ACTA ENTOMOLOGICA MUSEI NATIONALIS PRAGAE
Published 30.vi.2011 Volume 51(1), pp. 123–135 ISSN 0374-1036

A review of the genus *Linan* (Coleoptera: Staphylinidae: Pselaphinae)

Zi-Wei YIN[1)], Li-Zhen LI[1)] & Mei-Jun ZHAO[1,2)]

[1)] Department of Biology, College of Life and Environment Sciences, Shanghai Normal University, 100 Guilin Road, Shanghai, 200234, P. R. China; e-mails: yin_ziwei@yahoo.com; lizhenli@shnu.edu.cn

[2)] Corresponding author; e-mail: mjzhao@shnu.edu.cn

Abstract. The tyrine genus *Linan* Hlaváč, 2002 is reviewed. Six species are recognized, two of which are described as new: *L. inornatus* sp. nov. from Anhui Province, East China and *L. megalobus* sp. nov. from Guizhou Province, Southwest China. Illustrations of major diagnostic characters of all included taxa are provided. An identification key and a distributional map of the genus *Linan* is also provided.

Key words. Coleoptera, Staphylinidiae, Pselaphinae, *Linan*, taxonomy, new species, key, distributional map, China

Introduction

Hlaváč (2002) erected the genus *Linan* and placed it in the *Pselaphodes* complex of genera of the tribe Tyrini. Adults of the genus *Linan* may be readily recognized by the characteristic features of the genus (see diagnosis of the genus), or by using the keys provided by Hlaváč (2002) and Hlaváč & Chandler (2005).

Linan is a small genus comprised of three described species scattered in the Oriental Region. *Linan chinensis* (Löbl, 1964) (transferred from *Lasinus* Sharp, 1874), was described from East China, *L. hainanicus* Hlaváč, 2002 from South China, and *L. cardialis* Hlaváč, 2002 from northwestern Thailand and Southwest China (Hlaváč 2002).

In this paper we redescribe all the known species and add two new species, *L. inornatus* Yin & Li sp. nov. (Anhui Province, East China), and *L. megalobus* Yin & Li sp. nov. (Guizhou Province, Southwest China), respectively to the genus. An additional species, *Linan* sp. indet. (Jiangxi Province, China), is listed, but left unnamed, because no male specimen has become available for the study. Illustrations of habitus, diagnostic features, habitats, and an identification key are presented. A geographical distribution map of the genus is also given.

The distributional pattern (Fig. 42) of the genus suggests that further species are most likely to be found through future collecting efforts conducted in southern China and its adjacent regions.

Material and methods

All specimens were collected from leaf litter of the forest floor by sifting. They were killed with ethyl acetate and then dried. Dissections were done in 75% ethanol. The genitalia and other dissected parts were mounted in Euparal (Chroma Geselschaft Schmidt, Koengen, Germany) on plastic slides that were then placed on the same pin as the specimen. Photos were taken with a Canon EOS 40D Camera mounted with an MP-E 65 mm Macro Photo Lens; line drawings were made using Adobe Illustrator CS2. The material treated in the present study is deposited in the Insect Collection of Shanghai Normal University.

Slashes (/) are used to separate different lines on the same label. The terminology follows that proposed by Chandler (2001). The following acronyms are used in the text:

AL	maximum length of the abdomen;
AW	maximum width of the abdomen;
BL	length of the body (= HL + PL + EL + AL);
EL	length of the elytra, measured along sutural line;
EW	maximum width of elytra;
HL	maximum length of head, measured from anterior margin of the clypeus to the posterior apex, excluding occiput;
HW	maximum width of the head, measured across the eyes;
PL	length of the pronotum, measured along the midline;
PW	maximum width of the pronotum;
SNUC	The Insect Collection of Shanghai Normal University, Shanghai, P. R. China.

Taxonomy

Genus *Linan* Hlaváč, 2002

(Figs. 1–48)

Linan Hlaváč, 2002: 294. Hlaváč & Chandler 2005: 110.

Type species. *Lasinus chinensis* Löbl, 1964, by original designation.

Diagnosis. The genus *Linan* could be readily separated from allied genera within the *Pselaphodes* complex by the following combination of characters: Head with vertexal and frontal foveae indistinct; maxillary palpi with segments III–IV asymmetrical, roundly expanded or with external protuberance; pronotum with small but well-defined median and lateral antebasal foveae; head, pronotum and legs densely and roughly punctate; median metaventral fovea present; metaventral horn-like processes present in male; elytra simple without carinae.

Redescription. Length 2.35–3.63 mm. Head, antennae, pronotum, abdomen and legs reddish-brown, elytra lighter, maxillary palpi and tarsi yellowish-brown.

Head nearly triangular, roughly punctate, sparsely covered with pubescence; frontal fovea and pair of vertexal foveae very indistinct; antennae elongate, pubescent; scape roughly punctate, about as long as segments II–V combined; antennal club three-segmented; antennomeres IX–X strongly modified or not in male, not modified and weekly clubbed in female.

