

**REDISCOVERY OF THE FAMILY SYNTELIIDAE (COLEOPTERA: HISTEROIDEA)
AND TWO NEW SPECIES FROM CHINA**

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Abstract

Over hundred years have passed since *Syntelia davidis* Fairmaire, 1889, was reported from China (Moupin, now called Baoxing), but it was neglected and not included in any subsequent works treating the beetle fauna of China. This paper reports the rediscovery of the family Synteliidae in China and describes two species, *Syntelia sinica* Zhou, **new species**, and *S. mazuri* Zhou, **new species**, based on specimens collected in Sichuan province. Taxonomic history and current status of this beetle family are briefly reviewed, and a key to Asian species is given. Type specimens are deposited in Institute of Zoology, Academia Sinica.

The Synteliidae is a small beetle family, including only the genus *Syntelia* Westwood. The type species is *S. indica* Westwood. Before this study, only 5 species had been discovered and described worldwide (Fairmaire 1889; Hetschko 1926; Kryzhanovskij and Reichardt 1976; Kryzhanovskij 1989; Ohara 1994), namely *S. davidis* Fairmaire from China, *S. indica* Westwood from oriental India, *S. mexicana* Westwood and *S. westwoodi* Salle from Mexico, and *S. histeroides* Lewis from Japan. These species were all published before the end of the nineteenth century. After a century of silence, we describe here two species, *S. sinica* Zhou, **new species**, and *S. mazuri* Zhou, **new species**. They were collected in Southwest China (Sichuan). This is also the first time discovery of synteliid species from China since A. David (Fairmaire 1889).

Though *Syntelia davidis* Fairmaire was reported more than a hundred years ago, it was not known to most taxonomists and neglected by in subsequent taxonomic works (Hetschko 1926). This species was not included in the "Catalogue of Chinese Insects" (Wu 1937). The only exception is Kryzhanovskij and Reichardt (1976), who mentioned the species briefly but did not include Fairmaire (1889) in the reference list. According to the original text, the type of this species was in the collection of "A. David, coll. du Muséum" and is now kept in "Muséum national d'Histoire naturelle, Laboratoire d'Entomologie, Paris." Colleagues from the Museum cannot find the type (Hélène Perrin, pers. comm.), so it cannot be examined. Thus, *S. davidis* Fairmaire is not included in the key to species. Diagnosis and comparisons were made based on the original description.

Distributions of species within the Synteliidae are disjunct and seem to be limited to isolated points across long distances, in Mexico, Japan, China and India (Fairmaire 1889; Hetschko 1926; Lewis 1882; Ohara 1994; Salle 1873; Westwood 1864). Zoo-geographical patterns like this can be compared to the similar ones for Amphizoidae living in nearby streams (Roughley *et al.* 1998). These patterns can provide meaningful implications to study geological history and beetle evolution. But first, we should make it clear the gaps are reality in nature and not due to insufficient investigation. Our study in this paper contributes new data to fill gaps in the knowledge of synteliid distribution.

Lewis (1882) erected the family Synteliidae to accommodate two genera, *Syntelia* Westwood and *Sphaerites* Duftschmidt. Synteliidae was accepted as an independent

family but not including *Sphaerites* Duftschmidt, which is treated as an independent but closely related family to the Synteliidae (Crowson 1955, 1981; Hetschko 1926; Kryzhanovskij and Reichardt 1976; Kryzhanovskij 1989; Lawrence and Britton 1991; Ohara 1994).

