

Four new species of the Cimbicidae (Hymenoptera: Tenthredinoidea) from China

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Abstract: Four new species of the Cimbicidae from China are described: *Abia jimeii* Yan & Wei **sp. nov.**, *Zaraea zhui* Yan & Wei **sp. nov.**, *Leptocimbex nigrotegularis* Yan & Wei **sp. nov.**, and *Corynis zhengi* Yan & Wei **sp. nov.** A key to all extant Holarctic genera of Cimbicidae is provided.

Key words: sawflies; taxonomy; key

中国锤角叶蜂科四新种（膜翅目：叶蜂总科）

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摘要: 记述中国锤角叶蜂科4新种: 计美丽锤角叶蜂 *Abia jimeii* Yan & Wei **sp. nov.**, 郑氏敛锤角叶蜂 *Corynis zhengi* Yan & Wei **sp. nov.**, 黑肩细锤角叶蜂 *Leptocimbex nigrotegularis* Yan & Wei **sp. nov.** 和朱氏丑锤角叶蜂 *Zaraea zhui* Yan & Wei **sp. nov.**。提供了全北界锤角叶蜂科分属检索表。

关键词: 叶蜂; 分类; 检索表

Introduction

Cimbicidae is a small family of the superfamily Tenthredinoidea with about 215 valid extant species and 21 genera around the world (Yan *et al.* 2022). It includes four subfamilies: Abiinae, Cimbicinae, Pachylostictinae, and Corynidinae (Benson 1938). Within China, 82 species representing 16 genera have already been recorded (Yan *et al.* 2019, 2020a, b, 2021, 2022; Cheng *et al.* 2021). Here we report four new species of the family from China.

Material and methods

Specimens were examined with a Leica S8APO dissection microscope. Adult images were taken with a Nikon D700 digital camera and a series of images edited using Helicon Focus (HeliconSoft), while detailed images were taken with Leica Z16 APO/DFC550. The specimens must be sufficiently relaxed in a moist chamber before dissection. Dissected

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ovipositor valves, gonoforceps and penis valves were permanently mounted on slides in gum Arabic and images produced and composited automatically with a Nikon Ci-L/DS-Fi3. The series of images produced were focus-stacked using Helicon Focus (HeliconSoft, Kharkiv, Ukraine) and further processed with Adobe Photoshop CS 11.0.

The terminology of sawfly genitalia follows Ross (1945) and that of general morphology follows Viitasaari (2002). For a few terms (e.g. middle fovea and lateral fovea), we followed Takeuchi (1952). Abbreviations used are: POL — distance between the mesal edges of the lateral ocelli; OOL — distance between the eye and outer edge of lateral ocelli; OCL — distance between a lateral ocellus and the occipital carina or hind margin of the head.

All holotypes and paratypes of the new species are deposited in the Asian Sawfly Museum, Nanchang, China (ASMN).

Taxonomy

Key to extant Holarctic genera of Cimbicidae

1. Anal cell of fore wing divided into two by a long medial constriction; clypeus not enlarged, distinctly narrower than distance between lower corners of eyes, or antennae with 5 antennomeres and nearly as long as head breadth; inner margins of eyes strongly convergent or strongly divergent downward; mandibles and hind legs in males not excessively enlarged compared to their females 2
- Anal cell of fore wing divided into two base of the middle by a straight vein or seldom a punctiform petiole; clypeus distinctly broader than distance between lower corners of eyes; antennae at least with 6 clear antennomeres (except for *Pseudoclavellaria*) and distinctly longer than head breadth; inner margin of eyes subparallel or slightly convergent downward; mandibles and hind legs in males normal or excessively enlarged compared to their females. Cimbicinae 6
2. Inner margins of eyes strongly convergent downward; distance between antennal toruli about 2 times as long as breadth of clypeus, clypeus not separated from supraclypeal area by a distinct transversal furrow; anterior tentorial pit small and shallow; head narrowed behind eyes in dorsal view, POL longer than OCL; hind orbit with distinct occipital carina; mesonotum with sulcus between mesoscutal lateral lobe and middle lobe almost obsolete; hind coxae separated, apex of tibial spur acute and sclerotinous. Coryninae *Corynis*
- Inner margins of eyes strongly divergent downward; distance between antennal toruli about as long as breadth of clypeus, clypeus separated from supraclypeal area by a distinct transversal furrow; anterior tentorial pit large and deep; head enlarged behind eyes in dorsal view, POL much shorter than OCL; hind orbit round, without occipital carina; mesonotum with sulcus between mesoscutal lateral lobe and middle lobe deep; hind coxae contiguous, apex of tibial spur blunt and membranous. Abiinae 3
3. Anterior margin of clypeus distinctly incised; body without metallic luster or with weak metallic luster 4
- Anterior margin of clypeus truncate; body usually with distinct metallic luster 5
4. Claw bifurcate, inner tooth large; dorsal margins of eyes almost contact in male, distance narrower than basal breadth of flagellum *Orientabia*
- Claw with a small inner tooth at about middle; distance between dorsal margins of eyes in male broader than basal breadth of flagellum *Allabia*
5. Claw simple; head and thorax with dense long hairs *Zaraea*
- Claw bifurcate, inner tooth large; long hairs on head and thorax sparse or absent *Abia*
6. Labrum small, clearly narrower than 1/4 breadth of clypeus; jugum region in hind wing with or without crossvein; clypeus narrower than lower distance between eyes, or clypeus triangularly convex and