Pronotum about as long as wide, roughly punctate, pubescent. Width of the elytra wider than long, pubescent; each elytron with two basal foveae; discal stria reaching apical two-thirds of elytral length. Legs elongate and slender with femora roughly punctate, usually

Figs. 1–4. Male habitus of *Linan* spp. 1 – *L. cardialis* Hlaváč, 2002; 2 – *L. chinensis* (Löbl, 1964); 3 – *L. hainanicus* Hlaváč, 2002; 4 – *L. inornatus* sp. nov.

Figs. 5–6. Dorsal habitus of *Linan* spp. 5 – *L. megalobus* sp. nov., male; 6 – *L.* sp. indet., female.

simple without spine (except for *L. cardialis*); protibiae in some species expanded mesally at apex as a spur or lobe in male; tarsi three-segmented. Venter with metaventrite depressed, smooth; median metaventral horn-like processes paired and well-defined in male, various in length and shape; median metaventral foveae present.

Abdomen with first visible tergite (morphological tergite IV) largest, discal ridges present or absent; following segments successively shorter and narrower; paratergites well-defined. Aedeagus with median lobe large; parameres paired; endophallus provided with various types of sclerites.

Discussion. Species of the genus *Linan* can be classified into two groups (here proposed): the *L. cardialis* species-group, with strongly modified antennal segments IX–X and modified protibiae at apex in male, including *L. cardialis*, *L. hainanicus*, and *L. megalobus* sp. nov., and the *L. chinensis* species-group, lacking obvious sexual modifications of the male antennal club and protibiae, containing *L. chinensis* and *L. inornatus* sp. nov.

Linan cardialis Hlaváč, 2002

(Figs. 1, 7, 12, 17, 22–24, 27–28, 37, 42–43)

Linan cardialis Hlaváč, 2002: 294; Hlaváč & Chandler (2005: 110).

Type locality. Northwestern Thailand, Wiang Pa Pao, Ban Huay Ya Sai.
Material studied (1 ♂ 1 ♀). 1 ♂, '**CHINA:** Yunnan Prov. / Nabanhe N. R. / Shanshenmiao / alt. 1,700 m, 27.iv.2009 / Jiao-Yao HU & Zi-Wei YIN leg.' (SNUC); 1 ♀, '**CHINA:** Yunnan Prov. / Xishuangbanna N. R. / Wangtianshu / Taoxixiaodao / alt. 600–700 m, 11.vii.2009 / Lie NING leg.' (SNUC).

Diagnosis. Large in size, 3.3–3.6 mm. Antenna with three-segmented club, segments IX–X strongly modified in male. Metaventral horn-like processes large, bifurcate at apex. Pro- and mesotrochanter each with small but distinct spine on posterior margin; protibia expanded as rounded lobe at apex in male, unmodified in female.

Redescription. *Male* (Fig. 1). Length 3.63 mm (2.7–2.9 mm in Hlaváč 2002, wrong measurement, Hlaváč pers. comm.). Head slightly longer than wide, HL 0.79 mm, HW 0.73 mm; eyes prominent, each composed of about 50 facets. Antenna with scape elongate, about 4.6 times as long as wide, pedicel about as long as wide, antennomeres III–VII each longer than wide, VIII similar to pedicel, antennal club as in (Fig. 7), ventral side of segment IX with finely punctate sensory area nearly triangular, extended from basal sixth toward anterior margin.

Pronotum (Fig. 12) about as long as wide, PL 0.78 mm, PW 0.76 mm. EL 0.96 mm, EW 1.25 mm. Metaventral horn-like processes elongate and bifurcate at apex in lateral view (Fig. 17). Pro- (Fig. 22) and mesotrochanter (Fig. 23) with one spine on posterior margin; protibia expanded mesally at apex, forming broadly rounded lobe (Fig. 24).

Abdomen large, AL 1.08 mm, AW 1.30 mm; first visible tergite (morphologically tergite IV) about four times as long as the second; discal carinae well-defined, reaching basal fourth of tergite length; sternite IX as in Fig. 37. Aedeagus 0.53 mm long, structure as in Figs. 27–28.

Female. Similar to male in size; BL 3.28 mm, HL 0.76 mm, HW 0.69 mm, PL 0.77 mm, PW 0.73 mm, EL 0.91 mm, EW 1.29 mm, AL 0.84 mm, AW 1.35 mm. Eyes each composed of about 35 facets. Antenna slightly clubbed and not modified. Apex of protibia cylindrical, not expanded mesally.

Distribution and habitat. The range of this species extends from northwestern Thailand (Wiang Pa Pao) to Southwest China (Yunnan Province). Specimens were sifted from decayed leaf litter on the forest floor of a broad-leaved forest (Fig. 43).

Remarks. This species belongs to the *L. cardialis* species-group based on the modified antennal club in the male. It is closely allied to *L. hainanicus*, but may be distinguished by the larger size, the shape of the antennal club, and the presence of spines on the pro- and mesotrochanters.