Synteliidae has been placed in different superfamilies that represent different directions of beetle evolution (Crowson 1955, 1981; Ganglbauer 1903; Kolbe 1901; Lawrence and Britton 1991; Ohara 1994). The most commonly accepted opinion is to consider Synteliidae as a primitive family group of Histeroidea near Sphaeritidae and Histeridae (including Niponiinae) (Crowson 1955, 1981; Jeannel and Paulian 1944; Ohara 1994). This idea was originally proposed by Sharp and Muir (1912) and adopted currently by most histeroid systematists (e.g., Ohara 1994). Histeroidea is included in the Staphyliniform lineage, which is one of the three lineages of Polyphaga within the Coleoptera and is often divided into 3 superfamilies: the aquatic Hydrophiloidea and the terrestrial Histeroidea and Staphylinoidea (Crowson 1981; Ohara 1994). Lawrence and Newton (1982) suggested the inclusion of Synteliidae, Sphaeritidae and Histeridae in the Hydrophiloidea (excluding Hydraenidae), but some other authors treat them as an independent superfamily (Ohara 1994).

Kolbe (1903, 1908) proposed a group that he called Actinorrhabda to include Lucanidae, Synteliidae and Scarabaeidae, and a group he named Haplogastra to include Staphylinoidea and Actinorrhabda. This implied that Synteliidae was allied to Scarabaeidae, as a linkage connecting Staphylinoidea to Scarabaeidae. This idea originally appeared in Lewis (1882). Ganglbauer (1903) argued that the Synteliidae was closely related to Cucujidae. Both these families and many others were included in the Diversicornia, a high rank group below Polyphaga. Similarly, some other authors included Synteliidae in Clavicornia (Handlirsch 1925) or in Cucujoidea (Cai 1973). These suggestions have largely been abandoned (Crowson 1981; Kryzhanovskij 1989; Lawrence and Britton 1991; Ohara 1994), especially after synteliid larvae were discovered and studied by Mamayev (1976) and Nikitskii (1976). However, the problems revealed by some early works based on morphological observations (Ganglbauer 1903; Kolbe 1903, 1908; Lewis 1882) have not been solved completely and are still open for further study. The descriptions of the two new species from China contribute new data and may promote studies in this direction.

The terminology of the striae and other surface features follows Helava (1978) and Ohara and Nakane (1986). Eight striae on each elytron are named, from outside to inside, as external subhumeral stria, internal subhumeral stria, stria one to five, and sutural stria. This study was based on the specimens in the collection of Institute of Zoology, Academia Sinica, Beijing. The type specimens are deposited in the same institute.

Family Synteliidae Lewis

Synteliidae Lewis 1882:137–138 (excl. genus *Sphaerites* Duftschmidt); Sharp 1891:438; 1899:229; Ganglbauer 1899:415; 1903:282, 305; Kolbe 1901:134–135; 1908:121–122; Arrow 1909:484; Handlirsch in Schröder 1925:527, 596; Hetschko 1926:13; Nikitskii 1976:531–537; Kryzhanovskij and Reichardt 1976:414; Ohara 1994:61.

Type genus: *Syntelia* Westwood, 1864.

Genus *Syntelia* Westwood

Syntelia Westwood 1864:11; Reitter 1875(1876):18; Sharp 1891:439; Kolbe 1901:108; Jakobson 1911–1915:869; Hetschko 1926:13; Yuasa 1930:253; Kryzhanovskij and Reichardt 1976:414; Ohara 1994:61.

Type species: *Syntelia indica* Westwood, 1864.

Key to Asian Species of *Syntelia* Westwood

- 1 Elytron with only one deep and long dorsal stria, the others indicated by slight, fine puncture lines *S. indica* Westwood
- 1' Elytron with two or more dorsal striae deep and long 2
- 2 Elytron with two long dorsal striae, the third dorsal stria reduced, short and fine, no longer than 1/3 elytral length, *S. sinica* Zhou, **new species**
- 2' Elytron with three long dorsal striae, the third dorsal stria longer than 1/2 elytral length 3
- 3 The third dorsal stria of elytra nearly complete, only shortly interrupted on basal 1/6, all dorsal striae equally extended apically *S. mazuri* Zhou, **new species**
- 3' Elytron with more than three dorsal striae, striae deep and thick, the third dorsal stria interrupted in the middle, the fifth short and present only in the middle *S. histeroides* Lewis

Syntelia sinica Zhou, **new species**
(Fig. 1)

Diagnosis. This species is relatively small and slender, with only two long dorsal striae and without a slight impression near posterior angle of pronotum, allowing it to be easily distinguished from other congeners including *S. davidis* Fairmaire.

