowish. (China, Japan) ***A. orientalis* Luhman, 1991**
- Propodeum with apophysis. Flagellomeres at least 10 to 12 with distinct tyloids. Apices of tergites 2–6 almost entirely black 6
- 6 Area basalis and superomedia separated by strong carina, with distinct sculpture. Posterior end of first sternite distinctly basad of spiracle. Mesosoma black ***A. areolaris* Sheng, Li & Yang, sp. nov.**
- Area basalis and superomedia almost entirely confluent, smooth, shiny. Posterior end of first sternite reaching level of spiracle. Mesopleuron and propodeum darkish red. (Female unknown) (China) ***A. albimaculatus* Sheng, 1999**
- 7 Posterior end of first sternite distinctly basad of spiracle. All coxae brown to reddish brown 8
- Posterior end of first sternite reaching level of spiracle. Coxae with different coloration 9
- 8 Area basalis and superomedia entirely confluent. Propodeal spiracle almost circular. Postpetiole with dense longitudinal wrinkles and indistinct punctures. (Male unknown) (China) ***A. melanarius* Zong, Sun & Sheng, 2013**
- Area basalis and superomedia (Fig. 3C) separated by strong carina. Propodeal spiracle 3.0 × as long as wide. Postpetiole (Fig. 3D) smooth, without wrinkles, sparsely indistinctly punctate ***A. areolaris* Sheng, Li & Yang, sp. nov.**

- 9 Clypeus about 2.5 × as wide as long. Median portion of flagellomeres brownish. Coxae black. Tergites 2–6 orange.....***A. salicis* Luhman, 1991**
- Clypeus about 3.0 × as wide as long. Flagellum with median white band. Coxae red, orange or brown, or at least with orange or brown spots. Tergites 2–6 black, dark orange or brown **10**
- 10 Lower end of occipital carina reaching hypostomal carina at mandibular base. Tergites 2–5 black..... **11**
- Lower end of occipital carina reaching hypostomal carina distinctly above mandibular base. Tergites 2–5 dark orangish or brownish ***A. orientalis* Luhman, 1991**
- 11 Malar space 0.4 × as long as basal width of mandible. Propodeum (Fig. 5D) with distinct apophysis. Area superomedia 0.6 × as wide as long. First tergite (Fig. 6A) reddish brown. (China).....***A. guicus* Sheng, Li & Sun, sp. nov.**
- Malar space 0.6 × as long as basal width of mandible. Propodeum (Fig. 8D) without apophysis. Area superomedia wider than its length. First tergite (Fig. 8E) almost entirely black. (Male unknown). (China) ***A. rufithorax* Sheng, Li & Yang, sp. nov.**

***Amphibulus areolaris* Sheng, Li & Yang, sp. nov.**

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Figs 1–3

Diagnosis. Gena (Figs 1C, 2B) slightly convex medio-longitudinally, with dense punctures. Postocellar line 0.7 × as long as ocular-ocellar line. Areolet (Figs 1A, 3B) receiving vein 2m-cu at posterior 0.2. Metapleuron with coarse dense punctures. Propodeum with area basalis distinctly wider than long, reversed trapezoidal. Area superomedia (Fig. 3C) wider than long. Tergites smooth. Posterior end of first sternite distinctly basad of spiracle. Flagellomeres 10–12 (13) of male with tyloids. Head, mesosoma and tergites 16 entirely black.

Description. Female. Body length 8.6–10.1 mm. Fore wing length 6.8–8.0 mm. Ovipositor sheath length approximately 2.1–2.3 mm.

Head. Inner eye orbits divergent ventrally. Face (Fig. 1B) 2.0 × as wide as long, convex medially, with dense longitudinal punctures; dorsal margin with median small tubercle. Anterior tentorial pit relatively large, transversely elliptic. Median point of clypeal sulcus below line reaching ventral margins of eyes. Clypeus (Fig. 1B) shiny, distinctly convex, with sparse irregular punctures, 3.1 × as wide as long, apical margin weakly evenly arched forward, distinctly convex medially. Mandible (Fig. 2A) with transverse wrinkles, dense yellow brown setae and sparse punctures; teeth strong, upper tooth 1.5 × longer than lower tooth. Subocular sulcus indistinct. Malar space 0.5 × as long as basal width of mandible. Gena (Figs 1C, 2B) in dorsal view 0.8–0.9 × as long as width of eye, slightly convex median-longitudinally, with more or less dense punctures, distance between punctures mainly 0.2 to 1.0 × their diameter. Vertex (Fig. 2B) and frons with

