

New species of the genera *Csikia*, *Limoniscus*, *Neopsephus* and *Penia* from China (Insecta: Coleoptera: Elateridae)

RAINER SCHIMMEL

Abstract

In the following, six new species of the genera *Csikia* Szombathy, 1910, *Limoniscus* Reitter, 1905, *Neopsephus* Kishii, 1990 and *Penia* Castelnau, 1838, from China are described and illustrated: *Csikia fujianensis* n. sp. (Fujian province), *C. telnovi* n. sp. (Guangxi province), *Limoniscus zhejiangensis* n. sp. (Zhejiang province), *Neopsephus caoyutangensis* n. sp. (Zhejiang province), *N. zhejiangensis* n. sp. (Zhejiang and Jiangxi provinces) and *Penia xianhepingensis* n. sp. (Guizhou province). An especially remarkable new characteristic of one of the new species and the phylogenetic relation of further two species are introduced and discussed.

Zusammenfassung

Nachfolgend werden sechs neue Arten der Gattungen *Csikia* Szombathy, 1910, *Limoniscus* Reitter, 1905, *Neopsephus* Kishii, 1990 und *Penia* Castelnau, 1838, aus China beschrieben und abgebildet: *Csikia fujianensis* n. sp. (Fujian Provinz), *C. telnovi* n. sp. (Gunagxi Provinz), *L. zhejiangensis* n. sp. (Zhejiang province), *Neopsephus caoyutangensis* n. sp. (Zhejiang Provinz), *N. zhejiangensis* n. sp. (Zhejiang und Jiangxi Provinz) und *Penia xianhepingensis* n. sp. (Guizhou Provinz). Ein besonders auffälliges neues Merkmal eines der neuen Arten und die stammesgeschichtlichen Beziehungen zweier weiterer Arten werden vorgestellt und diskutiert.

Key words: Coleoptera, Elateridae, new species, Oriental region, phylogeny

Introduction

Very little is known about species of the genera *Csikia*, *Limoniscus*, *Neopsephus* and *Penia* from China. At present, there are only two species of the genus *Csikia*, three species of the genus *Limoniscus* and three species of the genus *Neopsephus* known from the Chinese

state territory. Also, our knowledge of the species of the genus *Penia* from China is absolutely insufficient. However, approximately 35 *Penia*-species are meanwhile known to occur on the territory of the People's Republic of China. The present work closes some further gaps to the knowledge of the species of the mentioned genera from China and introduces remarkable characteristics which have been unknown up to present. Thru colleagues and friends I recently received material of the mentioned genera for study and for my collection. This material has been collected in various provinces of China. The type material of the new species will be stored in the collection of the Natural History Museum, Erfurt, Germany, and in the collection of the author of this paper.

Abbreviations and methods

Abbreviations

CSV – Coll. SCHIMMEL, Vinningen, Germany.
NME – Naturkundemuseum Erfurt, Germany.

Methods

The examination of the collected material has been executed using a binocular ZEISS, Stemi 2000–C with a micron insert. Photographs were taken with a NIKON E4500 camera with an adaptor TV2/3”C 0.63x to the binocular. Body length of the specimens has been measured from apical margin of frons up to apex of elytra, and body width across the widest part of the elytra (in males at basal third, in females at apical third), using the micron insert of the binocular. The examined specimens have been fixed on white pasteboard. The genitalia of the males have been pulled out of the abdomen, cleaned and fixed beside the body of the specimen by using water-soluble transparent glue. Types of new species have been marked with red labels indicating the type status (Holotype and Paratype), and the names of the species and of the author.

Description of species

Csikia fujianensis n. sp.

(Figs. 1–6)

Type locality. China: Fujian prov., Ziyungdongshan.

Type material. **Holotype** ♂ (CSV): China: Fujian prov., Ziyungdongshan, 700–1100 m, 25°46'N/117°20'E, 31.V.2008, leg. H. Jatua. **Paratypes** 1♂, 1♀ (CSV, NME): Same data as Holotype, leg. H. Jatua.

Description of holotype. ♂: Vernicose, sub-ellipsoid, moderately vaulted species, with eleven-segmented, filiform antennae; pronotum widened campaniform; elytra subparallel-oviform; surface high glossy with a very vague micro-reticulation; length: 8.5 mm, width: 2.8 mm; reddish yellow, antennae and legs light yellowish, elytra medially castaneous; pubescence golden-yellow (fig. 1).

Head very smoothly declined from base to apex, occiput plain without any depression; lateral sides of frons distinctly vaulted above base of antennae, apically edged; cranium with very distant, fine and umbilicate punctures, interstices once to twice their diameter; eyes spherical; last maxilla segment fusiform; mandible bi-spicate apically; antennae filiform from second antennomere on (fig. 2), exceeding pronotal basal edges for the length of the last four antennomeres; second antennomere three times longer than wide apically, third antennomere one and a half times longer than second, fourth and following antennomeres slightly longer than third, last antennomere longitudinally fusiform.

Pronotum widened campaniform, along median line slightly shorter than wide across posterior angles, largest width across basal angles (length: 2.4 mm, width: 2.6 mm), disk very slightly vaulted, distinctly convex laterally, very slightly divergent posterior angles with shallow carina; pronotum with a short and shallow median furrow; pronotal lateral edges totally visible from dorsal view; pronotal punctures fine and umbilicate, distant, with interstices two to three times their diameter (fig. 3); pubescence extremely long, protruding, directed from median line and from base to apex and lateral sides.

Pro-, meso- and metathorax punctured distant and simple, with interstices three to four times their diameter; pubescence shorter than dorsally and adjacent.

Mesosternal fossa sides gradually concave to body axis, declivous throughout length.

Prosternal apophysis is slightly concave, centrally with a fine hooklet, apically acute (fig. 4).

Sternites finely punctured and covered with bristly and adjacent setae.

Scutellum lingulate, plain, apically and basally arcuate; punctures very distant and simple, interstices five to six times their diameter; pubescence fine, distant and protruding from base to apex and to lateral sides.

Elytra subparallel-elliptical from base to apex, arcuate bent apically; base very slightly wider than pronotal posterior angles, very slightly depressed at scutellum, margins vaulted, shoulders prominent (winged species); surface high glossy with a very vague micro-reticulation and distinctly deep elytral punctures with very small interstices (fig. 5); pubescence extremely long and protruding to apex and to lateral sides.

Alae are transparent and densely covered with very small, almost invisible blackish bristles.

Legs elongate, moderately long and thin; trochanter trapezoidal, distinctly separated from femur; longitudinally oval femur with a distal groove for accommodation of tibia, with fine and longer pubescence; tibiae covered with longer and protruding bristles; tarsomeres up to claws of decrescent length, ventrally with hardly visible, fine pubescence, fourth and fifth tarsomeres ventrally with distinctly developed trapezoidal euplantulae, that of fifth tarsomeres distinctly longer than that of fourth.

Mesosternal coxae are convex at basal third, tapering small to the lateral sides.

Aedeagus with a lanceolate median lobe, exceeding apices of parameres for the length of half of parameres; apices bi-spicate, apically and laterally acute (fig. 6).