Description. Male. Body 12.1 mm long (between apex of head and apex of pygidium); head 3.2 mm long; pronotum 3.4 mm long; elytron 5.8 mm long (from humerus to apex). Body 4.0 mm wide across middle of elytra; head 3.0 mm wide; pronotum 3.9 mm wide. Body stout, near cylindrical, slightly depressed; cuticle black with a slight metallic shine above. Palpi, ventral parts of legs, and tarsi rufopiceous.

Head vertex evenly convex, dorsal surface glabrous, punctures of different sizes irregularly clustered around eyes and obviously more dense in the frontal and lateral regions. Front margin nearly straight, with a marginal stria triangularly curved backwards, posteriorly and medial to it is a short longitudinal fossa that fades posteriorly, not extending beyond base of antennae. Maxillae robust, with three small blunt teeth internally, surface punctures small and regular. Eyes shorter than genae, laterally not protruding beyond head outline. Ventral surface less glabrous as dorsal and more closely punctured, punctation on submentum less dense and irregular than that on postgenae. Antennae geniculate and clubbed, joint 1 (scape) robust and longer than the others, 2 and 3 longer than the five following ones, the apical half of joint 8 and 9–11 combined to form an oval but slightly depressed club, with a length-to-wide ratio 1.38. Joint 1 to 8 glabrous, 9 to 11 dull and covered with golden pubescence and a few long setae laterally.

Pronotum glabrous, not punctured except along marginal stria, which extends continuously along lateral and posterior margins and curves inwards to form a triangular fossa behind each anterior angle. Anterior margin densely fringed with equal short golden setae, slightly arcuate medially and strongly curved on sides, forming large, projecting anterior angles. Posterior angles rounded and not distinct. Sides convergent posteriorly, with lateral margins narrowed medially and thickened in anterior one-half.

Scutellum oblong between elytra, with a length to width ratio of 1/3, slightly constricted between elytral basal margins; its basal part normally concealed under pronotum, broadly triangular and covered with coarse setigerous punctures in anterior portion.

Elytra nearly rectangular. External subhumeral stria complete, with punctures mostly coarse and deep, but smaller basally and apically; apically abbreviated before hind margin and basally united with marginal stria under humerus. Subhumeral stria only indicated by a few punctures distributed irregularly on elytral apex. First dorsal stria nearly complete, but abbreviated on basal 1/5 (humeral area). Second dorsal stria longer than others, its basal end united with basal marginal stria, forming the medial boundary of humeral area. Third dorsal stria short, no longer than 1/3 of elytral length, basally abbreviated before elytral midpoint. Fourth and fifth dorsal striae absent, only a rudiment of puncture lines present on apex and on base. Sutural stria complete, its basal end united with basal marginal stria and its apical end connected with hind marginal stria. Epipleura long and

