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## ***Penghou*, a new genus of flea beetles from China (Coleoptera: Chrysomelidae: Galerucinae: Alticini)**

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### **Abstract**

A new genus (*Penghou*) with a single new species (*P. yulongshan*) from Yunnan Province in China is described and illustrated. It is compared to *Hespera* Weise, *Hesperomorpha* Ogloblin, *Laotzeus* Chen, *Luperomorpha* Weise, *Mandarella* Duvivier, *Omeiana* Chen, *Stenoluperus* Ogloblin and *Taiwanohespera* Kimoto.

**Key words:** new genus, new species, flea beetle, Alticinae, China, Yunnan

### **Introduction**

The Chinese fauna of flea beetles with about 100 genera and 1200 species, is one of the largest and most complex among regional Asian faunas. Recent flea beetle field investigations revealed a number of new taxa (e.g. *Cangshanaltica* Konstantinov *et al.* 2013) (Konstantinov & Lingafelter 2002, Konstantinov *et al.* 2011, 2013, Ruan *et al.* 2014, Sprecher-Uebersax *et al.* 2009). Here we describe a previously unknown genus of flea beetles. Based on morphological characters, particularly those of the elytra and legs, it resembles genera close to *Luperomorpha* Weise and *Hespera* Weise. A recent, mostly molecular, phylogenetic study (Ge *et al.* 2012) placed these genera deep within Galerucini. However, their phylogenetic position as well as relationships of Alticini and Galerucini in general remains unclear, mostly due to a great species diversity (Galerucinae *sensu lato*, including Alticini contain about 1200 genera and 18000 species), and resulting problems of inadequate sample size. Discovery and proper documentation of generic diversity of flea beetles will contribute to resolution of their phylogentic relationships in the near future.

### **Material and methods**

Beetle structures were studied under a Zeiss Stemi SV11 Apo microscope. The female genitalia were dissected and mounted into slides with Hoyer's medium, photos were taken with digital camera Nikon 5200D attached to the Zeiss AxioStar Plus microscope. Observations of the male genitalia and habitus were made with a Zeiss Discovery V20 microscope and digital images were taken with an AxioCam HRC digital camera attached to it. Scanning electron micrographs were taken with FEI Quanta 450. Morphological terminology follows Konstantinov (1998). Abbreviations of collections:

IZCAS Institute of Zoology, Chinese Academy of Sciences, Beijing, China

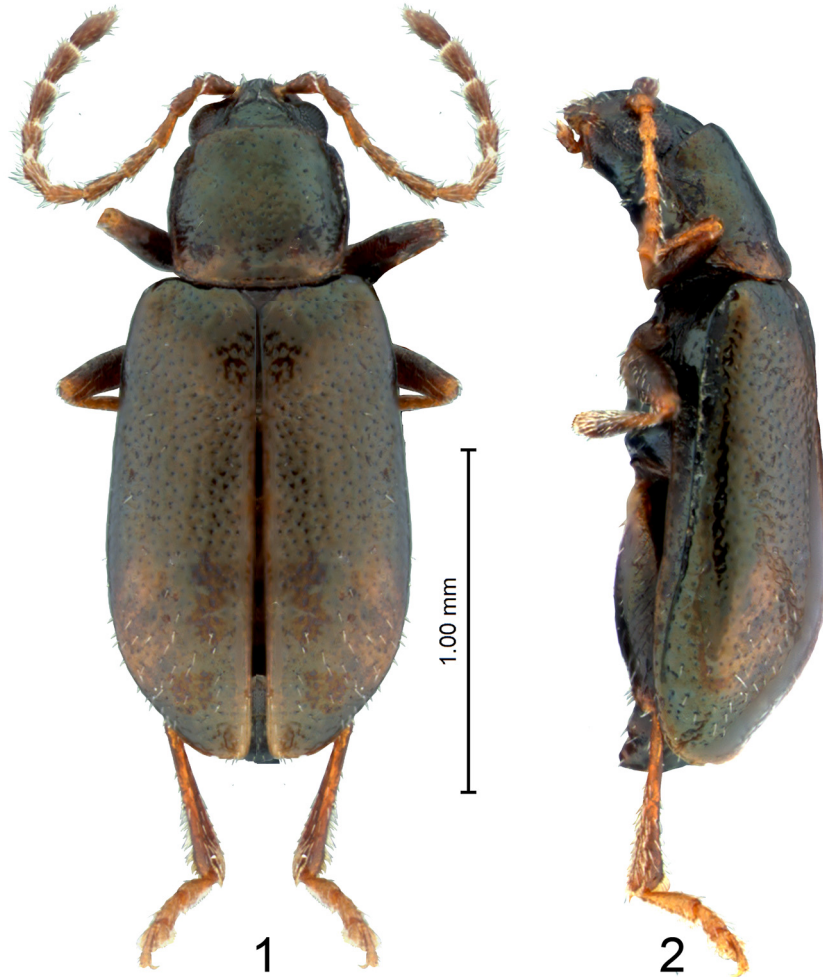
USNM National Museum of Natural History, Washington DC, USA