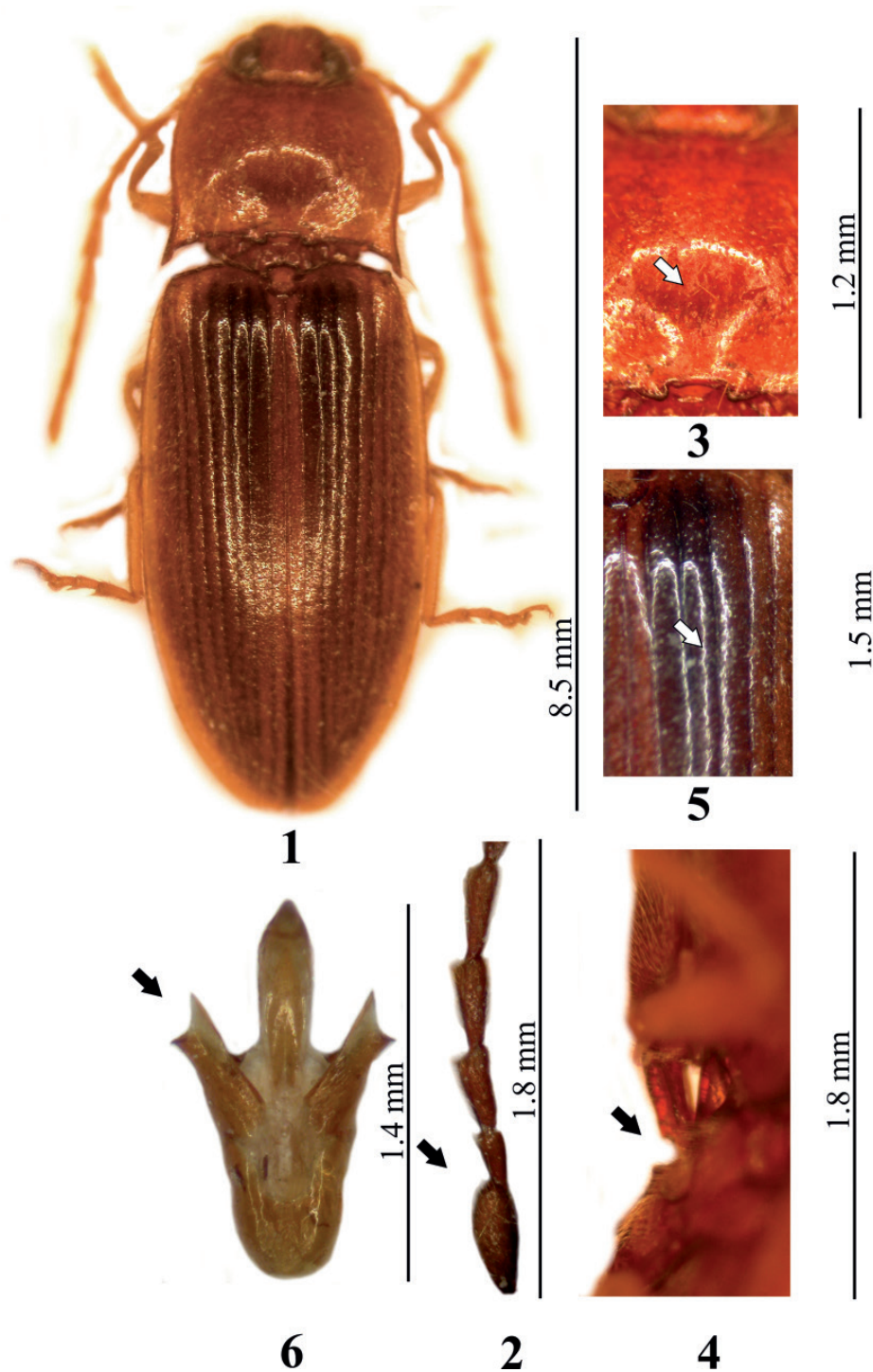
Female (Paratype) is somewhat bigger than males, color is darker, antennae are slightly shorter.

Morphology of larva is unknown.

Differential diagnosis. *Csikia fujianensis* n. sp. is in close relation to *P. sausai* Schimmel, 1996 from Jiangxi province in China, but can easily be distinguished from this species by the lighter yellow color, single hooklet centrally on prosternal apophysis, more elongate pronotum and more dense punctures on it and by the form of aedeagus with especially long apically apexes of parameres.

Etymology. The name of the new species refers to the name of the type locality.

Distribution. China: Fujian prov.



Figs. 1–6: Habitus and characteristics of *Csikia fujianensis* n. sp.: 1 – Habitus, 2 – antennomeres 1– 5, 3 – pronotal punctures, 4 – prosternal apophysis, 5 – elytral striae interstices, 6 – aedeagus.

Type locality. China: Guangxi prov., Longsheng env.

Type material. **Holotype** ♂ (NME): China: Guangxi prov., Longsheng env, 1000 m, 14.–22.V.1995, leg. S. Kurbatov; **Paratype** ♂ (CSV): China: Guangdong province, Pingyung Shan, 1000 m, 22°00'N / 111°10'E, 25.VI.2015, leg. H. Jatua.

Description of holotype. ♂: Vernicose, sub-ellipsoid, moderately vaulted species, with eleven-segmented, filiform antennae; pronotum widened campaniform with a short median furrow; elytra subparallel-oviform; surface high glossy with a very vague micro-reticulation; length: 6.0 mm, width: 2.4 mm; reddish yellow, antennae and legs light yellowish; pubescence yellow golden and extremely long (fig. 7).

Head very smoothly declined from base to apex, occiput plain without any depression; lateral sides of frons distinctly vaulted above antennal base, apically edged; cranium with very distant, fine and umbilicate punctures, interstices two to three times their diameter; eyes spherical; last maxilla segment fusiform; mandible bi-spicate apically; antennae filiform from second antennomere on, exceeding pronotal basal edges for the length of the last four antennomeres; second antennomere three times longer than wide apically, third antennomere one and a half time longer than second, fourth and following antennomeres slightly longer than third (fig. 8), last antennomere longitudinally fusiform.

Pronotum widened campaniform, along median line slightly shorter than wide across posterior angles, largest width across center (length: 1.7 mm, width: 1.8 mm), disk very slightly vaulted, distinctly convex laterally, posterior angles with shallow carina directed backwards; pronotum with a short median furrow; lateral edges of pronotum totally visible from dorsal view; pronotal punctures fine and umbilicate, distant, with interstices two to four times their diameter (fig. 9); pubescence extremely long, protruding, directed from median line and from base to apex and lateral sides.

Pro-, meso- and metathorax punctured distant and simple, interstices three to four times their diameter; pubescence shorter than dorsally and adjacent.

Mesosternal fossa sides gradually concave to body axis, declivous throughout length.

Prosternal apophysis slightly concave, centrally with two fine thorns, apically acute (fig. 10).

Sternites finely punctured and covered with bristly and adjacent setae.

Scutellum lingulate, plain, apically and basally arcuate; punctures very distant and simple, interstices five to six times their diameter; pubescence fine, distant and protruding from base to apex and to lateral sides.

