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● The description of a new species, *Sinopanamomus crypticus* sp. nov., representing the second species of the subfamily Leiestinae in China (Coleoptera: Endomychidae)

Hong-Liang SHI

College of Forestry, Beijing Forestry University, Beijing 100083, China;

<https://orcid.org/0000-0002-9989-5830>; shihl@bjfu.edu.cn

Abstract: The subfamily Leiestinae (Endomychidae) included only seven genera and fifteen species worldwide. In the present work, a new species *Sinopanamomus crypticus* sp. nov. is described from the Gaoligong mountains (Lushui city: Pianma pass) of Yunnan Province, China. This is the second known species of the genus, as well as the second record of the subfamily Leiestinae from China.

Keywords: China, Endomychidae, new species, Oriental Region

● 隆脊伪瓢虫亚科 Leiestinae 于中国的第二次发现暨一新种之描述：遁华隆脊伪瓢虫 *Sinopanamomus crypticus* sp. nov. (鞘翅目：伪瓢虫科)

史宏亮

林学院，北京林业大学，北京 100083，中国

摘要：隆脊伪瓢虫亚科 Leiestinae 此前全世界已知仅 7 属 15 种。本文描述了采自云南高黎贡山的一新种：遁华隆脊伪瓢虫 *Sinopanamomus crypticus* sp. nov.，模式产地为泸水市片马垭口。该新种是该属中所描述的第二个物种，也是该亚科于中国的第二次发现。

关键词：中国，伪瓢虫科，新种，东洋区

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● Introduction

The subfamily Leiestinae, a relatively small group within the family Endomychidae, exhibits the following distinctive characteristics: mesotrochantin concealed; mesosternum bicarinate with intercoxal process boat-shaped; and the presence of three pairs of pubescent pits located anteriorly, posteriorly, and laterally to the mesocoxae on the mesosternum and metasternum (Tomaszewska 2000a).

Tomaszewska (2000a) conducted a comprehensive and systematic revision of this subfamily, identifying six genera and thirteen species at that time. Subsequently, Tomaszewska (2015) described a species of the genus *Panamomus* from Japan, and Esser (2019) described a new genus and a new species from Yunnan, China. Thus, this subfamily comprises a total of seven genera and fifteen species worldwide (Shockley et al. 2009; Tomaszewska 2015; Esser 2019). Among them, three genera are distributed in North America, two are endemic to Japan, one has a disjunct distribution ranging from Japan to Europe, and the last genus, *Sinopanamomus* Esser, 2019, is previously known only by a single species occurring in Yunnan, China.

In the current study, I am going to provide a detailed description of a rare and peculiar new species belonging to the genus *Sinopanamomus* Esser, which was discovered in the western part of Yunnan Province, China. This discovery increases the global species count of this subfamily to sixteen and represents the second species of this subfamily found in China.

● Material and methods

Specimen examined in this study were deposited in the Collection of Forest Entomology Laboratory, Beijing Forestry University, Beijing, China (CBFU).

Measurements and abbreviations are as follows: the width of head (HW) was measured across outer margin of eyes; the length of head (HL) was measured from the anterior margin of pronotum to apex of clypeus; the length of pronotum (PL) was measured along median line; the width of pronotum (PW) was measured along maximum width of pronotum; the length of elytra (EL) was measured along the suture; the width of elytra (EW) was measured across the widest point of closed elytra; the length of body (BL) was the linear distance from the apex of labrum to elytral sutural end. A1–A11 were abbreviated for antennomeres 1–11. Morphological terms were based on those used in Tomaszewska (2000a, 2000b). All images of habitus, external and male genitalia characters were taken by a Nikon SMZ-18 stereoscopic dissecting microscope fitted with a Nikon D7500 camera. For each final image, several photographs were taken at different focal planes and combined with Helicon Focus software to get one synthesized photograph.

● Taxonomy

Subfamily Leiestinae Thomson, 1863

Genus *Sinopanamomus* Esser, 2019

Sinopanamomus Esser, 2019: 929. **Type species:** *Sinopanamomus yunnanensis* Esser, 2019.