***Penghou* new genus**

(Figs 1–25)

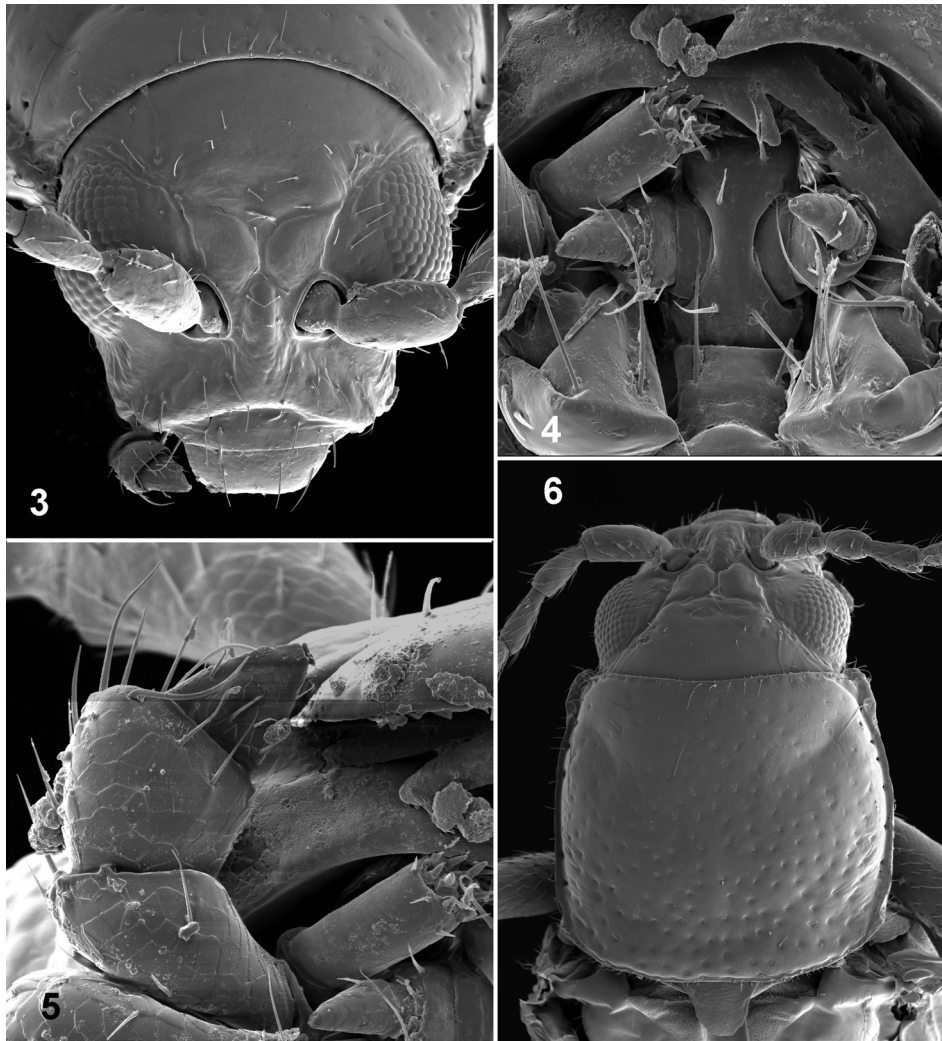
Body length: 1.90–2.20 mm; body width (widest point of elytra): 0.80–1.10 mm. Pronotum width to length: 1.08–1.12. Width of elytra at base (in middle of humeral calli) to width of pronotum at base: 1.30–1.40.

Head, pronotum except base, ventral side of body, and femora dark brown to black with light bronzish tint. Elytral disc, basal part of pronotum, tibiae, tarsi, and antennae light brown. Elytral surface and frontal part of pronotum with sparse, erect hairs (Figs 1, 2).



