

**Five new species of the genera *Labomimus* and *Linan*  
from Guangxi, South China  
(Coleoptera: Staphylinidae: Pselaphinae)**

Zi-Wei YIN<sup>1)</sup> & Li-Zhen LI<sup>1,2)</sup>

<sup>1)</sup>Department of Biology, College of Life and Environment Sciences, Shanghai Normal University,  
100 Guilin Road, Shanghai, 200234, P. R. China; e-mail: yin\_ziwei@yahoo.com

<sup>2)</sup> corresponding author: e-mail: lizhenli@shnu.edu.cn

**Abstract.** Five new tyrine species belonging to two genera from Guangxi, South China are described, illustrated and compared with allied species: *Labomimus maoershanus* Yin & Li, sp. nov., *Labomimus quadratithorax* Yin & Li, sp. nov., *Linan fortunatus* Yin & Li, sp. nov., *Linan huapingensis* Yin & Li, sp. nov., and *Linan hujiaoyai* Yin & Li, sp. nov. A revised key to *Linan* is given.

**Key words.** Staphylinidae, Pselaphinae, taxonomy, *Labomimus*, *Linan*, new species, Guangxi, South China

### Introduction

Members of the *Pselaphodes* complex of genera (HLAVÁČ 2002) are extremely diverse in China, particularly in the southern part of the country, with a large number of species being described in recent years. Currently, twenty-two species of *Labomimus* Sharp, 1883 and six species of *Linan* Hlaváč, 2002 are known (YIN et al. 2011, 2013; YIN & LI 2012). In July 2011, staffs of our lab surveyed the staphylinid fauna of several natural reserves in Guangxi, South China, and obtained a large number of tyrine specimens. A study of this material revealed five new species of *Labomimus* and *Linan* which are described in the present paper. A diagnosis, habitus picture and illustrations of major diagnostic features are provided for all treated species. A revised key to *Linan* is also included.

### Material and methods

A slash (/) is used to separate lines on the same label, and a double slash (//) is used to separate different labels on the same pin.

All measurements are in millimeter. The following acronyms are applied in the text: AL – length of the abdomen along the midline; AW – maximum width of the abdomen;

BL – length of the body (= HL + PL + EL + AL); EL – length of the elytra along the sutural line; EW – maximum width of the elytra; HL – length of the head from the anterior clypeal margin to the occipital constriction; HW – width of the head across eyes; PL – length of the pronotum along the midline; PW – maximum width of the pronotum.

Types of all new species treated in this paper are housed in the Insect Collection of Shanghai Normal University, Shanghai, China (SNUC).

## Description of new species

### *Labomimus maoershanus* sp. nov.

(Figs 1A, 2, 8A)

**Type locality.** China, Guangxi Province, Xing'an County, Mao-Er-Shan Mt., ca. 2,100 m a.s.l., 25°51'58"N, 110°24'45"E.

**Type material** (89 ♂♂, 100 ♀♀). HOLOTYPE: ♂, labeled 'CHINA: Guangxi Prov. / Xing'an County / Maoershan Mountain / 10.vii.2011, 2000–2140 m / Zhong Peng leg. // HOLOTYPE (red) / *Labomimus maoershanus* / sp. n., Yin & Li / det. 2012, SNUC'. PARATYPES: 14 ♂♂, 26 ♀♀, same label data as holotype; 9 ♂♂, 10 ♀♀, same label data except '11.vii.2011, W. J. He & L. Tang leg.'; 10 ♂♂, 8 ♀♀, same label data except '09.vii.2011'; 27 ♂♂, 17 ♀♀, same label data, except '10.vii.2011'; 26 ♂♂, 37 ♀♀, same label data, except '10.vii.2011 / Chen, Ma, Peng, Zhu leg.'; 2 ♂♂, 2 ♀♀, same label data, except Jian-Qing Zhu leg.' All paratypes bear the following label: 'PARATYPE (yellow) / *Labomimus maoershanus* / sp. n., Yin & Li / det. 2012, SNUC'.

**Diagnosis.** Reddish brown; medium-sized; postgenae rounded; antennomeres IX–XI enlarged; pronotum with lateral margins strongly angularly expanded laterally; with long metaventral processes; metatrochanter spinose; aedeagus with asymmetric median lobe.

**Description. Male** (Fig. 1A). Length 2.45–2.58. Head as long as wide, HL 0.61–0.62, HW 0.57–0.58; eyes each composed of about 25 facets. Antennal club as in Fig. 2A. Pronotum (Fig. 2B) slightly wider than long, PL 0.54–0.56, PW 0.62–0.63, with lateral margins strongly angularly expanded laterally. Elytra wider than long, EL 0.61–0.64, EW 1.01–1.03. Metaventral processes long, broadened apically (Fig. 2C). Protrochanters and profemora simple (Fig. 2D), mesotrochanters (Fig. 2E) slightly angulate ventrally, metatrochanters (Fig. 2F) with thick ventral spine. Abdomen large, AL 0.69–0.76, AW 1.09–1.10. Sternite IX as in Fig. 2G. Aedeagus length 0.47; with slightly asymmetric median lobe (Figs 2H–J).

**Female.** Similar to male in general; BL 2.51–2.58, HL 0.64–0.65, HW 0.55–0.57, PL 0.53–0.55, PW 0.59–0.60, EL 0.61–0.62, EW 1.07–1.11, AL 0.73–0.76, AW 1.14–1.15. Eyes each composed of about 20 facets. Antennae simple; metaventral processes absent.