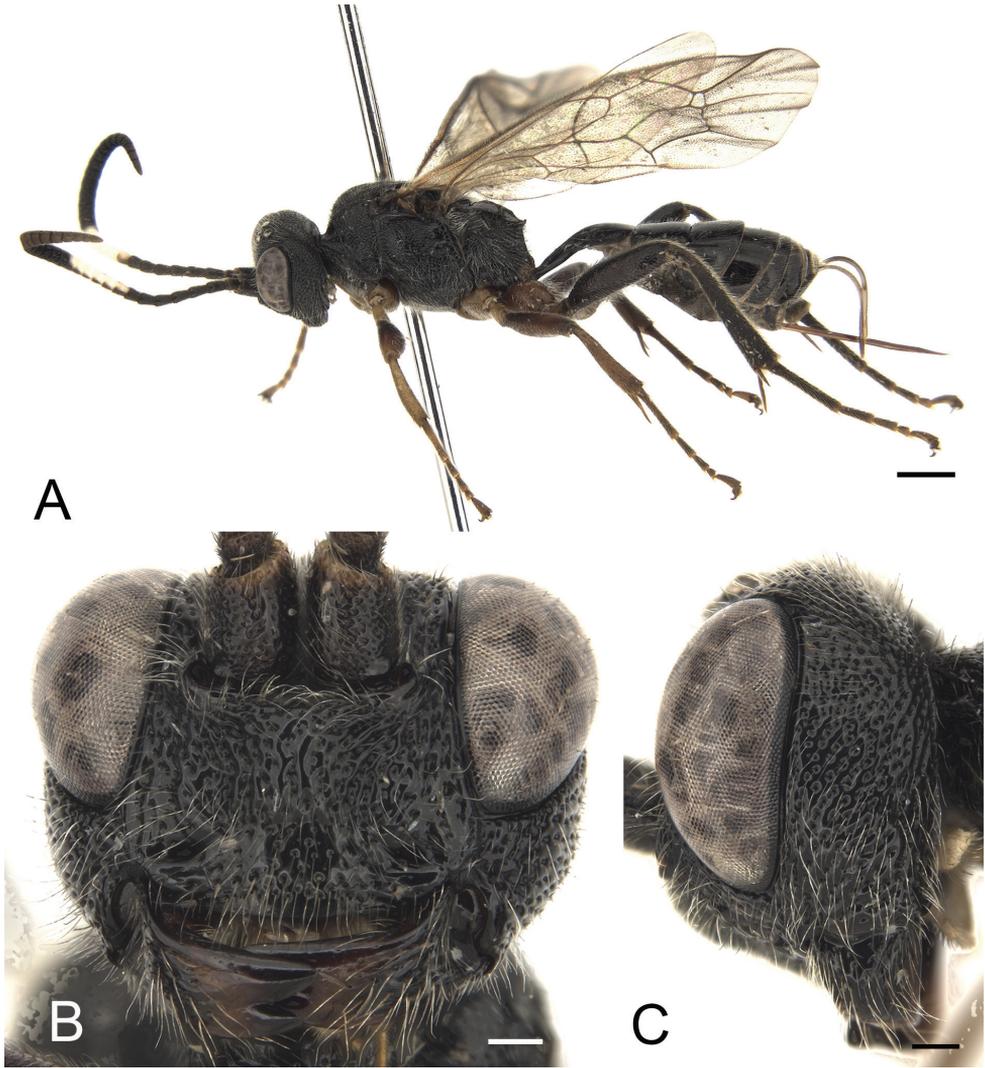


Figure 1. *Amphibulus areolaris* Sheng, Li & Yang, sp. nov., ♀, holotype (CBDPC) **A** habitus, lateral view **B** head, anterior view **C** head, lateral view. Scale bars: 1.0 mm (**A**); 0.2 mm (**B, C**).

texture as gena. Postocellar line $0.7 \times$ as long as ocular-ocellar line. Antenna with 27–28 flagellomeres. Flagellomeres 11 to 25 slightly wider than long, slightly flattened in ventral profile. Ratios of lengths from first to fifth flagellomeres: 1.1:1.2:1.1:1.1:1.0. Occipital carina complete, reaching hypostomal carina distinctly above base of mandible.

Mesosoma. Pronotum (Fig. 2C) with yellow brown setae; dorsal posterior area shiny, with distinct punctures; lower portion with dense oblique transverse wrinkles. Epomia long, strong. Mesoscutum (Fig. 2D) shiny, with uneven punctures, postero-median portion with irregular longitudinal wrinkles. Notauli distinct anteriorly. Scutoscutellar groove steep, with distinct longitudinal wrinkles. Scutellum slightly

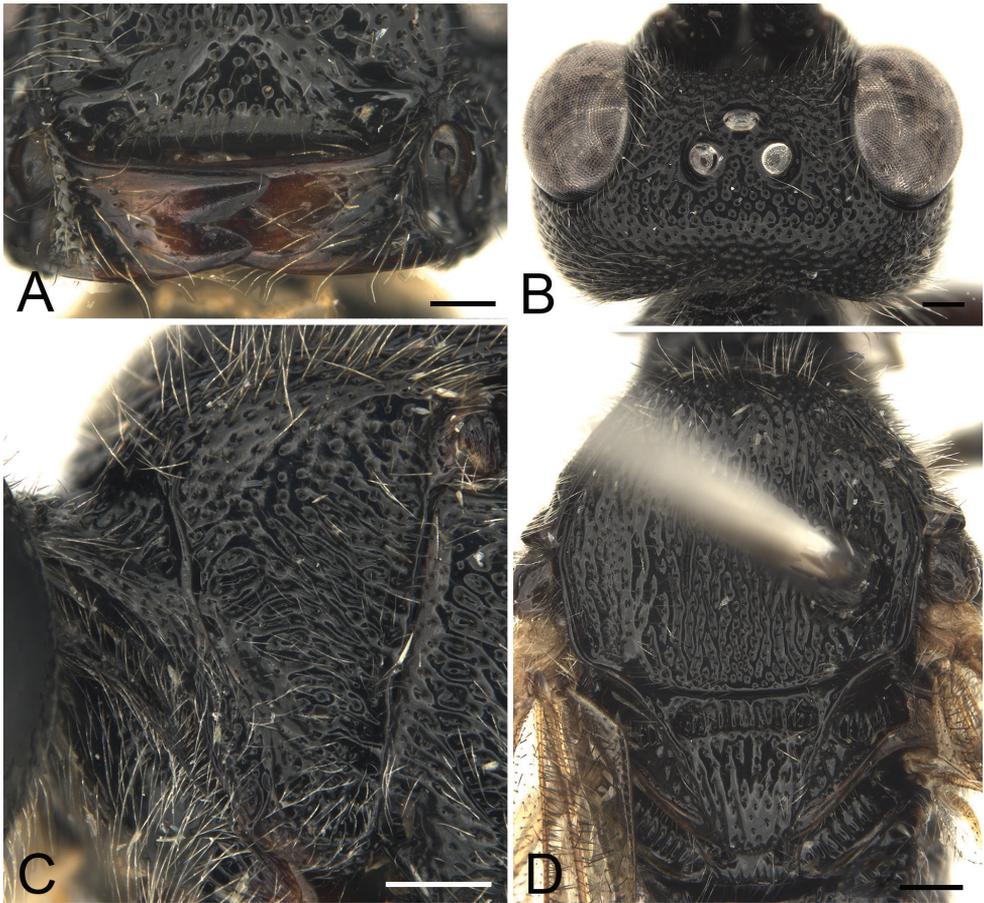


Figure 2. *Amphibulus areolaris* Sheng, Li & Yang, sp. nov., ♀, holotype (CBDPC) **A** mandibles **B** head, dorsal view **C** pronotum, lateral view **D** mesoscutum and scutellum, dorsal view. Scale bars: 0.2 mm (**A**, **B**); 0.3 mm (**C**, **D**).