**FIGURES 1, 2.** *Penghou yulongshan* sp. n., 1—paratype, dorsal habitus; 2—paratype, lateral habitus.

Head (Figs 3, 6) with midcranial and frontal sutures absent. Supraorbital sulcus shallow, sometimes consisting of few long and parallel wrinkles. Orbital sulcus and supracallinal sulci well developed. Supraantennal sulcus shallow, poorly developed. Supracallinal sulcus oblique and slightly convex. Midfrontal sulcus well developed, long; antennal calli completely separated. Suprafrontal and frontolateral sulci well developed. Antennal callus long, oblique, nearly trapezoidal, entering interantennal space. Surface of antennal callus above surface of vertex. Frontal ridge and vertex separated by antennal calli. Width of frontal ridge to width of antennal socket (counting surrounding ridges) 0.70–0.75. Frontal ridge in lateral view moderately convex. Area below antennal socket concave. Orbit normally wide, nearly as wide as transverse diameter of antennal socket. Distance between eyes above antennal sockets to transverse diameter of eye in frontal view 3.25–3.32. Sides of head below eyes converging ventrally. Labrum flat, trapezoid, with 2 pairs of setae; anterior margin slightly emarginate. Apical maxillary palpomere conical (Fig. 5). Preapical maxillary palpomere much wider than apical palpomere. Antennal sockets situated below middle of eye. Antenna filiform, with 11 antennomeres. Length of antenna over pronotum reaching middle of elytron.

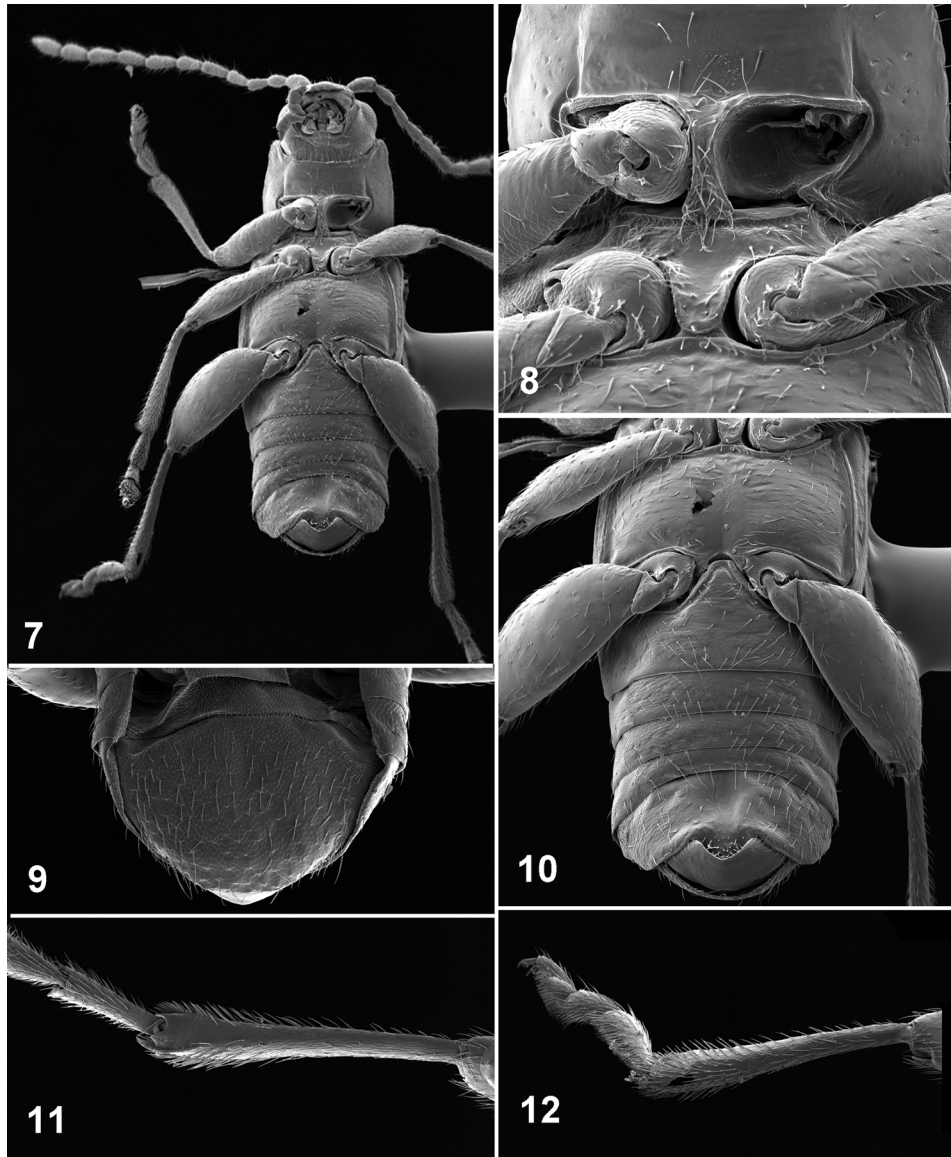


FIGURES 3–6. *Penghou yulongshan* sp. n., 3—head, frontal view; 4—mouth parts, ventral view; 5—maxilla; 6—pronotum.