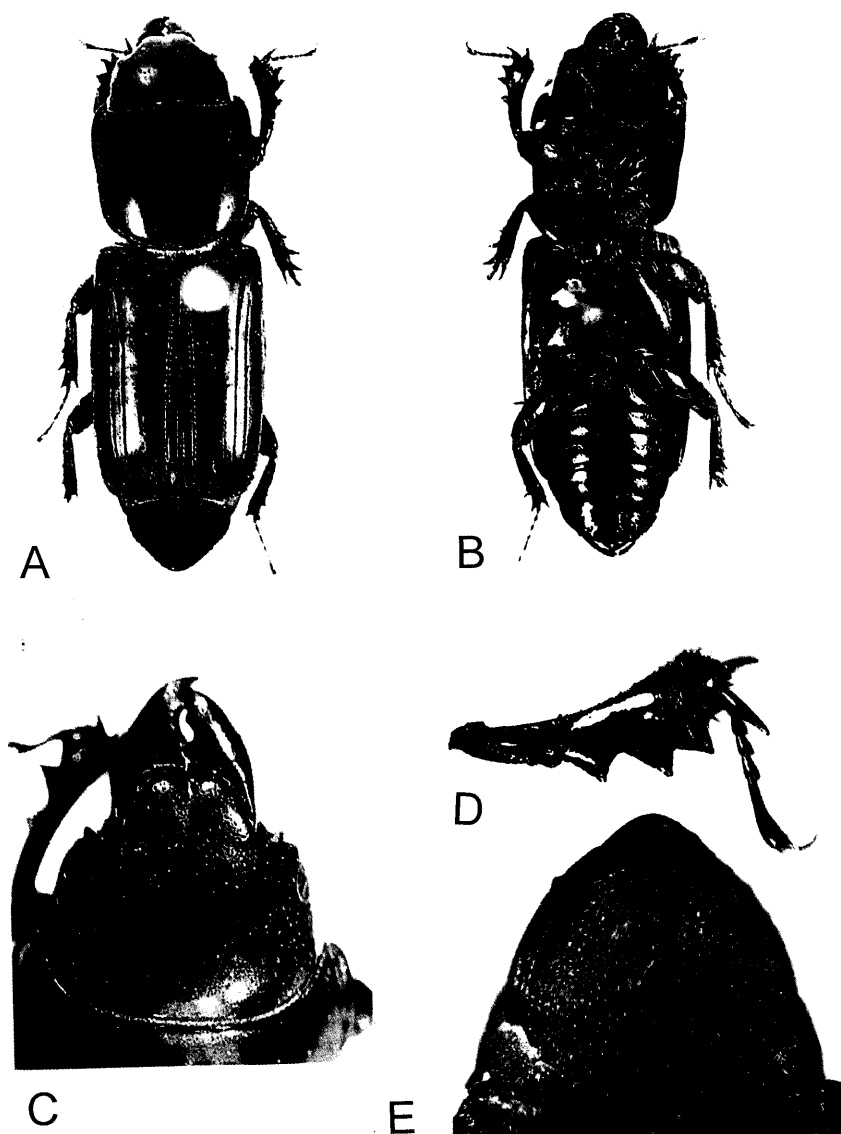


Fig. 1. *Syntelia sinica* Zhou, new species. A) Dorsal habitus; B) ventral habitus; C) head; D) right protibia, dorsal view; E) pygidium.

extending to elytral apex, basal 1/5 broadened under humeral area, where a row of setigerous punctures are present, sometimes irregularly scattered; the setae long and stout, golden-colored.

Pygidium depressed near each side, the basal end of the depression broadened and not attaining anterior angle; outside the depression, a carina extends from base to apex and unites with the opposite one to form distinct edge; surface densely punctured, intervals microsculptured.

Prosternal lobe impunctate, evenly elevated medially; anterior margin fringed with long golden setae and extended forwards to form a median triangle. *Prosternum* coarsely punctured, punctures united and transversely rugose before procoxae, punctation less dense laterally and even less dense toward anterior angles. Broad medial keel impunctate, interrupted in the posterior half between procoxae, anteriorly elongate, bearing a pair of long setae in anterior 1/3, posteriorly with oblong disc smooth and glabrous. *Hypomeron* coarsely punctured. *Mesosternum* punctures close and dense, forming coarse, rugose surface; moderately convex medially, and slightly concave in posterior 1/3; posterior margin narrow and connected to metasternum between mesocoxae; margin elevated around mesocoxae. *Metasternum* mainly impunctate, but densely punctured around anterior angle and lateral margins. A deep, punctured, triangular fossa extends behind anterior margin; medial longitudinal suture shallow but distinct. Along medial posterior edge the margin is separated by a stria extending from metasternum and is expanded slightly in the middle between metacoxae. *Abdominal sterna* coarsely and densely punctured, punctation finer and less dense medially.