- merging with supraclypeal area..... 7
- Labrum large, not narrower than 1/3 breadth of clypeus; jugum region in hind wing without crossvein; clypeus very short and much broader than lower distance between eyes, not merging with supraclypeal area..... 12
7. Jugum region in hind wing without crossvein; ventral side of middle and hind femora with 1–2 rows of dents, or anal cell in fore wing with a punctiform middle petiole, or head narrowed behind eyes in dorsal view 8
- Jugum region in hind wing with a crossvein; middle and hind femora without dent ventrally; anal cell of fore wing with a middle crossvein; head not narrowed behind eyes in dorsal view (malar space distinctly broader than diameter of median ocellus; posterior margin of abdominal tergum 1 strongly incised; clypeus triangularly convex and merging with supraclypeal area)..... 10
8. Outer side of middle and hind coxae with a large dent; ventral side of hind femur with 1–2 rows of dents; mandibles simple, without inner tooth; malar space very long, clearly longer than antennomere 4; antennae with 8–9 antennomeres (claw simple)..... *Odontocimbex*
- Outer side of coxae without dent; ventral side of femora without 1–2 rows of dents; mandibles with distinct inner tooth; malar space short, at most as long as antennomere 1, much shorter than antennomere 4; antennae with 6–7 antennomeres 9
9. Clypeus clearly narrower than shortest distance between eyes and separated from supraclypeal area with a shallow but distinct furrow; anal cell in fore wing with a short petiole at basal third; claw simple; tibial spur stout, much shorter than apical breadth of tibia, apex obtuse; head enlarged behind eyes in dorsal view *Praia*
- Clypeus clearly broader than shortest distance between eyes and merging with supraclypeal area, furrow between them absent; anal cell in fore wing with a distinct crossvein at basal fourth; claw bifurcate; tibial spur slender, clearly longer than apical breadth of tibia, tapering toward apex; head narrowed behind eyes in dorsal view..... *Agenocimbex*
10. Tibial spur acute at apex; head not distinctly enlarged behind eyes in dorsal view; malar space much shorter than antennomere 4; clypeus broader than long; fore wing with a longitudinal smoky stripe..... *Asicimbex*
- Tibial spur blunt and membranous at apex; head strongly enlarged behind eyes in dorsal view; malar space longer than antennomere 4; clypeus as long as broad or fore wing without a longitudinal smoky stripe..... 11
11. Clypeus and supraclypeal area entirely merging together and without depression between them; distance between antennal toruli and posterior margin of head clearly shorter than distance between toruli and anterior margin of clypeus; postocellar area much broader than long; distance between cenchri about 5 times as long as breadth of a cenchrus; fore wing with a broad longitudinal smoky stripe from base to apex; serrulae small and about as long as broad, far remote to each other..... *Palaeocimbex*
- Clypeus and supraclypeal area not entirely merging together, with a broad and shallow depression between them; distance between antennal toruli and posterior margin of head about as long as distance between toruli and anterior margin of clypeus; postocellar area about as long as broad; distance between cenchri about 2–3 times as long as breadth of a cenchrus; fore wing without a broad longitudinal smoky stripe from base to apex; serrulae large and much longer than broad, quite close to each other *Cimbex*
12. Ventral side of middle and hind femur with 1 distinct dent near apex 13
- Ventral side of femur without dent..... 14
13. Head small, higher than breadth in front view; thorax not less than 1.5 times as broad as head in dorsal view; venter of hind femur with 2 distinct longitudinal carinae; fore wing with distinct black maculae at base and below pterostigma; body hairs very dense; dorsal lobe of penis valve broad and strongly sclerotized, with a broad basin between it and lateral carina..... *Asitrichiosoma*

- Head large, broader than high in front view; thorax slightly broader than head in dorsal view; venter of hind femur without 2 longitudinal carinae; fore wing without distinct black maculae at base and below pterostigma; body hairs not very dense; dorsal lobe of penis valve short, weakly sclerotized and with a narrow basin between it and lateral carina *Trichiosoma*
- 14. Head and thorax with dense and long hairs; club of antennae not segmented; abdominal tergum 1 without lateral carina; tarsal pulvilli large, 1st and 2nd pulvilli nearly touching to each other, first pulvillus longer than 1/2 length of basitarsus; apical anal cell of forewing 1 to 2 times length of basal anal cell..... 15
- Head and thorax without dense and long hairs; club of antennae distinctly segmented; abdominal tergum 1 at least with distinct lateral carina at basal 1/2; tarsal pulvilli short and small, separated each other, distance between basal 2 pulvilli not shorter than length of a pulvillus, first pulvillus much shorter than half length of basitarsus; fore wing with apical anal cell about 3 times length of basal anal cell..... *Leptocimbex*
- 15. Labrum broadened toward base and distinctly narrowed toward apex; antennae with 6 antennomeres; inner spur of hind tibia as long as apical breadth of tibia; abdominal terga with long hairs; fore wing with apical anal cell 2 times as long as basal anal cell, vein 2m-cu almost interstitial to vein 1r-m; clypeus and labrum black..... *Labriocimbex*
- Labrum clearly narrowed toward base and distinctly broadened toward apex; antennae with 5 antennomeres; inner spur of hind tibia clearly shorter than apical breadth of tibia; abdominal terga without long hairs; forewing with apical anal cell as long as basal anal cell, vein 2m-cu remote from vein 1r-m; clypeus and labrum white *Pseudoclavellaria*