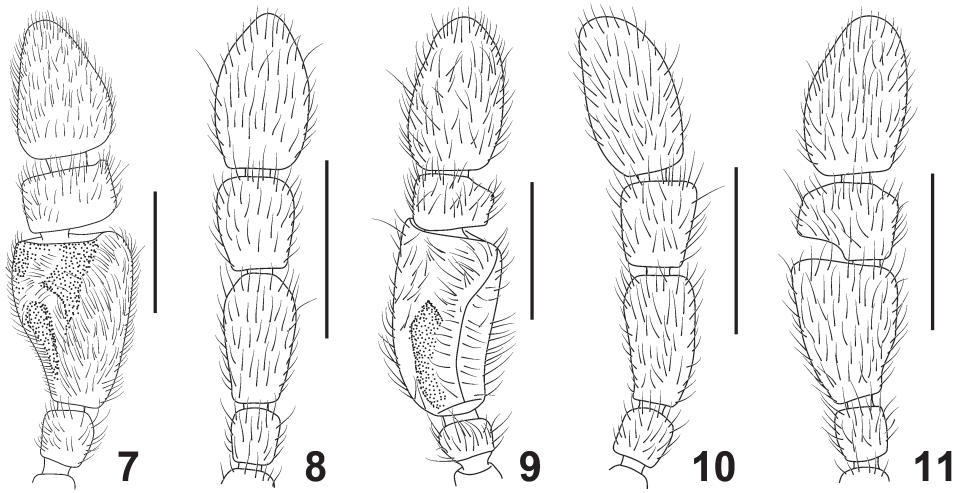
Linan chinensis (Löbl, 1964)

(Figs. 2, 8, 13, 18, 29–30, 38, 42, 44)

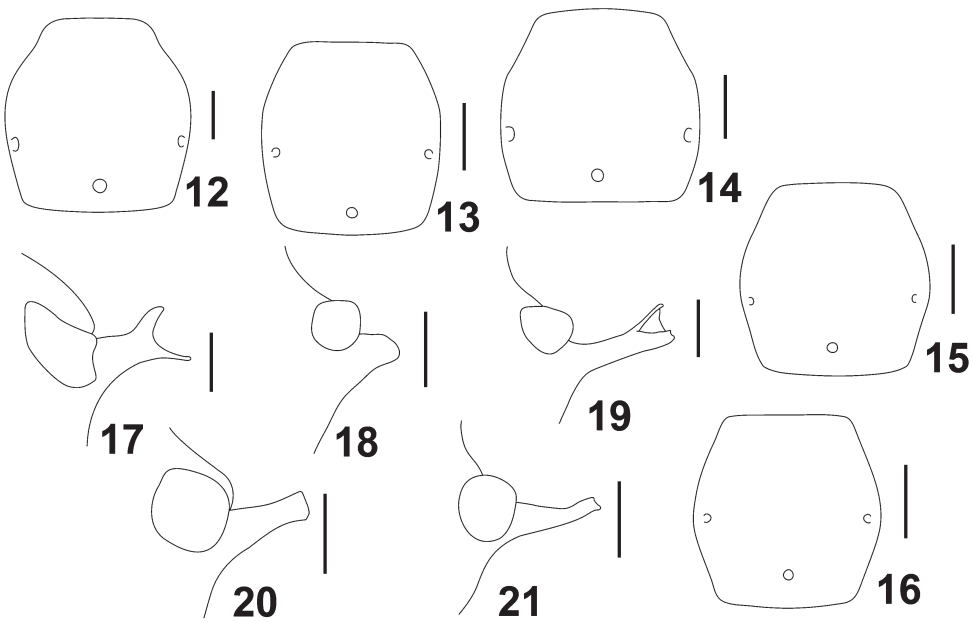
Lasinus chinensis Löbl, 1964: 45.
Linan chinensis: Hlaváč (2002: 294); Hlaváč & Chandler (2005: 110).

Type locality. East China, West Tianmushan Mountain.
Material studied (19 ♂♂ 8 ♀♀). 2 ♂♂ 1 ♀, '**CHINA:** Zhejiang Prov. / Lin'an Count. / West Tianmushan Mt. / alt. 800–1,150 m, 19.v.2006 / HU & TANG leg.'; 7 ♂♂ 3 ♀♀, '**CHINA:** Zhejiang Prov. / Longwangshan Mt. / Dong'guan / alt. 1,300 m, 24.v.2009 / FENG, LIU, YUAN & YIN leg.'; 3 ♂♂ 2 ♀♀, '**CHINA:** Zhejiang Prov. / Longwangshan Mt. / Parking lot / alt. 1,300 m, 27.v.2009 / YUAN leg.'; 1 ♂, '**CHINA:** Zhejiang Prov. / Longwangshan Mt. / Qianmutian / alt. 1,300 m, 27.v.2009 / YUAN leg.'; 6 ♂♂ 2 ♀♀, '**CHINA:** Zhejiang Prov. / Longwangshan Mt. / Qianmufeng / alt. 1,500 m, 29.v.2009 / FENG, LIU, YUAN & YIN leg.' (all SNUC).

