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Revision of the New World *Syntelia* Westwood (Coleoptera: Histeroidea: Synteliidae) with description of two new species, key and checklist of the family

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Abstract. A review of the mesoamerican *Syntelia* (Coleoptera: Synteliidae) is provided along with the description of two new species: *S. undosa* sp. nov. from southern Guatemala and southeastern Mexico, and *S. tajumulcensis* sp. nov. from southwestern Guatemala. Redescriptions and new distribution and habitat data are presented for the two previously known Mexican species. A complete checklist and diagnostic key to North American species of *Syntelia* is provided as well as photographs of all described species of the family.

Keywords. Morphology, taxonomy, Central America, Mesoamerica.

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Introduction

Syntelia Westwood, 1864 is a seldom encountered genus including five Asian and two Mexican species, all but two of which were described more than a century ago. A single fossil species was recently described from the mid-Cretaceous Kachin amber (Jiang & Wang 2021). The genus was originally placed in the family Trogossitidae Latreille, 1802 (Westwood 1864; Reitter 1876; Kolibáč 2013), but subsequently moved by Lewis (1882) to a new family: Synteliidae Lewis, 1882, into which the genus *Sphaerites* Duftschmid, 1805 was also placed. Currently these two genera are treated as separate monotypic families (Synteliidae and Sphaeritidae Shuckard, 1839), that together with the extinct

Cretohisteridae Zhou, Caterino, Ślipiński & Cai, 2018 and the much larger Histeridae Gyllenhal, 1808, comprise the Histeroidea Gyllenhal, 1808, sensu Hansen (1997).

Phylogenetic affinities between *Syntelia* and the Histeridae were first suggested in the late 19th century by Lewis (1882) and Sharp (1891). This hypothesis has been consistently supported by numerous morphological studies (Crowson 1955, 1974; Lawrence & Newton 1982, 1995; Newton 1991; Newton & Thayer 1992; Hansen 1997; Beutel 1999; and Zhou *et al.* 2018) based on numerous character systems: wing venation (Forbes 1926; Kukalová-Peck & Lawrence 1993), wing folding pattern (Forbes 1926), procoxal structure (Hlavac 1975), the aedeagus (Sharp & Muir 1912), larval habitus, fusion of antennal and buccal foramina, reduction from three to two larval instars, and presence of first instar egg bursters on the abdomen (Mamaev 1974; Lawrence & Newton 1982).

Formal phylogenetic analyses that include examples of the family have also supported a monophyletic Histeroidea but resulted in conflicting topologies: most works based, at least partially, on morphological characters (Hansen 1997; Beutel 1999; Caterino & Vogler 2002) supported (Sphaeritidae + (Synteliidae + Histeridae)), while later and more robust studies, a majority of which were based solely on DNA data, resulted mostly in ((Sphaeritidae + Synteliidae) + Histeridae) topology (Hunt *et al.* 2007; Lawrence *et al.* 2011; Bocak *et al.* 2014; McKenna *et al.* 2015; Zhou *et al.* 2018). Caterino *et al.* (2005) supported both topologies. Recent phylogenomic study (Kusý *et al.* 2025) rejected Synteliidae as sister to Histeridae and equally supported ((Synteliidae + Sphaeritidae) + Histeridae) and (Synteliidae + (Sphaeritidae + Histeridae)). The recently described extinct family, Cretohisteridae known from Cretaceous fossil beds (Yixian Formation, China), has been placed as more closely allied to Histeridae, than to either the Sphaeritidae or Synteliidae (Zhou *et al.* 2018). The analyses of Kusý *et al.* (2025) dated the divergence time of Synteliidae as early Jurassic.

Most morphological and biological studies of Synteliidae have been based on *S. histeroides* Lewis, 1882, which is known from Japan and eastern Russia (Ôhara 1994; Saito 2022; Kikuchi & Ôhara 2025) and is the most commonly encountered member of the genus. This is the only species for which the larvae are described (Mamaev 1974; Newton 1991). A summary of the literature for the entire family was recently published by Newton (2016).

In this paper, we present new data on central Mexican *Syntelia* and describe two new species from high elevation pine forests of Guatemala and southeastern Mexico. We redescribe the two already known New World species. In addition, we provide a checklist of all known species of the genus, an identification key and some general comments on the family.

Material and methods

Specimens were borrowed from, or studied at, the following institutions (abbreviations in brackets in the text):

BMNH = Natural History Museum, London, England, UK
CNC = Canadian National Collection of Insects, Agriculture Canada, Ottawa, ON, Canada
CSCA = California State Collection of Arthropods, Sacramento, CA, USA
CZUG = Centro de Estudios en Zoología, Universidad de Guadalajara, Zapopan, Jalisco, Mexico
FMNH = Field Museum of Natural History, Chicago, IL, USA
JSPC = Jan Simon-Pražák's personal collection, Hradec Králové, Czech Republic
MEBHK = Museum of East Bohemia in Hradec Králové, Czech Republic
MCZ = Museum of Comparative Zoology, Harvard University, Cambridge, MA, USA
OSAC = Oregon State Arthropod Collection, Oregon State University, Corvallis, OR, USA
SDC = Sergei Dementyev's personal collection, Moscow, Russia
UASM = Strickland Entomological Museum, University of Alberta, Edmonton, AB, Canada

USNM = National Museum of Natural History, Washington, DC, USA
UVG = Universidad del Valle de Guatemala, Colleción de Artrópodos, Guatemala City, Guatemala
ZMHB = Museum für Naturkunde der Humboldt-Universität, Berlin, Germany

Photographs of *S. westwoodi* Sallé, 1873 and *S. mexicana* Westwood, 1864 were taken with a Canon EOS 6D in combination with a Canon MP-E65 1–5 × macro lens. Other habitus photos were taken with a Keyence VHX 7100. Terminology and nomenclature follow Newton (2016).

Results

Taxonomy

Class Insecta Linnaeus, 1758
Order Coleoptera Linnaeus, 1758
Suborder Polyphaga Emery, 1886
Infraorder Staphyliniformia Lameere, 1900
Superfamily Histeroidea Gyllenhaal, 1808
Family Synteliidae Lewis, 1882

Genus ***Syntelia*** Westwood, 1864

Genus diagnosis (also see Newton 2016)

As the sole genus within the family Synteliidae, Newton's (2016) detailed family-level characterization can serve as a thorough reference to a generic diagnosis.

Here we present a short summary focusing on easily viewed diagnostic features. Members of *Syntelia* are elongate in form and range in size from 10–35 mm in length and possess a heavily sclerotized, darkly pigmented cuticle, which may be shining, matt, or with a greenish/blue metallic sheen depending on the species. The body habitus is cylindriform, with a porrect or slightly declivous head that bears large prominent mandibles and 11-segmented, weakly geniculate, clubbed antennae. The pronotum is widest anteriorly, often distinctly trapezoidal in shape, and as in many wood-boring beetles, freely movable relative to the mesothorax. The elytra are elongate and apically truncate, exposing a heavily sclerotized triangular pygidium dorsally (abdominal tergite VII).

Members of *Syntelia* and some genera of Trogossitidae (e.g., *Temnoscheila* Westwood, 1830) and Lucanidae Latreille, 1804 (e.g., *Ceruchus* MacLeay, 1819) could potentially be mistaken for each other; however, *Syntelia* possesses larger more prominent mandibles, an exposed pygidium, and weakly geniculate antennae with a much more compact antennal club.

Syntelia also share similarities to some genera in the Histeridae. However, most hister beetles have two exposed abdominal tergites (not one as in *Syntelia*) and are generally less elongate and/or cylindriform in bodyform, especially those of similar size to *Syntelia,* and typically have pronota that are either wider posteriorly or parallel sided. Histerid body shape is more compact with closely fitted prothorax and mesothorax (well visible dorsally at the connection between pronotum and elytra).

Syntelia undosa sp. nov.
urn:lsid:zoobank.org:act:4016B225-5EBD-4F20-8E85-1AF40A297F98
Figs 1, 3A, C, E, 7, 8I

Diagnosis

The species resembles *S. mexicana.* It differs from it by the absence of metallic sheen, rugose dorsal head punctation, greatly enlarged apical maxillary palpomere, simple prosternal tubercle (bifid in *S. mexicana*), undulate elytral striation and smaller body size. It is most closely similar to *S. tajumulcensis* sp. nov.

from which it can be distinguished by smaller body size, denser punctation of pronotal disc and undulate elytral striae.

Etymology

This species is named for the symmetrically undulating elytra.