Pronotum (Fig. 6) about as long as wide, with sides only slightly convex. Pronotal surface near base slightly transversely impressed, impression without distinct borders. Pronotal surface near apex with two oblique, shallow impressions forming in middle an even shallower impression. Pronotal base straight. Lateral margin of pronotum slightly explanate, with short setae. Anterolateral callosity relatively long, nearly parallel to lateral margin. Posterolateral callosity short, not protruding beyond lateral margin. Pronotal punctures larger and denser at base than at apex. A few short setae situated on apical margin and on basal margin near corners. Procoxal cavities open (Fig. 8). Intercoxal prosternal process thin, extends beyond procoxae, lateral sides concave, posterior end slightly widened and straight.

Scutellum present. Elytron (Fig. 15) with punctures confused, dorsal surface covered with sparse erected setae. Elytra at base wider than base of pronotum. Humeral calli well developed. Basal calli poorly developed with shallow impression posteriad. Epipleura (Fig. 17) oblique outwardly, gradually narrowing from base to apex, reaching end of side of elytron, but not apex. Width of epipleura in middle equal to width of metafemur at apex. Internal surface of elytron (Figs 16, 18–20) with 2 binding patches, spicules in middle of basal patch shovel shaped (Fig. 20), spicules on more distant patch ogival in shape, slightly bent anteriorly (Fig 19). Mesosternum (Fig. 8) without elevated projection in middle. Metasternum (Fig. 10) anteriorly without elevated projection in middle and not projecting forward hiding mesosternum. Metepisternum anteriorly wider than posteriorly.

Abdominal ventrites 1 and 2 not fused (Fig. 10). Abdominal ventrite 1 as long as ventrites 2, 3 and 4 together. Abdominal ventrite 5 longer than ventrites 4 and 3 together, evenly convex in female, in male obliquely cut on sides with lobe in middle. First abdominal ventrite between coxae without longitudinal ridges, with apex narrowly truncate. Last visible tergite without longitudinal groove in middle.



**FIGURES 7–12.** *Penghou yulongshan* sp. n., 7—paratype, ventral side; 8—pro- and mesosterna; 9—last abdominal tergite; 10—metasternum and abdominal ventrites; 11—metatibia, dorsal view; 12—metatibia lateral view.

Protibial and mesotibial spurs absent. Metatibia straight (Figs 7, 11, 12). Metatibia in cross-section around its middle more or less cylindrical. Middle part of metatibia dorsally convex. Bristles present on lateral and mesal sides of metatibiae. Metatarsomere 1 attached to apex of metatibia. Apical spur of metatibia simple, much shorter than maximum width of metatibial tip, narrow, ending in one tooth, situated medially. Tarsus with tarsomere 3 round, wider than long, with small incision in middle. First metatarsomere relatively long, but shorter than those in *Longitarsus* Latreille, convex dorsally, flat ventrally. Claws slightly appendiculate (Fig. 13). Wing with generally reduced veins. Radial vein slender, rp-mp2 short (Fig. 21).

Median lobe of male genitalia in cross section somewhat oval (Fig. 25).