Diagnosis. Medium sized, 2.77–2.89 mm. Antennal club weakly defined in male, not modified. Metaventral horn-like processes very short. Legs unmodified, without spines. Protibia not expanded at apex in both sexes.



Figs. 7–11. Antennal segments VIII–XI of *Linan* spp. in male. 7 – *L. cardialis* Hlaváč, 2002; 8 – *L. chinensis* (Löbl, 1964); 9 – *L. hainanicus* Hlaváč, 2002; 10 – *L. inornatus* sp. nov.; 11 – *L. megalobus* sp. nov. Scales: 0.3 mm.



Figs. 12–21. Pronotum and metaventral horn-like processes of *Linan* spp. in male. 12, 17 – *L. cardialis* Hlaváč, 2002; 13, 18 – *L. chinensis* (Löbl, 1964); 14, 19 – *L. hainanicus* Hlaváč, 2002; 15, 20 – *L. inornatus* sp. nov.; 16, 21 – *L. megalobus* sp. nov. Scales: 0.2 mm.

Redescription. *Male* (Fig. 2). Length 2.77–2.89 mm (2.9 mm in Löbl (1964: 45)). Head slightly longer than wide, HL 0.63–0.64 mm, HW 0.51–0.52 mm; eyes small, each composed of about 20 facets. Antenna with scape elongate, about 4.4 times as long as wide, antennomeres II–VII each longer than wide, VIII shorter, antennal club as in Fig. 8, not modified.

Pronotum (Fig. 13) about as long as wide, PL 0.57–0.59 mm, PW 0.57–0.58 mm. EL 0.78–0.80 mm, EW 1.02–1.08 mm. Metaventral horn-like processes (Fig. 18) short and rounded at apex in lateral view. Protibia cylindrical at apex, lacking medial expansion.

Abdomen large, AL 0.79–0.86 mm, AW 1.07–1.13 mm; first visible tergite (morphologically tergite IV) about twice as long as the second; discal carinae absent; sternite IX as in Fig. 38. Aedeagus 0.40 mm long, structure as in Figs. 29–30.

Female. Similar to male in size; BL 2.80–2.88 mm, HL 0.64–0.66 mm, HW 0.54–0.55 mm, PL 0.59–0.60 mm, PW 0.58–0.59 mm, EL 0.64–0.67 mm, EW 1.10–1.11 mm, AL 0.93–0.95 mm, AW 1.17–1.20 mm. Eyes each composed of about 20 facets.

Distribution and habitat. This species is found only in Tianmushan mountains (including Longwangshan Mountain), Zhejiang Province (East China). Specimens were sifted from leaf litter on the floor of a coniferous and broad-leaf forest (Fig. 44).

Remarks. This species belongs to the *L. chinensis* species-group due to the absence of obvious modifications of the antennal club. It is most closely allied to *L. inornatus* sp. nov., but may be distinguished by the relatively broader elytra and abdomen in contrast to the pronotum (PW : EW : AW = 1.00 : 1.88–1.90 : 2.02–2.03 in *L. chinensis*, = 1.00 : 1.62–1.64 : 1.75–1.78 in *L. inornatus* sp. nov.), the shorter metaventral processes, and the different shape of the aedeagus.

Linan hainanicus Hlaváč, 2002

(Figs. 3, 9, 14, 19, 25, 31–32, 39, 42, 45)

Linan hainanicus Hlaváč, 2002: 295. Hlaváč & Chandler (2005: 110).

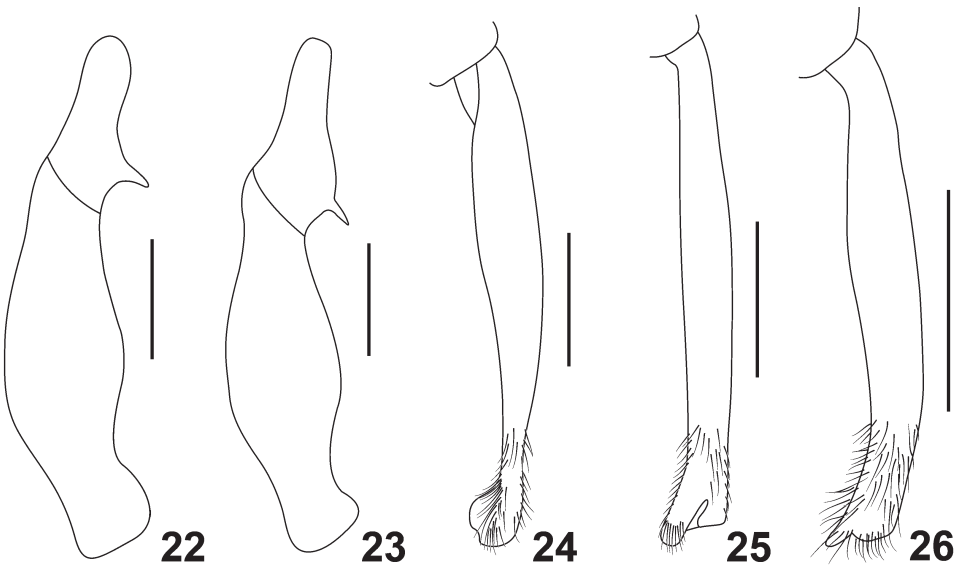
Type locality. China, Hainan Dao Island, Jian Feng Ling Nature Reserve.