Elytra subparallel-elliptical from base to apex, arcuate bent apically; base very slightly wider than pronotal posterior angles, very slightly depressed at scutellum, margins vaulted, shoulders prominent (winged species); surface high glossy with a very vague micro-reticulation, and distinctly deep punctures of elytral striae with very small interstices (fig. 11); pubescence extremely long and protruding to apex and to lateral sides. Alae are transparent and densely covered with very small, almost invisible blackish bristles.

Legs elongate, moderately long and thin; trochanter trapezoidal, distinctly separated from femur; longitudinally oval femur with a distal groove for accommodation of tibia with fine and longer pubescence; tibiae covered with longer and protruding bristles; tarsomeres up to claws of decrescent length, ventrally with hardly visible, fine pubescence, fourth and fifth tarsomeres ventrally with distinctly developed trapezoidal euplantulae, that of fifth tarsomeres distinctly longer than that of fourth.

Mesosternal coxae are convex at basal third, tapering small to the lateral sides.

Aedeagus elongate, median lobe subparallel, extremely long, exceeding apices of parameres for the length of them, apices of parameres bi-spicate, apically and laterally acute (fig. 12).

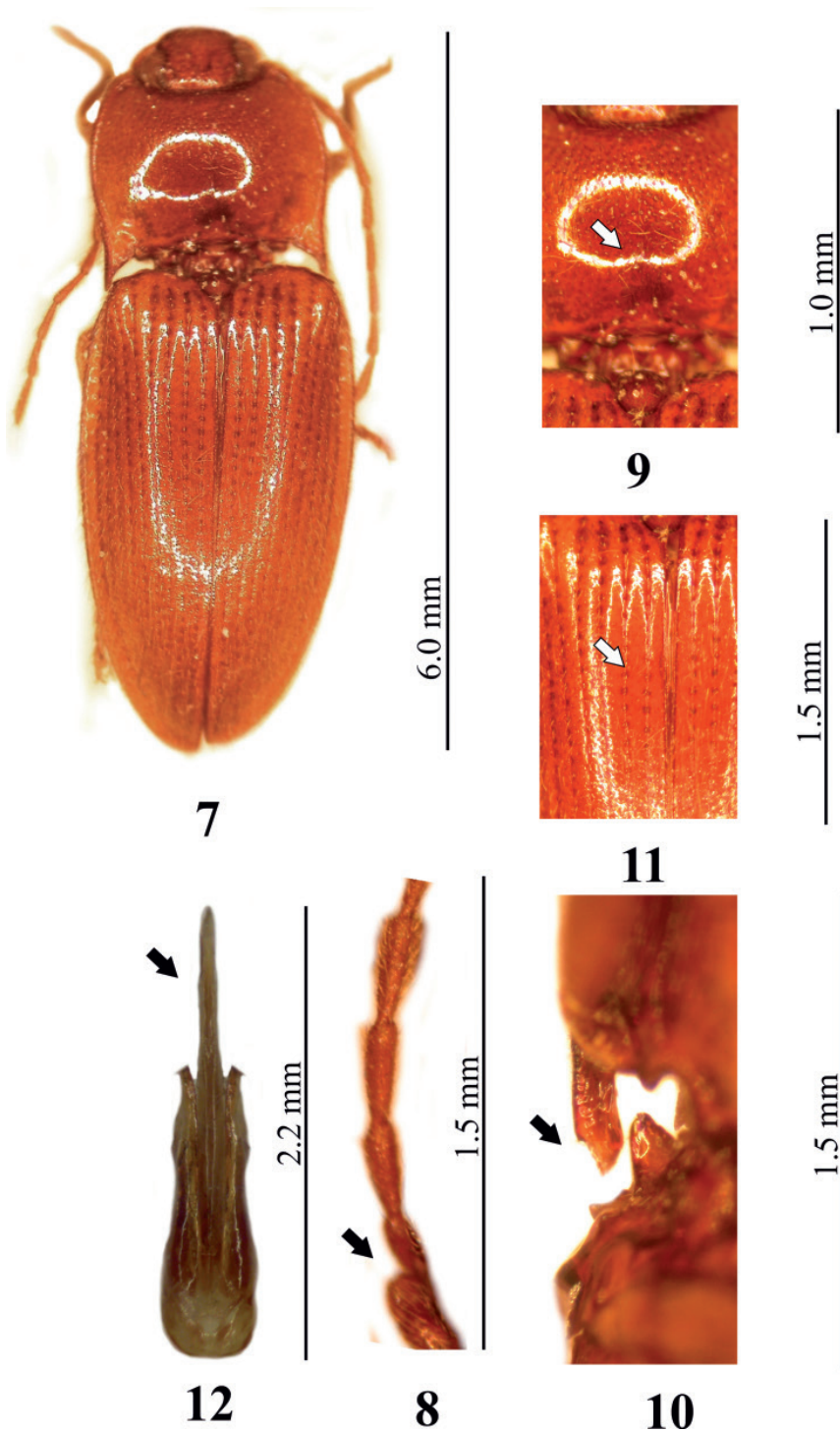
Females are unknown.

Morphology of larva is unknown.

Differential diagnosis. *Csikia telnovi* n. sp. is in close relation to *P. dimatoides* Szombathy, 1910 from Vietnam, but can easily be distinguished from this species by the smaller body, lighter yellow color, the two thorns centrally on prosternal apophysis and by the extraordinary form of aedeagus.

Etymology. The name of the new species refers to the name of my esteemed colleague, Dr. D. Telnov, Riga (Latvia).

Distribution. China: Guangxi and Guangdong provinces.



Figs. 7-12: Habitus and characteristics of *Csikia telnovi* n. sp.: **7** – Habitus, **8** – antennomeres 1-5, **9** – pronotal punctures, **10** – prosternal apophysis, **11** – elytral striae interstices, **12** – aedeagus.

Limniscus zhejiangensis n. sp. (Figs. 13–18)

Type locality. China: Zhejiang, Dapashan.

Type material. **Holotype** ♀ (CSV): China: Zhejiang, SE of Pan'an to Dapashan, 700–1000 m, 28°58'N/120°31'E, 16.V.2011, leg. H. Jatua.

Description of holotype. ♀: Semi-matt, subparallel, moderately vaulted species, with micro-reticulated integument and eleven-segmented, moniliform antennae; pronotum trapeziform; elytra subparallel; length: 10.3 mm, width: 2.5 mm; black, knees brownish, elytra yellow, sutural and lateral striae black, apically combined; pubescence silvery and brownish (fig. 13).

Head very smoothly declined from base to apex, occiput with a very shallow depression; lateral sides of frons distinctly vaulted above base of antennae, apically edged; cranium with very dense, deep and umbilicate punctures, interstices reduced to small and vaulted wrinkles; eyes spherical; last maxilla segment dolabriform; mandible bi-spicate apically; antennae moniliform from fourth antennomere on, just reaching pronotal apices; second and third antennomeres subglobular, as long as wide apically, fourth to tenth antennomeres subtrapezoidal, apical edges blunt, as long as wide apically and distinctly incrassate (fig. 14), last antennomere sub-oval, subapically constricted, disk with a shallow circular fovea covered with short, silvery setae (fig. 15).