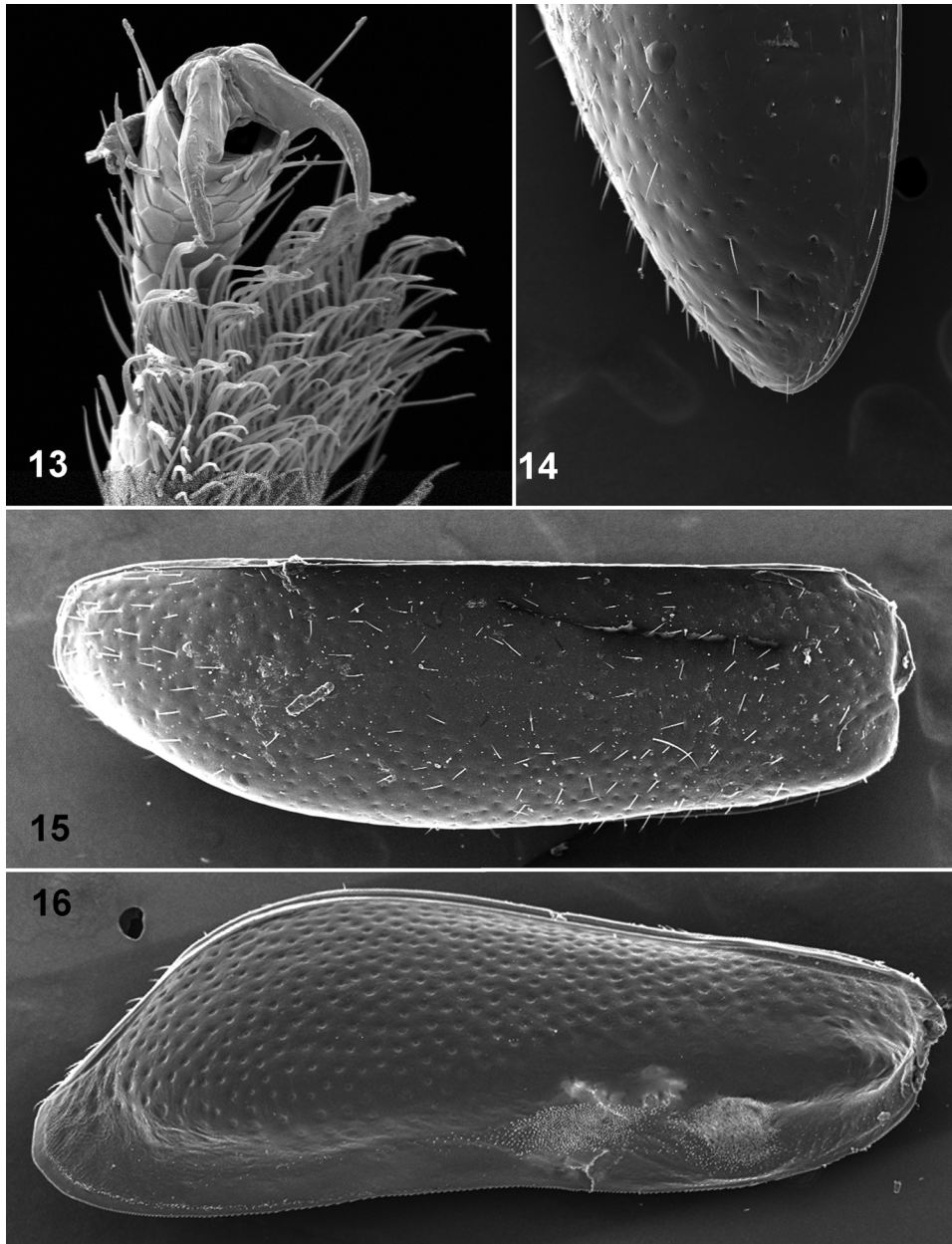
Spermatheca with distinct border between receptacle and pump. Receptacle longer than wide, much wider and longer than pump, straight. Spermathecal duct curved, without coils (Fig. 23). Vaginal palpi not fused medially, with length many times greater than width (Fig. 22). Tignum with narrow base and dilated apex (Fig. 24).