Material studied (5 ♂♂). 2 ♂♂, '**CHINA:** Hainan Prov. / Ledong Count. / Jianfengling N. R. / alt. 1, 000 m, 15.iv.2010 / Ting FENG leg.'; 1 ♂, '**CHINA:** Hainan Prov. / Ledong Count. / Jianfengling N. R. / alt. 500 m, 14.iv.2010 / Bao-Ping HUANG leg.'; 2 ♂♂, '**CHINA:** Hainan Prov. / Changjiang Count. / Bawangling N. R. / alt. 1,000 m, 11.iv.2010 / Zi-Wei YIN leg.' (all SNUC).

Diagnosis. Medium in size, 2.95 mm, antennomeres IX–X strongly modified in male. Metaventral horn-like processes large. Legs simple without spine; protibiae protuberant mesally at apex in male, cylindrical in female.

Redescription. *Male* (Fig. 3). Length 2.95 mm (2.4–2.7 mm in Hlaváč (2002) based on wrong measurement, Hlaváč, pers. comm.). Head slightly longer than wide, HL 0.68 mm, HW 0.63 mm; eyes prominent, each composed of about 50 facets. Antenna with elongate scape, about five times as long as wide, antennomeres II–III and VII each slightly longer than wide, IV–VI similar, elongate, VIII transverse, wider than long, antennal club as in Fig. 9, ventral side of segment IX with finely punctate sensory area linear, extended from middle toward posterior margin.

Pronotum (Fig. 14) about as long as wide, PL 0.62 mm, PW 0.62 mm. EL 0.87 mm, EW 1.13 mm. Metaventral horn-like processes as in Fig. 19, bifurcate at apex in lateral view. Protibia (Fig. 25) protuberant mesally, forming broadly truncate spur at apex.



Figs. 22–26. Details of legs of *Linan* spp. in male. 22 – protrochanter and profemur of *L. cardialis* Hlaváč, 2002; 23 – mesotrochanter and mesofemur of *L. cardialis*; 24 – protibia of *L. cardialis*; 25 – protibia of *L. hainanicus* Hlaváč, 2002; 26 – protibia of *L. megalobus* sp. nov. Scales: 0.3 mm.

Abdomen large, AL 0.78 mm, AW 1.08 mm; first visible tergite (morphologically tergite IV) about twice as long as the second; discal carinae short, reaching basal sixth of tergite length; sternite IX as in Fig. 39. Aedeagus 0.60 mm long, structure as in Figs. 31–32.

Female. Unknown.

Distribution and habitat. This species is endemic to western Hainan Island (South China). Specimens were sifted from the leaf litter along a small stream (Fig. 45).

Remarks. This species belongs to *L. cardialis* species-group based on the strong modification of the antennal club in the male. It is most closely allied to *L. cardialis*, but may be distinguished by the smaller size (2.95 mm of this species, 3.3–3.6 mm of *cardialis*), the shape of the antennal club and the shape of metaventral processes, the legs simple without spines, and the shape of the aedeagus.

Linan inornatus Yin & Li sp. nov.

(Figs. 4, 10, 15, 20, 33–34, 40, 42, 46)