Type material

Holotype

GUATEMALA • ♂; [San Marcos], Volcán Tacaná, SE slope near Rancho San Antonio; [15.13° N, 92.10° W]; elev. 9000 ft; 27–28 Jul. 1972; G.E. Ball leg.; UASM.

Paratypes (5 specimens)

GUATEMALA • 1 ♂; El Progreso Cerro Pinalón, arriba de Los Albores; [15.05° N, 89.9° W]; Dec. 1995; Christopher J. Marshall leg.; OSAC. • 1 spec.; Sacatapequez, San Cristóbal el Bajo, Finca Pilar, Cerro Cucurucho; 14.51853° N, 90.69125° W; elev. 2600 m; 19 Nov. 2016; Monzon and Z. Falin leg.; MEBHK • 1 spec.; Sacatepequez, San Cristóbal El Bajo; [14.54° N, 90.72° W]; elev. 2400 m; 8 Feb. 2003; J. Rivera leg.; UVG.

MEXICO • 1 ♀; Chiapas, 8.6 mi. E of San Cristóbal, Route 190; [16.60° N, 92.53° W], elev. 8500–9000 ft; 30 Apr. 1966; G.E. Ball and D.R. Whitehead leg.; UASM • 1 spec.; same data as for preceding; CSCA.

Description

Habitus (Fig. 1). Body elongate (~12–16mm), piceous, subcylindrical with distinctly striate elytra, and large, prominent, heavily sclerotized, serrate mandibles.

Head. With clear dorsomedial longitudinal depression; dorsally with coarse, irregularly spaced punctures of variable size; punctures less dense dorsomedially and absent directly behind eyes (Figs 1C, 3C); ventral punctures shallower than that of dorsum but denser, each puncture bearing a single short seta (Fig. 3E). Clypeus emarginate anteriorly. Clypeolabral suture barely visible, labrum very small rounded anteriorly.

Antennae. 11-segmented, scape elongate, weakly geniculate, antennomeres 2–7 rounded, shining, with sparse setation; antennomeres 4–7 of similar size; eighth antennomere discoid, weakly cupuliform; terminal three antennomeres (9–11), tomentose, tightly associated, forming a large, almost symmetrical club.

Mandibles. Linear length from dorsal articulation to apical tip nearly equivalent to midline length of exposed head; molar region thin, covered with long, orange setation; mid- to apical internal edge raised, thickened and unevenly serrate; each mandible bearing 4–5 teeth; apices acuminate; entire mandible excavated ventrally, enclosing maxillae and labium; external lateral surface with punctation in basal, external corner.

Maxillae. Lacinia small, not easily viewed; galea elongate, curved and rounded, edges covered with dense, long, orange setae; maxillary palpus 4-segmented, terminal palpomere longest, approximately 1/6 as wide as long.

Labium. Mentum trapezoidal, minutely setose, anterolateral corners projecting forward slightly (Fig. 3D), anterior edge paler than remainder; prementum deeply notched medially, appearing as two separate pieces, each ligula margined with long, orange setae; palpiger fused to ligula; palpus 3-segmented, terminal palpomere greatly enlarged (Fig. 3D), elliptical, half as wide as long.

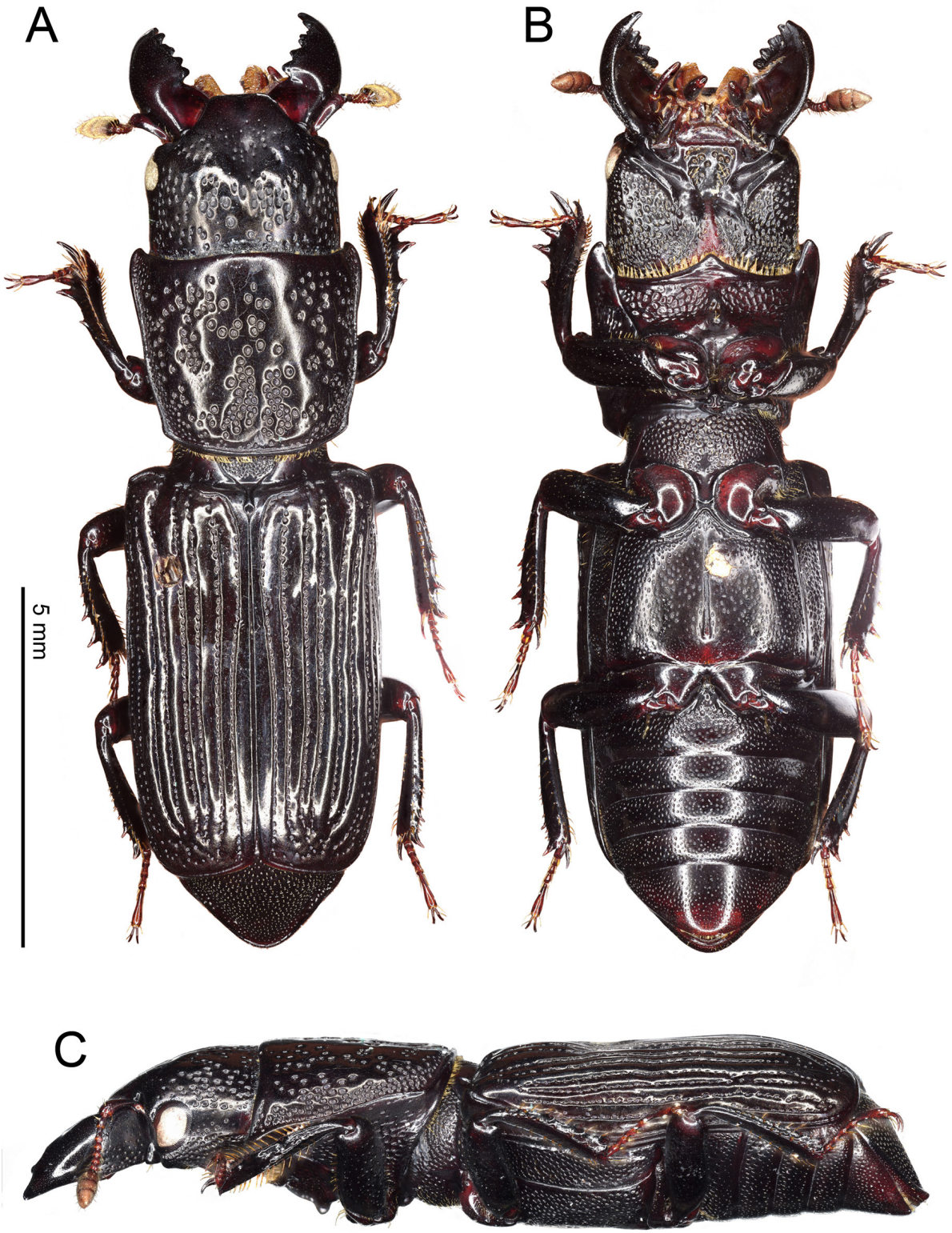


Fig. 1. *Syntelia undosa* sp. nov., paratype, MEBHK. **A**. Dorsal view. **B**. Ventral view. **C**. Lateral view.

Pronotum (Figs 1, 3). Elongate, trapezoid; moderately convex transversely; disc with irregular, deep punctures, primarily around midline of basal region but with several distinct groups of punctures in lateral discal space; lateral and posterior margin with punctate marginal groove which continues a short distance along anterior edge; hypomeron punctate except directly below lateral pronotal margin and in anterior-most angle.

Prosternum. Anterior edge prolonged medially into point; transverse groove behind anterior edge that is medially divided (Fig. 1B); dense, shallow, irregular punctures posterior to transverse groove; a central, prominent, ventrally directed tubercle with sparse setae situated between procoxae and transverse groove; procoxal cavities closed posteriorly.

Scutellum. Anteriorly shield-shaped and densely punctate, becoming greatly narrowed posteriorly, widening slightly again posteriorly (Figs 1, 3A).

Mesepimeron and mesepisternum. Broadly fused, suture only faintly visible; densely covered in setigerous punctures; mesocoxal cavities open laterally.

Mesoventrite. Anteriorly punctate, generally convex; mesoventral process medially concave, posteriorly rounded, truncate.

Elytron. Elongate; apically truncate, exposing abdominal segment VII; bearing 10 punctate striae; striae II–X terminate posteriorly prior to distal elytral edge; medial interstriae (I) continuing completely around apex of elytra joining an external marginal band that is wider anteriorly essentially forming a complete band around entire elytron; interstriae convex. Elytral surface with three weak longitudinal undulations giving the elytra a symmetrically wrinkled appearance and creating an illusion of 'wavy' striae (Fig. 3A–B; may be developed to a lesser extent in some specimens).