1. *Abia jimeii* Yan & Wei sp. nov. (Fig. 1)

Female. Body length 13 mm (Fig. 1A). Body black; apical 1/2 of mandible reddish brown (Fig. 1B); antennomeres 1–2 yellowish brown, antennomeres 3–5 black, antennomeres 6–7 deep brown (Fig. 1D); abdominal terga copper black (Fig. 1G), abdominal sternites black; ovipositor sheath yellowish brown (Fig. 1I). Wings yellowish brown and hyaline, anterior margin with deep smoke brown stripe, pterostigma brown at basal 1/2, pale brown at apical 1/2; veins of fore wings black brown, veins C, 1R₁ and A reddish brown; veins of hind wings largely reddish brown. Legs black, apical 1/6 of fore femora yellowish white, middle and hind femora yellowish brown (Fig. 1J), each of dorsal and ventral side with black brown longitudinal stripe, tibiae yellow, tarsi yellowish brown. Head with black long hairs (Fig. 1E), as long as antennomere 4; thorax with dense long hairs, basal 1/3 black, apical 2/3 yellowish brown; yellow fine hairs at base of abdominal terga dense and long, terga and sternites in the middle and back with sparse short hairs.

Body small size, with dense fine punctures, distinctly at thorax. Median fovea area of head strongly shiny, with strong brass metallic luster, other head area, lateral horn of pronotum, tegula and metascutellum with brass luster (Fig. 1K); mesonotum with weakly blackish purple luster, mesopleuron with weakly blackish blue luster (Fig. 1F), mesosternum and abdominal terga with strongly purple copper luster, hind margins of abdominal terga 1–3 shiny, abdominal sternites with strongly oily luster, both sides with blue luster (Figs 1G, 1H, 1I).

Clypeus truncated-shaped, elevated in middle, apical margin extremely thin; labrum almost flat, margin rounded arcuate, breadth slightly shorter than anterior margin of clypeus (Fig. 1B); anterior tentorial pits distinct, distance to lower margin of antennal sockets 1.5× diameter of median ocellus; malar space 1.2× diameter of median ocellus; middle and lower part of eyes inner margins slightly convergent downwards; supraclypeal area broad, concave in middle; frontal area subround, bottom distinctly concave; upper margin of antennal sockets strongly elevated, length about as long as antennomeres 1–2 combined; postocellar area with

distinct sink; vertex broad (Fig. 1C), distance between eyes $1.2\times$ OCL; occiput short and small, distinctly convergent. Antenna with 7 antennomeres, antennomere 3 strongly oblate, slightly longer than antennomeres 4–5 combined; antenna distinctly expanded from apex of antennomere 5, apex of antennomere 7 truncated, middle part with weak annular suture; antennomere 7 broader and longer than antennomere 6 (Fig. 1D). Furrows on mesonotum distinct; apex of metascutellum slightly protruding; cenchri slender, distance between cenchri $1.7\times$ breadth of cenchrus. Claws bifid, proximal tooth distinctly shorter than distal tooth (Fig. 1L). Abdominal tergum 1 with developed median carina; apex of sheath truncated in lateral view, lower margin arcuate, slightly protruding to apex of body; lancet slender, apex curved upwards, fine willow leaf shaped, with 32 serrulae (Fig. 1M), middle serrulae with 5–7 tiny proximal subbasal teeth and 9–10 distal subbasal teeth (Fig. 1N), basal 3 teeth slightly distinct, apical teeth tiny; distance between ventral pad about $1.6\times$ basal breadth of serrulae.