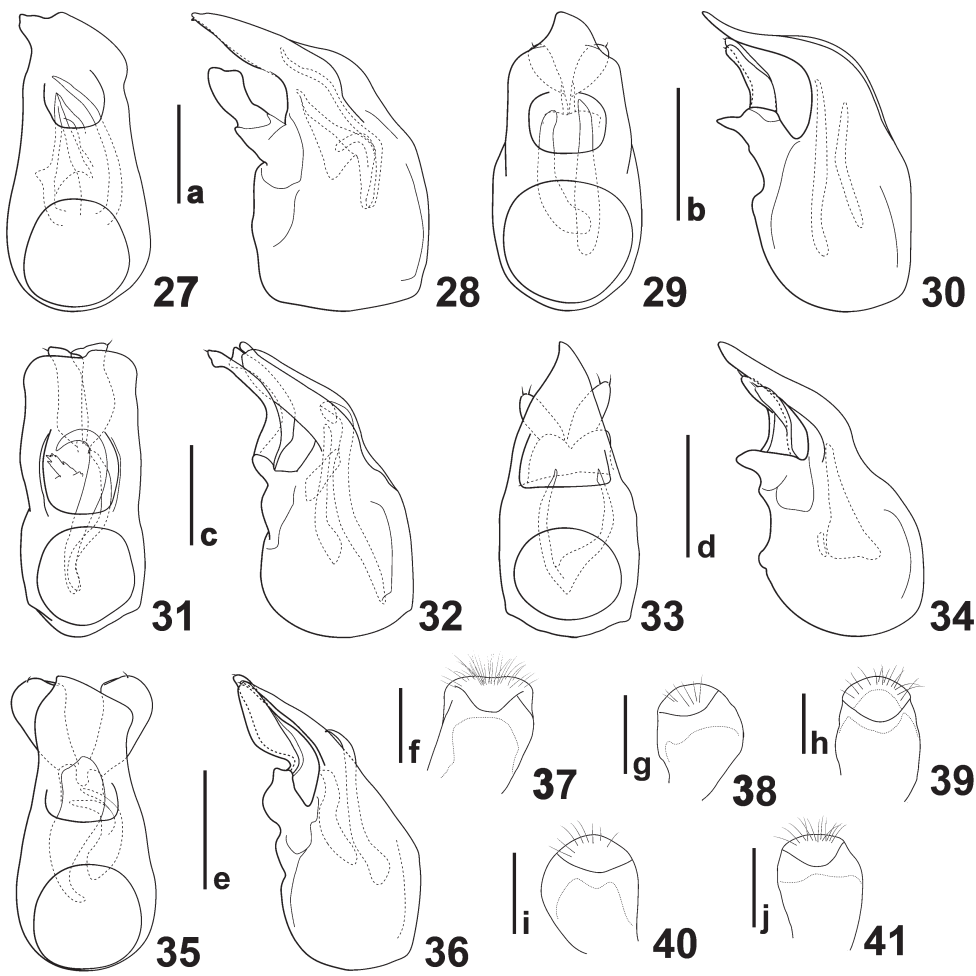
Type locality. China, Anhui Province, Tianzhushan Mountain.

Type material (7 ♂♂ 3 ♀♀). Holotype: ♂, '**CHINA:** Anhui Prov. / Tianzhushan Mt. / alt. 960 m, 23.iv.2005 / HU & TANG leg.'. Paratypes: 3 ♂♂ 2 ♀♀, same label data as the holotype; 1 ♂, same label data as the holotype, but 'alt. 1,150–1250 m, 25.iv.2005'; 2 ♂♂ 1 ♀, same label data as the holotype, but '18–20.v.2007, alt. unknown' (all SNUC).

Diagnosis. Medium in size, 2.63–2.68 mm. Antennal club slightly defined and not modified in male. Metaventral horn-like processes long. Legs simple without spine; protibiae cylindrical at apex, not expanded mesally in both sexes.

Description. Male (Fig. 4). Length 2.63–2.68 mm. Head slightly longer than wide, HL 0.59–0.60 mm, HW 0.52–0.54 mm; eyes small, each composed of about 20 facets. Antennal scape elongate, about 4.5 times as long as wide, pedicel slightly longer than wide, III–VII each longer than wide, VIII similar to pedicel, antennal club as in Fig. 10.

Pronotum (Fig. 15) about as long as wide, PL 0.57–0.59 mm, PW 0.55–0.59 mm. Elytra together wider than long, EL 0.71–0.72 mm, EW 0.95–1.01 mm. Metaventral horn-like processes (Fig. 20) long, truncated at apex in lateral view. Legs simple in structure, without spine.



Figs. 27–41. Aedeagus and sternite IX of *Linan* spp. 27, 29, 31, 33, 35 – aedeagus, in dorsal view; 28, 30, 32, 34, 36 – aedeagus, in lateral view; 37–41 – sternite IX of *Linan* spp. 27, 28, 37 – *L. cardialis* Hlaváč, 2002; 29–30, 38 – *L. chinensis* (Löbl, 1964); 31–32, 39 – *L. hainanicus* Hlaváč, 2002; 33–34, 40 – *L. inornatus* sp. nov.; 35–36, 41 – *L. megalobus* sp. nov. Scales: 0.2 mm (a, b, c, d, e); 0.1 mm (f, g, h, i, j).

Abdomen large, AL 0.76–0.77 mm, AW 0.98–1.06 mm; first visible tergite (morphological tergite IV) about twice as long as the second; discal carinae well-defined but very short, reaching basal sixth of tergite length; sternite IX as in Fig. 40. Aedeagus 0.47 mm long, structure as in Figs. 33–34.

Female. Similar to male in size; BL 2.50–2.83 mm, HL 0.60–0.64 mm, HW 0.52–0.54 mm, PL 0.55–0.60 mm, PW 0.59–0.63 mm, EL 0.67–0.68 mm, EW 0.97–1.02 mm, AL 0.68–0.91 mm, AW 1.03–1.12 mm. Eyes each composed of about 20 facets. Antennal club not modified.

Distribution and habitat. The new species is known only from Tianzhushan Mountain, Anhui Province (East China). Specimens were found in leaf litter on the forest floor of a coniferous and broad-leaf forest (Fig. 46).