**Comparative notes.** Males of the new species have the pronotal lateral margins strongly expanded laterally. Based on this feature *L. maoershanus* sp. nov. can be readily separated from all other congeners.

**Etymology.** This species is named after the type locality, Maoershan Mountain.

**Biology.** Individuals were sifted from leaf litter in a broad-leaved forest near the peak of the mountain (Fig. 8A).

**Distribution.** South China: Guangxi.

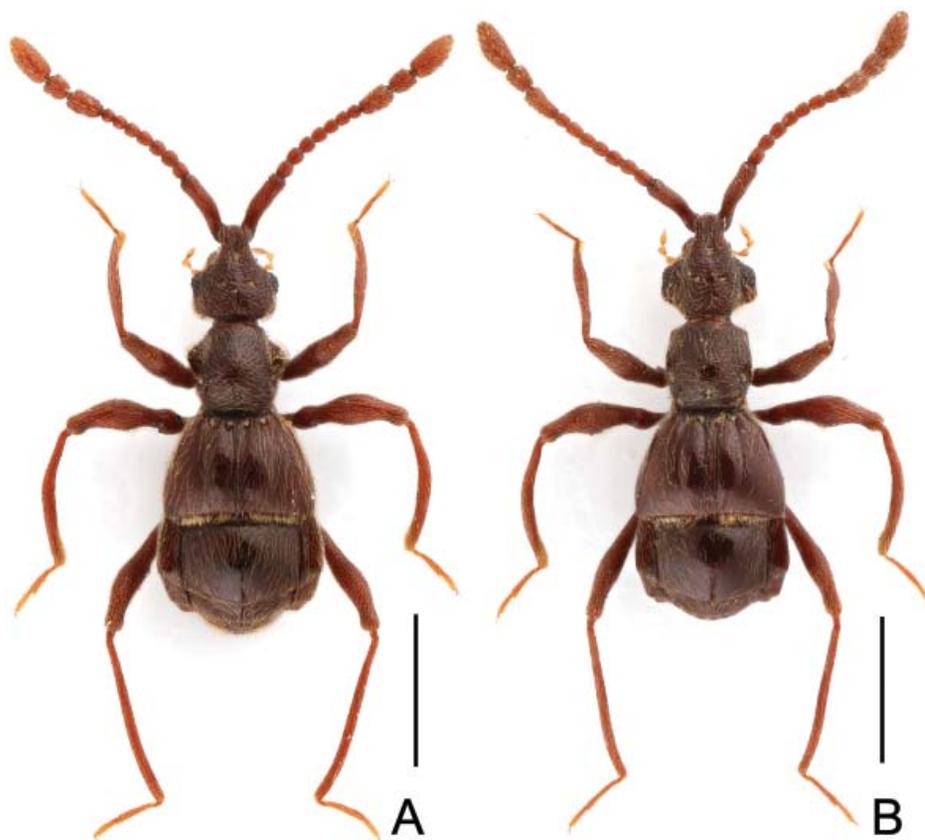


Fig. 1. Male habitus of *Labomimus* spp. A – *L. maoershanus* sp. nov.; B – *L. quadratithorax* sp. nov. Scales: 1 mm.

***Labomimus quadratithorax* sp. nov.**

(Figs 1B, 3, 8B)

**Type locality.** China, Guangxi Province, Lingui County, Huaping Natural Reserve, An-Jiang-Ping, 1400–1700 m a.s.l., 25°35'46"N, 109°55'41"E.

**Type material.** HOLOTYPE: ♂, labeled 'CHINA: Guangxi Prov. / Lingui County / Huaping, Anjiangping / 14.vii.2011, 1400–1700 m / Zhong Peng leg. // HOLOTYPE (red) / *Labomimus quadratithorax* / sp. n., Yin & Li / det. 2012, SNUC'.

**Diagnosis.** Reddish brown; medium-sized; postgenae strongly narrowed posteriorly; antennomeres IX–XI elongate and enlarged; pronotum nearly quadrate; with long metaventral processes; metatrochanter spinose; aedeagus with asymmetric median lobe.

**Description. Male** (Fig. 1B). Length 2.73. Head as long as wide, HL 0.68, HW 0.67; eyes each composed of about 20 facets. Antennal club as in Fig. 3A. Pronotum (Fig. 3B) as long