convex, with irregular punctures and weak longitudinal wrinkles; lateral carina reaching almost to apex. Antero-lateral portion of postscutellum with deep concavity, posterior portion distinctly convex transversely. Mesopleuron (Fig. 3A) with irregular transverse wrinkles, median portion with uneven punctures; speculum small. Dorsal end of epicnemial carina closing anterior margin of mesopleuron, almost reaching to 0.5 distance to subtegular ridge. Metapleuron slightly convex, with dense punctures and yellow brown setae; juxtacoxal carina almost complete. Anterior portion of submetapleural carina strongly convex. Fore wing (Figs 1A, 3B) with vein 1cu-a almost opposite 1/M. Areolet pentagonal, lateral veins convergent forwardly, receiving vein 2m-cu approximately at posterior 0.2. Postnervulus intercepted distinctly below middle. Hind wing vein 1-cu strongly inclivous, $3.0 \times$ as long as cu-a. Ratio of length of hind tarsomeres from first to fifth: 6.4:2.8:2.0:1.0:2.5. Propodeum (Fig. 3C) completely areolated; apophysis distinct; area basalis reversed trapezoid, anterior half smooth, posterior with sparse punctures. Area superomedia wider than long, receiving

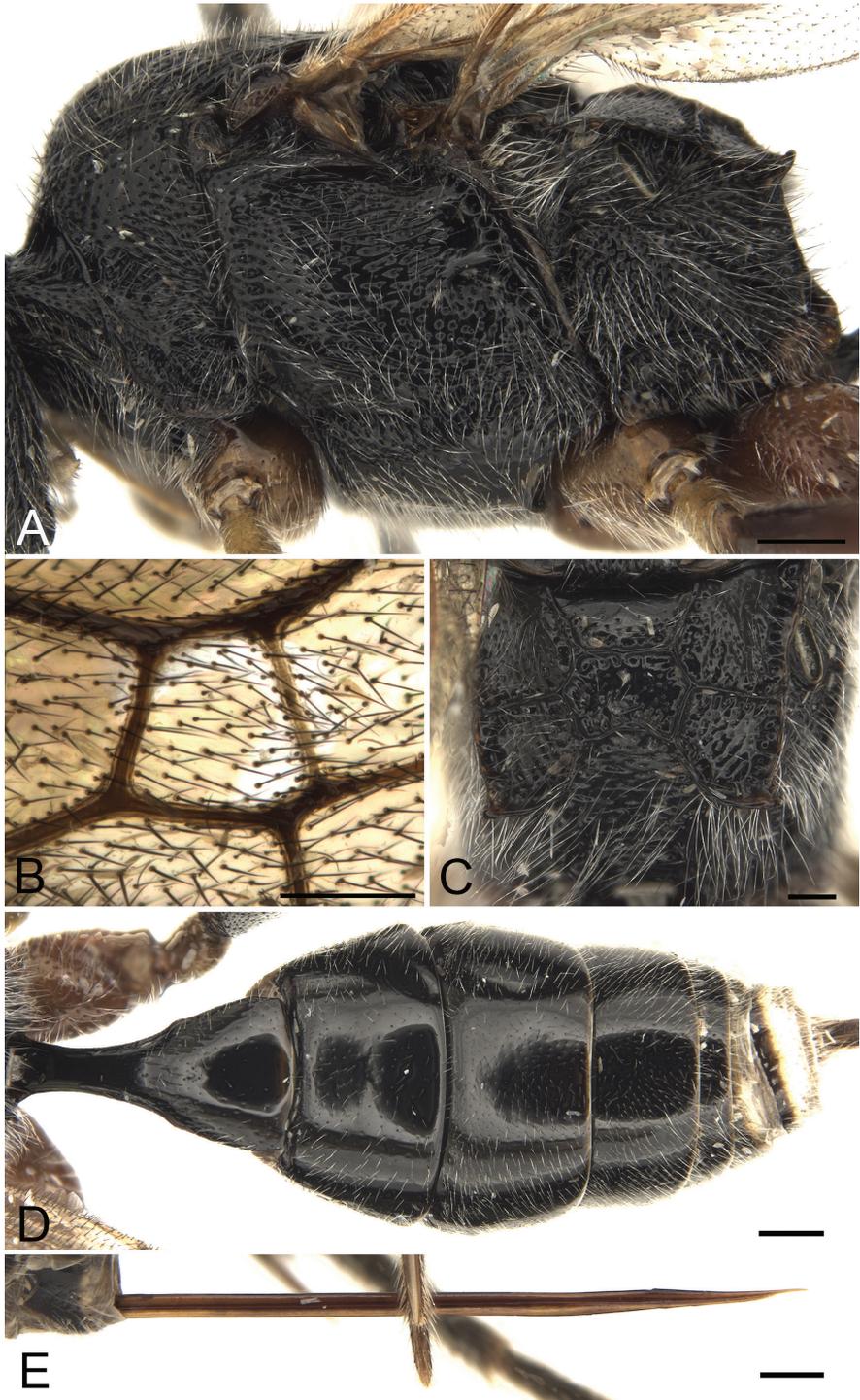


Figure 3. *Amphibulus areolaris* Sheng, Li & Yang, sp. nov., ♀, holotype (CBDPC) **A** mesosoma, lateral view **B** areolet **C** propodeum **D** metasoma, dorsal view **E** ovipositor, lateral view. Scale bars: 0.4 mm (**A, D**); 0.2 mm (**B, C**); 0.3 mm (**E**).

costula slightly before its middle, with indistinct punctures. Remainder areas with indistinct punctures, irregular weak wrinkles and yellow brown setae. Propodeal spiracle relatively larger, obliquely elliptic, approximate $3.0 \times$ as long as wide.

Metasoma (Fig. 3D). First tergite approximately $1.9 \times$ as long as posterior width, smooth, shiny. Postpetiole distinctly widened posteriorly, posterior width approximately $1.3 \times$ as its length, anterior and lateral portions with weak sparse punctures; latero-median carina indistinct; dorso-lateral and ventro-lateral carinae complete. Posterior end of first sternite distinctly basad of spiracle. Spiracle circular, small, located approximately at posterior 0.4 of first tergite. Tergites 2–4 shiny. Second tergite smooth, $0.5 \times$ as long as posterior width, with sparse indistinct fine punctures. Third tergite $0.47 \times$ as long as maximum width, with texture as second tergite, punctures denser than on second tergite. Fourth tergite with distinct fine punctures, denser than on third tergite. Ovipositor sheath $0.8 \times$ as long as hind tibia. Ovipositor (Fig. 3E) compressed, with indistinct subapical nodus and weak notch; ventral valve with three weak teeth.