Etymology. The Latin adjective *inornatus* means 'unadorned', referring to the absence of antennal modifications of the male.

Remarks. The new species belongs to *L. chinensis* species-group by the absence of modified antennae. It is very similar to *L. chinensis* in general appearance, but may be separated by the relatively narrower elytra and abdomen in contrast to the pronotum (see Remarks under *L. chinensis*), the larger metaventral processes, and the shape of the aedeagus.

Linan megalobus Yin & Li sp. nov.

(Figs. 5, 11, 16, 21, 26, 35–36, 41–42, 47)

Type locality. China, Guizhou Province, Kuankuoshui Nature Reserve.

Type material (10 ♂♂ 9 ♀♀). Holotype: ♂, '**CHINA:** guizhou Prov. / Zunyi, Suiyang Count. / Kuankuoshui N. R. Guizhou Prov. / Zunyi, Suiyang Count. / Kuankuoshui N. R., Houshan / alt. 1,500 m, 13.viii.2010 / Ting FENG leg.' (SNUC). Paratypes: 2 ♂♂, '**CHINA:** guizhou Prov. / Zunyi City, Suiyang Count. / Kuankuoshui N. R. Houshan / Zi-Wei YIN leg.'; 3 ♂♂, 8 ♀♀, '**CHINA:** guizhou Prov. / Zunyi, Suiyang Count. / Kuankuoshui N. R. / alt. 1,400 m, 13.viii.2010 / FENG & YIN leg.'; 4 ♂♂ 1 ♀, '**CHINA:** guizhou Prov. / Zunyi, Suiyang Count. / Kuankuoshui N. R. / Gongtonggou / alt. 1,550 m, 07–09.vi.2010 / YIN & ZHAI leg.' (all SNUC).

Diagnosis. Medium in size, 2.44–2.54 mm. Antennal club three-segmented, antennomeres IX–X strongly modified in male. Metaventral horn-like processes long. Legs without spine; protibiae in male expanded mesally at apex, normal in female.

Description. *Male* (Fig. 5). Length 2.44–2.54 mm. Head longer than wide, HL 0.58–0.59 mm, HW 0.49–0.50 mm; eyes prominent, each composed of about 30 facets. Antenna with scape elongate, about 3.4 times as long as wide, segments II–IV and VIII similar, each about as long as wide, V–VII each slightly longer than wide, IX–XI clubbed (Fig. 11), IX–X strongly modified.

Pronotum (Fig. 16) about as long as wide, PL 0.53–0.55 mm, PW 0.54–0.55 mm. Elytra together wider than long, EL 0.64–0.66 mm, EW 0.87–0.88 mm. Metaventral horn-like processes (Fig. 21) very long, slightly curved in lateral view. Legs without spine; protibia expanded mesally at apex, forming bluntly rounded spur (Fig. 26).

Abdomen large, AL 0.69–0.74 mm, AW 0.89–0.91 mm; first visible tergite (morphologically tergite IV) about twice as long as the second; discal carinae very indistinct; sternite IX as in Fig. 41. Aedeagus 0.49 mm long, structure as in Figs. 35–36.

Female. Similar to male in size; BL 2.45–2.54 mm, HL 0.58–0.60 mm, HW 0.50–0.52 mm, PL 0.53–0.54 mm, PW 0.54–0.56 mm, EL 0.62–0.66 mm, EW 0.88–0.98 mm, AL

Fig. 42. Distribution of the genus *Linan* Hlaváč, 2002. Black squares – *L. cardialis* Hlaváč, 2002; white triangle – *L. chinensis* (Löbl, 1964); white squares – *L. hainanicus* Hlaváč, 2002; white circle – *L. inornatus* sp. nov.; black circle – *L. megalobus* sp. nov.; black triangle – *L.* sp. indet.

0.72–0.74 mm, AW 1.03–1.05 mm. Eyes each composed of about 20 facets. Antennal club modified. Protibia cylindrical, not expanded mesally at apex.

Distribution and habitat. The new species is known only from Kuankuoshui Nature Reserve, Guizhou Province (South China). Specimens were sifted from leaf litter along a road (Fig. 47).

Etymology. The specific name, a noun in aposition, refers to the large parameres of the aedeagus (*mega* = very large, *lobus* = lobe).

Remarks. The new species belongs to *L. cardinalis* species-group based on the modified antennal club and protibiae in male. It may be distinguished from *L. cardialis* and *L. hainanicus* by the shape of antennomeres IX–XI, and by the form of the metaventral horn-like processes in male and the aedeagus.

Linan sp. indet.

(Figs. 6, 42, 48)

Material studied (3 ♀♀). 3 ♀♀, '**CHINA:** Jiangxi Prov. / Sanqingshan Mt. / alt. 1,500–1,600 m, 3.v.2005 / HU & TANG leg.' (SNUC).