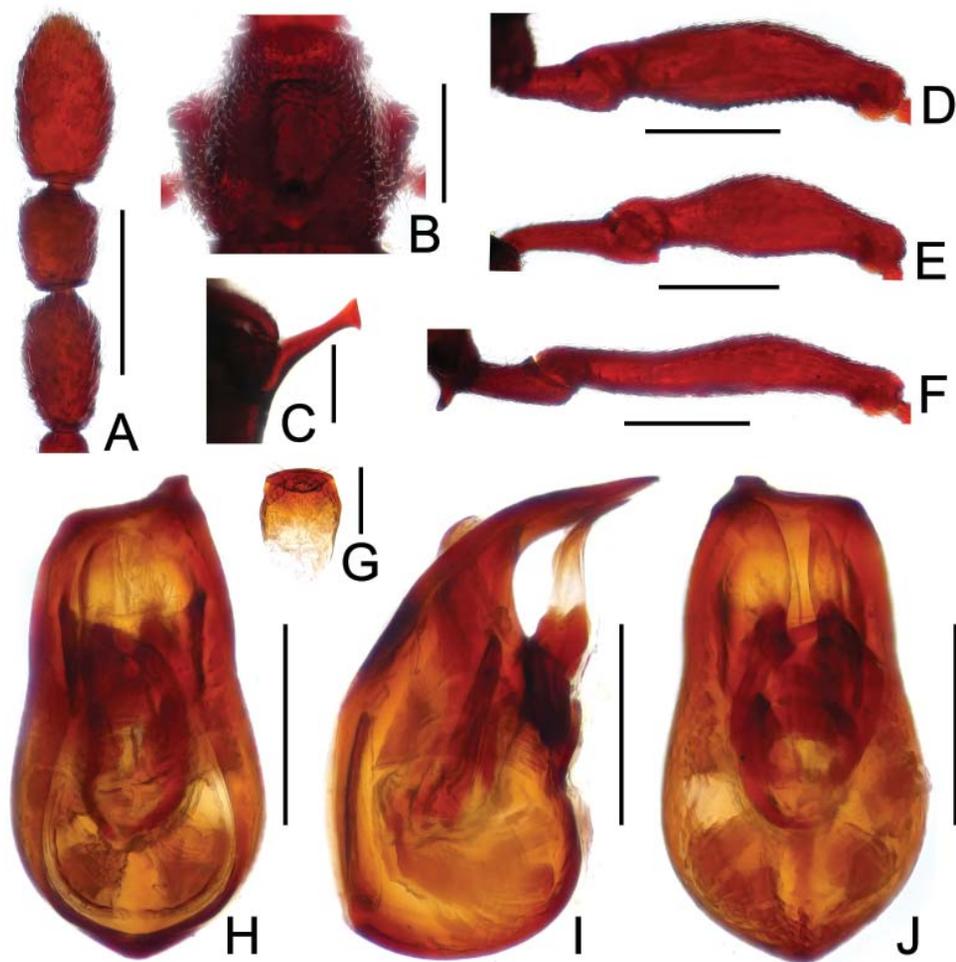


Fig. 2. Diagnostic features of male *Labomimus maoershanus* sp. nov. A – antennal club; B – pronotum; C – metaventral process, lateral view; D – protrochanter and profemur; E – mesotrochanter and mesofemur; F – metatrochanter and metafemur; G – sternite IX; H – aedeagus, dorsal view; I – same, lateral view; J – same, ventral view. Scales: A, B, D, E, F = 0.3 mm; C, H, I, J = 0.2 mm; G = 0.1 mm.

as wide, PL 0.61, PW 0.61, with lateral margins slightly rounded laterally. Elytra wider than long, EL 0.68, EW 1.06. Metaventral processes long, broadened apically (Fig. 3C). Protochanters, profemora (Fig. 3D), mesotrochanters and mesofemora (Fig. 3E) simple, metatrochanters (Fig. 3F) with short blunt ventral spine. Abdomen large, AL 0.76, AW 1.07. Sternite IX as in Fig. 3G. Aedeagus length 0.50; median lobe asymmetric at apex (Figs. 3H–J).

**Female.** Unknown.

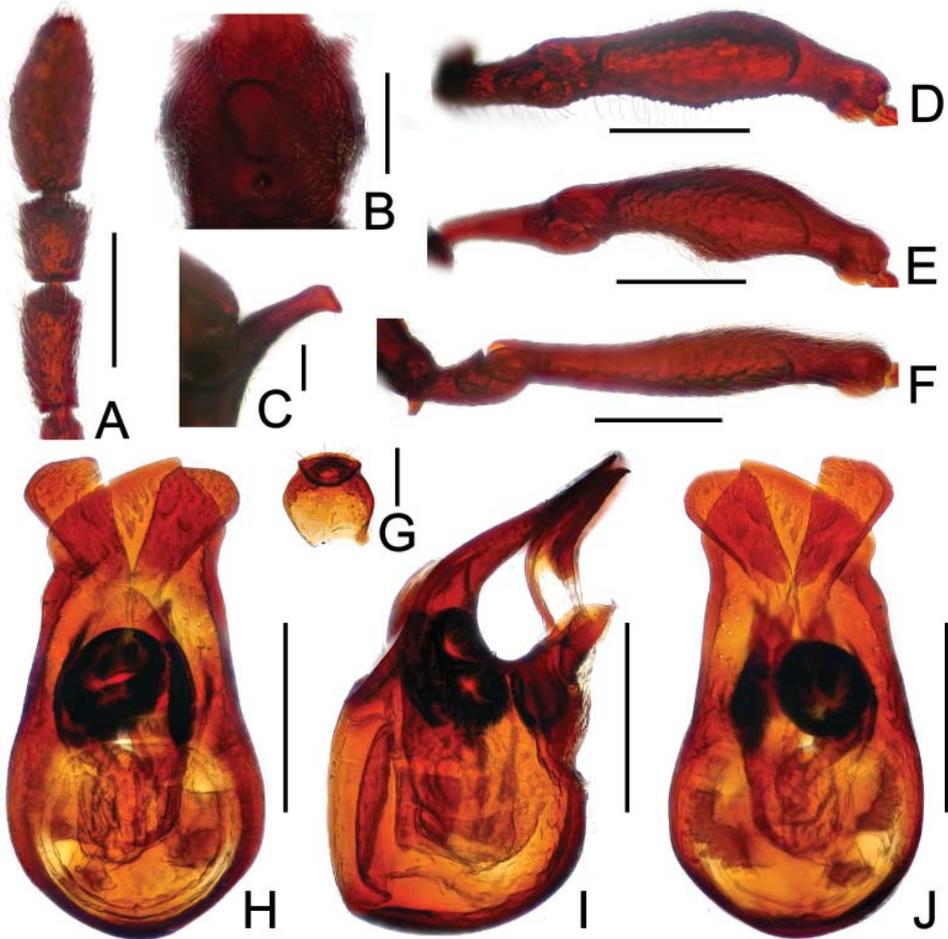


Fig. 3. Diagnostic features of male *Labomimus quadratithorax* sp. nov. A – antennal club; B – pronotum; C – meta-ventral process, lateral view; D – protochanter and profemur; E – mesotrochanter and mesofemur; F – metatrochanter and metafemur; G – sternite IX; H – aedeagus, dorsal view; I – same, lateral view; J – same, ventral view. Scales: A, B, D, E, F = 0.3 mm; H, I, J = 0.2 mm; C, G = 0.1 mm.