Diagnostic characters. Species of this genus are small-sized (BL = 2.6–3.1 mm), ovate and compact beetles. They have dark colored dorsal surface with vague pattern on elytra. This genus can be recognized among the subfamily by the combination of following important characteristics: dorsum pubescent; antennae simple in both sexes; terminal palpomere acuminate to apex; pronotum with deep basal sulci subparallelled to pronotal lateral margins; elytra with punctures not arranged in regular rows; hind wings reduced; prosternal process moderately broad, distinctly separating procoxae; mesosternum slightly longer than mesosternum; abdominal ventrite 1 slightly longer than three following ones together; male tibiae simple; male pro- and mesotarsomere 1 enlarged, with spongy pubescence ventrally; phallobase reduced, tegminal plate very large and sheath-shaped, parameres fused,

tegmenal strut paired, as long as parameres. All other known genera of the subfamily have the tegmenal strut conjoined apically, forming a sclerotized ring. However, *Sinopanmomus* is different from all the others by the tegmenal strut present as a pair of rod-shaped structure with their apices not conjoined.

Recognition and comparison to related genera. As indicated in the original description (Esser 2019), the genus *Sinopanmomus* is most similar to the Japanese genus, *Panamomus* Gorham, 1873. The main external differences between these two genera are on the pronotal basal sulci (basal sulci well-defined in *Sinopanmomus*, but hardly visible in *Panamomus*) and shape of terminal palpomeres (terminal palpomere acuminate in *Sinopanmomus*, as in Fig. 2B, cylindrical with slightly truncated apex in *Panamomus*). In addition to the above differences on external characters, I discovered that these two genera also have the following differences: (1) in *Sinopanmomus*, the tegmenal strut paired, apex not conjoined (Fig. 3D), whereas in *Panamomus*, the tegmenal strut ring-shaped; (2) in *Sinopanmomus*, the metatarsomeres 1–3 apically lobed beneath their following segments, their combined length (excluding apical lobe) equal to the length of tarsomere 4 (Fig. 2E), whereas in *Panamomus*, the metatarsomeres 1–3 not lobed apically, and their combined length much shorter than the length of tarsomere 4 (Tomaszewska 2015: Fig. 7).

For the prosternal process moderately broad, distinctly separating procoxae, the genus *Sinopanmomus* is also similar to other two Nearctic genera, *Phymaphora* Newman and *Stethorhanis* Blaisdell. *Sinopanmomus* is different from *Phymaphora* by the hind wings reduced, antennae and tibiae not modified in males, parameres fused, and tegmenal strut not ring-shaped; and different from *Stethorhanis* by the tibiae not modified in males, pro- and mesotarsi enlarged in males, ventrite 1 longer than three following ones together, and tegmenal strut not ring-shaped. An improved key to separate *Sinopanmomus* from similar genera in the subfamily Leiestinae is present below, modified from Tomaszewska (2000a).

Species of *Sinopanmomus* are pubescent, dark colored and small sized beetles, and might be confused with some species of different families belonging to Cucujoidea or Coccinelloidea for the first glance. *Sinopanmomus* species can be recognized from other similar families by a somewhat more compact and stout habitus, and by a set of distinguishing characters for Leiestinae: mesosternum bicarinate between coxae (Fig. 2A); mesosternum and metasternum with three pairs of pubescent pits, before, behind and lateral to the mesocoxae.

Habitat. Species of the genus *Sinopanmomus* are small and aptera beetles, inhabiting in leaf debris under closed forest. The holotype of the present new species *S. crypticus* was collected by pitfall traps on very thick debris layers under a highly closed mixed forest in elevation of 2980 m from the western slope of Gaoligong mountains. The types of *S. yunnanensis* were collected by sifting leaf litter and various debris in misted forest in elevation between 1990–2400 m.