Protibia expanded, outer margin with four denticles, apex with two long but unequal ones; dorsal surface near the outer denticles with a tarsal groove limited by a short row of brown setae internally; ventral surface with a long, sinuate, longitudinal keel sinuate and setiferous punctures along the internal margin. Outer margin of *mesotibia* with three denticles and *metatibia* with two.

Female equal or slightly smaller in body size, dorsal surface relatively dull.

Specimens Examined. *Holotype* ♂, CHINA: Sichuan Province, Heshui County (32°06'N, 102°49'E), 2,775 m, 23–26 July 2001, Xiao-dong Yu and Hong-zhang Zhou collected. **Paratypes.** 2 ♀♀, same as holotype.

Etymology. The species epithet is from Latin word *sinicus*, meaning “of China.”

Remarks. Specimens were collected in a forest habitat with mixed broad-leaved and coniferous trees using pitfall traps.

Syntelia mazuri Zhou, new species

(Fig. 2)

Diagnosis. This species is relatively large and stout, with three long dorsal striae on each elytron, so that we can distinguish it from *S. sinica* Zhou, new species and *S. davidis* Fairmaire. The main difference from *S. histeroideis* Lewis is the sculpture patterns and the length of the third dorsal stria of elytra: the new species has a longer third dorsal stria that is only interrupted on basal 1/6 near the humerus.

Description. Female. Body 17.0 mm long (between apex of head and apex of pygidium); head 5.2 mm long, pronotum 4.2 mm long, elytron 7.4 mm long (from humerus to apex). Body 5.1 mm wide between elytral humeri; head 4.1 mm wide; pronotum 4.9 mm wide. Body large, stout and near cylindrical, slightly depressed, with black and shining cuticle. Palpi, ventral parts of legs, and tarsi rufopiceous.

Head vertex evenly convex, dorsal surface glabrous, punctures much less dense and scattered laterally, microscopic punctures irregularly distributed. Front margin truncate and nearly straight, with a marginal stria triangularly curved posteriorly. A medial longitudinal fossa extends gradually posteriorly, fading, but extending beyond bases of antennae. Maxillae robust, with three short blunt teeth medially, surface punctation smaller and more regular than that on vertex. Eyes shorter than genae, laterally not protruding beyond head outline. Ventral surface less glabrous than dorsal and more closely punctured, but punctation on submentum less dense and more irregular than that on postgenae. Antennae geniculate and clubbed, joint 1 (scape) robust and longer than the others, 2 and 3 longer than the five following ones, apical one-half of joint 8 and 9–11 combined to form an oval but depressed club, length to width ratio 1.22. Joint 1 to 8 glabrous, 9 to 11 dull and covered with golden pubescence and a few long lateral setae.

Pronotum glabrous, not punctured except along marginal stria, which extends continuously along lateral and posterior margins and curves inwards to form a triangular fossa behind each anterior angle. Punctures along the stria larger and more irregular anteriorly. Anterior margin densely fringed with equal short golden setae, slightly arcuate medially and strongly arcuate laterally, forming large, projecting anterior angles. Posterior angles rounded and indistinct. Sides convergent posteriorly, with lateral margins narrowed medially and thickened in anterior one-half.