Pronotum trapeziform, very slightly convex laterally, along median line distinctly longer than wide across posterior angles (length: 2.9 mm, width: 2.4 mm), conspicuously vaulted, subbasally with a tubercle on each side of median furrow; median furrow basally distinctly developed, becoming shallow at apical third; posterior angles straight, apically obtuse, with a short but distinctly vaulted, sharp carina (fig. 16); pronotal lateral edges just visible up to basal third; pronotal punctures extremely dense, oviform and umbilicate, with interstices reduced to small and vaulted wrinkles (fig. 17); pubescence bent from median line and from base to apex and lateral sides, sub-laterally at basal third distinctly swirled.

Pro-, meso- and metathorax densely and umbilicate punctured, with interstices reduced to small wrinkles; pubescence long and accumbent.

Mesosternal fossa sides gradually concave to body axis, declivous throughout length. Prosternal apophysis

centrally very slightly bent, with rough and umbilicate punctures, apex smoothly step-like, apically obtuse.

Sternites finely punctured and covered with bristly and accumbent hairs.

Scutellum lingulate, distinctly vaulted, medially carinate, apically arcuate; punctures dense and umbilicate, interstices reduced to small and vaulted wrinkles; pubescence dense, fine and declined from base to apex and to lateral sides.

Elytra subparallel, apex arcuate bent; base very slightly wider than pronotal posterior angles, distinctly depressed at scutellum, margins vaulted, shoulders prominent (winged species); elytral striae with deep and dense punctures without interstices, space between striae conspicuously micro-reticulated and transversely rugose (fig. 18); pubescence short, bristly, declined to apex and to lateral sides.

Alae are transparent and densely covered with very small, almost invisible blackish bristles.

Legs elongate, moderately long and thin; trochanter trapezoidal, distinctly separated from femur; longitudinally oval femur with a distal groove for accommodation of tibia with fine and short pubescence; tibiae covered with longer and protruding bristles; tarsomeres up to claws of decrescent length, ventrally with hardly visible, fine pubescence.

Mesosternal coxae are convex at basal third, tapering small to the lateral sides.

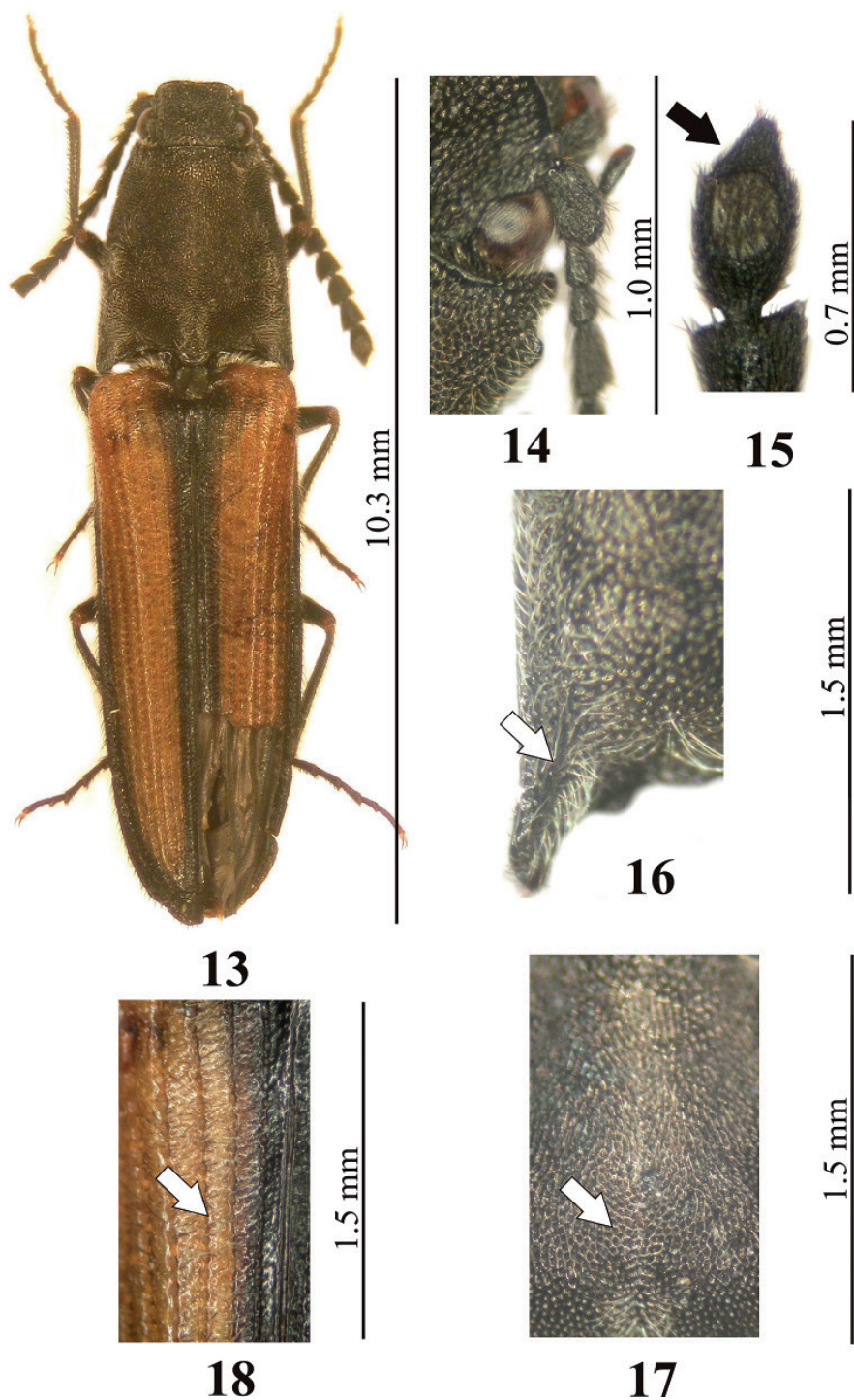
Males are unknown.

Morphology of larva is unknown.