**Comparative notes.** This species can be separated from all other congeners by the uniquely constricted postgenae and the quadrate pronotum.

**Etymology.** The new species is named from a combination of the Latin stem, ‘*quadrati*’ and Greek word ‘*thorax*’, referring to the unique pronotal shape of the new species. Noun in apposition.

**Biology.** The single specimen was collected by sifting leaf litter along a road to the peak in a broad-leaved forest (Fig. 8B).

**Distribution.** South China: Guangxi.

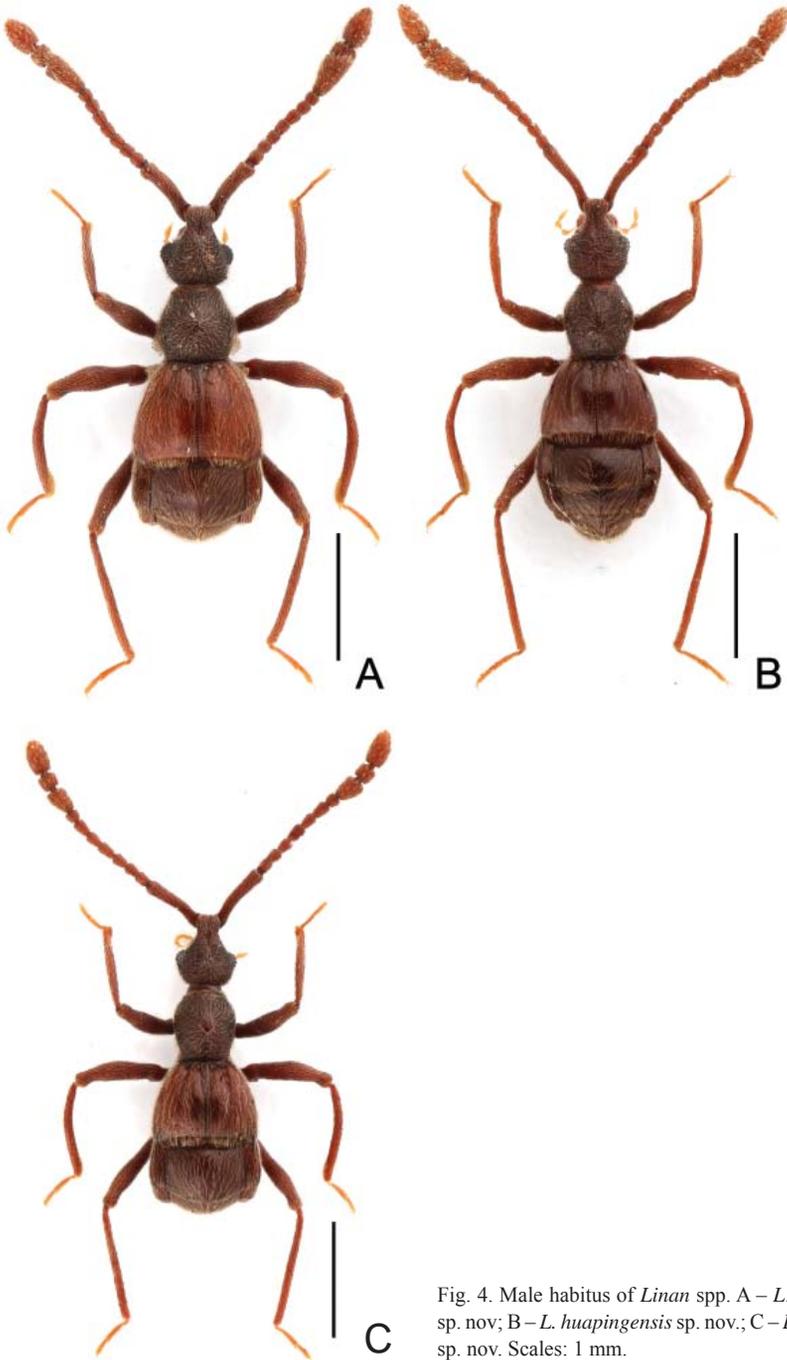


Fig. 4. Male habitus of *Linan* spp. A – *L. fortunatus* sp. nov.; B – *L. huapingensis* sp. nov.; C – *L. huijiayaoi* sp. nov. Scales: 1 mm.

***Linan fortunatus* sp. nov.**

(Figs. 4A, 5, 8C)

**Type-locality.** China, Guangxi Province, Jinxiu County, Lianhuashan Mountain, 1100 m a.s.l., 24°09'21"N, 110°06'48"E.

**Type material.** HOLOTYPE: ♂, labeled 'CHINA: Guangxi Prov. / Jinxiu County / Lianhuashan Mt. / 30.vii.2011, 1100 m / Jia-Yao Hu leg. // HOLOTYPE (red) / *Linan fortunatus* / sp. n., Yin & Li / det. 2012, SNUC'.