**Etymology.** We named the genus after the Péng hóu (), a tree spirit from Chinese folklore. The name is masculine.

**Type species.** *Penghou yulongshan* Ruan, Konstantinov, Prathapan, Ge, Yang, new species.

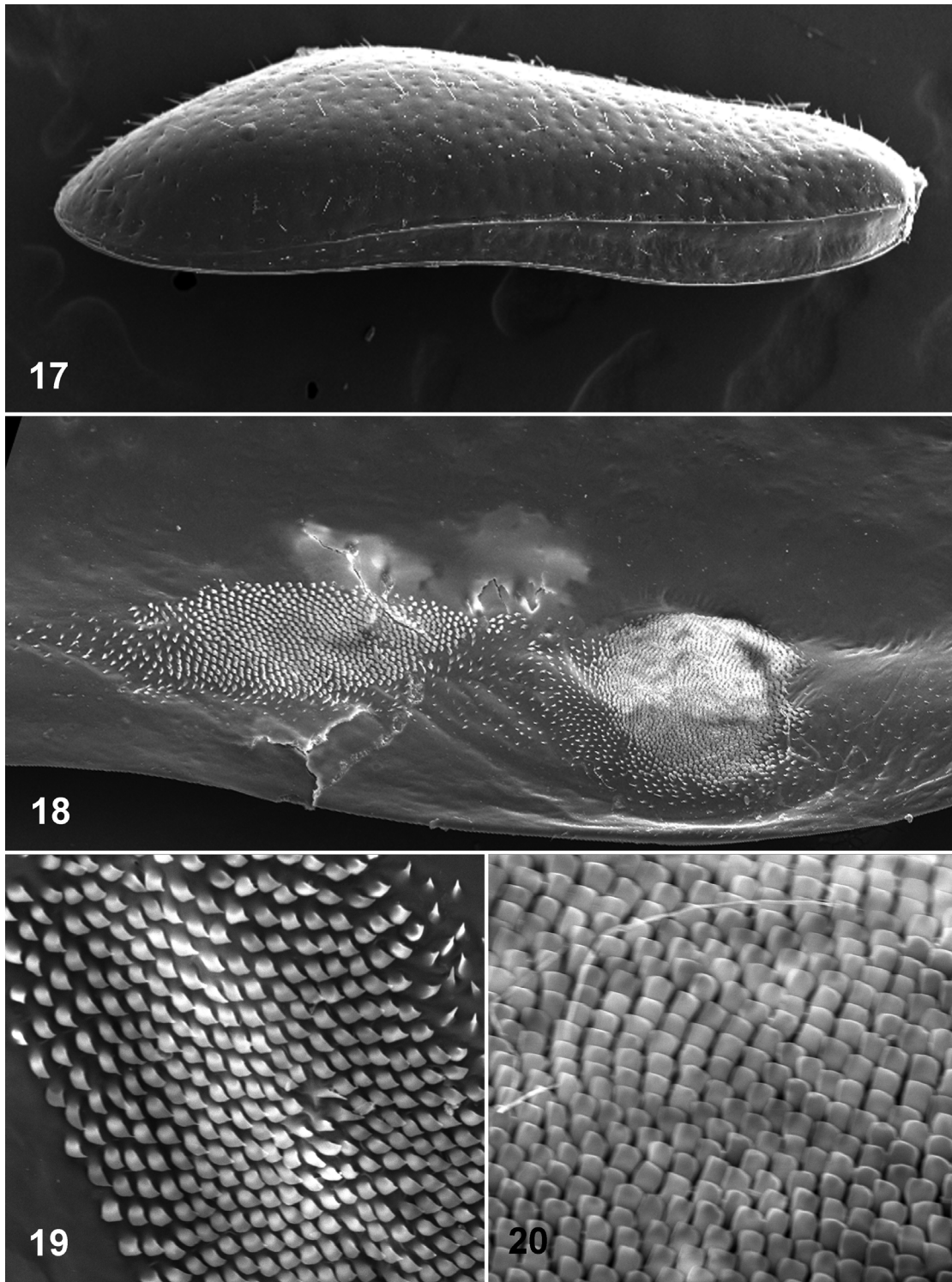
**Distribution.** China (Yunnan province.).

**Host plant.** Unknown.



**FIGURES 13–16.** *Penghou yulongshan* sp. n., 13—tarsal claws; 14—elytral apex; 15—right elytron, dorsal view; 16—left elytron, ventral view.

**Remarks.** *Penghou* is markedly different from all known genera of Chinese and broadly Oriental flea beetles. However, based on the general shape of the beetle body, setose elytra and general shape of the legs, *Penghou* is similar to *Hespera* and related genera (*Hesperomorpha* Ogloblin and *Taiwanohespera* Kimoto), *Laotzeus* Chen, *Luperomorpha*, *Mandarella* Duvivier, *Omeiana* Chen, and *Stenoluperus* Ogloblin. *Penghou* may be easily distinguished from the latter genera based on the following characters: smaller body size (maximum—2.2 mm, while average body size of *Hespera*—*Stenoluperus* is 3.6 mm); pronotum clearly elongate, about as long as wide, pronotum in *Hespera*—*Stenoluperus* generally much wider than long; pronotum with weak antebasal transverse impression and two oblique impression near apex, pronotum in *Hespera*—*Stenoluperus* (except for *Laotzeus*) lacks impressions, respectively; anterolateral callosity of pronotum elongate, barely extending beyond pronotal margin, the callosity is rounded, extending far beyond pronotal margin in *Hespera*—*Stenoluperus* (except some species of *Luperomorpha*); supracallinal sulci oblique, they are generally perpendicular to mid of the head in *Hespera*—*Stenoluperus*.