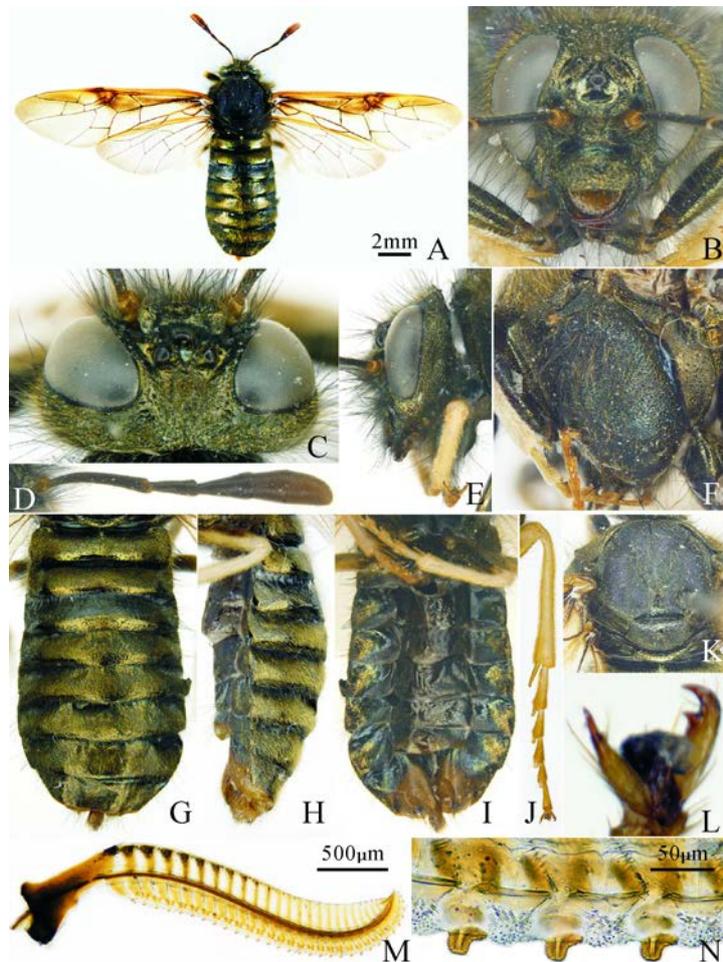


Figure 1. *Abia Jimeti* Yan & Wei **sp. nov.** A. Female adult (holotype), dorsal view; B. Head, frontal view; C. Head, dorsal view; D. Antenna; E. Head, lateral view; F. Mesopleuron and metapleuron; G. Abdominal terga; H. Abdomen, lateral view; I. Abdomen, ventral view; J. Tibia and tarsus; K. Thorax notum; L. Claw; M. Lancet; N. Middle serrulae.

Male. Unknown.

Holotype. ♀(CSCS18163), **China**, Xizang, Nyingchi City, Mainling County, Pai Town, Songlinkou, 29°29'31"N, 94°55'35"E, alt. 3687 m, 29-VII-2018, Lin LIU leg.

Etymology. The specific epithet of this new species refers to the forestry worker of Tibet, Mr. Caiwang JIMEI.

Remarks. The new species similar to *Abia niui* Wei & Deng 1999, but differs from the latter in the following characters: the postocellar area with distinct sink; the vertex broad, distance between eyes $1.2\times$ OCL; the claws with proximal tooth distinctly shorter than distal tooth.

2. *Zaraea zhui* Yan & Wei sp. nov. (Fig. 2)

Female. Body length 12 mm (Fig. 2A). Black largely; antenna black, antennomeres 6–7 brown, apex of mandible and labrum reddish brown, cenchri and metapleuron yellowish brown; yellowish macules on both sides basal of abdominal tergum 1, basal half of terga 2–7 orange, abdominal sternites 1–3 yellowish white, basal half of sternites 4–7 yellowish brown, blackish brown. Leg black largely, all femora and tibiae dark brown; tarsi yellowish brown. Wings pale yellow and hyaline (Fig. 2A), veins yellow at base, black at apex, pterostigma black, fore wing with smoke macule triangle, cover cells R, apex of 1Cu, base of 1Rs, 1M, most of 2cu. Head and thorax with long hairs, head hairs black at base and yellowish white at apex (Fig. 2C); hairs on mesonotum and mesopleuron yellowish brown (Figs 2H, 2I); hairs on metanotum and abdominal tergum 1 yellowish white, abdominal terga 2–8 with sparse and short hairs (Fig. 2P), coxae and femora with yellow white hairs (Fig. 2L); sheath hairs black (Figs 2J, 2K).

Body finely microsculptured, without metallic luster, with fine and dense punctures; labrum and mandible sparsely punctured, interspaces smooth, luster (Fig. 2C); frons with feebly luster; abdominal tergum 1 densely microsculptured, weakly luster; basal margin of terga 2–4 slightly shiny, other terga matte; abdominal sternites 1–3 glossy (Fig. 2P).

Clypeus slightly elevated in middle, clearly narrower than distance between lower margin of eyes, anterior margin truncated, posterior part thickened; labrum sub-triangle, base slightly narrower than breadth of anterior margin of clypeus; malar space broad, about $2.5\times$ diameter of median ocellus (Fig. 2C); supraclypeal furrow and anterior tentorial pits distinct; supraclypeal area slightly elevated and flat; lateral fovea deep; frontal area elevated, oval, convergent downwards; frontal carina distinct, without supra-antennal tubercles; postocellar furrow distinct, postocellar area without median furrow; vertex broad, distance between eyes $1.5\times$ OCL; POL: OOL: OCL = 9: 7: 16 (Fig. 2F). Antenna with 7 antennomeres, $1.6\times$ head breadth; club distinct, ventral side of antennomeres 6–7 with indistinct annular suture, slightly longer than antennomere 5 (Fig. 2D). Mesonotum with distinct lateral and middle furrow, juncture curved; mesepisternum slightly elevated, without transverse carina at lower margin; mesoscutellum slightly elevated, round trapezoidal, apex flat, anterior margin truncated, hind margin arcuate; cenchri willow leaf shape, distance between inner margin of cenchri $2.2\times$ the longest axis of a cenchrus (Fig. 2H); metascutellum not obtusely protruding backwards. Abdominal tergum 1 with distinct median carina, abdominal terga 2–6 with weak median carina, abdominal tergum 8 with distinct pit in middle. Anal cell in fore wing with petiole, veins 1r-m and 2m-cu not continuous, distance about $0.6\times$ length of 1r-m. Base of tibial spurs close to each other, apex membranous, claws simple, not divided. Apex of sheath roundish in