Key to genera of Leiestinae, modified from Tomaszewska (2000a: 67)

1. Prosternal process very narrow and short, procoxae contiguous or almost so other genera of Leiestinae
Prosternal process moderately broad, distinctly separating procoxae 2
2. Metasternum distinctly shorter than metasternum; all tibiae modified in males, angulate, denticulate, or dilated; elytra with very minute puncture only visible on cleared specimens; Nearctic species 3
Metasternum only slightly shorter than metasternum; tibiae simple in both sexes; elytra with distinct punctures; Asian species 4
3. Hind wings well-developed; antennal club modified in males; larger species (BL = 3.5–4.5 mm)
..... *Phymaphora*
Hind wings reduced, non-functional; antennae simple clavate in males; smaller species (BL = 2.3–2.6 mm)
..... *Stethorhanis*

4. Pronotum with a pair of well-defined basal sulci, their outer border clearly carinate; terminal palpomere acuminate to apex, apex not truncate; metatarsomere 4 in similar length of combined tarsomeres 1–3, China (Yunnan).....*Sinopanamomus*
 Pronotal basal sulci hardly visible, without well-defined outer border; terminal palpomere cylindrical, apex slightly truncate; metatarsomere 4 about in half length of combined tarsomeres 1–3, Japan*Panamomus*

***Sinopanamomus crypticus* sp. nov.** 遁华隆脊伪瓢虫

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Figs 1–3

Type material. Holotype: ♂ (CBFU): “Yunnan, Nujiang pref., Lushui county, 3km west of Pianma pass, 2980m, N25.9808, E98.6613. pitfall trap; mixed forest; 2024.VI.8; HL Shi, C Wang, WQ Yin & JH Chen lgt.”.

Diagnostic characters. The new species is recognizable among this subfamily for the combination of following characters: Body ovate, compact and stout, with vague brown pattern on elytra and pronotum; prosternal process moderately broad, distinctly separating procoxae; PW/PL = 1.3, with deep basal sulci; elytra pubescence, with distinct punctures not arranged in rows, sutural striae ending near apical third of elytra; hind wings reduced; all tibiae not modified in males; penis slender and curved, apex round-truncated in lateral view.