Description. *Female* (Fig. 6). BL 2.35–2.49, BW 1.07–1.08 mm, HL 0.59–0.60 mm, HW 0.52–0.54 mm, PL 0.52–0.54 mm, PW 0.55–0.57 mm, EL 0.60–0.64 mm, EW 0.99–1.01 mm, AL 0.64–0.71 mm, AW 1.07–1.08 mm. Eyes each composed of about 15 facets.

Distribution and habitat. This species is found only from Sanqingshan Mountain, Jiangxi Province (South-eastern China). Specimens were sifted from leaf litter of coniferous and broad leaf forest (Fig. 48.)

Remarks. Due to the lack of male specimens, this species cannot be placed in a species-group. But it is apparently a distinct species due to the small eyes each composed of about 15 facets

in the female, while the eyes of female in *L. chinensis* and *L. inornatus* sp. nov. are composed of about 20 facets. The number of facets of the compound eyes is usually a reliable character for use in separating closely allied species in Pselaphine beetles. We would like not to fully describe and name this species until a male specimen is found.

Figs. 43–48. Habitats of the genus *Linan* Hlaváč, 2002. 43 – Nabanhe Nature Reserve, Yunnan (*L. cardialis* Hlaváč, 2002); 44 – Longwangshan Mountain, Zhejiang (*L. chinensis* (Löbl, 1964)); 45 – Bawangling Nature Reserve, Hainan (*L. hainanicus* Hlaváč, 2002); 46 – Tianzhushan Mountain, Anhui (*L. inornatus* sp. nov.); 47 – Kuankuoshui N. R., Guizhou (*L. megalobus* sp. nov.); 48 – Sanqingshan Mountain, Jiangxi (*L.* sp. indet.).

Key to males of *Linan* Hlaváč, 2002

1. Antennae with antennomeres IX–X strongly modified (Figs. 7, 9, 11). *L. chinensis* species-group. 2
– Antennae with antennomeres IX–X not modified (Figs. 8, 10). *L. cardialis* species-group. 4
2. Antennomere IX in male with finely punctate sensory area (Figs. 7, 9); median metaventral horn-like processes bifurcate at apex in lateral view (Figs. 17, 19) 3
– Antennomere IX in male without finely punctate sensory area (Fig. 11); median metaventral horn-like processes not bifurcate at apex in lateral view (Fig. 21). China: Guizhou Province. ..... ***L. megalobus*** Yin & Li **sp. nov.**
3. Scape about 4.6 times as long as wide; sensory area of antennomere IX nearly triangular, extended from basal sixth toward anterior margin (Fig. 7); pro- and mesotrochanters each with small but distinct spine on posterior margin (Figs. 22–23); tergite IV about four times as long as next. Thailand: Wiang Pa Pao; China: Yunnan Province. .... ***L. cardialis*** Hlaváč, 2002
– Scape about 5.0 times as long as wide; sensory area of antennomere IX linear, extended from middle toward posterior margin (Fig. 9); pro- and mesotrochanters without spine or protuberance on posterior margin; tergite IV about twice as long as next. China: Hainan Island. ..... ***L. hainanicus*** Hlaváč, 2002
4. Median metaventral horn-like processes large (Fig. 20); aedeagus (Figs. 33–34). China: Anhui Province. ..... ***L. inornatus*** Yin & Li **sp. nov.**
– Median metaventral horn-like processes small (Fig. 18); aedeagus (Figs. 29–30). China: Zhejiang Province. ..... ***L. chinensis*** (Löbl, 1964)

Acknowledgments

We thank Mr. Peter Hlaváč (Košice, Slovakia) for sending reprints of his papers; Peter Hlaváč and Dr. Donald S. Chandler (Durham, U.S.A) for critical reading of the manuscript and providing valuable comments. We are also grateful to Dr. Shûhei Nomura (Tokyo, Japan) for his long-term guidance and encouragement during our work on Chinese pselaphines. All the collectors mentioned in the text are acknowledged for the field work. The present study is supported by the National Natural Science Foundation of China (No. 30870323), and the Shanghai Natural Science Foundation (No. 10ZR1421600).

References

CHANDLER D. S. 2001: *Biology, morphology and systemetics of the ant like litter beetles of Australia (Coleoptera: Staphylinidae: Pselaphidae)*. Associated Publishers, Gainesville, Florida, 560 pp.

HLAVÁČ P. 2002: A taxonomic revision of the Tyrini of the Oriental region. II. Systematic study on the genus Pselaphodes and its allied genera (Coleoptera: Staphylinidae: Pselaphinae). *Annales de la Société Entomologique de France* **38**: 283–297.

HLAVÁČ P. & CHANDLER D. S. 2005: World catalog of the species of Tyrini with a key to the genera (Coleoptera: Staphylindae: Pselaphinae). *Folia Heyrovskyana* **13**: 81–139.

LÖBL I. 1964: Eine neue Art der Gattung Lasinus Sharp aus China (Col., Pselaphidae). *Acta Rerum Naturalium Musei Nationalis Slovaci* (Bratislava) **10**: 45–48.