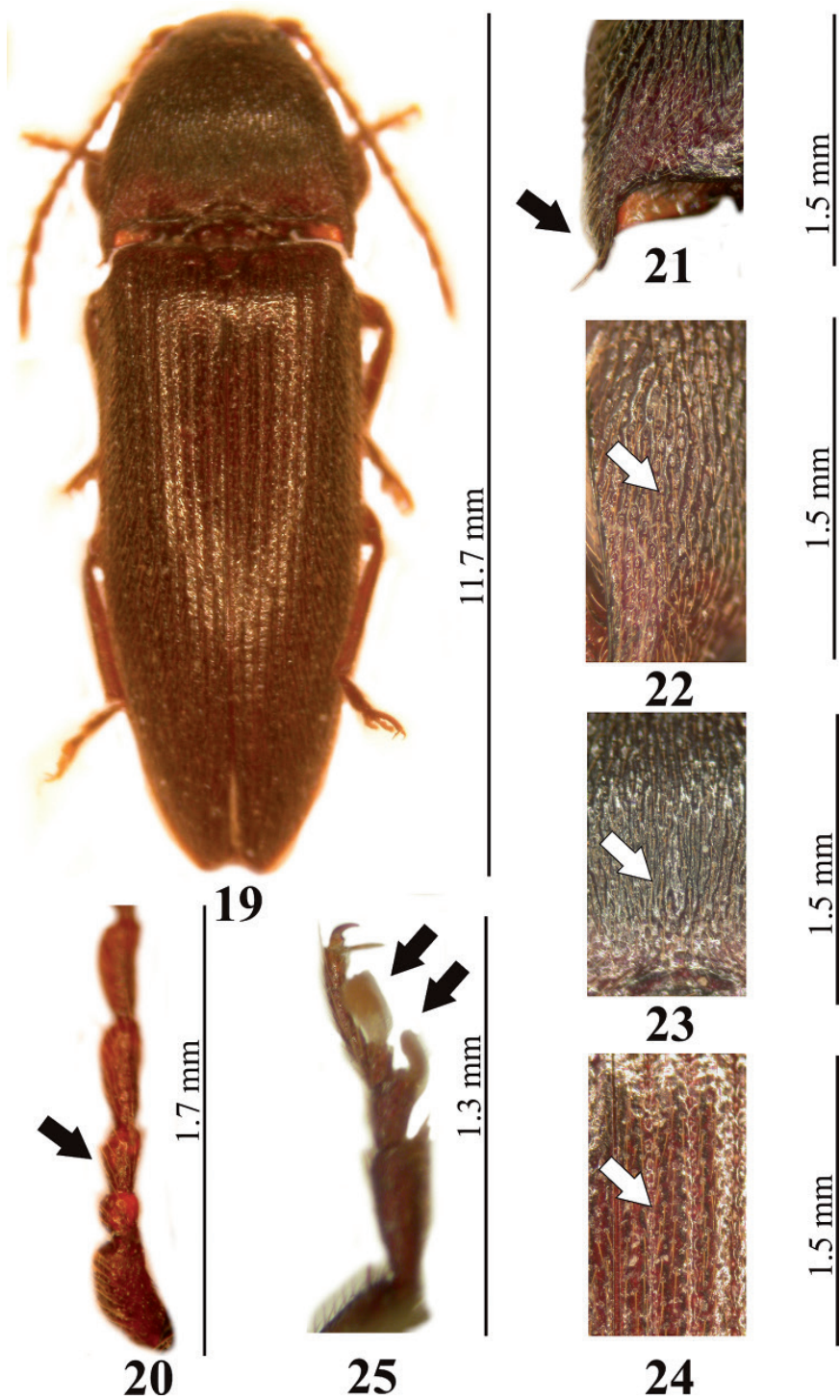
Differential diagnosis. *Limniscus zhejiangensis* n. sp. is in close relation to *L. shaanxiensis* Schimmel, 2006 from Shaanxi province in China, but can easily be distinguished from this species by the distinctly dense umbilicate punctures on pronotum, distinctly vaulted and sharp carina on pronotal hind angles, distinctly developed and long median furrow, tubercles bilaterally on each side of pronotal median furrow, distinctly incrassate antennomeres and by its sub-oval last antennomere which is subapically constricted and centrally with a circular fovea covered with small, silvery setae.

Etymology. The name of the new species refers to the name of the type locality.

Distribution. China: Zhejiang province.



Figs. 13–18: Habitus and characteristics of *Limoniscus zhejiangensis* n. sp.: **13** – Habitus, **14** – antennomeres 1–4, **15** – last antennomere, **16** – pronotal basal angle, **17** – pronotal punctures, **18** – elytral striae interstices.



Figs. 19–25: Habitus and characteristics of *Neopsephus caoyutangensis* n. sp.: 19 – Habitus, 20 – antennomeres 1–5, 21 – pronotal basal angle, 22 – pronotal punctures centrally, 23 – pronotal punctures basally, 24 – elytral striae interstices, 25 – tarsus with euplantulae.

Neopsephus caoyutangensis n. sp. (Figs. 19–25)

Type locality. China: Zhejiang, Caoyutang forest park.

Type material. **Holotype** ♀ (CSV): China: Zhejiang, Caoyutang forest park, 1100–1300 m, 27°55'N/119°39'E, 31.V.2010, leg. H. Jatua. **Paratype** ♀ (CSV): Same data as Holotype, leg. H. Jatua.

Description of holotype. ♀: Semi-matt, sub-oviform, moderately vaulted species, with eleven-segmented, filiform antennae; pronotum sub-trapezoidal; elytra sub-cuneate; length: 11.7 mm, width: 3.5 mm; castaneous, antennae, legs and base of pronotum reddish; pubescence yellowish, bristly and declined (fig. 19).

Head very smoothly declined from base to apex, occiput plain; lateral sides of frons distinctly vaulted above antennal base, apically edged; cranium with very dense, umbilicate punctures, interstices reduced to small, costiform vaulted wrinkles; eyes spherical; last maxilla segment dolabriform; mandible bi-spicate apically; antennae filiform from third antennomere on, exceeding pronotal apical edges for the length of the last two antennomeres; second antennomere sub-globular, as long as wide apically, two times longer than second, fourth antennomere longer than each of the following antennomeres and distinctly longer than second and third ones together (fig. 20), last antennomere longitudinally fusiform.

Pronotum sub-trapezoidal, along median line distinctly shorter than wide across posterior angles (length: 1.4 mm, width: 1.8 mm), disk moderately vaulted, without median furrow; pronotum distinctly convex laterally, posterior angles directed backward, apically acute (fig. 21); lateral edges of pronotum visible from base to center; pronotal punctures distinctly umbilicate and dense, interstices centrally reduced to small wrinkles (fig. 22), basally costiform vaulted (fig. 23); pubescence declined, directed from anterior margin to base and to lateral sides.

Pro-, meso- and metathorax dense and umbilicate punctured, interstices half to once their diameter; pubescence shorter than dorsally and adjacent.

Mesosternal fossa sides gradually concave to body axis, declivous throughout length.

Prosternal apophysis distinctly convex, apically bi-spicate.

Sternites distinctly punctured and covered with bristly and adjacent setae.

Scutellum lingulate, plain, apically straight, basally arcuate; punctures distant and simple, interstices once to twice their diameter; pubescence fine, distant and protruding from base to apex and to lateral sides.

Elytra sub-cuneate from base to apex, arcuate bent apically; base as wide as pronotal posterior angles, very slightly depressed at scutellum, margins vaulted, shoulders prominent (winged species); surface with a vague micro-reticulation and distinctly deep elytral striae punctures, interstices distinctly small (fig. 24); pubescence declined to apex and to lateral sides.

Alae are transparent and densely covered with very small, almost invisible blackish bristles.