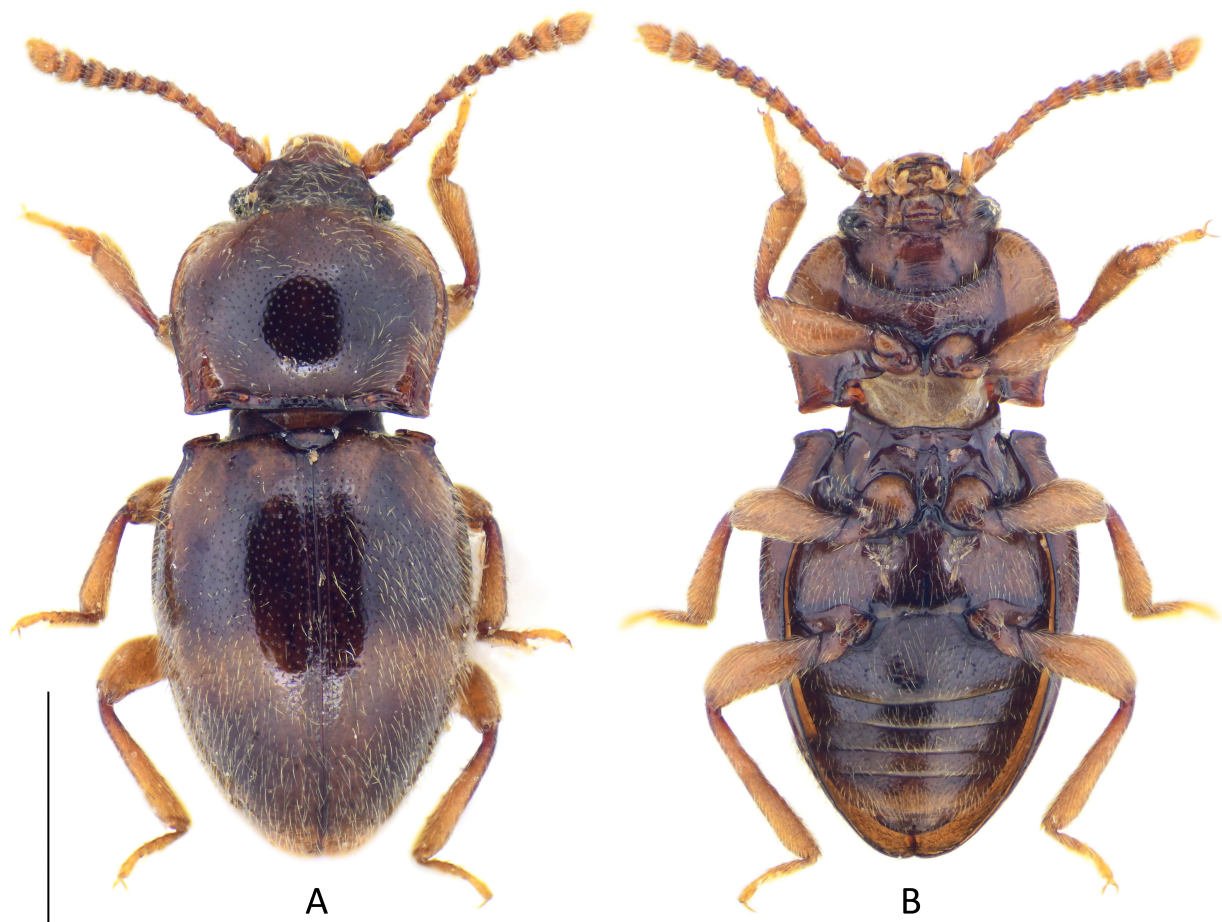


FIGURE 1. *Sinopanamomus crypticus* sp. nov.: **A** dorsal habitus **B** ventral habitus. Scale bar = 1.0 mm.



FIGURE 2. *Sinopanamomus crypticus* sp. nov.: **A** mesosternite **B** mouthparts, ventral view **C** right eye and tempora **D** left antenna **E** right metatarsus **F** right mesotarsus **G** right protarsus. Scale bar = 0.2 mm.

Comparison. Compared with the only known species within this genus, *S. yunnanensis* Esser, the new species can be readily differentiated by the slightly larger size, less stout body form, different pattern on elytra, and apex of penis longer, thicker, nearly symmetrically round-truncated in lateral view. Their differences are elaborated as below: (1) The general shape of penis similar in both species, but the apex much longer and thicker in *S. crypticus* sp. nov., and the extreme apex nearly symmetrically round-truncated in lateral view, but in *S. yunnanensis*, the apex shorter and narrower, and the extreme apex more pointed, slightly declined to the ventral surface; (2) in *S. crypticus* sp. nov., elytra pattern with more light region than the dark region, apical half of elytra nearly light colored with lateral sides slightly darkened, but in *S. yunnanensis*, elytra with much less light region, elytra with semicircular light pattern along apex; (3) elytra longer in *S. crypticus* sp. nov., EL/EW about 1.3, but much shorter in *S. yunnanensis* with EL/EW about 1.1 (measured from the habitus in original description); (4) pronotum slightly narrower in *S. crypticus* sp. nov., PW/PL about 1.3, but wider in *S. yunnanensis* with PW/PL about 1.4; (5) antennae slightly slender in *S. crypticus* sp. nov.; (6) BL is 3.1 mm in *S. crypticus* sp. nov., but slightly smaller (2.6 mm) in *S. yunnanensis*.

Description. BL = 3.1 mm, maximum width before middle of elytra, EW = 1.4 mm. Dorsum largely dark brown, with vague light brown pattern on elytra and pronotum (Fig. 1A): the peripheries of pronotum somewhat lighter than the disc, elytra light brown on regions near scutellum and shoulder, apical half of elytra largely light brown, slightly darker on outer-apical regions. Antennae, mouthparts and legs yellowish brown, distinctly lighter than dorsum; ventral surface reddish brown, nearly black on prosternal process, mesosternal process, and border of metasternite; abdominal ventrites 1–4 dark brown, the terminal one light brown.