**FIGURES 17–20.** *Penghou yulongshan* sp. n., 17—right elytron, lateral view; 18—elytron binding patches; 19—spicules on distant binding patch; 20—spicules on basal binding patch.

***Penghou yulongshan* new species**

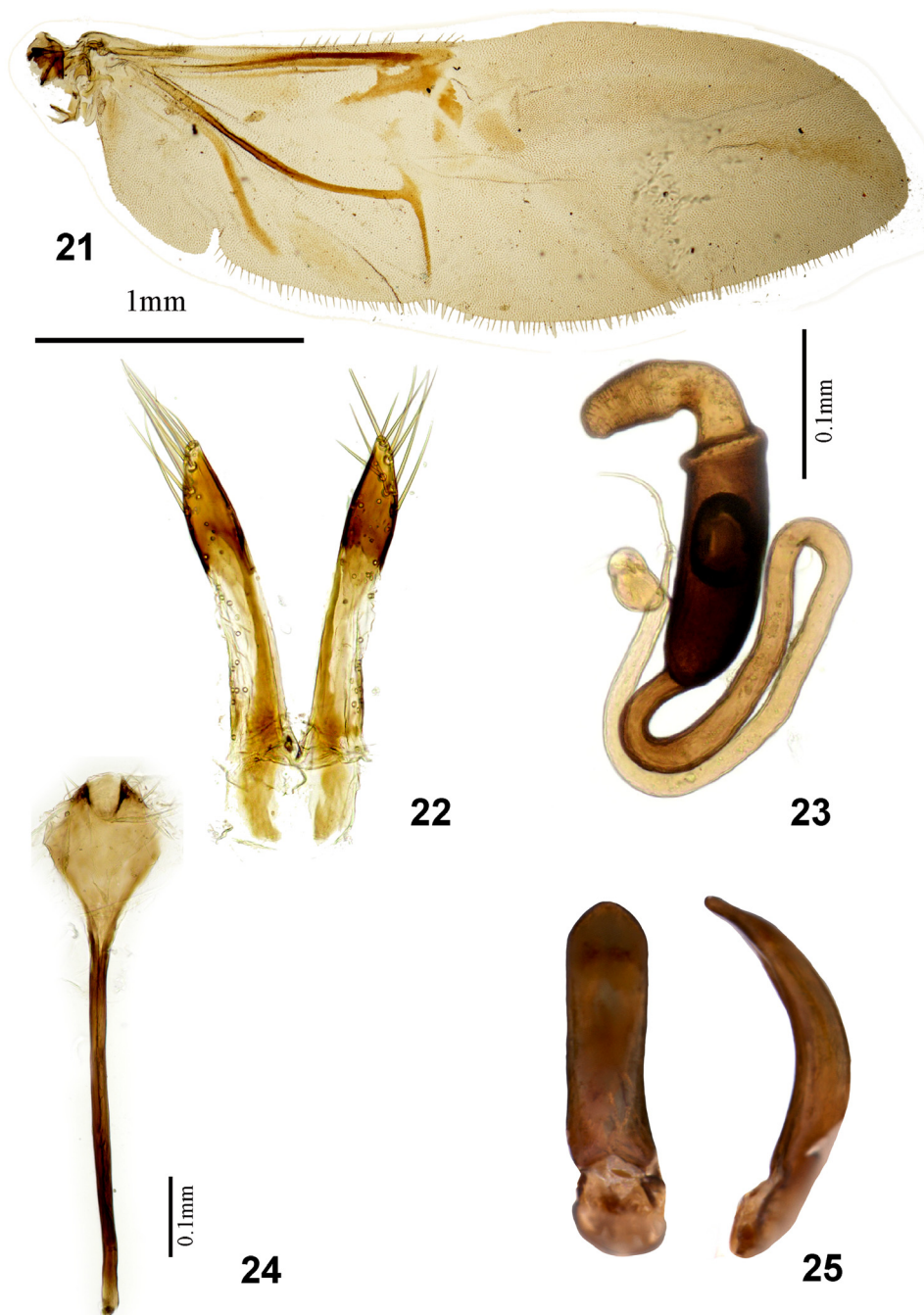
(Figs 1–25)

Body length: 1.90–2.20 mm; body width: 0.80–1.10 mm. Ratio of pronotum width at base to width at apex: 1.00–1.05. Elytra length (along suture) to width of both (maximum): 1.59–1.63. Length of elytron to length of pronotum: 2.70–2.90. Abdomen length to height of the body (in lateral view including metasternum): 2.65–2.72.