Legs elongate, moderately long and thin; trochanter trapezoidal, distinctly separated from femur; longitudinally oval femur with a distal groove for accommodation of tibia with fine and longer pubescence; tibiae covered with longer and protruding bristles; tarsomeres up to claws of decrescent length, first tarsomeres longer than the following three together, ventrally with hardly visible, fine pubescence, second and third tarsomeres ventrally with distinctly developed trapezoidal euplantulae (fig. 25), that of third tarsomeres slightly longer than that of second.

Mesosternal coxae are convex at basal third, tapering small to the lateral sides.

Males are unknown.

Morphology of larva is unknown.

Differential diagnosis. *Neopsephus caoyutangensis* n. sp. is in close relation to *N. turnai* Schimmel, 2007 from Hubei province in China, but can easily be distinguished from this species by the darker color, shorter antennae and by the conspicuously costiform vaulted interstices of pronotal punctures.

Etymology. The name of the new species refers to the name of the type locality.

Distribution. China: Zhejiang province.

Neopsephus zhejiangensis n. sp. (Figs. 26–30)

Type locality. China: Zhejiang, Caoyutang forest park.

Type material. **Holotype** ♂ (CSV): China: Zhejiang, Caoyutang forest park, 1100–1300 m, 27°55'N/119°39'E, 31.V.2010, leg. H. Jatua. **Paratype** ♀ (CSV): China: Jianxi, Jinggang Shan to Ciping, 2.–14.VI.1994, leg. E. Jendek & O. Šauša.

Description of holotype. ♂: Semi-matt, sub-oviform, moderately vaulted species, with eleven-segmented,

filiform antennae; pronotum sub-trapezoidal; elytra sub-cuneate; length: 8.2 mm, width: 2.3 mm; reddish brown, antennae, legs and base of pronotum yellowish; pubescence yellowish, bristly and declined (fig. 26).

Head very smoothly declined from base to apex, occiput plain; lateral sides of frons distinctly vaulted above antennae base, apically edged; cranium with very dense, umbilicate punctures, interstices reduced to small and vaulted wrinkles; eyes spherical; last maxilla segment dolabriform; mandible bi-spicate apically; antennae filiform from third antennomere on, exceeding pronotal apical edges for the length of the last three antennomeres; second antennomere sub-globular, as long as wide apically, two times longer than second, fourth antennomere longer than each of the following antennomeres and distinctly longer than second and third ones together, last antennomere longitudinally fusiform.

Pronotum sub-trapezoidal, distinctly convex laterally, along median line distinctly shorter than wide across posterior angles (length: 1.8 mm, width: 2.3 mm), disk moderately vaulted, posterior angles directed backward, apically acute (fig. 27); pronotum without median furrow; pronotal lateral edges visible from base to center; pronotal punctures oviform, distinctly umbilicate and dense, interstices half to once their diameter (fig. 28); pubescence declined, directed from anterior margin to base and to lateral sides.

Punctures on pro-, meso- and metathorax dense and umbilicate, interstices half to once their diameter; pubescence shorter than dorsally and adjacent.

Mesosternal fossa sides gradually concave to body axis, declivous throughout length.

Prosternal apophysis distinctly convex, apically bi-spicate.

Sternites distinctly punctured and covered with bristly and adjacent setae.

Scutellum lingulate, plain, apically straight, basally arcuate; punctures distant and simple, interstices once to twice their diameter; pubescence fine, distant and protruding from base to apex and to lateral sides.

Elytra sub-cuneate from base to apex, arcuate bent apically; base as wide as pronotal posterior angles, very slightly depressed at scutellum, margins vaulted, shoulders prominent (winged species); surface with a vague micro-reticulation and elytral striae punctures distinctly deep with very small interstices (fig. 29); pubescence declined to apex and to lateral sides.

Alae are transparent and densely covered with very small, almost invisible blackish bristles.

Legs elongate, moderately long and thin; trochanter trapezoidal, distinctly separated from femur; longitudinally oval femur with a distal groove for accommodation of tibia with fine and longer pubescence; tibiae covered with longer and protruding bristles; tarsomeres up to claws of decrescent length, first tarsomeres longer than the following three together, ventrally with hardly visible, fine pubescence, second and third tarsomeres ventrally with distinctly developed trapezoidal euplantulae, that of third tarsomeres slightly longer than that of second ones.

Aedeagus with an elongate, apically acute median lobe which exceeding apices of parameres conspicuously; parameres triangular, lateral apexes spine-like (fig. 30). Mesosternal coxae are convex at basal third, tapering small to the lateral sides.

Female (Paratype) have slightly bigger body, antennae are slightly shorter than in the Male (Holotype).

Morphology of larva is unknown.

Differential diagnosis. *Neopsephus zhejiangensis* n. sp. is in close relation to *N. hubeiensis* Schimmel, 2007 from Hubei province in China, but can easily be distinguished from this species by the much shorter body, shorter antennae, lighter color, more dense pronotal punctures and by the form of aedeagus.

Etymology. The name of the new species refers to the name of the type locality.

Distribution. China: Zhejiang province.

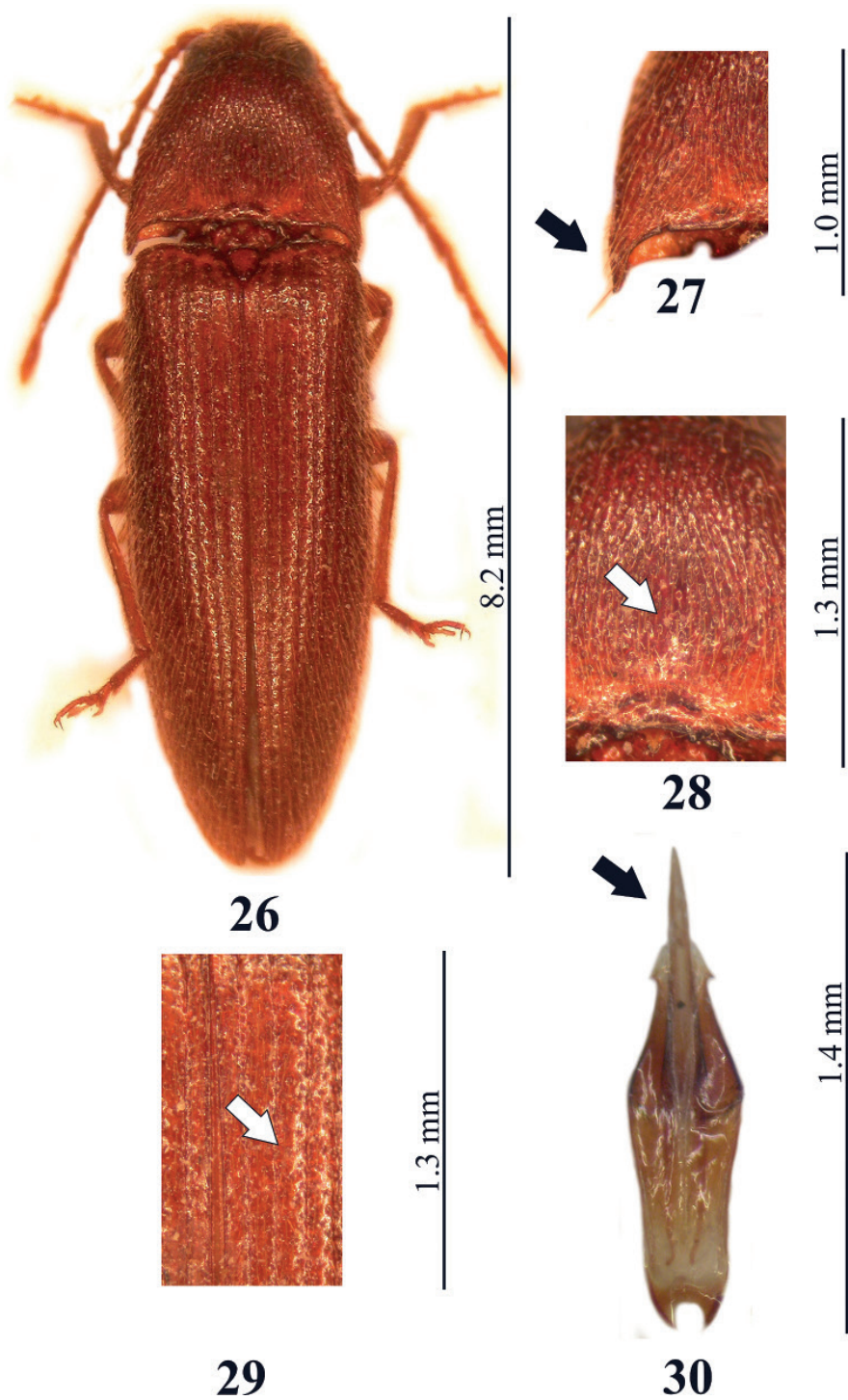
Penia xianhepingensis n. sp. (Figs. 31–35)