lateral view, not protruding to apex of body (Fig. 2J); lancet slender, apex curved upwards, willow leaf-shaped, with 32 serrulae (Fig. 2Q); middle serrulae fingerlike protruding, with distinct 5–6 proximal subbasal teeth, basal 2 distinct; distal subbasal teeth 1–2 distinctly, gradually weakened towards the apex (Fig. 2O); membrane between serrulae slightly long, triangular protruding, 2.8× base of serrulae.



Figure 2. *Zaraea zhui* Yan & Wei **sp. nov.** A. Female adult (holotype), dorsal view; B. Male adult (paratype), dorsal view; C. Head of female, frontal view; D. Antenna; E. Head of male, frontal view; F. Head of female, dorsal view; G. Head of male, dorsal view; H. Thorax notum; I. Mesopleuron and metapleuron; J. Ovipositor sheath, lateral view; K. Abdominal terga 7–8 of male; L. Hind leg; M. Gonoforceps; N. Penis valve; O. Middle serrulae; P. Abdominal terga; Q. Lancet.

Male. Body length 11 mm (Fig. 2B), color and configuration similar to female; but body back, without luster; club of antenna black brown; abdominal sternites 1–3 deeply brown; triangle macule on fore wing more broader; all tibiae and tarsi brown; head with black long

hairs, densely (Figs 2E, 2G); mesonotum hairs black at base, yellowish brown at apex; eyes nearly contiguous at vertex; abdominal terga 4–7 not sunken, without depressed pulvinus; base of abdominal tergum 7 with long transverse carina, curved; middle of tergum 8 with skeletal carina (Fig. 2K). Gonoforceps as shown in Fig. 2M; Penis valve shown in Fig. 2N.

Holotype. ♀(CSCS12009), **China**, Hunan, Wugang City, Mt. Yun, Victory Temple, 26°38.859'N, 110°37.026'E, alt. 1145 m, 16-IV-2012, Zejian LI leg. **Paratypes.** 1♀22♂ (CSCS12004), **China**, Hunan, Wugang City, Mt. Yun, Television Tower, 26°38.630'N, 110°37.299'E, alt. 1380 m, 11-IV-2012, Zejian LI & Zaiyang PAN leg.; 1♀10♂(CSCS12003), 12-IV-2012, locality and collector as former; 1♀4♂(CSCS12005), **China**, Hunan, Wugang City, Mt. Yun, Television Tower, 26°38.630'N, 110°37.299'E, alt. 1380 m, 12-IV-2012, Zejian LI leg.; 1♀(CSCS12009), collecting information as the holotype; 2♀(CSCS13014), **China**, Hunan, Wugang City, Mt. Yun, Yunfeng Pavilion, 26°38.983'N, 110°37.169'E, alt. 1170 m, 15-IV-2013, Zejian LI leg.; 9♀66♂, **China**, Hunan, Wugang City, Mt. Yun, Television Tower, 26°38.630'N, 110°37.299'E, alt. 1380 m, 12–20-IV-2011, Zejian LI & Li WEI leg.

Variation. Female body length 12–13 mm, male 10–12 mm; antennomeres 1–2 color from yellowish brown to black brown, both sexes tibiae and tarsi from brown to black brown; malar space about 2.3–2.5× diameter of median ocellus; distance between inner margin of cenchri 2.0–2.2× the longest axis of a cenchrus.

Etymology. The specific epithet is in memory of a famous insect taxonomist, Hongfu ZHU.

Remarks. The new species is similar to *Zaraea marginata* (Mocsáry, 1909) distributed in North China and Northeast Asia, but differs from the latter in the following characters: all the tibiae deep brown; the fore wing with triangle smoke macule under pterostigma, the cell 1M all smoky brown; the postocellar area without median furrow, the antenna black brown.

3. *Leptocimbex nigrotegularis* Yan & Wei sp. nov. (Fig. 3)

Female. Body length 19 mm (Fig. 3A). Black largely; labrum, clypeus, supraclypeal area and lower part of post orbit (Fig. 3E); scape and pedicel; posterior half of pronotum, terga 3–8 largely, basal of sheath yellowish-brown (Fig. 3H), tergum 1 lemon yellow with a basal margin black stripe (Fig. 3G); post orbit largely (Fig. 3C), lateral carina and dorsal part of mesoscutellum rust brown; antennal flagellum, each of laterotergites and apical of sheath blackish brown. Leg black largely, longitudinal stripe on venter of fore femora reddish brown; apical margin of middle and hind femora, basal part of all tibiae and all tarsi yellow; tibiae largely brown. Wings yellowish-brown and hyaline, anterior half of fore wing dark smoky, pterostigma, most of veins on fore wing and veins on apical part of hind wing blackish brown, the rest veins yellowish-brown. Body hairs short and silverish white, sheath hairs blackish brown.