Coloration (Fig. 1A). Black, except the following: dorsal profiles of flagellomeres 7–12 white, ventrally slightly brownish black; apical portion of flagellum brown to dark brown. Median portion of mandible, maxillary and labial palpi darkish red. Fore and mid coxae brown to darkish brown; femora, basal portions of tibiae and tarsi predominantly dark brown. Hind coxa and trochanter brown; tarsomeres brownish black. Posterior margins of tergites 6–8 white medially.

Male. Body length 8.8–11.2 mm. Fore wing length 6.4–8.4 mm. Antenna with 26–28 flagellomeres. Flagellomeres 10–12 (13) with tyloids. Face $1.6 \times$ as wide as long. Clypeus $2.6 \times$ as wide as long. Median portion of mesopleuron smooth. Area superomedia of propodeum $2.0 \times$ as wide as long. Apophysis indistinct. Black, except for following: Ventral profiles of flagellomeres 1–5, maxillary and labial palpi, fore tibia and first tarsomere yellowish brown. Flagellomeres 6–13, hind tarsomeres 1 apically and 2–4 white. Fore and mid femora reddish brown. Remainder of characteristics similar to female.

Etymology. The specific name is derived from the area superomedia being wider.

Material examined. Holotype. CHINA • ♀; Guizhou Province, Fanjingshan National Natural Reserve; 31 May 2019; leg. Tao Li; CBDPC.

Paratypes. CHINA • 1 ♀, 5 ♂♂; same data as holotype except: Fanjingshan National Natural Reserve, Yapanlin; 15 May to 7 July 2019; IT by Mao-Fei Tian; CBDPC • 1 ♂; same data as holotype except: Fanjingshan National Natural Reserve, Lengjiaba; 11 September 2019; IT by Zheng-Hai Yang; CBDPC.

***Amphibulus guicus* Sheng, Li & Sun, sp. nov.**

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Figs 4–6

Diagnosis. Gena (Figs 4C, 5A) evenly convergent posteriorly, with sparse uneven punctures. Clypeus smooth, shiny, subanterior margin with fine indistinct punctures. Propodeum (Fig. 5D) almost smooth, shiny, with indistinctly finely punctate. Area

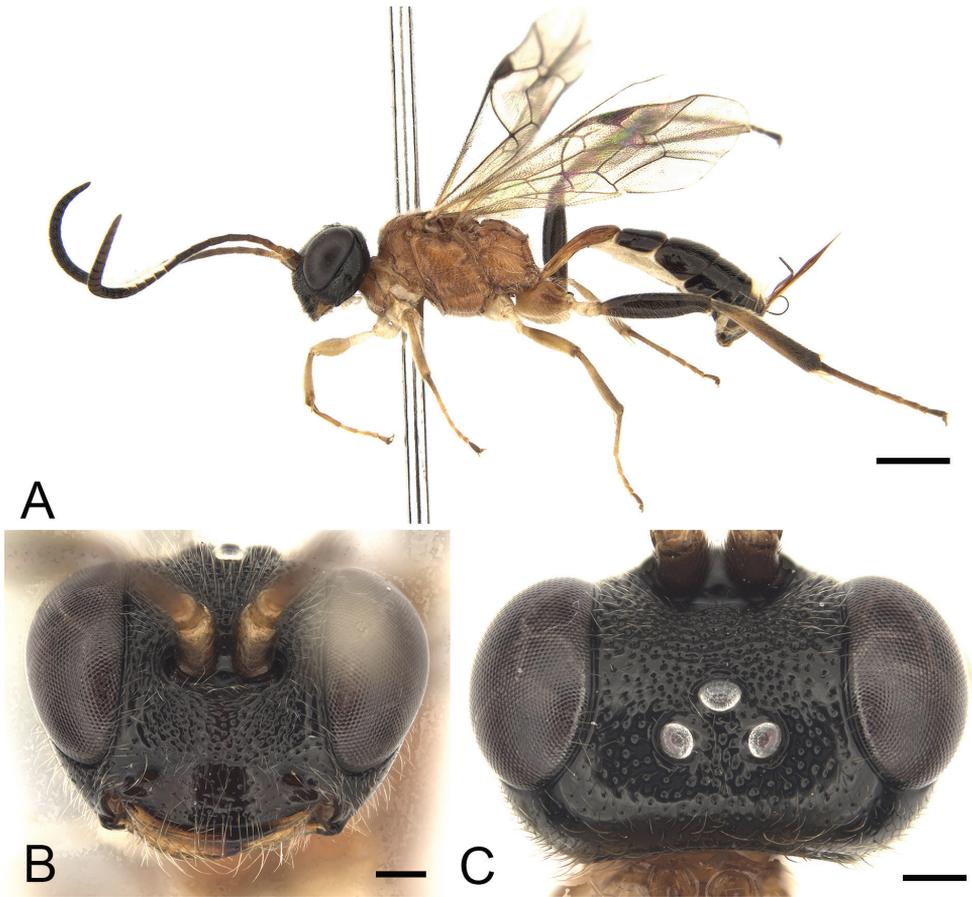


Figure 4. *Amphibulus guiiicus* Sheng, Li & Sun, sp. nov., ♀, holotype (CBDPC) **A** habitus, lateral view **B** head, anterior view **C** head dorsal view. Scale bars: 1.0 mm (**A**); 0.2 mm (**B, C**).

superomedia 0.6 × as wide as long. Tergites (Fig. 6A) shiny, with sparse fine punctures. First sternite reaching level of spiracle. Head and tergites 2–5 entirely black; Mesosoma and first tergite reddish to yellowish brown.

Description. Female. Body length 6.8–7.0 mm. Fore wing length 4.5–4.8 mm. Ovipositor sheath length approximately 1.2–1.4 mm.