Type locality. China: Guizhou prov., Xianheping.

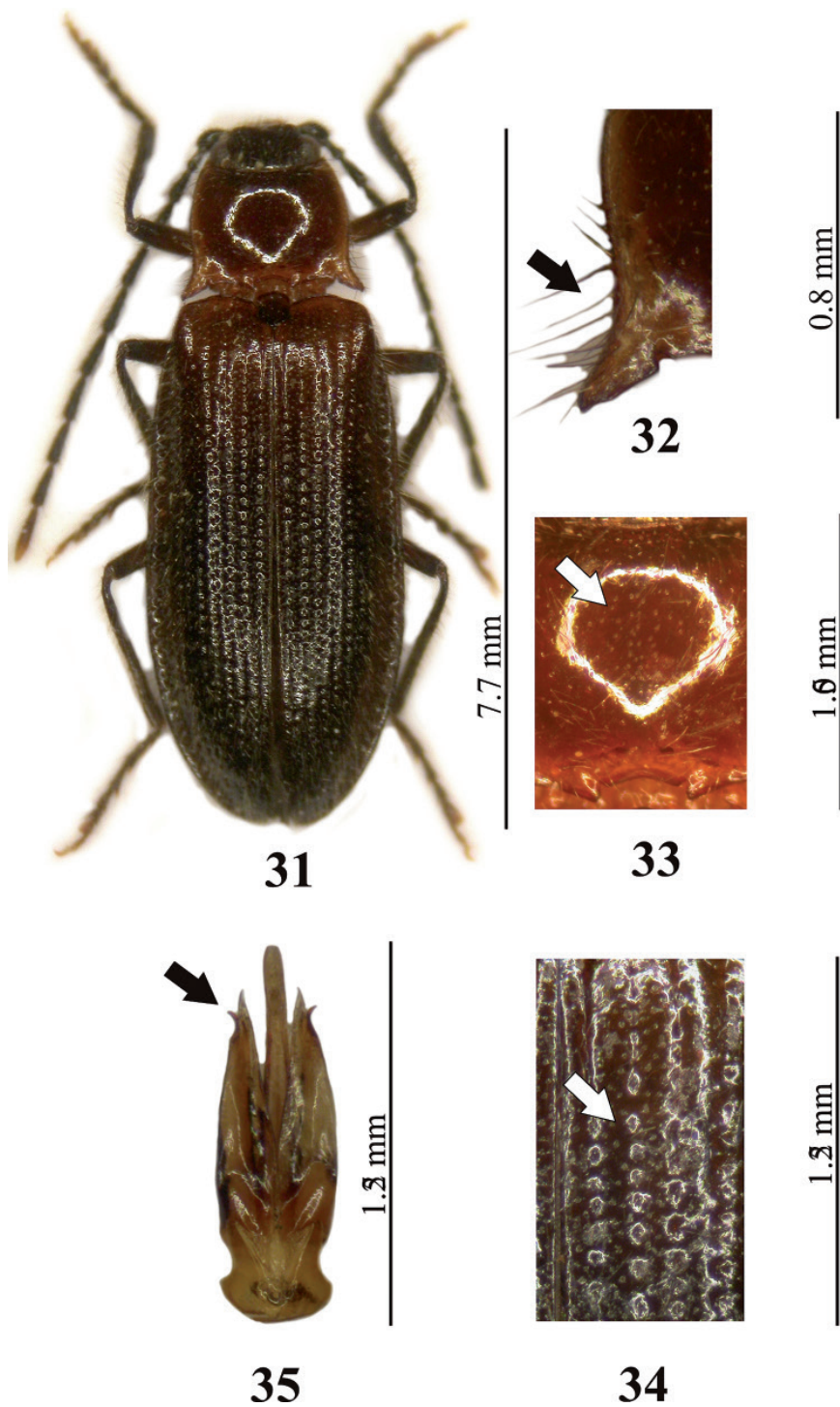
Type material. **Holotype** ♂ (CSV): China: Guizhou prov., Xianheping nat. res., 1300–1700 m, 24°59'N/105°36'E, 24.V.2014, leg. H. Jatua.

Description of holotype. ♂: Vernicose, sub-oviform, applanate species, with eleven-segmented, filiform, long antennae; pronotum widened campaniform; elytra subparallel-elliptical; surface high glossy; length: 7.7 mm, width: 2.5 mm; brownish, pronotum and base of elytra yellowish, antennae and apex of elytra as well as femora blackish; pubescence yellow and brownish, long and protruding (fig. 31).

Head very smoothly declined from base to apex, occiput with a very shallow depression; lateral sides of



Figs. 26–30: Habitus and characteristics of *Neopsephus zhejiangensis* n. sp.: 26 – Habitus, 27 – pronotal basal angle, 28 – pronotal punctures basally, 29 – elytral striae interstices, 30 – aedeagus.



Figs. 31–35: Habitus and characteristics of *Penia xianhepingensis* n. sp.: 31 – Habitus, 32 – pronotal basal angle, 33 – pronotal punctures centrally, 34 – elytral striae interstices, 35 – aedeagus.

frons distinctly vaulted above base of antennae, apically edged; cranium with very distant, simple punctures, interstices five to seven times their diameter; eyes spherical; last maxilla segment fusiform; mandible bi-spicate apically; antennae filiform from second antennomere on, exceeding pronotal apical edges for the length of the last six antennomeres; second antennomere two times longer than wide apically, third antennomere one and a half times longer than second, fourth and following antennomeres slightly longer than third, last antennomere longitudinally fusiform.