Metaventrite. Elongate, discal region with sparse punctures and with medial longitudinal sulcus, more pronounced posteriorly; lateral regions with setiferous punctures; metaventrite fusing anteriorly with mesoventrite between mesocoxae; pronounced 'Λ' shaped groove anteriorly between mesocoxae; posteriorly with short, faintly notched metacoxal process.

Abdomen. Tergite VII (pygidium) exposed, triangular shaped with rounded corners, weakly convex with upturned marginal edge, covered with dense, evenly spaced punctures; abdominal segments III–VI evenly punctate.

Legs. Protibia with three prominent teeth along the outer margin and two rows of setae along the inner edge (present in apical ⅔). A pair of prominent uneven protibial spurs present: – one twice the size of the other. Protarsal groove margins by a row of setae becoming longer apically. Profemur finely punctate. Procoxae nearly contiguous, moderately prominent and transverse. Mesotibia with three teeth and several rows of sparse setae. A pair of mesotibial spurs present. Mesofemur almost smooth, with few punctures anteriorly. Mesocoxae more widely separated, ovate. Metatibia as mesotibia, but only with two outer teeth and shorter spurs. Metafemur smooth. Metacoxae nearly contiguous, transverse, narrowing laterally to an anteriorly directed rounded point.

Aedeagus. Tri-lobed, narrowly elongate as illustrated in Figure 3H.

Biology

The specimens were collected in association with pine logs in high altitude forests. The biology is similar to that of *S. mexicana*.

Syntelia tajumulcensis sp. nov.
urn:lsid:zoobank.org:act:ED9559AC-A96D-41AC-BD13-A780CB3ECF92
Figs 2, 3C, G, I–J, 7, 8H

This species is very similar to *S. undosa* sp. nov. and agrees in most respects with the description of that species. The following description therefore is diagnostic and focuses on aspects in which the two species differ.

Diagnosis

It is most closely similar to *S. undosa* sp. nov. from which it can be distinguished by larger body size, sparser punctation of pronotal disc and straight elytral striae. It differs from *S. mexicana* in the absence of metallic sheen, rugose dorsal head punctation, greatly enlarged apical maxillary palpomere and simple prosternal tubercle (bifid in *S. mexicana*).

Etymology

The species is named after the volcano Tajumulco, where the type series was collected.

Type material

Holotype

GUATEMALA • ♂; San Marcos, Volcán Tajumulco, north slope; 15° 03′ N, 91° 53′ W; elev. 3500–3900 m; 26 May 1973; Terry Erwin and Gary Hevel leg.; Central American Expedition; USNM.

Paratypes

GUATEMALA • 1 ♂, 2 ♀♀; same collection data as for holotype; USNM • 1 ♂; same collection data as for holotype: MEBHK.

Description

Habitus. Similar to *S. undosa* sp. nov. but larger in overall body length (14–17 mm).

Head. Lacking median longitudinal depression, with more evenly spaced and consistently sized punctation; punctures slightly denser posteriorly; punctures present directly behind eyes.

Antennae. As in *S. undosa* sp. nov.

Mandibles. As in *S. undosa* sp. nov. with smaller punctures in basal, external corner.

Maxillae. As in *S. undosa* sp. nov. but with two additional prominent setae on the second maxillary palpomere (missing in *S. undosa*).

Labium (Fig. 6). As in *S. undosa* sp. nov. but with larger ligula.

Pronotum. Elongate, trapezoidal (Figs 2A, 3B); moderately convex transversely; disc with regular, dense punctation, slightly more densely arranged around midline of basal region; lateral and posterior margin with punctate marginal groove which continues a short distance along anterior edge; punctation of hypomeron dense, punctate region and impunctate anterior angle of hypomeron sharply separated by sulcus, extending from prosternal suture towards, but not reaching pronotal margin.

Prosternum. As in *S. undosa* sp. nov.; central, ventrally directed tubercle blunt, with several strong setae.

Scutellum. As in *S. undosa*.

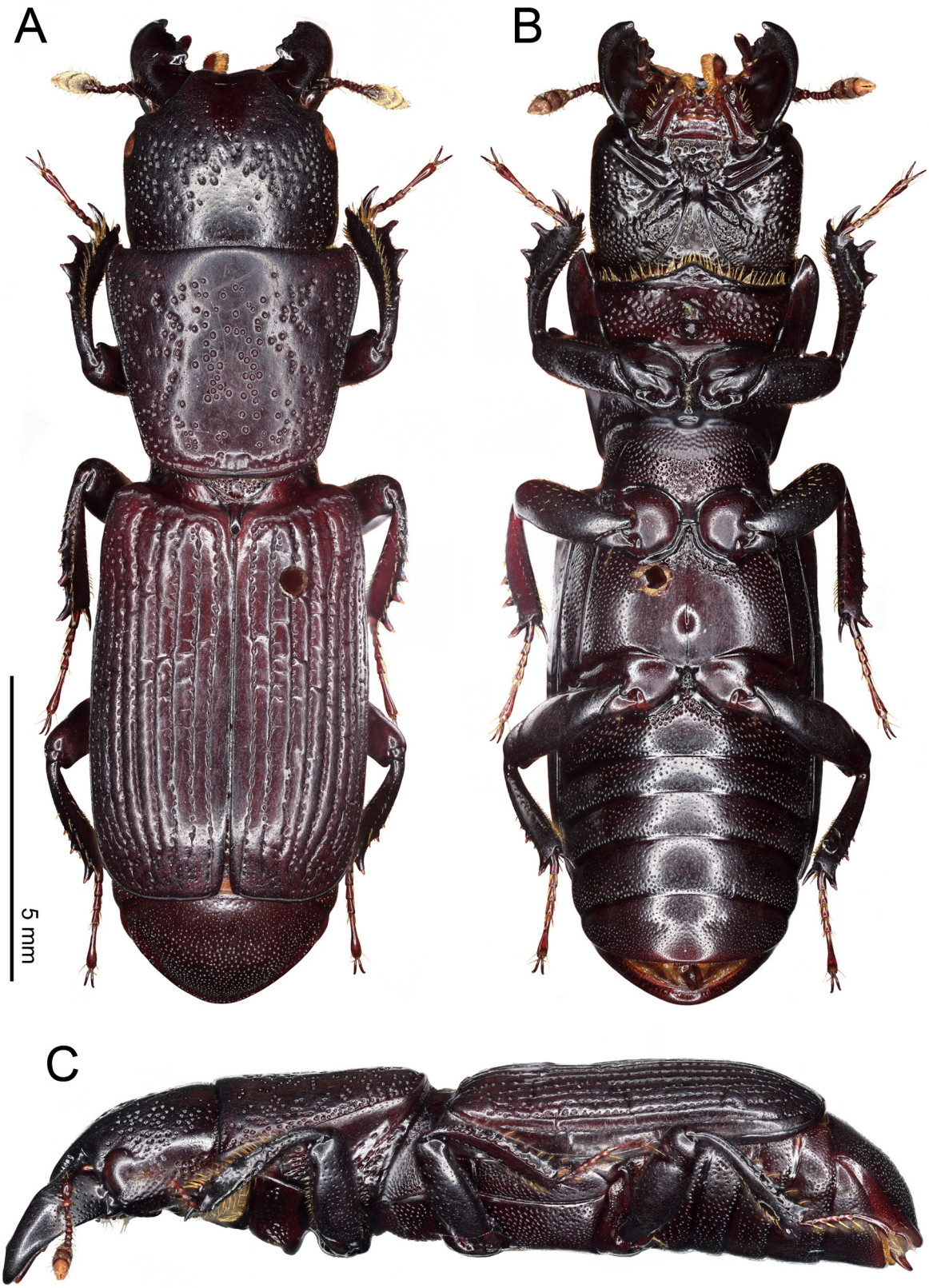


Fig. 2. *Syntelia tajumulcensis* sp. nov., paratype, ♂, MEBHK. **A**. Dorsal view. **B**. Ventral view. **C**. Lateral view.

Mesepimeron and mesepisternum. As in *S. undosa* sp. nov.

Elytron. Bearing 10 punctate striae without undulations, otherwise as in *S. undosa* sp. nov.

Metaventrite and abdomen. As in *S. undosa* sp. nov., with tergite VII (pygidium) covered in evenly spaced punctation, the punctures separated by their own diameter.