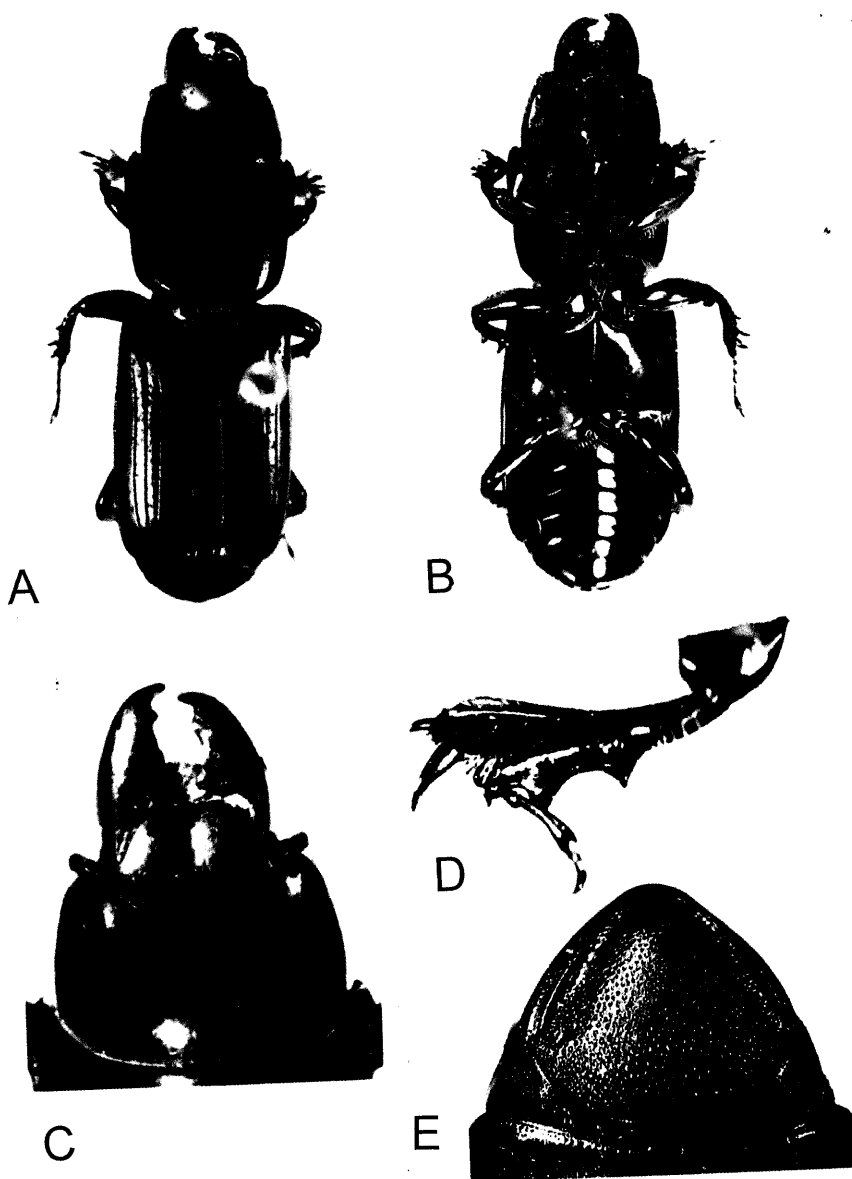


Fig. 2. *Syntelia mazuri* Zhou, new species. A) Dorsal habitus; B) ventral habitus; C) head; D) left protibia, dorsal view; E) pygidium.

Scutellum oblong apically between elytra, length to width ratio 0.29, slightly constricted between elytral basal margins, disc glabrous, basal portion normally concealed beneath pronotum broadly triangular and densely covered with coarse setigerous punctures.

Elytra nearly rectangular. Humeri slightly elevated and protruding anteriorly. External sub-humeral stria complete, with punctures coarse and deep in basal 2/3, basal end united with lateral

marginal stria under humerus, apical end slightly curved medially and not connected to hind marginal stria. Internal subhumeral stria only represented by a few punctures distributed irregularly on elytral apex. First dorsal stria nearly complete, but abbreviated on basal 1/5 (humeral area), its apical end inwardly sinuate. Second dorsal stria longer than the other dorsal striae, its basal end connected to basal marginal stria, forming the medial boundary of humeral area. Third dorsal stria long, nearly complete, but interrupted in basal 1/6. Fourth dorsal stria short, only apical 1/5 obvious, and a very short basal rudiment. Fifth dorsal stria nearly absent, only represented by a short line of small punctures on apex and, occasionally, base. Sutural stria complete, its basal end connected to basal marginal stria and its apical end united with hind marginal stria. Elytral apex punctured, dorsal striae not reaching hind margin. Epipleura long and extending to elytral apex, basal 1/5 broadened under humeral area, where setigerous punctures in two rows, the outer row longer than the inner row; the setae long and stout, golden-colored.