Head, pronotum except base, lateral sides of elytra, ventral side of body, basal antennomere, and femora dark brown to black with light bronzy tint. Elytral disc, basal part of pronotum, tibiae, and tarsi, and antennomere second to seventh light brown. Elytral surface and frontal part of pronotum with sparse, erect hairs.

Vertex with shallow, oblique grooves above antennal calli. Surface of vertex covered with mostly transverse wrinkles and with few shallow punctures. Orbit with 2 setiferous punctures. Supraorbital pore barely recognized. Distance between antennal sockets to transverse diameter of one antennal socket 1.25–1.30.

Antennomere 1 shorter than next two combined. Antennomere 2 about as long but wider than antennomere 3, shorter than 4. Antennomere 5 about as long as antennomeres 4 and 6 separately. Length to width of antennomere 9: 1.75–1.80; 10: 1.62–1.68; and 11: 2.25–2.35.



**FIGURES 21–25.** *Penghou yulongshan* sp. n., 21—wing; 22—vaginal palpi; 23—spermatheca; 24—tignum; 25—median lobe of aedeagus, ventral and lateral views.



Pronotal surface covered with relatively coarse punctures, distance between them about as great or greater than their diameter. Punctures on sides form relatively deep, oblique wrinkles.

Elytral punctures on disc about as large and dense as pronotal punctures, smaller sparser and shallower on sides and apex.

Length (not counting trochanter) to maximum width of metafemur 2.35–2.45. Length to width of metatibia in lateral view 5.60–5.70. Width of metatibia at base to width at apex in dorsal view 0.44–0.45. Length of metatibia to length of first metatarsomere 2.80–2.85. Length of metafemur to metatibia 1.15–1.20. Apical spur of metatibia simple, narrow, ending in one tooth, situated medially. First protarsomere of males about as wide and long as in females. First protarsomere of male, length to width ratio (in dorsal view): 1.62–1.70. Length of first protarsomere to length of second protarsomere: 1.40–1.45. Width of first protarsomere to width of second protarsomere: 1.12–1.17. First metatarsomere of male, length to width ratio (in dorsal view): 3.10–3.12. Length of first metatarsomere to length of second metatarsomere: 1.50–1.60. Width of first metatarsomere to width of second metatarsomere: 0.97–1.02. Length of fourth metatarsomere to length of third metatarsomere: 1.80–1.90.

Median lobe of male genitalia relatively short and wide, with apex narrowing broadly, lacking denticle. Ventral surface with relatively narrow groove, widening abruptly in apical one third.

Spermathecal receptacle nearly cylindrical with straight inner side and slightly curved outer side. Border between receptacle and pump making a “lip” on internal side. Spermathecal duct long, making 3 turns in a single plain. Vaginal palpi separated medially, with apex gradually convex laterally and nearly straight medially, bearing about 9 long setae. Posterior end of tignum relatively well sclerotised, forming two highly sclerotized, long teeth at the end.

**Etymology.** This species is named after the mountain region in Yunnan, Yulongshan where it was collected.

**Holotype.** male: 1) China, Yunnan, Lijiang, 29.V. 2002, Yulongshan, Black River, 2800m, N27°08'46" E100°15'03", leg. A. Konstantinov & M. Volkovitsh; 2) ♂; 3) Holotype; 4) *Penghou yulongshan* n. sp. des. Ruan *et al.* 2014 (IZCAS).

**Paratypes.** Male and female: 1) China, Yunnan, 30.V.2002, 20km N Lijiang Yulongshan, 3406m, dry river, N27°05'39"E100°13'45", leg. A.Konstantinov &M. Volkovitsh; 2) Paratype *Penghou yulongshan* new species, des. Ruan *et al.* 2014 (2 USNM). Male: 1) China, Yunnan, 32km N. Lijiang, 02.VI.2002, Yak Meadow, 3600m N27°10'11"E100°14'55", leg. A.Konstantinov &M. Volkovitsh; 2) Paratype *Penghou yulongshan* new species, des. Ruan *et al.* 2014 (USNM). Male: 1) China, Yunnan, Lijiang, 29.V.2002, Yulongshan, Black River 2800m N27°08'46"E100°15'03", leg. A.Konstantinov &M. Volkovitsh; 2) Paratype *Penghou yulongshan* n. sp., des. Ruan *et al.* 2014 (USNM).

**Distribution.** China (Yunnan province.).

**Host plant.** Unknown.

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