Pronotum widened campaniform, along median line distinctly shorter than wide across posterior angles (length: 3.0 mm, width: 3.5 mm), very slightly vaulted centrally, distinctly convex laterally, posterior angles apically acute divergent with very shallow carina (fig. 32); pronotum without median furrow; pronotal lateral edges totally visible from dorsal view; pronotal punctures simple and extremely distant, interstices irregularly, two to eight times their diameter (fig. 33); pubescence extremely long, protruding, directed from median line and from base to apex and lateral sides.

Pro-, meso- and metathorax distant and simple punctured, with interstices three to four times their diameter; pubescence shorter than dorsally and adjacent.

Mesosternal fossa sides gradually concave to body axis, declivous throughout length.

Prosternal apophysis distinctly concave and spine-like, apically acute.

Sternites finely punctured and covered with bristly and adjacent setae.

Scutellum lingulate, plain, apically and basally arcuate; punctures very distant and simple, interstices five to six times their diameter; pubescence fine, distant and protruding from base to apex and to lateral sides.

Elytra subparallel-elliptical from base to apex, arcuate bent apically; base very slightly wider than pronotal posterior angles, very slightly depressed at scutellum, margins vaulted, shoulders prominent (winged species); surface high glossy with a very vague micro-reticulation and distinctly deep elytral striae punctures with very small interstices (fig. 34); pubescence extremely long and protruding to apex and to lateral sides.

Alae are transparent and densely covered with very small, almost invisible blackish bristles.

Legs elongate, moderately long and thin; trochanter trapezoidal, distinctly separated from femur; longitu-

dinally oval femur with a distal groove for accommodation of tibia with fine and longer pubescence; tibiae covered with longer and protruding bristles; tarsomeres up to claws of decrescent length, ventrally with hardly visible, fine pubescence, fourth and fifth tarsomeres ventrally with distinctly developed trapezoidal euplantulae, that of fifth tarsomeres distinctly longer than that of fourth ones.

Mesosternal coxae are convex at basal third, tapering small to the lateral sides.

Aedeagus sub-oviform, median lobe subparallel, exceeding apices of parameres conspicuously, apices of parameres bi-spicate, apically acute, laterally bent (fig. 35).

Females are unknown.

Morphology of larva is unknown.

Differential diagnosis. *Penia xianhepingensis* n. sp. is in close relation to *P. dolini* Schimmel, 1998 from Guizhou province in China, but can easily be distinguished from this species by the smaller body, less widened pronotum, longer antennae, different color and by the form of aedeagus.

Etymology. The name of the new species refers to the name of the type locality.

Distribution. China: Guizhou province.

Discussion

The publication of the *Limoniscus zhejiangensis* n. sp. is the first of an Elaterid-specimen which possess a shallow circular fovea centrally on the last antennomere. The surface of the antennae of the specimen is covered with shorter blackish setae, the apex of the antennomeres are covered with protruding longer and bristly setae. The pubescence of the mentioned fovea is completely different and is densely covered with small, declined, distally directed silvery setae. Most probably, these setae constitute the extra-cuticle parts of sensory plates which function as receptor. Undoubtedly, this characteristic is an evolutionary adaption to the environment in which the specimens of this species living and point to a different form of perception, compared with species missing such a faculty of perception. The function of this interesting characteristic is unknown and needs to be investigated in more detail and separately. However, the form of the setae in the fovea of the last antennomere points to a possibly auditory sense

or to a mechanically-sensory function which could be in close coherence to the movement behavior of the species.

The external characteristics and habitus appearances of the species *Penia dolini* Schimmel, 1998 and *P. xianhepingensis* n. sp. are almost identical. These two species just differing in the characteristics mentioned above. Also, the mentioned specimens occurring in close neighbouring habitats: Leigongshan (*P. dolini*) and Xianheping nature reserve (*P. xianhepingensis* n. sp.) in the Guizhou province in China and perhaps the populations of the two species overlap. Besides, the specimens of the two species have been collected in a similar altitude and they seem to be occupants of the same natural zones: 1200–1900 m a.s.l. (*P. dolini*) and 1300–1700 m a.s.l. (*P. xianhepingensis* n. sp.). Based on these facts the two mentioned species can systematically be taken as such of a common phylogenetic basic group. Their speciation may be based on the founder effect and on sympatric mechanisms resulting in species separation.

Acknowledgements

I would like to express my sincere thanks for supporting this study to the following persons: Mr. H. Jatua, Prague (Czech Republic), Dr. E. Jendek and Dr. S. Šauša, Bratislava (Slovakia), Dr. D. Telnov, Dzidriņas (Latvia) for providing material for study and for my collection. Thanks also to my friends and colleagues Mr. H. Arimoto, Osaka (Japan), Prof. Dr. G. Platia, Gatteo (Italy), Dr. S. Jiang, and Dr. C. Xiaoqing, Shenzhen Polytechnic, Shenzhen (China) for providing valuable information about Chinese Elaterid-material used in this study. Many thanks also to Mr. M. Hartmann, Naturkundemuseum Erfurt, for the editorial works on this paper.

References

- CASTELNAU, F. L. LAPORTE DE (1835): Études entomologiques, ou descriptions d'insectes nouveaux sur la synonymie. – Revue d'Entomologie **3**: 157–181.
- KISHII, T. (1990): Taiwanese Elateridae collected by Mr. M. Yagi, with Descriptions of some New Species (Coleoptera). – Entomological Revue of Japan **45** (1): 11–27.
- REITTER, E. (1905): Bestimmungstabellen der europäischen Coleopteren, 56. Heft, Elateridae, Elaterini, Subtribus: Athouina aus der

paläarktischen Fauna. – Verhandlungen des naturforschenden Vereins in Brünn **43**: 1–122.

- SCHIMMEL, R. (1998): Neue und wenig bekannte Elateriden sowie eine neue Gattung, *Acumenator* n. gen. aus Südostasien (Insecta: Coleoptera, Elateridae). – Mitteilungen POLLICHIA **85**: 235–259.
- (2006): Neue *Ampedus*-, *Limoniscus*-, *Pachyderes*-, *Pectocera*- und *Pengamethes*-Arten aus China, Malaysia, Indonesien und Myanmar (Insecta: Coleoptera, Elateridae). – Veröffentlichungen des Naturkundemuseums Erfurt **25**: 241–259.
- (2007): Neue Elateriden aus der Orientalischen Region (Insecta: Coleoptera, Elateridae). – Mitteilungen POLLICHIA **93**: 179–201.

Author's address:

Rainer Schimmel
 Wiesenstraße 6
 D-66957 Vinningen, Germany
 E-mail: rainer.schimmel@gmx.de

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Veröffentlichungen des Naturkundemuseums Erfurt \(in Folge VERNATE\)](#)

Jahr/Year: 2015

Band/Volume: [34](#)

Autor(en)/Author(s): Schimmel Rainer

Artikel/Article: [New species of the genera Csikia, Limoniscus, Neopsephus and Penia from China \(Insecta: Coleoptera: Elateridae\) 285-298](#)