Head. Face (Fig. 4B) 2.2 × as wide as long, slightly convex medially, with weak punctures, distance between punctures mainly 0.5 to 1.5 × their diameter, sparser laterally. Anterior tentorial pit relatively large, almost circular. Median point of clypeal sulcus above level of line reaching lower margins of eyes. Clypeus smooth, 3.2 × as wide as long, evenly convex, with sparse indistinct punctures and long brown hairs; apical margin evenly arched forward. Mandible with fine punctures; upper tooth 3.3 × as long as lower tooth. Malar space 0.4 × as long as basal width of mandible. Gena (Figs 4C, 5A) shiny, in dorsal view 0.3–0.4 × as long as width of eye, evenly convergent posteriorly, with sparse uneven punctures. Vertex (Fig. 4C) with distinct punctures,

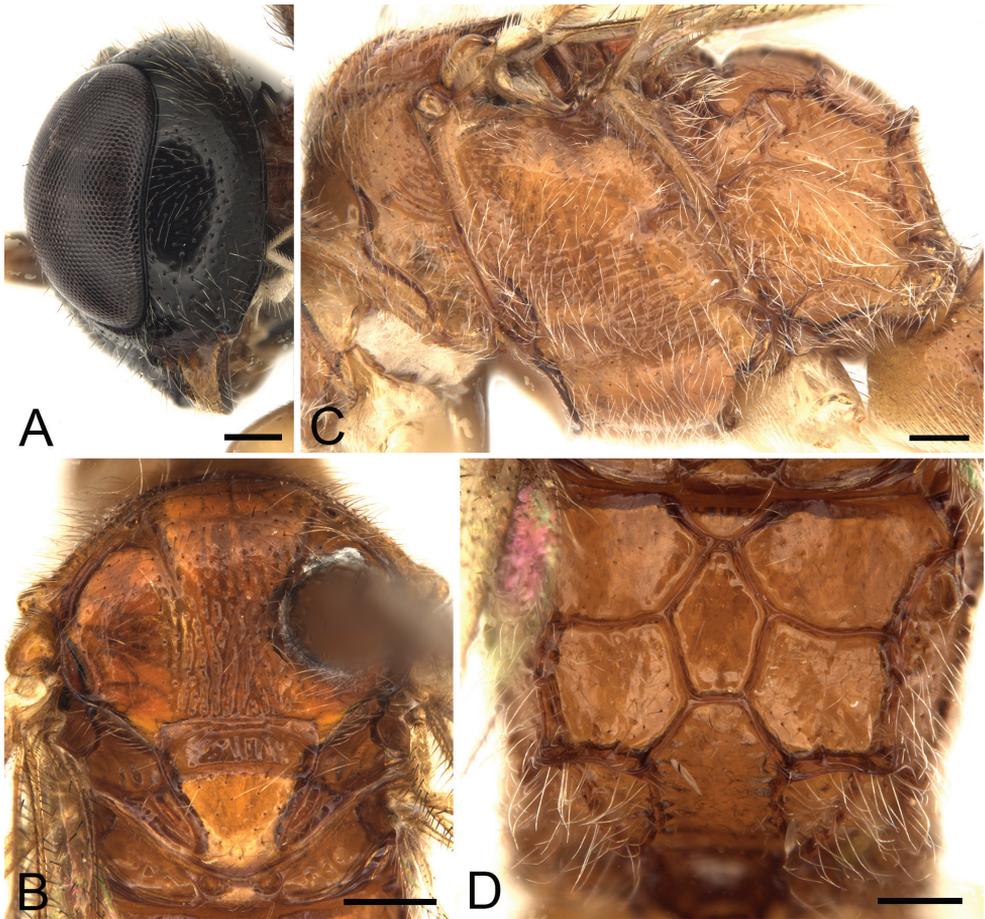


Figure 5. *Amphibulus guiiicus* Sheng, Li & Sun, sp. nov., ♀, holotype (CBDPC) **A** head, lateral view **B** mesoscutum and scutellum, dorsal view **C** mesosoma, lateral view **D** propodeum. Scale bars: 0.2 mm (**A, C, D**); 0.3 mm (**B**).

denser on stemmaticum than lateral and posterior portion. Postocellar line $0.8 \times$ as long as ocular-ocellar line. Frons with dense punctures. Antenna with 23–26 flagellomeres. Flagellomeres 11 to 22(23) almost wider than long, ventral slightly flattened in ventral view. Ratios of lengths from first to fifth flagellomeres: 1.0:1.2:1.3:1.3:1.2. Occipital carina complete, reaching hypostomal carina almost near base of mandible.

Mesosoma. Dorsal and anterior portion of pronotum (Fig. 5C) shiny, medio-posterior with indistinct oblique wrinkles, dorsal posterior portion with distinct fine punctures. Epomia long, strong, lower end reaching to anterior margin of pronotum, dorsal end almost reaching dorsal margin. Mesoscutum (Fig. 5B) shiny, lateral and anterior portions almost smooth, with sparse indistinct fine punctures, posteromedian portion with indistinct longitudinal wrinkles and fine punctures. Anterior portion of notaulus distinct. Scutoscutellar groove shiny, with indistinct longitudinal wrinkles. Scutellum with texture as lateral portion of mesoscutum, basal portion of lateral ca-

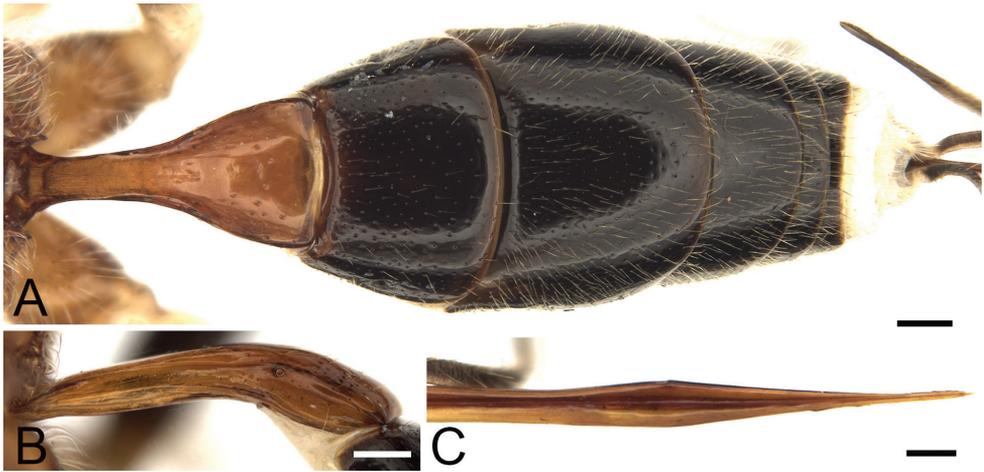


Figure 6. *Amphibulus guiticus* Sheng, Li & Sun, sp. nov., ♀, holotype (CBDPC) **A** metasoma, dorsal view **B** tergite 1, lateral view **C** posterior portion of ovipositor, lateral view. Scale bars: 0.2 mm (**A, B**); 0.1 mm (**C**).