Pygidium depressed near each side, the basal end of the depression broadened and not attaining anterior angle; outside the depression, a carina extends from base to apex, uniting with the opposite one and forming a distinct edge; surface densely punctured, but less dense on disc.

Prosternal lobe impunctate, evenly elevated medially; anterior margin fringed with long golden setae and extending forwards to form a median triangle. *Prosternum* coarsely punctured, punctures united to form transverse rugulae before procoxae, punctation less dense laterally and even less toward anterior angles. Broad, median keel impunctate and interrupted in the posterior one-half between procoxae, anteriorly elongate, bearing a pair of long setae in anterior 1/3, the posterior part with oblong disc smooth and glabrous; posterior margin fringed with long golden setae. *Hypomeron* coarsely punctured. *Mesosternal* punctures more dense than on other ventral surfaces, coarse and rugose; moderately convex medially and slightly concave in posterior 1/3; posterior margin narrow and connected to metasternum between mesocoxae. *Metasternum* mostly impunctate, but densely punctured around the anterior angle and lateral margins. A deep, triangular, median fossa extends posteriorly between mesocoxae; median longitudinal suture distinct and deeper posteriorly; posterior margin interrupted by a stria from metasternum and medially slightly expanded between metacoxae. *Abdominal sterna* coarsely and densely punctate, except the medial portions of segments 2–3 and the hind one-half of the medial portion of segment 1; medial punctation of segment 5 small and sparse.

Protibia expanded and robust, outer margin with four stout denticles, apex with two long but unequal ones. Dorsal surface near the outer denticles with tarsal groove limited by a short row of brown setae intally; ventral surface with a long, sinuate, longitudinal keel and setigerous punctures along intal margin. Outer margin of *mesotibia* with three denticles and *metatibia* with two.

Specimens Examined. Holotype ♀. CHINA: Sichuan Province, Emei Mt. (27°01'N, 103°19'E), 1,800–1,900 m, 25 July 1957, You-cai Lu collected.

Etymology. Named for Dr. Slawomir Mazur, histeridologist from Warsaw Agricultural University, Poland.

Other Described Species of *Syntelia* Westwood

1. *Syntelia histeroides* Lewis, 1882

Syntelia histeroides Lewis, 1882:137–138; Redtenbacher 1886:216; Sharp and Muir 1912:511; Hetschko 1926:13; Yuasa 1930:257; Kryzhanovskij and Reichardt 1976:414; Hisamatsu 1985:219; Kryzhanovskij 1989:295; Ohara, 1994:61–65.

Material Examined. Two specimens from Japan, 1885, G. Lewis collected, in Hope Entomological Collections, Oxford University Museum of Natural History.

Distribution. Japan, Russia (Kuril Is.).

2. *Syntelia davidis* Fairmaire, 1889

Syntelia davidis Fairmaire, 1889:11–12.

Distribution. China (Moupin, now called Baoxing).

3. *Syntelia indica* Westwood, 1864

Syntelia indica Westwood, 1864:11; Hetschko 1926:13.

Material Examined. The type of the species (TYPECOL: 244, HOPE DEPT. OXFORD), borrowed from Hope Entomological Collections, Oxford University Museum of Natural History.

Distribution. East India.

4. *Syntelia mexicana* Westwood, 1864

Syntelia mexicana Westwood, 1864:11; Salle 1873:12; Reitter 1875 (1876):23; Sharp 1891:440; Hetschko 1926:13

Distribution. Mexico.

5. *Syntelia westwoodi* Salle, 1873

Syntelia westwoodi Salle, 1873:13; Sharp 1891:440; 1899:229; Hetschko 1926:13.

Distribution. Mexico.

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