Dorsum of head with amaranth metallic luster, minutely punctured, interspaces between punctures with fine and dense microsculptures; head below antennal sockets strongly shiny, almost smooth. Median mesoscutal lobes minutely punctured, slightly sparsely microsculptured, feeble shiny; mesoscutellum and metascutellum with amaranth metallic strongly shiny, anterior slope of scutellum smooth, posterior part of mesoscutellum and metascutellum with sparse and large microsculptures; mesepisternum densely microsculptured, indistinctly punctured, with rusty metallic luster (Fig. 3F); metapleuron slightly smooth, luster.

Abdominal tergum 1 smooth, strongly shiny; terga 2–3 densely punctured mixed with minute microsculptures, shiny; terga 4–8 densely and minutely punctured and microsculptured, dim. Coxae and femora sparsely punctured, shiny.

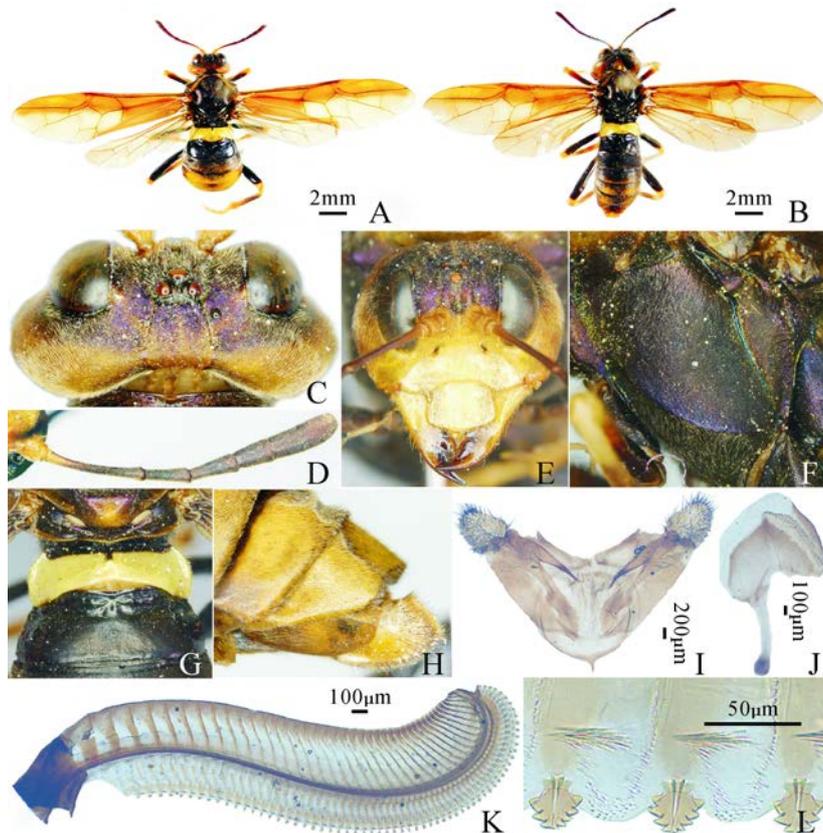


Figure 3. *Leptocimbex nigrotegularis* Yan & Wei **sp. nov.** A. Female adult (holotype), dorsal view; B. Male adult (paratype), dorsal view; C. Head of female, dorsal view; D. Antenna; E. Head of female, frontal view; F. Mesopleuron and metapleuron; G. Metanotum and base of abdomen; H. Ovipositor sheath, lateral view; I. Gonoforceps; J. Penis valve; K. Lancet; L. Middle serrulae.

Labrum flat without middle carina, anterior margin roundly protruding; clypeus distinctly broader than distance between lower margin of eyes, anterior margin with arcuate incision; malar space about 3× diameter of middle ocellus; inner margins of eyes feebly convergent downwards, distance between lower corner of eyes slightly shorter than longest axis of eye (Fig. 3E); frons slightly below top of eyes, frontal walls low and obtuse; supra-antennal tubercles indistinctly elevated; middle fovea wide and shallow, lateral fovea slightly small, roundly (Figs 3C, 3E); interocellar furrow weak, postocellar furrow distinct; postocellar area flat, about as long as broad, lateral furrows fine and shallow, clearly divergent backwards, bottom not shiny. POL: OOL: OCL = 1.2: 3: 6 (Fig. 3C). Head enlarged clearly behind eyes in dorsal view. Antenna with 7 antennomeres (Fig. 3D), about 1.6× breadth of head, antennomere 3 about 1.1× length of antennomeres 4 and 5 combined, as long as antennomeres 6 and 7 combined (Fig. 3D), antennomere 7 weakly enlarged with faint annular,