rina present anteriorly. Postscutellum transverse, smooth, with deep antero-lateral pits. Dorsal portion of mesopleuron (Fig. 5C) almost smooth, shiny, with sparse indistinct punctures; median portion with indistinct oblique wrinkles; lower slightly convex. Speculum indistinct. Metapleuron (Fig. 5C) evenly convex, with sparse fine punctures; lower portion with indistinct wrinkles. Juxtacoxal carina complete. Anterior portion of submetapleural carina distinctly convex. Ratio of length of hind tarsomeres from first to fifth: 6.9:2.6:1.9:1.0:1.8. Fore wing with vein 1cu-a opposite 1/M. Areolet pentagonal, lateral veins weakly convergent forward, receiving vein 2m-cu approximately at posterior 0.4. Hind wing vein 1-cu strongly inclivous, 3.0 × as long as cu-a. Propodeum (Fig. 5D) almost completely areolated, carinae strong; almost smooth, shiny, with sparse indistinct fine punctures. Area basalis almost triangular. Area superomedia 0.6 × as wide as long, receiving costula slightly before its middle. Apophysis distinct. Propodeal spiracle obliquely elliptic, approximate 3.2 × as long as wide.

Metasoma (Fig. 6A). First tergite (Fig. 6A, B) smooth, shiny, approximately 2.1 × as long as posterior width, median portion somewhat prismatic. Postpetiole evenly widened posteriorly, posterior width distinctly longer than its length. Latero-median carina weakly present; Dorso-lateral and ventro-lateral carinae present. First sternite reaching level of spiracle. Spiracle small, circular, located approximately at posterior 0.3 of first tergite. Tergites 2–4 (Fig. 6A) shiny. Second tergite smooth, strongly widened posteriorly, 0.6 × as long as posterior width, lateral with sparse indistinct fine punctures. Third tergite almost parallel laterally, with distinct even setae. Remaining tergites with dense short setae. Ovipositor sheath 0.8 × as long as hind tibia. Ovipositor (Fig. 6C) slightly compressed, subapical nodus indistinct, with weak notch; ventral valve with two weak teeth.

Coloration (Fig. 4A). Mainly black, reddish brown and white. Head black; maxillary and labial palpi yellowish white; mandible, scape and pedicel brownish yellow; dorsal profiles of flagellomeres 7–11 (12) white. Mesosoma reddish brown. Fore and mid-

dle coxae and all trochanters whitish yellow; remainder of fore and middle legs, hind coxa and subbase of tibia and tarsus predominantly yellowish brown; hind femur and posterior portion of tibia brownish black. First tergite reddish brown; tergites 2–6 black; tergites 7–8 white, blackish brown laterally. Pterostigma and wing veins brownish black.

Male. Body length 4.1–7.0 mm. Fore wing length 3.4–4.8 mm. Antenna with 22–25 flagellomeres. Flagellomeres 10–12 with tyloids. Face 2.1 × as wide as long. Clypeus 2.8 × as wide as long. Occipital carina reaching hypostomal carina above base of mandible. Area superomedia 1.0–1.2 × as wide as long, receiving costula at its anterior 0.3. Apophysis indistinct. Basal and ventral profiles of flagellomeres yellowish brown, dorsal profiles dark brown. Remainder of characteristics similar to female.

Etymology. The specific name is derived from the type locality, gui, the Chinese abbreviation for Guangxi Zhuang Autonomous Region.

Material examined. Holotype. CHINA • ♀; Guangxi Zhuang Autonomous Region, Shiwandashan National Natural Reserve; 275 m; 13 November 2018; IT by Qing-Tang Huang; CBDPC.

Paratypes. CHINA • 1 ♀; same data as holotype; CBDPC • 7 ♂♂; same data as holotype except: 20 November to 4 December 2018; CBDPC • 3 ♀♀; same data as holotype except: 29 April to 15 May 2019; CBDPC • 1 ♀; same data as holotype except: Dayaoshan National Natural Reserve, Shengtangshan; 1520 m; 30 January 2019; IT by Tao Li; CBDPC • 8 ♂♂; same data as holotype; CBDPC.

***Amphibulus rufithorax* Sheng, Li & Yang, sp. nov.**

<https://zoobank.org/1A98A643-78BD-4895-BE43-3A1801AB121B>

Figs 7, 8

Diagnosis. Frons (Fig. 8A) with coarse dense punctures. Fore wing (Fig. 7A) vein 1cu-a distinctly distal to M&RS; areolet receiving vein 2m-cu approximately at its middle. Lateral carinae of area basalis (Fig. 8D) mostly vestigial. Area superomedia almost as wide as long, receiving costula at anterior 0.3. First sternite reaching level of spiracle. Head and tergites 2–6 almost entirely black; First tergite predominantly black. Mesosoma reddish brown.

Description. Female. Body length 4.9–6.7 mm. Fore wing length 4.1–5.1 mm. Ovipositor sheath length 1.1–1.2 mm.