Head small, HW = 0.72 mm, HL = 0.46 mm; dorsally pubescent, without distinct puncture or microsculpture on vertex; eyes small and strongly prominent, coarsely faceted; tempora not tumid behind eyes. Antennae clavate (Fig. 2D), with 3-segments loose club; scape stout, slightly longer than width, A4 slightly shorter than A3 and A5, A6–A8 globular, A9 slightly narrower than A10, A10 slightly wider than length; A11 wide with rounded apex, slightly asymmetric; length of A1–A11 (mm): 0.13/ 0.12/ 0.11/ 0.095/ 0.105/ 0.08/ 0.085/ 0.08/ 0.095/ 0.105/ 0.13. Mandibles bifid on apex; terminal maxillary palpomere acuminate, apex not truncated, more than twice length of penultimate one; terminal labial palpomere acuminate, in similar length of penultimate one (Fig. 2B).

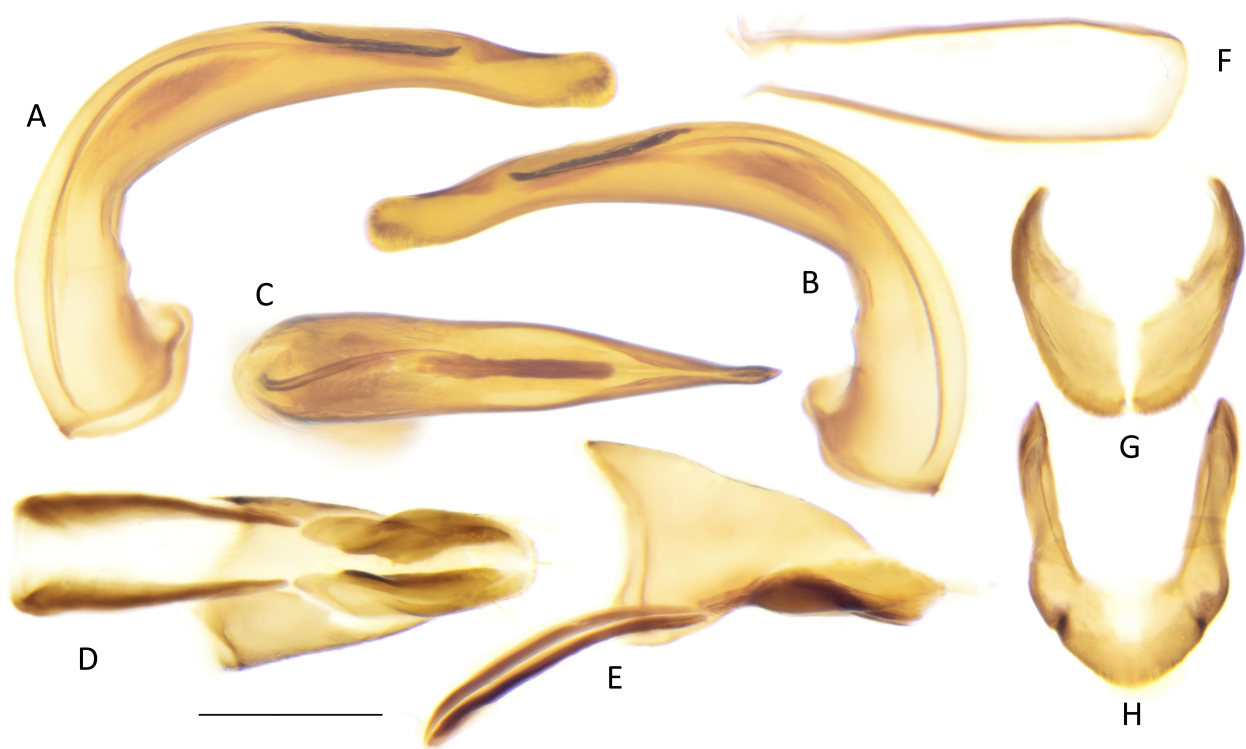


FIGURE 3. Male genitalia of *Sinopanamomus crypticus* sp. nov.: **A** penis, left lateral view **B** penis, right lateral view **C** penis, dorsal view **D** tegmen, ventral view **E** tegmen, lateral view **F** sternite IX **G** sternite VIII **H** tergite VIII. Scale bar = 0.2 mm.