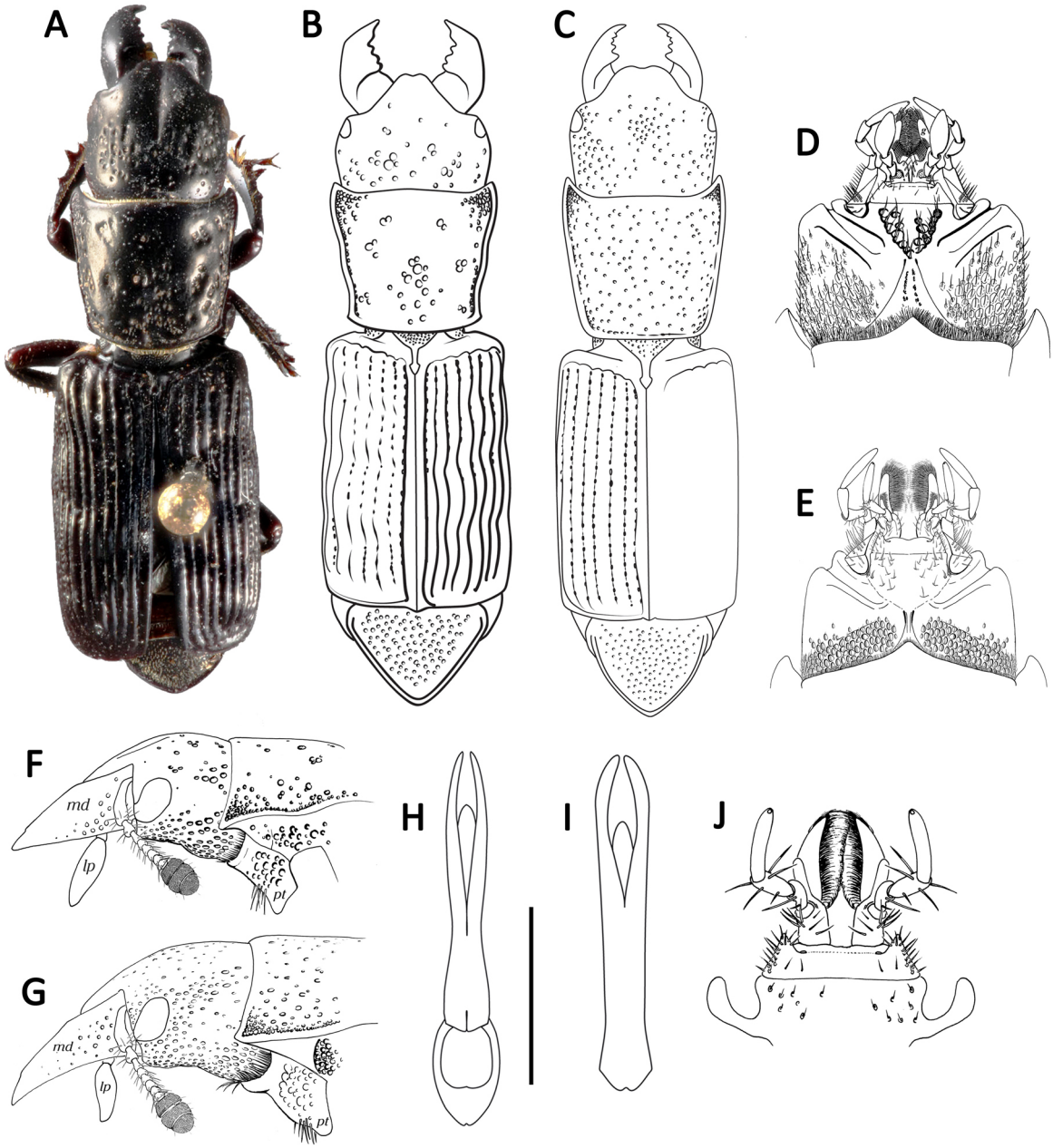


Fig. 3. A–B, D, F, H. *Syntelia undosa* sp. nov. **C, G, I–J**. *S. tajumulcensis* sp. nov. **E**. *S. mexicana* Westwood, 1864. **A**. Dorsal view, paratype, ♂, OSAC. **B–C**. Dorsal view. **D–E**. Head, ventral view. **F–G**. Head, lateral view. **H–I**. Aedeagus, dorsal view. **J**. Labium detail. Abbreviations: g = galea; lp = labial palpus; md = mandible; pt = prosternal tubercle. Scale bar: H–I = 1 mm.

Legs. As in *S. undosa* sp. nov.

Aedeagus. Differing from *S. undosa* sp. nov. in the relative length of the parameres which are separated for less than half the distance between the basal piece and the posterior apices (Fig. 3I).

Biology

The specimens were collected in high altitude pine forests. The biology of this species is similar to *S. mexicana.*

Syntelia mexicana Westwood, 1864
Figs 4, 6C, 7, 8D

Material examined

MEXICO • 2 specs; Veracruz, Cofre de Perote, N slope, 10.0 mi. S of Las Vigas; [19.5° N, 97.15° W]; elev. 9600 ft; 24 Jul. 1967; G.E. Ball, T.L. Erwin and R.E. Leech leg.; FMNH • 2 specs; same data as for preceding; MCZ • 2 specs; same data as for preceding; UASM • 1 spec.; same data as for preceding; USNM • 1 spec.; Veracruz, 14 km NW of Xijo, E slope of Cofre de Perote; 19°29′13″ N, 97°06′58″ W; elev. 2950 m; 19 Jul. 2021; J. Simon-Pražák leg.; wet pine forest; JSPC.

Redescription

Habitus. Body elongate, subcylindrical (~15–20 mm), cuticle smooth, shiny and black, elytra fully striate.

Head. With clear dorsomedial longitudinal depression; dorsally with delicate, irregularly spaced punctation of variable size mostly in lateral areas. Clypeus emarginate anteriorly. Clypeolabral suture barely visible, labrum very small rounded anteriorly.

Antennae. 11-segmented, scape elongate, weakly geniculate, pedicel round, antennomere 3 elongated, antennomeres 4–7 rounded, shining, with sparse setation; eighth antennomere discoid, weakly cupuliform; terminal three antennomeres (9–11), tomentose, tightly associated, forming a large, almost symmetrical 3-segmented club.

Mandibles. Linear length from dorsal articulation to apical tip nearly equivalent to midline length of exposed head; molar region thin, covered with long, orange setation; mid- to apical internal edge raised, thickened and unevenly serrate; each mandible bearing four teeth; apices acuminate; entire mandible excavated ventrally, enclosing maxillae and labium; external lateral surface with punctation in basal, external corner.

Maxillae and labium. As in *S. undosa* sp. nov. but apical labial palpomere long and slender, slightly shorter and narrower than apical maxillary palpomere.

Pronotum. Elongate, trapezoid; moderately convex transversely; disc with irregular, deep punctures, most dense medially; lateral and posterior margin with punctate marginal groove which continues a short distance along anterior edge; hypomeron punctate except directly below lateral pronotal margin and in anterior-most angle.

Prosternum. Anterior edge prolonged medially into point; transverse groove behind anterior edge that is medially divided; irregularly rugose punctation posterior to transverse groove; central, prominent, ventrally directed tubercle situated between procoxae and transverse groove; procoxal cavities closed posteriorly.

Scutellum. Anteriorly shield-shaped and densely punctate, becoming greatly narrowed posteriorly, widening slightly again posteriorly.