**Diagnosis.** Reddish brown; medium-sized; postgenae rounded; antennomeres IX–XI enlarged and modified; pronotum with lateral margins rounded basolaterally; pronotal and elytral

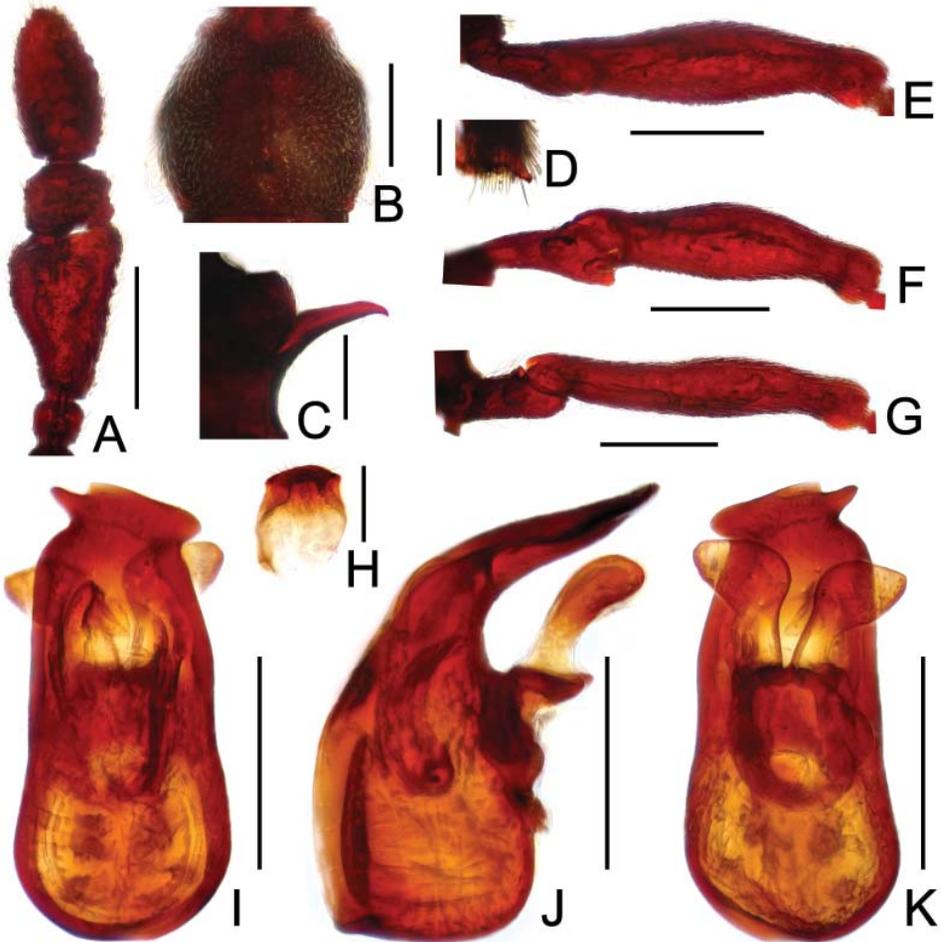


Fig. 5. Diagnostic features of male *Linan fortunatus* sp. nov. A – antennal club; B – pronotum; C – metaventral process, lateral view; D – apical spur of protibia; E – protrochanter and profemur; F – mesotrochanter and mesofemur; G – metatrochanter and metafemur; H – sternite IX; I – aedeagus, dorsal view; J – same, lateral view; K – same, ventral view. Scales: A, B, E, F, G = 0.3 mm; C, I, J, K = 0.2 mm; H = 0.1 mm; D = 0.05 mm.

basolateral margins with tufts of dense setae; with long metaventral processes; metatrochanter protuberant; aedeagus with asymmetric median lobe.

**Description. Male** (Fig. 4A). Length 2.51. Head slightly longer than wide, HL 0.60, HW 0.57; eyes each composed of about 30 facets. Antennal club as in Fig. 5A. Pronotum (Fig. 5B) about as long as wide, PL 0.58, PW 0.59, with round lateral margins. Elytra wider than long, EL 0.71, EW 1.02. Metaventral processes long, pointed apically (Fig. 5C). Protibiae with indistinct apical spur (Fig. 5D), protrochanters and profemora simple (Fig. 5E), mesotrochanters (Fig. 5F) with short and blunt triangular ventral protuberance, metatrochanters (Fig. 5G) with short truncate ventral protuberance curled. Abdomen large, AL 0.62, AW 1.01. Sternite IX as in Fig. 5H. Aedeagus length 0.46; with apically asymmetric median lobe (Figs. 5I–K).

**Female.** Unknown.

**Comparative notes.** The species is placed as a member of the *L. cardinalis* group (species-groups defined in YIN et al. 2011). It shares with *L. huapingensis* sp. nov. (described below) and *L. megalobus* Yin & Li, 2011 the long metaventral process not being apically bifurcate. The tuft of dense setae at the pronotal and elytral basolateral margins of *L. fortunatus* sp. nov. separates the species from all other members of the *L. cardinalis* group.

**Etymology.** The species name reflects the joyfulness when the single male was discovered.

**Biology.** The individual was collected by sifting leaf litter along a path at mid-altitude of the mountain (Fig. 8C).

**Distribution.** South China: Guangxi.

### *Linan huapingensis* sp. nov.

(Figs 4B, 6, 8B)

**Type locality.** China, Guangxi Province, Lingui County, Huaping Natural Reserve, An-Jiang-Ping, 1700 m a.s.l., 25°35'46"N, 109°55'41"E.