Pronotum oval, disc strongly convex, densely punctate and pubescence, punctures coarser on central region, without visible microsculpture; PL = 0.9 mm, PW = 1.2 mm, greatest width a little beyond middle. Anterior margin weakly protruded at middle, anterior angles widely rounded; basal margin distinctly bordered, straight nearly its full length, slightly bent backward near posterior angles; lateral margins evenly curved on anterior half, nearly straight before posterior angles, well bordered and not crenulate; posterior angles right-angled, weakly pointed out. Lateral channels equally wide along the full length of lateral margins; a pair of deep basal sulci present near posterior angles, about one-fourth length of pronotum, their inner margin faintly defined, outer margin well defined by a sharp carinate which paralleled to lateral margins; a very deep and narrow basal channel along basal border between two basal sulci.

Elytra ovate and short, widest before midpoint, gradually narrowed to apex; EL/EW = 1.3. Disc strongly convex, densely punctate and pubescence, punctures not arranged in rows; surface without microsculpture. Elytra basal border sharply ridged, humerus with large denticle and callosity; basal region anterior to basal border strongly depressed and covered behind posterior margin of pronotum, with very strong transversal microsculpture on the basal region and mesonotum. Sutural striae reaching elytra base, gradually shallowed posteriorly, ending near apical third of elytra. Elytral reflexed border narrow but entire; epipleuron very wide near elytra humerus, gradually narrowed to apex, nearly entire. Scutellar shield semicircular, width about 2.2 times as length.

Ventral side. Prosternal process narrow, baculate with obtuse apex, distinctly separate procoxae, extending to posterior margin of procoxae. Mesosternum bicarinate between mesocoxae, with a pair of pubescence pits before mesocoxae; mesocoxae narrowly separated, mesosternal process about 0.65 as wide as coxal diameter. Metasternum short, only slightly longer than mesosternum, with two pairs of pubescence pits behind and lateral to mesocoxae. Abdominal ventrite 1 longer than others, longer than three following ones together, and shorter than four following ones together; ventrite 5 (sternite VII) slightly shortened, apex of sternite VIII exposed.

Legs. Tibiae without modification in males. Tarsomeres (Figs 2E, F, G) 4-4-4, segment 3 smallest; pro- and mesotarsi with tarsomere 1 strongly dilated in males, with ventral spongy pubescence, tarsomeres 2–3 bilobed, tarsomere 4 simple, slightly shorter than three rest ones together; metatarsi with tarsomeres 1–3 distinctly lobed apically, lobes of tarsomeres 2–3 in similar length as themselves, tarsomeres 4 in similar length of three rest ones together.

Male terminalia. Sternite VIII (Fig. 3G) completely divided, apex round-truncated; tergite VIII (Fig. 3H) with a pair of long basal struts, apex slightly projected, with a pair of sclerotized patches on each side. Tegmen (Figs 3D–E) with large tegminal plate, sheath-shaped, about half length of penis; phallobase reduced; parameres fused, with shallow and wide ventral protruding, apex setose; tegminal struts in similar length as tegminal plate, composed of a pair of paralleled rod-shaped structure with their apices not conjoined. Penis (Figs 3A–C) slender and curved, apex round-truncated in lateral view, laterally compressed; base of penis slightly dilated; endophallus composed of a long flagellum extended from base of penis to apical orifice, and a thick filiform chitinized piece on apical orifice.

Females unknown.

Etymology. The scientific name of the new species is derived from the Greek root “*crypt-*” which means hidden, referring to the secretive habits of this rare species under a highly closed forest in mid-high elevation in Western Yunnan.

Distribution. The new species is only known from the type locality in Pianma, of the south section of Gaoligong mountain range in Western Yunnan. The new species distributes about 500 km northwest to the other species in the genus *S. yunnanensis*.

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● Additional information

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