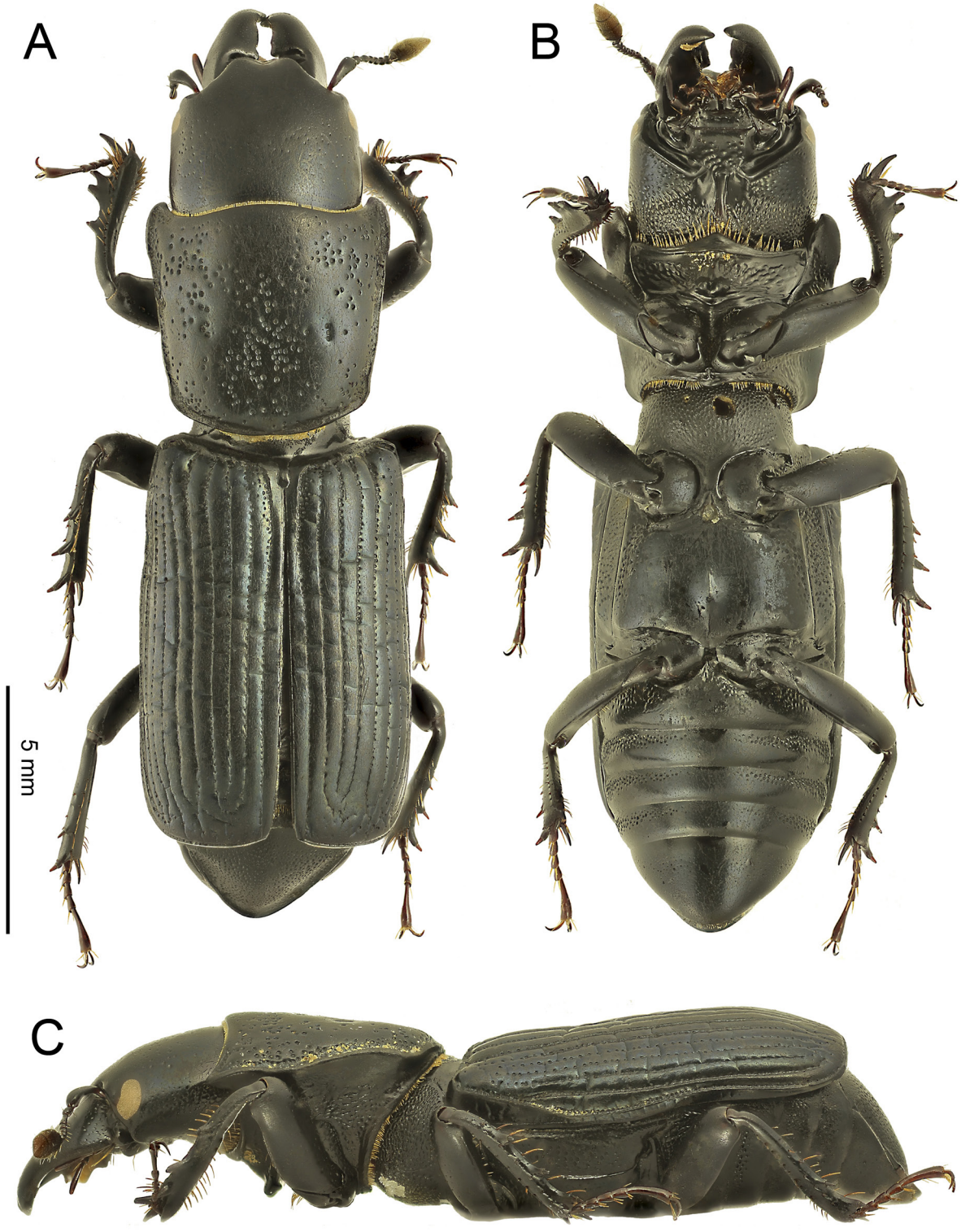


Fig. 4. *Syntelia mexicana* Westwood, 1864, JSPC. **A**. Dorsal view. **B**. Ventral view. **C**. Lateral view.

Mesepimeron and mesepisternum. As in *S. undosa* sp. nov.

Mesoventrite. Punctate (except between mesocoxae), generally convex; mesoventral process medially concave, posteriorly rounded, truncate.

Elytron. Elongate; apically truncate; bearing 10 dorsal punctate striae; sometimes (variable) posteriorly connected in pairs, forming round arches; interstriae convex. Subhumeral and epipleural striae present, complete.

Metaventrite. Elongate, discal region impunctate (except anterior corners) and with a posteriorly pronounced medial longitudinal sulcus,; lateral regions with setiferous punctures; fusing anteriorly with mesoventrite between mesocoxae; pronounced 'Λ' shaped groove anteriorly between mesocoxae; posteriorly with short, faintly notched metacoxal process.

Hind wings. Described in Lawrence *et al.* (2022).

Abdomen. Tergite VII (pygidium) exposed, triangular shaped with rounded corners, weakly convex with upturned marginal edge, covered in dense, punctation, punctures separated by 1–2 times their diameters; abdominal segments III–VI evenly punctate.

Legs. As in *S. undosa* sp. nov.

Biology

According to personal communications from two of the collectors (G.E. Ball, T.L. Erwin), the series of specimens from Cofre de Perote were found under the bark of large pine logs or under the logs themselves, thus agreeing in habitat with the original collection made by Sallé (1873). The specimen collected by J. Simon-Pražák (along with two larvae) was found in high altitude mixed forest (Fig. 6E), inside a small, almost completely rotten pine log (about 20 cm diameter) with bark still attached (Fig. 6C, E–F).

Previously published distribution records

Holotype and one other specimen: MEXICO • 2 specs (holotype and one other specimen); [Veracruz] Rancheria del Jacale; [18.90° N, 97.20° W]: May 1855; on "pic d'Orizaba" excursion, near snow, under bark of very large fallen half-buried pine log (Sallé 1873).

Sallé (1873) collected two specimens together, one of which he sent to Mniszech (collection now in Paris), which was subsequently described by Westwood (1864) and is now the holotype; the second was retained by Sallé and is now in BMNH, but has no type status.

Syntelia westwoodi Sallé, 1873
Figs 5, 6A–B, 7, 8D

Material examined

MEXICO – **Oaxaca** • 1 spec.; 3.4 km S of Santiago Chazumba, Rte. 125; [18.15° N, 97.68° W]; elev. 1670 m; 21 Aug. 1992; G.E. Ball and H.E. Frania leg.; dead saguaro cactus; "67-92"; UASM • 1 spec.; Mitla; [16.91° N, 96.44° W]; elev. 5500 ft; 26 Jul. 1962; H.E. Milliron leg.; in rotting cactus; CNC • 5 specs; 3.5 miles E of turnoff for Mitla on road to Ayutla; [16.925° N, 96.319° W]; elev. 6000 ft; 6 Sep. 1973; A. Newton leg.; in pile of fermenting pieces of large multi-columnar cactus freshly cut on 23 Aug. 1973; FMNH – **Puebla** • 3 specs; Zapotitlán Salinas; 18°18′14″ N, 97°30′09″ W; elev. 1550 m; 5 Aug. 2021; J. Simon-Pražák and S. Dementyev leg.; cactus forest with bush; JSPC • 9 specs; same data as for preceding; SDC • 1 spec.; San Bernardo, Acatlán de Osorio Puebla; 18°12′ N, 98°06′ W; Apr. 2012; CZUG • 1 spec.; Tehuacán; ZMHB • 2 specs; no locality; ZMHB.

Redescription

Habitus. Body elongate, subcylindrical, robust (~25–30 mm), cuticle smooth, matt and black, elytra with reduced striation, large, prominent, heavily sclerotized mandibles.

Head. Frons smooth without depressions, punctation present in anterior corners of frons and lateral parts of clypeus. Frontoclypeal suture visible as very thin fragments on the sides. Clypeus anteriorly emarginate. Labrum wide and truncate.

Antennae. 11-segmented, scape elongate, only slightly curved. Pedicel short and bulbous. Antennomere 3 long (twice as long as 4). Antennomeres 4–7 short and wide. Antennomere 8 wide, cupuliform, tightly adjacent to the three segmented and setose club.

Mandibles. Almost as long as frons + clypeus, slightly curved ventrad, delicately punctate (with coarser punctures basally). Inner edge with three blunt teeth.

Maxillae and labium. As in *S. undosa* sp. nov.

Pronotum. Wide (wider than long), width increasing anteriorly. Disc with only miniscule, hardly visible punctures. Lateral and posterior edges with a marginal groove, barely curved onto the anterior edge and widely interrupted behind the head. Hypomeron smooth.

Prosternum. Anterior edge prolonged medially into a widely angulate point; transverse groove behind anterior edge that is medially divided, dense, shallow punctation in posterior half of prosternum. Central, prominent, ventrally directed tubercle with sparse setae situated between procoxae and transverse groove; procoxal cavities closed posteriorly.

Scutellum. Anteriorly shield-shaped and densely punctate, becoming greatly narrowed posteriorly forming a sharp angle.

Mesepimeron and mesepisternum. As in *S. undosa* sp. nov.

Mesoventrite. Anteriorly punctate, generally convex; mesoventral process medially concave, posteriorly rounded, truncate.

Elytron. Elongate; apically truncate, covering entire propygidium, smooth and matt; with an entire sutural stria, one complete and one fragmented dorsal stria, full subhumeral stria and epipleural stria. All striae thin and shallow.