**Type material** (3 ♂♂, 2 ♀♀). HOLOTYPE: ♂, labeled 'CHINA: Guangxi Prov. / Lingui County / Huaping, Anjiangping / 17.vii.2011, 1400–1700 m / Zhong Peng leg. // HOLOTYPE (red) / *Linan huapingensis* / sp. n., Yin & Li / det. 2012, SNUC'. PARATYPES: 1 ♂, same label data as holotype; 1 ♀, same label data except '14.vii.2012'; 1 ♂, 1 ♀, same label data except '17.vii.2012 / W. J. He & L. Tang leg.' All paratypes bear the following label: 'PARATYPE (yellow) / *Linan huapingensis* / sp. n., Yin & Li / det. 2012, SNUC'.

**Diagnosis.** Reddish brown; medium-sized; postgenae rounded; antennomeres IX–XI enlarged and modified; pronotum with lateral margins rounded laterally; with long, thin metaventral processes; metatrochanter spinose ventrally; aedeagus with nearly symmetric median lobe.

**Description. Male** (Fig. 4B). Length 2.71–2.75. Head longer than wide, HL 0.67–0.68, HW 0.55–0.56; eyes each composed of about 20 facets. Antennal club as in Fig. 6A. Pronotum (Fig. 6B) slightly longer than wide, PL 0.60–0.61, PW 0.56–0.58, with lateral margins rounded. Elytra wider than long, EL 0.61–0.62, EW 0.98–1.00. Metaventral processes thin and long (Fig. 6C). Protrochanters and profemora simple (Fig. 6D), mesotrochanters (Fig. 6E) with tiny ventral spine, metatrochanters (Fig. 6F) with short triangular ventral spine. Abdomen large, AL 0.83–0.84, AW 1.05–1.06. Sternite IX as in Fig. 6G. Aedeagus length 0.36; with nearly symmetric median lobe (Figs. 6H–J).

**Female.** Similar to male in general; BL 2.56–2.67, HL 0.66–0.67, HW 0.54–0.56, PL 0.58–0.59, PW 0.55–0.67, EL 0.56–0.60, EW 0.96–1.01, AL 0.76–0.81, AW 1.05–1.10. Eyes each composed of about 13 facets. Antennae simple; metaventral processes absent.

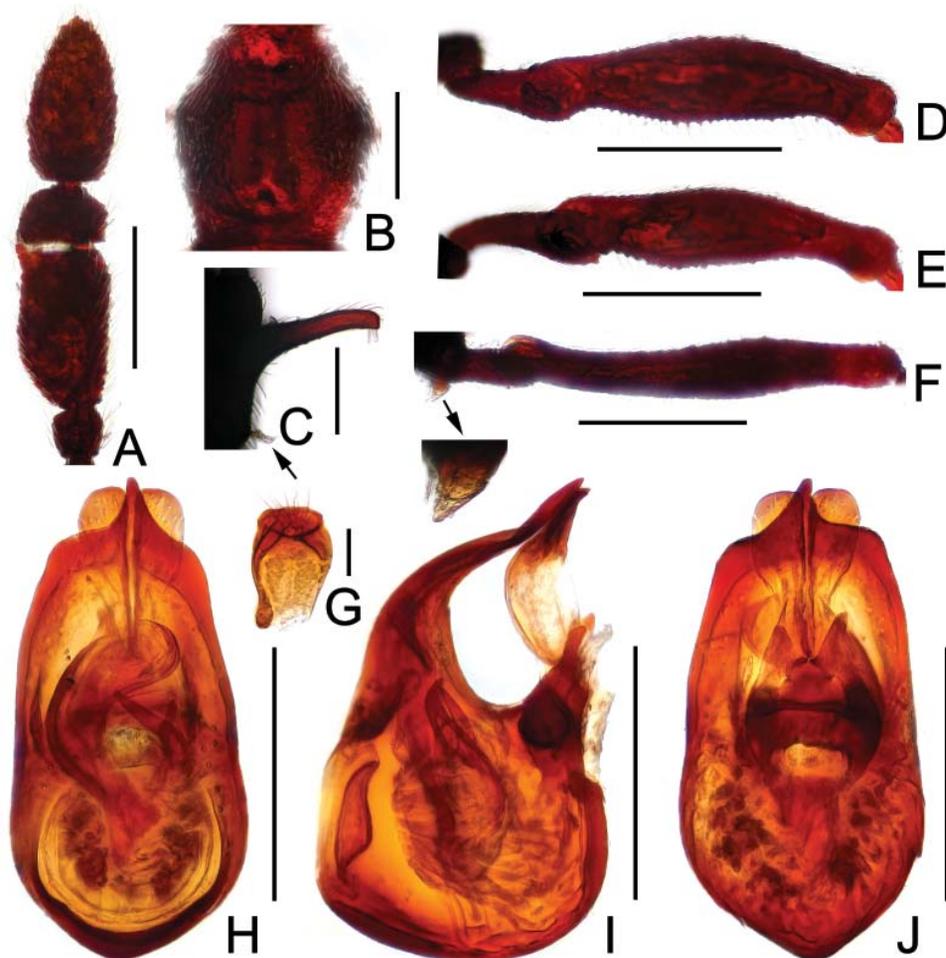


Fig. 6. Diagnostic features of male *Linan huapingensis* sp. nov. A – antennal club; B – pronotum; C – metaventral process, lateral view; D – protrochanter and profemur; E – mesotrochanter and mesofemur; F – metatrochanter and metafemur; G – sternite IX; H – aedeagus, dorsal view; I – same, lateral view; J – same, ventral view. Scales: A, B = 0.3 mm; C, D, E, F, H, I, J = 0.2 mm; G = 0.05 mm.