widest breadth $2\times$ the apical breadth of antennomere 3. Median mesoscutal groove and notaulus weakly, median of mesoscutellum obtusely raised, both lateral margin sub-parallel; middle of mesepisternum with distinct oblique carina; cenchrus narrow and long, the distance between inner margin of cenchri about $1.9\times$ length of a cenchrus (Fig. 3G); metascutellum protruding backward with a distinct median thorn. Inner tibial spur of hind leg $0.4\times$ length of basitarsus. Lateral carina of abdominal tergum 1 distinct and complete, middle carina low, not extending to posterior margin. Apical ovipositor sheath short and roundish in lateral view (Fig. 3H); apex of lancet curved upwards; lancet with 67 serrulae (Fig. 3K), middle serrulae protruded, clearly high above ventral pad, basal teeth slightly large, with 3–4 proximal subbasal teeth and 4–5 distal subbasal teeth, distance between ventral pad about $1.2\times$ basal breadth of serrulae (Fig. 3L).

Male. Body length 20 mm (Fig. 3B), color and structures similar to female except for following parts: labrum broad and large, with distinct median carina; abdominal terga 4–8 blackish brown; fore and middle coxae reddish-brown, with black macula, apical margin of middle and hind femora and all tibiae reddish-brown; postocellar clearly longer than broad. Penis valve is shown in Fig. 3J, gonoforceps shown in Fig. 3I.

Holotype. ♀, **China**, Shanxi, Lishan City, Huangguman, $35^{\circ}21.525'N$, $111^{\circ}56.310'E$, 2090 m, 13-VI-2009, Xiaohua WANG leg. **Paratypes.** 18♀14♂, collecting information as the holotype; 2♂, **China**, Hebei, Mt. Xiaowutai, Ximengou, $39^{\circ}59.172'N$, $115^{\circ}01.405'E$, 1607 m, 16-VI-2007, Zejian LI leg.; 3♀1♂, **China**, Shanxi, Longquan National Forest Park, $36^{\circ}58.684'N$, $113^{\circ}24.677'E$, 1500 m, 25-VI-2008, Xiaohua WANG & Hanlan FEI leg.; 1♂, **China**, Gansu, Mt. Xiaolong, 07-VII-2007, $34^{\circ}16.275'N$, $106^{\circ}08.201'E$, 1409 m, Meicai WEI leg.

Variations. Female body length 16–20 mm, male 17–21 mm. abdominal terga 4–8 color varied from yellowish brown to blackish brown; cenchri with different configurations, and the distance between inner margin of cenchri about $1.7–2.0\times$ length of a cenchrus.

Etymology. The specific epithet is a combination of the Latin words “*nigro-*” and “*-tegularis*”, referring to the black tegula.

Remarks. This new species is similar to *L. terrificus* Malaise, 1931, but differs from the latter in the following characters: the tegula, tergum 2 and hind femur entirely black, the antennal flagellum blackish brown, the head and thorax with amaranth metallic luster; the supra-antennal tubercles indistinctly elevated; the metascutellum protruding backward with a distinct median thorn.

4. *Corynis zhengi* Wei & Yan sp. nov. (Fig. 4)

Female. Body length 7.5 mm (Fig. 4A). Body black, apex of mandible dark reddish brown, yellow macules on both sides anterior of clypeus and ventral of antennomere 5; both lateral sides of pronotum, macules on posterior lateral margins of terga 1–5, posterior margins $1/3$ of terga 6–7 and posterior margins $1/2$ of tergum 8 yellow. Wings hyaline, without dark macule; pterostigma pale brown; veins blackish brown largely, basal $1/3$ yellowish brown. Legs black largely, apical of femora, basal $4/5$ of tibiae and basal half of basitarsus yellow; apical of tibiae, tibial spur and apical of basitarsus blackish brown; apical of claws yellowish brown. Body hairs short and yellowish brown. (Fig. 4B)