Metaventrite. Wide, discal region impunctate (except anterior corners) and with a more posteriorly pronounced medial longitudinal sulcus; lateral regions with setiferous punctures; fusing anteriorly with mesoventrite between mesocoxae; pronounced 'Λ' shaped groove anteriorly between mesocoxae; posteriorly with short, faintly notched metacoxal process.

Hind wings. Described in Lawrence *et al.* (2022).

Abdomen. Tergite VII (pygidium) exposed, triangular shaped with rounded corners, weakly convex with upturned marginal edge (forming a marginal pygidial groove), entirely smooth; abdominal segments III–VI evenly finely punctate.

Legs. Protibia with six teeth along the outer edge (most basal one short, others prominent) and two large protibial spurs (one twice the size of the other). Inner edge with two rows of long thick and dense setae, the upper row only in anterior half. Protarsal groove margined by two widely separated rows of

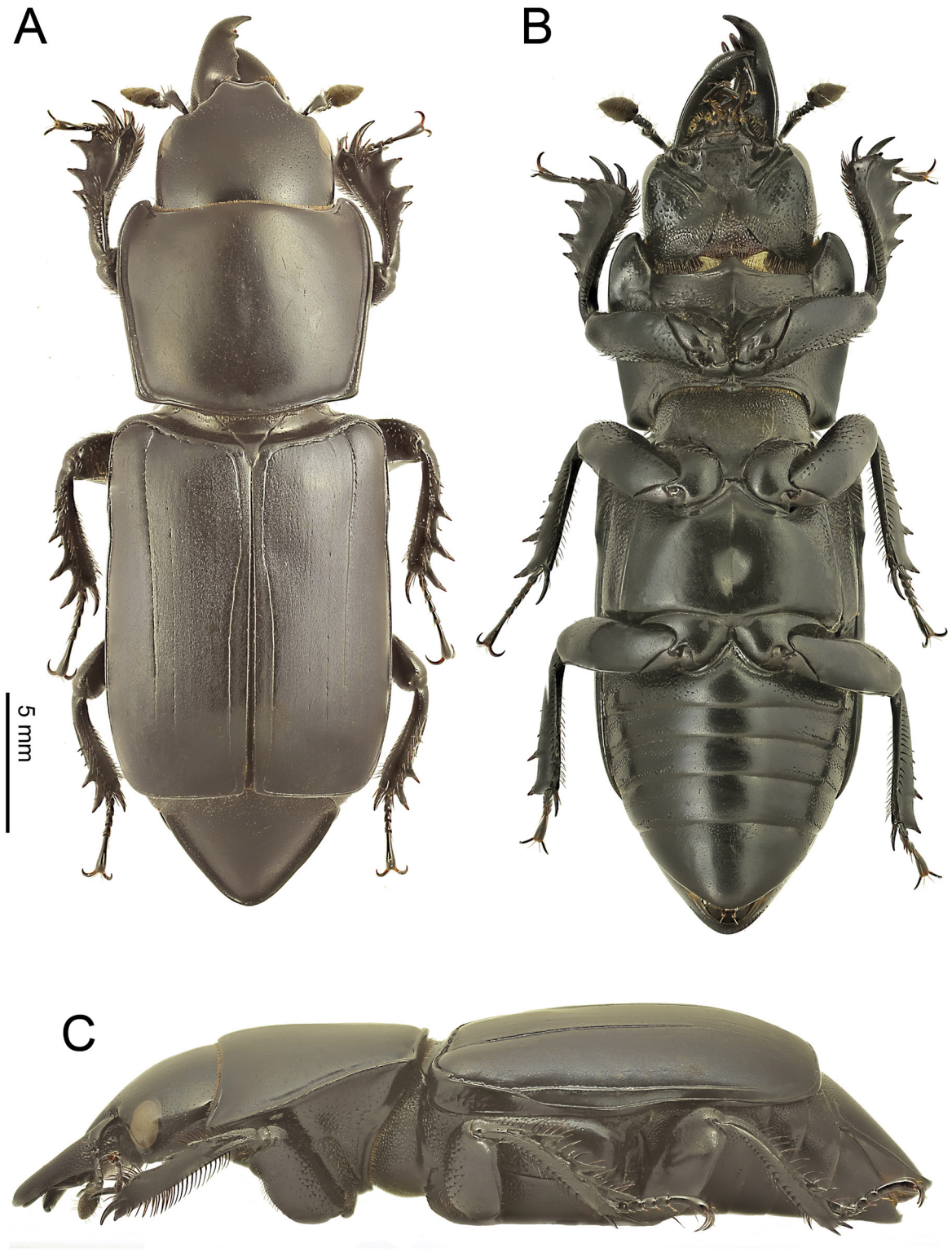


Fig. 5. *Syntelia westwoodi* Sallé, 1873, JSPC. **A**. Dorsal view. **B**. Ventral view. **C**. Lateral view.

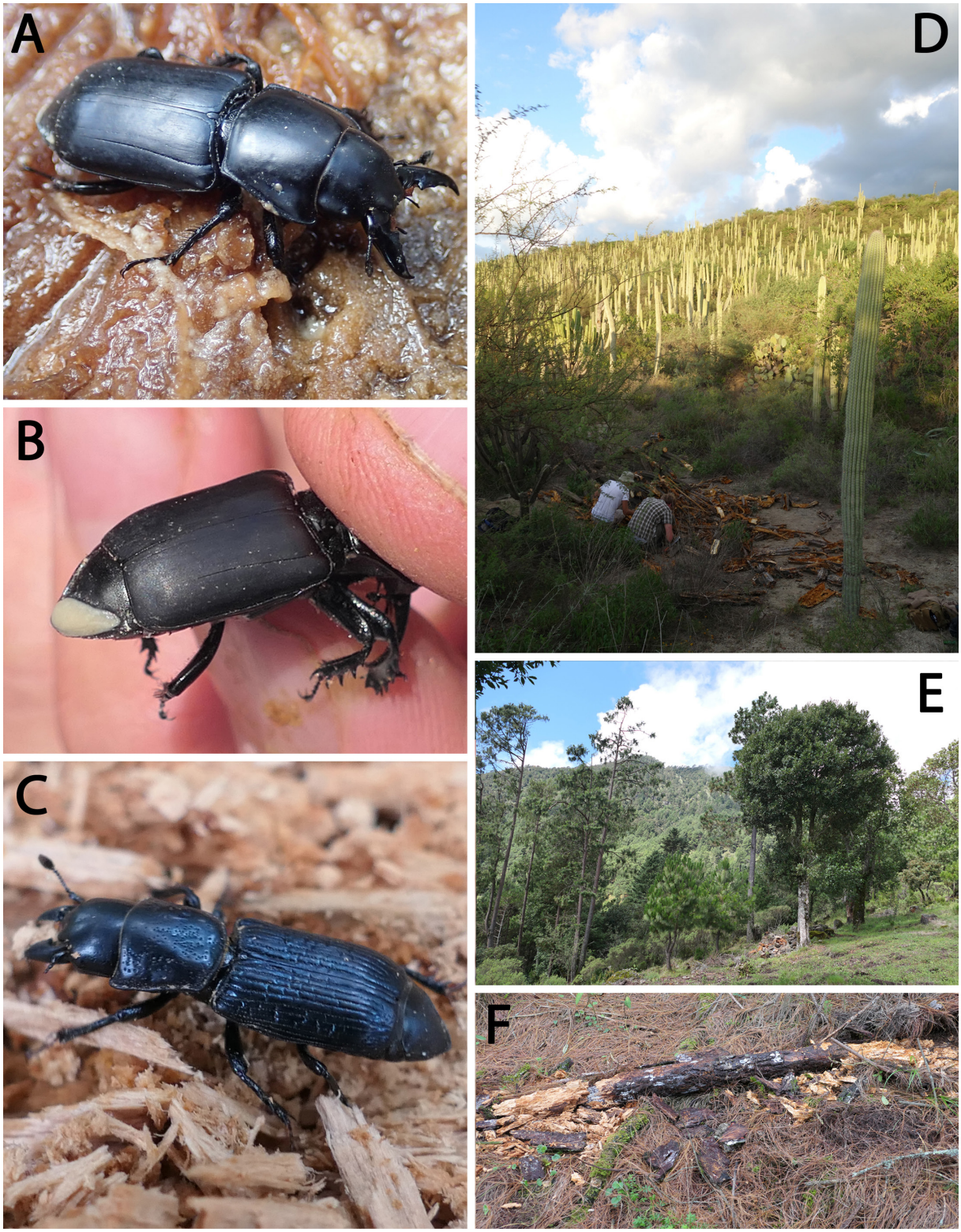


Fig. 6. Field photos. **A**. *Syntelia westwoodi* Sallé, 1873 in fermenting cactus. **B**. *S. westwoodi* defence secretion. **C**. *S. mexicana* Westwood, 1864 in rotten wood. **D**. Biotope and habitat (fallen *Myrtillocactus* sp., Puebla, Mexico) of *S. westwoodi*. **E**. Biotope of *S. mexicana*. **F**. Habitat (pine log, Veracruz, Mexico) of *S. mexicana.*

long setae. Profemur punctuate and setose on the outer edge. Procoxae nearly contiguous, moderately prominent and transverse. Mesotibia with three prominent and several smaller teeth on the outer edge and three comb-like rows of long setae – two along the inner edge, one along the outer edge. Two large mesotibial spurs present (one twice the size of the other; smaller than in protibial spurs). Mesofemur anteriorly punctuate and setose. Mesocoxae more widely separated, ovate. Metatibia as mesotibia but with two large teeth apically and a shorter pair or short metatibial spurs. Metafemur smooth. Metacoxae nearly contiguous, transverse, narrowing laterally to an anteriorly directed rounded point.