**Comparative notes.** The new species is placed as a member of the *L. cardinalis* group based on the modified antennal clubs in male. The protibiae lacking an apical spur, combined with the short elytra, the form of the antennomeres X, and the long metaventral processes with rounded apices readily separate the new species from the other members of the group.

**Etymology.** The new species is named after the type locality, Huaping Natural Reserve.

**Biology.** Individuals were collected by sifting leaf litter along a road to the peak in a broad-leaved forest (Fig. 8B).

**Distribution.** South China: Guangxi.

***Linan hujiayaoi* sp. nov.**

(Figs 4C, 7, 8D)

**Type locality.** China, Guangxi Province, Jinxiu County, Sheng-Tang-Shan Mt., ca. 1700 m a.s.l., 23°58'51"N, 110°06'06"E.

**Type material** (4 ♂♂, 7 ♀♀). HOLOTYPE: ♂, labeled 'CHINA: Guangxi Prov. / Jinxiu County / Shengtangshan Mt. / 26.vii.2011, 1650–1800 m / Jia-Yao Hu leg. // HOLOTYPE (red) / *Linan hujiayaoi* / sp. n., Yin & Li / det. 2012, SNUC'. PARATYPES: 3 ♂♂, 7 ♀♀, same label data as holotype; 2 ♀♀, same label data, except '1400–1600 m / Zi-Wei Yin leg.' All paratypes bear the following label: 'PARATYPE (yellow) / *Linan hujiayaoi* / sp. n., Yin & Li / det. 2012, SNUC'.

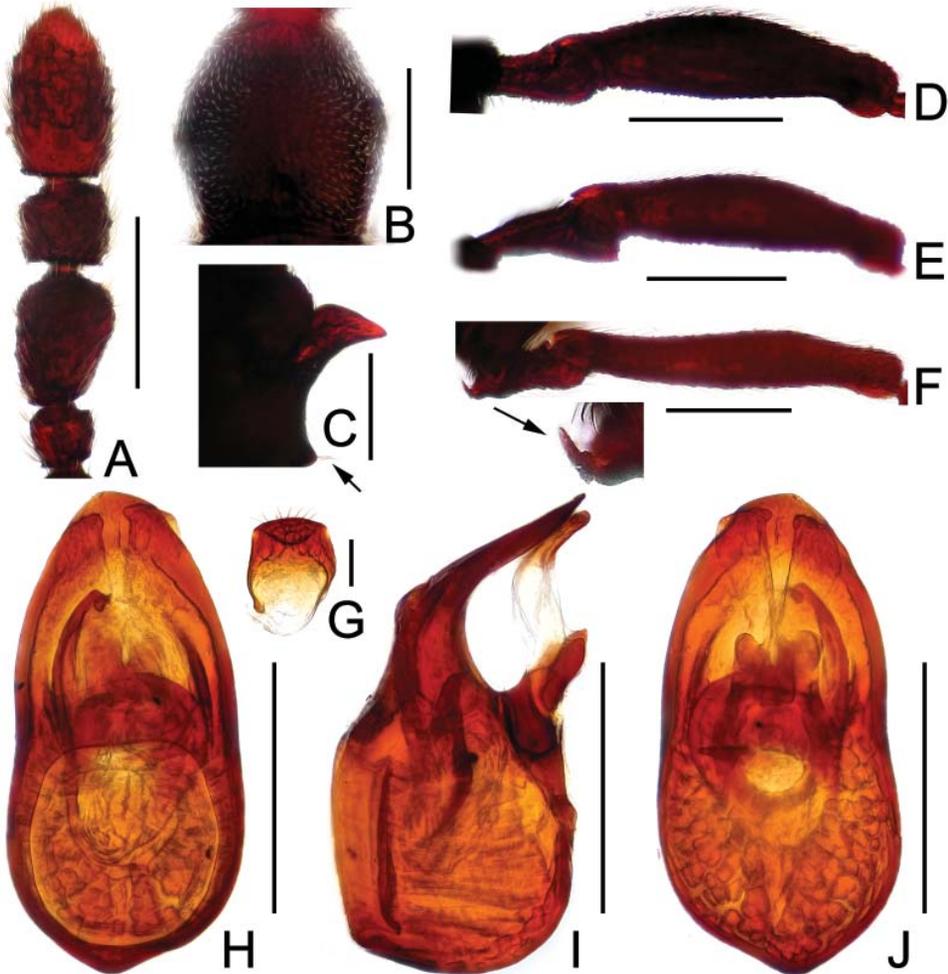


Fig. 7. Diagnostic features of male *Linan hujiayaoi* sp. nov. A – antennal club; B – pronotum; C – metaventral process, lateral view; D – protrochanter and profemur; E – mesotrochanter and mesofemur; F – metatrochanter and metafemur; G – sternite IX; H – aedeagus, dorsal view; I – same, lateral view; J – same, ventral view. Scales: A, B, D, E, F = 0.3 mm; C, H, I, J = 0.2 mm; G = 0.05 mm.



Fig. 8. Habitats of the new species. A – Maoershan Mt., 2000 m; B – Huaping N.R., 1700 m; C – Lianhuashan Mt., 1100 m; D – Shengtangshan Mt., 1700 m.

**Diagnosis.** Reddish brown; medium-sized; postgenae rounded; antennomeres IX–XI enlarged, lacking obvious modification; pronotum with lateral margins rounded; with short thick metaventral processes; metatrochanter spinose ventrally; aedeagus with nearly symmetric median lobe.