Head. Face (Fig. 7B) 2.3 × as wide as long, evenly convex medially, dense punctures and irregular indistinct longitudinal wrinkles medially; lateral side smooth, sparsely punctate. Anterior tentorial pit relatively large, obliquely elliptic. Median point of clypeal sulcus above level of line reaching lower margins of eyes. Clypeus smooth, shiny, 2.9 × as wide as long, evenly convex apically; with sparse fine punctures; apical margin weakly arched forward. Mandible with dense fine punctures; upper tooth 3.0 × as long as lower tooth. Malar space 0.6 × as long as basal width of mandible. Gena in dorsal view 0.62–0.65 × as long as width of eye, evenly slightly convergent backwardly, with irregular punctures, distance between punctures 0.5 to 3.0 × their diameter. Vertex (Fig. 7C) with sparse punctures and long brown setae. Stemmaticum with relatively dense punctures. Postocellar line 0.7 × as long as ocular-ocellar line. Frons (Fig. 8A) with dense punctures,

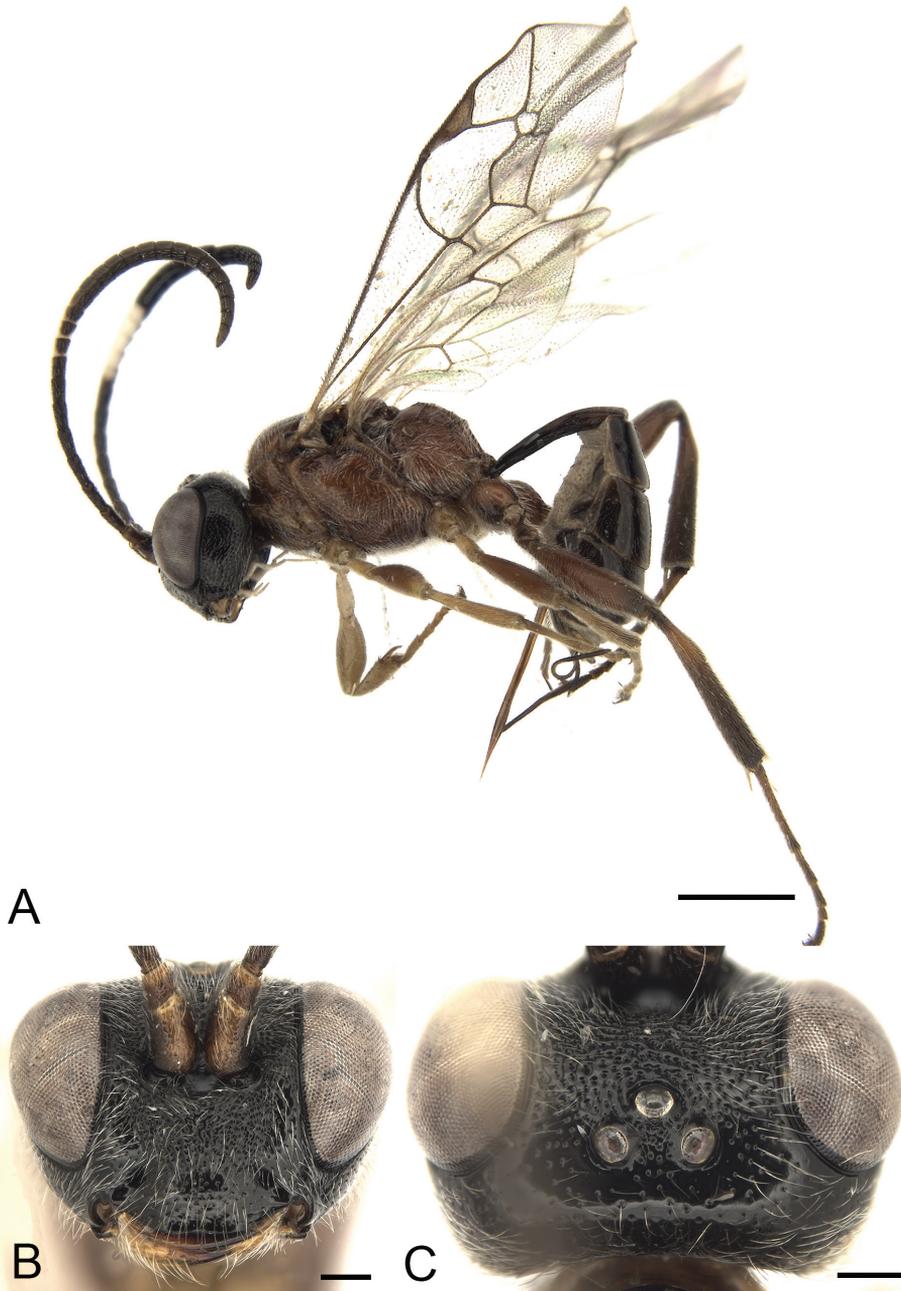


Figure 7. *Amphibulus rufithorax* Sheng, Li & Sun, sp. nov., ♀, holotype (CBDPC) **A** habitus, lateral view **B** head, anterior view **C** head, dorsal view. Scale bars: 1.0 mm (**A**); 0.2 mm (**B, C**).

distance between punctures at most $0.5 \times$ their diameter, lateral sparser than median portion. Antenna with 23–25 flagellomeres. Flagellomeres 11 to 23 (26) slightly flattened in ventral view. Ratios of lengths from first to fifth flagellomeres: 5.5:6.1:5.7:5.5:5.2. Occipital carina complete, reaching hypostomal carina at base of mandible.

Mesosoma. Pronotum (Fig. 8C) almost shiny, with indistinct fine punctures; lower portion with indistinct fine oblique wrinkles. Epomia long, lower end almost reaching to lower-anterior margin of pronotum, dorsal end almost reaching dorsal margin. Mesoscutum (Fig. 8B) shiny, lateral and anterior portions almost smooth, with shallow punctures; posteromedian portion with short irregular longitudinal wrinkles and fine punctures. Anterior end of notaulus distinct. Scutoscutellar groove deep, with distinct longitudinal wrinkles. Scutellum shiny, almost smooth, with few punctures; lateral carina present anteriorly. Postscutellum smooth, shiny, with deep antero-lateral pits. Anterior and lower portions of mesopleuron (Fig. 8C) with dense punctures and setae, dorsal posterior shiny, with sparse fine punctures. Speculum small, indistinct. Dorsal end of epicnemial carina almost reaching to 0.5 distance to subtegular ridge. Meta-pleuron (Fig. 8C) weakly convex, with dense setae and relatively sparse fine punctures. Median portion of juxtacoxal carina vestigial. Anterior portion of submetapleural carina strongly lobe-shaped convex. Ratio of length of hind tarsomeres from first to fifth:

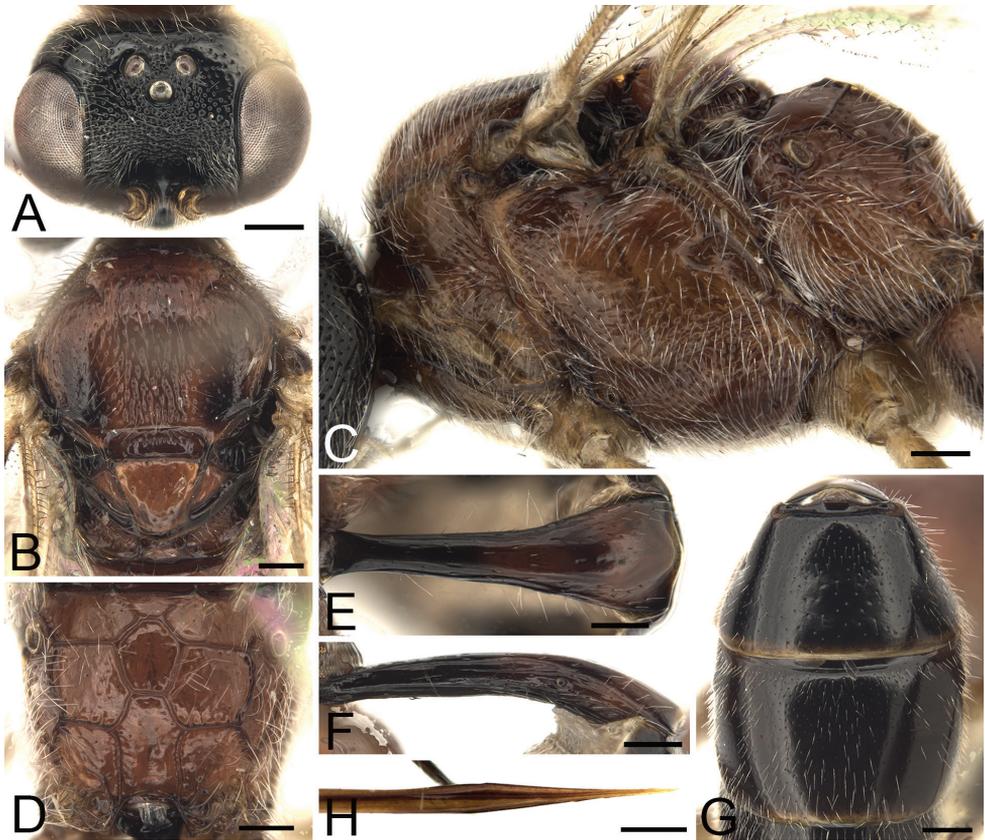


Figure 8. *Amphibulus rufithorax* Sheng, Li & Yang, sp. nov., ♀, holotype (CBDPC) **A** head, dorso-anterior view **B** mesoscutum and scutellum, dorsal view **C** mesosoma, lateral view **D** propodeum **E** tergite 1, dorsal view **F** tergite 1, lateral view **G** tergites 2–3, dorsal view **H** posterior portion of ovipositor, lateral view. Scale bars: 0.3 mm (**A**); 0.2 mm (**B**–**H**).

5.8:2.2:1.6:1.0:1.8. Wings slightly gray, hyaline; vein 1cu-a distinctly distal to M&RS. Areolet pentagonal, lateral veins strongly convergent forwardly, receiving vein 2m-cu approximately at its middle. Postnervulus intercepted at lower 0.3. Hind wing vein 1-cu strongly inclivous, $3.0 \times$ as long as cu-a. Propodeum (Fig. 8D) smooth, shiny, indistinctly punctate peripherally, completely areolated. Apophysis indistinct. Area basalis reversed trapezoidal, lateral carina mostly vestigial. Area superomedia hexagonal, maximum width slightly wider than its length, reaching costula at anterior 0.35. Propodeal spiracle elongate, approximate $1.4 \times$ as long as wide.

Metasoma. First tergite (Fig. 8E, F) approximately $3.0 \times$ as long as posterior width, smooth, shiny, with very sparse punctures; posterior half evenly widened posteriorly. Postpetiole approximately as long as its width. Latero-median carina indistinct; dorso-lateral and ventro-lateral carinae weak, complete. First sternite reaching level of spiracle. Spiracle circular, small, located approximately at posterior 0.4 of first tergite. Tergites 2–3 (Fig. 8G) almost smooth, shiny. Second tergite $0.6 \times$ as long as posterior width, with sparse indistinct fine punctures. Third tergite approximately $0.5 \times$ as long as maximum width, slightly convergent posteriorly. Remainder tergites with fine punctures and distinct setae. Ovipositor sheath $0.8 \times$ as long as hind tibia. Ovipositor (Fig. 8H) compressed, with indistinct subapical nodus and weak notch; ventral valve with two indistinct teeth.

Coloration (Fig. 7A). Head black; ventral profiles of scape and pedicel, mandible, maxillary and labial palpi yellowish brown; flagellomeres 7–11 white dorsally. Mesosoma almost entirely red brown. Fore and middle legs dark brown, except coxae and trochanters, fore femur apically and tibia whitish yellow. Hind coxa predominantly, trochanter, femur (apex black) darkish red, subbase of tibia brownish yellow. Posterior half of first tergite irregularly brown. Tergites 2–6 black, apical margins narrowly yellow. Tergites 7–8 white medially, black brown laterally. Wing veins brownish black; Pterostigma brown medially.

Male. Unknown.

Etymology. The specific name is derived from the mesosoma being entirely red brown.

Material examined. Holotype. CHINA • ♀; Guizhou Province, Fanjingshan National Natural Reserve, Yapanlin; 1250 m; 15 May 2019; IT by Mao-Fei Tian; CBDPC.

Paratypes. CHINA • 2 ♀♀; same data as holotype except: Lengjiaba; 840 m; 14 to 21 October 2019; IT by Zheng-Hai Yang; CBDPC • 1 ♀; same data as holotype; CBDPC • 8 ♀♀; Guizhou Province, Leigongshan National Natural Reserve; 1760 m; 17 June to 6 August 2019; IT by Wan-Xin Pan; CBDPC.

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