Biology

Syntelia westwoodi, by far the largest species of the genus, is unique among its congeners in its association with decaying cacti in relatively high-altitude arid regions, rather than decaying trees in pine or hardwood forests. The adults collected by the third author (AFN) near Mitla, Oaxaca on fermenting cuttings of columnar cacti were kept alive for several weeks and observed to prey upon maggots feeding on the rotting cactus, but no mating or oviposition was observed and no *Syntelia* larvae were found. Contemporaneous cuttings of fresh pieces of non-columnar *Opuntia* (L.) Mill., were also left to ferment by (AFN) at two other arid sites in Oaxaca (1.6 miles west of Mitla turnoff at 5600 ft, and 2.1 miles west of Totalapam at 3500 ft). Both failed to attract *S. westwoodi*. The second author (JSP) collected adult and larval specimens in decaying standing stems of *Neobuxbaumia* Backeb. cactus (Fig. 6A, D) and in fallen and rotten *Myrtillocactus* Console. A secretion of a white liquid with musky odour (possibly anti-predatory) from the marginal pygidial groove of the beetle was observed (Fig. 6B) when the beetle was handled. Bravo-Avilez *et al.* (2019) reported adults of *S. westwoodi* from decaying material and dry branches on two species of living columnar cacti of the genus *Stenocereus* (A.Berger) Riccob.

Previously published distribution records

Holotype

MEXICO • Oaxaca, vicinity of Rancho de la Parada; [17.2° N, 96.6° W]; elev. 2500–3000 m (Sallé 1873).

Other specimens

MESICO • 8 specs; [Puebla] Tehuacán; [18.5° N, 97.2° W]; Höge leg. (Sharp 1891).

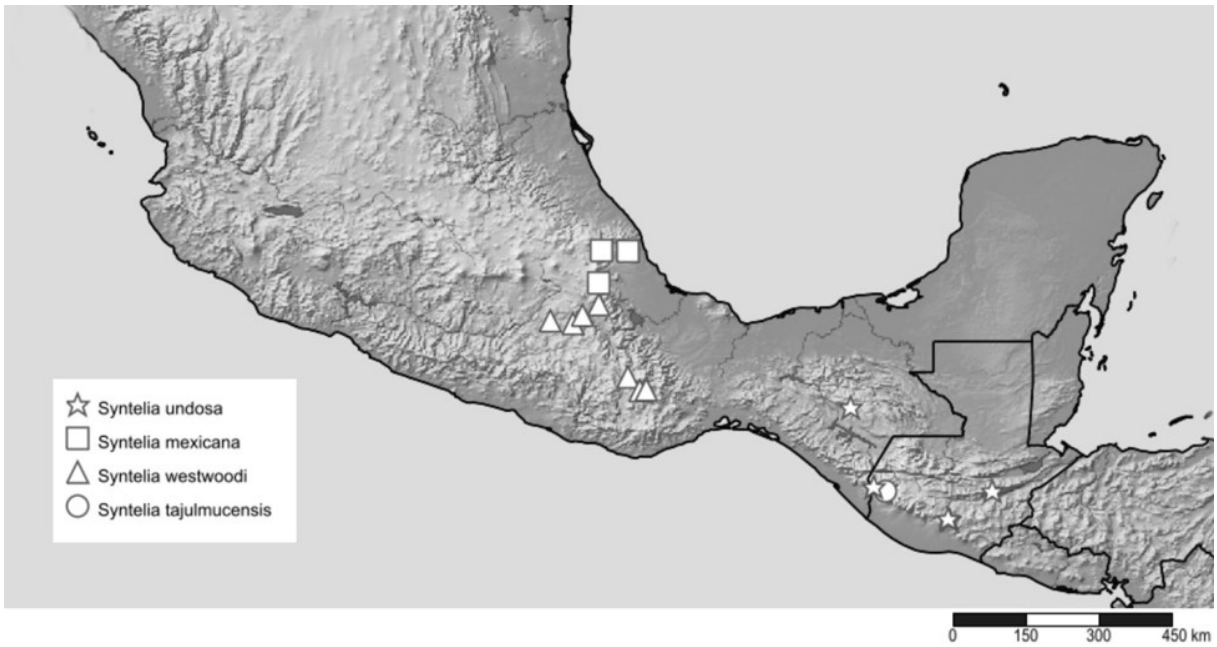


Fig. 7. Known occurrence records of New World species of *Syntelia*.

World checklist of Synteliidae

The last formal catalog of Synteliidae (Hetschko 1926) excluded *S. davidis*. This checklist includes all available names proposed to date for members of the family.

Syntelia Westwood, 1864: 11
Type species: *Syntelia indica* Westwood, 1864 designated by Kryzhanovsky & Reichardt (1976)

Syntelia davidis Fairmaire, 1889: 11 (Fig. 8E)
Type locality: China: "Moupin" [in Sichuan province, teste Kryzhanovsky & Reichardt (1976)]
Syntype depository: Muséum national d'Histoire naturelle, Paris, France
Distribution: China (Sichuan)

Syntelia histeroides Lewis, 1882: 138 (Fig. 8H)
Type locality: Japan: S. Hokkaido; Yashiu; Higo; Sado
Syntype depository: Natural History Museum, London, Great Britain
Distribution: Japan, Russia (Kuril Islands)

Syntelia indica Westwood, 1864: 11 (Fig. 8C)
Type locality: "India Orientali" ["hautes montagnes de l'Himalaya", teste Sallé (1873)]
Holotype depository: Hope Entomological Collections, Oxford, Great Britain
Distribution: northern India, northern Myanmar

Syntelia mazuri Zhou in Zhou & Yu, 2003: 267 (Fig. 8B)
Type locality: China: Sichuan: Emei Mt (27°01′ N, 103°19′ E), 1800–1900 m
Holotype depository: Institute of Zoology, Academia Sinica, Beijing, China
Distribution: China (Shanxi, Sichuan)

Syntelia mexicana Westwood, 1864: 11 (Figs 4, 8D)
Type locality: "Mexico" ["Rancheria del Jacale", on excursion to "pic d'Orizaba", teste Sallé (1873)]
Holotype depository: Muséum national d'Histoire naturelle, Paris, France
Distribution: Mexico (western Veracruz)

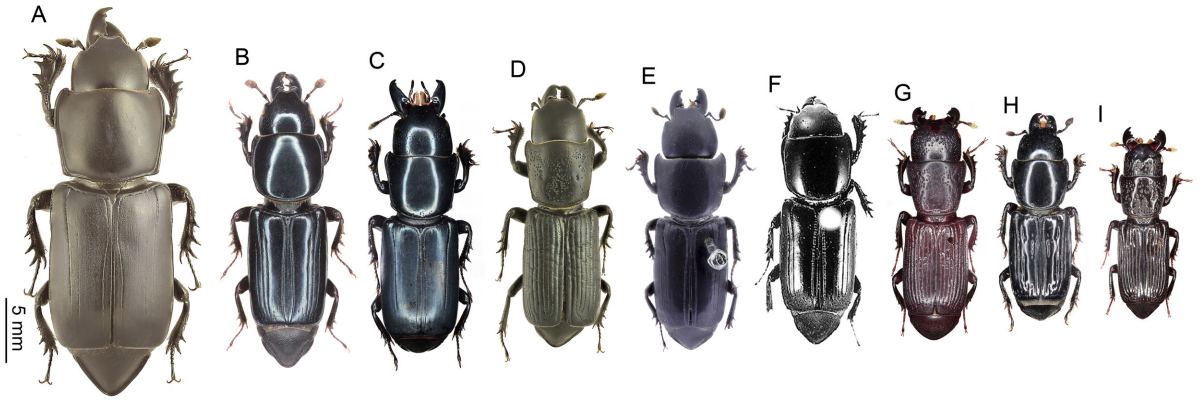


Fig. 8. Dorsal views of all known recent species of Synteliidae family. **A**. *S. westwoodi* Sallé, 1873. **B**. *S. mazuri* Zhou, 2003. **C**. *S. indica* Westwood, 1864. **D.** *S. mexicana* Westwood, 1864. **E**. *S. davidis* Fairmaire, 1889. **F**. *S. sinica* Zhou, 2003 (adapted from Zhou & Yu 2003). **G**. *S. tajumulcensis* sp. nov. **H**. *S. histeroides* Lewis, 1882. **I**. *S. undosa* sp. nov.