**Description. Male** (Fig. 4C). Length 2.42–2.46. Head longer than wide, HL 0.60–0.61, HW 0.52–0.53; eyes each composed of about 20 facets. Antennal club as in Fig. 7A. Pronotum (Fig. 8B) slightly longer than wide, PL 0.57–0.58, PW 0.52–0.53, with lateral margins rounded. Elytra wider than long, EL 0.64–0.65, EW 0.88–0.92. Short and thick metaventral processes nearly triangular (Fig. 7C). Protrochanters and profemora simple (Fig. 7D), mesotrochanters (Fig. 7E) with tiny ventral spine, metatrochanters (Fig. 7F) with short hook-like ventral spine. Abdomen large, AL 0.61–0.62, AW 0.91–0.97. Sternite IX as in Fig. 7G. Aedeagus length 0.37; with nearly symmetric median lobe (Figs. 7H–J).

**Female.** Similar to male in general; BL 2.33–2.43, HL 0.56–0.60, HW 0.48–0.51, PL 0.55–0.56, PW 0.51–0.52, EL 0.57–0.59, EW 0.89–0.92, AL 0.65–0.68, AW 0.96–0.97. Eyes each composed of about 20 facets. Antennae simple; metaventral processes absent.

**Comparative notes.** This is placed as a member of the *L. chinensis* group by the unmodified antennal clubs in the male. The new species is most close to *L. chinensis* (Löbl, 1964) by sharing the short metaventral process. The two species can be separated by the transverse antennomeres VIII and X in *L. hujiayaoi*, while *L. chinensis* has elongate antennomeres VIII and X.

**Etymology.** This species is named after Jia-Yao Hu, who collected all the male specimens of the type series.

**Biology.** Individuals were collected by sifting leaf litter of a coniferous broad-leaved forest near the peak of the mountain (Fig. 8D).

**Distribution.** South China: Guangxi.

### Revised key of YIN et al. (2011) to males of *Linan*

An error was detected in the original key: the two species-group names in the first two couplets were mistakenly interchanged. This revised key makes all the necessary corrections.

1. Antennae have antennomeres IX–X strongly modified (YIN et al. 2011: 128, Figs 7, 9, 11; Figs. 5A, 6A). *L. cardinalis*-group. .... 2
- Antennae have antennomeres IX–X lacking obvious modification (YIN et al. 2011: 128, Figs 8, 10; Fig. 7A). *L. chinensis*-group. .... 7
2. Pronotal lateral margins roundly expanded basolaterally. (South China: Yunnan). .... *L. tendothorax* Yin & Li, 2012
- Pronotal lateral margins evenly rounded, not basolaterally expanded. .... 3
3. Large-sized, over 3.3 mm; tergite IV about four times as long as tergite V. (Thailand: Wiang Pa Pao; Southwest China: Yunnan). .... *L. cardinalis* Hlaváč, 2002
- Medium-sized, less than 3 mm; tergite IV about twice the length of tergite V. .... 4
4. Protibiae lacking apical spur. (South China: Guangxi). .... *L. huapingensis* sp. nov.
- Protibiae with apical spur. .... 5

5. Pronotal and elytral basolateral margins with tuft of dense setae; protibiae with apical spur indistinct. (South China: Guangxi). ..... *L. fortunatus* sp. nov.  
 – Pronotal and elytral basolateral margins lacking tuft of dense setae; protibiae with distinct apical spur. .... 6
6. Median metaventral processes not bifurcate at apex in lateral view (YIN et al. 2011: 128, Fig. 21). (Southwest China: Guizhou). ..... *L. megalobus* Yin & Li, 2011  
 – Median metaventral processes bifurcate at apex in lateral view (YIN et al. 2011: 128, Fig. 19). (South China: Hainan). ..... *L. hainanicus* Hlaváč
7. Median metaventral processes long (YIN et al. 2011: 128, Fig. 20). (East China: Anhui). ..... *L. inornatus* Yin & Li, 2011  
 – Median metaventral processes short (YIN et al. 2011: 128, Fig. 18; Fig. 7C). .... 8
8. Antennomeres X and VIII more or less transverse (Fig. 8A); metaventral processes with pointed apex (Fig. 7C); metatrochanter protuberant ventrally (Fig. 7F). (South China: Guangxi). ..... *L. hujiayaoi* sp. nov.  
 – Antennomeres X and VIII elongate (YIN et al. 2011: 128, Fig. 8); metaventral processes with bluntly rounded apex (YIN et al. 2011: 128, Fig. 18); metatrochanter simple. (East China: Zhejiang). ..... *L. chinensis* (Löbl, 1964)

### Acknowledgments

We thank all the collectors for their efforts in the field. Ivan Löbl and an anonymous reviewer critically commented on a previous draft. This study is supported by the National Natural Science Foundation of China (No. 31172134) and Shanghai Normal University (DZL125; SK. 201242).

### References

- YIN Z. W. & LI L. Z. 2012: Notes on Michael Schülke's pselaphine collections from China. – Tyrini. I. genera *Labomimus* Sharp, *Linan* Hlaváč and *Pselaphodes* Westwood (Coleoptera, Staphylinidae, Pselaphinae). *ZooKeys* **251**: 83–118.
- YIN Z. W., LI L. Z. & ZHAO M. J. 2011: A review of the genus *Linan* (Coleoptera: Staphylinidae: Pselaphinae). *Acta Entomologica Musei Nationalis Pragae* **51**: 123–135.
- YIN Z. W., HLAVÁČ P. & LI L. Z. 2013: Further studies on the *Pselaphodes* complex of genera from China (Coleoptera, Staphylinidae, Pselaphinae). *Zookeys* **275**: 23–65.