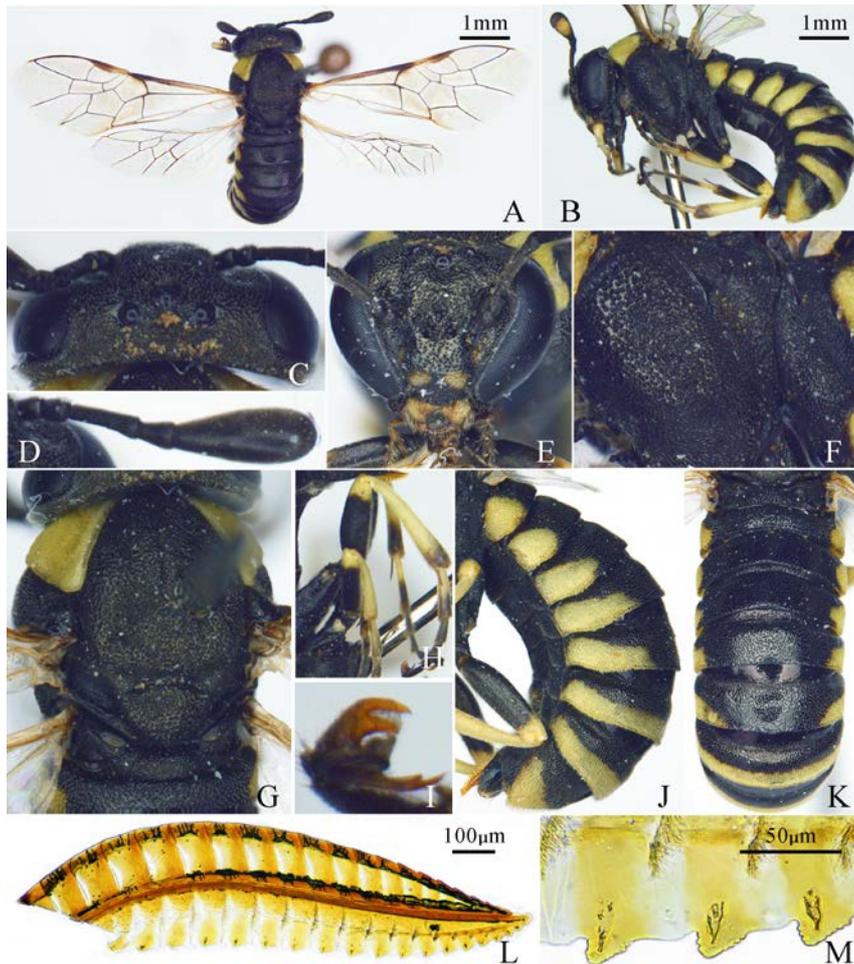


Figure 4. *Corynis zhengi* Yan & Wei **sp. nov.** A. Female adult (holotype), dorsal view; B. Female adult, lateral view; C. Head, dorsal view; D. Antenna; E. Head, frontal view; F. Mesopleuron and metapleuron; G. Thorax notum; H. Hind leg; I. claw; J. Abdomen, lateral view; K. Abdominal terga; L. Lancet; M. Middle serrulae.

Body small, without metallic luster; punctures on head and thorax densely (Fig. 4F), coarsely and distinctly, between punctures with dense and coarse microsculptures; abdominal terga finely punctured, interspaces slightly smooth.

Clypeus slightly narrower than distance between lower margins of eyes (Fig. 4E), anterior margin arc-shaped and deeply concave, distinctly bulge in middle; supraclypeal area distinctly raised; without supra clypeal furrow; labrum small and flat, anterior tentorial pits small and shallow, distance between antennal toruli about $3.5\times$ middle ocellus; distance between two antennal torulis about $4.5\times$ middle ocellus; malar space $0.5\times$ middle ocellus; frons slightly raised, frontal ridge absent; inner margins of eyes strongly convergent downward; postocellar furrow weak (Fig. 4C); postocellar area about $3\times$ broader than long, lateral furrow shallow, slightly divergent backwards; head distinctly shrink behind eyes, hind orbit with distinct occipital carina; POL: OOL: OCL = 4: 3.5: 2.8. Antenna with 5 antennomeres, slightly shorter than head breadth; antennomere 4 significantly longer than its

width; club of antenna strongly enlarged, widest breadth 3× the apical breadth of antennomere 3, distinctly longer than length of antennomeres 3 and 4 combined (Fig. 4D). Mesonotum distinctly bulge (Fig. 4G), median mesoscutal groove and notaulus absent; anterior margin of mesepisternum vertical raised, anterior margin of mesoscutellum roundish, both lateral margin distinctly convergent; cenchrus oval, the distance between inner margin of cenchri about 2.8× length of a cenchrus; metascutellum flat, not protruding. Anal cell of fore wing divided into two by a long medial constriction; vein cu-a not joining vein 1M, distance between vein 1M about 1/4 length of vein cu-a (Fig. 4A). Hind coxae separated; apex of tibial spur acute and sclerotinous; basitarsus length longer than tarsomeres 2–4 (Fig. 2H); claws medially-fissured, proximal teeth slightly shorter than distal teeth (Fig. 4I). Abdominal tergum 1 without middle carina and membranous patch (Fig. 4K). Apical ovipositor sheath short and roundish in lateral view (Fig. 4J); lancet straight, only apex slightly curved, with 20 serrulae (Fig. 4L); serrulae slanted proximally, lance with sawteeth on dorsal margin (Fig. 4M).

Male. Unknown.

Holotype. ♀(CSCS19113), **China**, Qinghai, Menyuan County, Xianmi Village, 102°1.48' E., 37°9.29' N., alt. 2671 m, 16-VII-2019, Yiwen ZHANG leg.

Etyymology. The specific epithet of this new species refers to a famous entomologist, Mr. Leyi ZHENG.

Remarks. This new species is similar to *C. mutabilis* Tischbein, 1852, but differs from the latter in the following characters: the tegula black; the posterior lateral margins of abdominal terga 1–5 with large yellow macules, middle posterior margins of tergum 5 black, yellow macules on both sides far away; terga 6–8 largely black, except for posterior margins 1/3 terga 6–7 and 1/2 of tergum 8 yellow; the antennomere 4 significantly longer than its width, antennomere 5 long oval, ventral side with yellow macules; the vein cu-a not joining vein 1M; the postocellar area about 3× broader than long.

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