Syntelia sinica Zhou in Zhou & Yu, 2003: 267 (Fig. 8F)
Type locality: China: Sichuan: Heshui County (32°06′ N, 102°49′ E), 2775 m
Holotype depository: Institute of Zoology, Academia Sinica, Beijing, China
Distribution: China (Shanxi, Sichuan)

Syntelia sunwukong Jiang & Wang, 2021
Type locality: Lowermost Upper Cretaceous (Cenomanian, ca 99 Ma) amber; Tanai, Hukawng Valley, northern Myanmar
Holotype depository: Qingdao University of Science and Technology, Qingdao, China
Distribution: fossil species found in Kachin amber, Myanmar

Syntelia tajumulcensis sp. nov. (Figs 2, 8G)
Type locality: Guatemala: Volcán Tajumulco, 3500–3900 m
Holotype depository: National Museum of Natural History, Washington DC, USA
Distribution: Guatemala (San Marcos)

Syntelia undosa sp. nov. (Figs 1, 8I)
Type locality: Guatemala: San Marcos, Volcán Tacaná, 9000 ft
Holotype depository: Strickland Entomological Museum, University of Alberta, Edmonton, AB, Canada
Distribution: Guatemala (El Progreso, San Marcos), Mexico (Chiapas)

Syntelia westwoodi Sallé, 1873: 13. (Figs 5, 8A)
Type locality: Mexico: Oaxaca, Rancho de la Parada, 2500–3000 m
Holotype depository: Muséum national d'Histoire naturelle, Paris, France
Distribution: Mexico (Oaxaca, Puebla)

Key to extant species of Syntelia (Coleoptera: Synteliidae)

The following key can be used to identify all known Mesoamerican species in the genus. Because the Asian species are currently being revised, this key groups them all under '*indica* group'.

If you are using this key to identify specimens for a published work (online or in print), please include a full citation to this publication in the bibliography.

1. Mandibles usually with at least 4 distinct teeth along mesial edge (the teeth may be worn down in older individuals); disc of pronotum with numerous coarse irregularly arranged punctures; elytron with 10 complete punctate striae (some may be interrupted or confused, especially toward apex); prosternum with prominent median tubercle (or bifid tubercle) anterior to coxae (*S. mexicana* group) 2
– Mandibles usually with 3 distinct teeth along mesial edge; disc of pronotum without coarse punctures, or with coarse punctures only near sides; elytron with 5 or fewer complete punctate striae (e.g., moderately deep, relatively continuous and extending more than ½ length of elytron); prosternum with or without a median tubercle 4

2. Dorsum of body with distinct but dull metallic blue/green sheen; punctation of head very sparse medially, more dense toward sides, the largest punctures only about half as large as those on pronotum; apical labial palpomere normal, long and slender, slightly shorter and narrower than apical maxillary palpomere; punctures at middle of pygidium separated on average by several times the diameter of a puncture; prosternal tubercle bifid; abdominal ventrites 2–4 each with coarse punctures concentrated in narrow band across middle; size larger, ~18–22 mm long (tip of mandibles to apex of pygidium); western Veracruz, Mexico ..... ***S. mexicana*** Westwood, 1864

– Dorsum of body without metallic sheen; head with more or less irregularly scattered punctures which are as large as those on pronotum; apical labial palpomere greatly enlarged, longer and more than twice as broad as apical maxillary palpomere and of unique shape (Fig. 3D); punctures at middle of pygidium separated on average by at most the diameter of a puncture; abdominal ventrites 2–4 with coarse punctures scattered across apical half or more of each ventrite; prosternal tubercle entire; size smaller, ~12–16 mm from apex of mandibles to apex of pygidium; Guatemala and Chiapas, Mexico 3

3. Coarse punctures of head (especially posteromedially from eye) intermixed with about equal number of smaller punctures; temple moderately punctate immediately behind eye but impunctate basally (Fig. 3G); punctation on either side of midline of pronotum more or less evenly scattered; pygidium with punctures at middle separated on average by about their diameters or slightly less (Fig. 3C); aedeagus with parameres dorsally fused anteriorly for about half of their length, each paramere gradually but distinctly widened before apex (Fig. 3I). Guatemala ..... ***S. tajumulcensis*** sp. nov.
– Head with few or no smaller punctures on interstices between coarse punctures; temple with nearly impunctate band extending from eye to base of head (Fig. 3F); punctation on either side of midline of pronotum strongly concentrated on basal half; pygidium with punctures at middle separated on average by much less than their diameters, many subcontiguous (Fig. 3B); elytra with three longitudinal undulations; aedeagus with parameres dorsally fused for less than half of their length, each paramere slender and not distinctly widened before apex (Fig. 3H). Guatemala and Chiapas, Mexico ..... ***S. undosa*** sp. nov.

4. Dorsum with very fine dense microsculpture, rather dull; scutellum triangular shaped (not constricted and then widened before apex); elytron with only 3 more or less complete, finely impressed striae (corresponding to striae #1, 5 and 10 from suture); pygidium at middle with very fine, widely separated punctures; gula with only vague indication of mid-longitudinal carina anteriorly; protibia usually with 5 (sometimes 6) external spines; prosternum with a median tubercle; size large, ~ 27–32 mm long; xeric areas of Puebla and Oaxaca, Mexico (*S. westwoodi* group) ..... ***S. westwoodi*** Sallé, 1873
– Dorsum without or with scarcely evident microsculpture, shining; scutellum constricted and then widened before apex (similar to Fig. 3A–B); elytron usually with 5 more or less complete, deeply impressed striae (corresponding to striae #1, 4, 5, 6 and 10 from suture); pygidium at middle rather coarsely, moderately densely punctate; gula with mid-longitudinal carina; protibia usually with 4 (sometimes 5) external spines; prosternum lacking a distinct tubercle and longitudinally carinate along midline; size small, ~12–16 mm long; eastern Asia ..... ***S. indica*** group

Discussion

Most published accounts of the Synteliidae focus on particular morphological features and/or their phylogenetic position within the Polyphaga. Since specimens are infrequently encountered, few biological observations of living specimens have been made. A brief account of *S. histeroides* was provided by Lewis who noted that the species was relatively abundant at various sites in Japan where adults could be found under moist bark during the winter months and during the summer at the exuding sap of young oaks (6–8 inches diam.). Sallé (1873) reported collecting *S. mexicana* from under a large pine log. Based on adult morphology, collection locations and relations to the Histeridae, Sharp (1891) inferred that synteliids likely developed in or under tree bark, preying on other arboricolous insects. More than 80 years later, Mamaev (1974) confirmed Sharp's suspicions by publishing the first account of larval Synteliidae (*S. histeroides*) found under the decaying bark of a cork tree. Mamaev observed active predation by the larvae on other insects and a preference for the blackened phloem of the fallen tree. The larva was later redescribed by Newton (1991). Zaitsev (2010) published detailed photographs of *S. histeroides* larvae online in a Flickr archive. The immature stages of the new world species remain undescribed.

A phylogenetic analysis of the species within Synteliidae has not been performed although would undoubtedly be of interest both biogeographically as well as for its relevance to the phylogenies of closely allied groups. The description of the larvae of any New World species, especially *S. westwoodi*, would certainly be phylogenetically informative. It is hoped that this paper will inspire additional field work focused on these unusual beetles.

Data availability

All data used in this study are contained in the text.

Author contribution

Conceptualisation, investigation, methodology, resources, writing – original draft, writing – review & editing: CJM, JSP, AFN. Supervision: AFN. Visualization: CJM, JSP.

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